Dynamics of Housing Affordability – A New Perspective from the LGA Level

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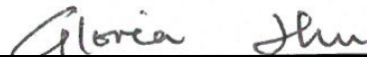
Abstract

This study highlights the importance of housing affordability at the Sydney Local Government Areas level by providing a descriptive analysis of factors affecting housing affordability and examining housing affordability for homeowners and renters using the 'ratio approach' from 2001 to 2016. It is observed that housing affordability deteriorates over the observed period for homeowners, partly because the percentage increase in income cannot catch up with the percentage increase in dwelling prices. However, an improvement in housing affordability for renters is shown after 2011. Housing affordability for homeowners is also examined using the user cost approach. The analysis is conducted separately for existing homeowners and first home buyers to capture the housing stress differences between the two. Housing affordability improvement is found for both groups of homeowners after 2011. Nevertheless, first home owners are observed to be more prone to suffering from housing stress compared to existing homeowners. Therefore, measures can be taken to help potential first home owners gain homeownership. With reference to geographical differences on the issue of housing affordability in 2016, it is observed that Western Sydney is considered more affordable than the Eastern side. This situation is due to the NSW government's intention of developing the north-western part of Sydney. As a result, more dwellings are expected to be built there at a lower price compared to those located in the inner ring of Sydney. To conclude, this study provides an updated picture on housing affordability situations at the Sydney Local Government Area level and gives policy implications on housing affordability accordingly.

Statement of Originality

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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Chapter 1: Introduction and motivation

1.1 Introduction

Food and shelter are essentials for every human being. Economists are concerned when access to food or shelter is interrupted, or even jeopardised. In Australia, deterioration in housing affordability has been widely documented (Wood & Ong 2011; Yates 2008). The problem is particularly acute in Sydney. According to the 17th Annual International Housing affordability Survey, Sydney was ranked the second least affordable major housing market in the world (Demographia 2017). Given persisting house price inflation, limited wage growth and excess demand for housing, housing affordability is likely to remain a concern in Sydney and in Australia more broadly.

This thesis addresses the issue of housing affordability in Sydney. Housing affordability is defined as the interplay between costs of consuming housing services in the form of owning or renting and household incomes. It is often considered along three dimensions: (i) affordable housing; (ii) social housing, and (iii) general affordability (Abelson 2016). Affordable housing refers to housing that can be accessed by the bottom 20% of households without paying more than 30 per cent of their household income in rents or mortgage repayments (Berry 2002). Social housing refers to dwellings provided by the federal, state and territory governments to low-income households who are in greatest need (Thomas 2016). Affordable housing, social housing and general affordability are different in the sense that they have different target groups. Affordable housing is mainly of interest to private renters, while social housing targets renters of houses owned by the public sector. General affordability takes the whole population into account, including home owners and renters. This research will touch on all three aspects, especially affordability at the

Sydney Local Government Area Level.

Previous literature has examined factors affecting housing affordability. In particular, income, population growth, land availability and land development processes and policies are factors that have an impact on housing affordability (Yates 2008). *The Economics References Committee of the Australian Senate* (2015) also argues that the causes of housing affordability stress are attributable to population growth and increases in household income. What is more, another committee has also made a report looking at housing affordability in Australia and found that strong housing demand and limited supply due to complex planning process have played a significant role in housing affordability issues (The Senate Select Committee on Housing Affordability in Australia 2008).

Various policy initiatives designed to assist low income earners with housing affordability have been suggested – and even tried. For instance, Australian governments have tried to tackle the problem by providing public housing to disadvantaged households. Public housing is managed by state and territory housing authorities and tenants are often granted rent subsidies by offering public housing to the disadvantaged at a cost below market rent. According to the research on housing assistance in Australia 2016, supply of community housing has almost doubled from 39,770 in 2008 to 73,620 in 2015 with the state of New South Wales taking up the largest proportion, even though there are still 200,000 households on the waiting list for social housing (Australian Institute of Health and Welfare 2016).

Housing assistance has also been introduced to provide subsidies for private renters. A Commonwealth Rent Assistance (CRA) scheme provides a rental allowance to low-income households without children and families with children which receive a benefit higher than the base rate of the Family Tax Benefit. These schemes aim to ensure that adults who have limited

income can afford to rent a house with adequate standards. Research into the effectiveness of CRA between 2001 and 2011 has been undertaken and found that rent assistance helps recipients escape from housing stress in the short term (Wood, Ong & Cigdem 2014). However, the long term effectiveness of rent assistance is of big concern since it depends highly on the accessibility of affordable rental dwellings in the private market (Hulse, Reynolds & Yates 2014).

Apart from providing assistance to public and private renters, the New South Wales (NSW) Government also provides support to first home buyers. During the period between 1st January 2016 and 30th June 2017, first home buyers were granted $10,000 on purchasing a new home up to a value of $750,000 and full stamp duty exemption on new homes up to a value of $550,000. The grant was $15,000 previously. Prior to September 2012, purchasers of existing property were also eligible to apply for grants. Partial stamp duty exemption was also granted on previously occupied homes valued between $550,000 and $650,000. First home owners who buy an existing property up to a value of $650,000 will also be granted $5000 (NSW Office of State Revenue 2016). However, concerns exist about the effectiveness of the scheme. The number of applicants for the first home owner grant scheme decreased from 37,414 in the financial year 2011/2012 to 9391 in the financial year for 2015/2016 (NSW Office of State Revenue 2016). This may be explained by the limited supply of new homes valued at $550,000 or below available in the market. The usefulness of the policy is also criticised, stating that benefits often go to the wealthy group of those who can obtain home ownership (DTZ Research 2004).

1.2 Social and economic implications

Housing is essential and has a profound impact upon lives. It affects not only family structures and wellbeing, but also the rate of economic growth (Barker 2004). Housing takes up the largest proportion of household expenditure (Quigley & Raphael 2004). Therefore, any changes in housing affordability can impose a significant impact on household budgeting.

Deterioration in housing affordability can give rise to a number of secondary socio-economic issues including hesitation in or delay of family formation. Homeownership is found to play a crucial role in making family formation decisions (Bruce & Kelly 2013; Merlo and McDonald 2002), because owning a property helps provide a sense of security which in turn encourages people to have children.   With rising costs of housing relative to income, family formation planning is therefore delayed. Recent research has found that households with children are more likely to suffer from housing stress for a longer period (Wood & Ong 2011), and this further discourages households from having children. From this, it can be seen that deteriorating housing affordability can give rise to lower fertility rates which can intensify the problem of an ageing population.

Poor housing affordability has been found to have a direct impact on mental health. Pevalin et al. (2008) have undertaken a longitudinal analysis of the British Household Panel Survey and found that inability to finance increasing housing costs can give rise to anxiety. This finding is also supported by Bentley et al. (2011), who report that deteriorating housing affordability has an adverse effect on mental health, even controlling for contemporaneous changes in income. The impact of housing affordability on mental health has been examined based on tenure type and the result has shown that deteriorating housing affordability tends to have a more negative effect on the mental health of renters compared to homeowners given the same level of income

(Mason et al. 2013). Insecurity of tenure and frequent forced moves can intensify the stress felt by individuals. Therefore, it can be concluded that housing affordability can have different impacts on homeowners and renters.

Deteriorating housing affordability not only affects the wellbeing of adults but also that of children. Previous research has discovered that children living in inadequate housing are likely to be educationally disadvantaged (DTZ Research 2004). The reason is that substandard housing conditions may affect children's health which can negatively affect school attendance and performance. Harkness and Newman (2005) support this idea and observed that children who live in more affordable housing are better off than children do not.

Numerous studies have focused on the relationship between housing affordability and children's wellbeing and discovered the positive relationship between the two. It is found that an increase in family income helps improve the mental health of children (Costello et al. 2003). Duncan and Brooks-Gunn (1997) shared the same view by showing that poverty can have an adverse effect on children's cognitive development. This phenomenon can be supported by the 'material hardship model' which argues that higher incomes facilitate easier access to goods and services that promote child development (Haveman & Wolfe 1995). Recent research has discovered that improving housing affordability helps provide reliable quality daycare services for children (Wardrip, Williams & Hague 2011). Children are also found to have better development and school performance when housing is more affordable since it helps reduce the frequency of moves (Lubell & Brennan 2007).

Furthermore, parents' mental health plays a crucial role in child development. Children are likely to be adversely affected if their parents are under housing stress. This phenomenon can be explained by the family stress model postulating that parental stress brought by financial

hardship is likely to result in inconsistent and punitive parenting behaviour (Conger et al. 1994). From this, it can be seen that housing affordability can indirectly impose a negative impact on children's wellbeing.

1.3 Specific policy implications

As noted in the introductory section, the substantial socio-economic impact of housing unaffordability raises government concerns. Along with the various assistance measures outlined earlier, increasing housing supply has become a major focus of government action in Australia (Schlesinger 2017). The NSW Government (2014) has set increasing housing supply as one of the goals in the report '*A plan for growing Sydney*' in order to improve housing affordability. By doing so, the government has proposed five-year housing targets aiming at increasing 189,100 units of housing for Greater Sydney between 2016 and 2021 to meet housing needs and improve lifestyles (Greater Sydney Commission 2016). Previous empirical studies have discovered an inverse relationship between house price and number of new dwellings constructed (Glaeser, Gyourko & Saiz 2008). Therefore, this measurement is hoping to relieve the rate of growth in dwelling prices. Nevertheless, the effectiveness of this measure depends heavily on price supply elasticity for housing which shows responsiveness of dwelling prices to changes in housing supply (Caldera & Johansson 2013).

1.4 Long run elasticity of house prices with respect to housing stock

The elasticity of house prices with respect to housing stock plays an important role in addressing the issue of housing affordability as it helps determine the efficiency of increasing housing supply as a tool in adjusting house prices. It shows the responsiveness of dwelling prices to a change in

housing supply. In other words, house price is regarded as a dependent variable while housing supply is treated as an explanatory variable from an econometrics' perspective.

Previous research has found that house price elasticity with respect to the housing stock is elastic in nature. Meen (2002) has looked at the long run relationship between house price and housing stock at the UK during the period between 1969 and 1996 and the value is estimated to be -2. Similarly, research on the real economic determinants of house prices has also been undertaken in Australia from 1975 to the first quarter of 2003. The house price elasticity with respect to the housing stock is estimated to be -3.6 (Abelson et al. 2005). This implies that when quantity supplies of housing increase by 1%, price decreases by 3.6%. Given the elastic nature of house price supply, there is a very strong argument that increases in housing demand, such as increases in per-capita income and population growth, is likely to improve housing affordability as it helps reduce housing cost.

1.5 Tax structure and housing affordability

Under the Australian tax system, negative gearing provides an incentive for property investment. Negative gearing allows property investors to get taxable income deductions when the holding costs of a property outweigh the income generated by that dwelling. As a result, costs of property investment can reduce and the minimum required rental yield is lower which can improve rental affordability. On the flip side, criticisms are often raised that this leads to housing affordability deterioration. Major critics of negative gearing often focus on the uniformity of the tax structure across individuals. It has been suggested that negative gearing acts as an untargeted housing demand booster which encourages more property investment (Blunden 2016); and favours high income property investors at the expense of first home buyers (Wood, Ong & McMurray 2011).

On the contrary, supporters of negative gearing argue that the effect of negative gearing is less pronounced than that of low interest rates (Guest 2014). Sloan (2014) supported and argued that a negative gearing cut will discourage housing investment which will ultimately lead to rental shortages especially for new housing. This highlights the importance of separating analysis between housing affordability for homeowners and renters.

1.6 Schwabe's law and housing affordability

Schwabe's law states that the poorer an individual is, the larger the proportion of their income is spent on housing (Hulchanski 1995). An empirical study looking at renters' behaviour in the Netherlands found that lower income households tend to spend a larger proportion of their income on housing, which is consistent with what Schwabe's law says (Haffner & Boumeester 2014). This study will examine if this law holds when looking at housing affordability for homeowners and renters at the Sydney Local Government Area level.

