STUDY REPORT

No. 183 (2007)

Changing Housing Need

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Preface

This report considers the factors influencing housing demand over the next 20 years. It includes a discussion of demand factors, the main influencing being the changing demographic structure and affordability. The effect on household type, location, ownership and housing type is discussed. The effect of demolitions, major renovations, and second homes (holiday homes, weekenders, etc) are included in the housing consent forecasts. A survey of home occupiers was undertaken, including identification of features important in their house selection, and features that could be improved. The summary includes a list of items that designers need to know about future housing needs.

Acknowledgments

Note

This report is intended for house designers, major builders and developers. It provides details of the future workloads by type, and location. It notes that the type of work traditional carried in the housing sector, and the characteristics of the occupiers, are changing.

CHANGING HOUSING NEED

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Abstract

This report considers the factors influencing housing demand over the next 20 years. It draws on reports commissioned by CHRANZ, Building Research, and other organisations. The first part of the report is on the drivers of demand, the main influencing being the changing demographic structure and affordability. The effect on household type, location, ownership and housing type is discussed. The effect of demolitions, major renovations, and second homes (holiday homes, weekenders, etc) are included in the housing consent forecasts. The second part contains the results of a survey of home occupiers, including identification of features important in their house selection. Occupiers were surveyed on features that could be improved. The summary includes a list of items that designers need to know about future housing needs.

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1. SUMMARY

This report is an analysis of the factors affecting future housing needs. The factors that are covered include:

- Demographics
- Affordability
- Housing numbers required by type and location
- Housing features required
- Demolition and renovations
- New housing assessment by owners

The main findings are:

The demand for new housing will be around 24,000 per year on average for the next 10 years, slightly down on current levels of about 26,000 per year. This is based on net migration flows of 10,000 per year, which is believed to be sustainable assuming the Government remains committed to replacing an ageing workforce. Major refurbishments are expected to increase and number approximately 3,000 per year for the next 10 years, and are additional to new housing. Demolition replacements and major refurbishments will total about 6,700 per year and are a significant part of future workloads. The demolitions/refurbishment projections are somewhat speculative and it is possible the true rate could be lower. However, the housing stock is ageing and significant numbers from the 1950s and 1960s now require major refurbishment (when not demolished for site redevelopment). The cost is similar to that for construction of a new house, and designer/builder workloads will increasingly be for major renovations.

The 2006 census indicated a continuing decline in housing ownership and the projections are for this to continue. Private sector landlords will have a larger share of the rental market and it is expected that Real Estate Investment Trusts (REITs) will begin to appear in the housing market. Designers and builders will increasingly have large landlords as clients.

There will be a larger proportion of multi-unit construction in the future, due to planning changes, transport costs and lifestyle changes, and the projection is for 32% of new dwelling units to be in multi-unit developments over the next 10 years. In the last 10 years the proportion has been about 25%. Improved quality, community engagement and good transport will be essential for occupant acceptance of these medium and high-density developments.

The main growth in new household formation is in couple-only and single person households. Not all construction will necessarily be for these groups as many will use existing housing, but it is likely a significant proportion of new units will be for these small households.

Universal Design (UD) is housing that has features needed by all sectors of the population, including the aged, large-bodied people, those with disabilities and young children. Such housing need not look different from traditional housing, adds only 1% to the house cost, and if the UD features are incorporated at construction there are cost savings due to avoidance of subsequent adaptation.

A BRANZ survey of over 200 recent new house owners showed about 45% did not obtain the thermal comfort levels they expected with comments relating to poor insulation, need for double glazing, and poor heating. 21% said they found the house layout to be of poor design. Only 22% specifically said they were happy with their new home, although there were a number of other owners with only minor complaints.

Designers should consider higher than Code levels of insulation for comfort reasons, and climate change adaptations in new housing (discussed later in Section 6.2.1)

2. LITERATURE REVIEW

2.1 New Zealand

A number of projects have been commissioned by the Centre for Housing Research Aotearoa New Zealand (CHRANZ) related to the changing housing market. These include: an analysis of the housing sector[1] over the last 20 years; housing tenure aspirations;[2] housing options for older persons;[3] and more recently two projects on supply constraints[4] and the future role of ownership and rentals,[5] both in the Auckland market; and a project on housing and disability.[6] The most recent report[7] analyses the 2006 census for home ownership trends.

The first gives a wealth of information on demographic and economic trends related to the housing market including family types, household formation, ethnicity, new and existing housing prices, tenure, social housing, affordability, and new housing starts. Some regional and Territorial Authority (TA) breakdowns are provided.

The second report on housing aspirations includes household demand projections based on Statistics NZ forecasts. It discusses the concept of the housing career and asks if it is still relevant. It notes some writers have suggested the link between housing career and life stage may have weakened and suggests the linear progression from tenure, to outright ownership is less relevant now. This arises from the observation in Australia and New Zealand of declining ownership rates and asks whether this is due to social, economic and political change (i.e. delayed ownership due to later marriage, less affordable housing, less Government assistance), or due to changing ownership preferences (i.e. other priorities for expenditure than housing ownership).

The second report also has results on focus group meetings to better understand aspirations in New Zealand for different age and tenure groups. Some of the findings, relevant to changing housing need, are:

- Almost all renters aspire to ownership and the main barrier is affordability.

- Older owners (>55 years) believe younger persons have higher expectations of modern and maintenance free housing, compared with themselves at the same age.

- The aspirations of younger persons surveyed support this view which, the report speculates, will make ownership more difficult to achieve.

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[1] DTZ New Zealand (2004) *Changes in the structure of the New Zealand Housing market.* CHRANZ (2 volumes).

[2] DTZ New Zealand (2005) *Housing tenure aspirations and attainment.* CHRANZ.

[3] New Zealand Institute for Research on Ageing (2004) *Accommodation options for older people in Aotearoa/New Zealand.* CHRANZ.

[4] Motu Economic and Public Policy Research (2007) *Housing supply in the Auckland region 2000-2005.* CHRANZ.

[5] DTZ New Zealand (2007*) The future of home ownership and the role of the private rental market in the Auckland region.* CHRANZ.

[6] CRESA et al (2007a) *Housing and disability: future proofing New Zealand's housing stock for an inclusive society.*

[7] DTZ New Zealand (2007b) *Census 2006 and housing in New Zealand.* CHRANZ and Building Research.

- There is only weak evidence to support the view that student loans are a barrier to ownership. Instead ready availability of credit for consumer goods is diverting savings and leading to high levels of indebtedness.

- Families in rental accommodation in preferred suburbs are prepared to continue renting rather than move to owner-occupied housing in cheaper suburbs.

- Younger households aspired to villa type housing with enough bedrooms for families, and close to good schools.

- Older homeowners (>55 years) have already acquired the home they wish to occupy for the rest of their lives. Most want a three bedroom home even though the nest may be empty.

The report concludes that it is mainly economic and political factors that have led to a decline in ownership rates, and that aspirations to ownership remain strong. The report is uncertain whether the fall is permanent, but on balance believes it will be a continuing downward trend, and will extend across more peoples' lifetimes, as well as being a deferral of ownership to later in life. It recommends a number of Government measures to help meet aspirations of ownership. However it accepts that many will never achieve ownership and it believes the Government needs to encourage a more professional management of private rental accommodation to provide for these people.

The third report, on housing for the elderly, provides data on types of existing accommodation and the reasons why older people are in these houses. It has useful information on design features that enable people to age-in-place i.e. without needing to shift accommodation. It finds two main challenges for the future:

- To maintain and upgrade/modify the existing housing stock to facilitate ageing-in-place (i.e. the family home), which is where most of the elderly will reside.

- To develop alternative options for special needs namely social, cultural and individual care needs.

Of particular concern are the elderly who have never achieved home ownership and hence do not have the ability to move to a more appropriate home, and those who may own a home but of insufficient value in marginal regions and hence have limited options. They cannot trade down and relocate to areas more suited to the elderly (e.g. near family and health care facilities), or modify the home to make it more "aged-friendly".

The implication of this report is that the Government will need to provide more grants and/or rental accommodation for the less well-off elderly, so they can move to a more suitable home, or modify their existing home.

The next two reports are for the Auckland region. The Motu report on housing supply examines the land and planning constraints over recent years that are thought to have adversely affected supply. They include:

- The Metropolitan Urban Limit (MUL) has constrained urban expansion and led to a shortage of land for large-scale development. At the same time the zoning changes within the MUL have done little to speed the rate of intensification within established areas, apart from the CBD.

- There is concentrated ownership of land within the MUL which is affecting land prices.

- Brownfield and under-developed residential sites have fragmented ownership which does not facilitate large-scale housing development.

- There is strong competition from business/industry for brown field sites.

- Development fees are not consistently applied and were not justified in some cases.

- Council processes take too long, and there are significant financial costs of delay.

- There is lack of innovation in the design of new sub-divisions.

The report has the following implications. Land and regulatory costs need to be contained (material and labour costs are of less concern). New land needs to be released outside the MUL, based around existing settlements and designed for commercial/industry use as well as for housing, to minimise commuting.[8] Councils should take leadership in urban redevelopment for medium/high-density housing by a compulsory land acquisition process. The RMA process needs a revamp to reduce delays with objections. Penalties should apply to councils for slow processing of consents. In conclusion, the report notes that both expansion and intensification will be needed in the Auckland region, and that the provision of housing will remain predominately a private sector activity.

The DTZ New Zealand Ltd report on the future of ownership and the rental market in Auckland finds:

- Auckland home ownership rates are below the national average (67.8% New Zealand, 64.6% for the 2001 census).

- 21% of owner-occupier households experienced stress (defined as 30% or more of gross household income spent on housing costs).

- There is a growing "intermediate" housing market where households cannot afford to buy at the lower quartile house price.

- The fall in ownership rates suggests an additional 5,600 rental units per year will be required for the next 10 years in the Auckland region.

- They project a 5% to 8% pa house value growth rate, which it is speculated will be barely enough to encourage a sufficient supply of private sector rental units.

- There is a need for institutional investors to ensure adequate supply, and improve the level of professionalism of landlords.

- Government facilitation will probably be necessary to attract institutional investors.

The main implication from this report is that institutional investors will be needed, first to provide rentals at the scale required, and second to introduce a level of professionalism in the rental market.

The next paper is by the Centre for Research Evaluation and Social Assessment (CRESA), Public Policy and Research, and Auckland Disability and Research Centre. The main findings were:

- Disabled peoples' housing needs are not being met by the current housing stock.

- Unmet need is likely to increase due to an ageing population.

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[8] The mayor of Manukau City on National Radio (18 June 2007) said that land supply was the main housing affordability issue and that the Government and the regional councils should acquire large tracts of land at the edges of the region for new towns.

- Disabled people and the Government spend considerable amounts on modifying existing houses for this group. The median amount is $8,500 per house.

- Most spending is on basic alterations such as door widening and large wet area showers, which can be more cost-effectively installed into new-built houses, or at the time of additions and major renovations of existing houses.

- There are very few UD features in new housing.

- Discussions with developers and land agents suggest there are significant house re-sale perception problems in providing features for the disabled.

The advantages of applying UD principles are discussed later in Section 7.2. The main implication from this report is the incorporation of age-friendly features should be provided in all new houses, but that it is important the houses do not look "institutionalised" or different from traditional houses.

The final report, on home ownership trends in the 2006 census, discusses the continual decline in ownership rates revealed in recent censuses. It derives projections of ownership rates, by region, which are used later in this report. It has a large amount of analysis of housing ownership/rental trends by household type, ethnicity, employment status, qualifications and region. The policy implications are that there is a significant middle income group of renters that will be supplied by the private sector in future years, and the challenge for Government is to improve rental accommodation (e.g. quality, tenants' rights), while still encouraging private sector investment. The alternative (or simultaneous) policy approach is to look at the supply side with a view to improving affordability, as per the Motu (2007) recommendations. The report offers both as possible measures to improve housing outcomes.

2.2 International review

Literature from the USA, Australia and the UK has similar themes to New Zealand on how an ageing population structure is causing, or will cause, a change in new housing demand away from the traditional family home of the post-war decades, and towards generally smaller and older household types. The National Association of Home Builders (NAHB) in the US has produced a publication[9] which aims to analyse the housing markets for three different demographic groups: the Baby Boomers, Seniors, and Echo boomers (Generation X and Y). This publication has extensive survey information on the types of features required in the houses for each group, and is discussed later in this Section.

The main housing research organisation in Australia is the Australian Housing and Urban Research Institute (AHURI), which has produced several publications on demographics and housing.[10],[11],[12] These papers provide data on the relative importance of life-cycle factors (age, education, income, relationships, children etc), and economic factors (wages, wealth, financial assistance, tax etc) in house purchase.

The first of these papers recorded the results of interviews with non-owners in the first year and the same persons 3 years later and found:

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[9] NAHB Research Centre (1999) *Changing demographics*.

[10] AHURI (2002) *Outcomes of home ownership aspirations and their determinants*.

[11] AHURI (2004) *Trends in home ownership rates in Australia: the relative importance of affordability trends and changes in population composition*.

[12] AHURI (2004) *What drives Australian housing careers? An examination of the role of labour markets, social and economic determinants*.

- Buying a home was more likely among those who had earlier reported that ownership was "very important" than those who rated it "important" or "somewhat important".

- However less than a third who rated ownership "important" or higher actually achieved ownership in the 3 year period.

- The main factor determining ownership in the 3 year period was two incomes for the household. Non-English speaking background (respondent or parents foreign born) respondents were twice as likely as English speaking background respondents to have achieved ownership. Those with high career aspirations were half as likely as others to have achieved ownership.

The second reference addressed the debate arising from the 2001 census showing falling home ownership rates and whether this was due to reduced affordability or delays in family formation. Despite the title the report does not address affordability and instead argues that when controlled for other characteristics there is no fall in ownership rates across birth cohorts. The findings were:

- More recent birth cohorts are more likely to be home owners, especially among males.

- The most significant determinant of ownership is formal marriage.

- For groups with the same relationship status, ownership rates fall as the number of children rise.

The third AHURI paper develops patterns for future housing ownership time-frames. Housing careers built on stable employment and family life are likely to produce the traditional housing career of leaving home, renting alone or with others, purchase, outright ownership, and finally entry to an aged care home. Rather than this "linear" career, a so-called "snakes and ladders" experience is suggested as more typical, and as shown in Figure 1. For example, good and bad life events affect the ability to sustain a mortgage. The pattern is based on the following findings:

- Parental home leaving is strongly linked with time spent in education.

- Persons born in non-English speaking countries move out of the parental home later than average.

- Due to decreased affordability, households on average are spending longer in the rental sector.

- Separated/divorced individuals are 30% less likely to attain or retain ownership compared to continuously married people.

- Remarried couples have the same likelihood of home ownership as continuously married couples.
- Owners with mortgages have lower unemployment rates, and shorter periods of unemployment, than public housing renters.

The model below on housing career was reviewed in the CHRANZ housing aspirations report and is generally accepted as also having relevance in the New Zealand situation.

In the UK the Joseph Roundtree Foundation funds a considerable amount of research into social policy issues, including housing. A summary paper 'Future influences on housing'[13] explores the influences on future housing and how these could affect

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[13] www.jrf.org.uk/knowledge/findings/housing/H8.asp

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housing built today. The report finds their housing market is changing in ways that many developers and housing associations have yet to recognise or respond to. They considered the 4 Cs of: Conservation, Comfort, Community and Cost. For Conservation the findings are that new housing should be within existing suburbs (and inner city redevelopment), where possible, mainly to reduce car use. Apart from insulation other conservation measures include low-flow taps and showers, facilities for waste recycling, and effective ventilation. They found that even committed "green" residents were not prepared to opt for the greenest solution when it conflicted with their design concept of the house and community.

Contemporary Housing Career

Source: 21st century Housing careers and Australia's Housing Future
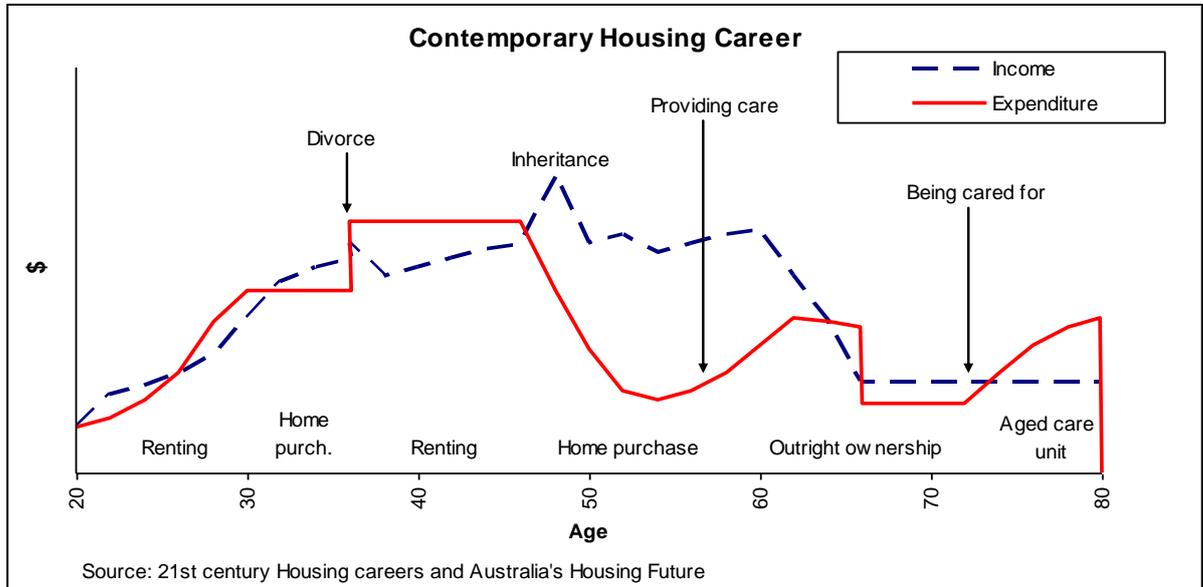
Figure 1. Housing ownership careers

The paper says most new UK housing (85% of houses to 2011) will be for single people both young and old. Surveys indicate young people are starting families later in life, and they will not be satisfied with a starter type family house but will demand comfort. Consumer views about Smart Homes were mixed. Those most in favour were the young and about 40% of respondents could see themselves living in a Smart Home within 10 years time (this research was carried out in 2000). The most popular feature of a Smart Home was seen to be security, but a sizable proportion 65% said they would be worried about "things going wrong" in the smart system.

The notion of community will be more important due to the decline in social networks based on family and employment. People should have the opportunity to live within walking distance of shops, facilities, employment and public transport.

Last, cost will continue to play a central role in housing. The report finds that a large proportion of housing cost is in the site and infrastructure development and there is limited scope to reduce these costs. They built three demonstration homes to trial various cost-saving features. These homes had very efficient space conditioning designs, which added to the initial cost, but were economic in the medium-term. The houses were pre-fabricated but consumer perception was somewhat unfavourable due to their bland appearance. They concluded the future is with mass-produced one-offs using rationalised construction and standard layouts, but with the ability to individualise each design through minor layout changes and material use. They suggest building flexibility into the basic house design by reducing circulation space, such as halls, and avoiding interior load-bearing walls.

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Research in the USA on housing preferences for the changing demographics was undertaken by the NAHB (reference 9). Among the findings of their vision for the future were:

- Homes will be more flexible (can readily shift interior walls).

- More emphasis on security, including design for safe neighbourhoods, and daily checks for the elderly.

- Cluster home communities will become more popular. These are greenfield communities of up to several hundred houses which have medium-density housing, protection of open spaces for recreation/wildlife protection, and local wastewater/stormwater management.

- UD will become more widespread. Some elements will be used in most new homes (i.e. lower light switches, raised power outlets, level door handles, extra timber in walls for retrofitting of grab bars, wider doorways), and their design will be subtle so that such aids do not look like those in a traditional nursing home.

- Baby-boomers (birth date 1948-64) are slow to retire and many will continue working from home, requiring good communication wiring.

- Some retirees will seek out multi-generational master-planned communities close to home. Unlike current retirees, fewer baby boomers will seek out age-restricted sun-belt villages.

- The elderly will belong to home owner associations (not necessarily retirement villages) which will require residents to purchase annual maintenance and repair contracts and the association will manage the repair process.

- The elderly will age-in-place, with health/cleaning assistance as required.

- Remodelling for ageing-in-place will be customised, rather than the elderly having to choose from a range of options.

Baby boomers were surveyed on their planned type of retirement home:

- 37% desired a new home in an established neighbourhood.
- 30% planned to build on a lot they already owned.
- 18% wanted to build in a new sub-division.
- 12% wanted to build in a master-planned community.
- 3% in an age-restricted community.

How much of this overseas research is relevant here is uncertain. Affordability seems to be less of an issue in Australia than New Zealand, especially outside Sydney and Melbourne. Their young seem to prioritise a career which often involves location mobility and this is prioritised above home ownership. However, it is noteworthy that persons with non-English speaking backgrounds are twice as likely as others to have achieved ownership (over the 3 year period of the study). This may be relevant for New Zealand with its rising Asian population.

The UK research indicates conservatism in provision of housing with an emphasis on existing styles and layouts in the large-scale developers that are common there. New Zealand has small-scale developers/providers who show some flexibility in design and a variety of forms, which may more easily accommodate sustainability features and higher-density housing. However, as in the UK, New Zealand builders are most familiar with stand-alone (or semi-detached) housing. There is a need to design and build medium-density, medium-rise multi-units in the future that support communities and are attractive to live in. The UMR survey (reference 2) indicates a local preference for

stand-alone three bedroom housing as the ideal among potential owners. Until they know that attractive multi-unit developments are available it is uncertain if developers will put resources into finding out what makes attractive medium-density developments at a reasonable price that will be attractive to owners.

USA research may be relevant in New Zealand because it indicates that the majority of baby boomers want to live outside master-planned or age-restricted communities, and expect to age-in-place, or build for their retirement in a established age-mixed neighbourhood community. The NZIRA research (reference 3), did not especially ask older persons the type of housing they would like in old age, but it notes that 91% of people older than 65 currently live in private dwellings, as opposed to institutions, and suggested this was likely to be the preferred arrangement into the future. This preference is supported in the BRANZ survey reported in Section 6.2 where only 20% of the over 50 years respondents expect to move house on retirement.

3. DEMOGRAPHICS

3.1 Age structure

The main determinant of demand for housing is population growth and the age structure of a population. For most western countries the trend has been for slowing population growth, although in some countries the population has stabilised or is in decline. In the 1960s and 1970s the shape of the age distribution curves were pyramidal and over the next decade or so they move more to a "honey-pot" shape with fairly uniform numbers over a wide range of age groups, but with big increases in the oldest age groups.

Figure 1 illustrates four different countries; mapping their population from 1986 to 2050 (the exception is the UK as data was only obtained from 1991).

It can be seen that in each of these countries the population goes from a pyramid to a "pillar", with New Zealand and Australia having more of a pillar look than the USA and the UK. A point of note for New Zealand is that the retired age group (say >65 years) expands by threefold from current numbers over the next 15 years.

