Final Report

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Understanding the patterns, characteristics and trends in the housing sector labour force

authored by

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ACRONYMS

ABS	Australian Bureau of Statistics
AHURI	Australian Housing and Urban Research Institute Ltd.
ANZSIC	Australian and New Zealand Standard Industrial Classification
ASIC	Australian Standard Industrial Classification
COAG	Council of Australian Governments
GFCF	Gross Fixed Capital Formation
HIA	Housing Industry Association
HSLF	Housing Sector Labour Force
ISIC	International Standard Industrial Classification
JTW	Journey-to-work
LMRs	Labour Market Regions
LISA	Local Indicators of Spatial Association
MBA	Master Builders Association
NZSIC	New Zealand Standard Industrial Classification
PCA	Property Council of Australia
QBSA	Queensland Building Services Authority
SD	Statistical Division
SEQ	South East Queensland
SLA	Statistical Local Area

EXECUTIVE SUMMARY

The focus of this study is the national policy problem of the gap between housing supply and demand, as identified and monitored by the National Housing Supply Council. Research to date has not focused upon the spatial distribution of labour supply and demand of the housing sector labour force (HSLF). Also research to date has not distinguished between labour engaged in building new dwellings and labour engaged in undertaking alterations and additions. In addressing this research gap, this Final Report presents the summative output of the AHURI research project entitled: *Understanding the patterns, characteristics and trends in the housing sector labour force in Australia*. It follows the publication of the Positioning Paper for the project (Dalton et al. 2011a).

The research addresses the following principal research question:

> What are the key features and trends in the structure, conduct and performance of the core parts of the housing industry and what are the main dimensions of the labour force working in these parts, in the context of considerable fluctuations in the level of activity in the housing industry?

Review and preliminary research presented in the Positioning Paper led to an account of the structure, conduct and performance of the housing industry. It identified four factors that shape the scale and nature of labour supply in the housing industry. The first confirmed the reported problem of rising demand for labour associated with the expansion of the natural resources sector. The second factor was the distribution of labour between the building of new dwellings and the re-building of existing dwellings associated with alterations and additions often referred to as housing renovation. The third is the continuing gender imbalance in the HSLF resulting from the continuing limited presence of women in the industry. The fourth is the exacerbation of labour shortages that result from spatial mismatches between the demand for labour and its supply. In this final report, the focus is upon the temporal and spatial dimensions of the HSLF across the new build and alterations and additions sectors.

This study utilises a mixed methods approach, including a literature review, exploratory interviews with industry stakeholders, quantitative data collection and analysis of spatial and temporal aspects of the industry, and focus groups. The quantitative analyses used data from two principal sources. First, ABS census data sorted into ANZSIC codes for 2001 and 2006 census years was used. Second, Queensland Building Services Authority (QBSA) data recording new housing building and renovation projects for the period 2001–10 was used. A spatial and temporal frame of reference was used to analyse data from these two sources. The results of this quantitative analysis were then tested with two focus groups comprised of builders with long-term industry experience.

Drawing on the ABS census data, Chapter 3 presents an analysis of the temporal dimensions of the HSLF with a particular focus on distinguishing between labour engaged in new build and alterations and additions. It shows that, overall, the size of the HSLF grew in the period 2001–06. In Victoria the workforce grew from 72 000 to 89 000, an increase of 23 per cent in the five-year period 2001–06. The 44 per cent growth in the Queensland workforce was almost twice that of Victoria for the same period when it grew from 53 000 to 77 000. The disaggregation of the HSLF showed that the alterations and additions workforce grew more rapidly than the new build work force, albeit from a lower base.

Chapter 4 presents research into the spatial dimensions of labour supply and demand through an analysis of ABS census data and QBSA data for Queensland, a picture of

spatial mobility including journey to work (JTW) and commuting patterns of the HSLF is revealed.

In Victoria, all residential HSLF was highly concentrated in Melbourne and in regional cities. For new build within Melbourne it is aligned with the growth corridors in the outer suburban metropolitan areas and is dispersed across the southeast, north, mid-west and along the Great Ocean Road. Regional cities including Geelong, Ballarat, Bendigo, Bairnsdale, Mildura, Shepparton and Wodonga also experienced an increased level of supply of labour for new build between 2001 and 2006. Alterations and additions labour in Victoria was highly concentrated in Melbourne and in regional cities. Two trends are evident in the data. First, it shows that the alterations and additions workforce has become more dispersed in Melbourne with more in the middle ring suburbs. Second, there has been a marginal decline in the levels of labour supply in alterations and additions in provincial cities.

In Queensland, all residential HSLF was highly concentrated along the coast. This reflects the broader settlement pattern of that state with concentrated urban settlement in South East Queensland (SEQ) and in provincial cities along the coast. The pattern for new build is similar, suggesting a pattern of demand in the cities and towns along the coast including the more northern smaller coastal cities, in addition to the larger provincial centres and SEQ. Within the Brisbane area, new build HSLF is concentrated in the outer suburban growth areas. The one exception to this coastal orientation is the presence of new build HSLF in Mt Isa, presumably associated with the development of the resources industry. Alterations and additions labour in Queensland, like Victoria, is largely a feature of inner and well established areas. In this context, the alterations and additions HSLF is largely found in the inner city of Brisbane. It is also found in the larger provincial cities and in the Gold Coast area.

Following this mapping of areas of high and low supply of the HSLF the relationship between supply and demand at the Statistical Local Area (SLA) level was assessed. This was undertaken using the concept of spatial mismatch where the supply of labour was represented by the growth in HSLF in all residential employment between 2001 and 2006, and demand was estimated using population growth as a surrogate measure. The resulting two-dimensional space has been divided into four quadrants, each representing a unique relationship between supply and demand. In this schema, Quadrants 1 and 4 are of particular significance as they indicate possible market failure. Quadrant 1 represents a condition of undersupply in housing labour where the demand for labour exceeds the supply, and Quadrant 4 represents the oversupply of housing labour and low demand for housing.

The cluster diagram presentation for the two years 2001 and 2006 for Victoria and Queensland indicate distinctive patterns across the four quadrants suggesting different supply and demand dynamics in the two states. This presentation also directs our attention to particular SLAs in Quadrants 1 and 4 in both states. SLAs in Quadrant 1 represent areas where demand for housing is less likely to be met by the available supply of housing sector labour. SLAs in Quadrant 4 represent areas where the demand for new build housing is greater than the supply of housing sector labour. This analysis potentially assists the development of policy responses that address the issue of a ‘spatial mismatch’ in particular areas and could assist in extending the discussion of HSLF beyond the customary focus on aggregate supply and demand.

Following the spatial mismatch analysis, the research into the spatial arrangements of the HSLF was extended using data only available in Queensland. This was done by relating the structure of the house building industry to the actual commutes of HSLF workers. The structure of the industry was described using changes in the number of building contracts, followed by a breakdown by builder category, job type and contract

cost in the period 2000–10. Journey-to-work (JTW) analysis was also undertaken to track spatial and temporal variations between locations of home and work. This indicated some remarkable levels of mobility exhibited by individual building contractors. Nevertheless, on average, distances travelled to jobsites actually reduced over the period 2001–10.

Chapter 5 presents an analysis of two focus groups comprised of residential house builders with experience of both new build and alterations and additions. Against the background of findings in the quantitative analysis they discussed their experiences of labour supply and demand. A key element in their explanation of supply and demand issues was the way in which different types of residential construction work shaped these processes. They confirmed that the HSLF is segmented and that this is reflected in different ways of building and associated skill requirements. The participants also discussed future labour supply and in particular the role of the apprenticeship system. Again, the different ways of building shaped the way in which the participants viewed the apprenticeship system.

Chapter 6 presents three principal findings and their implications for research and policy. First, the research confirms the idea that the HSLF is segmented into two sub-sectors and this segmentation largely reflects different ways of building and their different skill requirements. Therefore there is scope for a more explicit recognition of the different types of residential construction work in future HSLF research and policy discussion. Second, geography shapes the way in which these two distinct HSLF sub-sectors operate. Therefore there is scope for a more explicit geographic perspective to be included in future HSLF research and policy discussion. Third, retaining apprentices and the development of their skills is important for the supply of new labour in the HSLF. Therefore there is scope to further examine the apprenticeship system that is central to the supply of new skilled labour in the housing industry.

1 INTRODUCTION

This Final Report comprises the summative output of the AHURI research project entitled: *Understanding the patterns, characteristics and trends in the housing sector labour force in Australia*. It follows the publication of the Positioning Paper for the project (Dalton et al. 2011a). The remainder of this chapter summarises the research and policy significance of the study (1.1); the research questions guiding the study (1.2); the mixed method approach used (1.3); the findings of the Positioning Paper (1.4), and the structure of the remainder of this Final Report (1.5).

1.1 Significance of this study

This study is significant in two principal regards—it responds to a national policy problem, and it addresses a gap in research knowledge. The national policy problem stems from concerns around housing affordability, indicating a rising gap between housing supply and demand. In recent years the National Housing Supply Council has been established, and has further indicated the consistent undersupply of new housing (National Housing Supply Council 2010). The Council of Australian Governments (COAG) has also recognised the policy problem of undersupply of housing and has undertaken research and policy work aimed at stimulating additional housing supply (Council of Australian Governments 2009).

However, research undertaken to date has not focused specifically upon the spatial distribution of labour supply and demand in the housing industry, nor of the internal structure of the housing construction industry. Specifically, the part of the housing construction industry focused upon labour supply for reinvestment projects (renovations, alterations and additions, etc.) is typically missing from debates about new housing supply. In responding to this policy problem and gap in research knowledge, this study provides a significant contribution to our understanding of the HSLF in Australia.

1.2 Research questions

The research is focused on the HSLF and in particular the spatial and temporal fluctuations in labour and supply of housing. It seeks to answer the following principal research question:

> What are the key features and trends in the structure, conduct and performance of the core parts of the housing industry and what are the main dimensions of the labour force working in these parts, in the context of considerable fluctuations in the level of activity in the housing industry?

In this research, the labour force refers to those engaged directly in the construction of residential dwellings of various types including houses, apartments, town houses and flats, or in managing this work. It also includes those directly engaged in altering or adding to existing dwellings or in managing this work. It does not include those who work in closely related industries, in particular those industries that manufacture building materials, build urban infrastructure, facilitate real estate markets and manage social housing. The focus in this research is on those directly engaged in building new housing and altering and adding to the existing stock of housing. This focus is further defined in Chapter 3 where a detailed listing of the industry classes used to define the HSLF is presented.

Review and preliminary research for the Positioning Paper (Dalton et al. 2011a) led to an account of the structure, conduct and performance of the housing industry in the context of the continuing undersupply of new housing. In presenting this account of

the housing industry, the report argued that housing industry output also included alterations and additions. The value of alterations and additions constituted a very significant proportion of total industry output. Therefore analysis of the HSLF should seek to distinguish between those engaged in building new dwellings and those altering and adding to existing dwellings. This led to the development of secondary research questions (SRQs) to guide the research presented in this Final Report:

- SRQ1. What are the temporal dimensions of the HSLF and the new build and alterations and additions sub-sectors within the HSLF?
- SRQ2. What are the spatial dimensions of the HSLF and the new build and alterations and additions sub-sectors within the HSLF?
- SRQ3. Given the temporal and spatial dimensions of the HSLF, what are the defining patterns, characteristics and issues in the supply and demand for labour in the new build and alterations and additions sub-sectors?

1.3 Research approach

The Positioning Paper provides the background for the research presented in this Final Report. The Positioning Paper presented an institutional analysis of the structure, conduct and performance of the Australian housing industry, including the new build and renovation sectors, and an initial analysis of employment within the industry. In presenting this institutional analysis of the housing industry, the Positioning Paper report presents an extensive review of the literature. Therefore this report does not devote much space to the review of the literature. Instead readers of this report are encouraged to recognise that the background to this research is found in the Positioning Paper and only brief mention is made to its key findings below. The methods used in this research are those used to collect and analyse quantitative data that is used to develop an account of the spatial and temporal aspects of the HSLF and qualitative data drawn from two focus group discussions. The emphasis in this Final Report is to present an analysis of the HLF based upon this quantitative and qualitative data collection and analysis.

1.4 The Positioning Paper findings

The Positioning Paper (Dalton et al. 2011a) reports on the first stage of research for this project. It establishes the framework for understanding the mismatch between housing supply and demand, including fluctuations in housing markets, essential features of housing industry outputs, the policy and institutional context, initial modelling of spatial dimensions of supply and demand, and contemporary issues of sectoral labour and skills shortages.

The review reported in the Positioning Paper establishes that in Australia, housing production and the size of the industry is similar to other industrialised countries, as a share of the national economy. Regular fluctuations (cycles) of demand occur as they do also in other westernised countries. Fluctuations across the states are only partly synchronised, suggesting that approvals relate to both national and sub-national factors. Fluctuations are also noticeable in average times taken to complete dwellings—in recent years these have been rising. Further, the level of reinvestment in the existing housing stock found in alterations and additions (renovations) has been rising. Research into the HSLF must therefore include those engaged in new build and alterations and additions.

Building on other work (Ball 2006), the Positioning Paper presents an institutional account of the structure, conduct and performance of the housing construction industry. Based around building firms dominated by small businesses with sub-

contractors and employees, the industry also comprises building materials manufacturers, suppliers and intermediaries. It is also closely associated with the land development and sales industry, and associations representing the interests of the various actor groups including the Housing Industry Association (HIA), the Master Builders Association (MBA) and the Property Council of Australia (PCA).

Residential building companies present a diverse range in both activities and geographic spread, although most operate in just one state. During the 1990s and early 2000s there was an increase in the number of businesses that extended their operations into other states and diversified beyond building suburban detached dwellings. However, in more recent years these trends have reversed, suggesting a trend towards house building companies increasing their focus on their core business.

Against the background of reported shortages in skilled workers, the Positioning Paper identified four features shaping the HSLF supply. The first confirms the widely reported problem of rising demand for labour associated with the expansion of the natural resources sector. The second is the poor apprenticeship completion rate in the construction industry. The third feature flags competition for labour between the new build sector and the reinvestment (maintenance, alterations and additions, renovations, retrofitting) sector. The fourth is the significant gender imbalance in the HSLF, which is dominated by male workers. The fifth is the potential exacerbation of labour shortages due to spatial mismatches between HSLF demand and supply.

Through this work it was identified that further research into the changing size of the labour force—disaggregation of the HSLF into new build and renovations and the mapping of supply and demand for labour in each—would reveal more about the dynamics of the HSLF. In turn, this deeper understanding of patterns, characteristics and trends in the industry could be expected to inform potential responses to problems with housing supply associated with the HSLF. In this way, the Positioning Paper led to the second stage in the research, which is reported on in the remainder of this Final Report.

1.5 Structure of this Final Report

This report is presented in five further chapters.

- Chapter 2 presents an overview of the datasets methods used for processing and analysing the quantitative data on the HSLF and the conduct of two focus groups that followed the quantitative analysis.
- Chapter 3 presents a definition of the HSLF using an ABS industry classification system and then uses this system to present an analysis of the sectoral and temporal dimensions of the HSLF as a whole and for labour engaged in new build and alterations and additions.
- Chapter 4 extends the analysis of the spatial dimensions of labour supply and demand by mapping areas of high and low supply, identifying areas of potential mismatch between supply and demand, and the spatial mobility and commuting patterns of workers.
- Chapter 5 presents an analysis of the way in which the HSLF is organised around types of residential construction and the way that new workers are recruited. It finds that the key dimension is the level of skills required to work on one hand on volume or project-built housing and, on the other hand, one-off custom housing and alterations and additions.
- Chapter 6 concludes the report by drawing out key findings from the research about the HSLF in Australia, and identifying areas for attention in policy responses to the problem of housing supply.

2 UNDERTAKING THE RESEARCH

The research presented in this report is based upon both quantitative and qualitative research in Victoria and Queensland. These two states display different sub-market conditions and different urban morphologies. It was on this basis that an early judgement was made that the study of these two states was sufficient to develop a broad understanding of the Australian housing sector labour force. This reasoning is elaborated on in Section 2.1.

The objective for the quantitative analysis was to identify and describe, along three dimensions, the workforce engaged in building residential housing in Victoria and Queensland. First, the analysis sought to compare the HSLF across the inter-censual period of 2001–06 in order to assess the growth and changing composition. Second, the analysis sought to spatially map the concentration and dispersal of the labour force. And third, the analysis sought to disaggregate the HSLF into workers who build new housing and workers who work on alterations and additions. Section 2.2 describes the datasets and the way these were processed.

Qualitative research undertaken through focus groups was used to check and help interpret the results of the quantitative research. The participants in these focus groups were people with many years of experience in the housing industry. Section 2.3 describes the approach used to establish and conduct the focus groups.

2.1 Study areas

Victoria and Queensland were chosen as the study areas for this analysis for two main reasons. First, there are important differences in the socio-demographic profile of these states and different mixes of sub-market conditions. Queensland is a rapidly growing state particularly through in-migration from New South Wales and Victoria. It is also experiencing a rapid economic transformation particularly through mining in regional and remote Queensland. We therefore anticipated spatial variability in housing demand. On the other hand, Victoria is also growing rapidly through overseas migration and through natural growth, which is placing new demands on the housing market.

Second, there are differences in the urban morphology and settlement patterns of the two areas. Queensland has a more dispersed and multi-centric urban structure and Brisbane, the state capital of Queensland, has a lower primacy. In Victoria, Melbourne exhibits a greater degree of primacy and mono-centric urban structure through which settlement patterns vis-à-vis growth are controlled and regulated. We are specifically interested in evaluating how these differences in urban morphology influence the demand and supply of the HSLF. For example, it is possible that the mobility of labour (movement from Brisbane to Cairns or Townsville or from Melbourne to Bendigo or Ballarat) could be restricted because of the spatial organisation of the settlement systems. We anticipate a greater flexibility in the movement of labour in Victoria as compared to Queensland due to a more compact settlement pattern.

2.2 Quantitative methods

The quantitative research design comprised five stages:

1. Identification, selection and aggregation of the construction sector labour force.
2. Disaggregation of the construction sector labour force into residential and non-residential housing components.
3. Estimation of a spatial mismatch index based on the relationship between housing sector labour supply and the demand for houses.

4. Identification of the HSLF clusters using a spatial autocorrelation technique.
5. Spatial analyses using numerical tools that estimate the effects of spatial and contextual variables on the supply of the HSLF.

2.3 Datasets and data processing

2.3.1 ABS census data

This research uses a number of datasets including the ABS (Australian Bureau of Statistics) building approvals data and GIS databases. The ABS census is also used because it collects data that can be used to map where people live and where they work. In the Census, questions are asked about 'Usual residence' and 'Method of Travel to Work' by including questions: 'What is the person's usual address?' and 'How did the person get to work on Tuesday, 6th August 2006?' The employer address recorded in the census refers to the main job held in the last week, that is, the week before census night. The question that is asked is: 'For the main job held last week, what was the employer's workplace address?'

The classification system used in this research to identify people working in the housing sector is the Australian and New Zealand Standard Industrial Classification (ANZSIC) system. Classes, the smallest category at the base of the ANZSIC system, are identified using criteria including 1) homogeneity in terms of similarity of economic activities within each class; 2) economically significant and recognisable segments of Australian and New Zealand industry meeting user requirements; and 3) alignment with the International Standard Industrial Classification of all economic activities (ISIC). Specialisation and coverage ratios are used to measure the degree of homogeneity. Exclusivity and stability of industrial classes are further principles used in the development of the classification system. The economic significance limit was set at a minimum of $200 million turnover for Australia or $40 million for New Zealand, or employment of 3500 for Australia and 700 people for New Zealand.

The ANZSIC scheme is hierarchical and structured at four levels, namely Divisions, Sub-division, Group and Class. Alphabetical characters are used to denote the 19 divisions within the ANZSIC system of classification. The sub-division, group and class levels provide increasingly detailed dissections of the broad division categories. The hierarchical structure of Division E Construction is listed below:

- Division E Construction
- Sub-division 30 Building Construction
- Group 301 Residential Building Construction
- Class 3011 House Construction
- Class 3019 Other Residential Building.

The use of ANZSIC categories for estimating the labour force in the housing sector using census data is subject to two main limitations. These are:

- Reporting of the main job and its location held the week before census night does not adequately capture worker JTW in the housing sector because workers can work on projects across multiple sites.
- This data does not allow for the identification of skilled workers who might work within the broader construction industry and possibly in other industries.

2.3.2 Queensland Building Services Authority data

The Queensland Building Services Authority (QBSA) is a statutory authority established under the *Building Services Authority Act 1991*. A period of 10 years of

unit record data spanning 1 January 2001 to 31 December 2010 was sourced from the QBSA. This database captures all contractors performing building work valued over $3300 that are required to hold a QBSA license. Analysing this unique database enables us to develop new insights into the geographical dynamics of the new build and renovation sector at the finest scale coupled with its evolution over a decade.

A total of 574 394 records were supplied by the QBSA for mapping and analysis. A small number of records (2749 or 0.5%) were either missing or contained incorrect location identifiers (i.e. the suburb and postcode) and were therefore omitted from the subsequent analysis. In addition, builders identifying home/business locations outside of Queensland were also omitted (equating to a total of 15 687 or 2.7% of all records). The final database used for analysis reported here contained a total of 555 958 records.

The 555 958 records were then mapped using the postcode and descriptive statistics generated at the ABS Statistical Division (SD) level of aggregation. The 13 SDs that cover Queensland are considered by the ABS to represent large, general purpose, regional type geographic areas that are largely homogeneous regions in nature and characterised by identifiable social and economic links between the inhabitants and between the economic units within the region, under the unifying influence of one or more major towns or cities (Australian Bureau of Statistics 2011) As such they represent an appropriate scale for the analysis of the QBSA data.

2.4 Qualitative methods

Following the analysis of the quantitative data described above, two focus groups (one in Brisbane and one in Melbourne) were conducted. In Queensland, invitees were identified following consultation with the Housing Industry Association (HIA) and the QBSA. In Melbourne, invitees were identified following consultation with the HIA. In both states, the invitee list was developed in a way that resulted in focus groups where members between them had experience of different types of residential building. Among the builders with experience of new build there were some with experience with the larger volume builders, sometimes referred to as project builders, while others were experienced in building one-off houses. There was also considerable experience of alterations and additions building among the participants.

Both focus groups had 10 industry participants. All participants were invited to participate in the focus groups on the basis of their long-term experience working in the housing industry and their previous experience in participating in industry consultations and assisting industry research. Each invitee was contacted by telephone and the purpose of the focus group outlined. This initial contact was then followed up with an email that set out the purpose of the focus group and the time and location. An attachment containing a Plain Language Statement providing further background on the research was included.