1.7 Literature gap

Extensive research has been undertaken to examine housing stress in Sydney from various different perspectives. Randolph and Holloway (2002) have reviewed the geography of the housing unaffordability problem for homeowners in Sydney using 1996 census data and the 1999 National Housing Survey from the Australian Bureau of Statistics and realised that Western suburbs suffer more from housing stress compared to Inner and Eastern suburbs. However, the Productivity Commission (2004) shared an opposite view by arguing that deteriorating housing affordability is concentrated on more expensive suburbs in Sydney and then spreads to other parts of regions.

Contradictory results are also found when examining housing affordability for renters. Burke and Ralston (2003) have undertaken a state-based analysis of average rent as a proportion of real income in NSW and a long-term worsening of rental affordability is shown. In contrast, Harding et al. (2004) found improving housing affordability for private renters during the selected periods in Sydney. Therefore, there is a need to examine which of these trends prevail in more recent years with data collected at the Sydney LGA level.

This thesis attempts to quantitatively assess the dynamics of housing affordability for renters and homeowners in Sydney using data at the local government area level for the period of 2001 to 2016. The aim is to fill a gap in knowledge by presenting an analysis of affordability evolution. A further aim is to provide sound analysis for policymakers to implement housing affordability programs with multiple social objectives.

1.8 Thesis structure

This thesis is structured as follows. Chapter 2 presents a review of the literature on housing affordability, which will inform the specification of my model on housing affordability in Sydney LGAs. Chapter 3 provides a review of the available approaches for the measurement of housing affordability for homeowners and renters. Chapter 4 presents a descriptive analysis of fundamental forces that determine the level of housing affordability. Chapter 5 presents the results of our housing affordability measure calculations. Chapter 6 concludes the research by explaining how the findings may inform policy. Some comments on scope for further research are also provided.

1.9 Conclusion

Given surging housing costs in Sydney, concerns about housing unaffordability have been raised. Deterioration in housing affordability can inflict sizeable indirect costs on the economy and therefore the issue should be addressed. This study will review this issue by giving a descriptive analysis of the drivers of housing affordability (i.e. dwelling prices; housing rents; housing approvals and completions; population; and household income) and assessing the problem of housing affordability for renters and homeowners in Sydney at the local government area level during the period of 2001 to 2016. After the analysis, policy implications of findings about housing affordability are discussed to complete the study.

Chapter 2: Literature review on housing affordability

2.1 Introduction

In recent decades, macroeconomic studies on housing affordability have been undertaken globally. The issue of housing unaffordability is widely recognised in Australia and there is a substantial body of work looking at the issue at this geographical level. This chapter presents a review of the literature on housing affordability.

2.2 Factors affecting housing affordability

Housing affordability is commonly defined as the relationship between household income and housing expenditure; housing is regarded as affordable if expenditure to income is considered reasonable (Kutty 2005). There are a number of factors that are observed to have an effect on housing affordability, namely income, house prices and rents, interest rates, labour market conditions, mortgage and rent payments and supply constraints. Idrus and Ho (2008) noted that the persistence of the housing affordability problem is due to high property prices and inadequate affordable and well-located property supply within urban centres. O'Flynn (2011) uncovered this issue and found that the interaction of both demand and supply factors help influence the price of housing which in turn affects affordability. Therefore, the following discussion is categorised into 'demand side' and 'supply side' factors.

2.2.1 Demand side factors

2.2.1.1 Dwelling prices

Dwelling prices play a crucial role in the context of housing affordability as they represent the initial payment required to secure housing. Increasing house prices is classified as the major contributor to rising housing costs (Lawson & Milligan 2007). Empirical studies have been carried out to look at the relationship between housing cost and affordability. A study conducted in Europe between 1980 and 2003 found that housing costs were taking up a larger proportion of total household expenses in European countries. Ireland, Austria and France had the fastest growth rate in housing costs (Eurostat 2004). Taiwan is also severely affected by surging house prices. Tsai (2013), who studied housing in Taiwan, found that an increase in housing prices will increase mortgage payments, leading to a reduction in housing affordability.

2.2.1.2 Dwelling rents

Increases in mortgage payments will result in a rise in rental payments as landlords are likely to shift the burden to tenants. Scanlon and Whitehead (2004) have investigated the impact of housing costs to renters and found that non-family households, young households and renters are more prone to housing affordability problems. From this, it can be inferred that higher house prices and rising rental prices can result in housing affordability deterioration.

2.2.1.3 Income

Income plays a vital role in determining households' ability to secure housing. Household incomes are frequently cited as determinants affecting housing demand (Megbolugbe & Cho

1993). In other words, housing demand will increase when households have higher incomes. Linneman and Megbolugbe (1992) further investigated and supported the idea that housing affordability deterioration is primarily caused by income movement. Empirical studies have shown the importance of income on housing affordability. Bujang et al. (2010) analysed the relationship between demographic factors and housing affordability in Malaysia and found that affordability is influenced by monthly income. This idea is also supported by Mostafa et al. (2005) who looked at housing affordability in Hong Kong and discovered a significant relationship between income and housing affordability. Over past decades, there is evidence that real income has been decreasing especially for low income household in countries carrying out free-market reforms during the late 1980s/1990s (DTZ Research 2004). Australia also encounters this situation. The Affordable Housing National Research Consortium (2001) has studied the income movement in Australia between 1986 and 1996 and observed that median household incomes in real terms have fallen during the observed period with households belonging to the lower 40% income threshold suffering the most. This study will update real income changes at the Sydney Local Government Area level from 2001 to 2016.

2.2.1.4 Interest rates

Interest rates determine the cost of borrowing for home owners. Over the last twenty years there has been a significant decline in worldwide interest rates such as in the UK and Australia. These low interest rates play a significant role in fueling global house price appreciation.

Conversely, a surge in interest rates would pose a risk to housing affordability amongst first home owners. Changes in mortgage rates can affect demand for housing and ultimately prices (Abelson 1997). Private tenants, especially for those households who are in the bottom 40% of the income distribution, are likely to suffer more. If private renters face such high housing costs, they are

unlikely to be able to save the money required to become a first home owner. From this, it can be seen that housing affordability problems in the private rental market can translate into a home ownership accessibility problem (AHURI 2003). Moreover, high mortgage rates will increase mortgage payments and increase the chance of being under housing stress in the future.

2.2.1.5 Labour market conditions

Labour market conditions impact upon households' ability to participate in the housing market – particularly potential buyers who are currently renting. AHURI (2003) have suggested that the purchasing behaviour of first home owners is affected by labour market changes such as increased casual and insecure employment. If individuals are offered permanent jobs, they are encouraged to enter the market and thus increase the demand for housing. This idea is also supported by Burke and Hayward (2001) stating that part-time and casual employment are likely to reduce demand for homeownership.

2.2.1.6 Population

Structural change in the population is found to play a significant role in affecting housing demand and ultimately dwelling prices. The emergence of nuclear families can explain the surging housing demand. Kelly et al. (2005) and Knight and Eakin (1998) indicate that household size is reducing due to delay in getting married and family formation. As a result, the total number of households increases due to natural increase and an ageing population. Jud & Winkler (2002) supported this argument. They carried out an empirical study to examine 130 metropolitan areas in the United States and found that real housing price appreciation is strongly influenced by population growth.

Apart from natural increase, higher immigration rates are also considered one of the causes

leading to housing affordability determination. Rapid population growth is underpinned by an increasing rate of immigration in Australia which results in a rising demand for housing (The Senate Select Committee on Housing Affordability in Australia 2008). This idea is supported by O'Flynn (2011) concluding that increasing the rate of immigration in Australia gives rise to an increase demand for housing.

2.2.2 Supply side factors

Previous research has examined the relationship between housing supply and affordability in both Australia and internationally. In recent years, supply side factors have been a new focus when addressing housing affordability issues in developed countries across the globe (Lawson and Milligan 2008).

The effect of housing supply on affordability has been widely discussed in previous literature. Gyourko (2009) has looked at the effect of housing supply on house prices in the US and discovered an inverse relationship between the two. In other words, areas with limited housing supply tend to have higher house prices. Other studies have narrowed the scope by solely looking at the impact of community housing supply on affordability. The concern about causes of limited supply is raised and it is shown that dwelling shortages are mainly due to local regulation (Glaeser & Gyourko 2003). Therefore, housing supply plays an important role in determining housing affordability. Higher housing supply can reduce house prices which helps improve housing affordability.

2.3 Policy response to tackling housing affordability

In recent years, the debate concerning housing affordability has been defined in an era of rapidly increasing house prices in Australia's capital cities and some significant research and recommendations in terms of policy responses to declining housing affordability are widely discussed.

2.3.1 Demand side policy on housing affordability

Demand side assistance involves giving direct support to households with a housing need. Housing assistance helps increase the ability of the recipients to purchase or rent housing at an affordable price. However, previous research has looked at the effectiveness of this demand side policy and revealed that increased demand for housing would end up driving up prices in a highly constrained market where housing supply cannot increase in an unlimited way (Auckland Regional Growth Forum 2003).

Demand side policy often assumes that housing markets, especially private rental markets, will generally provide appropriate housing according to tenants' needs if they have sufficient income. This belief is supported by Housing NZ Corp (2004), who claim that their programs are viewed as efficient as they help promote consumer choice and self-reliance. At the same time, they are able to provide housing to low-income households at an affordable cost with lower quality (Housing New Zealand Corporation 2004). However, Katz and Turner (2003) criticise the effectiveness of demand driven policy commenting that its usefulness depends highly on the depth and duration of subsidies. The effectiveness of the measures is questioned if subsidies are provided on a temporary basis.

2.3.2 Supply side policy on housing affordability

Supply side responses to housing affordability involve giving a variety of discounts to those people and businesses involved in the production side of the housing sector. It is often done by adjusting the market directly so as to encourage the supply of appropriate and affordable housing. Apart from the government implementing policies directly, other approaches involve developing ways and means to secure affordable supply via the non-government sector. Berry (2002) has investigated this issue and suggested that attracting more private investment into affordable housing by providing housing subsidies can help increase the housing supply for lower income households in order to meet the growing need.

Supply response policies target not only homeowners but also renters. A number of countries have implemented rental programs for low and moderate income households. For instance, the US implements different related programs including the public housing program, the Low Income Housing Tax Credit program and providing local grants or low-interest loans for non-profit organisations that build or rehabilitate affordable rental housing (DTZ Research 2004). Katz et al. (2003) agreed on the effectiveness of affordable housing programs for increasing housing supply but raised concerns about housing quality. Houses of this type may have increased maintenance costs for homeowners, thus discouraging them from owning this property type. Therefore, it should not solely focus on building low-cost rental housing without considering the owners benefits.

2.3.3 Regulatory responses to housing affordability

Regulatory policies are another area that has been widely studied. Regulatory policies often refer to local zoning, land use and building regulation and are found to be ineffective in addressing the

problem of housing affordability. Previous studies observe that regulatory policy is often misused or even neglected. Katz et al. (2003) has reviewed the housing market situation in the US and discovered that the roles of regulatory policies are often overlooked. However, misuse of regulatory policy is common when it is used. Pendall (2000) discovered that exclusion of lower-cost housing is carried out through the process of land use planning so as to maximise local property values. Katz et al. (2003) has observed the negative behaviour of local land use and development regulations in slowing down the goal achievements of affordable housing policy. This type of behaviour gives rise to an increase in housing cost (Hayward 2003). From this, it can be seen that growth controls increase housing prices which can ultimately intensify the problem of housing affordability.

Nevertheless, previous studies raise concerns about the attractiveness of regulatory policies. One example is the provision of affordable housing. However, limited application of agreements on affordable housing provision raised the concern of the effectiveness of the policy (Carmichael, Flint & Slater 1999). This may be explained by potential buyers' preference for low-cost housing. Crook et al. (2002) point out that requiring developers to make provision for affordable housing is only effective when there is a huge demand for this type of quality in the local housing market. Therefore, the usefulness of policies also depends on market demand conditions.