The age structure is the basis for household formation which is different in each age group, with older age groups tending to have fewer persons per household. Therefore, while population growth in New Zealand is projected at about 17% between 2006 and 2026 (assuming net migration of 10,000 per year), the growth in number of households is projected to be about 24% over the same period.
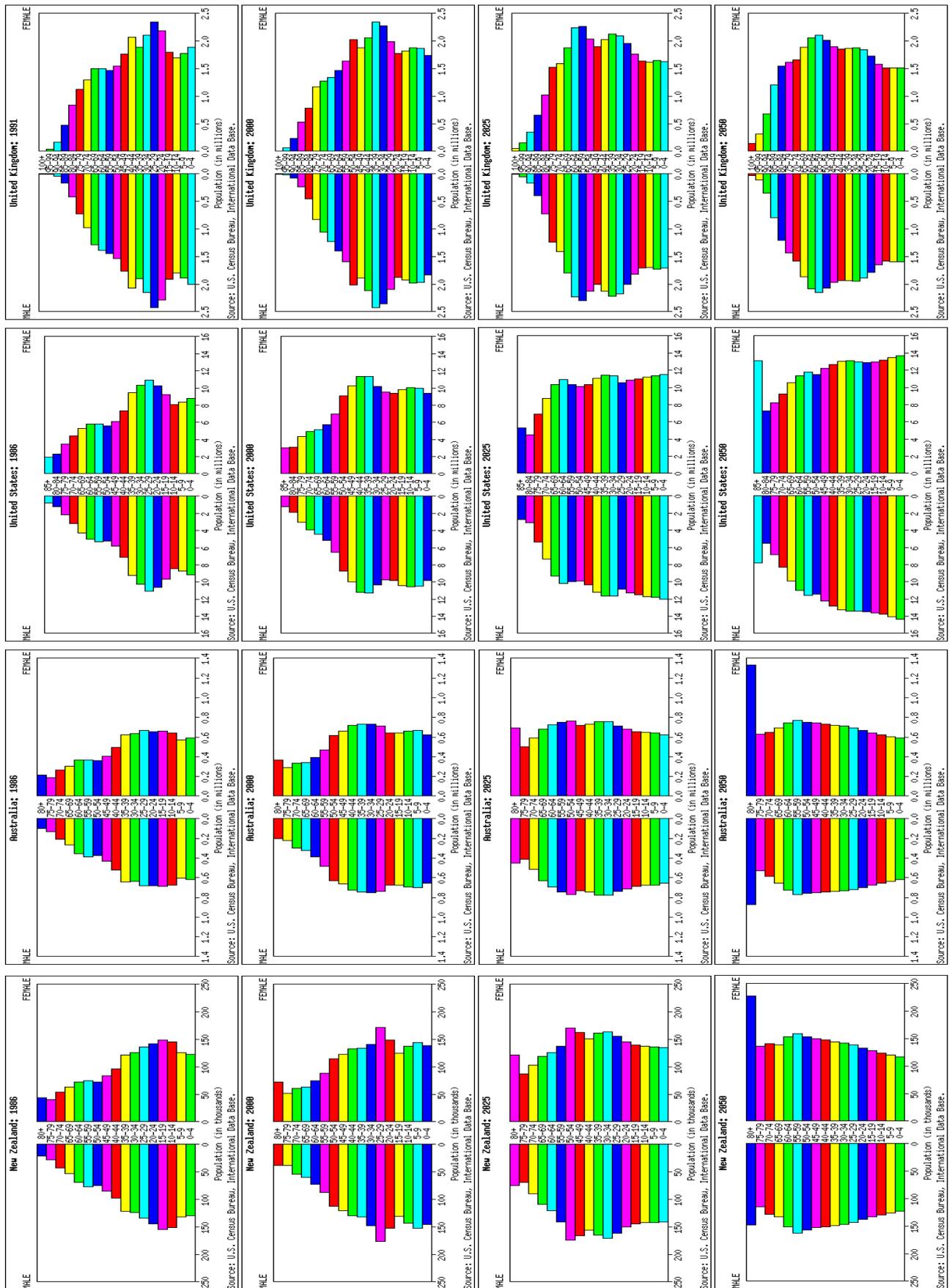
Figure 2. Population age structure for selected countries

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3.2 Ethnicity

Ethnic minority populations are growing in many countries and it is important to understand their housing wants and needs, since there is anecdotal evidence some specific features in housing are more important than others for the different groups.

In New Zealand the biggest percentage increase is expected to be the Asian group, with an expected increase of 92% from 2006 to 2026. Europeans are expected to make the smallest % increase with only an extra 2.3% expected over the 20 year period. Other expected increases can be seen in Figure 3 below:

Table 1. Population projections by ethnicity

New Zealand population forecasts					
Census year	European	Maori	Asian	Pacific	Other	Total
2001	2757	505	229	223	24	3737
2006	2875	535	337	251	29	4028
2011	2910	573	409	283	32	4208
2016	2928	608	493	316	35	4381
2021	2936	644	574	351	38	4542
2026	2942	676	646	382	40	4686
% change						
2006 to 2026	2.3	26.3	91.7	51.8	36.0	16.3
Source: Statistics NZ and BRANZ, usual resident population, middle scenario, i.e. 10,000 net migration per year.						
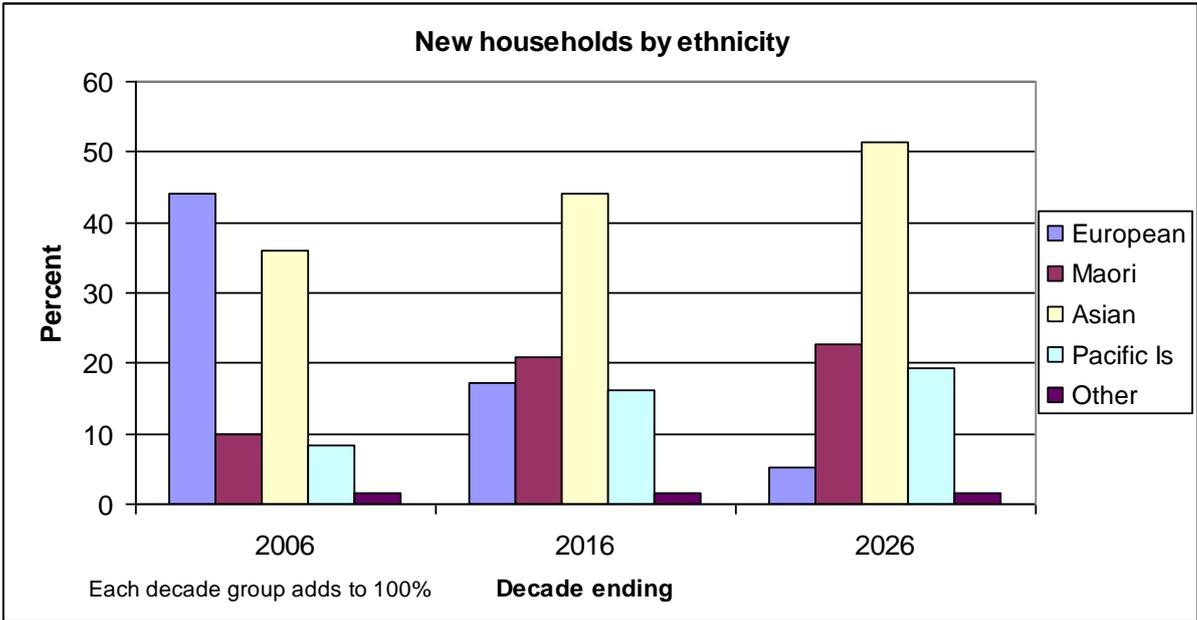
Figure 3. New households by ethnicity

The projected new household formation by ethnic group is shown in Figure 3. The Asian community has the largest number of new households, followed by Maori and Pacific Islanders. Note that this does not necessarily imply that the owners commissioning new houses in the future will follow the same ethnic distribution. Europeans remain the largest group in number by far through to 2026 and it is likely they will predominate in the new housing market, even though their growth rate is

small. Instead, as they trade in existing accommodation for new housing they will be freeing up some existing dwellings for the new households formed by the other ethnic groups. Further, the discussion below notes that multiple ethnic identification by persons in the census tends to over-state the numbers of non-European households.

The household formation trends are very dependent on immigration policies and the sourcing of migrants. The net migration assumptions in the above forecasts are: Europeans 4000 per year, Maori 2000, Asian 15,000, Pacific Island 500, Other 500.

It is quite possible these forecasts could be significantly in error regarding the ethnic mix. In the 1990s and early 2000s the Asian countries (including China and India) were the main source of new migrants. From about 2002 there have been changes in entry requirements, and a shift in marketing in countries with English skills. This has tended to shift the focus to immigrants from Europe, and led to a drop in migration from Asia (see **Figure 4**)

There are definition implications for ethnicity, with people of mixed ethnicity being able to list more than one group. People may change categories between subsequent censuses. This makes it difficult for forecasters to categorise people. The forecasts allow for multiple classifications, but the counts in each ethnic category that are ticked in the census are scaled down to line up with the overall population number. This method tends to over-state the non-European identification since each ethnic group ticked by respondents is given equal weight in the numbers (before scaling), and an individual person may identify more strongly with one particular ethnicity.

The long-term outflow of residents to Australia is expected to continue due to the greater wealth of Australia and its attractiveness to job seekers. At present most of these migrants are European and Maori. It is quite possible that the children of Asian migrants will join this outflow over the next two decade, thereby reducing the growth rate of the Asian population proportion.

These trends indicate that it is difficult to predict, or sensibly define, the ethnic mix of the future population, due to changing job markets overseas, the sensitivity of politicians to the issue,[14] the effect political statements will have on potential migrants, and the actual definition of ethnicity. However, we believe the middle scenarios used by SNZ for projecting ethnic mix in Figure 3Figure 3. are reasonable for use as a guide to the future. In the past 20 years migration has averaged 8,100 per year. An increase in net migration, to 10,000 per year on average, is expected because of the need to counter an ageing workforce. It is believed that despite outflows of New Zealand citizens, the Government will have little trouble in attracting new skilled emigrants.

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[14] For example, the Immigration Minister stated in early 2007 that New Zealand should be targeting regions that specialise in the skills for which we have shortages, such as IT skills in Southern India. In response the Maori Party said that immigration should be limited and that the skill deficiencies of the existing population should first be addressed. Their leader also said the recent increase in migration from Western countries is an attempt by the Government to stop the "browning of New Zealand".
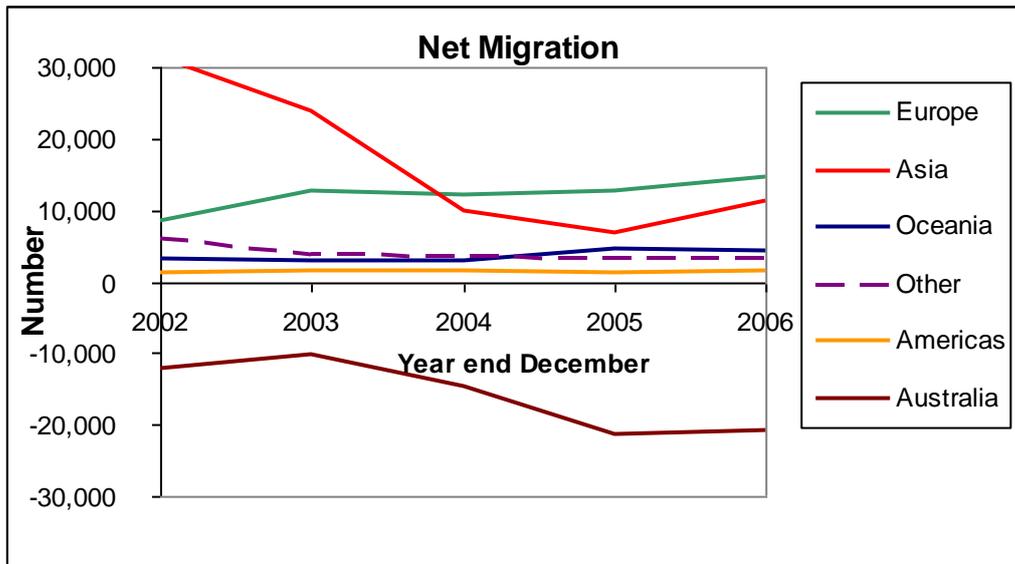
Figure 4. Net migration by world region of origin

Figure 5 shows the average family size by ethnic group. The general trend is that the average family size is decreasing, with the Pacific peoples' families on average being the largest. The European average family size has fallen below three, and the Asian group is also decreasing significantly.
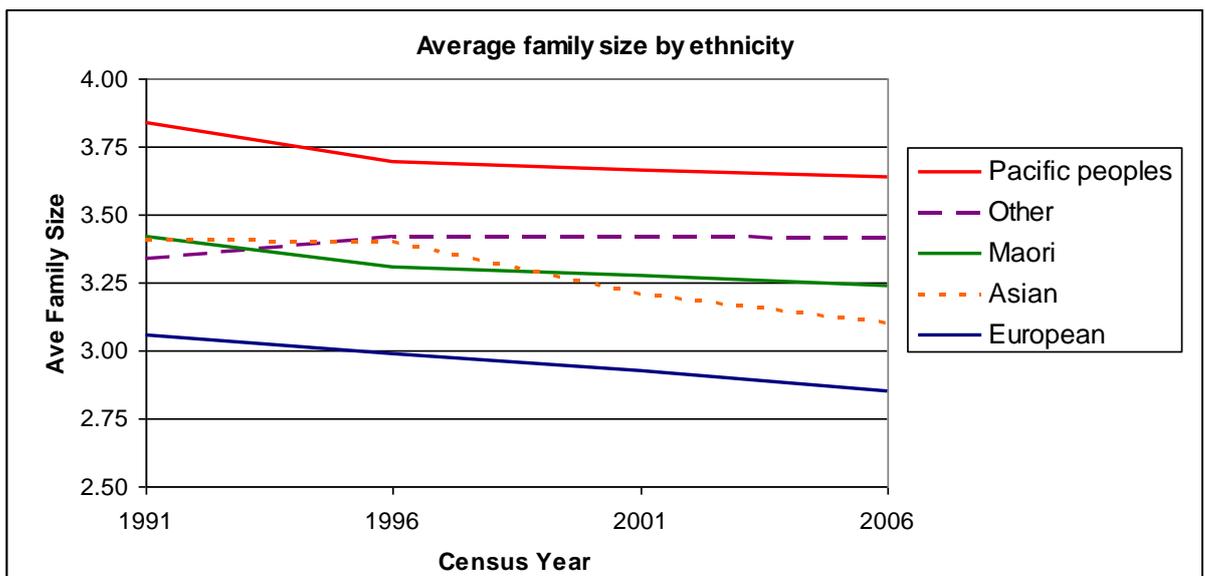
Figure 5. Family size by ethnicity

Figure 6 below shows the percentage of people belonging to each ethnic group by family type. It indicates that every ethnic group has been experiencing a decrease in the percentage of families with two parents plus child(ren), and an increase in a one-parent with child(ren) household. Couple-only households are the smallest family type, except for Europeans, who have a significantly larger share, and overall numbers, than other ethnic groups.
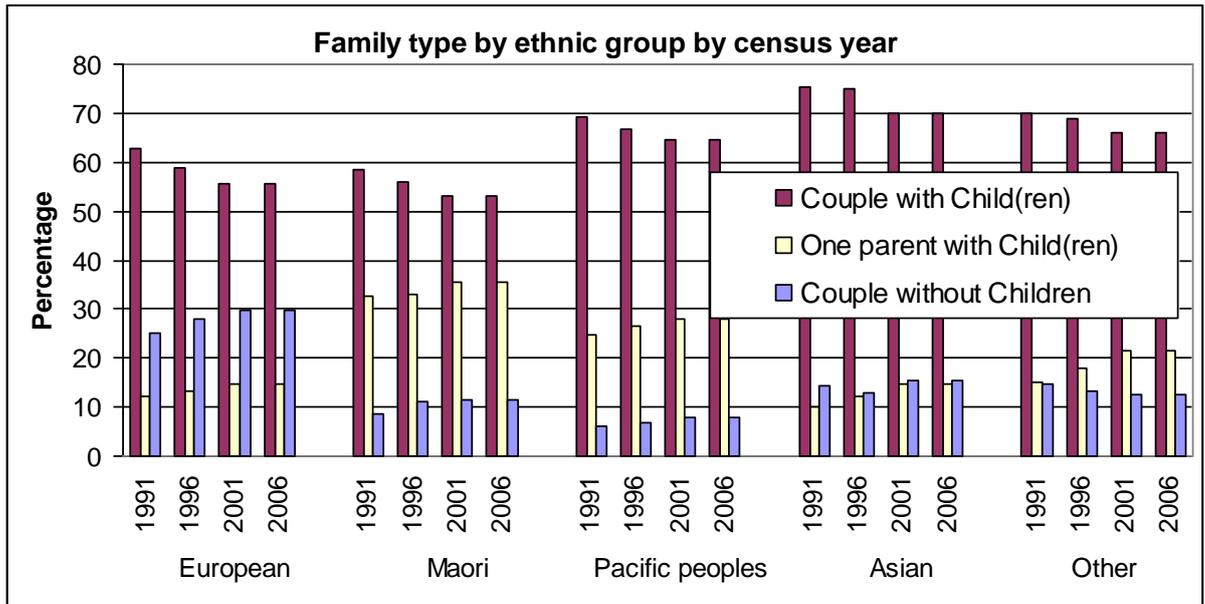
Figure 6. Family types by ethnicity

Combining all this information together suggests non-European households are more likely to have children than European. Apart from different family structures between the groups we were unable to find much information on the specific needs of the different ethnic groups. Some general needs, by ethnic group are as follows.

Older Maori form a special role in their communities and have a need for space to accommodate visitors, and to be located near family and marae, and other places of cultural significance (reference 3). However this report notes there is a diversity of Maori housing need, with some kaumatua and kuia preferring independent housing away from the whanau (respite from caring for grandchildren) while remaining accessible. Pacific Island households tend to be larger than average, multi-generational, often with other relatives in the same house. The houses need to be large, and parts of the house (hallways, toilets, showers) need sufficient space for typically large-framed Pacific people.

Asian people are a diverse group, but some preferences include the need to be able to close off the kitchen from the living areas. Medium and high-density living is preferred by some, and outdoor spaces tend to be hard paved and landscaped in hard materials rather than having a garden. The exterior of houses are often designed for the display of wealth. Feng Shui can be an important consideration in the detailing of a house for some Asian people.

3.3 Family types/household formation

For the total population the most common household types at present are a couple with no children, and two-parent + children, each being about 28% of all households. However, by 2026 two-parent + children households are expected to decline to 21% of all households (see Figure 7).

The main growth in numbers of households occurs in one-person households and couple no-children households, see Figure 7. Household projections – percentage shares

Parent-children households are believed to be at an all-time peak now, and will decline in number from now on for this middle scenario which includes average mortality/fertility trends and 10,000 net migrations per year on average. The charts assume a certain trend in living arrangements which over time are expected to tend toward smaller family sizes and proportionally more two-person and one-person households (forecast Series 5B).
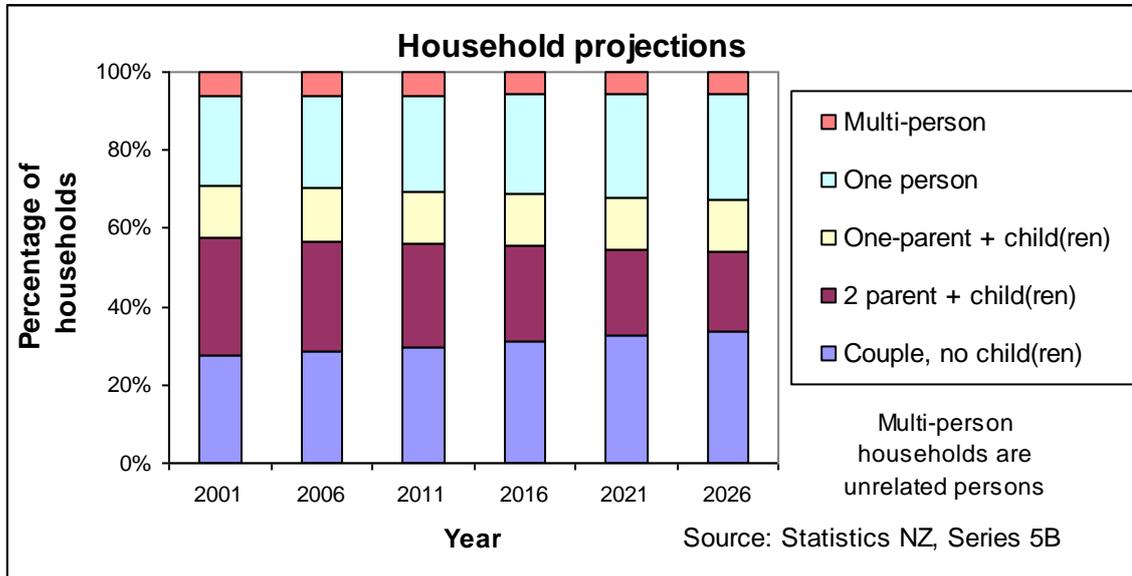
Figure 7. Household projections – percentage shares
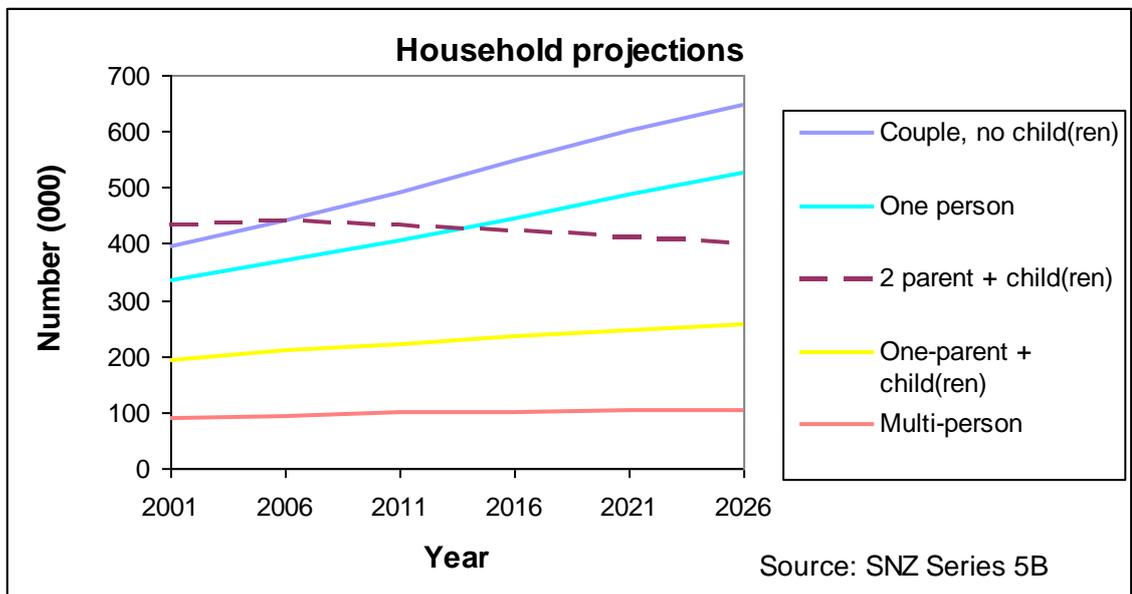
Figure 8. Household projections Series 5B – Number

Should migration be higher than 10,000 pa then the family housing market does not decline but flattens out. Also, it is possible that the trend toward small family sizes could level out, rather than continue to decline as assumed above. For example, see Figure 9, which is Statistics NZ scenario 9A that assumes long-term migration of 15,000 net inflows per year and unchanged living arrangements. Note, however, even with these quite optimistic child-oriented household assumptions the traditional two-parent-child(ren) household is at best near static in number over the years to 2026.