Each focus group ran for approximately two hours and was digitally recorded and transcribed. One member of the research team chaired each discussion while two other members listened carefully and followed up with supplementary questions. Each focus group began with a short presentation outlining the research and presenting some data on possible spatial mismatches revealed by the quantitative analysis. In this presentation it was also made clear that we were keen to understand possible segmentation of the HSLF associated with the distinction between new build and alterations and additions. The discussion thus centred around two key themes.

The first theme was experience of supply and demand of labour against the background of an industry where there was considerable fluctuation in new housing

starts. In this discussion particular attention was given to spatial dimensions in patterns of labour supply and demand that the research team had identified in the quantitative data analysis. This is where we explored and checked the efficacy of the idea of HSLF spatial mismatch.

Segmentation in the HSLF was the second theme initiated by questions about distinctions between workers engaged in building new housing and those engaged in alterations and additions. This developed into a discussion where participants agreed that HSLF segments could be better identified by distinguishing on one hand between volume built catalogue houses and on the other hand one-off houses and alterations and additions. This led to discussion of the types and levels of skill required for different types of residential building work.

3 TEMPORAL DIMENSIONS OF THE HSLF

This chapter outlines temporal dimensions of housing sector labour supply. It addresses secondary research question 1:

> What are the temporal dimensions of the HSLF and the new build and alterations and additions sub-sectors within the HSLF?

The analysis uses the industry classification system presented in the Australian and New Zealand Standard Industrial Classification System (ANZSIC). It is a system that provides a standard framework under which business units carrying out similar productive activities are grouped together (Australian Bureau of Statistics and Statistics New Zealand 2006, p.7). This grouping is organised hierarchically starting with classes that are then aggregated into groups, sub-divisions and divisions. Divisions are the largest level of aggregation and there are nineteen divisions. Residential housing business units are included within the Construction Division.

The chapter presents a summary account of the HSLF in two parts.

The first section outlines the approach used to define and present (a) aggregate data on the HSLF and (b) identify the components of this aggregate labour force engaged in building new dwellings and renovating existing dwellings. The second section presents estimates for the HSLF for the two census years 2001 and 2006. These estimates for Victoria and Queensland indicate growth in both states and relate the HSLF to the broader state labour forces. They also provide a guide to the relative size of the sub-groups engaged in building new dwellings and renovation.

3.1 Defining the housing sector labour force

As with all industries, the production processes in the housing industry are distinguished by their use of specialised human resources and specialised physical capital. In the system set up to guide the use and compilation of industry statistics, residential housing construction is included in the broader construction category (Australian Bureau of Statistics and Statistics New Zealand 2006). This category, Division E, includes:

> … units mainly engaged in the construction of buildings and other structures, additions, alterations, reconstruction, installation, and maintenance and repairs of buildings and other structures. Units engaged in demolition or wrecking of buildings and other structures and clearing of building sites are included in Division E. It also includes units engaged in demolition or wrecking of buildings, blasting, test drilling, landfill, levelling, earthmoving, excavating, land drainage and other land preparation.

Division E contains three sub-divisions—building construction, heavy and civil engineering construction, and construction services. Within each of these sub-divisions there is a hierarchy of groups and classes. Within building construction, there is a group ‘residential building construction’ at the three-digit level, containing two classes at the four-digit level, that captures a significant proportion of the residential construction ‘House construction’ (Class 3011) and ‘Other Residential Building Construction’ (Class 3019). However, there are other classes in other groups within Division E that include workers who are also engaged in housing construction, especially in the ‘construction services’ sub-division.

Therefore, estimating the size of the HSLF requires the identification of workers engaged in residential construction captured in the classes that are designated as residential and in other forms of construction. However, it is not possible to use the

ANZSIC system to identify the workers captured in the broader construction sector who are working on residential dwellings. Further, some restructuring of the ANZSIC categories between different census dates complicates comparisons over time. For example, in the 2001 census, the 'Residential Building Construction, nec' (Class 4122) and 'Building Structure Services, undefined' (Class 4220) were amended to 'Residential Building Construction, nfd' (Class 3010) and 'Building Structure Services, nfd' for 2006.

Because of these constraints, data categorised using ANZSIC codes requires some pre-processing so that classes related to the housing sector at a four-digit level can be included in estimating the size and composition of the HSLF.

In this report, the 2006 classifications presented in the Australian Bureau of Statistics and Statistics New Zealand have been adopted as the frame of reference and the data in the 2001 census harmonised with the 2006 categories. A starting point for the analysis is the units in the classes 'House construction' (Class 3011) and 'Other Residential Building Construction' (Class 3019). We refer to these as 'Core' housing industry classes. In addition there are units in classes that we describe as 'mixed or split' that are in the Construction Services Sub-division of Division E. These workers are found in the Groups: Building Construction Services (322), Building Installation Services (323) Building Completion Services (324) and Other Construction Services (329). Examples of these classes are 'Building Structure Services nfd' (Class 3220), 'Plumbing Services' (Class 3231), 'Electrical Services' (Class 3232).

The starting point in these classes for estimating the number of residential housing workers on one hand and workers in the broader construction sector on the other was to calculate a 'residential ratio'. This was calculated by dividing the total residential building approval values by total building approval values in each Statistical Local Area (SLA). The number of workers in the 'Mixed/Split' classes was calculated by multiplying the total industry workers by the 'residential ratio' for these classes. In other words, the HSLF is conceived of as the sum of workers in a bundle of industry classes. In the 2001 Census, there were 19 classes. Following revision of ANZSIC, three further classes relating to residential building were introduced resulting in a total of 22 industry classes in 2006. The tables below present the industry classes constituting the housing sector in both these years.

Distinguishing between the labour force engaged in building new residential housing and renovating existing housing can also be achieved through the development and use of ratios. A 'new build' ratio was calculated from building approval values that summed the values of new houses and new other residential buildings and divided this total by the total value of all residential building. The 'alterations and additions' ratio was calculated by dividing the total value of alterations and additions for houses and other residential buildings by the total value of all residential building. The proportion of workers engaged in 'new build' and 'alterations and additions' was calculated by multiplying the number of workers in both the core and mixed or split industry classes by the ratios derived from the building approval values.

This approach stands in contrast to existing techniques that estimate the degree of over or under supply of HSLF on the basis of economic indicators (e.g. hiring rates, wage movements, vacancy rates and employment changes) or through employer surveys of job advertisements and positions filled. Arguably, such estimates tend to misrepresent the size of the HSLF as it may include employment in commercial buildings or infrastructure construction.

3.2 Estimates of the housing sector labour force

3.2.1 Housing in the labour force

Tables 1, 2 and 3 present summary data on the HSLF in Victoria and Queensland.

Table 1 directly compares the numbers in each of the 'core' and 'mixed or split' residential housing sector classes for 2001 and 2006 and presents evidence of growth in the HSLF in both Victoria and Queensland in the period 2001–06. It also demonstrates that the size and growth of the HSLF can only be adequately described if workers working on residential housing in the 'mixed or split' classes are included in estimates. As Table 1 shows, there are a larger number of the percentage of in the 'mixed or split' classes. In 2001 it was 77 per cent of the total in both Victoria and Queensland and in 2006 it was 72 per cent in Victoria and 70 per cent in Queensland.

Tables 2 and 3 present data on changes in the HSLF for each industry class and relate this to total employment in Victoria and Queensland. In Victoria the HSLF formed 4.12 per cent of the total employment in 2006. In 2001 there were 72 000 people employed in Victoria in the HSLF, which increased by 17 000 to 89 000 in 2006, representing an increase of 23 per cent over a five-year period. Queensland shows significantly higher employment growth in the HSLF of 44 per cent in the same five-year period. The composition of the HSLF workforce in Victoria and Queensland is broadly similar. Within the housing sector, 'housing construction' is the largest class. In Victoria it is 39 per cent and in Queensland it is 43 per cent. Electrical, plumbing, painting and decorating and carpentry services are the other large classes in both Victoria and Queensland.

Tables 2 and 3 also show that, in both states, there has been some growth and contraction in the shares of employment across the different classes in the period 2001–06. In Victoria there was a marginal decline in employment in 'Air Conditioning and Heating Services' and 'Fire and Security Alarm Installation Services' and a slight increase in 'Housing Construction', 'Carpentry', and 'Landscaping construction services'. In Queensland, 'Housing Construction' and 'Electrical Services' have increased their share while there has not being any noticeable decline in other industry classes.

Also, Tables 2 and 3 show the number of people in the HSLF identified in the census as having no fixed address. These figures suggest that a significant number of people in the residential construction industry are highly mobile, to the extent that they indicate in their census returns that they have no fixed address. In Victoria, this figure was approximately 19 000 in 2006. In Queensland, this number is 23 000 people and therefore significantly higher than in Victoria. This suggests that a larger share of the Queensland HSLF can be described as itinerants in comparison to Victoria.

3.2.2 New build and alteration and additions

Tables 4 and 5 present the results of the disaggregation of the HSLF into the two sub-sectors of 'new build' and 'alterations and additions'. As noted above, this disaggregation was undertaken by dividing the total HSLF into these two categories developing and using a 'new build' and 'alterations and additions' ratio. The data presented shows that in both states the proportion of the HSLF engaged in alterations and additions has grown more strongly than in new build. Although it should be noted that the base for the growth in people working on alterations and additions in both states is considerably lower than for new build.

In Victoria, there were 58 000 people employed in new build in 2001 and this increased to 69 000 in 2006. This increase of 11 000 people to the new build labour

force in the period 2001–06 represents an increase of 18 per cent. In alterations and additions, there were about 14 000 people employed in 2011 and 18 000 in 2006, an increase of approximately 4000, or 31 per cent. In Queensland, there were approximately 44 000 people employed in new build in 2001, which increased to approximately 56 000 in 2006. This increase of 12 000 people engaged in new build in the 2001–06 period represents an increase of 29 per cent. In alterations and additions, there were 9000 people employed in 2001, which increased to 14 000 in 2006. Approximately 5000 people were added to alterations and additions during the period 2001–06, representing a 50 per cent increase.

3.3 Conclusion

This chapter has presented a response to the secondary research question: What are the temporal dimensions of the HSLF as a whole and the new build and alterations and additions sub-sectors?

It first described the categories, containing records of workers who worked in the housing industry, which were used to interrogate the census data. Using these categories, the data presented showed that, in aggregate, the size of the HSLF grew in the period 2001–06. In Victoria, the workforce grew from 72 000 to 89 000, an increase of 23 per cent in the five-year period 2001–06. The 44 per cent growth in the Queensland workforce was almost twice that of Victoria for the same period when it grew from 53 000 to 77 000.

This aggregate data was then split to distinguish between workers who worked on ‘new build’ housing and those who worked on ‘alterations and additions’. The results of this splitting showed that there had been growth in both sub-sectors. The rate of growth in the alterations and additions sub-sector was greater than for the new build sector, although this growth was from a lower base.

Table 1: Employment in selected construction industry classes (Division E) 2001 and 2006—Victoria and Queensland

Industry Class 2001			Industry Class 2006			
	Vic	**Qld**	**Class code**		**Vic**	**Qld**
Residential Building Construction, nec	1,103	663	*	Residential Building Construction, nfd	21	14
House Construction	20,834	15,648	3011	House Construction	34,619	33,387
Not categorised in 2001	*na*	*na*	3019	Other Residential Building Construction	1,135	1,722
Building Structure Services, undefined	38	41	NA	Building Structure Services, nfd	19	3
Concreting Services	4,369	3,685	3221	Concreting Services	6,004	5,759
Bricklaying Services	3,502	1,974	3222	Bricklaying Services	4,027	2,608
Roofing Services	1,837	1,321	3223	Roofing Services	2,184	2,141
Structural Steel Erection Services	741	829	3224	Structural Steel Erection Services	969	1,326
Not categorised in 2001	*na*	*na*	*	Building Installation Services, nfd	82	54
Plumbing Services	12,004	6,687	3231	Plumbing Services	13,217	8,375
Electrical Services	12,475	9,915	3232	Electrical Services	14,981	14,749
Air Conditioning and Heating Services	3,786	2,758	3233	Air Conditioning and Heating Services	2,848	3,214
Fire and Security System Services	1,594	1,031	3234	Fire and Security Alarm Installation Services	1,635	1,406
Not categorised in 2001	*na*	*na*	3239	Other Building Installation Services	958	959
Building Completion Services, undefined	42	34	*	Building Completion Services, nfd	44	23
Plastering and Ceiling Services	4,364	2,985	3241	Plastering and Ceiling Services	5,072	4,053
Carpentry Services	7,413	5,562	3242	Carpentry Services	9,827	7,548
Tiling and Carpeting Services	3,646	3,207	3243	Tiling and Carpeting Services	4,287	4,453
Painting and Decorating Services	8,078	6,775	3244	Painting and Decorating Services	8,470	8,100
Glazing Services	1,196	810	3245	Glazing Services	1,642	1,189
Landscaping Services	4,597	3,575	3291	Landscape Construction Services	6,565	5,475
Not categorised in 2001	*na*	*na*	3292	Hire of Construction Machinery with Operator	200	523
Construction Services, nec	4,416	3,758	3299	Other Construction Services, nec	3,806	4,302
Core housing classes	**21,937**	**16,311**		**Core housing classes**	**34,640**	**33,401**
Mixed/split housing classes	**74,098**	**54,947**		**Mixed/split housing classes**	**87,972**	**77,982**
Residential housing sector total	**96,035**	**71,258**		**Residential housing sector total**	**122,612**	**111,383**

* Class code undefined in ABS census data

Note: Nec – not elsewhere counted

Nfd – not further defined

Table 2: Estimates of the housing sector labour force by industry class, 2001 and 2006, Victoria

Industry Class	Victoria							
	2001			2006			Change in employment (2001–06)	Per cent of change in employment (2001–06)
	Number of people employed in the residential housing sector	Per cent of total residential housing sector employment	Per cent of total employment	Number of people employed in the residential housing sector	Per cent of total residential housing sector employment	Per cent of total employment		
Residential Building Construction, nfd	1,103	1.53	0.06	21	0.02	0.00	-1082	-98
House Construction	20,834	28.88	1.04	34,619	38.89	1.60	13,785	66
Other Residential Building Construction	na	na	na	591	0.66	0.03	na	na
Building Structure Services, nfd	26	0.04	0.00	14	0.02	0.00	-12	-46
Concreting Services	3,025	4.19	0.15	3,670	4.12	0.17	645	21
Bricklaying Services	2,480	3.44	0.12	2,664	2.99	0.12	184	7
Roofing Services	1,276	1.77	0.06	1,371	1.54	0.06	95	7
Structural Steel Erection Services	472	0.65	0.02	550	0.62	0.03	78	17
Building Installation Services, nfd	na	na	na	47	0.05	0.00	na	na
Plumbing Services	8,187	11.35	0.41	8,386	9.42	0.39	199	2
Electrical Services	8,090	11.21	0.40	8,796	9.88	0.41	706	9
Air Conditioning and Heating Services	2,413	3.34	0.12	1,585	1.78	0.07	-827	-34
Fire and Security Alarm Installation Services	1,023	1.42	0.05	910	1.02	0.04	-114	-11

Industry Class	Victoria							
	2001			2006			Change in employment (2001–06)	Per cent of change in employment (2001–06)
	Number of people employed in the residential housing sector	Per cent of total residential housing sector employment	Per cent of total employment	Number of people employed in the residential housing sector	Per cent of total residential housing sector employment	Per cent of total employment		
Other Building Installation Services	na	na	na	522	0.59	0.02	na	na
Building Completion Services, nfd	27	0.04	0.00	27	0.03	0.00	0	0
Plastering and Ceiling Services	2,980	4.13	0.15	3,212	3.61	0.15	233	8
Carpentry Services	5,166	7.16	0.26	6,235	7.00	0.29	1,069	21
Tiling and Carpeting Services	2,511	3.48	0.13	2,717	3.05	0.13	206	8
Painting and Decorating Services	5,540	7.68	0.28	5,439	6.11	0.25	-100	-2
Glazing Services	784	1.09	0.04	931	1.05	0.04	148	19
Landscape Construction Services	3,265	4.53	0.16	4,304	4.84	0.20	1,039	32
Hire of Construction Machinery with Operator	na	na	na	107	0.12	0.00	na	na
Other Construction Services nec	2,946	4.08	0.15	2,303	2.59	0.11	-643	-22
Total	72,148	100	3.61	89,024	100.00	4.12	16,876	23
Not stated areas industry class total*	**13,701**	**-**	**-**	18,649	-	-	**4,948**	36

* In addition there were other participants in the housing sector labour force who did not state any fixed location for employment in their census return

Note: Percentage of total employment = [Residential housing sector employment/ Total employment of all industry classes, in Vic]*100; percentage change in employment (2001–06) = [Change in employment (2001–06)/Residential housing sector employment (2001)]* 100.

Table 3: Estimates of the housing sector labour force by industry class, 2001 and 2006, Queensland

Industry Class	Queensland							
	2001			2006			Change in employment (2001–06)	Per cent of change in employment (2001–06)
	Number of people employed in the residential housing sector	Per cent of total residential housing sector employment	Per cent of total employment	Number of people employed in the residential housing sector	Per cent of total residential housing sector employment	Per cent of total employment		
Residential Building Construction, nfd	663	1.24	0.04	14	0.02	0.00	-649	-98
House Construction	15,648	29.32	1.05	33,387	43.32	1.92	17,739	113
Other Residential Building Construction	na	na	na	912	1.18	0.05	na	na
Building Structure Services, nfd	29	0.05	0.00	0	0.00	0.00	-29	-100
Concreting Services	2,550	4.78	0.17	3,305	4.29	0.19	755	30
Bricklaying Services	1,424	2.67	0.10	1,540	2.00	0.09	116	8
Roofing Services	901	1.69	0.06	1,238	1.61	0.07	338	37
Structural Steel Erection Services	514	0.96	0.03	703	0.91	0.04	190	37
Building Installation Services, nfd	na	na	na	29	0.04	0.00	na	na
Plumbing Services	4,579	8.58	0.31	4,872	6.32	0.28	293	6
Electrical Services	6,178	11.58	0.41	7,729	10.03	0.44	1,551	25
Air Conditioning and Heating Services	1,595	2.99	0.11	1,596	2.07	0.09	1	0
Fire and Security Alarm Installation Services	644	1.21	0.04	650	0.84	0.04	6	1
Other Building Installation Services	na	na	na	471	0.61	0.03	na	na
Building Completion Services, nfd	20	0.04	0.00	11	0.01	0.00	-9	-45

Industry Class	Queensland							
	2001			2006			Change in employment (2001–06)	Per cent of change in employment (2001–06)
	Number of people employed in the residential housing sector	Per cent of total residential housing sector employment	Per cent of total employment	Number of people employed in the residential housing sector	Per cent of total residential housing sector employment	Per cent of total employment		
Plastering and Ceiling Services	2,141	4.01	0.14	2,367	3.07	0.14	226	11
Carpentry Services	3,964	7.43	0.27	4,423	5.74	0.25	459	12
Tiling and Carpeting Services	2,235	4.19	0.15	2,614	3.39	0.15	378	17
Painting and Decorating Services	4,778	8.95	0.32	4,825	6.26	0.28	47	1
Glazing Services	523	0.98	0.04	603	0.78	0.03	80	15
Landscape Construction Services	2,522	4.73	0.17	3,211	4.17	0.18	689	27
Hire of Construction Machinery with Operator	na	na	na	250	0.32	0.01	na	na
Other Construction Services nec	2,460	4.61	0.17	2,321	3.01	0.13	-139	-6
Total	**53,368**	**100**	**3.58**	**77,069**	**100**	**4.44**	**23,701**	**44**
Not stated areas industry class total*	**18,344**	**-**	**-**	**23,147**	-	-	**4,803**	**26**

* In addition there were other participants in the housing sector labour force who did not state any fixed location for employment in their census return

Note: Percentage of total employment = [Residential housing sector employment/ Total employment of all industry classes, in Qld]*100; percentage change in employment (2001–06) = [Change in employment (2001–06)/Residential housing sector employment (2001)]* 100.

