

## Chapter 5

### Methodological issues



## Overview

The release of data from the 2011 Census has provided the Council with an opportunity to reassess and evaluate its basis for estimating housing supply and latent or underlying demand as well as the housing shortfall.

While the Census has provided an up-to-date source of information to assess Australia's housing situation, it has also thrown up a wide range of technical questions to consider. This chapter starts with the population estimates that form the basis of estimates of household numbers. It then focuses on the key building block of the analysis of housing demand: household numbers and how these relate to underlying, or latent, demand. Finally it investigates some data-related issues.

The Australian Bureau of Statistics (ABS) made a sizeable downward revision to the estimated number of people living in Australia as at August 2011 from what had been implied from estimates of population growth since the previous Census in 2006. On the methodology currently employed by the Council, this would automatically lead to a reduction in the estimate of the underlying number of households and, consequently, to a downward revision to the Council's estimate of housing shortage. However, questions arise as to whether the revised population estimate can be automatically translated into a revised household estimate.

When published, ABS population estimates will be revised back to 1991<sup>1</sup> and the impact of this adjustment will likely be spread unevenly across the 1991–2011 period. As population estimates and changes feed into the Council's methodology for calculating housing demand at several stages in the process, there are clear challenges in producing consistent historic data. Meanwhile, some of the estimates the Council's methodology links to, such as actual and projected household numbers, are unlikely to be updated.

As a consequence, for its next State of Supply report the Council will evaluate whether, and if so how, recent estimates of the shortfall need to be revised or whether a new methodology should be adopted. This chapter provides an initial analysis of the factors that have contributed to the Council's past estimates of shortage and of the implications of revised population data on these estimates. It then considers how the shortage estimates might be presented to more clearly highlight the assumptions that underpin them. The Council is mindful of taking account of the latest information and, potentially, simplifying how any housing shortfall is measured.

Chapter 2 pointed to a range of areas where the population's housing circumstances have changed. This chapter looks at some of the technical challenges faced by the Council in assessing the balance between housing supply and latent or underlying

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1 ABS December 2012, *Australian Demographic Statistics*, June quarter 2012, cat no. 3101.0.

demand. The release of the preliminary results of the 2011 Census raised a range of issues to consider. Some commentators and analysts suggested that the Census showed there is no housing shortfall. The Council does not agree with this assertion, for a variety of reasons outlined in this chapter. From the Council's perspective, the shortfall is based on how many more homes a given population would require if observed past rates of household formation were unchanged. The Census, on the other hand, simply shows how the population occupies the existing stock.

The analysis offers further support to that presented in Chapter 2 for the notion of a housing shortfall by showing how household formation rates have changed in each five-year age group since 2001. These changes have an impact on household size over and above the impact that arises from demographic change. Several commentators have missed this point. They have failed to recognise that demographic change alone would have meant that, other things being equal, average household size would have continued to fall. The fact that it has been relatively stable over the past decade means that there have been changes in the rate of household formation. People of the same age are less likely to form households than a decade ago. Household growth ran above and beyond population and age-related drivers up to 2001. But this turned decisively in the early part of the last decade. In other words, for some reason the rate of household formation slowed from around 2001 to below that which the purely demographic drivers suggested would be the case given the experience of previous decades. The Council contends that this is at least partly due to housing availability.

First, it is important to understand what drives household growth.

## Drivers of household growth

Supporting evidence of a housing shortfall can be seen in an analysis of the source of household growth between Censuses. Over the past few decades, the number of households has grown more rapidly than the population. This can be attributed to changes in the age distribution of the population and to changes in the propensity (likelihood) for each age group to form households. Table 5.1 breaks down growth in the number of households between Censuses into three parts: population growth, age structure and other factors (the primary driver of which is a change in the propensity to form households). The analysis is based on the share of households and people from the Census rather than on absolute numbers. This minimises the impact of revisions to population estimates (see later in this chapter).