2.4 Empirical studies on housing affordability

Housing affordability has a significant impact in the global and local economy. Due to its importance, empirical studies on housing affordability have been undertaken in various countries. These can be generalised into two types: housing affordability for homeowners, and housing affordability for renters.

2.4.1 Housing affordability for homeowners

Empirical studies are undertaken globally to address housing affordability for homeowners. However, different findings are often observed. Bramley (1992) studied the housing affordability problem across regions for homeowners in England and found an overall deterioration in housing affordability. Liu et al. (2008) shared the same view of decreasing housing affordability when evaluating the housing affordability in Beijing during the period of 2002-2006. Duan (2011) agreed with this view by undertaking a study to examine the housing affordability issue in Lanzhou, China, using the price to income ratio between 2001 and 2008 and the result reflects that housing unaffordability persists during the observed period. This idea is also supported by Kosareva and Tumanov (2008) who, when examining housing affordability in Russia, discovered an intensification of housing unaffordability and that the housing affordability differential between regions is also significant. This view is supported by Jones et al. (2011), who showed the presence of geographical difference when examining housing affordability in the north west region of England. Although the issue of housing unaffordability is regarded as a global concern, housing in some countries is observed to be largely affordable. Quigley and Raphael (2004) carried out research in housing affordability in the USA from 1970 to 2000 and could not find any significant issue of housing unaffordability for homeowners.

Previous studies have analysed the geography of housing stress in Sydney but with different perspectives. Randolph and Holloway (2002) reviewed the geography of the housing unaffordability problem for homeowners in Sydney using 1996 census data and the 1999 National Housing Survey from the Australian Bureau of Statistics and realised that Western suburbs suffer more from housing stress compared to Inner and Eastern suburbs. However, the Productivity Commission (2004) shared an opposite view by arguing that deteriorating housing affordability is concentrated in more expensive suburbs in Sydney, which has then spread to other regions.

2.4.2 Housing affordability for renters

Literature on house affordability for renters is also widely documented in Australia and internationally. Deterioration of rental affordability was observed in England in 1990 (Bramley 1992). The US was also found to have rental affordability deterioration (Quigley & Raphael 2004).

Housing affordability for renters is also widely documented in Australia. Berry and Hall (2001) found that the affordability problem is prevalent in the private rental market, especially for low-income tenants. This finding is also supported by Landt and Bray (1997) who examined rental affordability in Australia and found that low-income earners generally suffered from rental stress. Previous research looked at housing affordability for renters in Sydney at a more micro level but produced contradicting views. Burke and Ralston (2003) have undertaken a state-based analysis of average rent as a proportion of real income in NSW and a long-term worsening of rental affordability is shown. Randolph and Holloway (2002) supported this and presented an analysis of housing affordability for renters at the collector district (CD) level using data from the confidential unit record file (CURF) of the 1996 Census of Population and Housing and found that there is a general spread of households with rental affordability problems throughout the inner middle and western Sydney suburbs. In contrast, Harding et al. (2004) found improving housing affordability for private renters in Sydney between 1998 and 2004.

In an attempt to reconcile some diverging views, this study tries to examine which of these trends prevail in more recent years with data collected at the Sydney LGA level by firstly providing a descriptive analysis on drivers of deteriorating housing affordability and assessing the problem of housing affordability for renters and homeowners in Sydney at the local government area level during the period of 2001 to 2016.

2.5 Conclusion

This chapter has provided an overview of literature on housing affordability from different aspects including factors affecting housing affordability, housing policy, and empirical studies on housing affordability. Having observed diverging views on housing affordability in Sydney, this study will re-examine this issue using data collected at the Sydney LGA level during the period 2001 to 2016.

Chapter 3: Ideas and measures of housing affordability

This chapter reviews a range of available approaches for the measurement of housing affordability. Access to reasonable housing is uniformly viewed as a basic necessity for maintaining an acceptable living standard. In developed countries like Australia, it is commonly accepted that housing should be affordable to people across different income levels. Housing acts as an important tool in tackling social exclusion or to maintain social cohesion (Berry 2003). Therefore, identifying groups which are experiencing housing affordability problems are vital so that prompt policy planning can be undertaken. The work in this chapter will inform the specification of models examining housing affordability at the Sydney local government area level. This chapter helps provide a more comprehensive understanding of contemporary housing affordability measures and aid the interpretation of the empirical part of the thesis.

A number of measures have been developed that attempt to measure housing affordability depending on research objectives. A measure is considered as effective if it can capture the characteristics of housing market and household consumption behaviour (Yang & Chen 2014). It should also be able to provide policy implications by measuring the gaps between affordability and policy targets for future policy improvements.

This section reviews some measures of housing affordability, focusing on three main methods: the ratio approach, the residual income approach and the user cost approach.

3.1 Ratio approach

The ratio approach is regarded as one of the most popular measures in assessing housing affordability. Specifically, price-to-income ratio is commonly used when measuring housing affordability for homeowners while rent-to-income ratio is a prevalent measure for renters' housing affordability. Hulchanski (1995) supported this by claiming that price-to-income ratio and expenditure-to-income ratio indicators are the most widely-used measures in examining housing affordability.

The ratio approach is usually measured in two ways: 1) The ratio between the median prices of a dwelling and median income, which is also known as the Price-to-Income Ratio. 2) The ratio between median rents of a dwelling and median income, which is known as the Rent-to-Income Ratio. These two measures can be expressed in the following ways:

$$\text{Rent} - \text{to} - \text{Income Ratio} = \frac{median\ rents\ of\ a\ dwelling}{median\ income}$$

$$\text{Price} - \text{to} - \text{Income Ratio} = \frac{median\ prices\ of\ a\ dwelling}{median\ income}$$

A household's ability to purchase standard dwellings has also been measured by identifying the percentage of income being spent on housing (Renaud 1991). This addresses the issue of whether households are spending an acceptable amount of their income on paying rent or dwelling prices. In this measure, housing is regarded as affordable if housing costs take up less than 30% of gross household income.

Due to its simplicity, this measure is widely used by various international organisations including the World Bank and the United Nations. Since the measurement is conducted as a ratio form, it is ideal for making comparisons across areas (Bogdon & Can 1997). This measurement is also

adopted by the Demographia (2017) in the International Housing Affordability Survey, which claims that it is a reliable, easily understood and essential structural indicator for measuring the residential market situation and helping make housing affordability comparable across local housing markets. This measure can provide a useful insight on how the housing market performs and can also provide information about the level of sustainability of human settlements with regards to housing affordability such as the impact of market forces and housing policies upon the living conditions of people (Liu, Reed & Wu 2008). Therefore, the ratio has been used as a measurement in previous research globally including Hong Kong (Hui 2001), South Africa (Aboutorabi & Abdelhalim 2000) and the UK.

However, there is a theoretical debate concerning the validity of the ratio approach. Stone (2006) examined this approach and claimed that income can all be spent on housing consumption if income decreases. From this, it can be seen that this concept fails to account for trade-offs between housing and other household consumption. It is also regarded as a crude measure by failing to consider housing quality and density (Burke, Neske & Ralston 2004). Some households may be willing to live in smaller dwellings in order to save for other consumption. It is also unable to capture various performances across tenures, locations and household types (Hancock 1993). Moving further away from cities is a choice for households who would like to save housing costs without sacrificing their quality of living.

Furthermore, a uniform benchmark cannot apply to households in different income groups. High income households may spend 70% of their income on housing costs without sacrificing their standard of living while low income groups may spend only 30% on housing but have difficulties in maintaining basic needs. From this, it can be seen that households may choose to consume housing services based on their utility preferences instead of budget constraints. Since this measurement is unable to provide a detailed explanation of housing affordability, it plays a

limited role in providing policy implications.

Moreover, definitions of income and housing costs are often inconsistent in the context of housing affordability. Milligan (2003) claimed that previous research has different ways of calculating household income and housing costs which provides an obstacle to extend the study due to data availability. Hulchanski (1995) supports this and indicates that the price to income ratio is only considered a rule of thumb in approximating housing cost in relation to a household's income as there is a lack of theoretical and empirical foundation for the price ratio. This can explain why researchers fail to provide a detailed insight based on the ratio.

Nevertheless, it provides a good start in assessing housing affordability by being able to identify individuals who are under housing stress and show housing consumption trends. The housing price-to-income ratio is particularly relevant to those regions where mortgaged housing-ownership to new households is prevalent (Yang & Chen 2014). As a result, it can act as an indicator of households' ability to purchase a house.

3.2 Residual income approach

The residual income approach is another measurement in examining housing affordability. In the 1960s, concern about housing affordability was raised in the US. Dolbeare (1966) was one of the pioneers to question the ratio approach and a residual income method was proposed. The residual income approach acts as an improvement on the ratio approach. It highlights the relationship between incomes, housing costs and expenditures on non-housing necessities. In this approach, housing is deemed unaffordable if income, after deducting housing expenditure, falls below the amount required to support an 'acceptable' level of other consumption. This

approach has been widely applied in international reviews (Freeman, Chaplin & Whitehead 1997). Kutty (2005) used this approach in measuring housing affordability in the US and found that it provides a more accurate picture on poverty compared to the ratio approach. Yang and Wang (2011) supported this idea when undertaking the Beijing study.

The residual income approach can overcome problems of the ratio approach. Firstly, housing-induced poverty can be better identified. Stone (1975) introduced the term 'shelter poverty' to describe households in which their income is insufficient to meet their non-shelter needs after paying for housing costs. This idea has been further developed and an idea of housing-induced poverty is introduced (Kutty 2005). This concept is important in identifying households who are truly under housing stress. By using the residual income approach, it provides a flexible theoretical framework in examining the distribution of affordability subject to household choice or financial constraints.

Secondly, the residual income approach helps specifically address the applied housing standard. Being able to address the standard set *a priori* can guide policymakers to identify the target level of affordable housing expenditure. Effective measures of housing affordability can also be implemented such as setting an appropriate level of housing assistance for poor households (Stone 2006b).

However, implementation of the residual approach raises a number of issues. A measure of the socially acceptable level of housing consumption in terms of size and quality is required when addressing the issue of housing affordability using the residual approach. This concept is complex and hard to define (White 2004). One of the ways to determine an adequate housing standard is by using a quality-based measure (Lerman & Reeder 1987).

3.3 User cost approach

This approach estimates the costs incurred in terms of the amount of other goods and services foregone as a result of the use of the house. This idea originated from Gillingham (1980) who used Jorgenson's idea of the user cost of business capital (Jorgenson 1963). The user cost approach is also advocated by many scholars namely Hendershott and Slemrod (1982), Poterba (1984), Yang and Adams (1987) and Lee and Chung (2017). According to Fox and Tulip (2014), the real cost of housing (RCH) equals the sum of mortgage payments in real terms, opportunity cost of owning a house, direct cost of owning a house minus dwelling appreciation. In real terms, it may be stated in the following equation:

$$\text{RCH} = P\alpha r^m + P(1 - \alpha)r^e + P(r + t + pt) - Pra$$

Where

P = house price at start of year

α = mortgage loan as percentage of house price

$r^m =$ real mortgage rate

$r^e =$ real rate of return after tax on owner's equity foregone

$r =$ annual running cost as percentage of house price

$t =$ annual transaction cost incurred as percentage of house price

$pt =$ annual property tax incurred as percentage of house price

$ra =$ real appreciation for a constant quality home as percentage of house price

There are two approaches when calculating the real user cost of housing, namely ex ante and ex post measures. Both of them serve different purposes when it comes to housing affordability

analysis. An ex ante measure prevents negative values as housing consumption decisions are based on decisions on dwelling consumption that are based on costs previously incurred (Diewert 2003). However, it does not provide evidence of the housing cost that property owners actually paid and user cost is often measured in the form of expected value (Brown et al. 2011). In contrast, observed amounts are used when using the ex post measure. Looking at the history of house price movements, it helps understand the impacts of economic policies which can eventually provide an insight on future decisions (Brown et al. 2011). Therefore, different measures have their own advantages and both approaches are proposed in empirical analyses. For instance, Verbrugge (2008) addressed this issue and found that an ex ante user cost measurement is an appropriate measure for owner costs in the US due to a great divergence of rents and ex ante user costs.