Table 4: Estimates of housing sector labour force, new build and alterations and additions, 2001 and 2006, Victoria

Industry Class	Victoria											
	2001				2006				Change (2001–06)		Per cent change (2001–06)	
	New Build		Alterations and additions		New Build		Alterations and additions					
	Residential housing sector employment	Per cent total residential housing sector employment	Residential housing sector employment	Per cent total residential housing sector employment	Residential housing sector employment	Per cent total residential housing sector employment	Residential housing sector employment	Per cent total residential housing sector employment	New Build	Alterations and additions	New Build	Alterations and additions
Residential Building Construction, nfd	855	1.47	246	1.78	15	0.02	6	0.03	-840	-240	-98	-98
House Construction	16,620	28.66	4,125	29.85	26,913	39.22	7,491	41.53	10,292	3366	62	82
Other Residential Building Construction	na	na	na	na	442	0.64	148	0.82	na	na	na	na
Building Structure Services, nfd	21	0.04	5	0.03	12	0.02	2	0.01	-9	-3	-43	-60
Concreting Services	2,466	4.25	542	3.92	2,976	4.34	660	3.66	510	118	21	22
Bricklaying Services	2,016	3.48	446	3.23	2,145	3.13	485	2.69	129	39	6	9
Roofing Services	1,048	1.81	221	1.60	1,116	1.63	243	1.35	68	21	6	10
Structural Steel Erection Services	394	0.68	76	0.55	454	0.66	94	0.52	60	18	15	24
Building Installation Services, nfd	na	na	na	na	35	0.05	11	0.06	na	na	na	na
Plumbing Services	6,633	11.44	1,519	10.99	6,724	9.80	1,602	8.88	92	83	1	5
Electrical Services	6,504	11.22	1,560	11.28	6,945	10.12	1,801	9.99	441	242	7	15
Air Conditioning and Heating Services	1,964	3.39	443	3.21	1,289	1.88	290	1.61	-675	-153	-34	-35
Fire and Security Alarm Installation Services	805	1.39	216	1.56	715	1.04	190	1.06	-90	-25	-11	-12
Other Building Installation Services	na	na	na	na	412	0.60	108	0.60	na	na	na	na

Industry Class	Victoria											
	2001				2006				Change (2001–06)		Per cent change (2001–06)	
	New Build		Alterations and additions		New Build		Alterations and additions					
	Residential housing sector employment	Per cent total residential housing sector employment	Residential housing sector employment	Per cent total residential housing sector employment	Residential housing sector employment	Per cent total residential housing sector employment	Residential housing sector employment	Per cent total residential housing sector employment	New Build	Alterations and additions	New Build	Alterations and additions
Building Completion Services, nfd	22	0.04	5	0.04	22	0.03	5	0.03	0	0	0	0
Plastering and Ceiling Services	2,418	4.17	542	3.92	2,573	3.75	601	3.33	156	59	6	11
Carpentry Services	4,114	7.10	1,017	7.36	4,929	7.18	1,242	6.88	815	225	20	22
Tiling and Carpeting Services	2,022	3.49	473	3.42	2,171	3.16	516	2.86	149	43	7	9
Painting and Decorating Services	4,412	7.61	1,091	7.89	4,280	6.24	1,100	6.10	-132	9	-3	1
Glazing Services	632	1.09	150	1.09	752	1.10	177	0.98	120	27	19	18
Landscape Construction Services	2,631	4.54	616	4.46	3,438	5.01	830	4.60	807	213	31	35
Hire of Construction Machinery with Operator	na	na	na	na	136	0.20	13	0.07	na	na	na	na
Other Construction Services nec	2,407	4.15	528	3.82	136	0.20	424	2.35	-2271	-104	-94	-20
Total	**57,983**	**100**	**13,821**	**100**	**68,628**	**100**	**18,040**	**100**	**10,645**	**4218**	**18**	**31**

Table 5: Estimates of housing sector labour force, new build and alterations and additions, 2001 and 2006, Queensland

Industry Class	Victoria											
	2001				2006				Change (2001–06)		Per cent change (2001–06)	
	New Build		Alterations and additions		New Build		Alterations and additions					
	Residential housing sector employment	Per cent of total residential housing sector employment	Residential housing sector employment	Per cent of total residential housing sector employment	Residential housing sector employment	Per cent of total residential housing sector employment	Residential housing sector employment	Per cent of total residential housing sector employment	New Build	Alterations and additions	New Build	Alterations and additions
Residential Building Construction, nfd	558	1.28	103	1.11	10	0.02	4	0.03	-548	-99	-98	-96
House Construction	12,752	29.19	2,797	29.97	24,267	42.98	5,969	42.51	11,515	3,172	90	113
Other Residential Building Construction	na	na	na	na	759	1.35	138	0.98	na	na	na	na
Building Structure Services, nfd	25	0.06	4	0.05	0	0	0	0	-25	-4	-100	-100
Concreting Services	2,089	4.78	440	4.71	2,520	4.46	609	4.34	431	169	21	38
Bricklaying Services	1,166	2.67	243	2.61	1,151	2.04	279	1.98	-15	36	-1	15
Roofing Services	739	1.69	154	1.65	930	1.65	243	1.73	191	89	26	58
Structural Steel Erection Services	434	0.99	77	0.83	578	1.02	107	0.76	144	30	33	39
Building Installation Services, nfd	na	na	na	na	22	0.04	5	0.04	na	na	na	na
Plumbing Services	3,757	8.6	795	8.52	3,787	6.71	896	6.38	30	101	1	13
Electrical Services	5,081	11.63	1,075	11.52	6,108	10.82	1,423	10.13	1,027	348	20	32
Air Conditioning and Heating Services	1,317	3.01	273	2.92	1,269	2.25	289	2.06	-48	16	-4	6
Fire and Security Alarm Installation Services	536	1.23	105	1.12	514	0.91	122	0.87	-22	17	-4	16

Industry Class	Victoria											
	2001				2006				Change (2001–06)		Per cent change (2001–06)	
	New Build		Alterations and additions		New Build		Alterations and additions					
	Residential housing sector employment	Per cent of total residential housing sector employment	Residential housing sector employment	Per cent of total residential housing sector employment	Residential housing sector employment	Per cent of total residential housing sector employment	Residential housing sector employment	Per cent of total residential housing sector employment	New Build	Alterations and additions	New Build	Alterations and additions
Other Building Installation Services	na	na	na	na	357	0.63	100	0.71	na	na	na	na
Building Completion Services, nfd	17	0.04	3	0.04	8	0.01	2	0.01	-9	-1	-53	-33
Plastering and Ceiling Services	1,761	4.03	359	3.84	1,775	3.14	437	3.11	14	78	1	22
Carpentry Services	3,210	7.35	721	7.72	3,345	5.92	843	6.01	135	122	4	17
Tiling and Carpeting Services	1,836	4.2	379	4.06	1,962	3.48	490	3.49	126	111	7	29
Painting and Decorating Services	3,844	8.8	892	9.56	3,617	6.41	922	6.57	-227	30	-6	3
Glazing Services	436	1	85	0.91	480	0.85	108	0.77	44	23	10	27
Landscape Construction Services	2,100	4.81	406	4.35	2,475	4.38	593	4.23	375	187	18	46
Hire of Construction Machinery with Operator	na	na	na	na	264	0.47	36	0.26	na	na	na	na
Other Construction Services nec	2,026	4.64	421	4.51	264	0.47	426	3.03	-1,762	5	-87	1
Total	**43,684**	**100**	**9,332**	**100**	**56,462**	**100**	**14,040**	**100**	**12,778**	**4,708**	**29**	**50**

4 SPATIAL DIMENSIONS OF LABOUR SUPPLY AND DEMAND

The spatial distribution of labour is of particular interest in the housing construction industry. In the case of housing, along with the construction industry more broadly, construction work is administered from business premises but the actual construction work is performed on project sites. In the case of housing, the business premises could be an office but for small builders it can be the home of the business owner. Further, all construction sites only exist for a limited time that extends from the first works on the site through to the completion of the project. Each site becomes the location for a spatially specific temporary organisation. This means that people who work on residential housing projects, or other construction projects, are constantly changing their work location. Correspondingly, their Journey-to-work (JTW) is also changing on a daily, weekly or monthly basis.

This chapter focuses on the constantly changing location of work and the JTW dynamic. It is important that the supply of and demand for labour in the HSLF be placed in the spatial context of large metropolitan cities and regional centres. This chapter does this by reporting on spatial analyses of housing labour supply at two different levels—the ABS delineated Labour Market Regions (LMRs) and Statistical Local Areas (SLAs). The mapping of employment patterns in the housing sector, however, is illustrated at an SLA level, which depicts the spatial distribution of labour supply at a much smaller areal unit (Sections 4.1–4.2).

The spatial clustering of housing employment is measured using spatial autocorrelation measures, used to identify geographical hotspots of housing labour supply (Sections 4.3–4.4). Within a city or region, demand plays out spatially in sub-market location choices, which in turn affects where there is either a labour shortage or alternatively the possibility of unemployment. Given the regular changes in JTW, as mentioned above, the analysis in the latter sections of this chapter (Sections 4.6–4.7) focuses upon the spatial mobility and commuting patterns of the HSLF particularly in Queensland, where the state-based QBSA data provides sufficient granularity to make present a more detailed analyses. In addition to the granularity of JTW data that this dataset offers, it is also available for a 10-year period (2001–10) compared to the census data which is restricted to the 2001–06 period. In turn, this enables the secondary research question two guiding this chapter to be addressed:

> What are the spatial dimensions of the HSLF and the new build and alterations and additions sub-sectors within the HSLF?

4.1 Housing sector labour supply and labour market regions

Table 6 presents labour force estimates for the Victorian HSLF at the level of labour market regions for both new build and alterations and additions. It shows that it was the Bendigo LMR that showed the most rapid growth in the HSLF in the five-year period to 2006, both in new build and in alterations and additions. In this LMR, 1300 were employed in new build and 190 people were employed in alterations and additions in 2001. This increased to 4600 and 730 respectively in 2006 representing increases of 249 per cent and 284 per cent. The share of housing employment to total employment for Bendigo increased from 3.16 to 9.12 per cent.

Across the LMRs of metropolitan Melbourne there was widespread variability in employment across new build and alterations and additions. For example, 5300 and 2300 people were employed in Melbourne Inner South in new build and alterations and additions in 2001, which reduced to 3600 and 1300 in 2006. The rate of employment in new build in Melbourne Inner, Melbourne Northwest and Melbourne Outer East, and in alterations and additions in Melbourne Inner East was also negative over the five-year period, while the rate of

employment change in all other LMRs in Melbourne was positive. The restricted supply of vacant land suitable for housing development in the more established suburbs provides less opportunity for new housing development, resulting in a smaller HSLF in these regions.

In Queensland LMRs, Queensland Outback and Gold Coast regions showed negative growth in new build HSLF. Similarly, Darling Downs–Maranoa and Queensland Outback also showed negative growth in the alterations and additions HSLF. In 2001, about 780 and 230 people were employed in Queensland Outback in new build and alterations and additions, which reduced to 230 and 220 in 2006. In contrast, significant growth in HSLF employment was observed in Mackay, Wide Bay and Cairns in new build. In Mackay, about 1200 people were employed in new build in 2001, which increased to 2300 in 2006. The LMRs with the highest increases in employment in additions and alterations over the five-year period were the Sunshine Coast, followed by Moreton Bay-South, Brisbane East and Cairns. In the Sunshine Coast LMR, about 230 people were employed in alterations and additions in 2001, which increased to 700 in 2006. The share of the alterations and additions labour force increased from 4 per cent to nearly 8 per cent over the five-year period.

Table 6: Housing sector labour force estimates, labour market regions, new build and alterations and additions, 2001 and 2006, Victoria

Labour market region	Victoria											
	2001				2006				Change (2001–06)		Per cent change (2001–06)	
	New Build		Alterations and additions		New Build		Alterations and additions					
	Residential housing sector employment	Per cent of total residential housing sector employment	Residential housing sector employment	Per cent of total residential housing sector employment	Residential housing sector employment	Per cent of total residential housing sector employment	Residential housing sector employment	Per cent of total residential housing sector employment	New Build	Alterations and additions	New Build	Alterations and additions
Ballarat	1,026	2.46	211	2.02	1,494	2.96	227	1.78	468	16	46	8
Bendigo	1,321	3.16	190	1.81	4,608	9.12	730	5.72	3,286	541	249	284
Geelong	2,304	5.52	376	3.60	2,608	5.16	766	6.00	304	389	13	104
Hume	1,229	2.94	217	2.08	1,658	3.28	247	1.93	429	30	35	14
Latrobe–Gippsland	2,065	4.94	338	3.23	3,109	6.16	468	3.67	1,044	130	51	38
Melbourne–Inner	4,202	10.06	2,030	19.41	3,267	6.47	3,010	23.58	-935	980	-22	48
Melbourne–Inner East	1,951	4.67	1,044	9.98	2,586	5.12	1,001	7.84	635	-43	33	-4
Melbourne –Inner South	5,328	12.76	2,304	22.03	3,621	7.17	1,314	10.29	-1707	-990	-32	-43
Melbourne—orth East	2,852	6.83	675	6.46	3,560	7.05	816	6.39	709	141	25	21
Melbourne– North West	2,153	5.15	246	2.35	1,969	3.90	307	2.40	-184	60	-9	25
Melbourne– Outer East	4,383	10.49	933	8.92	4,171	8.26	1,339	10.49	-212	406	-5	44
Melbourne– South East	4,234	10.14	621	5.94	6,046	11.97	761	5.96	1,812	140	43	23
Melbourne– West	2,819	6.75	325	3.11	4,132	8.18	401	3.14	1,313	76	47	23
Mornington Peninsula	2,858	6.84	413	3.95	3,219	6.37	645	5.05	360	231	13	56
North West	1,016	2.43	171	1.63	1,422	2.82	220	1.72	406	49	40	29
Shepparton	1,049	2.51	127	1.21	1,577	3.12	171	1.34	528	44	50	35
Warrnambool and South West	977	2.34	236	2.25	1,452	2.88	342	2.68	475	107	49	45
Total	**41,765**	**100**	**10,456**	**100**	**50,498**	**100**	**12,763**	**100**	**8,732**	**2,307**	**21**	**22**

Table 7: Housing sector labour force estimates, labour market regions, new build and alterations and additions, 2001 and 2006, Queensland

Labour market region	Queensland											
	2001				2006				Change (2001–06)		Per cent change (2001–06)	
	New Build		Alterations and additions		New Build		Alterations and additions					
	Residential housing sector employment	Per cent of total residential housing sector employment	Residential housing sector employment	Per cent of total residential housing sector employment	Residential housing sector employment	Per cent of total residential housing sector employment	Residential housing sector employment	Per cent of total residential housing sector employment	New build	Alterations and additions	New Build	Alterations and additions
Brisbane–East	1,724	5.62	199	3.50	1,856	4.53	493	5.55	132	294	8	148
Brisbane–North	1,007	3.28	600	10.56	1,549	3.79	638	7.20	542	39	54	6
Brisbane–South	1,752	5.72	779	13.72	2,418	5.91	1,038	11.70	666	259	38	33
Brisbane–West	966	3.15	241	4.24	977	2.39	351	3.96	11	111	1	46
Brisbane Inner City	2,125	6.93	800	14.09	3,117	7.62	1,109	12.50	993	309	47	39
Cairns	1,495	4.87	251	4.43	2,470	6.04	561	6.32	975	309	65	124
Darling Downs–Maranoa	744	2.43	183	3.22	1,151	2.81	152	1.71	406	-31	55	-17
Fitzroy	1,604	5.23	186	3.28	2,521	6.16	283	3.19	917	97	57	52
Gold Coast	5,075	16.55	485	8.54	4,327	10.57	721	8.13	-748	236	-15	49
Ipswich	1,152	3.76	186	3.28	1,641	4.01	253	2.85	489	67	42	36
Logan–Beaudesert	1,816	5.92	292	5.15	2,155	5.27	638	7.19	339	345	19	118
Mackay	1,225	3.99	110	1.95	2,335	5.71	242	2.73	1,110	132	91	120
Moreton Bay–North	1,278	4.17	130	2.28	1,670	4.08	185	2.08	392	55	31	42
Moreton Bay–South	1,265	4.13	106	1.87	1,391	3.40	291	3.28	126	184	10	175
Queensland–Outback	779	2.54	232	4.09	491	1.20	221	2.49	-288	-11	-37	-5
Sunshine Coast	3,025	9.87	232	4.09	4,373	10.69	706	7.96	1,348	474	45	204
Toowoomba	810	2.64	121	2.14	1,292	3.16	216	2.43	482	94	60	79
Townsville	1,303	4.25	358	6.31	2,287	5.59	495	5.58	984	137	76	38
Wide Bay	1,518	4.95	186	3.27	2,900	7.09	279	3.15	1,382	94	91	50
Total	**30,661**	**100**	**5,678**	**100**	**40,919**	**100**	**8,870**	**100**	**10,258**	**3,193**	**33**	**56**

4.2 Mapping areas of high and low supply

Figure 1 shows that, within Victoria, the HSLF was highly concentrated in Melbourne and in regional cities. Other areas, such as Northwest, West, Southwest, Southeast, Far Southeast and along the Great Diving Range, experienced lower levels of labour supply. There is a greater concentration of labour in and around Melbourne in 2006, particularly in the western suburbs and along the growth corridors in comparison to 2001. Greater Dandenong, Casey and Frankston and regional cities such as Geelong, Ballarat, Bairnsdale, Mildura, Shepparton, Mansfield and Wodonga, all show an increase in the housing labour supply between 2001 and 2006.

In Melbourne, labour supply in housing in 2001 was concentrated along the growth corridor that links the Yarra Ranges-South West and Kingston North. However, in 2006, labour supply has tended to scatter over a wider area to include Mornington Peninsula-South, Mornington Peninsula-West, Frankston West, Kingston North, Glen Eira–Caulfield, Manningham Ringwood, Wyndham North and Darebin-Preston.

Figure 2 shows the labour force engaged in new build in 2001 and 2006 for Victoria. The spatial distribution of labour in new build is relatively dispersed across the Far Southeast, Southeast, Melbourne, North, Mid-West and along the Great Ocean Road. As expected, the largest concentration of new build labour is recorded in different parts of the Melbourne metropolitan area. An increase in labour supply is noted around eastern parts of Melbourne such as the Greater Dandenong, Casey and Frankston areas in 2006 relative to 2001.

Regional cities, including Geelong, Ballarat, Bendigo, Bairnsdale, Mildura, Shepparton and Wodonga also experienced an increased level of supply of labour for new build between 2001 and 2006, as did Greater Shepparton, parts of the Grampians, Hamilton, the Latrobe Valley and Mansfield. New build developments are not restricted to Melbourne, and the HSLF new build subsector is accordingly spread out across other regional cities and townships in Victoria.

In Melbourne, shifts in new build are apparent. In 2001, high concentrations of new build labour is recorded in the Yarra Ranges-South, Yarra Richmond, Mornington Peninsula-South, Mornington Peninsula-West, Frankston West, Melbourne Inner, Melbourne Southbank-Docklands, Melbourne Remainder, Whittlesea South, Wyndham North and Bayside Brighton, while the highest concentrations in 2006 are recorded in Yarra Ranges-South, Mornington Peninsula-South, Mornington Peninsula-West, Frankston West, Kingston South, Greater Dandenong-Dandenong, Casey South, Casey Berwick, Wyndham North, Brimbank Sunshine and Port Phillip West. There is spatial specificity, but the patterns for new build seem to align with growth corridors in outer suburban metropolitan zones.