**Table 5.1 Sources of growth in number of households, 1961–66 to 2006–11, Australia (thousand households)**

	Growth in households ('000s) from change in			
	Population	Age composition	Other factors	Total
1961–66	317	-84	138	370
1966–71	366	-31	183	519
1971–76	314	1	155	470
1976–81	455	43	30	528
1981–86	450	56	13	519
1986–91	484	87	-95	476
1991–96	367	121	129	616
1996–2001	200	93	170	463
2001–06	484	61	-98	447
2006–11	657	34	-38	653
<b>Total</b>	<b>4,094</b>	<b>381</b>	<b>586</b>	<b>5,061</b>
Relative contribution (per cent)				
1961–66	85.6	-22.8	37.2	100
1966–71	70.7	-5.9	35.2	100
1971–76	66.8	0.2	33.0	100
1976–81	86.1	8.2	5.8	100
1981–86	86.8	10.7	2.5	100
1986–91	101.6	18.3	-19.9	100
1991–96	59.5	19.6	20.9	100
1996–2001	43.2	20.1	36.7	100
2001–06	108.2	13.6	-21.8	100
2006–11	100.6	5.2	-5.8	100
<b>Total</b>	<b>80.9</b>	<b>7.5</b>	<b>11.6</b>	<b>100</b>

Source: Indicative Planning Council (IPC) for the Housing Industry 1993. Subsequent ABS Censuses of Population and Housing. NHSC calculations.

Note: The IPC's method for disaggregating the drivers of household growth is based around household reference persons in each age group, the share of the population in each age cohort and changes to the total population. The population component is calculated from the change in population across all age groups between Censuses and the average ratio of reference people, and share of people in each age cohort, between the two periods. The age component is calculated from the average total population across the two periods, the change in the share of the total population accounted for by each age cohort in the latter period, and the average share of reference people for each cohort across the two periods. The 'other factors' component is based on the average population across the two Censuses, the change in share of reference people for each cohort, and the average share of the population accounted for by each cohort between the two periods. The full description from the IPC can be found in Appendix 2.

Population growth<sup>2</sup> is the most straightforward source driving the increase in the number of households. This has been the main driver of household growth in Australia for the last 50 years, accounting for over 80 per cent of household growth over the period. Purely by itself — that is, if all other factors remained constant — population growth would have led to a larger increase in the number of households than has actually taken place over the last decade for currently available population estimates. It is important to note that this is not inconsistent with the fact that the number of households has increased at a slightly higher rate than the population as a whole. The age distribution of the population growth is important. To give a simple example, newborn babies do not, in the short term, lead to additional households. However, adult migrant arrivals will, in many cases, form new households.

The second factor is the age structure of the population, which affects the number of households that are formed from a given population, because the likelihood of people forming households, or changing the type of household they live in, varies over their lifetime. An obvious example is that people are more likely to move out of their parental home and form a new household in their twenties than at other times in their life. At the same time their parents are more likely to see the average number of people in their household decline as a result. Any change in the age structure of the population, therefore, can change the number of households associated with a given population.

The ageing of the population in Australia has accounted for 7.5 per cent of household growth over the last 50 years. Older households are more likely to consist of just one person and, as Table 5.2 demonstrates, are more likely to be household references than younger people. Therefore, as the proportion of older people in the population increases, household size will naturally decrease and there will be more households for a given population size.

The final component of household growth is ‘other factors’, which is driven primarily by the rate of household formation within each age group. This is influenced by a range of factors, many of which are likely to be interdependent. They include social trends and cultural choices as well as constraints due to housing affordability and availability. This component identifies whether equivalent groups of people are more or less likely to form households than they did previously.

Analysis of households by age over the last decade shows a lower rate of people recorded as a household ‘reference person’ across most groups, especially among younger cohorts. The household reference person is the household member used in the Census as the starting point for identifying the relationships between usual residents of a household. The rates presented in Table 5.2 are the share of the total population in each age group that are recorded as a household reference person. It is

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2 It should be noted that the population component of growth will likely change following revisions to the Estimated Resident Population (ERP). However, this is unlikely to change the fact that it is comfortably the most significant source of household growth.

a measure of the likelihood of forming a household. The reduced likelihood of forming a household at a younger age is one potential adjustment people may make due to a lack of affordable housing.

**Table 5.2 Household reference person by age (per cent)**

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

Source: ABS Censuses of Population and Housing 2001, 2006 and 2011.

Note: The data show the share of people in each age group who are identified as reference person of the first family in a household or as reference person in a non-family household. Reference people in second and third families in a household are excluded as references but included in the total population.