This approach acts as an improvement relative to the ratio and residual approaches. The user cost approach takes into account the ongoing costs of housing, such as maintenance, that the ratio and residual approaches ignore. Therefore, the user cost approach is able to provide a more realistic picture of housing affordability than the ratio and residual approaches.

However, there are drawbacks of the real user cost of housing that have to be addressed. Firstly, the real user cost of housing ignores travel to work costs. Households may trade housing costs for commuting costs. If two households share similar incomes and consumption patterns and one spends more on housing and less on commuting, the latter is presumably as well off as the household who spend less on housing and more on commuting.

Secondly, affordability measures based on median prices and incomes are unlikely to reflect significant differences between existing and first home owners. Existing home owners are often able to purchase a dwelling with higher value which allows them to enjoy lower real costs of

housing compared to first home owners. Therefore, dwelling prices and incomes have to be chosen carefully when examining the housing affordability problem for first home buyers.

3.4 Conclusion

This chapter has provided an account of the various approaches for the measurement of housing affordability. After reviewing housing affordability approaches from different perspectives, no universally accepted measure can be found.

In this study, housing affordability measures can generally be divided into three categories: the ratio approach, the residual income approach and the user cost approach. Although shortcomings for each indicator have been identified, one of them plays a significant role in depicting the housing affordability problem.

Chapter 4: Descriptive analysis of the Sydney housing market

4.1 Introduction

Deteriorating housing affordability is a matter of economic, social and policy concern. The Productivity Commission has addressed the housing affordability issue and uncovered that increasing house prices were primarily caused by an excess demand, which was induced by limited housing supply growth and strong population (Productivity Commission 2004). As a result, these two factors result in persisting dwelling price inflation and continuing rental increase which ultimately give rise to the increase in housing cost. Given the limited wage growth, the issue of housing affordability has intensified as the increase in wage growth cannot catch up with the surging housing cost.

Factors affecting housing affordability play an important role in addressing the affordability issue. The evolution of those variables can even provide some clue in explaining the current situation of housing affordability. Therefore, this chapter presents a descriptive analysis of variables that are observed to play a role in explaining housing affordability in the Sydney housing market at the Local Government Areas (LGA). Those variables include 1) property sales prices; 2) rental prices; 3) housing approval and completion; 4) population; 5) household income.

4.2 Coverage of Local Government Areas (LGAs)

This study involves 43 LGAs as defined in the 2011 Census dictionary and Map 4.2.1 shows the geographical location for each LGA respectively.

Map 4.2.1 List of Local Government Areas of 2011
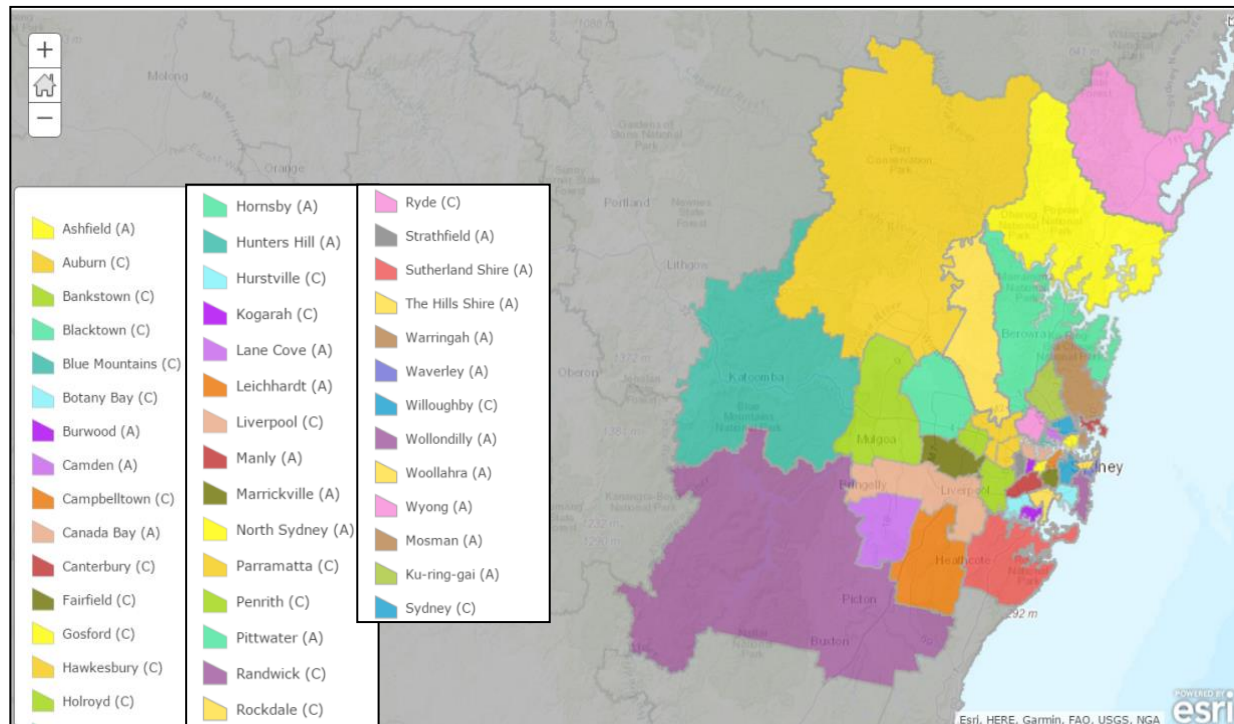
In 2016, the NSW government undertook council amalgamations to improve their efficiency. According to the report prepared by the Department of Premier and Cabinet, 20 new councils were formed (2017). As a result, the Australian Bureau of Statistics (ABS) has also created new boundaries for LGAs by briefly following the department guideline. Map 4.2.2 shows the updated list of Local Government Areas for 2016. Both types of classification for 2011 and 2016 will also be used in this research depending on data grouping. In order to facilitate graphical presentation, LGAs are grouped into 13 categories as shown in Table 4.2.3.
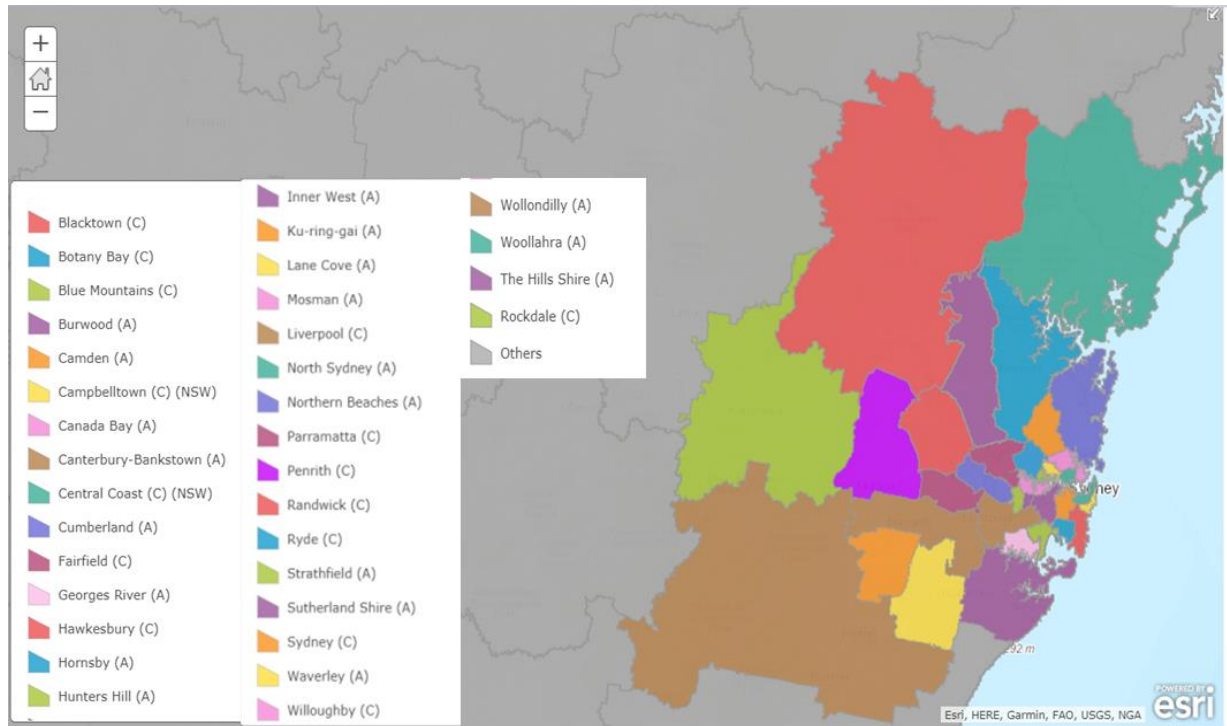
Map 4.2.2 Local Government Areas of 2016

Table 4.2.3 Grouping of LGAs

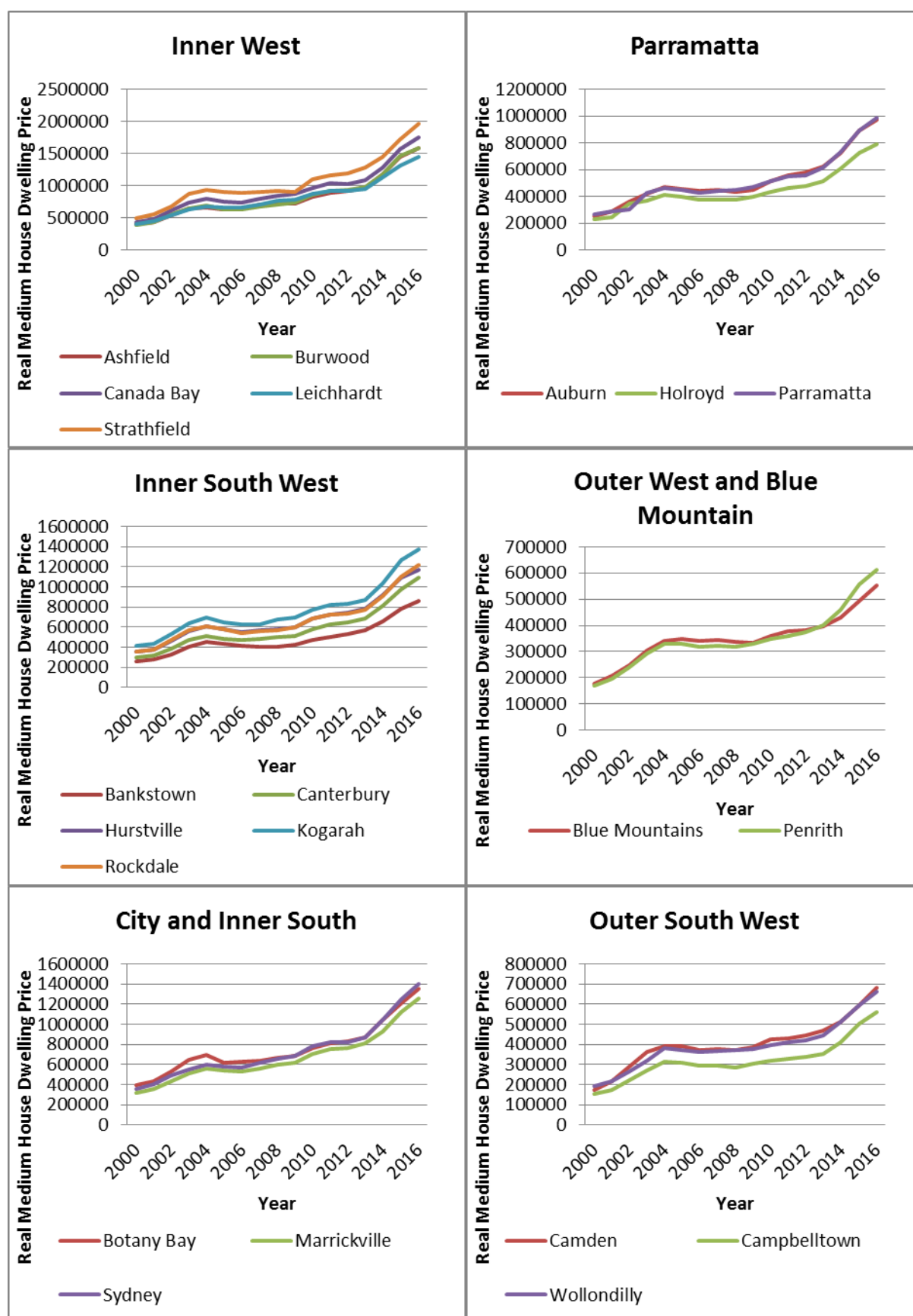| Inner West | Ashfield | Inner South West | Bankstown |
	Burwood		Canterbury
	Canada Bay		Hurstville
	Leichhardt		Kogarah
	Strathfield		Rockdale
Parramatta	Auburn	Outer West and Blue Mountains	Blue Mountains
	Holroyd		Penrith
	Parramatta		
City and Inner South	Botany Bay	Outer South West	Camden
	Marrickville		Campbelltown
	Sydney		Wollondilly
South West	Fairfield	North Sydney and Hornsby	Hornsby
	Liverpool		Ku-ring-gai
	Sutherland		Lane Cove
			Mosman
			North Sydney
			Willoughby
Ryde	Hunters Hill	Central coast	Gosford
	Ryde		Wyong
Northern beaches	Manly	Eastern Suburbs	Randwick
	Warringah		Waverley
	Pittwater		Woollahra
Baulkham Hills, Hawkesbury and Blacktown	Hawkesbury		
	The Hills Shire		
	Blacktown		