Figure 1: Housing sector labour force, all residential, 2001 and 2006, Victoria

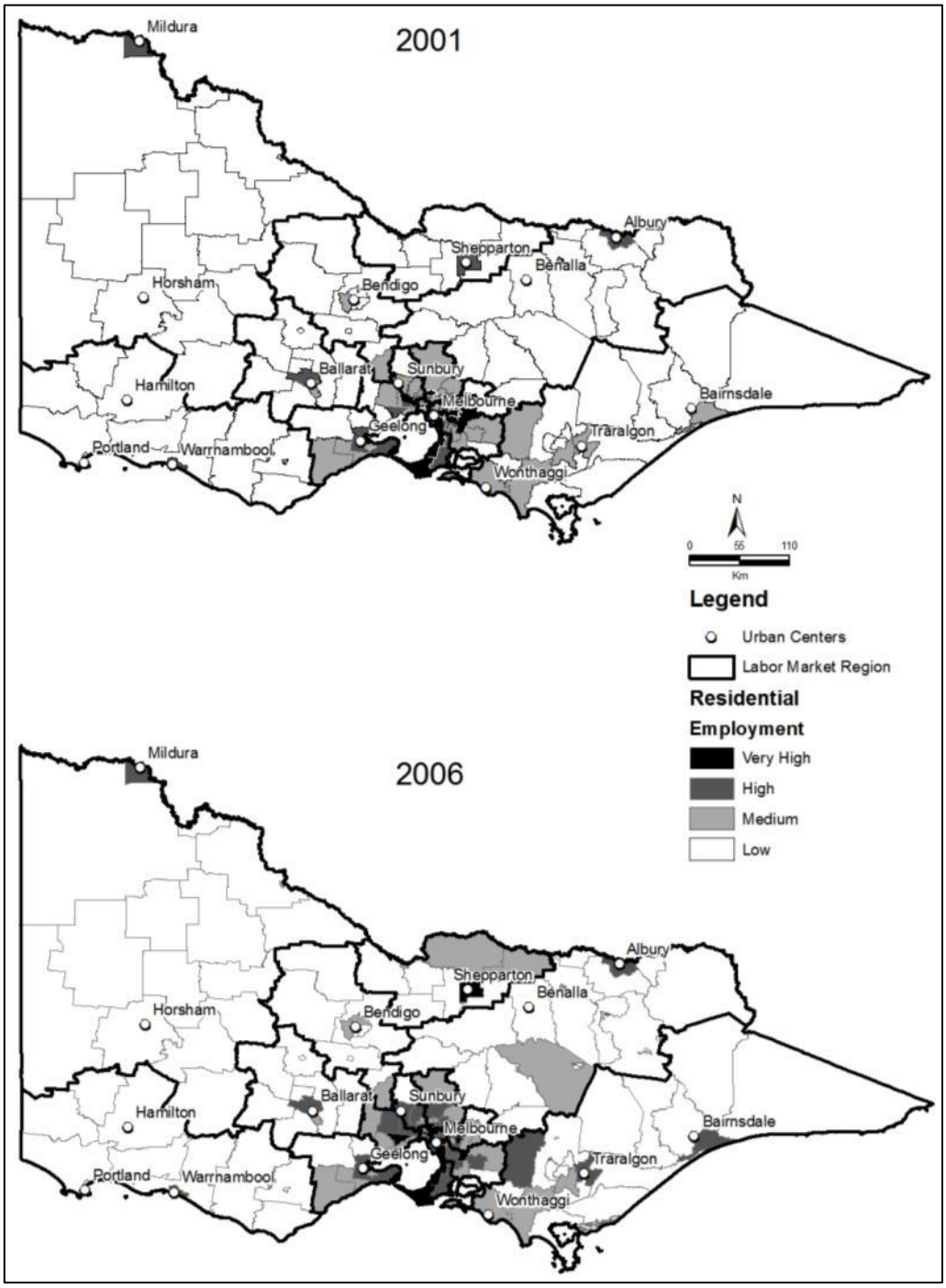


Figure 2: Housing sector labour force, new build, 2001 and 2006, Victoria

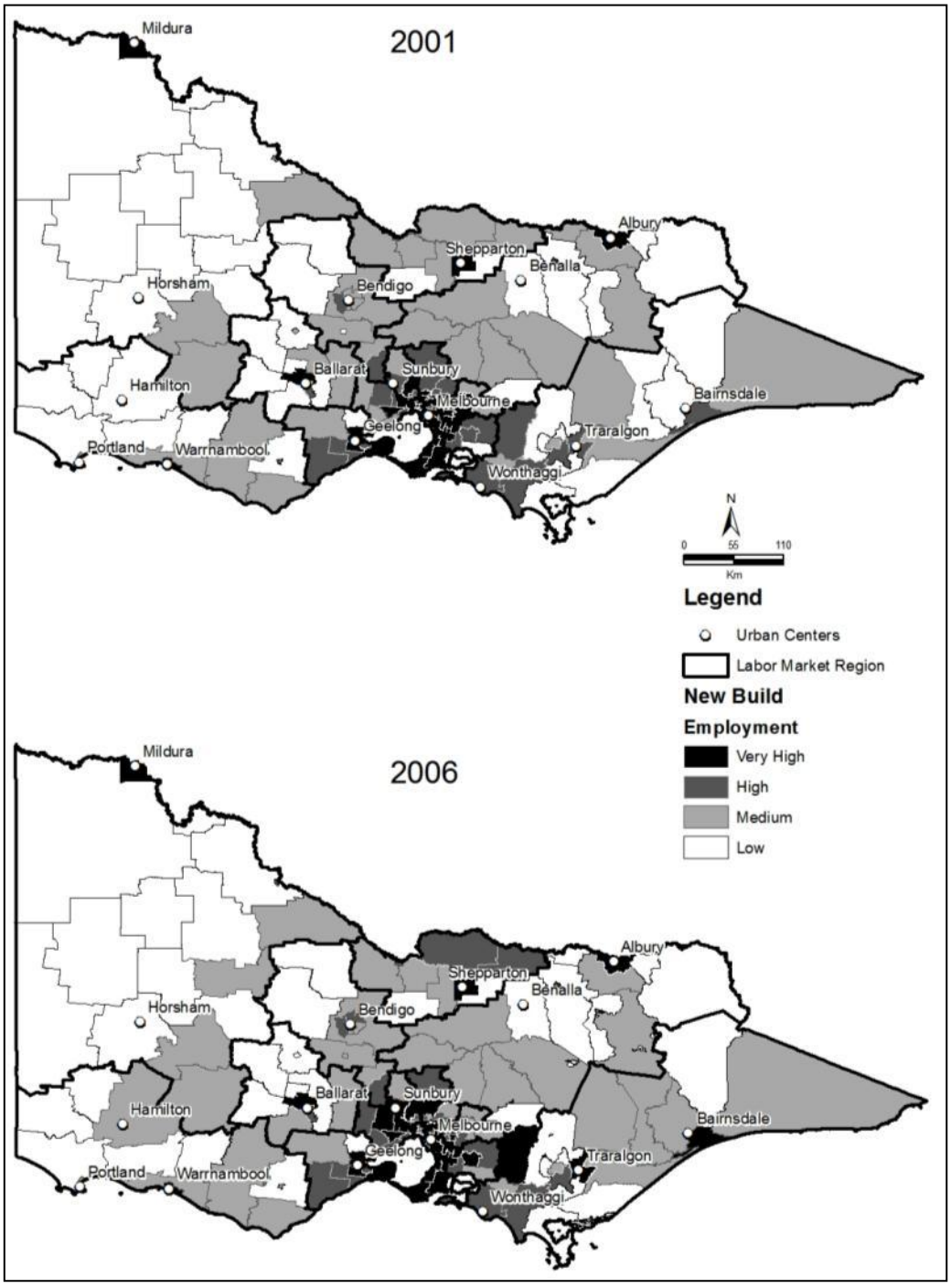
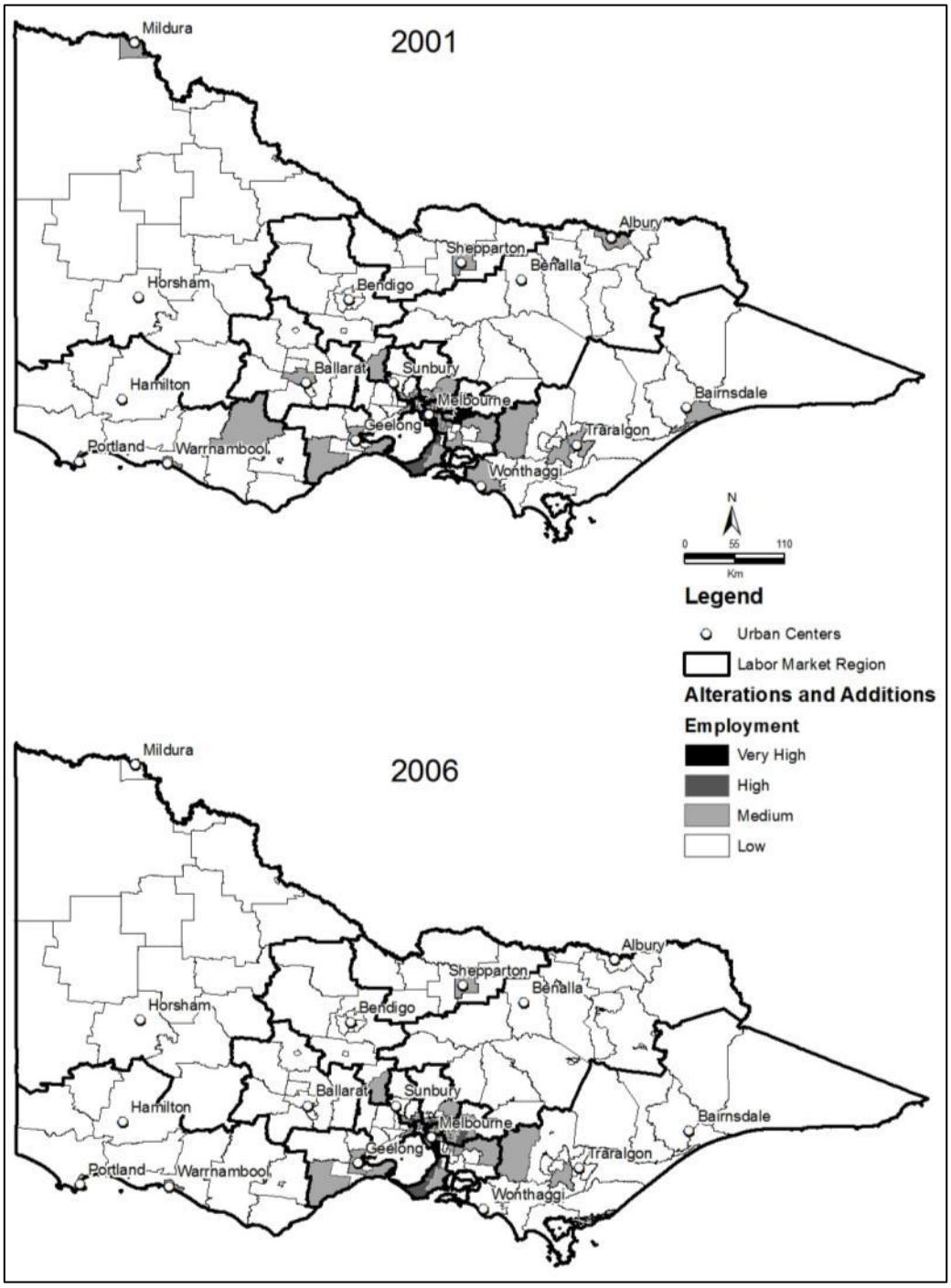


Figure 2 shows the distribution of the alterations and additions subsector. This, in comparison to new build, shows a more spatially restricted pattern of labour supply. Most renovation tends to occur around Melbourne with particular focus on inner and middle suburbs. Some decline is labour supply is noted in regional Victoria over a period between 2001 and 2006. For example, Greater Geelong, parts of Surf Coast, Warrnambool, Ballarat, Bairnsdale, Mildura, Shepparton, Wodonga and Frankston have experienced marginal decline in the levels of labour supply in alterations and additions. In 2006, a higher level of labour was required in the alteration and additions category in Melbourne, Ballarat, Greater Geelong and Shepparton, and parts of the Yarra Ranges.

Figure 3: Housing sector labour force, alterations and additions, 2001 and 2006, Victoria

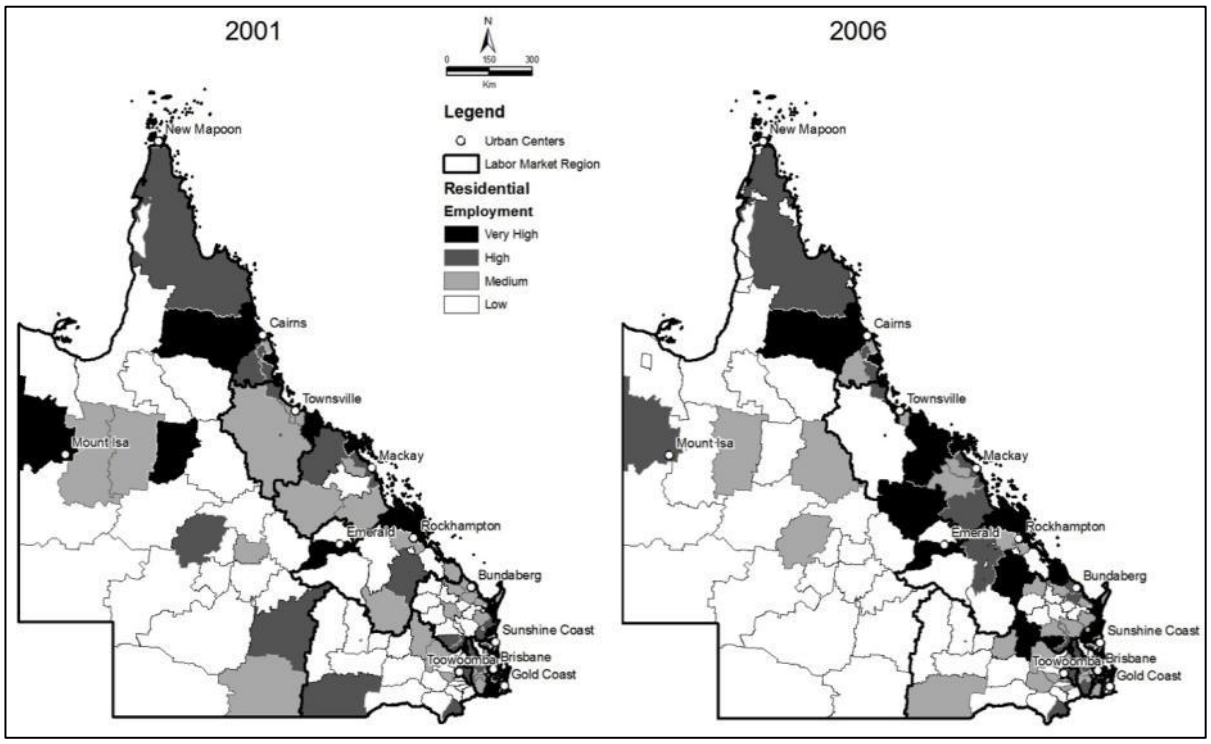


Areas around the outer metropolitan Melbourne, including Yarra Ranges-South, Bayside Brighton, Bayside South, Glen Eira South, and Whittlesea South experienced a shift in housing alterations and additions activities between 2001–06, becoming less intense but more dispersed in 2006. Relatively more alterations and additions activity occurred in the inner and middle parts of Melbourne such as Melbourne Inner, Melbourne Remainder, Port Philip West, Knox North, Knox South, Mooney Valley, Essendon and Moreland Brunswick (Figure 3).

Figure 4 shows the geographic distribution of housing labour supply in Queensland for 2001 and 2006. Relatively higher levels of housing development activities are discernible along the coast, where a large proportion of housing labour is supplied. Brisbane, the Gold Coast,

Sunshine Coast, Fraser Coast, South Burnett, Capricorn, Gladstone, Whitsundays, Mackay and Cairns and Tropical North are indicative of significant HSLF supply. Across SEQ, Caboolture Shire, Redcliffe City, Southeast Outer Brisbane and Redland Shire are also indicative of significant HSLF supply. However, a more restricted labour supply is noted in regional and rural Queensland, with the exception of Mt. Isa and Julia Creek.

Figure 4: Housing sector labour force, all residential, 2001 and 2006, Queensland



Turning to new build (Figure 5) the labour supply is also coast-oriented. This may indicate a pattern of new build housing labour supply largely driven by demand emanating in cities and towns along the coast. This is consistent with narratives and patterns of sea-change movement and interstate migration. However, there are also a few pockets of relatively high new build labour in regional Queensland. A stronger labour in-flow also occurred in Capricorn, Cairns, Townsville and Tropical North. Housing labour supply tends to be more clustered along the coast in 2006 relative to the preceding situation in 2001. Mt Isa is the only case that stands out in terms of labour supply in new build, which may be associated with the rising demand for housing emanating from the mining boom. The spatial structure of labour supply in new build is quite fragmented in 2001, with labour supply being highly concentrated in Caboolture Shire, Pine River Shire, Southeast Outer Brisbane, Loganholme and Beaudesert Shire.

Figure 5: Housing sector labour force, new build, 2001 and 2006, Queensland

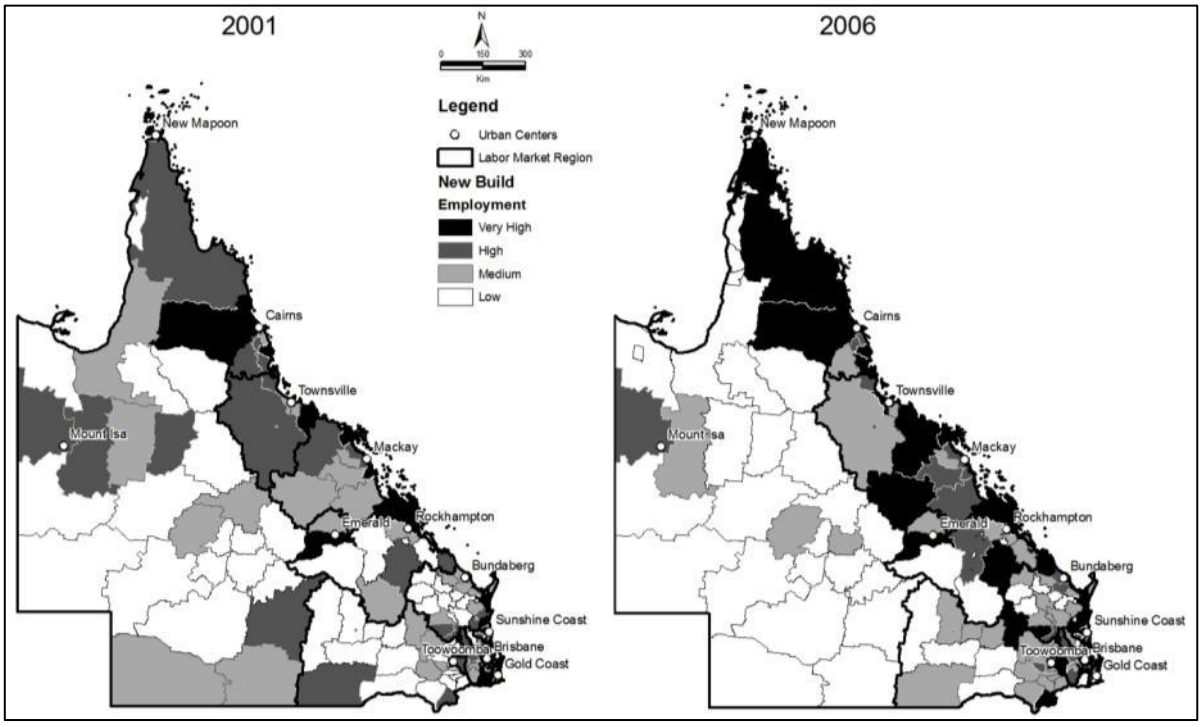
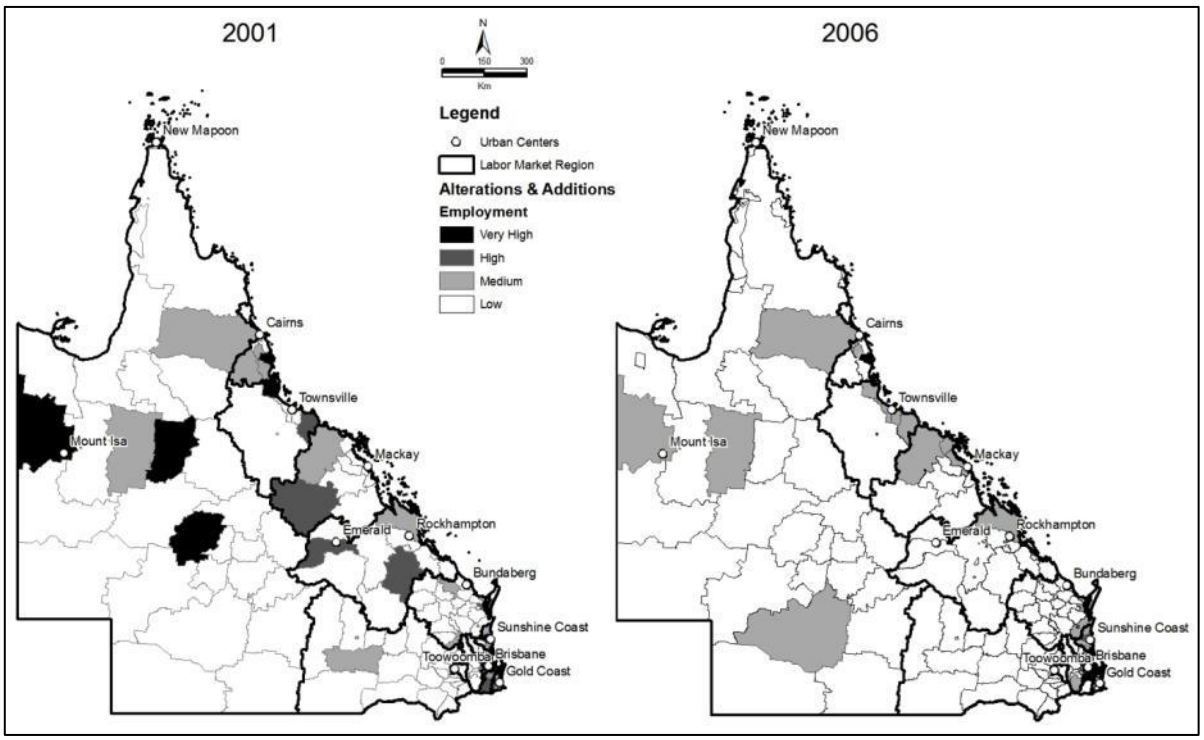


Figure 6: Housing sector labour force, alterations and additions, 2001 and 2006, Queensland



In alterations and additions (Figure 6), the HSLF subsector in 2001 shows more evidence of relative strength across some of the regional townships, such as Mt Isa, Richmond, and Longreach. However, the alterations and additions labour supply in those areas has declined in 2006. Notwithstanding this particular trend, overall, alterations and additions appear to be largely an inner city, coastal and city-related housing renovation phenomenon with the exception of Redbank and Southeast Outer Brisbane and Logan City.

4.3 Spatial labour force clusters

Spatial labour force clusters here represent areas of high or low housing employment. For instance, a ‘hotspot’ of high employment (High-High) is a state where areas that are close together (geographically) have similar values (high housing employment) than those that are further apart. In contrast, a ‘cold spot’ represents an area of low value surrounded by areas of low values (Low-Low). The analysis will enable the measurement of the spill-over effects of the housing sector labour supply, meaning the growth in employment in an area that generates or affects employment growth in the neighbouring areas.

A range of spatial autocorrelation techniques can be employed to quantify spatial clustering of employment. One commonly used technique to calculate the degree of spatial clustering in the observations is the Moran’s I (1950) index. This index can be based on binary contiguity between spatial units. In the binary weight matrix, spatial connectivity is expressed as either a 1 or an 0. That is, if two spatial units have a common border of non-zero length then they are considered to be ‘neighbours' and assigned a value of 1, otherwise they are attributed a value of 0 (not neighbours).

Moran's I is positive when there exists a positive correlation between sites, negative for a negative correlation and zero when no spatial autocorrelation exists. The Moran’s I index ranges from +1 to -1 with values close to +1 indicating spatial clustering and values near -1 indicating spatial dispersion. A spatial weighting matrix was generated using the ‘first-order contiguity’, where areas with common borders are defined as neighbours. The Moran’s I computed for the distribution of employment in the housing sector employment is 0.25, which indicates the presence of positive spatial autocorrelation.

It shows that observations are spatially dependent, that is, SLAs that are close together have similar values than those SLAs that are further apart. This indicates that there is a ‘spill-over effect’ whereby high concentration of employment at a particular area exerts a positive effect on its neighbours. We can therefore infer that areas of high concentration of housing labour supply are more likely to be surrounded by high values.

The Moran’s I index is a global measure (i.e. measures that assess the whole dataset) and therefore it does not indicate the effect of local processes on driving housing industry-related employment at a particular locality. To explore this, the Local Indicators of Spatial Association (LISA) is applied. This decomposes the global measure into contributions for each area (Anselin 1995) to detect local clustering. LISA statistics enable the detection of:

- Regions where autocorrelation is unusually different.
- Clusters of positive or negative autocorrelation.
- Abnormal observations in the data.

The Local Moran I statistics enable the spatial clustering of similar or dissimilar values to be mapped for every observation across a geographic space as shown in Figure 7.