As seen in Table 5.1, over the last 50 years as a whole an increase in the rate of household formation (remembering that this is after the impact of population growth and the changing age structure are accounted for) has contributed around 11 per cent to total household growth. This is perhaps unsurprising. As people became more affluent, they likely used their increased wealth to live in more comfortable circumstances. Over the last decade, however, this component has had a negative impact on household growth. In other words, there has been a decline in the net tendency for new households to form. The only other period where this occurred was between the 1986 and 1991 Censuses. While it is not possible to identify the specific reasons for this with aggregate data, the negative impact of ‘other factors’ offers support to the Council’s contention that insufficient additions to housing supply, notably in the ‘affordable’ segment of the market, has contributed to lower household formation rates.

The negative impact from ‘other factors’ was greater in the period 2001 to 2006 than in 2006 to 2011. This suggests that the housing situation changed from around 2001. There was a clear change in the mixture of drivers of household growth around that time. It provides some support for the Council’s approach in estimating the change in

the balance between supply and underlying demand by starting with a 2001 benchmark of 'equilibrium'.

## Underlying or latent demand

The analysis above shows what has driven actual household growth. One of the challenges the Council faces is to assess whether the available housing supply is adequate for, and/or has had an impact on, growth in the number of households.

To do this, the Council first estimates changes in the level of underlying demand. It looks at what household growth would be if past formation patterns had continued — this can be considered as the equivalent of keeping the 'other factors' component in Table 5.1 unchanged, or at least only allowing for it to change at a predetermined rate. This measure of underlying demand can be interpreted as potential or 'latent' demand. It measures a level of demand driven by past household formation trends and by population and age demographics. It does not necessarily represent the effective market demand that is likely to emerge in the form of new purchasers or new renters.

Potential demand will equal market demand only when households can afford to, or are willing to, buy or rent the dwellings that are available in the market. The actual number of households is constrained by the availability of housing.

The Council estimates and projects 'underlying demand' for housing as a means of assessing whether additions to Australia's housing stock are sufficient to meet recent patterns of effective (actual) demand for housing. It is the structural underpinning of housing demand, driven by population growth and the assumption that past household formation patterns continue. It is a measure of demand across the entire housing system. It includes all housing sectors (private, public and not-for-profit) and types of tenure (owner-occupation and rental).

Market demand, on the other hand, is affected by economic factors and can fluctuate cyclically, largely in accordance with variations in housing prices, rents, interest rates, household income, levels of employment and unemployment, and confidence. Measures of market demand tend to exclude non-private housing and/or the public housing sector.

In the short to medium term, estimated underlying or latent demand is primarily demographically driven, but over the long term inevitably it is also influenced by structural changes in the economy, changes in the distribution of income and wealth, urban development patterns, social and cultural change and, indeed, trends in the supply and affordability of housing.

Previous Council reports have included estimates and projections of growth in underlying demand since 2001. These have been based on modelling household net



transition probabilities,<sup>3</sup> and applying these to the ABS' Estimated Resident Population (ERP) data and its population projections. Household estimates have been derived by:

1. differentiating household composition and housing consumption patterns by the age and gender of all members of Australian households (also differentiated by state and territory and by capital city and 'rest of state') — these data are taken from the Census;
2. identifying consequent age- and gender-specific 'net probability transitions' for members of the population to move between certain types of households (single person, two related adults, two-parent families with one child and so on) and certain types of housing (owned, privately rented, rented, public rental and other); and
3. applying these transition likelihoods to the known, estimated or projected size and age/gender mix of the population at a later point in time to produce estimates of the number of households in various locations (and in various housing types, although the Council uses the latter sparingly and very carefully).

The resulting estimates of households and housing tenure are a measure of underlying demand for housing. They assume that the demographic and cultural drivers of demand continue to apply as they have done previously as the population grows. The measure can also be interpreted as a measure of housing need ('How many households do we need to accommodate?') although it must be acknowledged that this measure of need presumes a household formation rate determined by the income, wealth and observed housing preferences of the population in the base period.

In arriving at these estimates and projections, some challenging assumptions need to be made in addition to the continuation of household formation and housing consumption patterns. Most notably the Council assumes that migrants (international and interregional) have the same propensities to form households and consume housing as does the Australian population as a whole. For projections, international and interstate migration is also assumed to be sustained at a predetermined level (different assumptions give rise to the high, medium and low scenarios in the State of Supply Report). There is an implicit assumption that other drivers of household formation are all stable (or, more specifically, do not vary from the established trend) within the estimation or projection period.