The living arrangement variants reflect how persons combine with others to form the various family/household relationships. It is formulated to account for changing social patterns including age of cohabitation or marriage, rates of partnership formulation, timing of childbearing, propensity of young adults to stay in the family home, propensity of people to live alone, propensity to form extended families, propensity to have non-related persons in households etc. The Statistics NZ household formation forecasts are based on population growth/migration scenarios and then the total population at any future time is derived for the different household/family types according to the particular living arrangement assumptions for that total population.
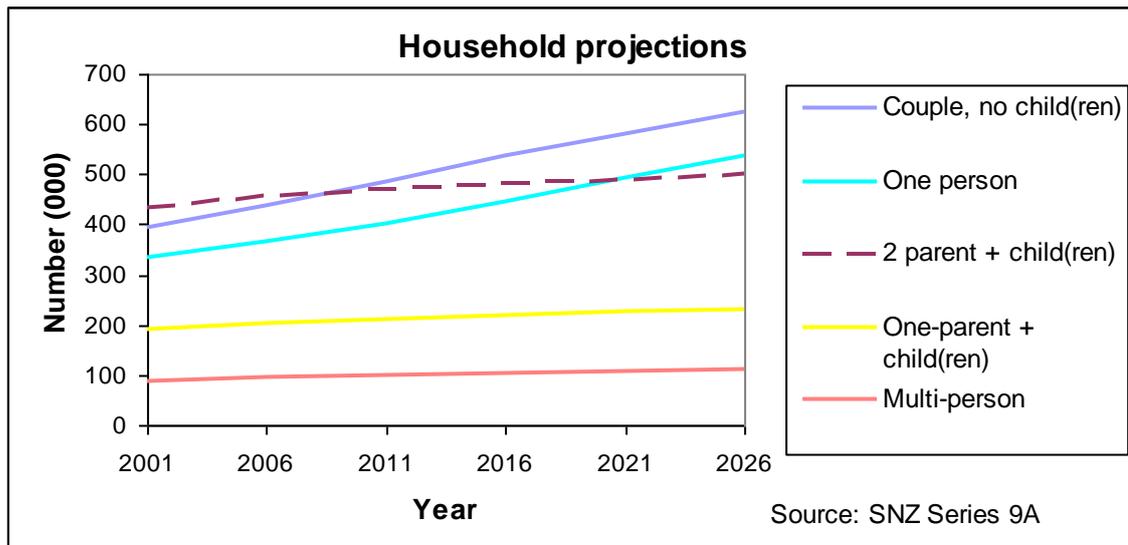
Figure 9. Household projections Series 9A – Number

3.3.1 Demand for new dwellings

To find the total number of new dwellings required in future years it is necessary to add three components:

- New household formation, as discussed above.
- Demolition replacements.
- Holiday homes and second homes.

This is done in Table 2 below, for three Series 1A (low household formation), 5B (middle scenario) and 9C (high scenario). The "middle scenario" assumes current trends for living arrangements continue, and 10,000 net migrations per year on average. The "high" scenario assumes today's living arrangement proportions are unchanged, and 15,000 migration. The low scenario assumes 5,000 net migrations per year, and recent trends in living arrangements. The scenarios also have different demolition and second home assumptions.

Depending on the scenario the new household formation averages between 15,000 and 22,000 new households per year. In addition there are between 5,000 and 11,000 demolition replacements per year, on average. While the table shows demolitions, many of these will be major refurbishment of the dwellings rather than total replacement. The analysis in the Appendix indicates approximately half are refurbishment (see Section 9.2). The amount of work in these major renovations will be significant and may be as much as building from new. The analysis of building consents

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in the Appendix suggests that major alteration works (i.e. work not involving additions), averages at least 80% of the cost of a new house. Refurbishment to extend the life of a building is a more sustainable practice than demolition to waste and building from new. It is also an opportunity to upgrade the performance of the building, e.g. extra insulation, double glazing retrofits, and water saving measures. At the same time there may be some new additions and/or alterations, so probably the major refurbishment will cost about the same as a new house of the same size.

The demolition models are described in the Appendix, but their main feature is that demolition, or major refurbishment, is concentrated around a nominal dwelling life of 100 years.

The required numbers for second homes and other normally unoccupied homes is assumed to be based on a fixed percentage of the total housing stock. At any one time about 9% of the stock is unoccupied, and is for sale or rent, or deceased estate, or is a second home (holiday home, CBD weekday apartment, weekender). There needs to be a "buffer" stock of vacant houses for the housing market to operate efficiently, because there are delays between sequential occupancies. As the total stock increases this buffer also needs to increase. New houses will not usually go directly into the buffer group (unless they are spec houses), but it is possible the new owner's previous house will be in the buffer group. So, indirectly some new housing is needed to help maintain the unoccupied stock at an appropriate level for housing market efficiency. Second homes could be modelled as a separate category, possibly based on household incomes. However, they do not necessarily remain as second homes but often become permanently occupied. Separate modelling has not been done, and instead they are assumed to be a percentage of the total stock, and lumped in with the "buffer" stock.

Table 2. New housing demand to 2026

New dwellings by household type						

Couple, no child(ren)	2 parent + child(ren)	One-parent + child(ren)	One person	Multi-person	Total	Per year
Forecasts 2007 to 2026						
"Middle" Scenario		**Number of new dwellings (000) (1)**				(000)
197	-39	44	154	9	365	18.2
		Demolition replacements (2) (100 yr life) =				8.0
		Normally unoccupied homes (holiday homes, homes for sale/ rent)=				1.5
				Total new units per year		27.7
"High" Scenario						
283	-157	69	219	30	445	22.2
		Demolition replacements (2) (90 yr life)=				11.4
		Normally unoccupied homes (holiday homes, homes for sale/ rent)=				2.0
						35.6
"Low" Scenario						
150	3	13	129	7	301	15.1
		Demolition replacements (2) (110 yr life)=				6.0
		Normally unoccupied homes (holiday homes, homes for sale/ rent)=				1.1
						22.1
Forecasts 2007 to 2016						
"Middle" Scenario		**Number of new dwellings (000) (1)**				(000)
102	-18	23	73	6	186	18.6
		Demolition replacements (2) (100 yr life) =				6.7
		Normally unoccupied homes (holiday homes, homes for sale/ rent)=				1.7
				Total new units per year		26.9
"High" Scenario						
144	-76	36	106	17	227	22.7
		Demolition replacements (2) (90 yr life)=				10.7
		Normally unoccupied homes (holiday homes, homes for sale/ rent)=				2.4
						35.8
"Low" Scenario						
80	5	7	62	5	159	15.9
		Demolition replacements (2) (110 yr life)=				5.0
		Normally unoccupied homes (holiday homes, homes for sale/ rent)=				1.3
						22.2

(1) Households in private and rental dwellings only
The scenarios are based on Statistics NZ Series 1A (Low), 5B (Middle),
and Series 9C (High).
(2) Includes major refurbishment in place of demolitions.

Note: The middle forecast is for 26,900 new dwelling units per year on average up to 2016. However the number of new dwelling consents may be about 3,000 per year lower than this because, as described above, about 50% of the demolition replacements are likely to be major renovations which will significantly extend the life of the house. The volume of work will be close to that for 26,900 new dwellings

4. HOUSING AFFORDABILITY AND TENURE

4.1 Affordability

New house affordability is shown in index form since 1970 (see Figure 10). It is an index based on a wage index, new building costs and section prices, and mortgage interest rates (base at March 2003 = 100). From the 1970s to 1988 rising interest rates and construction costs resulted in reduced affordability. Between 1988 and 1993 affordability increased dramatically as mortgage interest rates fell from about 18.5% to

10.5%, while incomes were up about 22% and house prices rose only 17% over the same period.

Between 1993 and 1998 wages rose about 9% but construction costs rose 30% and interest rates increased by about 1%. This caused affordability to fall over this period. In 1998 the increase in affordability was mainly due to a fall in mortgage rates from about 11% to 7%. Since 1999 affordability has dropped due to increasing construction costs and increased mortgage interest rates. The series uses floating interest rates, which were quite common until about 5 years ago (now most mortgages are fixed for about 2 year periods) so the true trend in affordability is probably for a slower decline in affordability since 2000 than indicated in the chart.

The chart has two sets of forecasts which depend on the assumptions made for growth in incomes, new housing construction cost changes, land prices and interest rates.

Table 3 shows these assumptions and recent trends in these parameters. It indicates wages have risen by 2.2% pa, on average over the last 10 years, construction costs by 3.9% pa, and section prices by about 11% pa.

At present mortgage rates are rising, but are still low compared to New Zealand historic levels, although not by world standards. A major reason for high interest rates is the large current account deficit and non-taxed gains in housing investment, which to some extent distorts investment flows away from the export sector. It is assumed these misalignments are unsustainable and that some restructuring will occur in fiscal policy that will result in a long-term decline in interest rates.

The "expected" scenario indicates a flattening out of affordability. With the "optimistic" scenario wage growth is quite high while house and land price escalation is quite low, in historic terms, and the mortgage interest rate (6.0% in 2016) is 3.0% below current rates. With this scenario the affordability trend improves.

At the time of writing (October 2007) a Select Committee is considering submissions on affordability of housing and their report is not available. It is noted that while land costs have been forwarded as a major influence on affordability the Auckland City Council submission states the current MUL in the Auckland Region has 16 years capacity for new housing demand across the region. This is contrast to the study in reference 4 which says concentration of land ownership in the Greenfield sites of Auckland and fragmentation of ownership in redevelopment sites are major problems.

Table 3. Housing affordability parameters

New housing affordability parameters				
	Percentage annual change		Percentage annual change to 2017	
	Last 5 year average	Last 10 year average	Expected	Optimistic
Average Wages	2.7	2.2	2.5	4.0
New house construction costs	6.6	3.9	3.5	2.5
Section prices	14.3	10.9	7.0	5.0
Ave interest rate %(over period)	8.26	8.40	At 2016 7.0	6.0

Affordability Index   New Housing

(a high index indicates improved affordability)

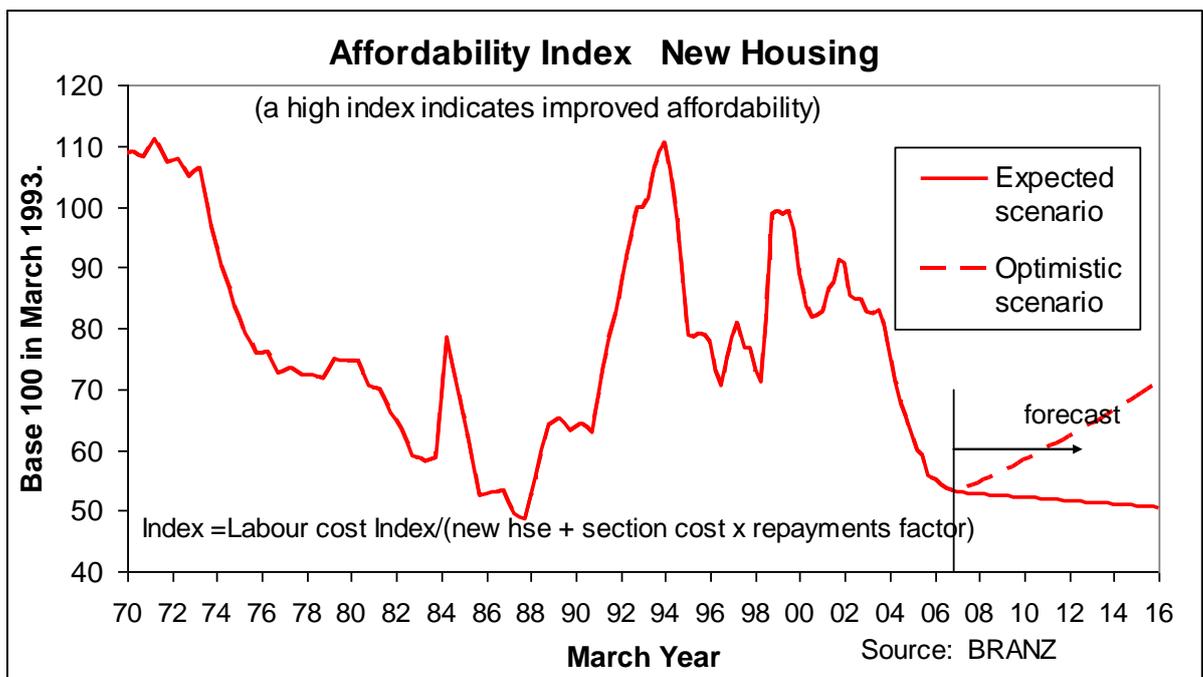Index =Labour cost Index/(new hse + section cost x repayments factor)

Figure 10. Affordability of new housing

The chart above is for new housing affordability, but it is interesting to note that affordability of existing housing follows a very similar pattern since 1993 which is when their series began. The Appendix has the AMP existing house affordability series (produced by Massey University Property Studies Centre), and details of the BRANZ new house affordability index.

4.2 Tenure

Ownership of housing has been declining in recent censuses and was down to 66.9% (including family trusts) in the 2006 census. For the first time the 2006 census recorded family trusts and found that 11.5% of households lived in a dwelling held by a family trust. These were all assumed to be owner-occupied which is likely to be an over-estimate, in which case the ownership rate will be lower than 66.9% as at March 2006.

It is postulated there is a relationship between affordability trends and changes in home ownership. The two series are shown in Figure 11 and indicate downward trends in both series, apart from a rise in the 1996 census. It is surprising that ownership did not increase in the 5 years to the 1996 census, given it was a period of improving affordability. The reasons for this are not known, but it could be because it was a period of strong outflow of New Zealand citizens, off-set by new immigrants who did not appear to immediately enter into ownership at that time.
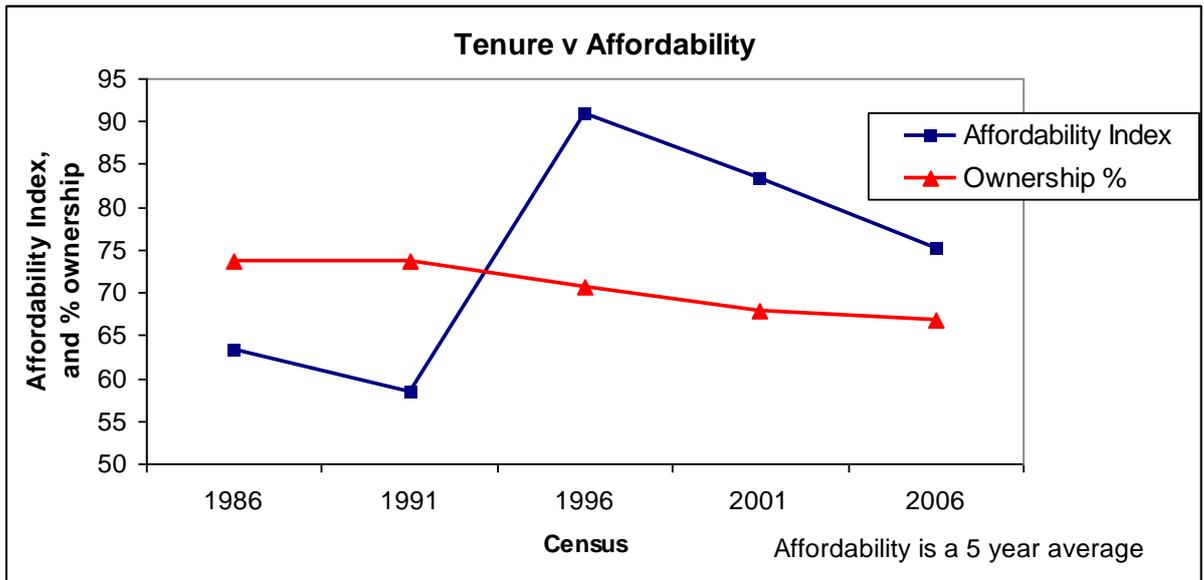
Figure 11. New housing tenure vs affordability

Forecasts for home ownership by DTZ (2007) indicate a continuation in the decline in ownership, by 0.5% per year; through to 2016 (see Figure 12). We believe that affordability does have an affect on the ownership rates and the affordability forecasts in the previous section for a decline are in line with the DTZ forecast of a decline in ownership.
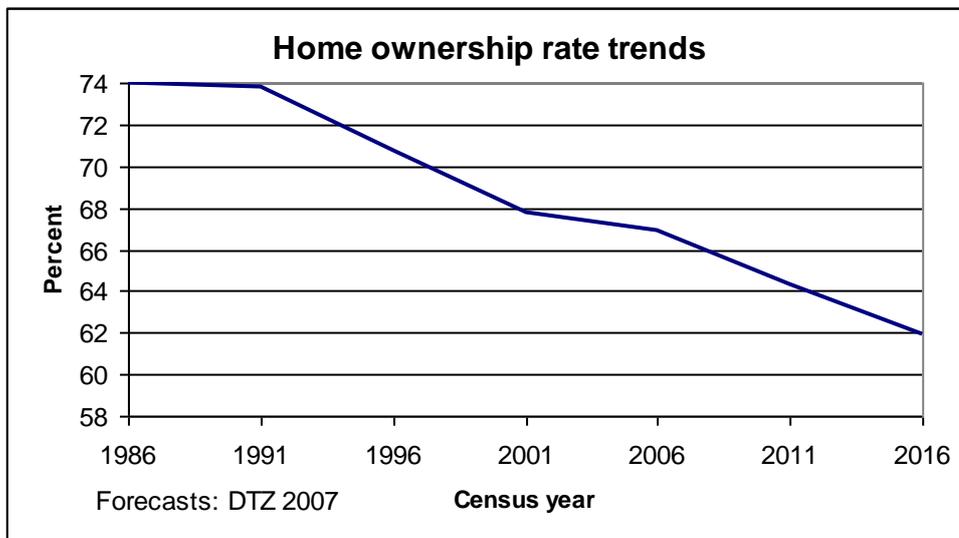
Figure 12. Home ownership rate forecast

4.3 Housing floor areas

The average floor area of new houses in New Zealand has steadily grown since statistics were first gathered and is now about 203 sqm. In Australia the average for a detached house is about 225 sqm and in the USA about 228 sqm. Experts in the USA (polled by the NAHB) believe it will decline slightly by 2015 to about 220 sqm. Already there is evidence the average areas are levelling out. In some cases owners are trading-off better quality finishes and higher studs for less floor area. Formal living rooms/lounges are in decline with 40% of new homes having just a family room. It is

likely in New Zealand we have reached a peak in detached house floor areas, although floor space remains an important priority in new house design, and average bedroom numbers remain high at 3.8 according to the BRANZ survey reported later in Section 6.2.
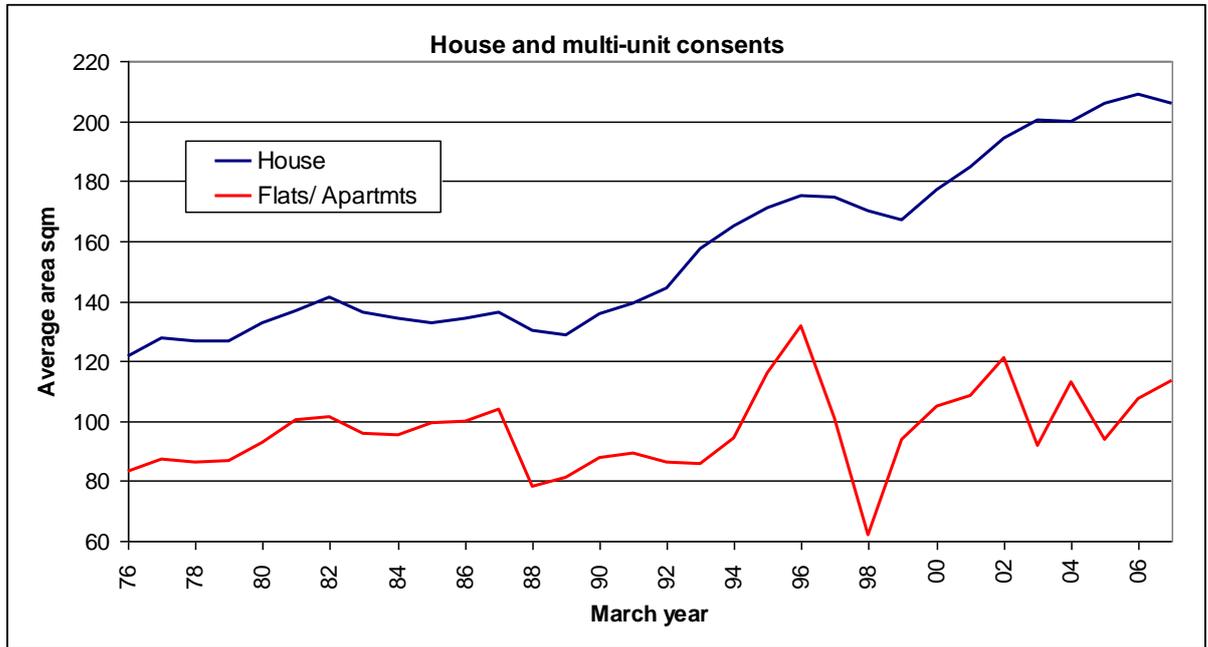
Figure 13. Average floor areas in new housing

5. REGIONAL HOUSING TRENDS AND FORECASTS

The regional demand for new housing is based on household projections by region. To this is added normally unoccupied homes (second homes, holiday homes etc), based on BRANZ projections of unoccupied rates by regions. Finally, demolition replacements and major refurbishments are added based on the proportion of houses in each region that were built pre-1960 (see Table 4). The reason for including refurbishments is as described earlier – the volume of work in a major refurbishment is similar to that for a new dwelling, and also it is difficult to project the exact split between demolition replacements and major upgrades.