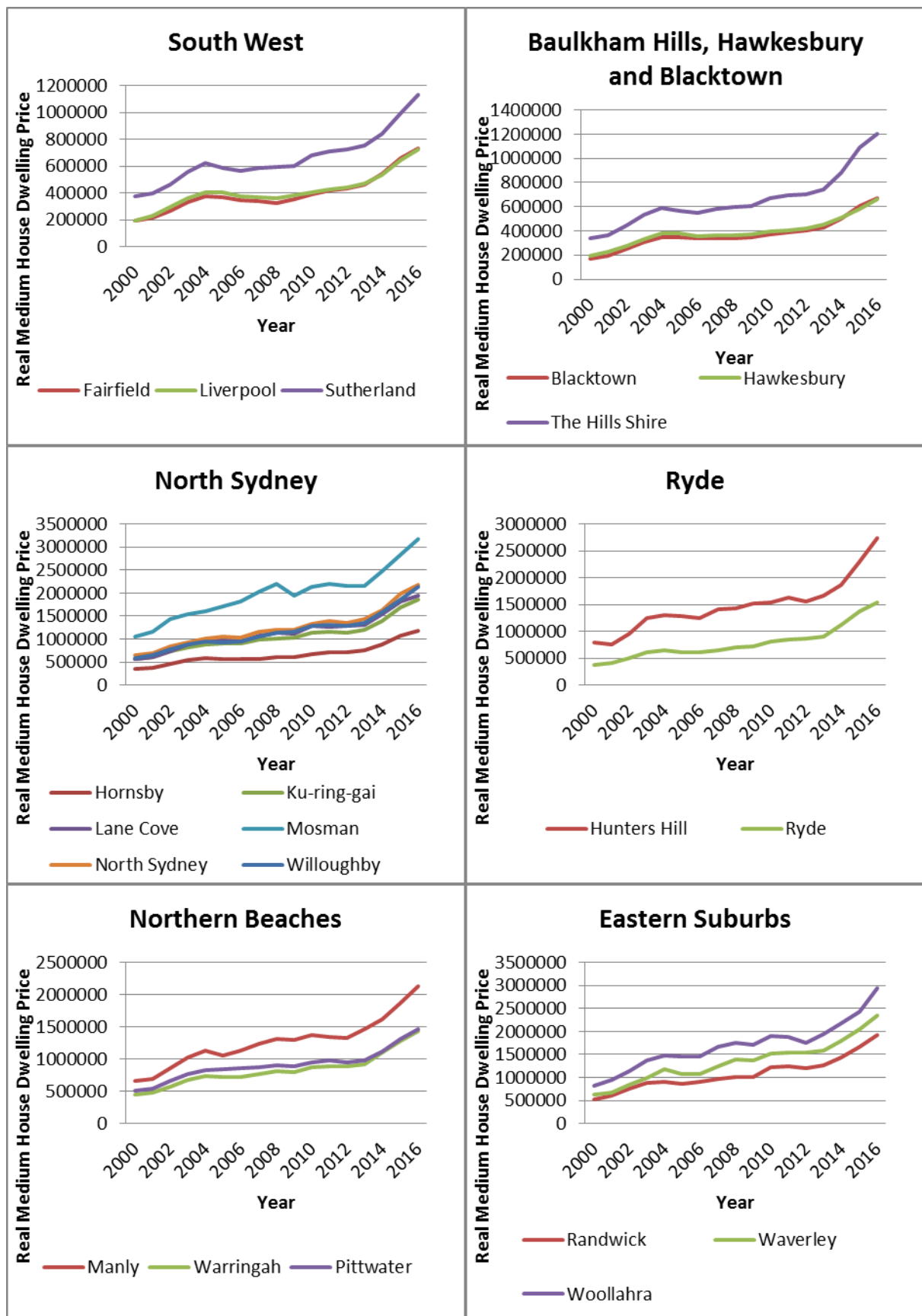*4.3 Dwelling prices for houses and units in Sydney Local Government Areas*

Dwelling prices are regarded as one of the factors affecting housing affordability. House prices are found to have a negative impact on housing affordability (DTZ Research 2004). In other words, higher prices are likely to result in reduced affordability, ceteris paribus. Therefore, regions which have higher prices are expected to be less affordable.
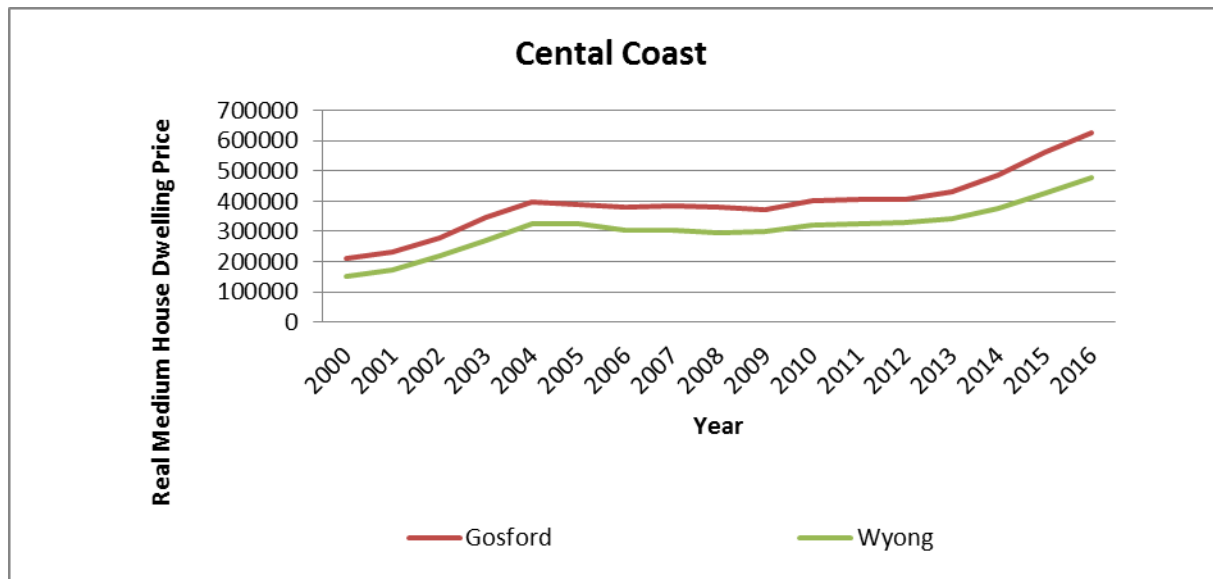
Graph 4.3.1 shows the median annual house prices for Sydney in real terms. Similar to units, LGAs in Sydney experienced an increase in house price from 2000 to 2016. Increasing house prices inevitably increased the opportunity cost of owning a house, thus leading to a decrease in housing affordability. In 2016, Mosman had the highest annual real price for houses with $3,169,207, followed by Woollahra with $2,949,344 and Hunters Hill with $2,738,152 while Wyong had the lowest real price of $476,602 followed by the Blue Mountains with $554,561 and Campbelltown with $560,714.