For longer time periods, the latter assumption is obviously untenable. The Council has been consistently explicit about this. Apart from anything else, the emergence of a

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3 This methodology has been produced by Professor Peter McDonald and Dr Jeromey Temple at the Australian National University. A detailed technical paper can be found on the Council's website ([www.nhsc.org.au](http://www.nhsc.org.au)).

major and sustained deficit in housing supply will affect prices, housing aspirations and preferences and the distribution of housing wealth, as well as housing-related policies and program settings and other structural factors affecting housing demand. In short, underlying demand and supply would converge in the longer run, most likely due to changes on both the demand and supply sides.

The Council's measure of underlying demand is derived from numbers of people living in all forms of what the ABS calls 'occupied private dwellings'. As defined in the Census, private dwellings include social housing but exclude institutional forms of residence, such as prisons and nursing homes, and various forms of accommodation (such as hotels and serviced apartments) occupied for short periods.

This contrasts with the usual measures of market demand, which focus on the sale (and price trend) of new and established housing for private sale and (less often) on the demand for private rental housing. Market demand for housing has often been described as lacklustre or soft over the past couple of years, on the evidence of the activity and price trends outlined in Chapter 1. These observations are based on the slowdown in private home sales and on flat or declining prices. On the other hand, historically low rental vacancy rates, increasing rents and burgeoning waiting lists for social housing all point to growing demand in the housing segments of those least able to cope.

In contrast the estimation of growth in supply is relatively straightforward, although it is complicated by poor data on losses to housing stock from demolition and uninhabitability and by changes in the prevalence of second-home ownership and other sources of vacancies among existing housing stock.

## Council estimates and Census results

A number of commentators questioned the Council's findings following the first-stage release of data from the 2011 Census. Some claimed that underlying demand is lower than the Council's estimates and projections and that the Census count of households (actually, occupied private dwellings) in 2011 is considerably smaller than the Council's estimate of underlying demand.

There are several reasons why direct comparisons of these headline numbers are both inappropriate and misleading, in the Council's view. These can very broadly be split into conceptual, comparability and data reasons and are covered briefly below. Additional detailed technical information can be found in the Appendix 2.

## Conceptual issues

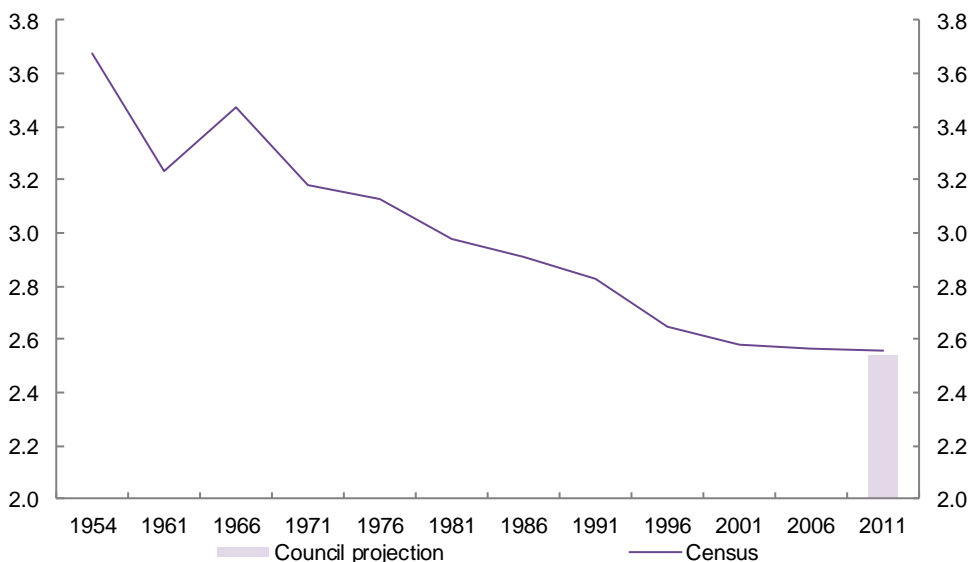
One of the key points to be made is that a housing shortfall is indicated when fewer households have formed than would have been the case if previous trends had continued. If, as the Council believes, a net shortage of available housing has led to

fewer households forming, then the actual number of households will be lower than the Council’s estimate of underlying or latent demand described previously. The unadjusted Census data suggest that household growth from 2006 to 2011 (and 2001 to 2006) was lower than it would have been had longer-term trends in household formation continued through this period.