The projected new dwellings by region are further broken down into stand-alone housing and multi-units (see Table 5). The table shows the actual split between stand-alone, horizontally attached, and vertically attached dwellings for the last 10 years of new housing, plus the forecasts. The distinction is that a horizontally attached unit has a wall(s) in common with other occupancies (e.g. terraced housing and duplexes), and a vertically attached unit has a ceiling and/or floor in common with another occupancy (e.g. medium-rise flats and high-rise apartments).

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Table 4. Projected dwelling stock numbers at 2006, 2016 and 2026 by region

Demand for new dwellings decades to 2016 and 2026.								
	Occupied and unoccupied dwellings					Demolition replace & refurb per year		Total new dwellings per year
	Number			Ave change per yr				
	2006	2016	2026	2007	2017	2007	2017	2007	2017
	(1)			to 2016	to 2026	to 2016	to 2026	to 2016	to 2026
Northland	70,137	78,059	85,670	792	761	149	209	941	970
Auckland	481,374	554,918	625,579	7354	7066	1,606	2,253	8,960	9,319
Waikato	172,893	205,088	236,019	3219	3093	343	481	3,562	3,574
Bay of Plenty	111,801	123,943	135,609	1214	1167	222	312	1,436	1,478
Gisborne	17,799	18,201	18,587	40	39	96	135	136	174
Hawke. Bay	61,560	64,038	66,418	248	238	281	394	528	632
Taranaki	44,871	49,796	54,528	493	473	220	309	713	782
Manawatu	97,359	107,048	116,358	969	931	503	706	1,472	1,637
Wellington	186,933	196,479	205,651	955	917	998	1,401	1,953	2,318
Nel/ Marlb/Tas	60,714	69,541	78,022	883	848	200	280	1,082	1,128
West Coast	15,819	15,969	16,114	15	14	359	503	374	517
Canterbury	226,392	256,540	285,505	3015	2897	1,027	1,441	4,042	4,337
Otago	90,387	101,215	111,619	1083	1040	476	668	1,559	1,709
Southland	41,787	41,514	41,252	-27	-26	220	308	192	282
NZ	1,679,826	1,882,349	2,076,930	20,252	19,458	6700	9400	26,952	28,858
Note: Approx 50% of demolition replacements are major refurbishment rather than total replacement.								

Over the last 10 years the main centres had large percentages of their new housing as vertically attached units, at around 30% of all new dwellings in Auckland and Wellington. There were also significant percentages of horizontally attached units in these two centres, resulting in a low stand-alone housing share of around 60%. The regional trends for stand-alone housing percentage are in Figure 14, which indicates all the major centres have a reducing percentage of new stand-alone houses since the mid-1990s, although there has recently been a recovery due to over-building of apartments in some centres.

To produce the forecasts the main assumptions are that stand-alone housing will continue to decline as a percentage of new units, by about 0.5% pa in the main centres and by about 0.3% pa elsewhere. In Auckland the rate of "intensification" is assumed to be very much greater than elsewhere, as discussed in Section 5.1.

Table 5 Projected new dwellings per year by type by region

New dwellings by type - Decades to 2016 and 2026.										
		Stand-alone houses			Horizontal attached			Vertically attached		
	Census	New consents 10 years ending			New consents 10 years ending			New consents 10 years ending		
	2006	2006	2016	2026	2006	2016	2026	2006	2016	2026
	% stock	% (1)	% (2)	% (2)	% (1)	% (2)	% (2)	% (1)	% (2)	% (2)
Northland	89	93	90	87	5	7	9	2	3	4
Auckland	76	64	49	34	8	18	28	28	33	38
Waikato	89	88	85	82	6	8	10	6	7	8
Bay of Plenty	85	91	88	85	3	5	7	6	7	8
Gisborne	88	81	78	75	11	13	15	7	8	9
Hawke. Bay	84	82	79	76	7	9	11	10	11	12
Taranaki	89	87	84	81	7	9	11	5	6	7
Manawatu	88	90	87	84	5	7	9	5	6	7
Wellington	75	59	54	49	14	16	18	27	30	33
Nel/ Marlb/Tas	87	92	89	86	4	6	8	3	4	5
West Coast	91	95	92	89	5	7	9	0	1	2
Canterbury	82	79	74	69	15	17	19	6	9	12
Otago	85	76	71	66	12	14	16	11	14	17
Southland	92	85	82	79	10	12	14	6	7	8
NZ	82	75	69	62	9	13	18	16	18	20
Number of dwelling units per year (average per year) (3)										
Northland		1,062	847	844	62	70	91	18	24	35
Auckland		6,127	4,397	3,175	786	1,632	2,629	2,650	2,931	3,515
Waikato		2,395	3,029	2,932	153	271	344	173	262	298
Bay of Plenty		1,916	1,261	1,253	71	77	109	123	98	116
Gisborne		85	107	131	12	18	26	8	12	16
Hawke. Bay		464	419	482	42	50	73	58	60	78
Taranaki		250	601	637	21	67	89	15	44	57
Manawatu		591	1,284	1,378	33	103	147	32	86	112
Wellington		1,278	1,054	1,135	299	309	413	590	590	770
Nel/ Marlb/Tas		887	966	973	42	69	94	33	48	61
West Coast		126	342	458	7	26	47	1	5	12
Canterbury		2,702	2,998	3,001	501	674	810	210	369	527
Otago		758	1,113	1,134	123	224	280	112	222	295
Southland		177	157	222	20	22	38	12	13	22
NZ		18,817	18,574	17,754	2,170	3,612	5,190	4,034	4,766	5,914
(1) Statistics NZ										
(2) BRANZ forecasts.										
(3) Derived from above percentages and the the region forecasts in the previous table.										

It is noteworthy that the above assumptions give a similar proportion of stand-alone to multi-unit to that provided in recent forecasts by DTZ (2007b), their Table 8.12. Their tables shows about 65% of units are stand-alone for the 10 years to 2016, and Table 5 above has about 69% as stand-alone.
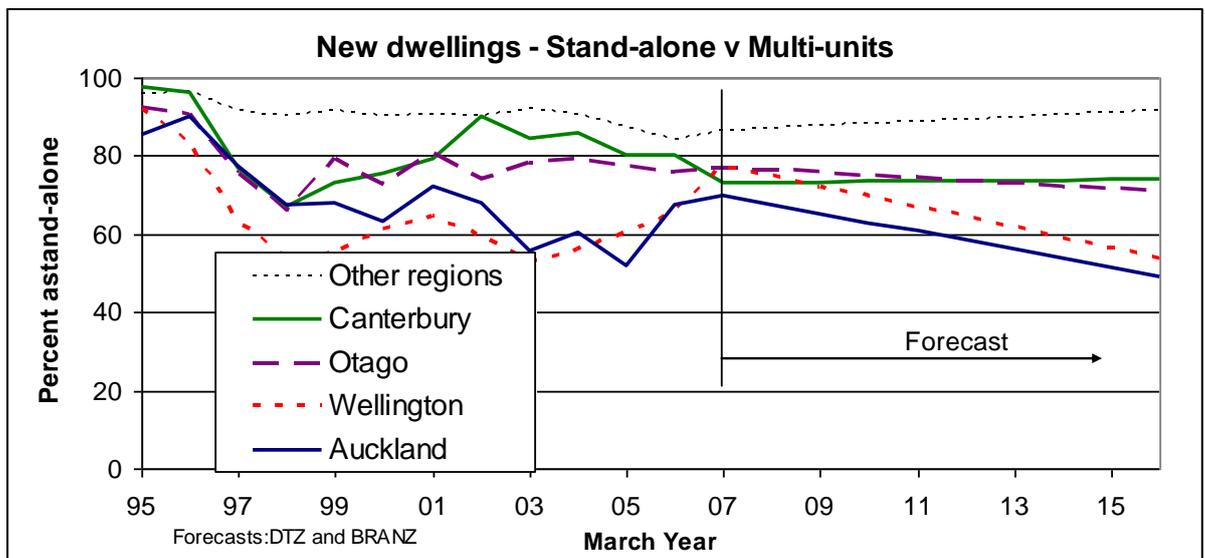

Figure 14. Stand-alone vs multi-units building consent trends

Numbers of new housing by tenure, owned and rented, are shown in Table 6. The forecasts are based on DTZ (2007) percentages to 2016, extrapolated by BRANZ to 2026. The numbers for new dwellings assume new housing will be split between owners and renters in the same ratio as the increase in households owning and renting. However, this is simplistic since the increase in renters is likely to be largely met in the existing stock and most new housing will be for owner-occupiers. So while the table implies 18,800 new dwellings per year are for renters, and only 8,200 per year are for owners, in practice most of the new construction will be for owner-occupiers. As they move to their new house the existing house (or an existing house further on the same transaction chain) is freed up, and becomes available for rental purposes.

Table 6. Ownership rate projections

Home ownership rates							
	Ownership rate Percentage			New dwellings per year 2007 to 2016		2017 to 2026	
Yr end March	2006	2016	2026	Owned	Rented	Owner	Rented
Northland	68.6	64.1	59.7	288	654	231	739
Auckland	63.8	58.3	54.1	2,576	6,384	2,724	6,595
Waikato	65.4	61.4	58.1	1,496	2,067	1,395	2,179
Bay of Plenty	67.3	62.1	57.7	311	1,126	305	1,173
Gisborne	61.8	57.0	53.2	- 8	144	23	151
Hawke. Bay	67.9	62.7	59.5	11	517	170	462
Taranaki	69.9	64.6	61.1	223	490	306	476
Manawatu	66.8	62.4	56.1	490	982	240	1,397
Wellington	66.1	61.3	57.5	300	1,653	582	1,736
Nel/ Marlb/Tas	72.8	66.6	63.2	344	738	475	653
West Coast	69.3	64.5	59.6	165	209	230	288
Canterbury	70.4	65.3	61.6	1,485	2,557	1,710	2,627
Otago	69.1	64.1	60.7	548	1,012	693	1,016
Southland	73.5	68.8	64.2	- 64	256	- 8	290
NZ	66.9	61.9	57.9	8,164	18,788	9,076	19,782
Includes occupied and unoccupied dwellings and demolition replacements.							
Source: Ownership rate DTZ 2007, Dwelling numbers by region BRANZ.							

Table 6 suggests that 18,800 houses per year are for renters, but as described above this is misleading. All we can surmise is that 26,900 new houses and major refurbishments are required per year and that between 8,000 and 26,900 of these will be for owner-occupiers. It is likely the majority will be for owner-occupiers but we have no data to confirm what the ratio will be. The BRANZ survey described later suggests that only 8% of new houses are immediately rented at present.

5.1 Auckland metropolitan planning

As the largest city, Auckland is a special case for assessing future housing types. The dwelling type forecasts in Table 5 indicate quite high percentages of multi-unit dwellings in the Auckland region.

The Auckland Regional Growth Strategy (RGS, agreed by all councils in 1999) provides for housing intensification along transport corridors and in sub-regional centres. The theoretical housing densities and dwelling types are shown in Table 7.

Table 7. Auckland region growth strategy

CENTRAL AREA	TRANSPORT CORRIDORS	SUB-REGION CENTRE	TOWN CENTRE	NEIGHBOURHOOD EDGE-OF-TOWN
100 to 500 DU/Ha	45 to 55 DU/Ha	45 to 80 DU/Ha	40 to 50 DU/Ha	30 to 45 DU/Ha
Up to 15 storey apartment	**50m to PT link**	**400m radius**	**400m radius**	**400m radius**
	3-6 storey aprt	3-6 storey aprt	3-4 storey aprt	3-4 storey aprt
	2-3 storey terr	2-3 storey terr	1.5-2.5 storey terr	1.5-2.5 storey terr
	2 storey townh	2 storey townh	2 storey townh	1-2 storey townh
			1.5-2 storey house	1-2 storey house
	100m to PT link	**1000m radius**	**800m radius**	
	2-3 storey terr	2-3 storey terr	1.5-2.5 storey terr	
	2 storey townh	2 storey townh	2 storey townh	
			1.5-2 storey house	
Mixed use developmt	Business ground level	Housing 20-60% of total floor space	Housing 50-80% of total floor space	Housing 70-80% of total floor space
	Residential higher levels			
	5,000 - 12,000 DU per corridor	10,000 - 12,000 DU per centre	4,000 - 5,000 DU per centre	700 - 1,000 DU per centre

DU/HA = dwelling units per hectare
PT = passenger transport
aprt = apartment
terr = terraced housing
townh = town house

Examples of the above are:

Transport corridors: New North Rd, Dominion Rd, Mt Eden Rd , Manukau Rd.
Sub-regional centres: Newmarket, Otahuhu, Manukau City Centre, Takapuna, Albany Centre, Papakura, Orewa, Massey North, Henderson, New Lynn.
Town centres: Grey Lynn, Mt Wellington Quarry, Onehunga, Mt Roskill, Te Atatu, Pukekohe, Botany, Howick, Pt Chevalier, Remuera, Avondale, Ellerslie, Hunters Corner, Mangere Town, Pakuranga, Manurewa, Papatoetoe, Otara, Glen Innes, Mt Albert, Panmure, Sylvia Park, Glenfield, Browns Bay, Milford, Northcote, Huapai, Warkworth etc.

An approximate estimate of the new housing potential is four transport routes at 10,000 per route, 10 sub-regional centres at 10,000 per centre, and 30 town centres at 4,000 each. This gives a total of about 260,000 dwelling units in medium to high-density developments. This is more than the required number of new dwellings in the region through to 2026, though the actual additional capacity available is about 70% of this number since "intensification" (i.e. medium-high density housing) is already underway in many of the centres. Even so, it appears that the strategy allows for most new housing demand to be taken up by multi-unit housing, rather than stand-alone dwellings. At present it is estimated approximately 4,000 new units per year are being built in these "intensification" zones (mainly in the CBD). Given that the current annual new housing volume is about 9,000 per year in the Auckland region it is apparent that

the majority of new construction remains stand-alone, at present. We have allowed for the stand-alone percentage share to decline from about 70% now, to about 30% in 2026. There will still need to be a significant amount of low-density and stand-alone housing in other areas of the MUL and new Greenfield sites to meet demand. A recent survey[15] of developers indicates that the RGS is encouraging more intensive development in CBDs, but that the redevelopment of town centres and along transport routes is seen as too difficult and not viable at present.

Other surveys have explored housing preferences in the Auckland region. In the RGS research, residents were asked about living along the transport corridors and near transport centres and 40% said yes, 27% said maybe and 33% said no. Those in favour saw the benefits of better access and travel time, and better lifestyle. Those against wanted less intense living, and were worried about medium-high density housing quality. Other surveys indicate that town houses and other purpose designed medium-density developments were preferred to cross-lease infill housing.

5.2 Suburban future

The general tenor of the research in Auckland and other centres is that the majority of households still aspire to the traditional stand-alone house with a garden. The BRANZ survey of new house owners, reported in the next section, also supports this aspiration. However, due to affordability constraints, and transport and lifestyle considerations, households are increasingly prepared to live in medium and high-density housing, especially if they are well designed and have good public transport.

In an article[16] in the Business section of the *NZ Herald* a property developer stated that the physical structure of suburbs (both infill and new fringe developments) will undergo rapid change. The main changes foreseen are:

- Housing density will increase.
- There will be higher expectations of quality, connectivity and community in suburbs.
- Service industries will need to be localised.
- Sustainability features will be important.
- The traditional flat land subdivision will change to have greater regard for social, environmental and economic consequences.
- Demand for higher quality, but remaining affordable will mean more modular construction.

This outlook does not rule out greenfield developments, but indicates they will need to be better planned, and that there will be a shift to more medium-density housing.

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[15] Knox, Smith (2006) *Developer survey: intensification in Auckland*. Regional Growth Forum December 2006.

[16] Martin Udale, 'Forces building to reshape suburbs'. *NZ Herald* 12 February 2007.

6. HOUSING FUTURES AND LIFESTYLES

6.1 Scenario settings

This section reviews three futures studies, developed for CHRANZ, Landcare and Building Research.

6.1.1 Bates, Kane (2005) – the future of housing in New Zealand (for CHRANZ)

This report carries out a STEEP (social, technological, environmental, economic and political) analysis of factors impacting on the future housing market. The report starts with a list of predetermined elements. These are:

New technologies: Improved operation of buildings due to improvements in air conditioning systems, solar thermal and photovoltaics, and intelligent services management systems.

Construction skills: Shortages due to retirements, and the relative lack of new apprenticeships.

Mass-produced housing: A rise in factory-built houses, due to quality demands, with standardised components due to the need for economic scale of production.

Demographics: A continuing fall in average persons per house due to demographic trends. Ageing population and more people in residential care.

Existing housing stock: Approximately 70% of the 2030 housing stock already exists and will need modification for changing demographics and household types.

Climate change: The existing stock will need to be adapted to cope with increased coastal and inland flooding, overheating in summer, and increased strong wind events.

Our comments on these elements are:

Construction skills are currently in short supply due to recent increases in demand and shortages, although these are now abating. However, shortages may continue even as demand reduces due to increasing baby-boomer retirements. The shortage may favour pre-built mass produced housing because quality is more easily controlled in a factory environment. If this occurs it will entail a shift from the current small site-based firm size that is characteristic of the industry now, towards larger firms. One impetus for this is the shift to higher density multi-housing, which is better carried out by larger firms. But we believe the small-scale firm will remain, especially for retrofitting and maintaining the existing stock, but also as builders of new housing. The main reasons for this view are first, that the size of the industry is unlikely to expand sufficiently to drive down costs enough to drive out the small builder completely. Second, residential skills are largely located in small firms due to the preference of participants to run their own business. Hence, while we believe there will be more mass produced housing for medium-density housing, as postulated in the study, the small-scale builder will remain an important part of the industry.

From these pre-determined elements four scenarios were developed by Bates and Kane:

- Sunrise/sunset
- Change of heart
- Vertical village
- Gates of heaven.

The *Sunrise/sunset* scenario notes that regional growth rates may vary, for a variety of reasons including commodity prices and business relocation. This will affect employment prospects and the housing market. The need for households to relocate

can also be unstable for social outcomes, particularly for beneficiaries because the Government's role in social housing provision is not well co-ordinated with local government, community groups and private providers.

The *Change of heart* scenario speculates that society is moving from a goods-based ownership market economy to one based on access to "experiences" and to intangibles. People are becoming more accepting of debt, and less interested in housing ownership, in part due to affordability problems. REITs provide rentals which house an increasing percentage of the population.

The *Vertical village* is a medium to high-density housing scenario developed to overcome the current unsustainable transport patterns. Security, soundproofing, privacy, and community interaction spaces are prime considerations in the design of these developments.

The *Gates of heaven* scenario is when society fragments into socio-economic housing groups. As an example, there is a trend in the USA toward gated communities of conservative interests. The scenario notes that the New Zealand fertility rate is dropping below replacement rate and that this is not economically sustainable in the long-term. There needs to be a reversal in fertility (as has occurred in the USA), or immigration needs to increase, and associated with this may be a tendency to form separate communities, with the risk of ghettos for lower socio-economic groups.

There are elements in all scenarios which appear to be relevant to our housing future, rather than any one scenario being a more "accurate" forecast. In terms of the forecasts elsewhere in this report the following aspects of the four scenarios are relevant:

Sunrise/sunset: The demographic-based forecasts contained in Section 5 are based on a continuation of past regional growth trends, but this scenario notes the economic viability of regions can change unexpectedly, impacting on the type and number of new housing demand. For example, the recent world-wide popularity of coastal and lake side properties has impacted on a number of rural regions, at the expense of hinterland locations, and this was largely unforeseen. Although it is not addressed in this scenario, the issue of population replacement is relevant here. The middle demographic forecasts used in this report (based on Statistics NZ "middle" forecasts) is for 1.85 persons per female by 2021, which is below the replacement rate of 2.1. This is not demographically sustainable and some groups advocate family-friendly policies (at work and elsewhere) to reverse the demographic decline, and which would impact on the type of housing required.

Change of heart: Already the proportion of households renting is up to 33%, and not only affordability but lifestyle trends and aspirations could lead to increased renting. The current rental market is dominated by small-scale private landlords and it is uncertain how well this sector could supply an expanded market. A large number of landlords have invested for the tax advantages[17] and may leave the market if personal tax rates are reduced, or capital gains on rentals are taxed, both of which are quite possible in the medium to long-term. The outlook seems favourable for a "rationalisation" of the rental market and we find the REIT scenario quite plausible.[18]

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[17] Westpac Bank (2007) *House prices have been pushed up by tax rates and interest rates*. Website (www.westpac.co.nz) 16 March 2007.

[18] Department of Building and Housing has commissioned work on REITs. A private sector player is reported (*NZ Herald* 10 June 2007) to be launching a REIT by the end of 2007. Housing NZ has leased almost 2,800 rentals from private landlords, with some companies in the hundreds. A REIT has a similar financial structure to mutual funds. If most rental housing was owned by REITs their value would be approximately $80 billion which is about the same as the New Zealand share market capitalisation.

The implication is that designers and builders will increasingly have investment companies as their clients, rather than individual owners.

The main message of the *Vertical villages* scenario is that current transport patterns are unsustainable, both in terms of transport costs and impact on the environment. Regardless of preferences, public transport will have an increasing role, and cars less of a role. This affects the future location of housing, and will lead to densification/redevelopment of housing along transport corridors. The relative roles of CBD vs suburban business centres are unclear but greenfield developments and/or urban renewal will need to be planned to minimise transport to work. Housing development needs to be integrated with commercial/business development because low-density housing with long commuting distances will not be sustainable. This scenario is consistent with the Auckland RGS for "intensification" in selected areas.

In the last scenario, *Gates of heaven*, there is trend toward conservatism in society at large, manifest in a rise in spirituality and conformity and away from liberalism. The driver is generally older professional people intent on joining like-minded citizens in communities, which may be gated to exclude others. The question posed by the report is whether this is an "innocuous form of protected suburban development or a worrisome precedent for a divided urban realm".

This scenario is less convincing than the others. Some suburbs will be more preferable than others because of the socio-economic considerations. Also, due to life stages and preferences some will prefer inner city high-density living, while others prefer suburban living. But it is difficult to see many "special interest" communities that are sufficiently insular or afraid of others to have a "divided urban realm". One of the largest now under construction is the Point Ridge community in Albany, with an eventual 176 units on completion. There are others in Auckland and elsewhere, and the total number of units is believed to be a very small proportion of all new dwellings. The issue for our forecasts is not so much whether gated communities will increase in number, but whether integrated communities will thrive in the future.

The Government is trying to locate HNZC housing projects in "mixed" developments, at both the micro and macro scales. The former are isolated state rentals in new housing developments; the latter are Greenfield developments, such as the Hobsonville Air Base development of 3,000 homes, where 85% will be privately owned, including 15% affordable housing and 15% to be state house rentals. It is believed the Government is considering ways to make it mandatory to provide some affordable housing in all new developments, reserved for first home buyers. One issue is what happens at re-sale and whether or how the properties are reserved for first home buyers or low-income households on an ongoing basis. At this time it is uncertain how successful the Government will be in its attempt to encourage "mixed" developments.