Graph 4.3.2 shows the median real annual unit prices for Sydney. The LGAs are grouped into 13 regions mainly following the classification from Australian Statistical Geography Standard definition of statistical area level 4 defined by the Australian Bureau of Statistics. Table A.1 in Appendix A shows the classification of LGAs for each group. In general, there was an increasing trend in unit prices from 2000 to 2016. In 2016, the LGA which had the highest median unit prices as of 2016 was Manly with $1,072,571 followed by Woollahra with $1,028,033 and Hunters Hill with $961,535 while Wollondilly had the lowest unit price of $339,490 followed by Wyong with $362,584 and Campbelltown with $413,752.
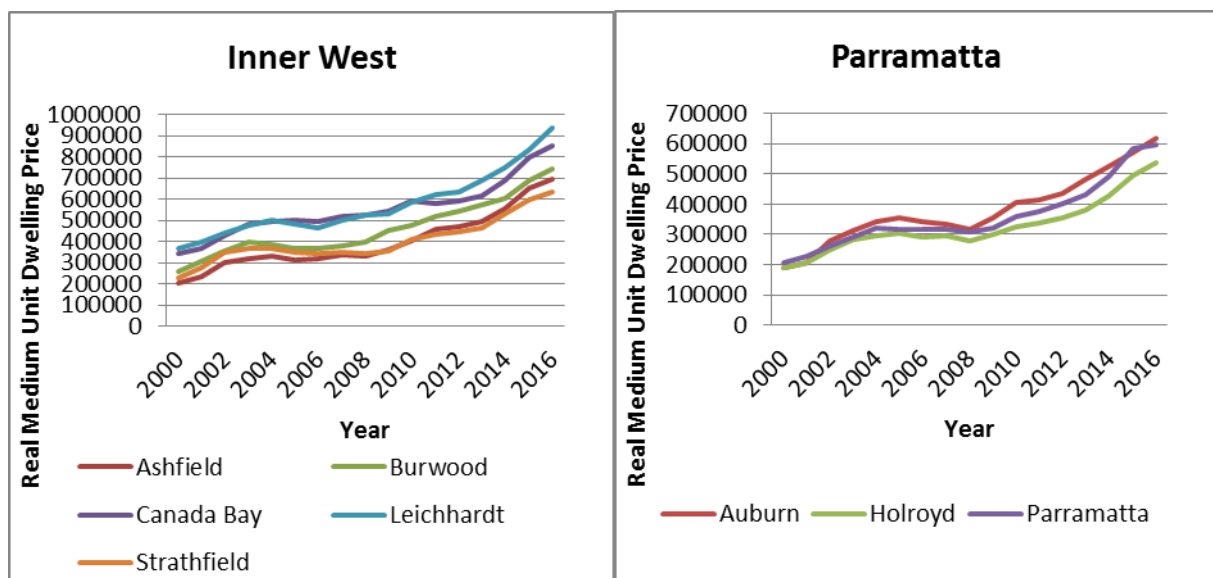
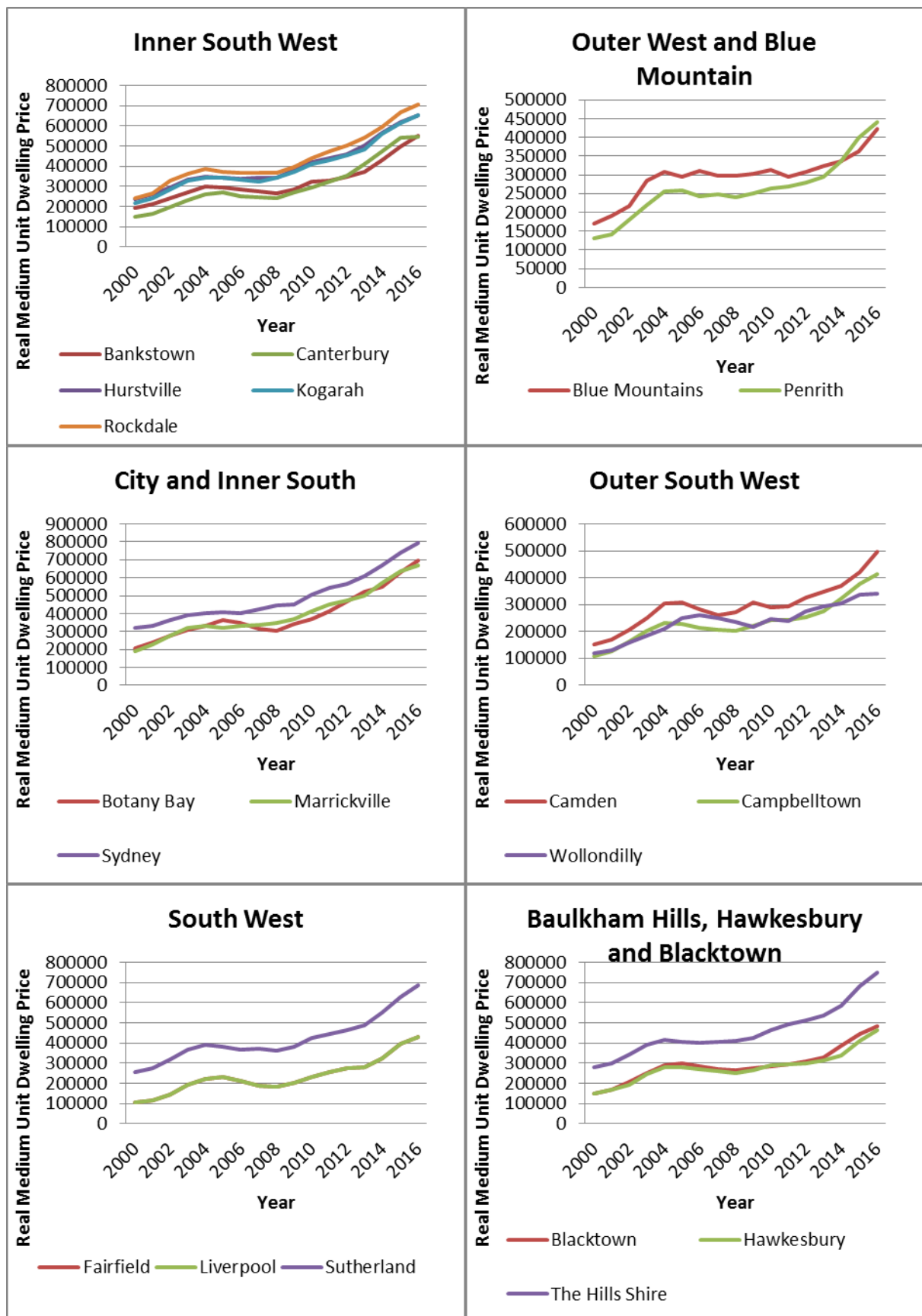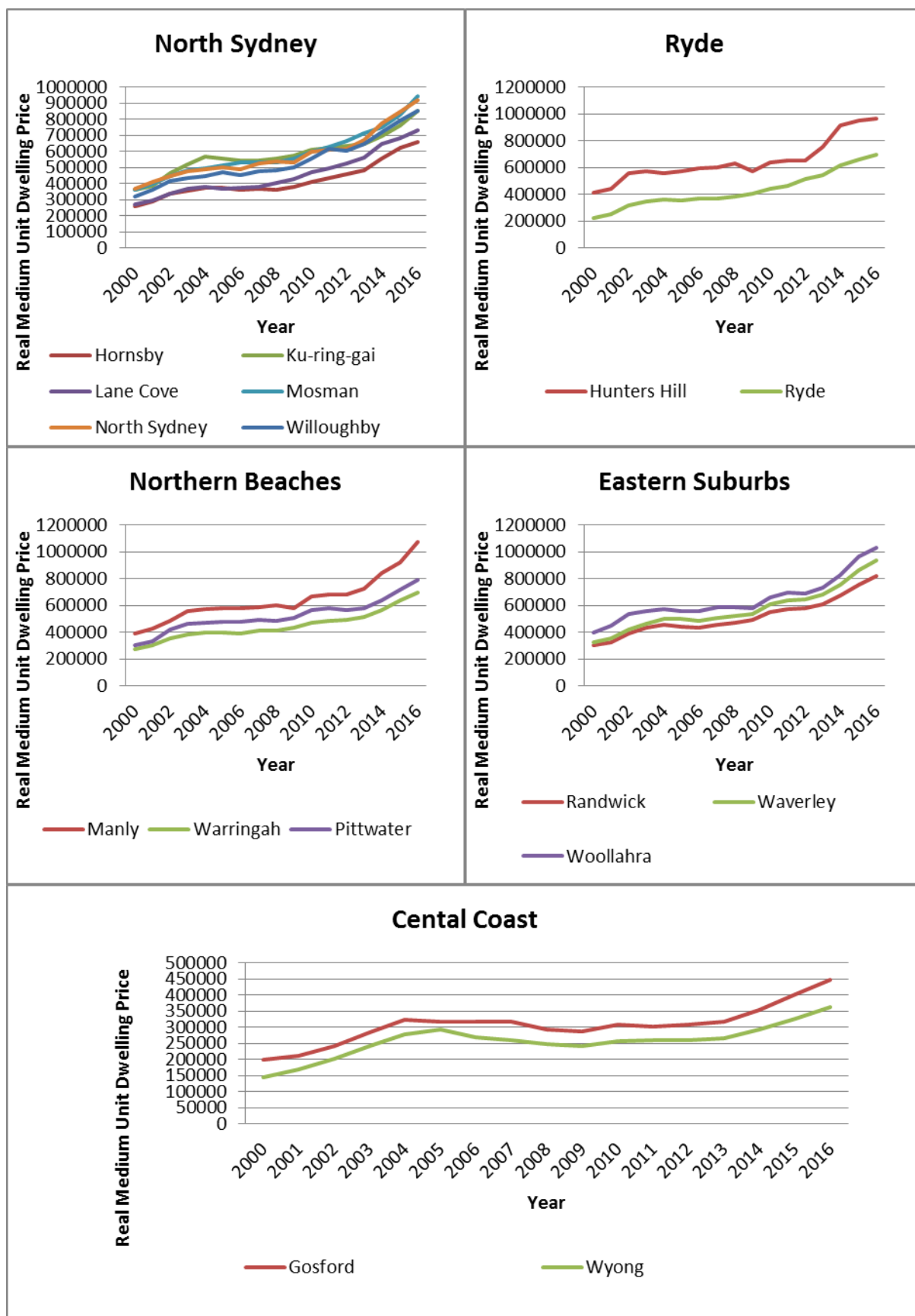Graphs 4.3.1 Median dwelling prices for houses in real terms from 2000 to 2016

Inner West

Legend: Ashfield, Burwood, Canada Bay, Leichhardt, Strathfield

Parramatta

Legend: Auburn, Holroyd, Parramatta

Inner South West

Legend: Bankstown, Canterbury, Hurstville, Kogarah, Rockdale

Outer West and Blue Mountain

Legend: Blue Mountains, Penrith

City and Inner South

Legend: Botany Bay, Marrickville, Sydney

Outer South West

Legend: Camden, Campbelltown, Wollondilly

South West

Real Medium House Dwelling Price vs Year

Legend: Fairfield, Liverpool, Sutherland

Baulkham Hills, Hawkesbury and Blacktown

Real Medium House Dwelling Price vs Year

Legend: Blacktown, Hawkesbury, The Hills Shire

North Sydney

Real Medium House Dwelling Price vs Year

Legend: Hornsby, Ku-ring-gai, Lane Cove, Mosman, North Sydney, Willoughby

Ryde

Real Medium House Dwelling Price vs Year

Legend: Hunters Hill, Ryde

Northern Beaches

Real Medium House Dwelling Price vs Year

Legend: Manly, Warringah, Pittwater

Eastern Suburbs

Real Medium House Dwelling Price vs Year

Legend: Randwick, Waverley, Woollahra

Cental Coast

Graph 4.3.2 Median dwelling prices for units in real terms from 2000 to 2016

Inner West

Parramatta

Inner South West

Real Medium Unit Dwelling Price vs Year (2000–2016)

Legend: Bankstown, Canterbury, Hurstville, Kogarah, Rockdale

Outer West and Blue Mountain

Real Medium Unit Dwelling Price vs Year (2000–2016)

Legend: Blue Mountains, Penrith

City and Inner South

Real Medium Unit Dwelling Price vs Year (2000–2016)

Legend: Botany Bay, Marrickville, Sydney

Outer South West

Real Medium Unit Dwelling Price vs Year (2000–2016)

Legend: Camden, Campbelltown, Wollondilly

South West

Real Medium Unit Dwelling Price vs Year (2000–2016)

Legend: Fairfield, Liverpool, Sutherland

Baulkham Hills, Hawkesbury and Blacktown

Real Medium Unit Dwelling Price vs Year (2000–2016)

Legend: Blacktown, Hawkesbury, The Hills Shire

North Sydney

Legend: Hornsby, Ku-ring-gai, Lane Cove, Mosman, North Sydney, Willoughby

Ryde

Legend: Hunters Hill, Ryde

Northern Beaches

Legend: Manly, Warringah, Pittwater

Eastern Suburbs

Legend: Randwick, Waverley, Woollahra

Cental Coast

Legend: Gosford, Wyong

4.3.1 Percentage change for real property prices from 2001 to 2016

Graph 4.3.3 shows a rapid percentage increase for real house prices from 2001 to 2016. Quigley and Raphael (2004) examined the effect of property prices on housing affordability and found smaller percentage changes in dwelling price will help improve housing affordability. Graph 4.3.3 shows that most LGAs had a percentage increase in house prices of 180% from 2001 to 2016. The three LGAs with the largest percentage increase in house prices were Ryde with 276%, Burwood with 268% and Ashfield with 266% while the Blue Mountains had the lowest percentage increase of 167% followed by 168% in Gosford and 174% in Mosman. LGAs which experienced higher percentage increases in unit price were likely to suffer from housing affordability deterioration.

Similar results are found when looking at percentage change of median property price for units. With reference to Graph 4.3.4, median property prices for houses for most LGAs increased by 120% from 2001 to 2016. Fairfield and Liverpool had the highest percentage increase for unit price with 276% followed by Canterbury with 235% while Gosford had the lowest percentage increase in real unit price with 113% followed by Wyong with 115% and Hunters Hill with 119%.