Consequently differences between Census-based data on the number of households and the Council’s estimates are entirely consistent with, although not necessarily unambiguous evidence of, there being a housing shortfall.

Affordability constraints may have been a contributory factor in short-run changes in household formation patterns. These patterns can be influenced by changes in a wide range of factors such as the economic backdrop, policy, land release and builder innovation and so on. Such factors are examples of where the circularity of the housing system can take hold. Fewer available homes will lead to fewer households recorded as living in them. If this trend is used to derive projected household growth it will lead to a slowing in future underlying demand growth.

**Figure 5.1 Average household size over time**



Source: ABS 2011 Census of Population and Housing, based on place of usual residence. NHSC projections based on McDonald and Temple model of underlying demand.

Furthermore there has been some misunderstanding and oversimplification of the basis on which changes in average household size have been or should be determined. Census data, based on place of usual residence, reveal that average

household size fell slightly from 2.57 in 2006 to 2.56 in 2011<sup>4</sup> (see Figure 5.1). The 2006 and 2011 Censuses both reveal a break from the long-term trend of significant declines in household size over the last half-century. The Council's model of underlying demand from 2006 also assumes a larger decline in average household size than actually took place.

The state of the housing market and housing affordability in the period 2006 to 2011 supports a housing-market explanation for the arrested decline in average household size. Higher birth rates have also contributed, as babies will increase the number of people per dwelling but not the number of households for some years.<sup>5</sup> The analysis of the sources of change in the number of households shown in Table 5.1 indicates that 135,000 fewer households formed in Australia over the period 2001 to 2011 than would have been expected on the basis of population growth and changes in the age structure of the population. Fewer households mean larger households relative to previous trends.

## Comparability, measurement and timing challenges

While Census data is undoubtedly the best available source of information, definitions, adjustments, collection and reporting can change over time. It is also reliant on people completing the forms accurately with little incentive to do so.

One of the first points to note is that much of the current Census data, and reporting on it, is based on the raw counts published by the ABS. The Council has not changed its view that it is important to use Censuses as the primary source of benchmark data, but complications arise when comparison is made with historic data compiled on a different basis.

The Census does not record every person in the country, or every dwelling for that matter. There is a significant level of 'undercount'. The ABS addresses this in a Post Enumeration Survey (PES)<sup>6</sup> that includes a process to identify and survey some of those missed in the original count. Most of the detailed data on housing currently available, however, is based on the raw unadjusted data, and there is yet to be an estimate produced for the total number of dwellings or the total number of households. The ERP is the ABS's estimate of the total number of people usually resident in Australia. This is derived from both the Census and other sources

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4 Estimated household size excludes 'Visitors only' and 'Other non-classifiable' households, and is based on a count of all persons enumerated in dwellings on Census Night, including visitors from within Australia. It excludes usual residents who were temporarily absent on Census Night. The ABS also calculates average household size based solely on households where the number of people is known from the place of enumeration data. That methodology produces an average of 2.58 people per household in 2011.

5 The share of the population made up by those under five years old increased over this period from 6.3 per cent to 6.5 per cent. Source: ABS March 2012, *Australian Demographic Statistics*, cat no. 3101.0.

6 ABS June 2012, *2011 Census of Population and Housing: Details of Undercount*, cat no. 2940.0.

(including the PES) and produces a different (higher) population base than the raw Census data for place of usual residence.

### Population estimates

A key issue to come out of the PES is that the estimated Australian population at 30 June 2011 is now 294,000 lower than the previously published ERP.