Auckland City has a joint venture with the NZ Housing Foundation[19] to provide an equity share housing scheme for modest income first home buyers. The Foundation provides part of the purchase price and takes a proportional part of the profit when the house is eventually sold. The aim is to build 100 houses over the next 5 years. The Foundation has already built a few in Manukau City on a "rent-to-buy" basis where buyers pay market rent for 5 years then get 75% of the increased market value of the house as a free deposit on its purchase. It is also developing 70 houses in Glen Eden, Auckland, which are being offered on either basis. Both schemes have advantages but the equity share scheme appears to be more popular for several reasons. Owners get title at the start, the deposit required is quite low, 3 to 5%, and the Foundation share, which can be up to 40%, significantly reduces the purchase price barrier.

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[19] www.nzhf.org.

6.1.2 Frame, Taylor, Delaney (2005) – four futures for New Zealand

This study examines the future out to about 2050 and has various reactions to environmental degradation and the resulting decline in economic resilience. The four scenarios are:

- Fruits for the few
- The Shire
- Market orthodoxy
- Living on No. 8 wire.

The characteristics are summarised in the table below.

Table 8. Landcare scenarios

Fruits for the few	**The Shire**
Powerful corporations	Comprehensive sustainability measures
Businesses adopt sustainable practices to protect their investment and trade	Modest economic growth
Strong economic growth	Consensus building
Individuals not sustainability minded	Government role in facilitating social cohesion
80/20 society (80% wealth held by 20% of population)	Quality of life focus
Minimal Government intervention	
Some social unrest	
Future housing implications	*Future housing implications*
Gated communities for some locals and rich migrant communities	Regional community housing developments, assisted by Government
	High level of sustainable features in housing
Market orthodoxy	**Living on No. 8 wire**
Globalisation proceeds apace	No change in current sustainability practices until 2030
Resource depletion	Environmental and ecosystem depletion
Strong competition and individualism	Eventual pragmatism, public work camps, and community environmental initiatives
Short-term Government focus and strong economic growth	Informal markets and barter
Economy not resilient to climate change	Modest economic growth
Economic slow-down post-2030	Strong Government role in trade-offs, redistribution, environmental restoration and public works after 2030
Future housing implications	*Future housing implications*
Gated communities	Regional focus and away from the major cities. Government housing a significant % of total stock. Eventual provision of sustainability features in houses
Low sustainability uptake in housing	

The study has an emphasis on resource sustainability and its approach is that resource depletion will eventually lead to an economy-wide slow-down. We find their scenarios quite challenging in that they all foresee quite major changes in the way the economy is structured. The scenarios postulate either restructuring on a voluntary basis in the near future or as an emergency response 20 to 30 years into the future due to environmental degradation and economic collapse. There seems to be little faith in these scenarios for the market and voluntary take-up of conservation measures aided by some Government regulation, to maintain current economic growth rates and improve sustainability.

6.1.3 Bengtsson, Hargreaves, Page (2007) – assessment of the need to adapt houses to climate change in New Zealand

This project, produced for Building Research, examined the impact of expected climate change impacts on the existing housing, and what features future new housing will require to mitigate these impacts. It examined both the physical impacts, and the change in how people will use their houses because of climate change i.e. the social impacts.

The physical impacts are:

- Average temperature rise of up to 0.8^{o}C by 2030 and 2.4^{o}C by 2080.

- Drought – more frequent.

- Bushfire risk – increase in eastern parts of New Zealand.

- Extreme rain events – double in frequency by 2080.

- Flood events – double in frequency by 2080.

- Cyclones – decrease in frequency and an increase in intensity.

- Sea level rises of up to 0.16 m by 2030 and 0.52 m by 2080.

Measures to counter these include:

- Temperature – more insulation, especially in northern regions, to reduce cooling loads in summer.

- Drought – provision of on-site storage rain water tanks. Recycling of grey water.

- Bushfire – more fire-resistant wall claddings, requirements for bush-house distances.

- Extreme rain events – slightly more maintenance of spouting and wall claddings will be required.

- Flood events – more accurate flood plain mapping by TAs, and more building restrictions.

- Cyclones – heavier fixing of roof claddings. An upgrade in window wind loading design.

- Sea level rises – more accurate coastal erosion mapping by TAs, and more building restrictions.

The report says that many of these measures should be incorporated into new housing being built now since it can be quite expensive to adapt later. For example, more insulation can be justified on economic grounds for most new houses in most locations now, mainly due to heating energy savings. In the warmer parts of the country the benefits of more than Code levels of insulation in new housing are marginal at present but will become more so as cooling energy begins to dominate residential space

conditioning energy use. In existing housing the retrofitting of insulation is currently very economic for most households.

Another example of a climate change impact is drought. Use of stored rain water for washing and grey water for gardening are good sustainability practises that can be used now, and are calculated to be economic as water charges continue to rise.

The social reactions to climate change also have a bearing on how houses should be designed now, or modified in the case of existing houses.

The following measures are recommended for consideration, including some impacts from trends not directly related to climate change:

- Temperature rises – tropical house styles i.e. verandahs, more outdoor areas, more openings in the exterior envelope, cross-ventilation. More screens for protection from insects.

- Move from the coast – relocation of elites from some coastal areas due to erosion, to further inland. Social conflict arises with the existing groups in the relocated areas.

- More immigrants due to the relatively benign direct effects of climate change on New Zealand, compared to many other countries.

- Ageing population – need to provide features for older inhabitants.

- Security – fear of crime leads to security features and gated communities.

Overall, the changes in design are likely to require a mixture of more outdoor oriented living, the need to protect the house from extreme weather events, and consideration of a need for security. At the same time there is a need for UD features (see Section 7.2), and possibly particular ethnic considerations.

6.2   Survey of general population

Households were surveyed by BRANZ on housing preferences and lifestyle aspirations. The aim was to explore the following aspects:

- Location factors in new and existing housing.
- Required design features in selection of the house.
- Defect/faults in new and existing housing – unprompted.
- Respondents' lifestyle priorities (housing, travel, career, etc).
- Expectations of retirement accommodation.

The results are summarised in Figure 15 through to Figure 25 below. The survey questions are in the Appendix for new house owners, and the existing house occupier survey is almost identical. The findings and implications are:

Location selection: Affordability is the major factor in choosing the location of a new house, with views and suburban status close behind (Figure 15). The same factors were important for existing home buyers, but close to public transport rated higher for existing home buyers than new house owners (Figure 16).

Design features of house: Looking at the particular design features of a house it was surprising that double garaging rated highest in new housing and third highest in existing houses. This result shows the important role of private transport in our living arrangements. Total house size, quality fittings in the kitchen and bathroom, a garden,

and low maintenance walls and roof also rated high in the selection choice for both new and existing houses (see Figure 17 and Figure 18).

For those renting, the total size of the house, and quality bathroom and kitchen fittings rated high (see Figure 19). Again a double garage was also important.

Improvements in design: The next two charts are the comments made by occupants about the housing features that could be improved and that they found unsatisfactory. Respondents were able to write any response they wished and a wide range of comments have been assembled into categories – see Figure 20 (new house owners) and Figure 21 (occupants of existing houses). For new housing the most common complaints were:

- Poor house layout – this included rooms too small, rooms wrong shape and house orientation is wrong, more storage space needed, entrance way and transition to garage and outdoors is not well done, less open plan preferred etc.

- Landscape/garden – the most common comment was that landscaping (patios, pizza oven etc) and establishment of the garden is yet to be done. Other comments included poor contours, poor section drainage, and poor quality of fencing.

- Inadequate heating – this included not enough fixed heaters, and the need for central heating, underfloor heaters and solar water heaters, also heat pumps too draughty. Garden/landscaping. This was mainly the need for more garden space and outdoor living areas.

- Double glazing – the main comment was the owners wished they had specified double glazing.

- Garage – the most common comment was the garage is too small.

- Energy inefficient – this included need for better solar design, water heater too far from use point, house not air-tight in high winds, gas water heater is inefficient, and a number just said energy efficient design.

- Bathroom – most comments said they wished the bathroom or shower unit was bigger. There were some comments on the quality of the finish of tiles and paint work.

For existing house occupiers the defect areas were no garden or the need for landscaping, the bathroom and kitchen, need for a garage (or double garage), inadequate/nil insulation, and poor house layout. Inadequate heating and the need for double glazing and insulation also featured.

Lifestyle priority: The aim of this question was to explore priorities of home ownership vs other priorities such as travel, consumer purchases etc. For renters the main priorities are work/career, saving for a first home, and lifestyle purchases. Over 63% of the respondents were below 41 years in age. The quite high priority to home ownership indicates younger people still aspire to ownership, despite the recent adverse trends in affordability. However, it is not a sole priority with lifestyle purchases and funding children's education at about the same score. A continuation of house renting will be an acceptable compromise for many households. See Figure 22.

For owners their lifestyle priorities were work/career, followed by short-term travel, retirement savings, and paying off the mortgage, see Figure 23.

It was hoped we could test young persons' (<31 years) home ownership aspirations. However, most of those picked up in the survey already owned their home and the

number of renters in the age group was too small to derive statistically accurate conclusions about their aspirations on ownership. It is known from the 2006 census that less than a third of this group actually own a house, so the sample is not representative of the age group.

Retirement accommodation: The final charts, Figure 24 and Figure 25, are on retirement housing expectations, for the under 50s age group and the over 50s age group. The two charts have a similar pattern and the major difference is the first bar where, not surprisingly, the under 50s have a high expectation they will shift houses before retiring, compared to the over 50s.

The other differences are the under 50s are slightly less receptive to leaving the house to the children and working after age 65 years.

6.2.1 Conclusions of survey

The main conclusions of the BRANZ survey of occupiers are:

- In terms of location of the house, either new or existing affordability is the major consideration, and closeness to work and public transport are middle-to-low ranked for both new and existing housing. This suggests households at present remain willing to travel significant distances to work.

- The most important design feature in new housing is a double garage, quality bathroom and kitchen fittings/fixtures, overall size, and low maintenance claddings. Existing house owners have similar priorities, and garden/lawn space is also ranked high.

- The design defects in new housing are poor layout and heating/energy efficiency performance. 37 responses out of 177 new house responses mention house layout, and 81 comments related to poor heating, and poor insulation and energy efficiency measures. This suggests a significant proportion of new owners are unsatisfied with the comfort levels in their new homes.

- Saving for a first home by renters is a medium priority (score = 1.8) and work/career aspirations scores higher (2.2) in priority.

- About 60% of the over 50s group expect to remain in their existing house at retirement. This lines up approximately with the 50% of the same age group who said they will not move to a smaller house on retirement. Other studies, mentioned in Section 2 indicate ageing-in-place is the preferred option.

The survey form for new house owners is in the Appendix.
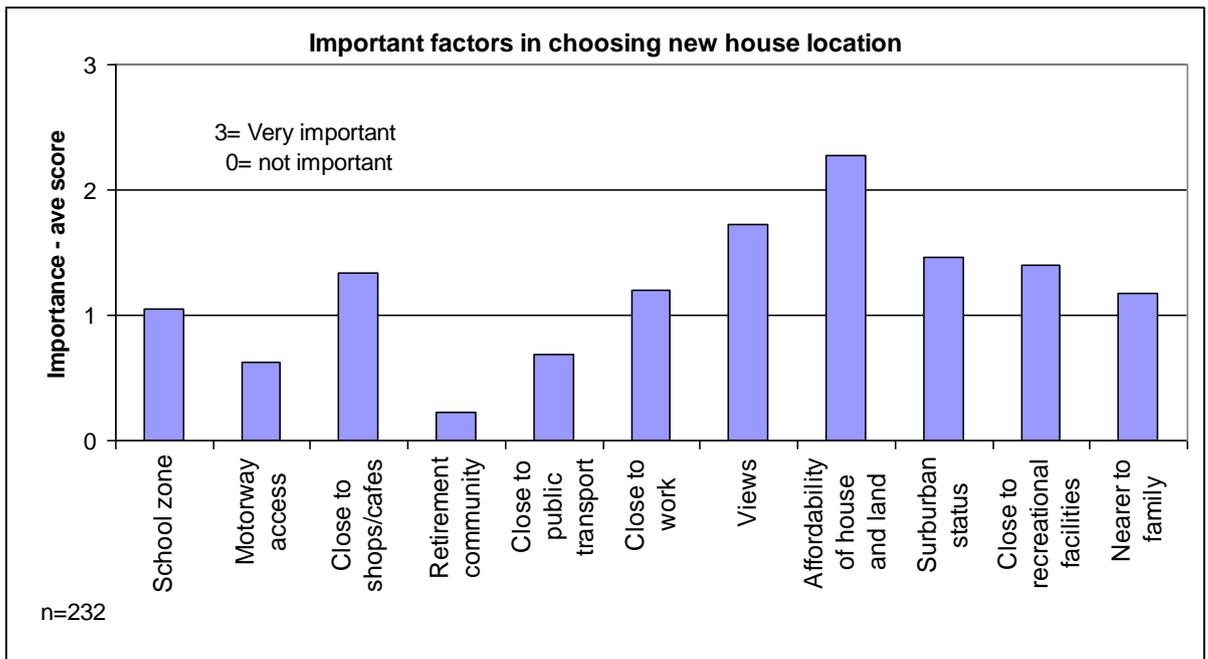
Figure 15. Decision factors in selecting new home ownership location
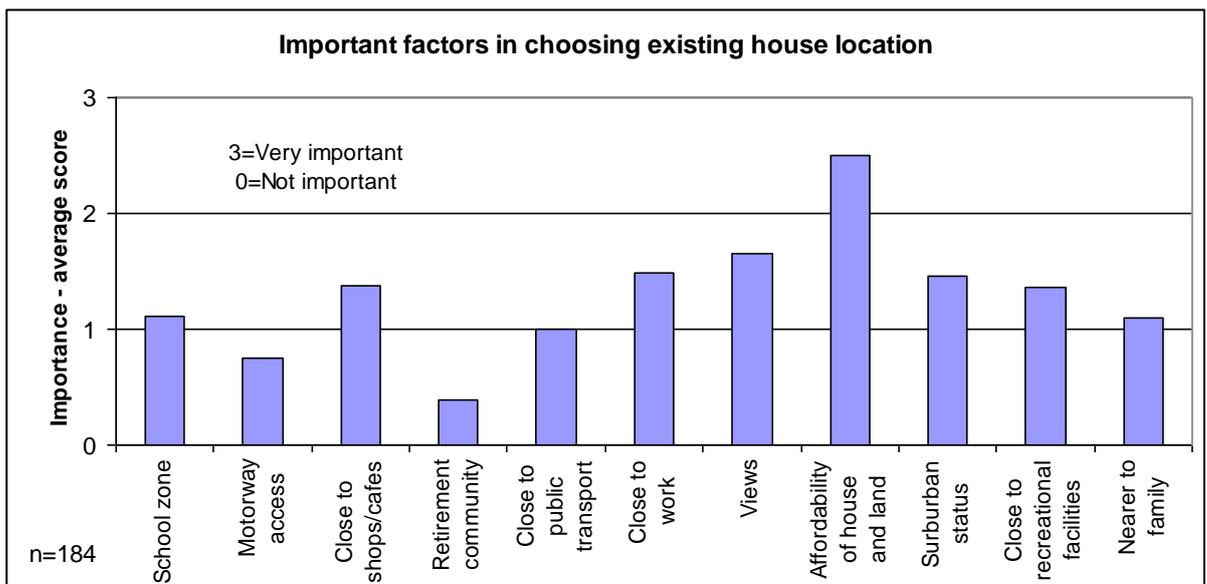
Figure 16. Decision factors in selecting existing house ownership location

The response numbers for the particular question are shown on the bottom left of the charts.
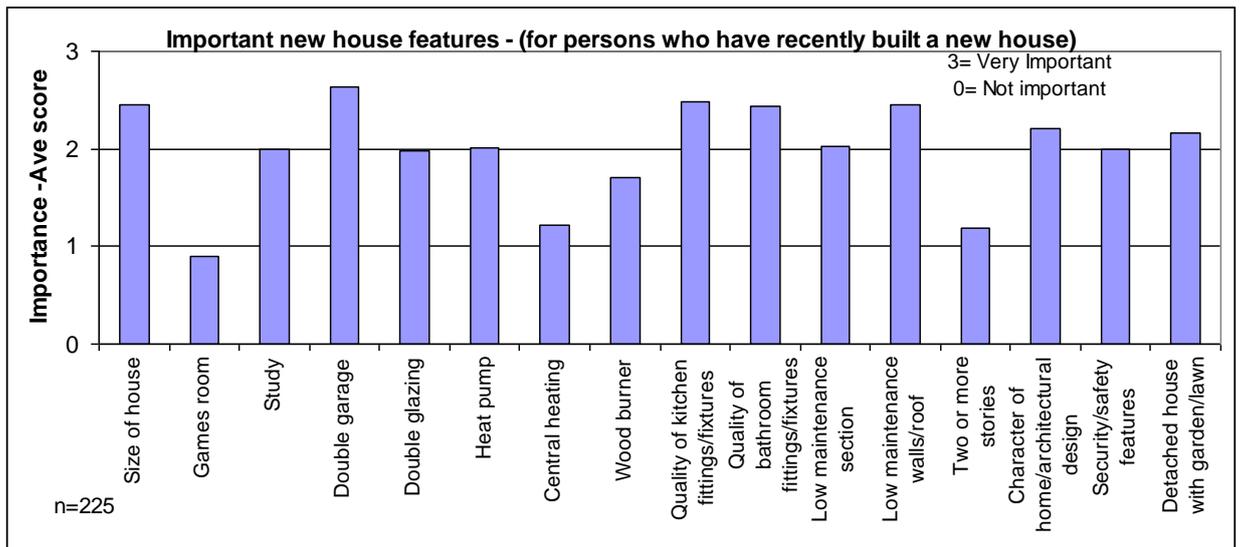
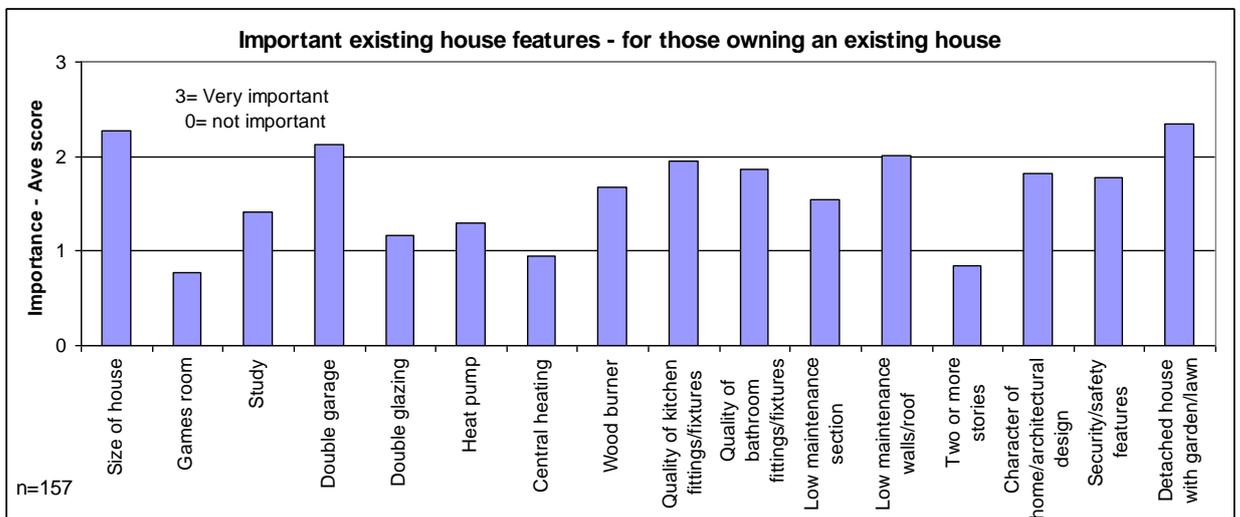**Figure 17. Importance of design features in a new house**

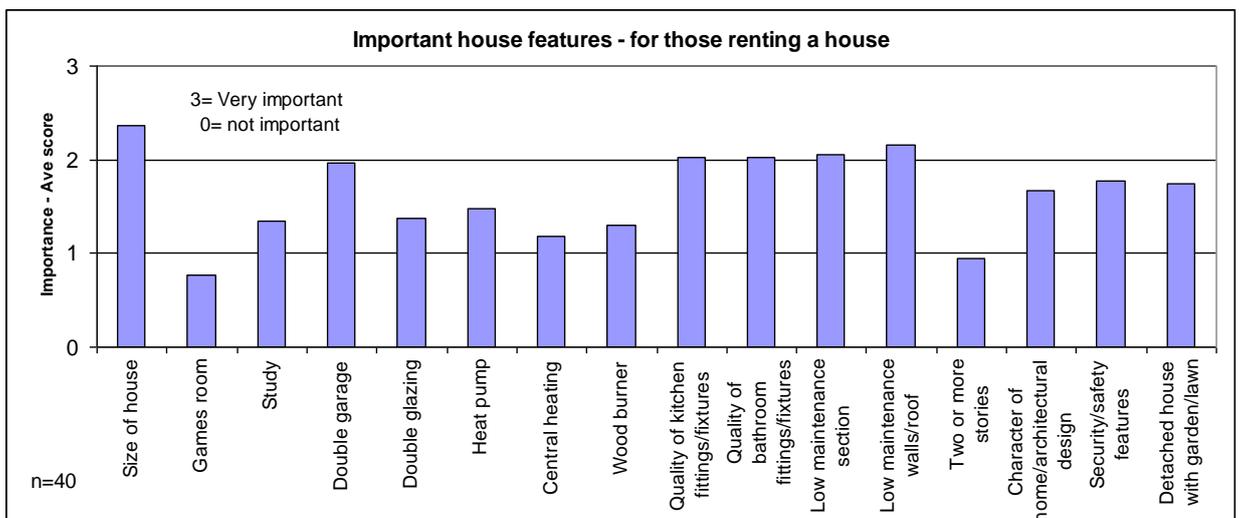**Figure 18. Importance of design features in selecting an existing house**

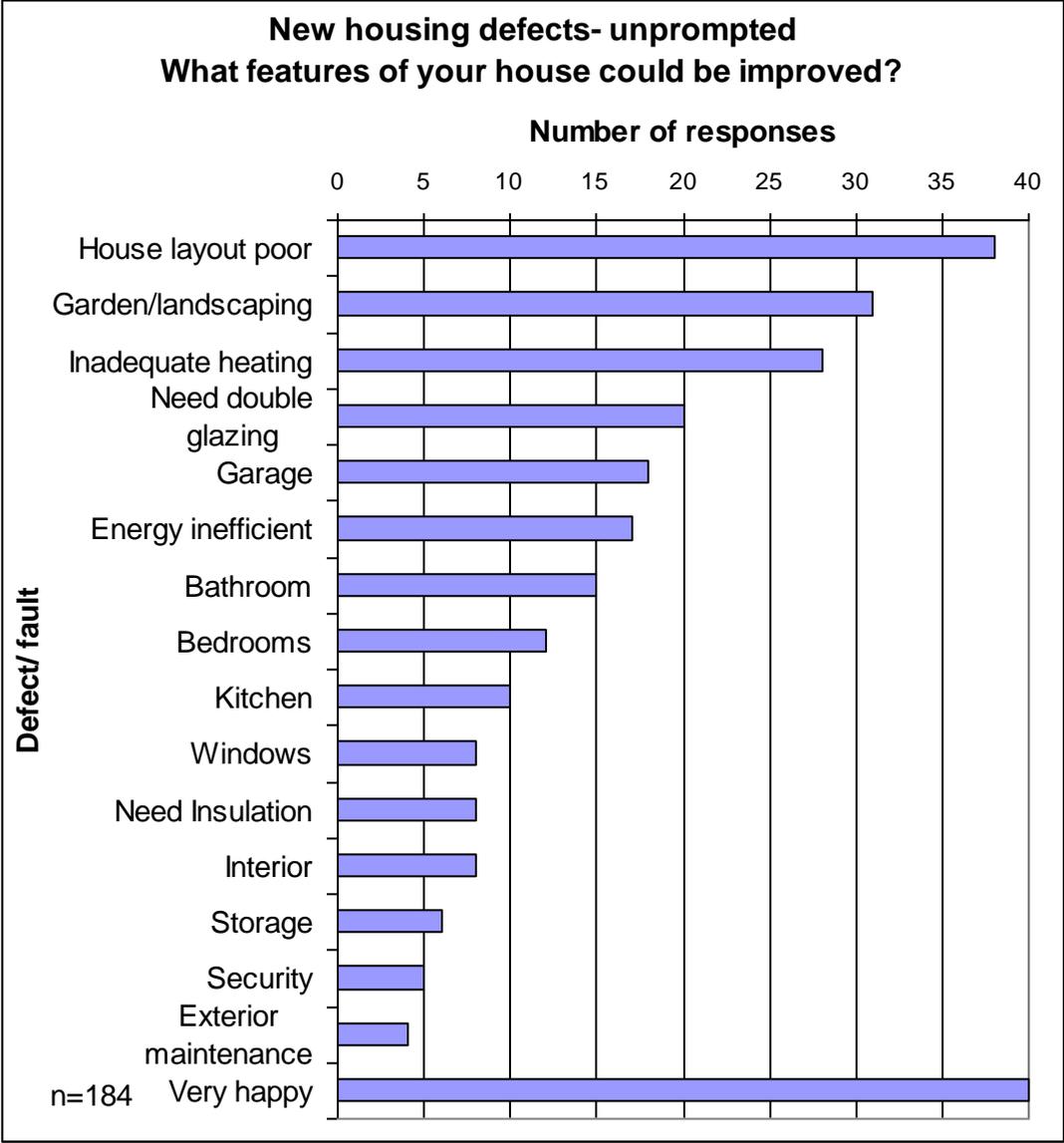**Figure 19. Importance of design features for those renting a house**

New housing defects- unprompted
What features of your house could be improved?