Graph 4.3.3 Percentage change property prices for houses

Percentage change of real median prices for houses from 2001 to 2016
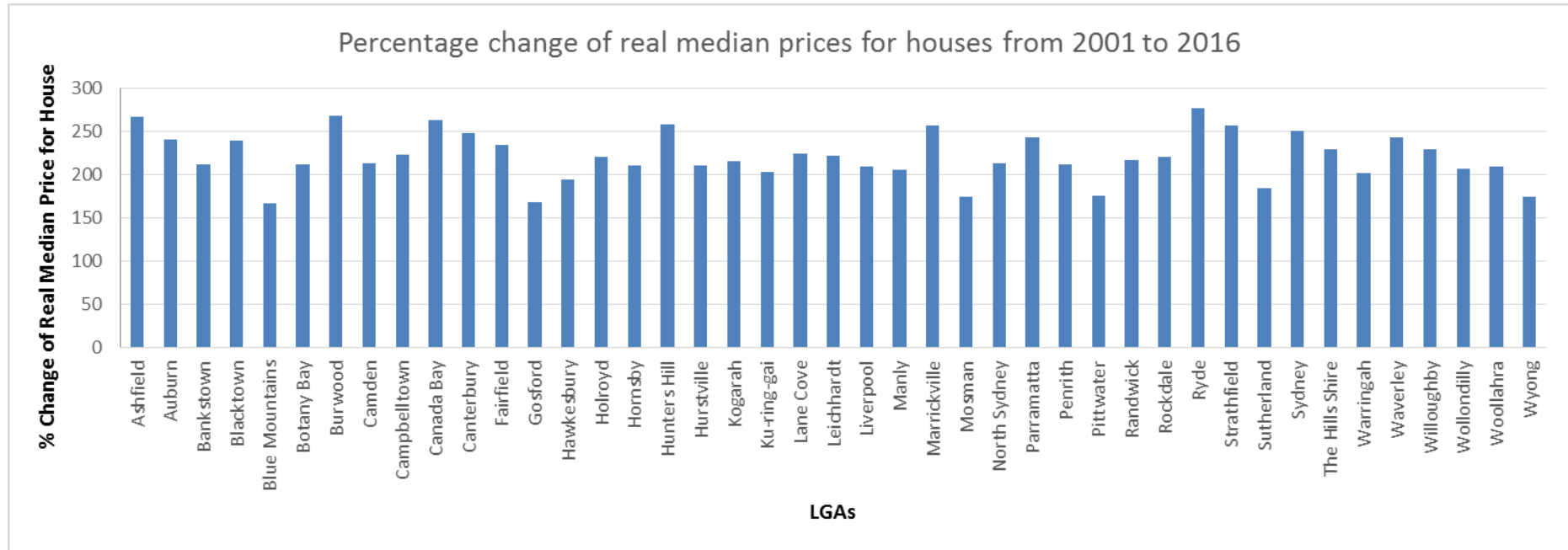
Source: SIRCA CoreLogic Data.

Graph 4.3.4 Percentage change property prices for units

Percentage change of real median prices for units from 2001 to 2016
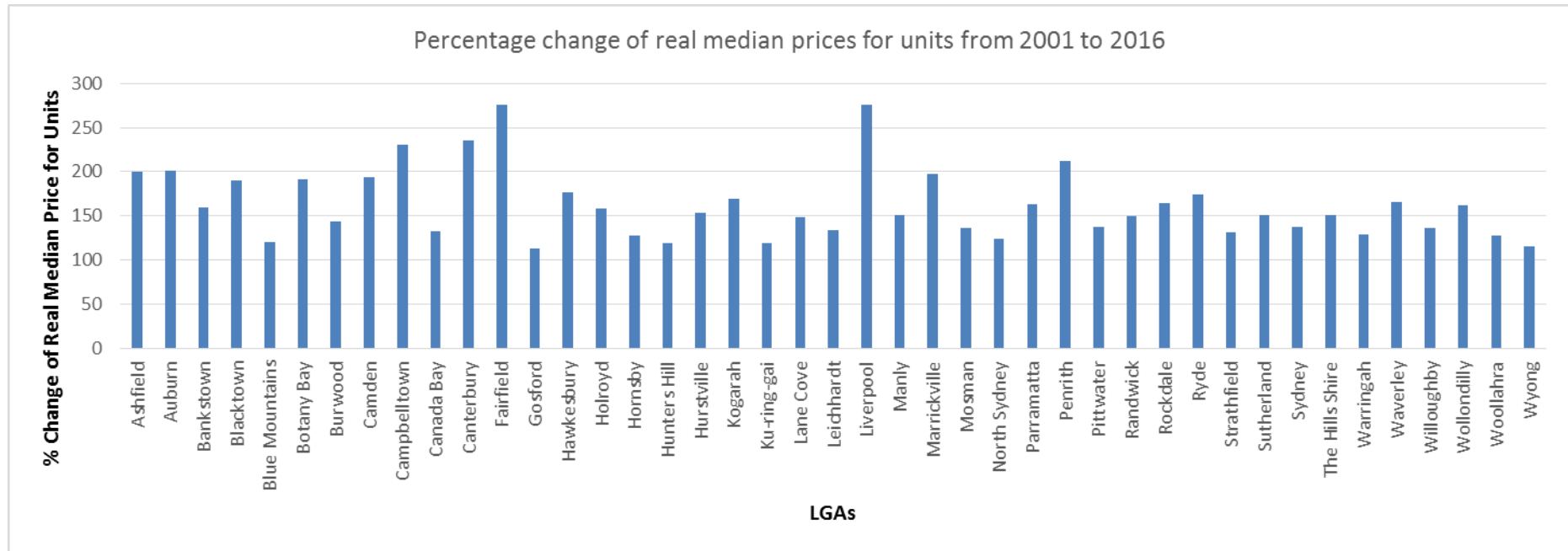
Source: SIRCA CoreLogic Data.

4.4 Rental performance for houses and units in Sydney Local Government Areas

In order to provide a better picture of rental movement in Sydney Local Government Areas, rental performance for houses and units are presented in real term from 2005 to 2016. With reference to Graph 4.4.1, there was an increasing trend in real house rent for all Sydney LGAs. In 2016, Mosman was the most expensive LGA with the real weekly rent being $1567 followed by Manly with $1285 and Woollahra with $1176 while Wyong had the cheapest rent with $394 followed by Campbelltown with $415 and the Blue Mountains with $421.

Similar trends were found when looking at the real rent for units. With reference to Graph 4.4.2, Manly was the LGA which had the highest median weekly rent in 2016 with $689 followed by Waverley with $682 and Woollahra with $659 while Wollondilly had the lowest median rent of $335 followed by Fairfield with $341 and Wyong with $345.

Graph 4.4.1 Rent for houses in real term from 2005 to 2016

Inner South West

Real Medium House Weekly Rent vs Year (2005–2016)

Legend: Bankstown, Canterbury, Hurtsville, Kogarah, Rockdale

Outer West and Blue Mountain

Real Medium House Weekly Rent vs Year (2005–2016)

Legend: Blue Mountains, Penrith

City and Inner South

Real Medium House Weekly Rent vs Year (2005–2016)

Legend: Botany Bay, Marrickville, Sydney

Outer South West

Real Medium House Weekly Rent vs Year (2007–2016)

Legend: Camden, Campbelltown, Wollondilly

South West

Real Medium House Weekly Rent vs Year (2005–2016)

Legend: Fairfield, Liverpool, Sutherland

Baulkham Hills, Hawkesbury and Blacktown

Real Medium House Weekly Rent vs Year (2005–2016)

Legend: Blacktown, Hawkesbury, The Hills Shire

Source: SIRCA CoreLogic Data.

Graph 4.4.2 Rent for units in real terms

Inner West

Real Medium Unit Weekly Rent vs Year (2005–2016)

Legend: Ashfield, Burwood, Canada Bay, Leichhardt, Strathfield

Parramatta

Real Medium Unit Weekly Rent vs Year (2005–2016)

Legend: Auburn, Holroyd, Parramatta

Outer West and Blue Mountain

Real Medium Unit Weekly Rent vs Year (2006–2016)

Legend: Blue Mountains, Penrith

Inner South West

Real Medium Unit Weekly Rent vs Year (2005–2016)

Legend: Bankstown, Canterbury, Hurstville, Kogarah, Rockdale

City and Inner South

Real Medium Unit Weekly Rent vs Year (2005–2016)

Legend: Botany Bay, Marrickville, Sydney

Outer South West

Real Medium Unit Weekly Rent vs Year (2007–2016)

Legend: Camden, Campbelltown, Wollondilly

South West

Real Medium Unit Weekly Rent vs Year (2005–2016)

Legend: Fairfield, Liverpool, Sutherland

Baulkham Hills, Hawkesbury and Blacktown

Real Medium Unit Weekly Rent vs Year (2005–2016)

Legend: Blacktown, Hawkesbury, The Hills Shire

Cental Coast

Real Medium Unit Weekly Rent vs Year (2005–2016)

Legend: Gosford, Wyong

North Sydney

Real Medium Unit Weekly Rent vs Year (2005–2016)

Legend: Hornsby, Ku-ring-gai, Lane Cove, Mosman, North Sydney, Willoughby

Ryde

Real Medium Unit Weekly Rent vs Year (2005–2016)

Legend: Hunters Hill, Ryde

Northern Beaches

Real Medium Unit Weekly Rent vs Year (2005–2016)

Legend: Manly, Warringah, Pittwater

4.4.1 Percentage change of real rent for dwellings from 2006 to 2016[1]

When comparing the two graphs showing the percentage change of real rent for units and houses respectively from 2006 to 2016, a common trend is shown. Graph 4.4.3 shows the percentage change of rent for houses and most of them are found to have increased by at least 60% in 10 years. Manly had the largest percentage increase in house rent with 108% followed by Marrickville with 102% and Botany Bay with 98% while Hunters Hill had the lowest percentage increase with 57% followed by Lane Cove with 61% and Pittwater with 65%.

Percentage change in rent for units also shares a common characteristic. Graph 4.4.4 shows most LGAs had a percentage change of rent for units above 50%. Marrickville had the highest percentage increase with 102% followed by Canterbury with 101% and the Blue Mountains with 100% while Hunters Hill had the smallest percentage increase in rent of 49% followed by Fairfield with 60% and Auburn with 63%.

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[1] Real rent data for Wollondilly is only available from 2007, therefore no result is found when looking at the percentage change of units rent from 2006 to 2016.