The latest update from the ABS indicates that it intends to revise ERPs back to 1991.<sup>7</sup> The ABS will revise down estimates between 1991 and 2011 to a better (and lower) estimate of what ERP would have been, had the new and improved methodology been available. Revisions to more recent Census points will be greater than those further back — for example, the 2006 figure will likely be revised down by more than the 1996 data. However, the exact method for calculating the revisions, and therefore the magnitude and distribution (either by age or by State/Territory) of the change in the intervening years, is currently unknown.<sup>8</sup>

**Figure 5.2 Population estimates by State, June 2011 (ERP, persons)**



Source: ABS 2012, *Australian Demographic Statistics*, December 2011 and September 2011, cat no. 3101.0.

Regionally the largest preliminary adjustment for the June 2011 population was in Queensland, both absolutely in ‘losing’ 106,000 people (Figure 5.2) and proportionately in the reduction of its population by 2.4 per cent (Figure 5.3).

<sup>7</sup> ABS December 2012, *Australian Demographic Statistics*, June quarter 2012, cat no. 3101.0, ‘Basic Guide to Revisions to Historical Population Estimates in 2013’.

<sup>8</sup> The ABS has provided an indicative estimate of 240,000 fewer people at 2006, 130,000 fewer at 2001 and 70,000 fewer at 1996.

New South Wales, Victoria and South Australia also had substantial downward adjustments of their ERPs of more than 1 per cent. In contrast, the ERPs in Western Australia and Tasmania were revised very slightly higher, by around 0.1 per cent. The ERPs in the Northern Territory and the Australian Capital Territory were increased by 0.4 per cent and 0.6 per cent respectively.<sup>9</sup> This could have implications for assessing the balance between housing supply and demand at State and Territory level.

**Figure 5.3 Revision to population estimates by State, June 2011 (ERP, per cent difference) (revision from earlier estimate)**



Source: NHSC calculations. ABS 2012, *Australian Demographic Statistics*, December 2011 and September 2011, cat no. 3101.0.

Note: The percentage is the revision to ERP as a share of State/Territory revised ERP as at June 2011.

### **Household numbers**

There are particular challenges when it comes to considering how the revised population data feed into the number of households and therefore calibrating underlying and actual demand. The ABS has not yet released estimates of households for June 2011 and is not expected to do so until 2014.

The fact that no dwelling or household estimates will be available for another year appears to have been overlooked by some commentators critiquing the Council in light of the Census. A variety of bases have been used to compare against the Council’s estimates, some of which are not comparable even after accounting for conceptual differences.

For a variety of reasons it is not yet clear how revised population data will impact on the Council’s underlying demand projections and it is equally unclear how they will

<sup>9</sup> ABS June 2012, *Australian Demographic Statistics*, December 2011, cat no. 3101.0.

affect past estimates of actual numbers of households produced by the ABS or its estimate of the actual number of households for 2011. Any revisions to the number of households and underlying demand are impacted by the likelihood that the scale of adjustments will probably be smaller further back in time. The magnitude of change in population since 2006 is still being finalised by the ABS, partly because the final ERP for June 2011 has not yet been produced, but mainly because the size of the adjustment to the 2006 ERP is currently unknown.

There are additional challenges faced by the Council around the increase in underlying or latent demand between 2001 and 2006, which was based on projected population growth over the period from a 2001 ERP. It is not known whether the final estimates of population growth between 2001 and 2006 will be similar to the projected growth on which the underlying demand figures are based. However, given that the ABS has indicated that the revisions to the ERP will be less for earlier years than they are for later years, the divergences from the Council's earlier estimates are likely to be less significant than those for later estimates.

### *Dwellings*

There are also issues with the interpretation of 2011 Census data in relation to the supply side. Some commentators have not recognised how crucial vacant dwellings are to estimates of supply shortages (and therefore to the Council's analysis).

Overall, these issues significantly complicate attempts to estimate the true number of unoccupied dwellings. This is crucial for any calculation of a housing shortfall, and the share reported in the Census may not be a particularly accurate reflection of reality. The Census count of unoccupied dwellings is based on the dwelling status on Census night. Unlike the analysis of housing characteristics and people on a place of usual residence basis produced by the ABS, there is no adjustment made for usually occupied dwellings being vacant on Census night — for example, people being temporarily away on that night — or for usually vacant dwellings being temporarily occupied.