Figure 20. How could your new house be improved?

Existing housing defects- unprompted
(What features of your house could be improved?)
Number of responses
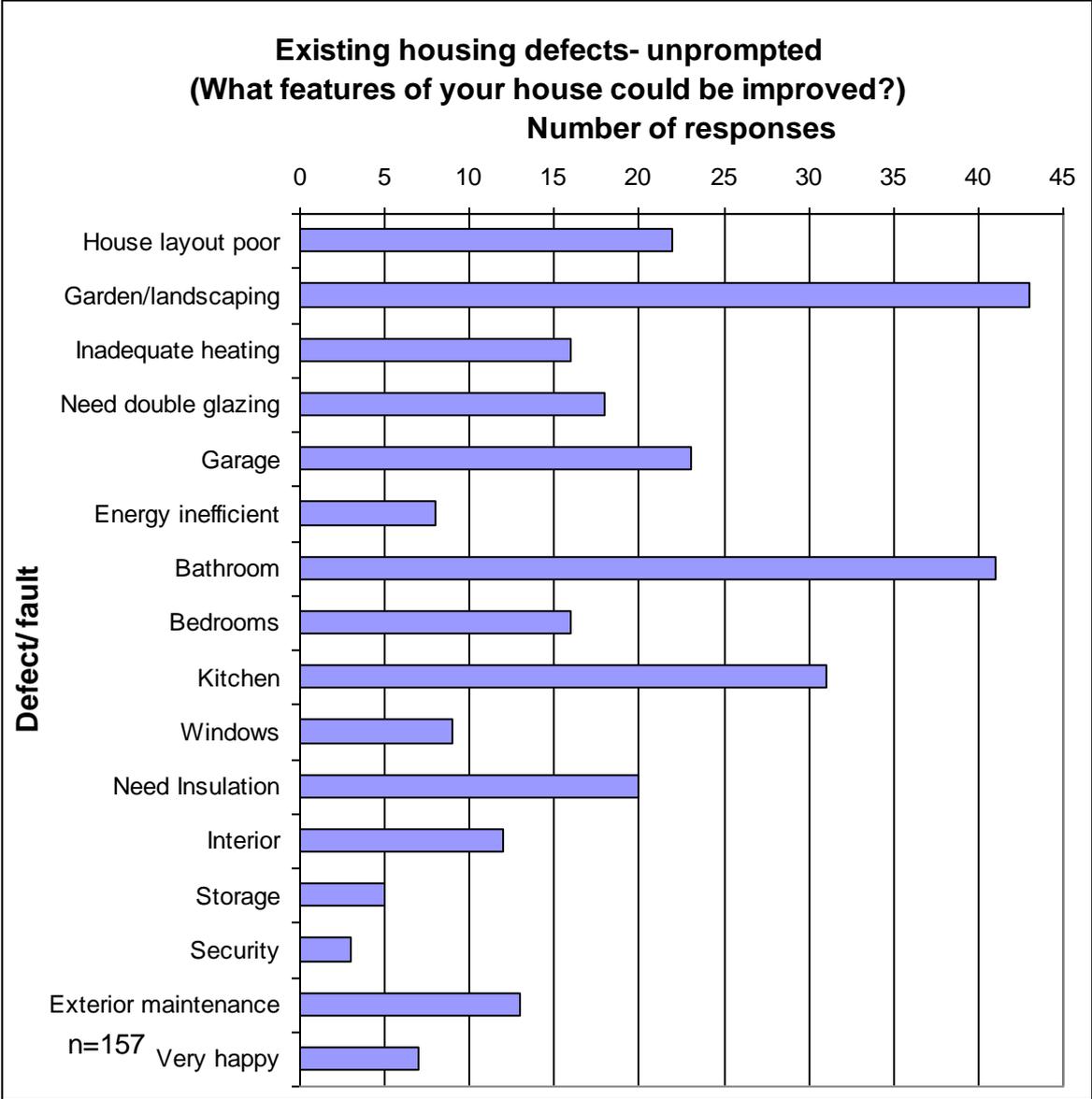
Figure 21. How could your existing house be improved?
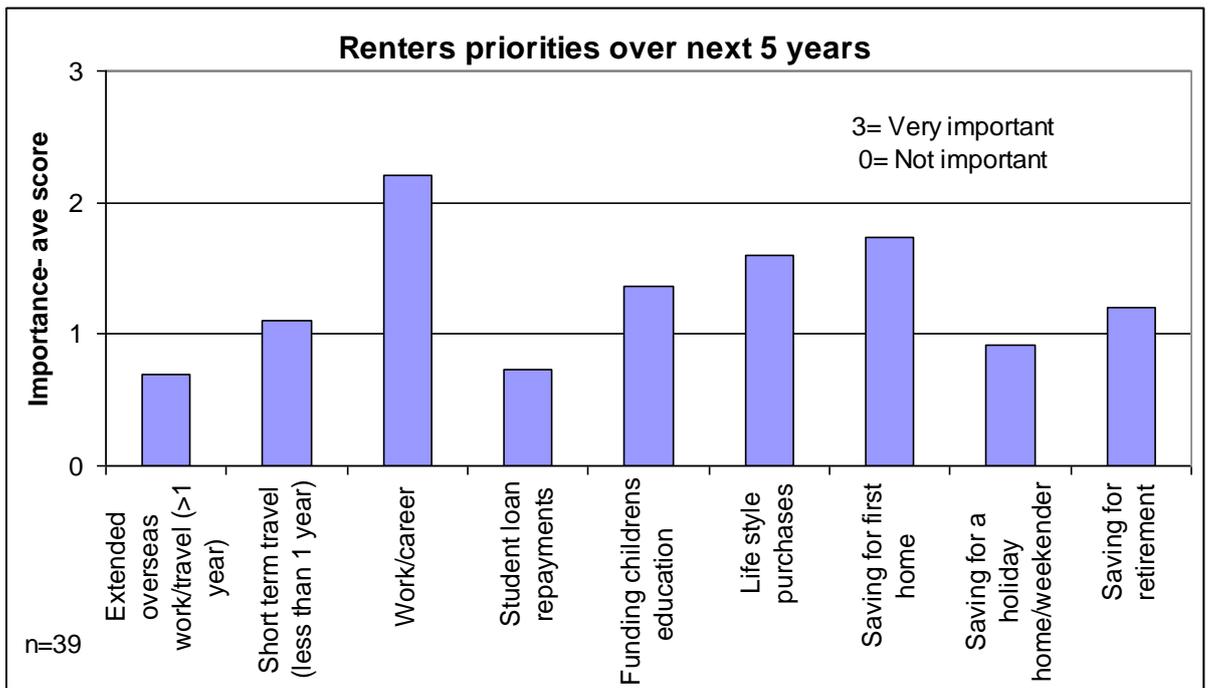
Figure 22. Renters' lifestyle priorities
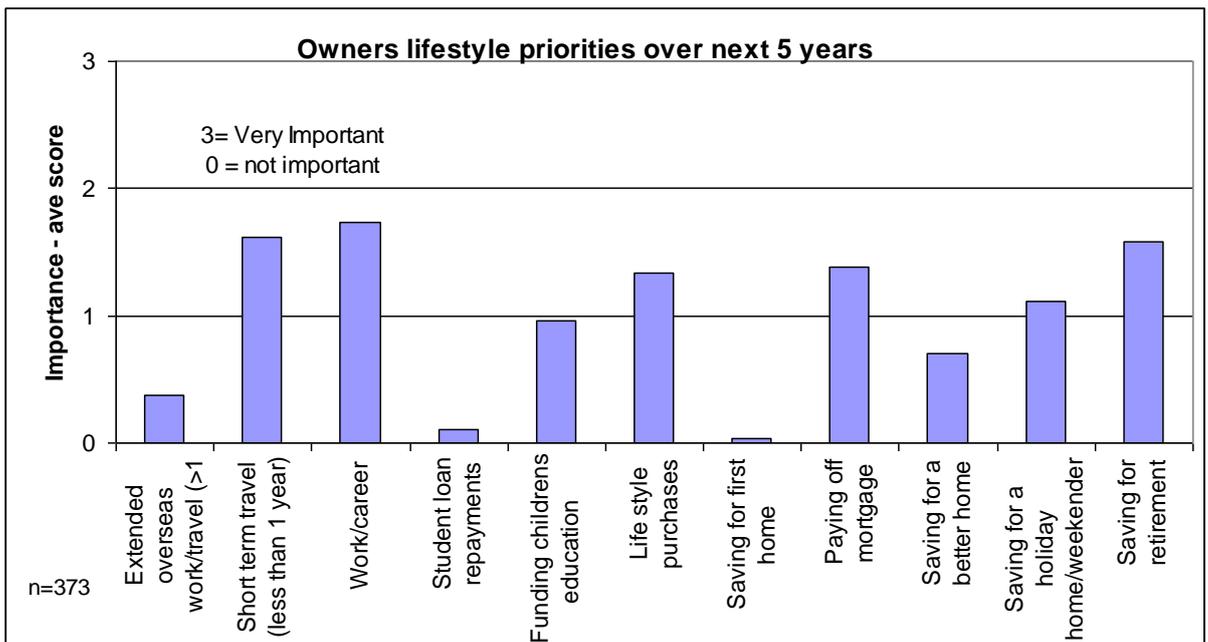
Figure 23. Owners' lifestyle priorities
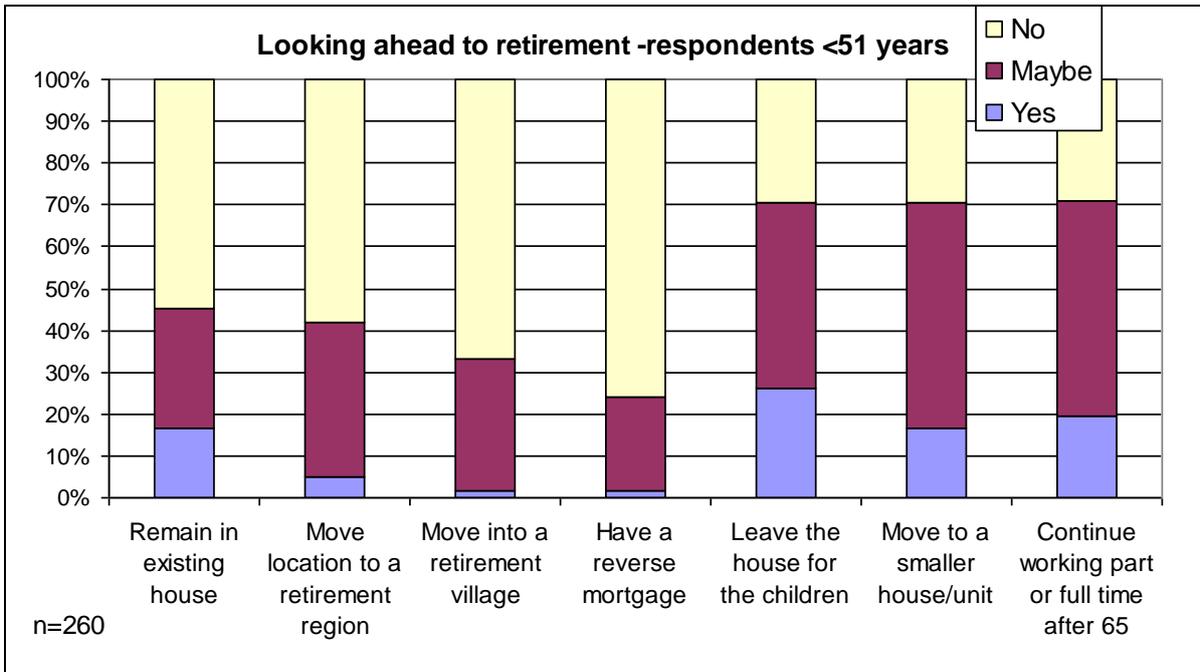
Figure 24. Retirement housing expectations – <51 years age group only
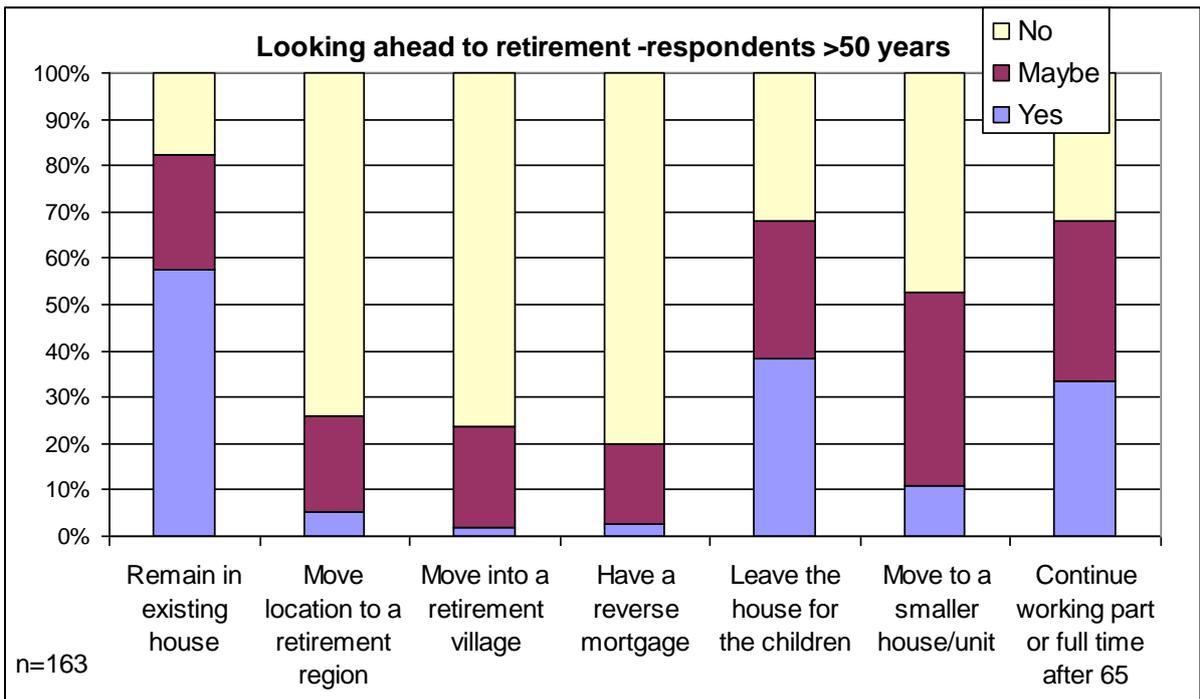
Figure 25. Retirement expectations – respondents >50 years age group

7. WHAT DESIGNERS AND BUILDERS NEED TO KNOW

These are the features/design aspects designers and builders need to consider now.

7.1 New housing numbers, location and occupiers

- The middle forecast is for 26,900 new dwellings per year, on average, between now and 2016. A large proportion of these (6,700) will be demolition replacements, or major refurbishments rather than building from new. Over the last 10 years the average has been 25,300 units per year, so the projection is for a slight increase.

- The main location will be in Auckland region, 33% of all new units. They will be a mixture of infill, site redevelopment along transport routes and town centres, and expansion around existing peripheral towns.

- 45% of new households in the decade ending 2016 will be Asian ethnicity, with European, Maori and Pacific Island being about 15% to 20% each. Note: many new households will move into vacant existing houses, rather than building from new, and it is expected the majority of new housing will continue to be for Europeans in the short and medium-term.

- Much of this new housing will be for couples and single persons as the family types projected in Figure 7 show these two groups as the major growth types.

- Ownership is expected to continue its decline from 67% now to about 61% in 2016. However new housing is likely to be more than 61% owner-occupied in 2016 as most new households rent on their formation.

7.2 Type of work and housing features

- Approximately 31% of new units will be multi-unit, medium to high-density construction.

- 25% of new housing in the decade to 2016 will be demolition replacements and/or major refurbishments of the stock.

- Large landlords, of the REIT type, are expected to emerge in the next 10 years and will be major purchasers of both existing and new housing.

- UD features should be installed in all new housing.

- It is cost-effective to install climate change adaptation features (extra insulation, passive vents, good width eaves, extra wind bracing in some locations etc).

- The BRANZ survey of owners of new houses indicates the comfort levels were not as expected, and designers should consider higher than Code insulation and double glazing.

- Within the confines of the site and budget, good outcomes are not always achieved for orientation, relative room sizes and shapes, storage space, entrances and transition zones.

A number of organisations have developed schedules of features that "user-friendly" housing should have. This section considers two of these schedules:
- Lifetime Homes Standards[20]
- UD in Housing.[21]

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[20] Joseph Rowntree, Foundation Lifetime Homes Group.
www.jrf.org.uk/housingandcare/lifetimehomes/partMandLTH.asp

The first of these arose out of the observation that many British houses were inconvenient for large segments of the population, including young families, frail older people and those with disabilities. Features include:

- Level or gently sloping approach to the home.

- Well-lit and covered access threshold.

- Halls and doorways wide enough for wheelchair access i.e. 1200 mm wide with 90 degree corners, or 900 mm with chamfered corners. All doors at least 760 mm for 1200 mm corridors and 810 mm for 900 corridors.

- Turning places for wheelchairs in the ground floor living spaces.

- Living/family room at entrance level (for possible use as a bed space in two-storey construction for those with temporary impairments).

- Wheelchair access dimensions in the ground floor toilet are provided.

- Extra dwangs or plywood to secure grasp rails in toilets and bathrooms.

- Blocked-out area in upper floor to accommodate a future lift shaft from near the entrance.

- Easy route for a railed ceiling hoist from bedroom to bathroom (i.e. non-load bearing partition walls between the two areas, and future access through the wall to be free of services.)

- Bathroom laid out to provide side access to the toilet and bath.

- Window sills sufficiently low for viewing from a wheelchair.

- Power sockets and light switches are positioned for access by all (i.e. between 450 mm and 1200 mm from the floor).

None of these are required in the NZ Building Code for housing, but occur as a matter of good design practice in many houses e.g. even approaches and level access, good lighting, and service rooms on the ground floor. Some of the other changes e.g. hallway widths, larger bathrooms, extra dwangs for fixing rails, removable upper floor lift space, would involve extra cost, but this need not be expensive with proper design consideration. An increase of 1% on the house cost was quoted in an US study.[22] A different US study[23] found that 79% of visitors to a UD home said they were willing to pay an extra 4% of the house cost for all the UD features (including an elevator).

The second standard, UD, targets people of all ages and sizes, and is applied to all buildings. In the past industry has developed special products for special groups, but the aim of UD is to design every product and building so that everyone can use it to the greatest possible extent. The features include:

- At least one stepless entrance.

- Garage floors at house level so vehicles do the climbing.

- Clear spaces inside and outside the front entry, of 1.6 x 1.6 m.

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[21] The Centre for Universal Design (2006). *Universal design in housing.* North Carolina State University.

[22] www.adaptenv.org/newsevents/ud_housing_herald.php

[23] Christenson (2007) *Responses of the public to residential UD features.* www.lifease.com.

- Weather protection at the entrance.

- Windows at/near the front door for identification of visitors.

- Open plan design

- At least one bedroom and bathroom at ground floor level.

- All doorways at least 810 mm and all hallways at least 1070 mm wide.

- Turning space in all rooms of 1.5 m diameter.

- Two-storey dwellings to have floor-to-ceiling storage space at ground floor with a knock-out floor for subsequent installation of a lift.

- At least one bathroom to have a 1.5 x 1.2 m minimum kerbless shower.

- Adequate wheelchair space in at least one toilet.

- Shower fixture controls designed for all ages/health condition (i.e. single-level water controls, adjustable height head, 1.5 m flexible hose, pressure-balanced and anti-scald valves etc).

- Kitchens. At least 1.2 m spaces between walls, cabinets and benches.

- Variable height kitchen work surfaces.

- Laundry, sink no more than 860 mm above floor with knee space below. Clear space of at least 900 mm in front of the washer and drier.

- 50% of storage less than 1400 mm high.

- Extra width and length around garages. Minimum door height of 2.4 m for tall vehicles.

- Decks at the same level as the house floor.

- Switches 1100 to 1200 mm above floor. Power sockets minimum 460 mm above floor.