Figure 7: Housing sector labour force, all residential, employment clusters, 2006, Victoria

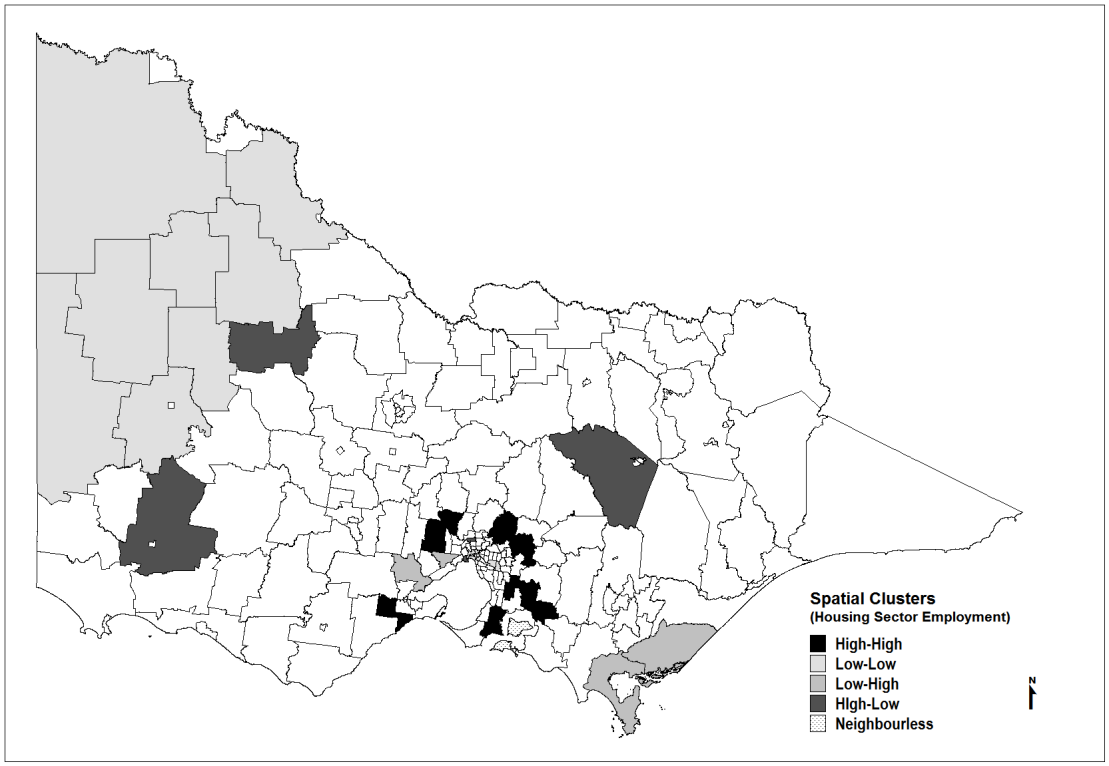
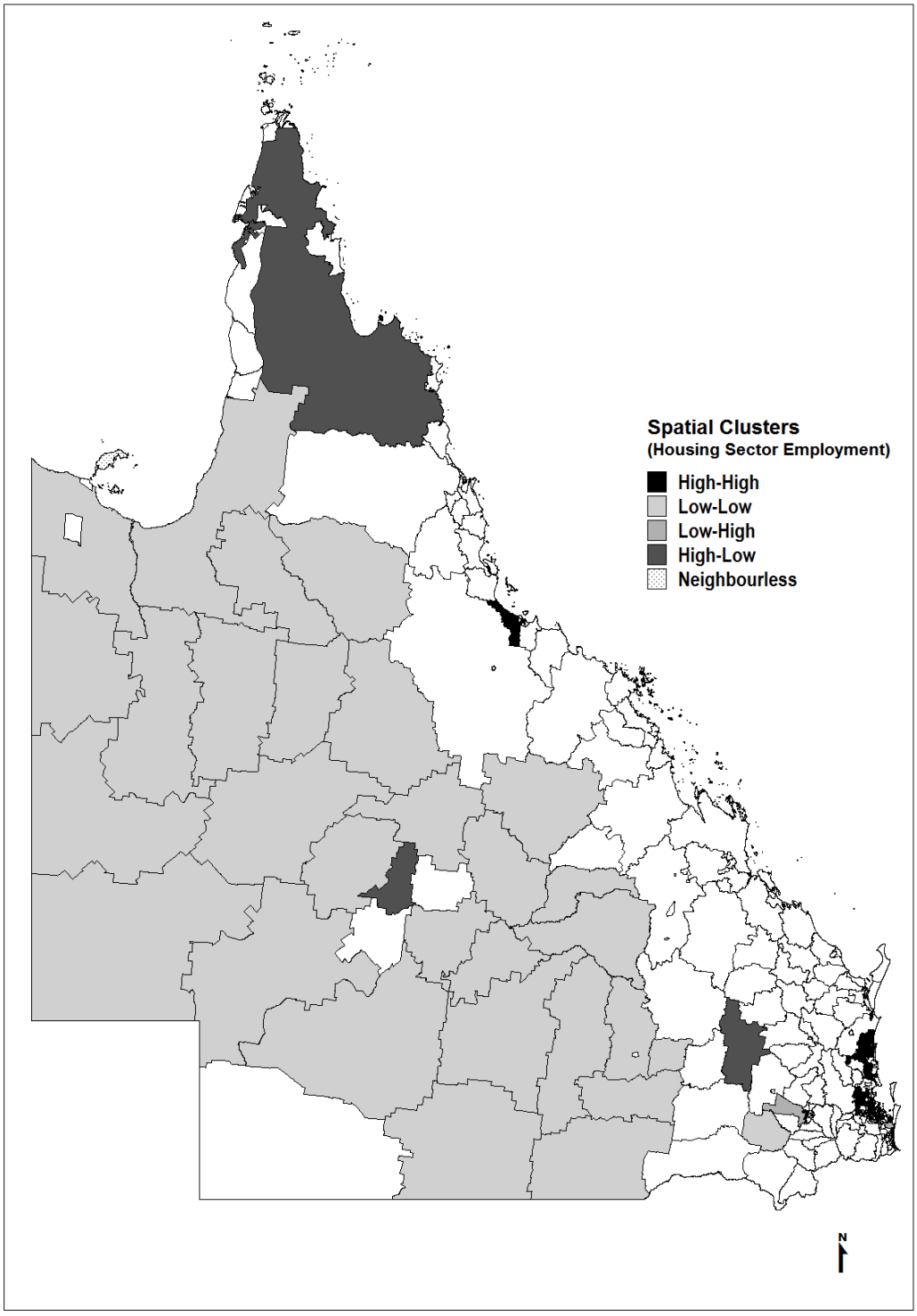


Figure 7 illustrates spatial clusters in Victoria. The areas highlighted in dark black colour are the High-High values, meaning that a clustering of contiguously high levels of HSLF labour supply exists. Where an area is shaded as dark grey, it shows the high-low values, meaning a state of high supply in an area surrounded by low supply, thus creating an island type condition. There are 14 SLAs that have formed five distinct spatial housing employment clusters. These clusters are located along the growth corridors on a concentric ring pattern in the outer fringe area of Melbourne. The SLAs in these clusters include Surf Coast (S)–East, Melton (S) Balance, Hume (C)–Sunbury, Nilumbik Shire, Yarra Ranges, Casey (C)–Cranbourne and Berwick, Cardinia (S)–Pakenham, and Mornington Peninsula.

Figure 8 illustrates spatial clusters in Queensland. These are largely contained within the South East Queensland Region and include Toowoomba in the west; Caloundra; Pine Rivers; Karana Downs; Albany Creek, McDowall; Balmoral; Chandler-Capalaba West; Burbank and Parkinson-Drewvale. There are few High-Low clusters in regional Queensland such as Cook (S) and Ilfracombe (S) in Queensland–Outback and Chinchilla (S) in Darling Downs–Marano.

The benefits of clustering of relatively high areas of HSLF supply may include skills development, facilitation of ideas and knowledge, and access to more specialisation across the labour pool, plus the economies of agglomeration such as reduced transaction costs. Hence, there is a long history of industry policy supporting clustering, through investments in public infrastructure and training institutions, finance and collective marketing for regional programs, the provision of specific labour forces with support, and mechanisms for the co-location of new firms. The difficulty in envisaging such approaches for the HSLF is that, as indicated above, the industry is in effect spatially diverse by nature—it is a set of temporary organisations essentially organised around building sites.

Figure 8: Housing sector labour force, all residential, employment clusters, 2006, Queensland



4.4 Assessing spatial mismatch

Understanding the supply of the labour force in the residential housing sector requires an analysis of the demand for housing. Potentially a poor relationship between demand and supply and associated market failure is possible when employers have difficulty attracting qualified workers for jobs in a particular area or workers struggle to get employment in a particular area. As Shah and Burke (2003, p.20) note:

> The performance of a labour market varies across regions. One aspect of this geographical disparity could be that while some regions may have shortages of particular skills other regions may have surpluses.

Further, competition to access the limited pool of skilled labour in the housing industry from the resources sector, commercial construction and major infrastructure projects is evident. The possibility of shortages and competition for labour is also a concern of the National Housing Supply Council (2010, p.25) when they note the possibility of the skilled tradespeople retiring in greater numbers than the industry is able to replace with new migrants or apprentices. In this context, the spatial dimensions of labour supply are of increased importance. Any rigidities and bottlenecks in housing labour supply due to a mismatch between the location of labour supply and the demand for labour will contribute to higher house prices and rents.

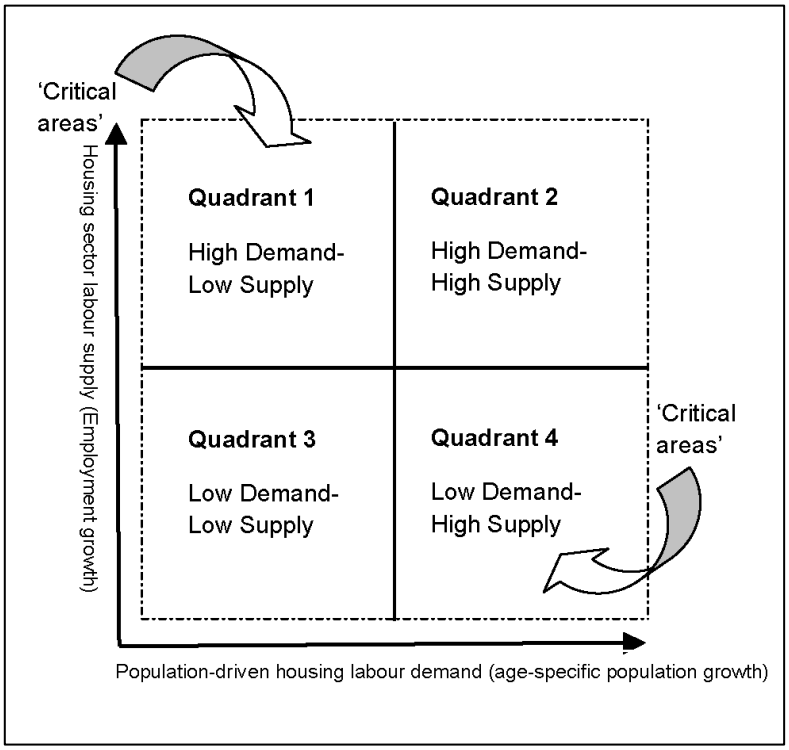
Figure 9 presents a conceptual framework analysing supply and demand in the residential housing sector. The horizontal axis represents the demand for new dwelling construction that is population driven.[1] For new build housing, age-specific population growth has been used as a surrogate measure for estimating the demand of residential housing labour. It is based on an assumption that new housing demand is largely population driven. The vertical axis represents the labour supply that is estimated through employment growth in the HSLF. The resulting two-dimensional space has been divided into four quadrants, each representing a unique relationship between supply and demand for housing sector labour.

Quadrants 1 and 4 are of particular significance as they indicate possible market failure. Quadrant 1 represents a condition of undersupply in housing labour where the demand for labour exceeds the supply, while Quadrant 4 represents oversupply of housing labour and low demand for housing. These two quadrants represent critical areas by highlighting spatial mismatch between demand and supply of labour in the housing sector. In these quadrants, house builders can experience difficulty in attracting qualified workers or workers can struggle to find a job on house building sites.

This situation could be the result of residential segregation that separates potential workers from available jobs because some workers prefer to find work closer to where they live or resist travelling long distances. Arguably, without understanding the spatial distribution of the HSLF in relation to house building in particular areas, it is difficult to determine the cause of spatial mismatch. The following section empirically establishes the relationship between supply and demand for housing labour to ensure that the sector is better equipped to supply the future needs of Australia's housing system.

[1] This use of population growth as a surrogate measure for labour demand is one way of measuring demand. Other more robust and direct measures such as relative differences in total earnings could be used to measure labour shortages, assuming that builders are prepared to pay a premium to attract labour into areas where they are experiencing shortages. Also, monitoring job advertisements that were not filled, or were filled by recruiting from outside the local labour market could perhaps be another way of capturing evidence of labour shortages. However, these other ways of measuring labour demand and supply would require considerable field research.

Figure 9: Housing sector labour force supply and demand, assessing spatial mismatch



4.5 Housing labour force spatial mismatch

Understanding the interaction of supply and demand of residential housing sector labour, both for new build and alterations and additions, is an important contribution to labour market analysis. In this project, supply of labour is represented by the growth in employment in terms of the total labour force in the housing sector between 2001 and 2006; while demand is estimated through a surrogate measure using the growth in population above the age of 18 years during the same period.

Using the quadrant analysis presented in Figure 9, a graphical illustration of the relationship between demand and supply of labour has been established. The purpose of this representation is to identify the 'critical areas' where there is a spatial mismatch between labour supply and demand resulting from population growth for new build housing.

Figures 10, 11, 12 and 13 locate SLAs in Victoria and Queensland for 2001 and 2006 on two axes that relate employment growth in the housing sector and the demand for new build housing measured by age specific population growth. Figures 10 and 11 for Victoria and figures 12 and 13 for Queensland indicate distinctive patterns across the four quadrants suggesting different supply and demand dynamics in the two states.

In Victoria, the spread of SLAs in both 2001 and 2006 indicates moderate growth in housing sector labour associated with increasing demand for housing supply. This is evident in Figures 10 and 11 that show a shift of SLAs into Quadrant 4 associated with an increase in the labour supply. Overall increased demand for housing is associated with an increase in the supply of labour.

In Queensland, the pattern is different; Figures 12 and 13 show a similar distribution of SLAs for 2001 and 2006. Overall in both years the pattern indicates a low supply of housing sector labour and a low demand for new build housing. Only a small number of SLAs have moved to the right, indicating increased demand for new housing.

The spatial mismatch framework directs our attention in particular to SLAs in Quadrants 1 and 4 in both states. SLAs in Quadrant 1 represent areas where demand for housing is less likely to be met by the available supply of housing sector labour. SLAs in Quadrant 4 represent areas where the demand for new build housing is greater than the supply of housing sector labour.

In Victoria, there are only a few SLAs in Quadrant 1 in both 2001 and 2006 which indicates that there are few areas with an oversupply housing labour sector accompanied by low demand. One of these is Melbourne South Bank Docklands, a central city redevelopment area that is the site for high-density inner city apartments. The other SLA is Frankston East in 2006 indicating a slight oversupply of labour. SLAs in Quadrant 2 are Melton East, Casey-Berwick, Wyndham-North, and Casey Cranbourne. These are areas where there is high demand for labour and high supply of new build housing. Most SLAs are in Quadrant 3, especially in 2001, indicating that they experience low demand for new housing and corresponding low supply of housing sector labour. In 2006, the number of SLAs in Quadrant 4 was greater than 2001. However, overall the data indicates a concomitant increase in the supply of labour across this five-year period. Overall, this pattern indicates efficiency in the housing sector labour market where high demand for housing associated with population growth coincides with a sufficient supply of labour.

In Queensland, there are more SLAs in Quadrant 1 than in Victoria, indicating an excess supply of housing sector labour and a low demand for new housing. The SLAs that stand out in this quadrant are Ipswich-East, Mackay, Maroochy-Buderim and Griffin-Mango Hill. Quadrant 2, indicating high demand for new housing and high supply, had only one SLA in 2001, Mackay, and none in 2006. Quadrant 3 is where the overwhelming number of SLAs were in 2001 and 2006 indicating low demand for new housing and low supply of housing sector labour. There was some growth in the number of SLAs in Quadrant 4 between 2001 and 2006. The data suggests that in 2006 Rockhampton, Calliope, Kingston, Jondaryan and Mundingburra were experiencing an increase in housing demand that was not accompanied by significant HSLF growth.

The quadrant analysis presented above depicts a relationship between population and employment growth, which assists in identifying potential spatial mismatches in housing labour force demand and supply. It assists in answering the secondary question posed for this chapter: What are the spatial dimensions of the HSLF and the new build and alterations and additions sub-sectors within the HSLF? This type of analysis could therefore support the development of policy responses that address the issue of a ‘spatial mismatch’ in particular areas and go beyond the customary focus on aggregate supply and demand.

Figure 10: Housing sector labour force employment and population growth, 2001, Victoria

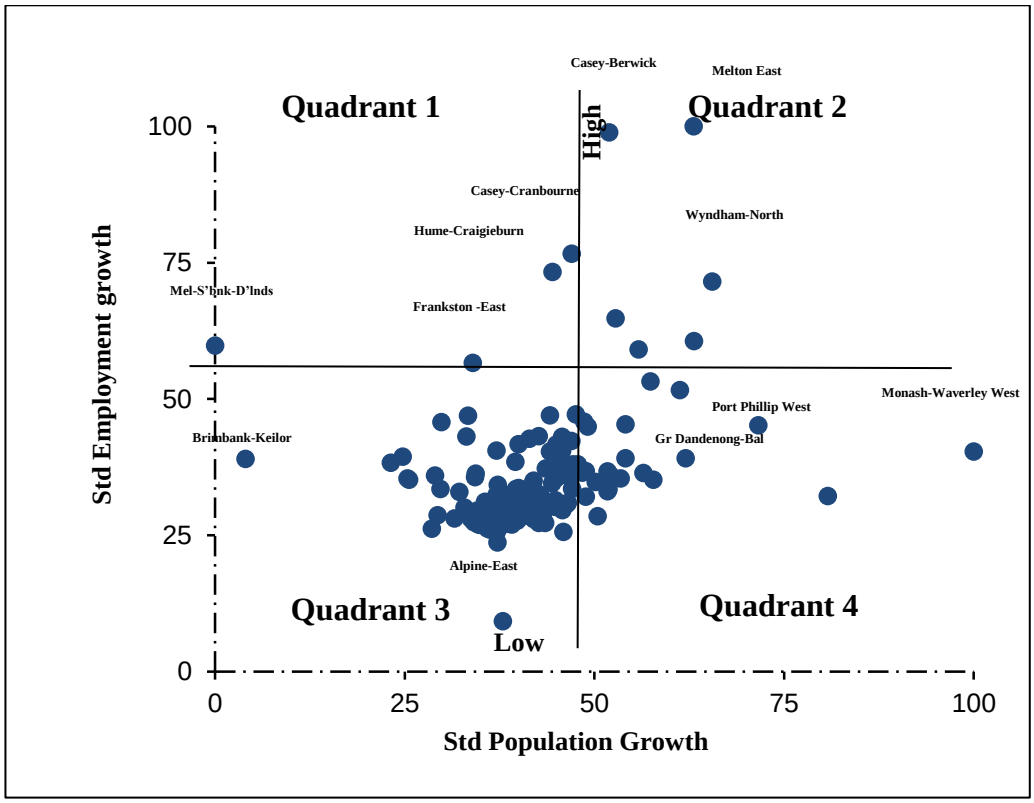


Figure 11: Housing sector labour force employment and population growth, 2006, Victoria

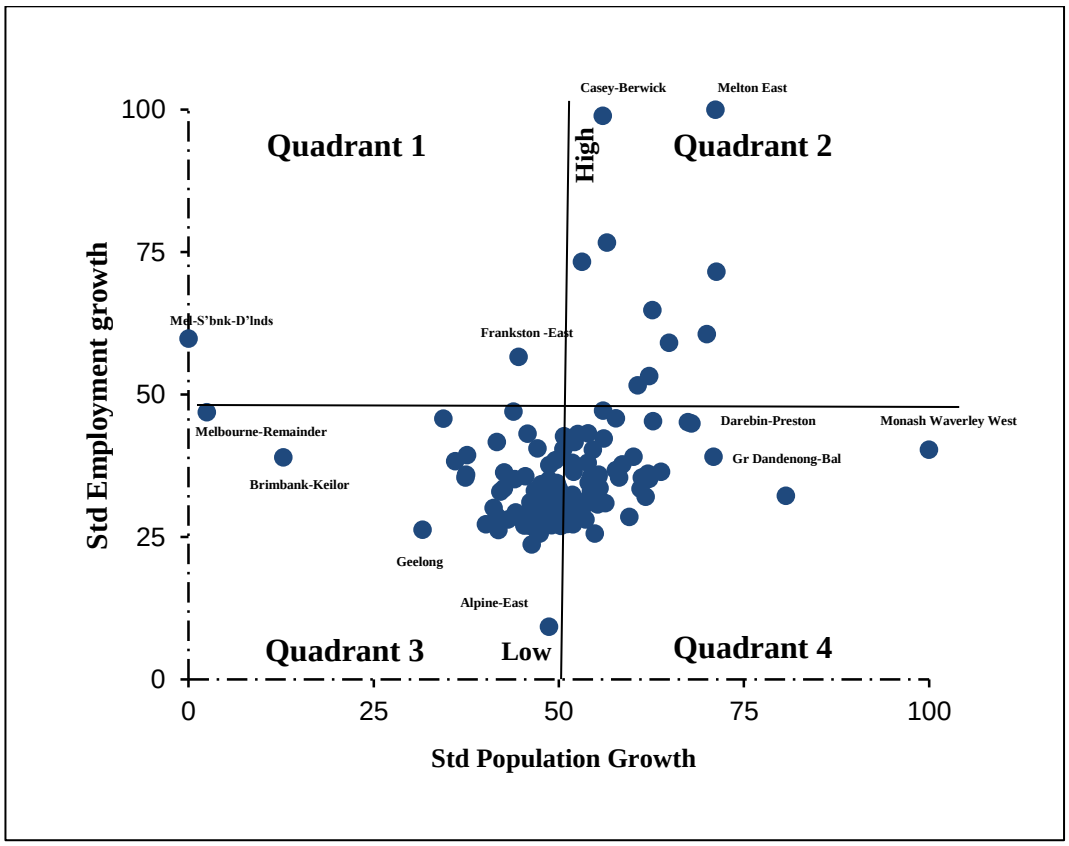


Figure 12: Housing sector labour force employment and population growth, 2001, Queensland

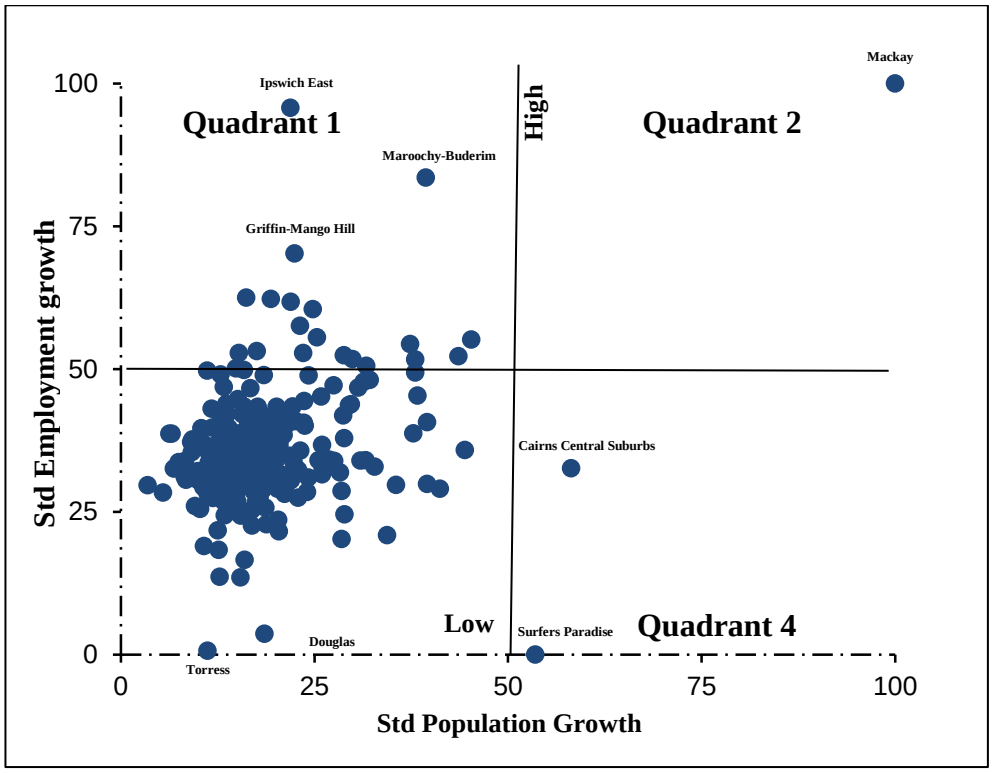
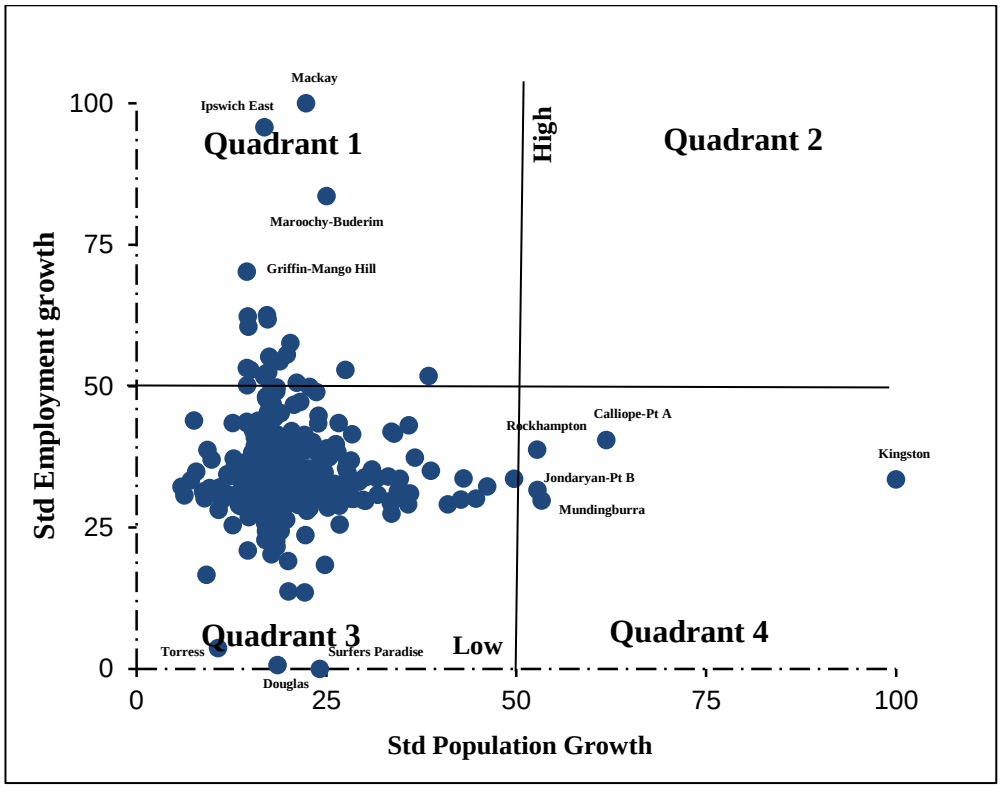


Figure 13: Housing sector labour force employment and population growth, 2006, Queensland



4.6 Spatial mobility and commuting patterns of the housing sector labour force

Following the mismatch work reported in the previous section, an alternative way of examining mismatches between supply and demand is to examine the actual commutes of HSLF workers. Where these are longer, and lengthening over time, we could confidently predict that there is a spatial mismatch in that respective region over the time period under consideration. The only data available to this study that enables such a fine-grained analysis of individual commutes is the QBSA data, hence this analysis is limited to the state of Queensland. The analysis is conducted in two stages.