One possible method for re-estimating the number of unoccupied dwellings is from the difference between the total number of households and the adjusted total dwelling count. This is because the total number of households is estimated using living arrangements reconciled with the total population,<sup>10</sup> whereas the dwellings count is estimated separately. At present it is only possible to do this for 2006; the comparison is made in Table 5.3. The Council estimates that a larger share of dwellings was vacant (and not available for occupation) than the raw Census figures suggest. However, this method cannot overcome the issue of some structures being counted as dwellings if occupied but not when unoccupied.

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10 The ABS estimate of the number of households is based on both the total estimated resident population and living arrangement propensities from the Census. The unoccupied dwelling count is based on the share of dwellings recorded as unoccupied.

**Table 5.3 Share of unoccupied dwellings at June 2006**

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Australia
Total dwellings	2,796,003	2,119,120	1,705,138	694,367	860,243	222,379	76,043	132,551	8,605,844
Households	2,548,057	1,928,617	1,513,021	626,547	776,266	196,052	64,374	126,500	7,780,193
Estimated unoccupied	8.9%	9.0%	11.3%	9.8%	9.8%	11.8%	15.3%	4.6%	9.6%
Census unoccupied	8.8%	9.8%	8.4%	9.6%	9.9%	11.9%	6.2%	6.3%	9.2%

Source: ABS 2007, *2006 Census of Population and Housing*. ABS 2008, *Household and Family Projections, Australia, 2006 to 2031*, cat no. 3236.0. NHSC calculations.

Note: Census unoccupied share is the 2006 PES estimate of unoccupied dwellings counted in the Census. The ABS advises that it is likely to be an underestimate of the number of unoccupied dwellings. Estimated data are calculated from total dwellings estimates (after undercount adjustment) less number of households at June 2006.



While these are only ‘back of the envelope’ calculations, similar shares for 2011 would point to around 40,000 more dwellings being unoccupied than the raw data suggest. Given that many of these dwellings would actually have been in use (being renovated or occupied by a household that is temporarily absent — so recorded as unoccupied when they are usually occupied) as opposed to being available for purchase or rent on Census night, this speculative analysis suggests that in 2011 there were fewer dwellings available for households to occupy as a primary residence, arguably adding to the shortfall. However, this is highly speculative and there are considerable margins of error around this analysis.

Additionally, some commentators point to vacant dwellings as direct evidence against a housing shortfall. This misses a key point in the Council’s analysis that, by and large, these usually vacant dwellings are not available to households who might be considered as in the ‘gap’. Many will already be owned by other people as second/holiday homes, and some may be uninhabitable or awaiting demolition. The location of these dwellings is also important, particularly whether they are located in areas where there are employment opportunities, even if they are available and affordable.

### ***Data consistency and those missed in the Census count***

Another factor that should be acknowledged is that the Census results may not be fully adjusted for those missed in the initial count. While the PES does fill in some of the gaps, by definition those in the most extreme situations (such as refugees living with other Australian residents, people living in ‘illegal’ boarding houses (mis)reported as private dwellings or students living in overcrowded rental dwellings), are least likely to be recorded, either in the initial count or in subsequent efforts to contact them.

Changing collection techniques or changes within the undercounted population, means there is a possibility that the characteristics of those ‘missed’ in each Census are different over time — so the raw data may be recorded on a slightly different basis each time. It is also likely that those not counted are in the most extreme housing circumstances. For example, those in illegal boarding houses and/or overcrowded conditions are less likely to be picked up no matter how thorough the follow-up surveys.

## **Review of existing methodology**

As it has acknowledged many times, there are a number of issues with the Council’s current methodology for estimating the housing shortfall above and beyond the specific challenges thrown up by the 2011 Census.

On the supply side the Council must make a number of assumptions about vacancies and demolitions, some of which are based on rather dated information.<sup>11</sup>

On the demand side there is the issue of the use of a moving base for the rate of household formation (which contributes to estimates of underlying demand), with different sets of trends applied to the periods 2001–06 and 2006–2011. The rather circular nature of estimating underlying housing demand and supply (given that, by definition, the actual number of households equals the actual number of occupied dwellings at any point in time) means the ‘forced’ reconciliation at each Census effectively causes the observed gap to vanish when the snapshot is taken — despite reductions in demand induced by cyclical economic factors, by increases in land and housing prices relative to income, and/or by regulatory issues that directly reduce housing production, as opposed to changes in people’s ‘underlying’ housing choices or aspirations. As a result, the Census snapshot, at least at an aggregate level, cannot account for underlying demand or housing ‘need’.