Many of these are targeted for wheelchair mobility, but are also useful for large people and for the elderly. People of all ages and the able-bodied will also benefit from many of these features. Readers will note that the UD standard has many similar features to the British Lifetime Homes standards.

The above features were incorporated into the Talbot Park Community Renewal Project undertaken by Housing New Zealand Corporation (HNZC) in East Tamaki, Auckland. The project involved refurbishing 108 flats and building 111 new homes (with 59 existing units demolished). Some units had most of the above features, while others had only a few, so not all units could be described as 100% UD. However, in addition to UD features, 13 units were built for large/extended families with between five and eight bedrooms. Also, sustainable building practices were used for the development including:

- Above Code insulation standards.

- Passive solar design.

- Solar water panels in some houses.

- Rainwater tanks in some houses.

- Permeable paving.

- Rain gardens (capture and detain stormwater and slowly release into the surrounding ground).
- Stormwater holding tanks and disposal systems.

It is likely that in the near future most new housing developments will incorporate some or all of these features in their projects.

8. CONCLUSIONS

Demographic trends suggest a significant change in household types away from the traditional family homes, with most growth occurring in the couple-only and one-person households, according to the Statistics NZ projections. The trend in housing tenure in recent censuses has been to a smaller percentage of owner-occupiers and this trend is expected to continue due to affordability limitations and changing lifestyle priorities for households. There will be more medium and high-density housing on redeveloped sites along transport routes and close to existing town centres.

The UMR survey (reference 2) indicates a preference for stand-alone three bedroom houses as the preferred accommodation option. The BRANZ survey (see Section 6.2) supports this preference with high importance scores for detached housing and garden space. However, we believe affordability and sustainability pressures, such as described in the *Vertical village* scenario (see Section 6.1.1) will lead to increasing acceptance of medium and high-density housing.

The forecasts are that a significant proportion of new housing (31%) will be for multi-unit construction, and the number of new housing units built for rentals is likely to rise. The projections in this report are that almost 70% of new households that are formed in the 10 years to 2016 will be renting, and that the REITs will own an increasing proportion of the stock. In other words the clients of designers and builders will increasingly become the large trusts rather than owner-occupiers.

One qualification to these projections is that the REITs are likely to purchase existing stock, as well as commission new housing, and the percentage of new housing that is rentals will be less than 70%. In that case the new buyers will be a mix of families, one-person households and couple-only households, which raises the question of the average new dwelling sizes. The BRANZ survey reported in Section 6.2 found that while 50% of the over 50s age group were not prepared to move to a smaller house on retirement, the other 50% were open to the possibility. If we follow overseas trends it appears likely that new dwelling sizes will reduce somewhat from the current 203 sqm average.

A major message from the survey was a significant proportion of owners were unhappy with the layout of their new house, and that the comfort levels were not as expected, as shown by the comments on inadequate heating, and the need for more insulation and double glazing. The need for double garaging was a top priority, reflecting low-density dispersed housing, and probably it also reflects low perceptions of the quality of public transport in some of our new suburbs.

Climate change predictions are for higher temperatures across New Zealand and in the upper North Island cooling will be a major issue. Designers could consider designing houses for more natural ventilation (e.g. cross-ventilation), using verandahs, and increasing insulation above Code levels.

Consideration should be given to UD features in new housing, given the ageing population and the likely re-sale benefits of these features. Many of the measures do not cost significant amounts, and a 1% cost increase was found in one study. When properly designed, a UD house should appear the same as a traditional house without any "institutional" appearance.

The average rate of demand for new housing units over the next 10 years is expected to be about 26,900 per year. A significant proportion is major renovations and/or demolition replacements, caused either through physical deterioration or site redevelopment. The demolition projections are based on assumptions about the average life of houses (between 85 years and 100 years since the 1940s). This could be too pessimistic in which case the numbers of demolitions are too high. However, the housing build-up of the 1950s and 1960s is reaching the stage of requiring major renovation and even if not demolished will require significant amounts of modernising/maintenance work to continue its life. As an approximation we have assumed this renovation work will be a significant proportion of a total replacement, so that workloads for builders will be roughly the same whether it is total replacement or major renovations and additions.

9. APPENDIX

This Appendix contains sections on:
- Demolitions.
- Alterations/addition consent analysis.
- Affordability.
- Survey forms and more results.

9.1 Demolition model

The rate of demolitions by year is required since this is expected to form a significant part of the future workloads of builders. The demolition can be caused by physical deterioration of the building, or by economic obsolescence in which the site is redeveloped, usually to higher density housing or commercial use. We do not have data on the expected life of New Zealand houses, although estimates have been made as discussed later. It may be rather than demolition, a feasible and cost-effective alternative is to carry out major refurbishment. We do not separately quantify demolitions and refurbishments and have instead assumed that the latter is similar in value to demolitions. The next section indicates current consented alterations work which predominately involves structural alterations and replacement, rather than additions, costs at least 85% of a new house's cost. So major renovations to significantly extend the life of a house have been assumed to cost approximately the same as demolishing and building from new.

A starting point for modelling is to ask what is the current demolition rate? Although a building consent is required for a building demolition there is no official information collected centrally on demolitions. Using a sample of consent lists from selected TAs the national demolition rate, scaled up for all TAs, is at least 1,600 housing demolitions for the year ending March 2005.[24] This is believed to be on the low side because it is known that demolition work is not always included in the work description attached to the consent. Often demolition is included on the same consent as the replacement

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[24] BRANZ (2005) *Housing demolitions – BRANZ Report E392* for Energy Efficiency and Conservation Authority.

building and the demolition description is not captured. Hence the 1,600 per year rate is a minimum number.

Three different models for demolitions are now described. They are:
- Inter-census model
- Dynamic housing stock model
- Static cohort life table model.

9.1.1 Inter-census model

One method for calculating demolitions is to consider the number of houses (both occupied and unoccupied) at census time and knowing the number of consents between censuses (at 5 year intervals) the demolition rate can be inferred:

House stock (t) = House stock (t-5) + Consents (5 year period) – Demolitions (5 year period, where t = census year.

Rearranging gives:

Demolitions (5 year period) = House stock (t-5) – House stock (t) + Consents.

The table below shows this model for recent censuses. It indicates demolitions ranging from -600 per year to 2,400 per year, since 1976. The variation between censuses, and negative demolitions for some periods, arises from a number of factors:

- The dwelling count at census time may not be accurate, in part because there have been changes in the definitions, and what is recorded as a permanent dwelling.

- The consent cancellation rate is not known.

- Some multi-units are converted back into single units but are not recorded as a change in new dwellings in the consent process.

Table 9. Inter-census demolitions model

New dwelling demographic model								
Updated Oct 2006								
Census year	76	81	86	91	96	01	06	11
							(4)	(4)
Occupied Private Dwellings (1)	923,200	1,005,489	1,088,598	1,177,662	1,276,332	1,359,843	1,471,746	1,574,894
Unoccupied dwellings (1)	84,600	97,116	107,532	122,712	113,388	147,435	159,273	161,483
All Private Dwellings (permanent	1,007,800	1,102,605	1,196,130	1,300,374	1,389,720	1,507,278	1,631,019	1,736,377
Unocc dwell as % of stock	8.4	8.8	9.0	9.4	8.2	9.8	9.8	9.3
Dwelling consents (5 years) (2)	157875	108922	96911	103597	98541	115919	135143	
Cancellations %	4.0%	2.0%	1.0%	1.0%	1.0%	1.0%	1.0%	
Dwelling consents (5 years) (2b)	151560	106744	95941.9	102561	97555.6	114760	133791.6	125358
Average consents per year			19188	20512	19511	22952	26758	25072
Demolitions per year (3)		2388	483	-337	1642	-560	2010	4000
	Demolition average per year 1976 to 2001 =					723		
Usually Resident Population (1)	3,088,700	3,132,800	3,262,397	3373926	3618303	3737277	4,027,947	4,263,000
Population growth %pa		0.28	0.81	0.67	1.41	0.65	1.51	1.14
Persons per Occupied Dwelling	3.346	3.116	2.997	2.865	2.835	2.748	2.737	2.707
(1) Source: Statistics New Zealand								
(2) Number of consents for the five years to the September preceding the census. Assume varied cancellations								
(3) Derived from the proceding rows: Demolitions (t) = (Stock(t-5) - Stock(t) + Consents(5 years))/5. -ve demos implies some								
(4) BRANZ forecasts. conversions from flats to single units.								
Main assumptions in the model are marked by a box=								

The derived demolition rate from the table is about 2,200 per year between 2001 and 2006.

9.1.2 Housing stock dynamics model (I Johnstone)

Work by Johnson[25] indicates a somewhat higher number of demolitions than above. This model uses derived life tables for each cohort of the housing stock. The life tables give the probability of demolition at each year of life and there are different tables for each age cohort (in 10 year age bands). The expansion rate of the stock (i.e. the volume of new dwellings) affects the life tables for each age cohort.

In Table A in the Appendix of the Johnstone paper the replacement rates (or demolition rates) are shown for various levels of new dwelling activity. Recently the number of new dwellings averaged about 30,000 per year, giving a gross gains rate of about 2.0% pa, and according to the table an annual replacement rate of 0.5% of the stock which is a demolition rate of about 7,700 per year. In other words, the Johnstone model predicts that the number of current demolitions is 7,700 per year.

9.1.3 Static life tables

This model is a simplified static life table model developed by BRANZ. The house cohort life profiles are based on Johnstone's results which derives an expected life of 90-110 years for typical New Zealand housing. The simplest model is to assume a 100 year life for all dwellings and use a time series of the new housing consents to determine demolition rates.

Figure 26 shows this series and with a 100 year lag the demolition rate would currently be about 5,000 per year. A more realistic model is to allow for some spread about the expected mean life, and to have different mean lives for different age cohorts. To this end the model uses the results from the 2005 *House Condition Survey* which show:

- 1910s and 1920s houses are in slightly better condition than 1930s to 1950s houses, suggesting more robust construction than later decades.

- 1940s and 1950s houses have the lowest valuations, often on large sections, and are assumed to be more likely cohorts for redevelopment.

- Many 1990s houses suffer from weathertightness problems.

The above observations were used in developing the sets of life tables for the various cohorts. These are shown in Figure 27, and using the building stock numbers by year, see Figure 28, the demolition rates were derived.

The demolition numbers are shown in Figure 29 and indicate about 5,000 demolitions per year now, rising to 12,000 per year by about 2026.

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[25] Johnstone, I (1994) 'New Zealand Housing stock dynamics'. Ministry of Housing: Housing Research Conference, May 1994.
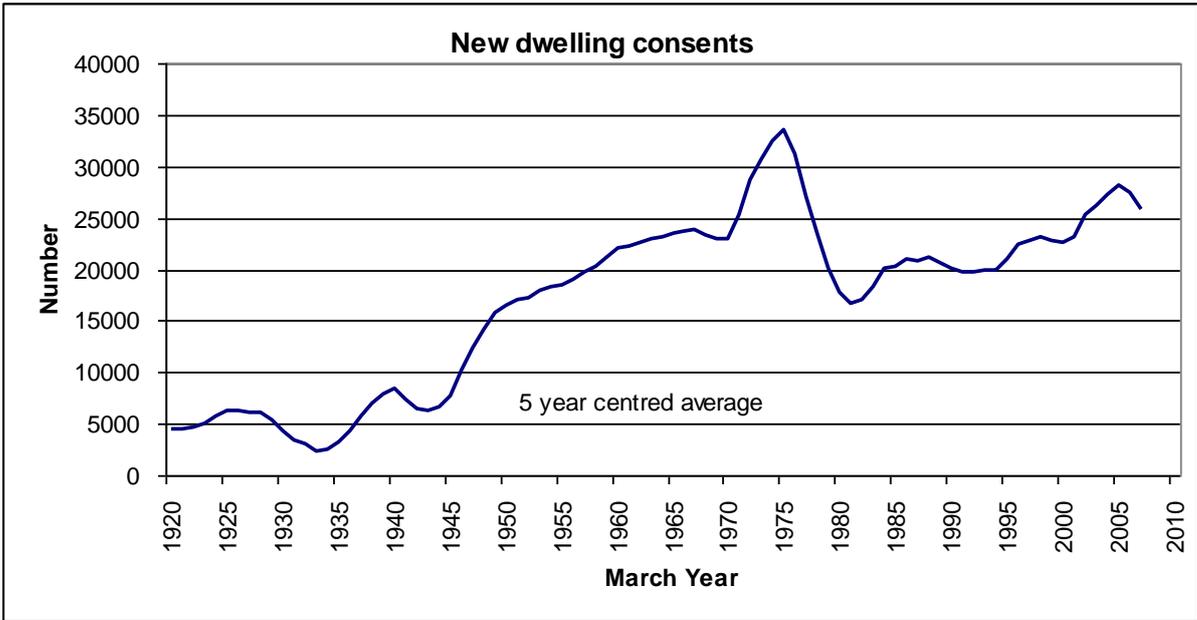
Figure 26. New dwelling consents by year
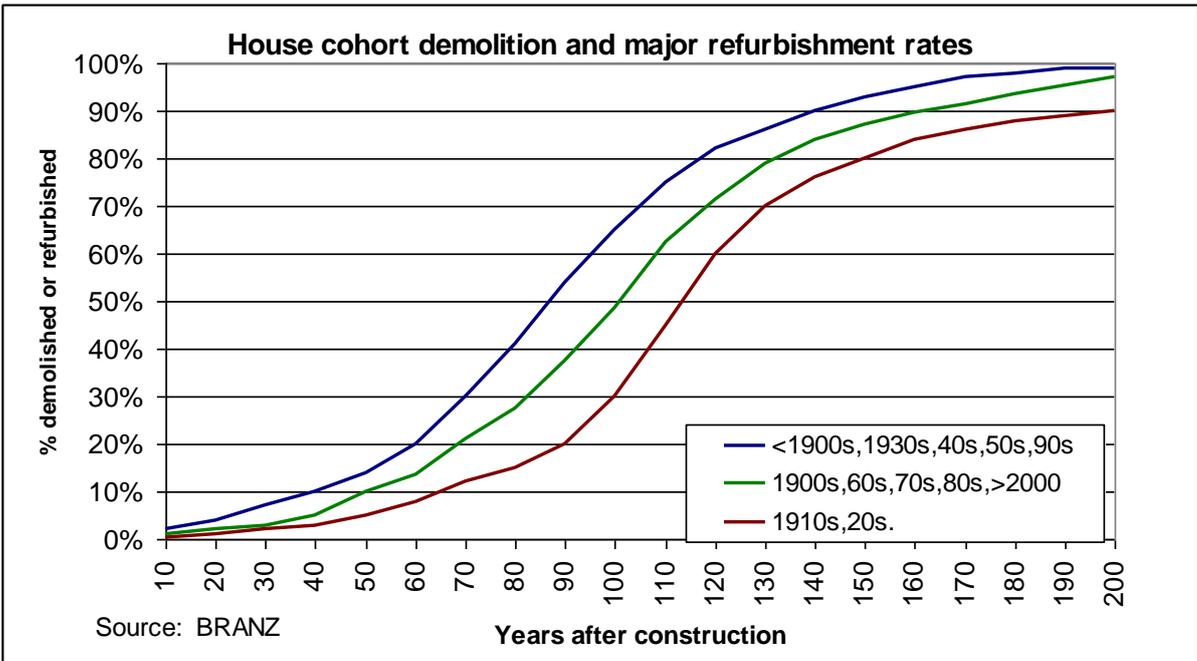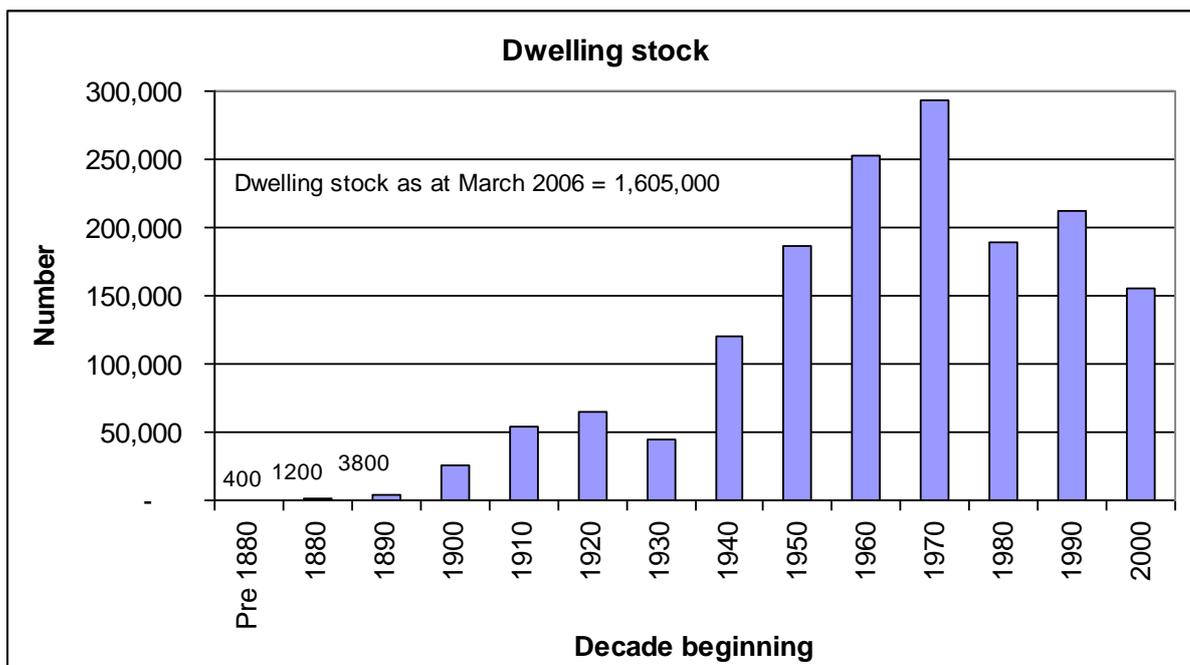

Figure 27. House demolition rates by age cohort

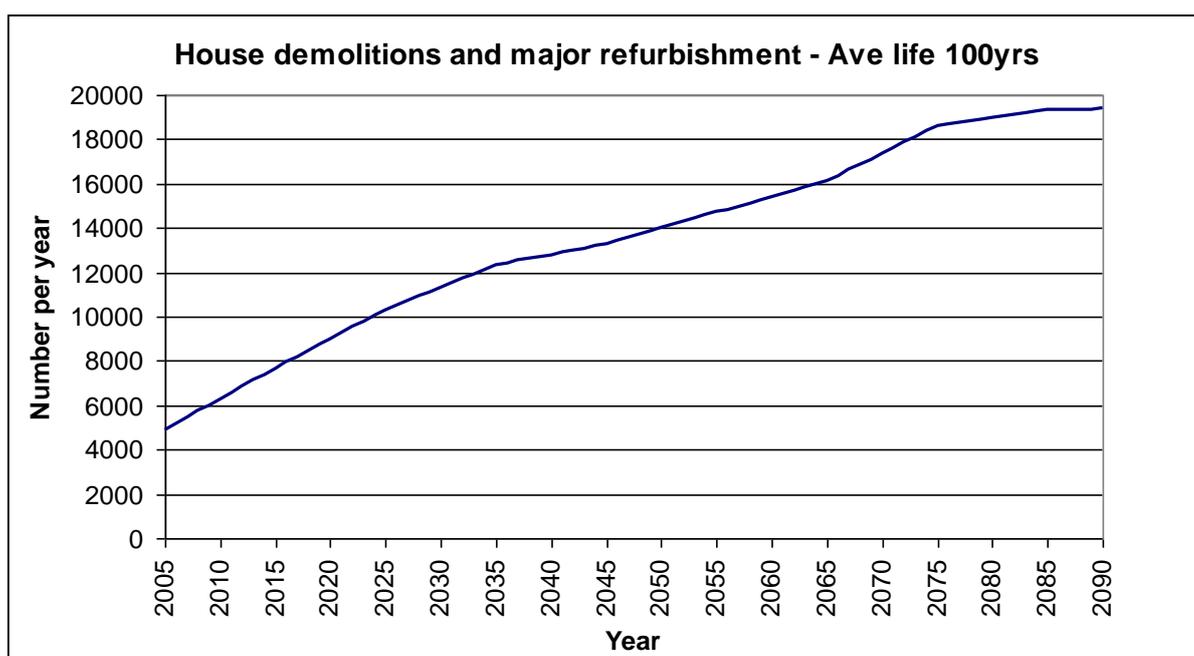**Figure 28. Dwelling stock numbers by age cohort at March 2006**

Figure 29. House demolition forecasts by year

9.2 Alterations and additions (A&A) house building consent analysis

In the previous section it was noted that houses approaching the end of their "nominal" physical life would not necessarily be demolished and replaced, but that major renovation may be undertaken to significantly extend the life of the building. This section is an attempt to quantify the cost of this work as a proportion of the cost of total replacement (i.e. a new house).

An analysis was carried out on current A&A consents to examine the types of work done on the existing housing stock. The aim was to estimate the approximate

expenditure required to upgrade a house that is reaching the stage of requiring major repairs. It is not a straightforward analysis because owners often combine a variety of work in one consent, for example, the following are often combined:

- Major repairs such as replacement claddings, windows, repiling etc.

- Upgraded bathrooms/kitchens.

- Change the internal layout by removing and adding internal walls.

- Add new rooms such as bedrooms and second bathrooms, at the same level, or as a new level and roof.

Over time the original structure may be a small part of the overall building and effectively the life of the building is extended. The value distributions for all A&A consents for the year ending June 2007 are in Figure 30.

This chart is based on data from the "Whats-On"[26] group. This company records each consent issued monthly, including a descriptor of the work taken off the consent application. It specifies the building type, and whether the work is new, additions or alterations, and usually the floor area of the addition. Beyond that the descriptor varies in detail and may or may not give further details and the type of work (some categories are: repiling, recladding, new rooms, decks, ensuite, moving walls, replacing windows, doors and skylights, adjust window positions, new main entrance, basement development, extending rooms, relocate kitchen, relocate internal spaces, relocate stairs, replace fire damage, sleep-outs, sheds, garages, conservatories, relocation complete dwelling on same site or from another site, relining, fire places etc).

Figure 30 indicates a significant proportion of A&A consents are major, say over $99,000 in value, numbering 3,205 consents for the year. The average value of these large consents is $199,000, and the work includes both alterations and additions. It is likely that in spending this amount the owner would ensure that the existing house was made structurally sound and the claddings were brought up to the same standard as the new additions. So it is likely a significant part of the expenditure is on major renovations. Hence of the 5,000 demolitions/refurbishments estimated in Section 9.1.3, approximately 3,000 are refurbishments and the other 2,000 are demolitions, which lines up with the estimate derived in Table 9.

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[26] www.whatson.co.nz.