- A Queensland-wide exploration of the change in the number of building contracts is presented, followed by a breakdown by builder category, job type and contract cost for the period 2000–10.
- A JTW analysis of the changing relationship between home/business locations and jobs sites for the period 2000–10 for Queensland SDs and SEQ SLAs is presented.

First, looking at the total number of contracts, Table 8 shows that there was a growth in the number of contracts for each SD in Queensland. The largest growth over the decade was experienced in Mackay (118.5%) equating to an average additional 2318 new contracts per year. The smallest growth over the decade to 2010 occurred in the North West, growing by only 8.1 per cent or an average of 180 new contracts per annum.

Table 8: Residential building contracts, 2000–2010, Queensland

Statistical District	No of contracts, average pa	Per cent change
Brisbane	23,686	89.5
Gold Coast	7,463	70.9
Sunshine Coast	4,508	88.0
West Moreton	1,136	50.8
Wide Bay-Burnett	3,937	43.1
Darling Downs	3,063	44.0
South West	185	72.6
Fitzroy	2,825	82.0
Central West	160	77.8
Mackay	2,318	118.5
Northern	2,938	79.4
Far North	3,197	73.1
North West	180	8.1
State total	**55,596**	**78.8**

Next, looking at the change in the contract dollar value, Table 9 demonstrates a rise in average contract value over the 10-year period. The largest percentage increase occurred in Central West (a 193.3% increase) equating to an average contract value of $44 874 over the 10 years. This compares to Brisbane with the smallest rise of 36.2 per cent, although this is backed by a markedly higher average contract value of $105 909 (the third highest across the state, behind the Sunshine and Gold Coast regions). Interestingly, a 10 per cent decline in contract value was recorded for the North West, also the area with the smallest growth in contracts in the state.

Table 9: Residential building contract value, percentage change 2001–10, Queensland

Statistical District	Average value ($)	Per cent change
Brisbane	105,909	36.2
Gold Coast	158,620	51.7
Sunshine Coast	125,765	38.2
West Moreton	80,929	51.0
Wide Bay-Burnett	80,063	62.6
Darling Downs	93,940	55.6
South West	56,065	82.6
Fitzroy	96,593	86.9
Central West	44,874	193.3
Mackay	91,126	60.9
Northern	92,207	60.2
Far North	98,363	62.6
North West	83,388	-10.0
State total	**92,911**	**54.3**

Unpacking the type of contracts driving these changes in Table 10 highlights the changing ratio of new build to renovations between the 13 SDs. Across Queensland there were 208 274 new build and 298 738 renovation contracts over the 10-year period equating to an average annual increase of 361 new builds and 2236 alterations and additions. This amounts to a significant shift over the decade, as the growth in alterations and additions far outstrips that in new build, amounting to a demand-led reshaping of the industry.

Table 10: Contracts for new build and alterations and additions, 2001–10, Queensland

	New build		Alterations and additions	
Statistical district	**No. of contracts, average pa**	**Per cent change**	**No. of contracts, average pa**	**Per cent change**
Brisbane	8,562	7.1	14,389	135.31
Gold Coast	2,452	-12.5	2,541	202.81
Sunshine Coast	1,890	6.0	2,114	168.10
West Moreton	829	98.9	956	217.45
Wide Bay-Burnett	1,649	38.1	1,790	99.33
Darling Downs	1,263	9.0	1,536	97.97
South West	58	-1.6	134	309.59
Fitzroy	1,163	110.3	1,511	84.62
Central West	35	85.3	167	34.31
Mackay	801	105.6	1,429	155.63
Northern	986	45.6	1,685	130.14
Far North	1,103	26.4	1,548	77.88
North West	38	0.0	74	97.73
Total	20,827	18.6	29,874	134.32

Finally, data on different builder categories is presented in Table 11 as a way of describing the distribution of residential building work across businesses of different sizes. The largest categories of residential builders are Categories 2 and 3 and the Self-certification builder/trade' with 16.25 per cent, 30.82 per cent and 27.71 per cent of all contracts respectively. In other words, more than a quarter of all contracts over the 10-year period were undertaken by self-certified builders and trades with turnovers of less than $300 000 per annum. Overall the three largest categories, businesses and individuals with turnovers of less than $3 million undertake more than three-quarters of all contracts per annum. This data further confirms the evidence presented in the Positioning Paper (Dalton et al. 2011a) that the residential housing industry is primarily an industry comprised of small and medium-size businesses. Further, the data in Table 11 presenting the percentage change in shares suggests that the growth has been in small and medium-size businesses. Accompanying this growth by small and medium-size businesses, the data for categories 7 and 8 indicates that larger businesses have experienced a decreasing share of total contracts where a 3.9 per cent and a 31.2 per cent reduction in their share is noted.

Table 11: Residential builder contracts, share and change in share, 2001 to 2010, Queensland

Residential builder categories	Annual allowable turnover	Per cent average share of contracts	Per cent change
Category 1	$300K to $600K	0.76	29.9
Category 2	$600K to $3M	16.25	75.4
Category 3	$3M to $12M	30.82	58.8
Category 4	$12M to $30M	3.19	114
Category 5	$30M to $60M	3.23	70.5
Category 6	$60M to $120M	3.27	8.5
Category 7	$120M to $240M	3.91	-3.9
Category 8	Exceeding $240M	5.74	-31.2
Estimated ATO Cat 1–3	$300K to $12M	0.00	0.00
Self-certification–Builder/Trade	not exceeding $300K	27.71	-51.2
Self-certification–Trade	not exceeding $100K	1.48	68.3
No Financials Required	NB	3.63	-92.4
		100	

NB: This builder/contractor category includes individuals now only supervising building and no longer holding a licence that would allow them to 'contract' building work. At the time of the contracting for the construction in the data extract, the builder/contractor would have been included in one of the other groupings.

4.7 Journey-to-work spatial patterns

The second component of the analysis explores the spatial dynamics of the relationship between the location of the individual or business and the work site coupled with its change over the 10 years. The spatial scale of this analysis is the SD to investigate the state-wide patterns. This analysis is extended for SEQ as this area comprises 67 per cent of the state's population and 66 per cent of the building contracts. It is undertaken at the ABS SA Level 4 (SAL4) scale which is the scale used in the ABS Labour Force Survey. Ten SAL4s cover the SEQ region. This higher spatial resolution assists in exploring the spatial dynamics of the more subtle commuting patterns of this large urban area.

First, looking at the spatial patterns of movement across the state, Figure 14 depicts the flows of builders between statistical districts for all building contracts. Further, the figure presents data on the percentage of individuals/businesses residing in the same SD as the job site, termed 'self-containment'. The map clearly highlights the degree to which there is a substantially higher volume of flows between the SDs within the SEQ region, illustrated in the inset map, when compared to the remainder of the state. The flows between Brisbane and the Gold Coast are the strongest, and interestingly there are relatively large flows from the Sunshine Coast to the Gold Coast (2859 contracts over the 10-year period 2001–10) and correspondingly low flows (360) in the opposite direction (i.e. Gold coast to Sunshine coast). The flows between the SDs in the SEQ region shows the level of self-containment that each experience, the highest being Brisbane (82.9%), Sunshine coast (76.2%), Gold coast (72.6%) and lastly West Moreton (26.7%). In other words, nearly three-quarters of all jobs of individuals/businesses in West Moreton are in other SDs, predominately the neighbouring SDs of Brisbane and the Gold coast.

Given the volume of flows occurring between the SDs in the SEQ region, increasing the spatial resolution offers further insights into the spatial patterning of JTW movements. Figures 15 and 16 illustrate the flows and self-containment for SAL4 regions across SEQ. Both Toowoomba and the Sunshine Coast demonstrate the highest levels of self-containment, 87.9 per cent and 81.9 per cent respectively over the 10-year period. Compared to the remainder of Queensland, the SEQ region possesses the greatest amount of interaction between the various SDs, highlighted by both the number and volume of spatial flows in Figures 15 and 16.

Next, disaggregating individuals and businesses, Figures 17 and 18 illustrate differences in the spatial flows between SDs for those contracts that are being undertaken by individuals compared to building businesses. This indicates the remarkable levels of mobility exhibited by individual building contractors. Nevertheless, when we turn to self-containment and JTW data we find that, on average, travel distances reduced over the period. Table 12 shows the change in self-containment for all builders, indicating a trend towards more localised working.

Table 12: Change in self-containment for all builders, 2001 to 2010

Statistical District	Self containment, per cent 10-year av. (2001–10)	Per cent change 2001–10
Brisbane	84.7	-5.5
Gold Coast	51.0	-1.3
Sunshine Coast	73.7	1.7
West Moreton	48.3	9.1
Wide Bay-Burnett	86.4	12.5
Darling Downs	85.6	6.7
South West	83.5	13.9
Fitzroy	94.8	4.4
Central West	87.9	9.5
Mackay	95.0	4.9
Northern	89.6	6.0
Far North	84.8	-1.6
North West	20.9	10.2

Table 13 highlights that the shortest JTW was in the Brisbane SD at 45.9 kilometres each way (based on the 10-year average), however it was this area that experienced the largest increase in the distance travelled (a 92% increase between 2001 [33 kilometres] and 2010 [63 kilometres]). The only other area to experience a rise in the JTW over the 10 years was the Gold Coast where the JTW increased from 63 kilometres in 2001 to 96 kilometres in 2010 (a 53.1% increase over the 10 years). All other SDs in Queensland recorded a reduction in the JTW over the 10 years, the largest being the South West region that saw a reduction from around 170 kilometres in 2001 to 51 kilometres in 2010, equating to an overall 70.2 per cent decrease. It should be noted that these figures present mean average JTW and there is scope for further work in future research to examine variations between businesses/individuals, trades, and job types.

Table 13: JTW distance and per cent change in JTW for all builders, 2001 to 2010

Statistical District	Average JTW Km travelled (2001–10)	Per cent change 2001–10
Brisbane	45.9	92.0
Gold Coast	66.0	53.1
Sunshine Coast	59.7	-2.2
West Moreton	48.6	-15.5
Wide Bay-Burnett	41.6	-43.7
Darling Downs	53.3	-25.9
South West	109.0	-70.2
Fitzroy	73.5	-35.7
Central West	130.0	-63.4
Mackay	47.8	-51.3
Northern	65.1	-51.5
Far North	139.1	-30.9
North West	627.4	-14.9

Figure 14: Spatial flows of builders between statistical districts for all building contracts, Queensland

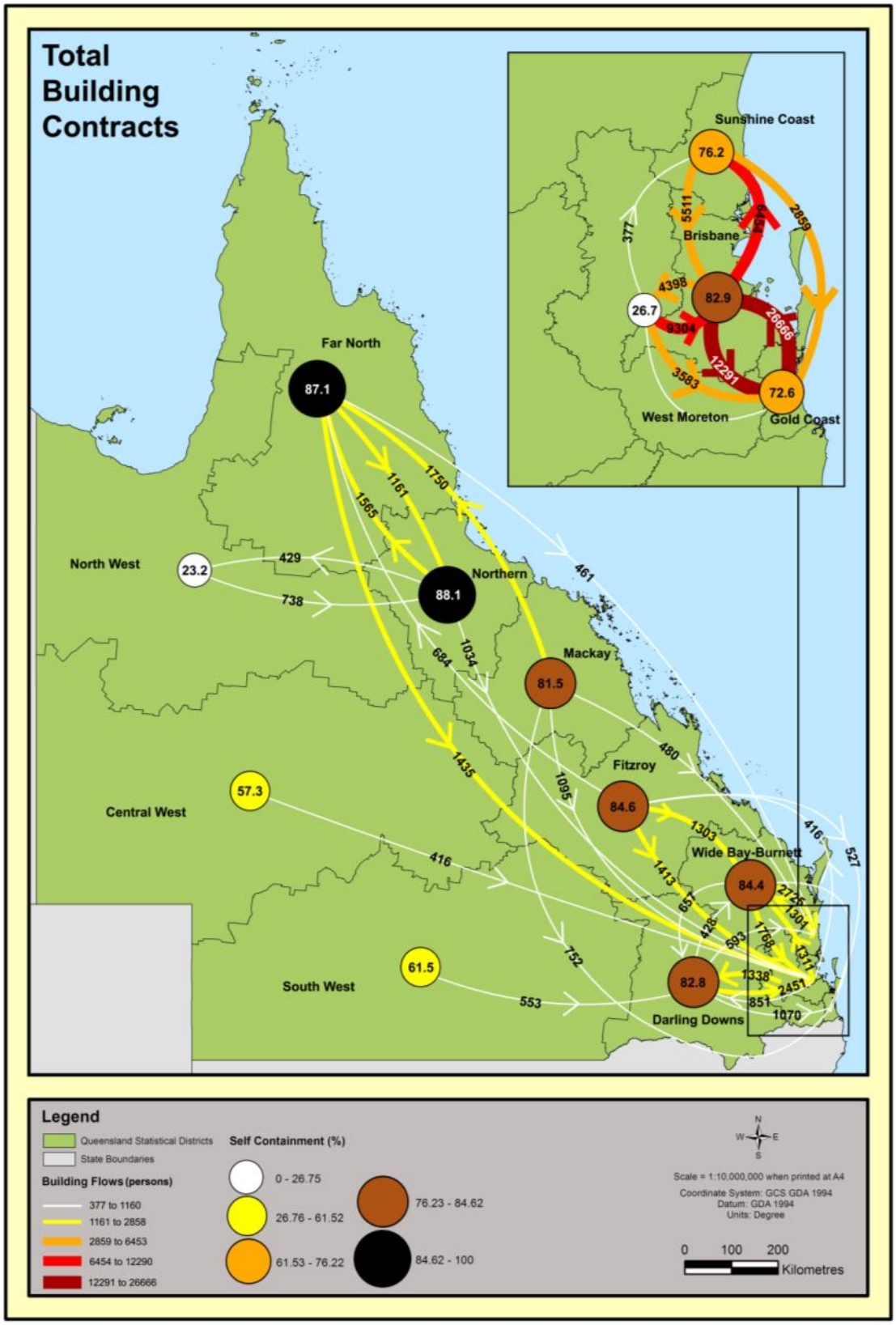


Figure 15: Spatial flows of builders between statistical areas for all building contracts, South East Queensland

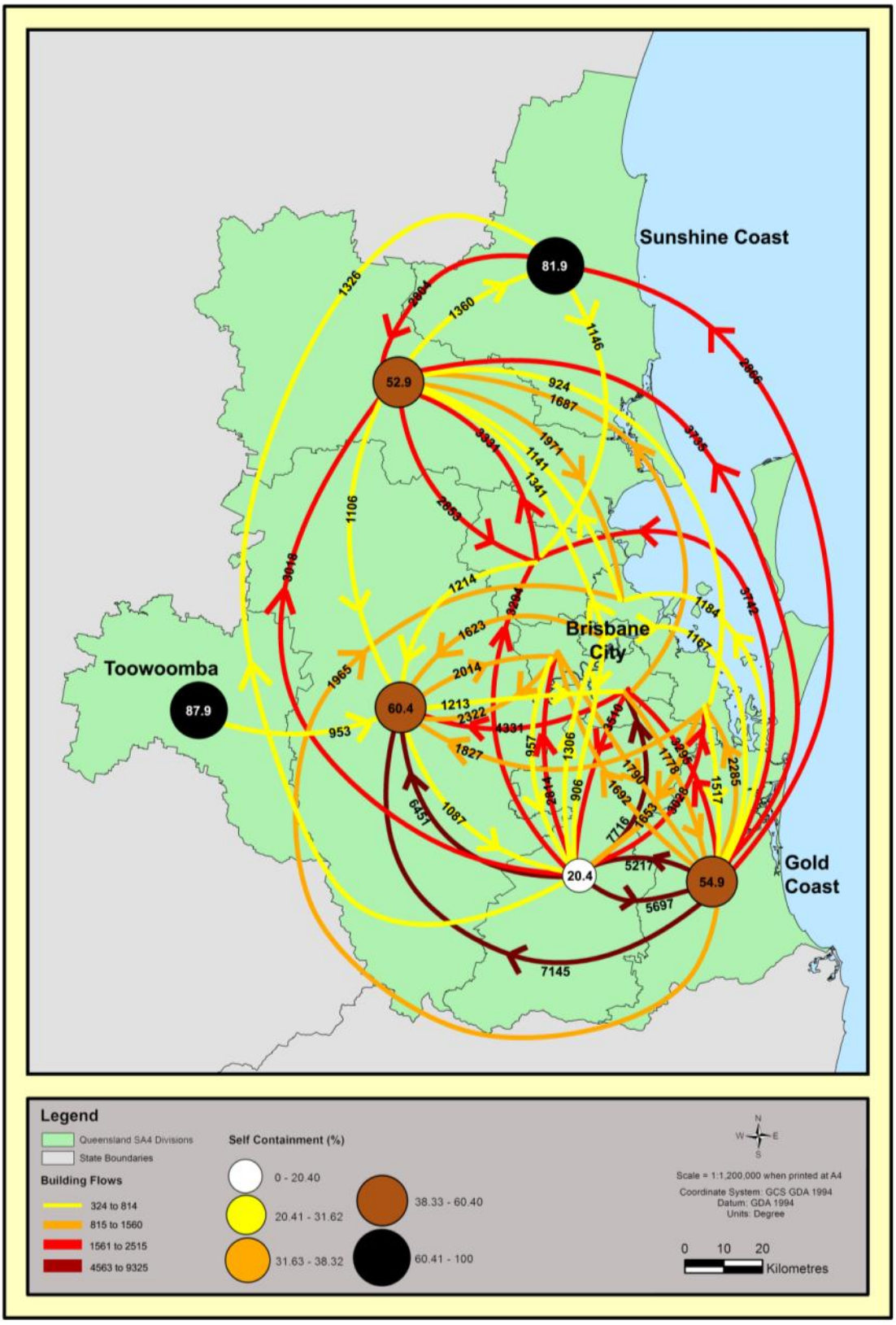


Figure 16: Spatial flows of builders between statistical areas for all building contracts, Brisbane

Figure 17: Spatial flows of builders between statistical areas for company building contracts, Queensland