The Council’s past practice of calculating the gap on a cumulative basis while using changing assumptions about the rate of household formation is similarly problematic, for two reasons.

Firstly it takes no account of the likelihood that some of the change will have been driven by choice and social change rather than by constrained housing supply. For example some adult children may choose to stay in the parental home longer than previous generations (larger homes making it more comfortable, staying in education for longer, and so on) rather than being ‘forced to’ due to housing affordability. Separating these two drivers from each other is a near impossible task, and in reality a combination of both factors will often be in play.

Secondly, the cumulative method does not allow for changes and adaptations to the current housing environment to become ‘embedded’ in the population. The cumulative approach effectively assumes that previously measured underlying or ‘pent up’ demand will remain unmet even if, for whatever reason, the culture of housing consumption has changed over time.

Rather than attempting to predict changes in this propensity over time, as is the current approach, the Council will consider changing its method of estimating underlying demand to one based on people’s propensity to form a household at a selected previous point in time. Under such a method, changes in household formation propensities between the two latest Censuses will provide the basis for estimating household formation rates in the subsequent period between Censuses.

While this is conceptually very similar to the current methodology, it would simplify interpretation of the differences between actual household numbers and projections of underlying demand, and of the emerging differences between underlying demand

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11 NHSC 2011, *National Housing Supply Council State of Supply Report 2011*, pp 103–4 and 168–9.

and actual housing production. This approach would estimate what the housing gap would be if households occupied the housing stock in the same way (for example, households comprising people of certain ages have the same average size) as at the selected point in the past. This would be compared with current household formation patterns revealed by the Census every five years.

This change would result in the Council producing a sequence of estimates and projections of underlying demand that differ based on their different starting points (one for each Census year since 2001), rather than a single cumulative series.<sup>12</sup> This would help in demonstrating the timing of changes in household formation propensities. It could also produce a set of estimates and projections of underlying demand from any past Census, and of the cumulative gap between additions to underlying demand and housing production since that time. This would incorporate the latest known propensities for people to be in different household types and housing tenures, and hence the latest known information on how the Australian population has adjusted its housing consumption to the current supply and affordability of housing.

Regardless of whether it changes its methodology, the Council will need to fully assess the implications of the revised population data on its estimates. The magnitude of revisions to historic data is unclear but it is likely that population growth since 2001 has actually been lower than previously stated — as the ABS is likely to revise the 2001 ERP by less than the 294,000 downward revision for 2011.

As the Council's model is based on the cumulative change each year, there are many points in the chain where data revisions will have an impact. At this point the Council assumes that ABS revisions to the past ERP data are unlikely to be followed by revisions to the historic household estimates and/or projections from 2002 to 2006. Post-2006 estimates of household numbers conceivably could be revised. Taking all this into account, it is unlikely that the Council will be able to recreate a time series of estimated underlying demand for housing from 2001 to 2011 that is consistent with revised ERP over the entire period. But it may be able to produce estimates of underlying demand for the total population at 30 June 2011 based on people's propensities to be in certain types of households in 2011, 2006 and 2001.

A final point to consider is the State and Territory distribution of the changes. The Council's modelling of underlying demand is partly driven by historic interstate migration patterns, as well as by the destination of overseas arrivals. Since 2006, Queensland has been overtaken by Western Australia as the state with the fastest

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12 This methodology could still allow for high, medium and low scenarios for any projections.

rate of population growth.<sup>13</sup> The Council will assess these changing dynamics and how they impact on the housing situations across the States and Territories.

In summary, emerging data from the 2011 Census provide an invaluable opportunity to evaluate and validate the Council's methodology for calculating the balance between housing supply and demand. While much of the recent critique of the Council's work appears to be based on misunderstanding of its methodology or on inappropriate comparison of differing datasets, there are still valid reasons to reassess. The Council will continue to evaluate and validate its methods as final Census-based estimates of population and households are produced by the ABS. Adjustments to methodology and reflection on previous estimates will appear in the 2013 State of Supply Report.

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13 This is based on revised 2011 data. It is not yet clear what impact the forthcoming revisions to 2006 and earlier data will have, but is unlikely to change what looks to have been a significant change away from Queensland's traditional status as the fastest growing state by population.