**Dwelling alteration and addition consents -
Year ending June 2007**

3205 consents
for the year >$99K,
Ave value $199K

2% 11%

48% 19%

20%

Legend:
- $5-$10K
- $10-19K
- $20-49K
- $50-99K
- >$99K

Percent by value
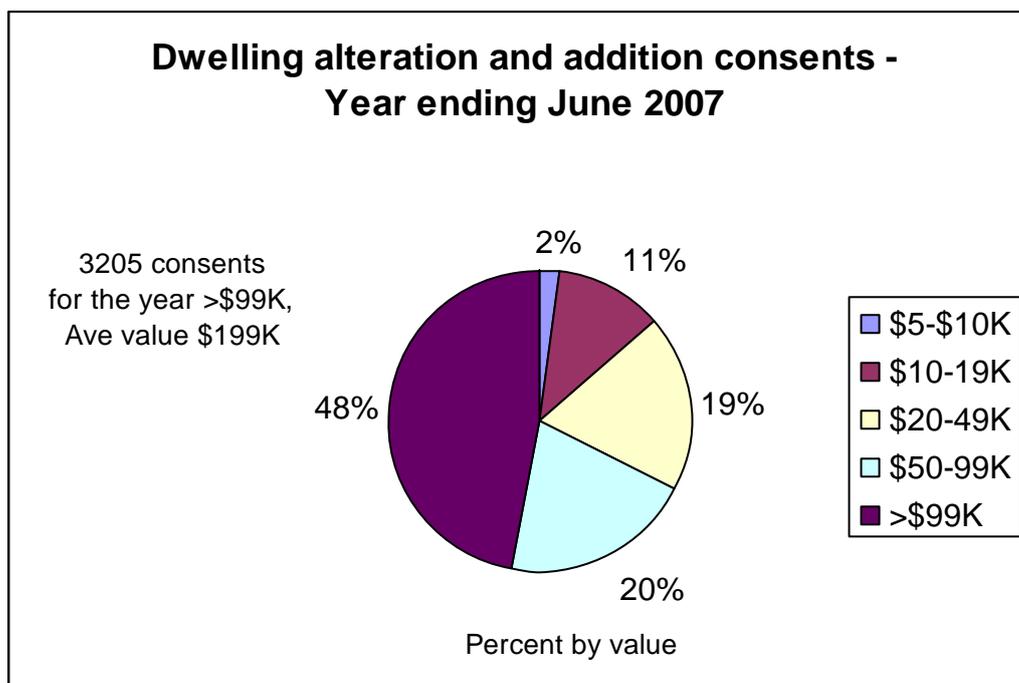
Figure 30. Dwelling A&A consents by value group

When consents with the descriptor of "additions" or "extensions" are excluded, and those with non-zero floor areas are also excluded, there were only 370 consents over $99,000 in value in the year at an average of $179,000 each. From this we conclude that a major renovation in an old house, with no new floor area added, will cost about $179,000, and since additions are often done at the same time the major renewal cost per house could be up to $199,000.

From QVNZ data the average size of an existing house is about 150 sqm and replacement cost at $1400 per sqm is about $210,000. So major renovations would typically cost between 85% and 95% of a replacement house.

Another analysis was done for consents with renovation or modernisation in their descriptor, and nil floor area. Only 258 consents for the year were found, at an average of $48,000 each. Many were HNZC houses and probably represent 1950s–1960s era houses that are being modernised for different family sizes than envisaged in their original design. The descriptor has no mention of external work so we have assumed the renovation is caused by changing type of occupant, rather than due to structural deterioration, although some lining repair may be included in the consents. This suggests that 1950s–1960s era houses do not yet require major structural repair. However, it indicates that all houses in these age cohorts, not only HNZC rentals, may need major internal renovation now, both for new family types, and for modern lifestyles, and this will amount to a significant volume of work for builders.

9.3 Affordability

The details of the construction of the BRANZ new house affordability index follow.

The index is a ratio of a labour wage index divided by a new house cost index and a financial factor index:

- The labour wage index is all industries all occupations' wages/salary including overtime.

- The new house cost is a combined new house cost index and a real section price index. The house cost index used is the Capital Goods Price Index (housing), and for the section the QVNZ section price index is used. The two are combined into one index using a varying weight between the section and house construction costs.

- The financial factor is the annual capital recovery factor for a 20 year term, and uses the floating house mortgage rate.

The chart below reproduces the new house affordability index of Figure 10 with the addition of the existing house affordability index as per the AMP series (produced by Massey University Property Studies Centre since 1993). The two lines follow a very similar pattern, because two of three parameters (income index, the financial factor) are common to the two series, and the third parameter, the cost of new housing and existing housing, tend to track each other.
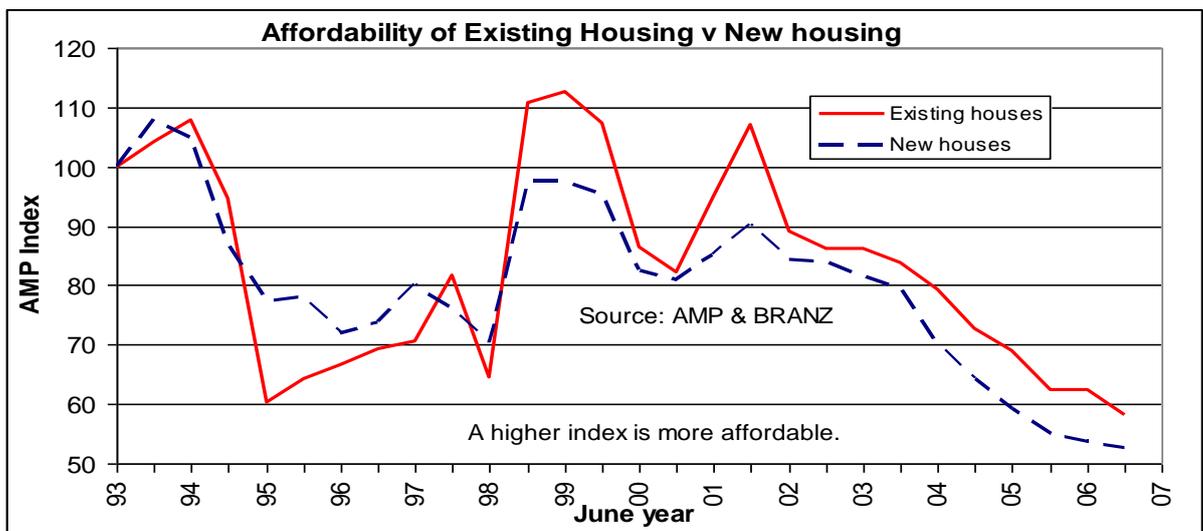
Figure 31. Affordability of new and existing houses

9.4 BRANZ housing perceptions survey

This was a postal survey to two sets of occupants:

- Owners of new homes recently completed (within the last 9 months), as obtained from building consent lists.

- Occupants of existing homes, obtained from the QVNZ database.

Selection was random and an incentive was offered for the return of the completed form. A response rate of about 25% was achieved. Some characteristics of the returns are as follows:
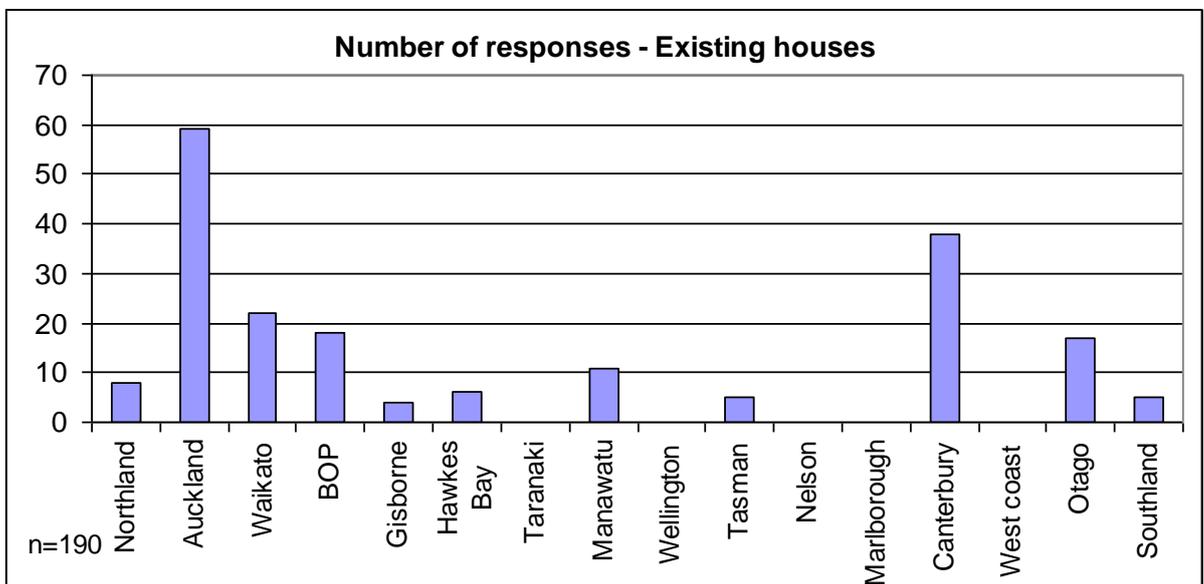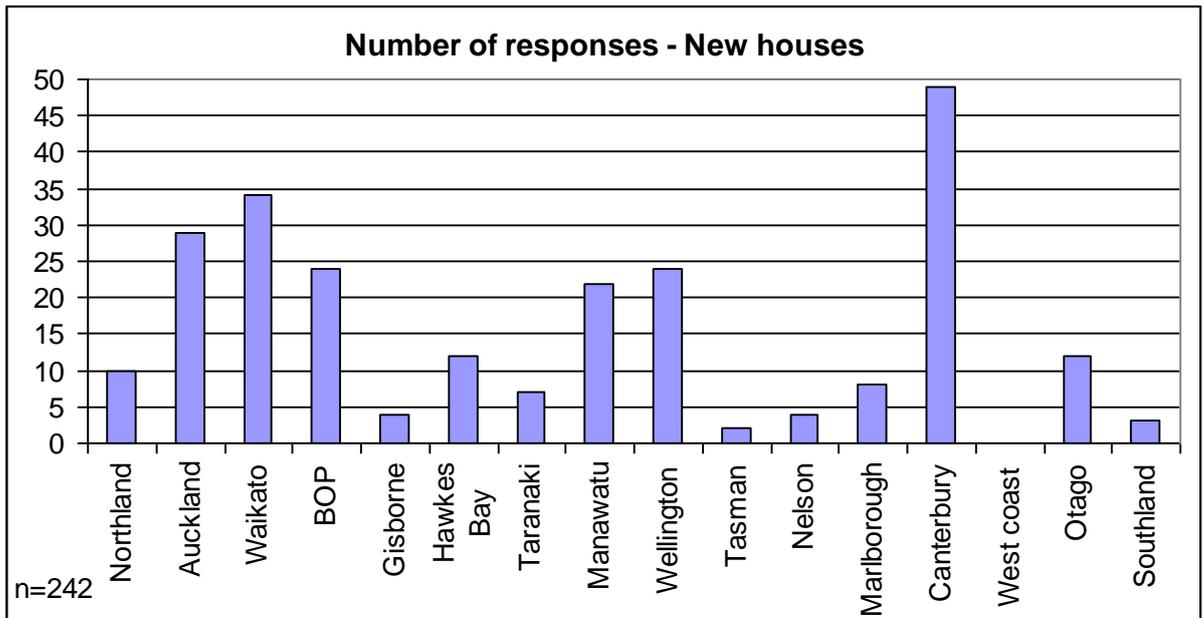
Figure 32. BRANZ survey responses

There are a disproportionate number of responses from Canterbury for new housing; otherwise the numbers are roughly in proportion to new dwelling starts in each region. For existing houses there are disproportionate responses from Auckland and Canterbury.
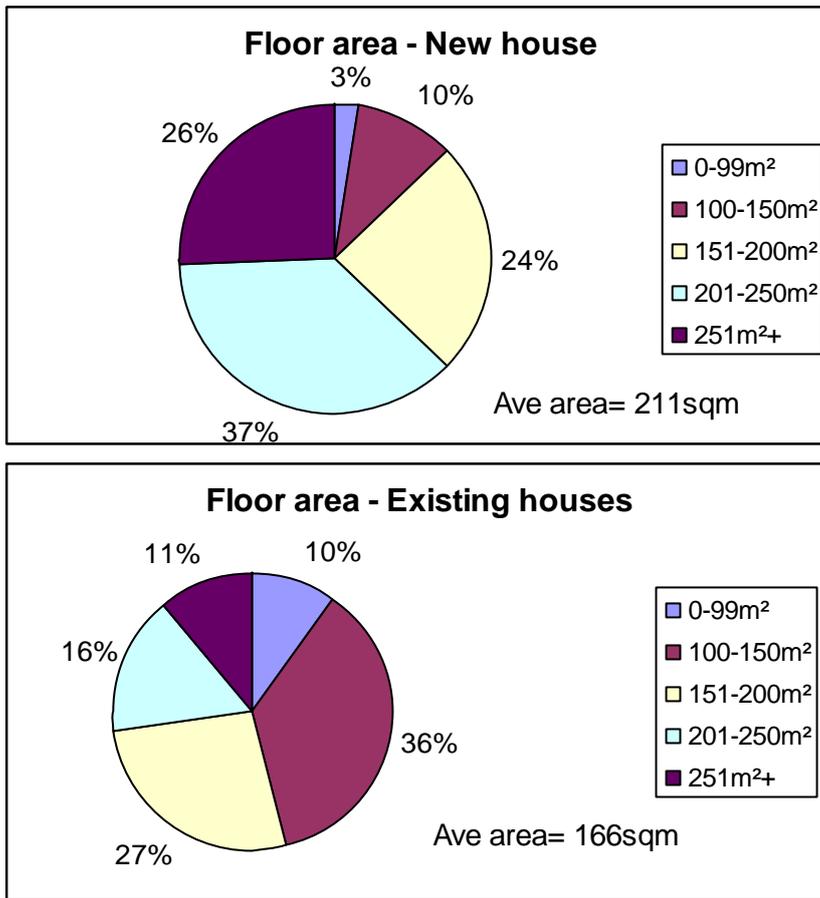
Figure 33. Survey responses floor areas

The average new house floor area from building consent data is 203 sqm for the last year, so the responses are for slightly larger houses than average. The average number of bedrooms in the new houses was 3.8.

QVNZ data indicates the average floor size of existing houses is about 145 sqm, so again the sample is larger in floor area than the total population.

Age distribution -New house respondents

Age distribution -Existing house respondents
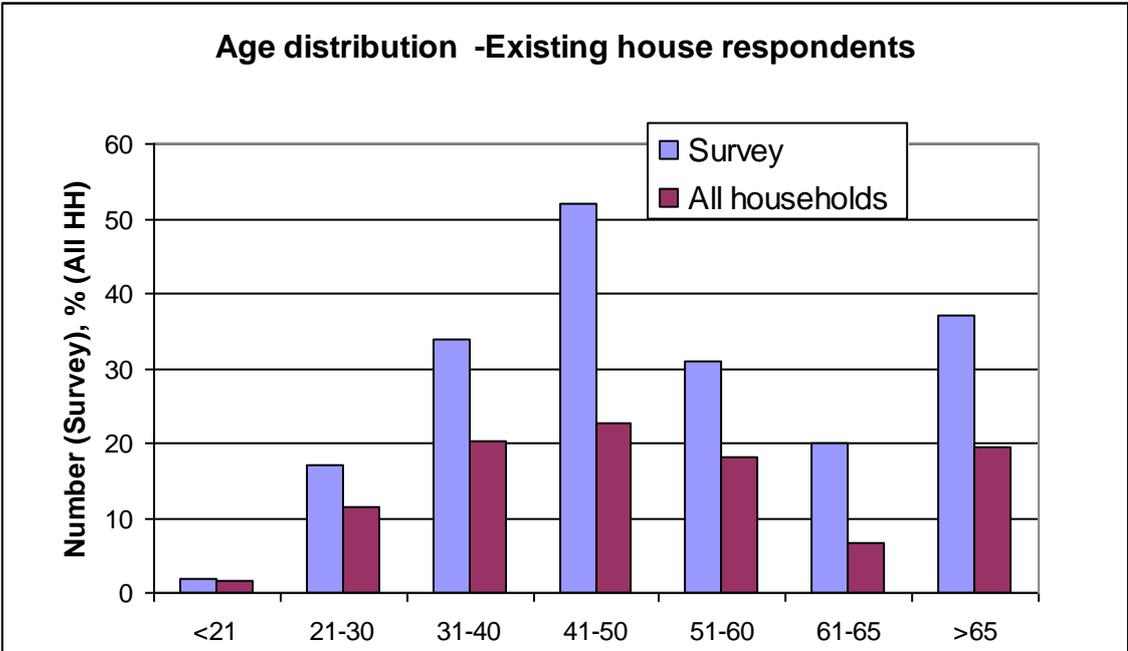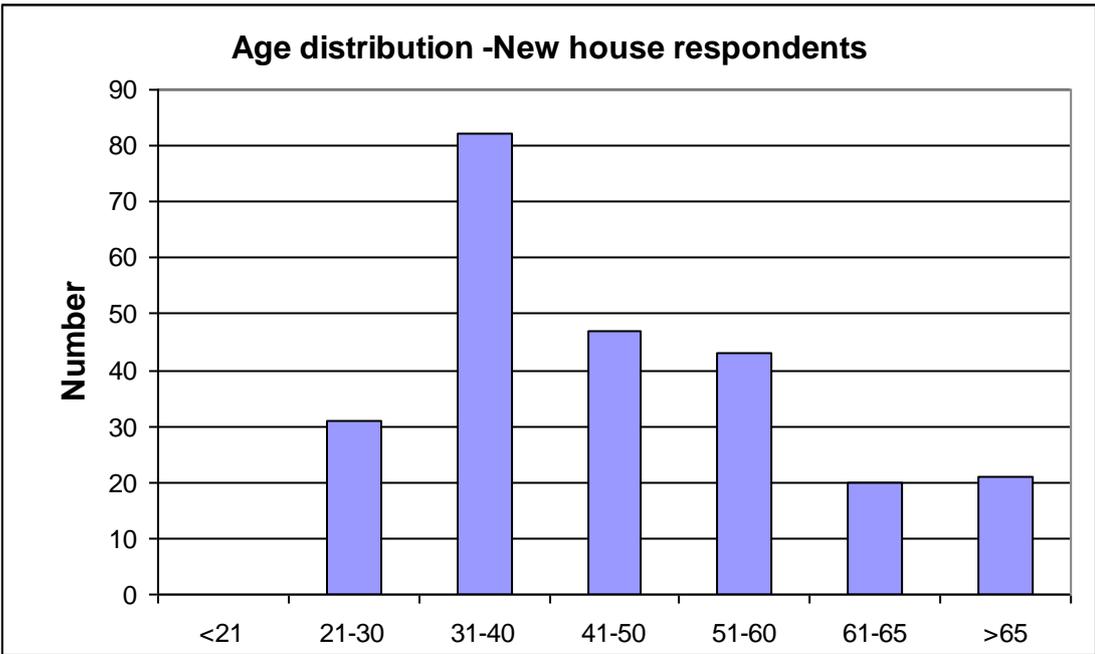
Figure 34. Survey responses – age profiles of respondents

The age distribution in the BRANZ survey from existing house occupants is approximately in line with all households as per the 2006 census.

The survey forms for new house occupants follows on the next two pages.

Table 10. New house occupants survey

1. **Do you own or rent this house?**

   ☐ Rent   ☐ Own (with or without a mortgage)

2. **What is the floor area of your house?** *(please estimate if unkown)*

   ☐ 0-99m²
   ☐ 100m² - 150m²
   ☐ 151m² - 200m²
   ☐ 201m² - 250m²
   ☐ 251m² +

3. **How many bedrooms does your house have?** ☐

4. **In selecting the location of your new house, how important were these factors?**

	Very Important	Quite Important	Minor Importance	No Importance
School zone	☐	☐	☐	☐
Motorway access	☐	☐	☐	☐
Close to shops/cafés	☐	☐	☐	☐
Retirement community	☐	☐	☐	☐
Close to public transport	☐	☐	☐	☐
Close to work	☐	☐	☐	☐
Views	☐	☐	☐	☐
Affordability of house and land	☐	☐	☐	☐
Suburban status	☐	☐	☐	☐
Close to recreational facilities	☐	☐	☐	☐
Nearer to family	☐	☐	☐	☐
Other, *please state* _____	☐	☐	☐	☐

5. **What is your age group?**

<21 years	21-30	31-40	41-50	51-60	61-65	>65
☐	☐	☐	☐	☐	☐	☐

6. **How many children do you have living with you?**

   Under 18 years old: ☐

   18 years old and over: ☐

7. **What are your priorities over the next 5 years?**

	Very Important	Quite Important	Some Importance	No Importance
Extended overseas travel/work (more than 1 year)	☐	☐	☐	☐
Short term travel (less than 1 year)	☐	☐	☐	☐
Work/career	☐	☐	☐	☐
Student loan repayments	☐	☐	☐	☐
Funding childrens education	☐	☐	☐	☐
Life style purchases (e.g. - Car)	☐	☐	☐	☐
Saving for a first home	☐	☐	☐	☐
Paying off a mortgage	☐	☐	☐	☐
Saving for a better home	☐	☐	☐	☐
Saving for a holiday home/weekender	☐	☐	☐	☐
Saving for a retirement	☐	☐	☐	☐
Other, *please state* _____	☐	☐	☐	☐

8. Looking ahead to retirement, do you expect to:

	Yes	Maybe	No
Remain in existing house?	☐	☐	☐
Move location to a retirement region?	☐	☐	☐
Move into a retirement village?	☐	☐	☐
Have a reverse mortgage?	☐	☐	☐
Leave the house for the children?	☐	☐	☐
Move to a smaller house/unit?	☐	☐	☐
Continue working part or full time after 65?	☐	☐	☐

9. What house features were important in selecting/designing your new home?

	Very Important	Quite Important	Minor Importance	No Importance	Not Considered
Size of house	☐	☐	☐	☐	☐
Games room	☐	☐	☐	☐	☐
Study	☐	☐	☐	☐	☐
Double garage	☐	☐	☐	☐	☐
Double glazing	☐	☐	☐	☐	☐
Heat pump	☐	☐	☐	☐	☐
Central heating	☐	☐	☐	☐	☐
Wood burner	☐	☐	☐	☐	☐
Quality of kitchen fittings/fixtures	☐	☐	☐	☐	☐
Quality of bathroom fittings/fixtures	☐	☐	☐	☐	☐
Low maintenance section	☐	☐	☐	☐	☐
Low maintenance walls/roof	☐	☐	☐	☐	☐
Two or more stories	☐	☐	☐	☐	☐
Character of home/architectural design	☐	☐	☐	☐	☐
Security/safety features	☐	☐	☐	☐	☐
Detached house with garden/lawn	☐	☐	☐	☐	☐

10. What features of your house do you think could be improved? *Please list as many as you can*

_____

_____

_____