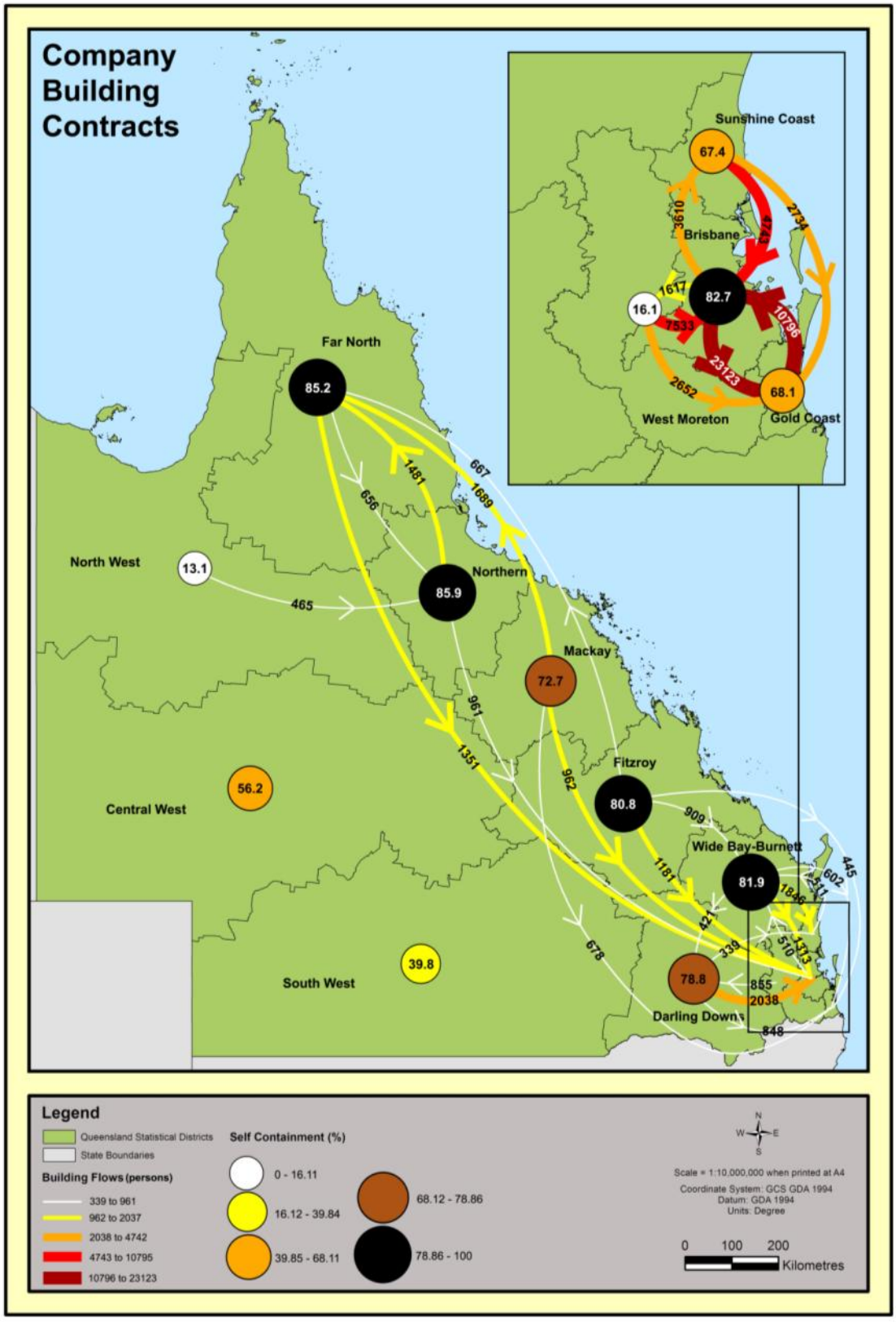
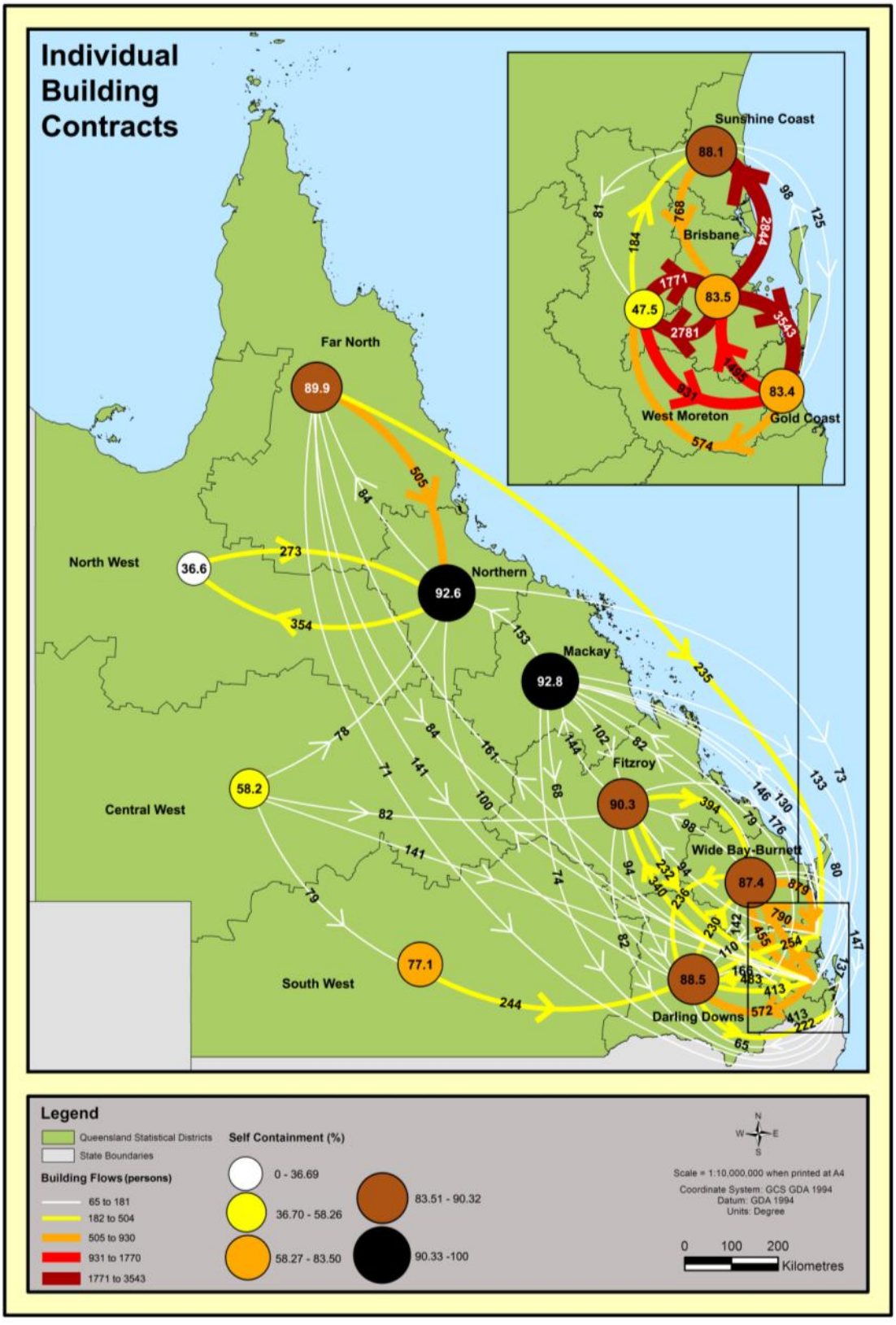


Figure 18: Spatial flows of builders between statistical areas for individual building contracts, Queensland



4.8 Conclusion

The analyses presented in this chapter responded to secondary research question two that asked: What are the spatial dimensions of the HSLF and the new build and alterations and additions sub-sectors within the HSLF?

The analysis confirmed that there were spatial dimensions in the HSLF and the new build and alterations and additions sub-sectors. In Victoria HSLF workers engaged in building new dwellings are principally found in Melbourne within the growth corridors that form a ring around the fringe. Similarly in Queensland the HSLF workers are principally found within the SEQ region. However, in both states these new build HSLF workers are also found in regional cities and towns. HSLF workers engaged in alterations and additions are primarily located in the inner and middle ring suburbs of Melbourne and Brisbane. However, they also have a presence in regional cities and towns.

The investigation of spatial mismatch distributed across the four quadrants found that there was no strong spatial mismatch evident in the relationship between the growth of housing labour supply and the growth in demand measured through age-specific population growth. The results indicate that the SLAs in the growth areas represent areas of high population growth that coincides with high to moderate growth in the labour supply for housing. There are, however, a few SLAs that sit in Quadrants 1 and 4 that suggest that there may be a mismatch between supply and demand. This indicates that HSLF markets in both states tend to be efficient and that labour is available when needed with some exceptions.

The finer grained analysis of the HSLF in Queensland supported by QBSA data also suggests that there are areas where workers are travelling longer distances. However, the average JTW declined over the 2000–10 period. Longer distances are found in Brisbane and the Gold Coast, where increased JTW might be associated with employers having difficulty attracting qualified workers for jobs in a particular area. The focus groups were convened in order to explore some of these issues further and these are reported on in Chapter 5.

5 PATTERNS, CHARACTERISTICS AND ISSUES

This chapter brings the analysis presented in the previous two chapters together and draws upon the analysis of structure, conduct and performance developed in the Positioning Paper, and the qualitative data obtained from two focus group discussions—one in Victoria and one in Queensland. It responds to secondary research question three:

> Given the temporal and spatial dimensions of the HSLF, what are the defining patterns, characteristics and issues in the supply and demand for labour in the new build and alterations and additions sub-sectors?

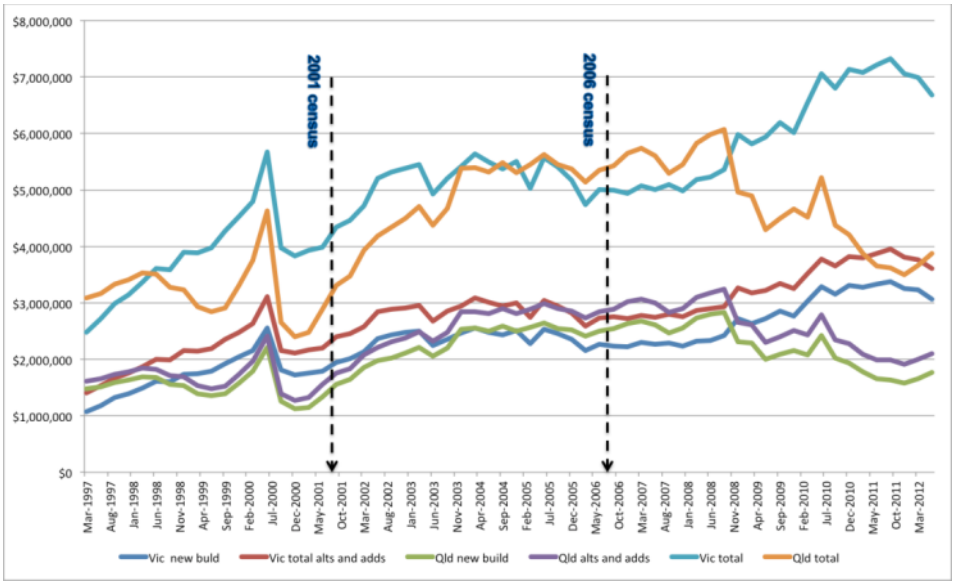
The chapter extends the analysis of the labour force by presenting an analysis of a dialogue with people with long experience of labour force issues in the housing industry and previous experience in assisting industry research. The focus in these discussions was on what difference geography and the type of residential building work made to demand and supply and on the issues experienced by new entrants to the HSLF through the apprenticeship system. The chapter draws out common themes and develops a framework for understanding how types of house building activities, work contracts, skills and payment interact within the HSLF.

5.1 Overview of spatial and temporal dimensions

Overall, the size of the HSLF, as shown in Chapter 3, grew in the period 2001–06. In Victoria, the workforce grew from 72 000 to 89 000, an increase of 23 per cent in the five-year period 2001–06. The 44 per cent growth in the Queensland workforce was almost twice that of Victoria for the same period when it grew from 53 000 to 77 000. This growth was closely aligned with levels of activity in residential housing measured in terms of value of work. The value of work trends for both Victoria and Queensland are presented in Figure 19 for new residential building and alterations and additions as chain volume estimates, after the direct effects of price changes have been eliminated. The trends therefore represent volume change, and indicate that the period 2001–06 was a period of growth in the residential housing industry, which was particularly strong growth in Queensland.

Although it should be noted that even during this period of growth there was fluctuation in the flow of resources into the industry. This has become even more the case since 2006. As others have observed, fluctuations in industry activity have been a long-term feature of the Australian housing industry (Bureau of Industry Economics 1990). These fluctuations result in cyclical flows of labour in and out of the industry with some leaving temporarily and others leaving the industry permanently. However, researchers have not assessed the nature and extent of these flows. Figure 19 presents the value of work trends for both new build and alterations and additions for Victoria and Queensland. It shows that the trends in new build and alterations and additions move closely together.

Figure 19: Value of work done, new build and alterations and additions, Victoria and Queensland



Source: ABS 8755.0 Construction work done, table 05 Value of building work done, chain volume measure

5.2 The focus groups

Following the analysis of the quantitative data, two focus group discussions were conducted—one in Brisbane and one in Melbourne. A description of how the focus group participants were selected and invited and how the focus group discussions were conducted is presented in Section 2.4 on qualitative methods.

Each focus group began with a short presentation of research findings followed by guided discussion around the following two topics.

- Participant experience of HSLF supply and demand. The background for this discussion is an industry where labour demand fluctuates considerably in relation to residential housing investment. In this discussion, particular attention was given to the way in which patterns of supply and demand varied by geographic area and the idea of spatial mismatch considered.
- Segmentation of the housing sector labour market. This began with discussion of distinctions between workers engaged in building new housing and those engaged in alterations and additions. It subsequently extended into discussion of labour force segments associated with volume built or project built houses, one-off houses and alterations and additions.

The following discussion draws on the transcripts of the two focus groups and presents a discussion of housing sector labour demand and supply in relation to types of residential building work; geography; and recruitment of new entrants to the industry.

5.3 Types of residential construction

The analysis in this report has been based on the distinction between new build and alterations and additions. Further, the research data presented in Chapters 3 and 4 suggests that the demand for labour generated by builders is closely tied to these two different types of residential building work. This is evident in the way the employment trends in these two different forms of residential building work is often not the same, both at an aggregate level and spatially. This suggests that it is important to examine a little more closely the way in which building work across these two areas is organised.

In volume or project house building, companies employ supervisors, or site managers, who typically supervise the building of between 10 and 15 houses. They coordinate three types of contracts: materials supply contracts, supply and install contracts and trade subcontracts. The total number of contracts used by these volume builders in building each house has grown over recent decades to approximately 90 separate contracts (Dalton et al. 2011b). All these contracts very carefully specify what materials are to be supplied and what work is to be done for the particular price.

One aspect of the growth in the number of contracts for volume built houses has been the fragmentation of the work in some trades. This is particularly the case for carpenters where typically carpentry work has been divided up into wall and roof framing, fitting-off of doors and windows and eaves fascia and lining. In the case of 'framers', there is a further distinction between those able to construct a single storey frame and those able to construct both single and double storey frames. The other trades are engaged as subcontractors in the same way. They undertake their work based on measurements taken from the documentation and then priced. For example, the price for plumbing is worked out on a price per plumbing point. Similarly, the price for electrical wiring is worked out on a price for each power point and light fitting.

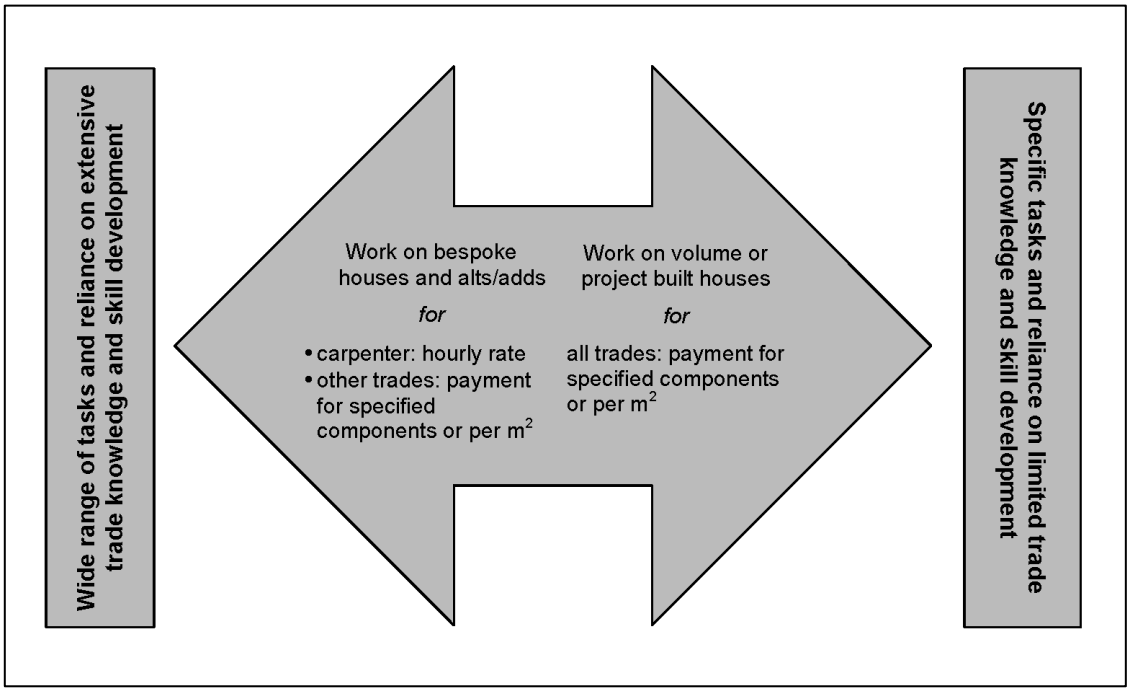
Alterations and additions building is done by builders who specialise in this type of work. However, alterations and additions builders do sometimes build one-off houses commissioned by a person who already owns the land and has had a design prepared by an architect or building designer. Therefore, we can identify a category of builders who contract to build one-off commissioned houses or alterations and/or additions. We use the term 'bespoke builder' to describe the builders who build on this made-to-order basis.

There are two significant differences between the way bespoke builders and volume builders organise their building work. First, in bespoke residential building, the work of carpenters has not been fragmented. Typically, carpenters working for bespoke builders will undertake all types of carpentry. Also from time to time they will also undertake small amounts of other types of work, such as roofing and tiling. Further, it is likely that one of these carpenters will coordinate other trades coming to the site, in addition to working directly on the building. Multi-skilled carpenters are a key feature of this type of building site. Second, carpenters working for bespoke builders are typically paid an hourly rate, unlike carpenters working for volume builders, who are paid for particular pieces of work completed. They remain sub-contractors, but because the work that they do is more varied an hourly rate payment system is the norm.

The way bespoke builders engage the other trades such as plumbers, electricians, plasterers, painters and tilers is substantially the same as in volume building. However, observations made by focus group participants suggest that these trade subcontractors generally do not work across both the volume building and alterations and additions sub-sectors.

It is on this basis that we propose a simple typology based on the distinction between volume building and bespoke building. This distinction enables two points to be established on a continuum, illustrated in Figure 20, which supports analysis of the HSLF and the issues affecting supply and demand.

Figure 20: Type of residential building work, skills and payment



What is perhaps most important about this distinction is the nature of the skills associated with each worker category set out in the rectangles at the end of the two arrows. On the right-hand side the trades are working to specific and limited tasks specified in sub-contracts that require limited trade knowledge and skill development. A builder who does bespoke work describes the system in the following terms:

> Myself, I do massive renovations and new homes and my guys do everything. I think a project builder has a certain set of labour … [but] a builder, like myself, we have a different set of labour. My guys all work for me full time. And I find that if I get a tradie who's used to doing project work, it's virtually impossible for me to teach them to do the work we do. No matter how much I pay them, they're never, ever good enough.

This directs attention to the left-hand rectangle. Builders doing this type of work require workers who are able do a wide range of work supported by extensive trade knowledge and highly developed skills and can solve problems. As another bespoke builder says: 'Are we competitive with the project homebuilders? No. But can we run rings around them and solve the problem? Yes. Because we've educated our guys …'

The breadth of work that can result from this approach is illustrated in the following description:

> The supervisor is obviously running the project and liaising with the client and all that sort of stuff, but they're basically a leading hand and instructing plasterers and electricians and others and we give them that power, the most senior person in the group, and they do all the framing and they fix. They do both. There's no distinction as there is in [project] housing. And they pour the footings and if there's only a handful of tiles to be laid, ceramic tiles or roof tiles, they just to that.

And another focus group participant suggests that this is not all and this list could include roof plumbing: 'It would probably be a tin roof, wouldn't it, if no one sees?' The answer is yes, but that the regulation of plumbing and electrical work does impose a limit. 'Yeah, well, if no one sees, but they won't do real plumbing and real electrical work'.

Another builder uses this same understanding to lay claim to the idea of who is and who is not a carpenter. 'You can't put a lock up and fixing carpenter that's in cottage work in, a lot of times, without a lot of supervision, into reno work. A reno carpenter, to me, is a true carpenter. That's a weird way to say it, isn't it.'

5.4 The geographical dimension

There is a geographical dimension to the way builders and workers experience the dynamics of supply and demand in residential building. As was shown in the Chapter 4 analysis of census data, the work of the HSLF is concentrated in particular areas in Victoria and Queensland. Also within Melbourne and Brisbane there are distinct concentrations or clusters of work for both new build and alterations and additions. Moreover, the presentation of these data shows that the concentrations have changed in the inter-censual period 2001–06.

The analysis of the QBSA data takes the geographic analysis of the HSLF a step further for Queensland because it shows the JTW travel patterns in the housing sector. Workers in the industry are based in one location, their home or perhaps an office, and travel to other locations to work on dwellings. This data shows both the level of self-containment, which is the extent to which their base is in the same statistical district as their work, and their travel to another statistical district. This JTW analysis confirms that there are high degrees of self-containment for most statistical districts. However, the analysis also shows large numbers of builders that travel beyond their home statistical district to undertake residential building work.

The focus group discussions provided a basis for identifying issues associated with the geographic separation of home and work in an industry where work location is constantly changing. The discussion below presents an analysis of the way that Melbourne and Brisbane builders, both project and bespoke builders, talk about JTW issues within large metropolitan cities and further afield in regional areas outside of metropolitan cities. They confirm that JTW is a consideration in the way they attract and retain workers.

In the case of volume builders, they operate across a number of estates on the fringe of Melbourne and Brisbane. Work on each estate starts when the builder collaborates with the land developer to build a small number of houses in a display village. Another three or four project builders will do the same. In other words, out on the fringe, the pattern of land development and house building leads to the creation of small areas of intense building activity.

A project builder described it in these terms: 'So our jobs kind of ratchet up and disappear and ratchet up and disappear all over the place'. The challenge for supervisors as they start houses on a new estate is to bring their sub-contractors with them. Generally, 'we've found that trades follow supervisors. If you've got a good supervisor, then the trades will … they'll work for him over others'. However, because of this movement there was attrition and it was important to maintain the group. This project builder described this process of maintaining a core group:

> It's more about your brickies and then your top-up of chippies that gives you grief going to different areas. And it gets tough when … your business sort of grows in one area and has a good quorum. And then it starts [to decline in that area] and you say, 'Well, I don't want to reinvent the wheel. Can I get you blokes to come over here?' You get some that will. Some will do it for a while, and then you've got to find a new core in that area.

For some project builders the struggle to find labour, especially in periods of high demand, could be at the expense of quality. As a builder noted, 'because they're under pressure, they're putting on anyone. The supervisor is not there supervising the quality'. In other

words, a response to a labour shortage can be expanding the supply by recruiting sub-contractors that produce poor quality work (Dalton et al. 2011b). The concept of shortage can be mediated by the way in which supervisors establish boundaries about who is acceptable and who is not.

One project builder in Melbourne has taken very direct action to at least make sure the supervisor in each region limit their own JTW. The objective behind this is to ensure that they closely supervise each dwelling under construction. A representative of a project building company explained the logic behind their recruitment of new supervisors:

> We prefer to employ people who live in that particular region because they're driving around to, you know, between 9 to 15 sites … and we do want them to visit their sites every day … And if they're travelling already an hour to get to that region because they live in another region … they might not … they have to leave at 6:00 in the morning and they don't return home till 7:00 at night, they become … very burnt out.

Just how far the trades are prepared to travel varies on the amount of work around and the builders have a number of rules of thumb to describe. One suggested that 'all trades will drive up to probably 45 minutes without a worry these days'. However, there are limits as one builder making an observation about the geography of Melbourne and preparedness to travel explained:

> Our experience is they will go most places and the only time you get kickback is east-west. If you're in the southeast and you want them to come and help you out in the west they'll do it for a little while, but they won't stay there long term. They'll do the right thing by you but that's about it.

They might do it because it is the 'right thing', but they also do it because it provides them with greater economic security. 'They will be prepared to travel for a certain amount of time because they still want ongoing work from that company'. In other words, they 'don't have to muck around and go and find someone else and ring up another bloke and try and find the work'.

A decline in building work can, however, act as an incentive to travel quite long distances. This was particularly the case in South East Queensland (SEQ) where the downturn in work from 2008 was rapid. A Brisbane builder described what happened:

> There are people that live on the Gold Coast now that drive to Brisbane every day to get to the south side [Brisbane south] builder's work. And yet three or four years ago, before the GFC, they wouldn't think about driving up the highway.

This preparedness to travel was also evident in the way that some trades were travelling out from SEQ to build houses in provincial cities that were within driving distance. In a number of these cities the growth in population stemming from the resources boom was creating demand for new houses. A builder described this process in relation to Gladstone that is 530 km from Brisbane:

> You know, you can drive up there in five or six hours. … I know guys from here that are up there now, as in tradies. A couple of blokes get in their ute and drive up. And they'll take a caravan up, or there's guys that take up tents. And they might go up there for six or eight days. Or they'll go up there and do the brickwork on a house and then come back here, come back home for three or four days. And then they'll go up for the next one.

In the case of the bespoke builders who build one-off houses, small town house developments and renovations, it seems that there is greater loyalty and longer and steadier working relationships. These builders generally seek to contain the JTW by staying within a

defined area. They can do this because they are often working on projects where owners are seeking high quality work and there is greater price elasticity than that tolerated by the project builders. However, at times they will work further afield which increases the JTW for them and their tradespeople. A Brisbane builder provided an example of a project requiring his tradespeople to travel for three hours each day:

> We're currently building a house at [suburb name]. That's an hour and a half trip out of our area, up and back every day. The first one took us two years. And now we're doing another one that's going to take us two years. And my guys, I got them all together, all my trades and I said this is what I'm going to do with jobs and it's going to take us this long. It's a bit out of their comfort zone—but not a problem, not one complaint.

A Melbourne builder's experience was similar. One of the other participants in the focus group put a proposition to this builder:

> I think probably in your situation [name] … and I'm speculating here. Probably those guys you were using, that come from the foothills of the Dandenongs is probably where the majority of your work has been for a long period of time. So, for exactly that reason, they've formed a relationship with the builder and if it happens there's work on the other side of the river, well, they'll go there, or the other side of the …

The builder replied 'That's exactly right'.

In general, it seems that bespoke builders undertaking a limited number of jobs each year form strong relationships with their trade workers centred on maintaining access to skills that can be relied upon and are always available. A Queensland builder summed it up in these terms: 'We've generally used the same people all the time and they've been with us for years and a good builder is only made by their trades. If you've got the best trades, you've got a bit of knowledge'.

5.5 New workers

An important aspect of labour supply is the recruitment and training of new workers through trade apprenticeships. This issue was reviewed in the Positioning Paper (Dalton et al. 2011a) and it was noted that the major long-term issue was the very large number of apprentices that do not complete their apprenticeship. Admittedly the analysis in this paper was limited because data for the residential housing industry is included within the broader construction industry.

Nevertheless, there is no suggestion from any group in the residential building industry that it is any different from the broader construction industry and that a major continuing issue of skill formation for new entrants into the industry remains. Within the broader construction industry, the data shows that cancellations and withdrawals have outnumbered completions in the period 2000–10. In 2010, there were 22 000 commencements, 11 800 completions and 15 000 cancellations or withdrawals from apprenticeships in the construction trades (Dalton et al. 2011a, p.58).

Accompanying this tracking of trends there has been continuing attempts to identify the causes for the low completion rate. The most probing of these has been the enquiries conducted by the Building Industry Consultative Council Industry Advisory Body (2008). It identified the following four main causes:

- Lack of appropriate supervision in the workplace.
- Problems with poor and inappropriate training.
- Bullying and abuse in the workplace.
- Low wages.

These were all issues that focus group participants identified and the discussion repeatedly returned to the industry experience of apprentices and issues with the apprenticeship system. However, the observations that focus group participants made about apprentices indicated a range of views. It was possible to discern that the experience of the apprenticeship system was closely aligned with the division in the type of work, skills and forms of payment identified above and illustrated in Figure 20.

In broad terms, the focus group participants that were engaged in bespoke building were committed to apprenticeships and spoke, often passionately, about their approach where they made retention and broad skill development central objectives. In contrast, the volume builders were less connected to apprenticeship arrangements. Instead they learnt about apprenticeship issues from their sub-contractors. It seems that the cause of this difference is the difference in the organisation of work and skill requirements.

5.5.1 Supervision in the workplace

In the focus groups, the builders engaged in bespoke building broadly support the traditional apprenticeship system. An aspect of this was talking about the way they set expectations and how relationships of trust and reciprocity develop between builders and apprentices. The following three quotes illustrate their approach to the development of trust and reciprocity.

> [Apprentices] I think I get my pound of flesh out of them. Pretty hard taskmaster. I don't think that government subsidies will keep them employed. I don't think the government subsidies at the end is what makes me employ them. So at the end of the day I'm quite happy to share that around and give other kids a go.
>
> I've trained a few apprentices over the years and I've retained them. I think they've enjoyed the work, I look after them and so I've always found people I've chosen to work for me have always stayed with me.
>
> But I will tell you now, I've got a guy that's worked for me for 18 years. I've had him from an apprentice and he's working for me today, and he's got a four-wheel drive, trailer, the whole lot. So whose fault that your trades are leaving?

These statements stand in contrast to the description of what happens in the project building industry when various schemes have been developed in an attempt to meet a sharp spike in labour demand. A builder with experience in this part of the industry describes what has happened during the last increase in demand:

> We got so busy, we need labour, so all trades came up with, oh, yeah, we can throw subbies at you, or apprentices. You get 20 blokes who get in there and stand and hold a piece of timber up for the boys or walk on a truss. That's why we're having all the accidents and that's why workplace health and safety got traction.

In this context, the emphasis is on getting the work done and attention to the way the work was done and longer-term learning becomes a second order consideration.

5.5.2 Training

There was broad consensus in the focus groups that there was a problem with the training. For example, there was agreement that 'I guess we're just not looking out for the apprentices well enough throughout the whole process and we're not getting the quality of tradesmen'. And there was a need to 'come back from the grass roots, whether it be your chippies or your apprentices or your builders. There's got to be a starting point that we've got to regrow this industry to make it get better for all of us'. However, there were significantly different lines of argument in the focus groups about how this should be done.

The bespoke builders broadly upheld the tradition of engaging apprentices and providing them with a structured training environment that complemented their time release for TAFE training. A bespoke builder spoke about his strategy in the following way:

> I took the decision about three years ago that we were going to put on a lot of apprentices. We've now got eight. We're only a small business. We've got eight kids and none of them are going anywhere. They're all going to do their four years, which flies in the face of what you're saying and what you're saying is not wrong either. … They're guys that have actually sought us out and saying, 'My dream is to become a carpenter. And if it's going to take me 10 years to get there, eventually I'd like to be a builder'.

Another bespoke builder emphasised the way in which apprentice carpenters should become knowledgeable about their own trade and other trades so that they could go on to become builders with a broad knowledge of all aspects of residential building:

> But they need to incorporate a lot more into it though. I really believe. We've tried to employ apprentices to work with the plumber and the electrician as well for a period of two months, just to get an understanding of what they do. And they're just more handy, they can't do the job, but they know what sort of pipe fitting they use and why and that it does this and how much fall it's got on it and stuff like that. So they become more of a builder.

This approach stood in contrast to the description of what can happen to an apprentice working for a framing sub-contractor who erects walls and trusses for a volume builder:

> … then you take this other poor apprentice, 17, 18-year-old, who is working for a framer who does prefabs and trusses. All he's going to do is run all day, carrying. He's not going to learn a thing, so he's going to put up with it for six months and say, 'stuff this'.

In this context, there are some in the industry advocating a significant reworking of the apprenticeship system. The central idea is to recast the training system so that it resembles the fragmentation of trade work now apparent in the extensive system of contracting used to build project homes. In the case of carpentry, it was noted above that the system of contracting has divided up wall and truss framing, lock up carpentry and eaves carpentry. The proposal that is associated with this division of labour is to divide up the training:

> If you learn to frame, well, then later on you might want to learn more, so you can do a lockup and fix the eaves. If you know the basics, and know how to use a saw and use a hammer, and all that type of thing and …

A similar question is asked about bricklaying apprenticeships: 'Why do you need to learn to do chimneys and all this? All you need to do is lay house bricks and sills probably'.

Of course, the broader arrangements across the two different forms of building work shape the possibilities for training in a profound way. A project builder, who observed that the bespoke builders worked within a set of economic relationship that established a capacity to train apprentices, tellingly made this point. He noted: 'but your guys are on wages, so they don't care if they sit down for half an hour and teach them how to do a mitre'. This underscores the point that the type of work and skill requirements provides different contexts for on-the-job training.

5.5.3 Bullying and abuse in the workplace

There was little discussion in these focus groups about the extent and nature of bullying and abuse in the residential building industry. However, again there is a suggestion that the different types of work, skill requirements and payment systems can be related to the phenomena of bullying and abuse. Broadly, what a builder with experience in the project

building industry suggested in one focus group is that contract system cost and time pressures can establish drivers for this type of behaviour. In a discussion of the treatment of apprentices, he noted: 'right, where what all our guys do [is] they just abuse shit out of them all day'. Because they work within a piece work system, the imperative is 'I've got to get this job done as quick as I can'. Therefore, for example: 'Why are you only carrying three studs. Carry four'.

5.5.4 Low wages

There was a consensus in both focus groups that apprentice wages were low compared to what was on offer to young people in the broader labour market. However, again there was a difference of opinion between the bespoke builders and the project builders about its importance and therefore no consensus about what should be done about low wages.

The bespoke builders were broadly of the view that if apprentices were being trained so that they were developing a broad range of skills and being mentored into becoming skilled tradespeople then low wages were acceptable. One bespoke builder summed up the situation: '… but if you just look after them and treat them as human beings, our guys are going nowhere. They've been earning absolutely bugger all'. However, the quid pro quo is that they are learning something every day. Moreover, 'they're not with a subbie here and then he hasn't got any work and with that subbie and that subbie. All he's doing is carrying the timber here, lift the timber up there … and he uses cheap labour'. The trade-off for low wages during apprenticeships was thorough training and entry into a skilled occupation.

The view coming from those closer to the project builders was that the training system should be reconfigured. As discussed above, their argument was that apprenticeships should be modularised to reflect the fragmentation of jobs now evident in the sub-contract system. At the conclusion of a module the apprentice would have this qualification recognised and be paid accordingly. The problem from this perspective with the current system of four-year full trade apprenticeships is that the young apprentice thinks 'shit, I've got to wait four years before I earn a decent dollar. I'm out of here'.

The alternative was explained in the following terms with framing used as the example:

> If you started your apprenticeship and you were going for six months and you knew that you only had six months before you could go out on your own and become a framer you would stay. But if you have another three years, 'I'm sick of this. I'm not going to have shit wages for another three years. I'm going to go and do this'. You'd do it.

Even so there was an argument that it would still not be economic for sub-contractors in the project building industry to engage apprentices without a subsidy:

> I really believe we've got to subsidise … somebody has to … the government have got to subsidise the carpenter to employ an apprentice because with the subcontract system you get paid on how much you churn out. And so you've got to make it worthwhile for that bloke to keep that apprentice.

5.6 Conclusion

This chapter has presented an analysis of transcripts of discussions conducted in two focus groups comprised of residential house builders. They were presented with a summary account of the quantitative analysis of the temporal and spatial dimensions of the HSLF. The purpose of these focus groups was to assist in making sense of this quantitative analysis and connect it with the experience of builders who have long-term experience in recruiting workers and supervising their work on site. In particular, this element of the research sought to answer secondary research question three: Given the temporal and spatial dimensions of the HSLF, what are the defining patterns, characteristics and issues in

the supply and demand for labour in the new build and alterations and additions sub-sectors?

Two main finding have come from the analysis.

1. There are differences in the way builders think about what type of workers they require. They do this in the main by being clear about the skills they require for the type of residential building they are engaged in. In other words, the nature of the work itself defines the patterns and characteristics of the workers they seek from the labour market.
2. A key issue for all builders is the future supply of skilled labour. Discussion centred on the flow of younger people into the industry and the suitability of the apprenticeship system. Again, the type of residential building shaped the way in which builders approached this issue. There is evidence of differences. Some support the modularisation of apprenticeship training where a sequence of specific ‘competencies’ are learnt and formally recognised. This is in contrast to others who support a more wholistic skill development that follows a longer term ‘master-apprentice’ approach.

6 CONCLUSION

As reported in Chapter 1, the Positioning Paper presented an extensive literature review based on the limited academic literature and a considerable amount of industry and policy literature. It also presented an analysis of ABS housing industry data and data made available by the HIA from their industry surveys. This supported an analysis of the housing industry using a structure, conduct and performance conceptual framework.

Two main propositions followed, namely, that there are two sub-sectors (new build and alterations and additions) and that the temporal and spatial characteristics of the HSLF required further research. In particular, it found that labour force research tended to subsume the HSLF in the broader construction sector. This subsuming of housing within the broader construction industry made it difficult to understand the particular issues experienced by the housing industry.

The analysis presented in the Positioning Paper is summarised in Chapter 1 and this summary is not repeated here. Instead, what follows is a synthesis of the research findings and a discussion of the implications of these findings for future research and policy.

6.1 Synthesis of findings

This research shows that the HSLF is not homogenous. Even within the trades, there is no 'typical' representative and, even within the sub-sectors of new build and alterations and additions, there is variation in practices, conduct and performance of businesses. There is no archetypal Australian residential building company. Although firm size is typically small, and it could be regarded as tiny by comparison to other sectors, there is variation in structures and contracting arrangements both between sub-sectors and over time. There is spatial variation, with new build being concentrated in 'growth areas' where there is land supply and population growth, and alterations and additions more concentrated in ageing inner and middle ring suburbs.

In order to investigate these variations, the research adopted a multi-method approach. The quantitative research used ABS and QBSA data to develop both temporal and spatial accounts of the HSLF. The results of this research formed the background for the qualitative research undertaken through two focus groups comprised of experienced builders engaged in different types of residential building work. As a result, reflections can be made and a richer picture of temporal and spatial variation drawn.

Much of the quantitative work draws upon ABS census data for 2001 and 2006. The results show that the total employment in the residential sector grew between 2001 and 2006 with only a few classes of employment showing marginal decline. Techniques were applied to disaggregate the HSLF data into the two sub-sectors of 'new build' and 'alterations and additions'. Over the 2001–06 period, there was a greater growth in alterations and additions than in new build, albeit from a lower base.

Spatially, the picture is more diverse. For example, in Victoria, HSLF labour in the alterations and additions subsector is, in comparison to new build, more spatially concentrated. Most alterations and additions work tends to occur around Melbourne with particular focus on inner and middle suburbs. However, this has changed over time, and understanding the interaction of supply and demand of residential housing sector labour, both for new build and alterations and additions, is an important contribution to labour market analysis.

In this research, the supply of labour is represented by the growth in employment in terms of the total labour force in the housing sector between 2001 and 2006; while demand is estimated through a surrogate measure using population growth above the age of 18 years during the same period. These dimensions were used to establish four related quadrants

that sought to identify ‘critical areas’ where there was a mismatch between labour supply and the demand for labour. In both Victoria and Queensland a small number of SLAs were identified using this methodology.

A finer grained analysis was undertaken using the QBSA database. It presented an analysis of changes in the number of building contracts; followed by a breakdown by builder category, job type and contract cost over the decade to 2010. JTW analysis was also undertaken that tracked spatial and temporal variations between home and building sites. This indicated some remarkable levels of mobility exhibited by individual building contractors. Nevertheless, on average, distances travelled to jobsites actually reduced over the period 2001–10.

The quantitative analyses were extended by analysing the transcripts from two focus groups comprised of builders with many years of experience and broad understandings of the residential housing industry. The discussion in each focused on their experience of labour supply and demand processes and the way in which different types of residential construction work shaped the way in which this labour market operated.

In summary, three main research findings can be drawn from this research report that respond to the principal research question:

> What are the key features and trends in the structure, conduct and performance of the core parts of the housing industry and what are the main dimensions of the labour force working in these parts, in the context of considerable fluctuations in the level of activity in the housing industry?

- The HSLF is segmented and this segmentation largely reflects different ways of building and their different skill requirements. Bespoke building of one-off houses and alterations and additions is closely associated with a broad range of tasks and high levels of skill, particularly for carpenters. The other trades working on these jobs tend to have long-term relationships with these builders. Project or volume building of new houses is associated with more specialised tasks, especially for carpenters, requiring a narrower range of skills. There appears to be little movement of workers between the two different types of building work.
- Geography shapes the way in which these two distinct HSLF sub-sectors operate. Housing sector workers move from job to job, and therefore from site to site. However, the patterns within the sub-sectors are different. Project building workers appear to be more mobile and work across larger distances within metropolitan areas as new outer suburban housing estates start up and others wind down. In contrast, bespoke builders working on one-off houses and alterations and additions appear to work within particular areas and to work with the same tradespeople over time. If they do go further afield, their long-term trade workers are likely to go with them.
- Retaining apprentices and the development of their skills is important for the supply of new labour in the HSLF. However, there is a problem of poor apprenticeship retention. The focus groups confirmed the reasons for poor retention in the broader construction industry identified by the Building Industry Consultative Council Advisory Body (2008)—lack of appropriate supervision in the workplace, problems with poor and inappropriate training, bullying and abuse in the workplace, and low wages. Further, the focus groups indicate the importance of addressing shortcomings of the apprenticeship system in the housing industry.

6.2 Implications for further research and policy

The implications of the three principal research findings for policy and future research are presented in relation to these findings.

There is scope for a more explicit recognition of the different types of residential construction work in future HSLF research and policy discussion.

Discussion of the HSLF government and industry representatives is conducted using aggregate supply and demand data. For example, the regular report by the HIA Economics Group (2011) that presents assessments of the demand and supply of skilled labour in the housing industry makes no distinction between labour required for different types of building work. Similarly, the National Housing Supply Council (2010, Chapter 3) discussion of new housing supply and the workforce that builds this housing does not distinguish between different types of residential building. The research presented in this report—both the quantitative analysis and the focus group analysis—shows that the different types of building work have resulted in distinct labour market sub-sectors. These sub-sectors have different geographies and the skills of the workers are different. Further, it seems that there is limited movement between these two sub-sectors by workers. They tend to specialise in one or the other.

This underscores the importance of explicitly recognising both sub-sectors within research and policy focusing on the HSLF. ABS National Account data indicates that the level of gross fixed capital formation (GFCF) in alterations and additions as a proportion of all GFCF has ranged between 38 per cent and 49 per cent since the mid 1980s (Dalton et al. 2011a, p.22). The magnitude of these two forms of building, on one hand bespoke building of one-off houses and alterations and additions and on the other hand volume production of catalogue houses, are roughly equal. Therefore, it is important that this difference in the outputs of the HSLF is recognised in the regular analysis of HSLF supply and demand. Further, there is little prospect that the GFCF ratio of alterations and additions to new build will diminish in future years as the size of the total housing stock increases relative to annual additions to the existing stock.

There is scope for a geographic perspective to be included in future HSLF research and policy discussion.

Discussion of the HSLF supply and demand is conducted without reference to the geography of this supply and demand below the state and territory level. This lacuna is evident in all of the regular industry research such as that cited above. At one level it could be argued, on the basis of the evidence presented in this research, that there is limited evidence of HSLF market failure that can be attributed to workers resisting JTW time and monetary costs. This is a reasonable interpretation of the cluster analysis and the analysis of a decade of JTW data for the Queensland HSLF presented in Chapter 4.

Nevertheless, there are two reasons why it is important to include a geographic dimension in HSLF research and policy discussion.

- There is a strong connection between land use planning and policy supporting the supply of new housing. It is important therefore, particularly in periods of high demand for HSLF labour, that consideration is given to sequencing land use release decisions that open up areas for housing development. The additional demand that follows the start-up of new outer suburban housing estates will be based on builder assumptions about where the labour will come from. It is important that these assumptions are tested. There is evidence in the cluster analysis, particularly in periods of very high demand, that supply can be constrained. Further, there is evidence that one of the ways in which this constraint is overcome is for builders to engage workers who compromise the quality of house building (Dalton et al. 2011b, pp.45–46).
- There is a strong connection between mobility of workers in urban areas and economy wide productivity (Crafts & Leunig 2005; Eddington 2006). This relationship between the time and monetary cost of travelling to building sites in the housing industry is one that has not been researched. However, it is *prima facie* a key variable in the productivity of

the HSLF. The product of the HSLF is site specific and workers must travel on the urban road network, usually in small vehicles and often on congested roads, from home to a site and often between sites during the day. The time and monetary cost of this travel is a factor that affects the productivity of these workers.

There is scope to further examine the apprenticeship system that is central to the supply of new skilled labour in the housing industry.

Participants in the policy debate about the future of apprenticeships in the housing industry appear not to have recognised that housing industry employers have different expectations of the apprenticeship system. In future policy work on trade apprenticeship systems, there is scope to inform the analysis through an explicit recognition of the expectations of employers of the bundle of skills associated with different types of residential construction. Based on this research, it is argued that a key factor shaping these different expectations is about the skill requirements needed for different types of building.

Employers engaged in what we have described as bespoke building support a system where apprentices develop a broad range of skills over a four-year period. This approach can be described as the traditional 'master-apprentice' approach. In contrast, employers engaged in the volume or project house building are more interested in apprentices developing particular competencies required to work on specified elements of new houses. They also support an approach where apprentices sequentially add competencies over time if they move to work on other elements of the typical house. This could be described as a 'modularised' approach to skill development. What this suggests is that significant reform of the apprenticeship system is required and that this reform should be driven by an understanding of the two sub-sectors and their distinct requirements.

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