Graph 4.4.3 Percentage change of rent for houses between 2006 and 2016

Percentage change of real rent for houses from 2006 to 2016

(Bar chart. Y-axis: % Change of Real House Rent, ranging 0 to 120. X-axis: LGAs)
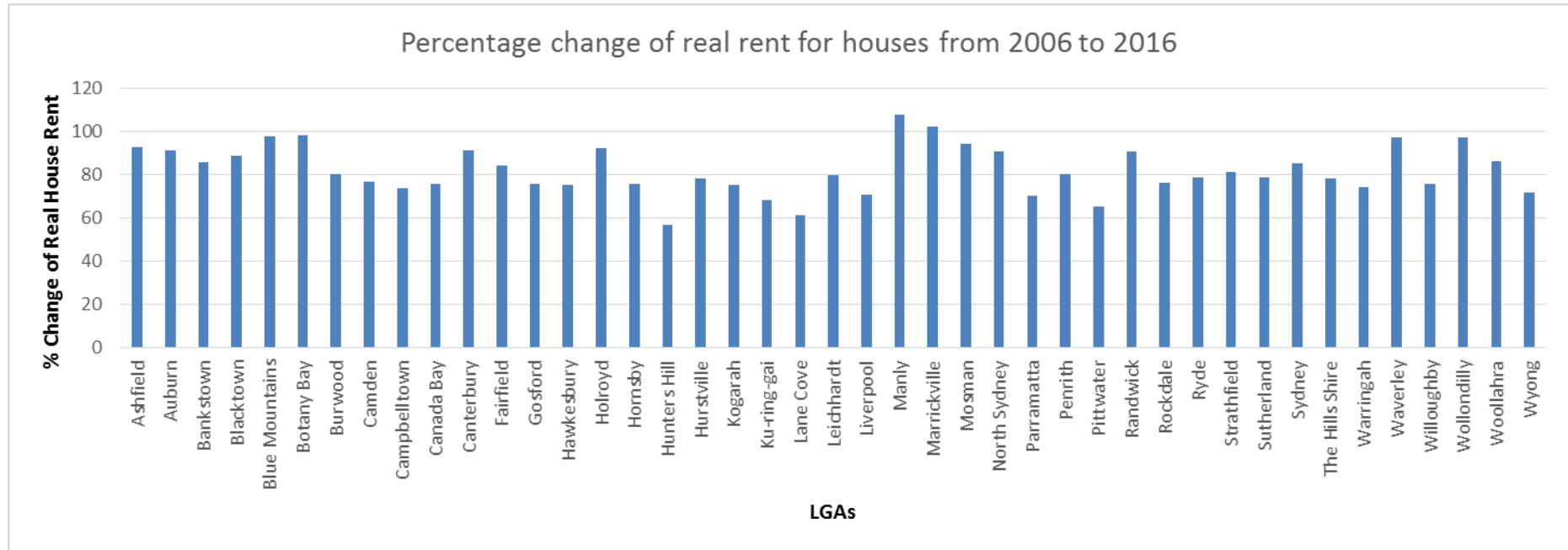
Graph 4.4.4 Percentage change of rent for units between 2006 and 2016
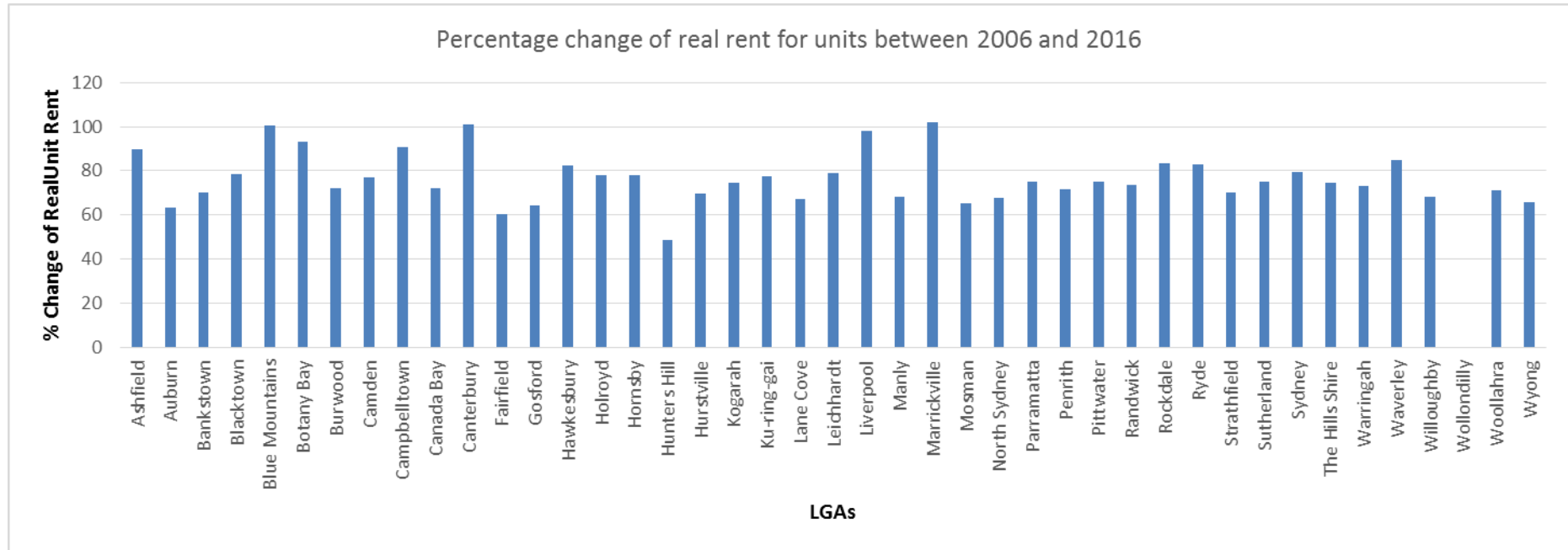
Source: SIRCA CoreLogic Data

4.4.2 Percentage change of real rent for dwellings from 2011 to 2016

When comparing the two graphs showing the percentage change of real rent for units and houses respectively from 2006 to 2016, a common trend is shown. Graph 4.4.5 shows the percentage change of rent for houses and most of them are found to have increased by at least 15% in 5 years. Manly had the largest percentage increase of house rent with 36% followed by Waverley with 34% and Marrickville with 33% while Hunters Hill had the lowest percentage increase with 7% followed by Parramatta and Fairfield with 15% each.

Percentage change of rent for units also shares a common characteristic. Graph 4.4.6 shows the percentage change of rent for units and all LGAs were above 15%. The Blue Mountains had the highest percentage increase of rent for units with 36% followed by Wollondilly with 35% and Hunters Hill with 30% while Woollahra, Ku-ring-gai and Blacktown had the smallest percentage increase in rent of 17% each.

Graph 4.4.5 Percentage change of real rent for houses between 2011 and 2016

Percentage change of real rent for houses from 2011 to 2016
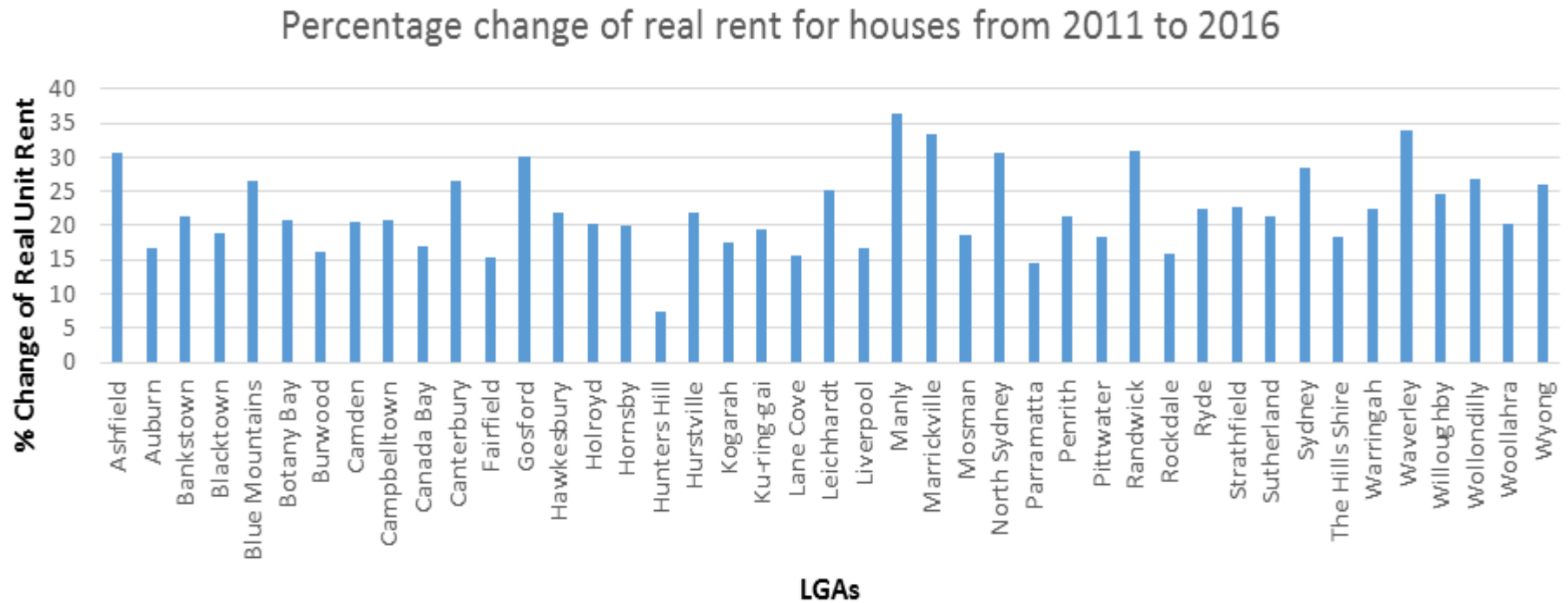
Graph 4.4.6 Percentage change of real rent for units between 2011 and 2016

Percentage change of real rent for units between 2011 and 2016
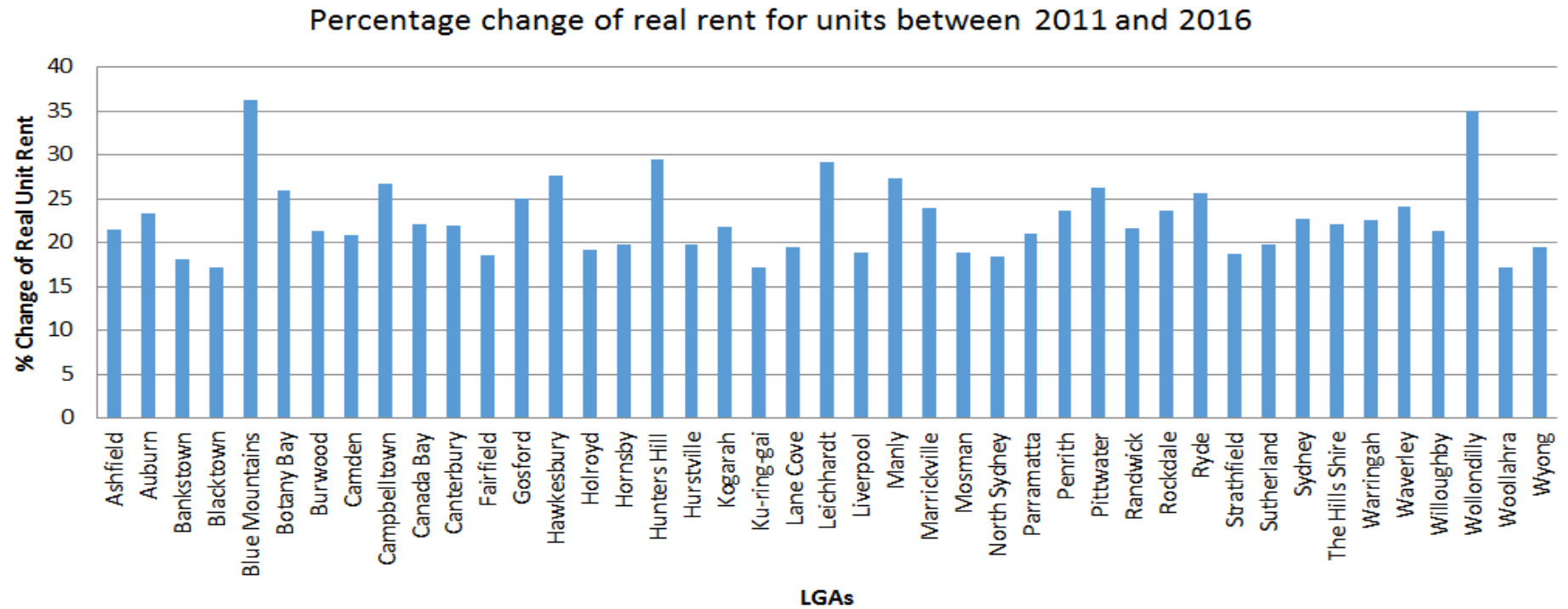
4.5 Price-to-rent ratio

Graph 4.5.1 shows price-to-rent ratio for houses for each LGA. When looking at price-to-yearly rent ratio for houses from 2005 to 2016 on a monthly basis, the Eastern Suburbs had the highest median price to yearly rent ratio (36.5385) followed by Inner West (35.1959). Strathfield was the LGA which had the highest median price to rent ratio during the observed period with 42.9941 followed by Woollahra with 40.0452, Hunters Hill with 38.4615, Randwick with 36.18693 and North Sydney with 35.9789.

Graph 4.5.2 provides an overview of price-to-rent ratio for units. When looking at price-to-yearly rent ratio for units from 2005 to 2016, the category of Ryde had the highest median price to yearly rent ratio during the sample period with 27.0655 followed by the group of North Sydney with 24.4755. Hunters Hill was the LGA which had the highest median price to rent ratio in the observed period followed by Mosman with 25.9844, Leichhardt with 25.9109, Manly with 25.5682 and Woollahra with 25.

Graphs 4.5.1 and 4.5.2 show a common trend of price to rent ratio for units and houses. Both graphs show that most regions experienced a decline in the price-to-rent ratio before 2009 and the ratio had started to increase since 2013. The increase in the ratio implies that the rate of rental increase is lower than the percentage increase in dwelling prices.

Graph 4.5.1: Price-to-rent ratio for houses

South West

Baulkham Hills, Hawkesbury and Blacktown

North Sydney

Ryde

Northern Beaches

Eastern Suburbs
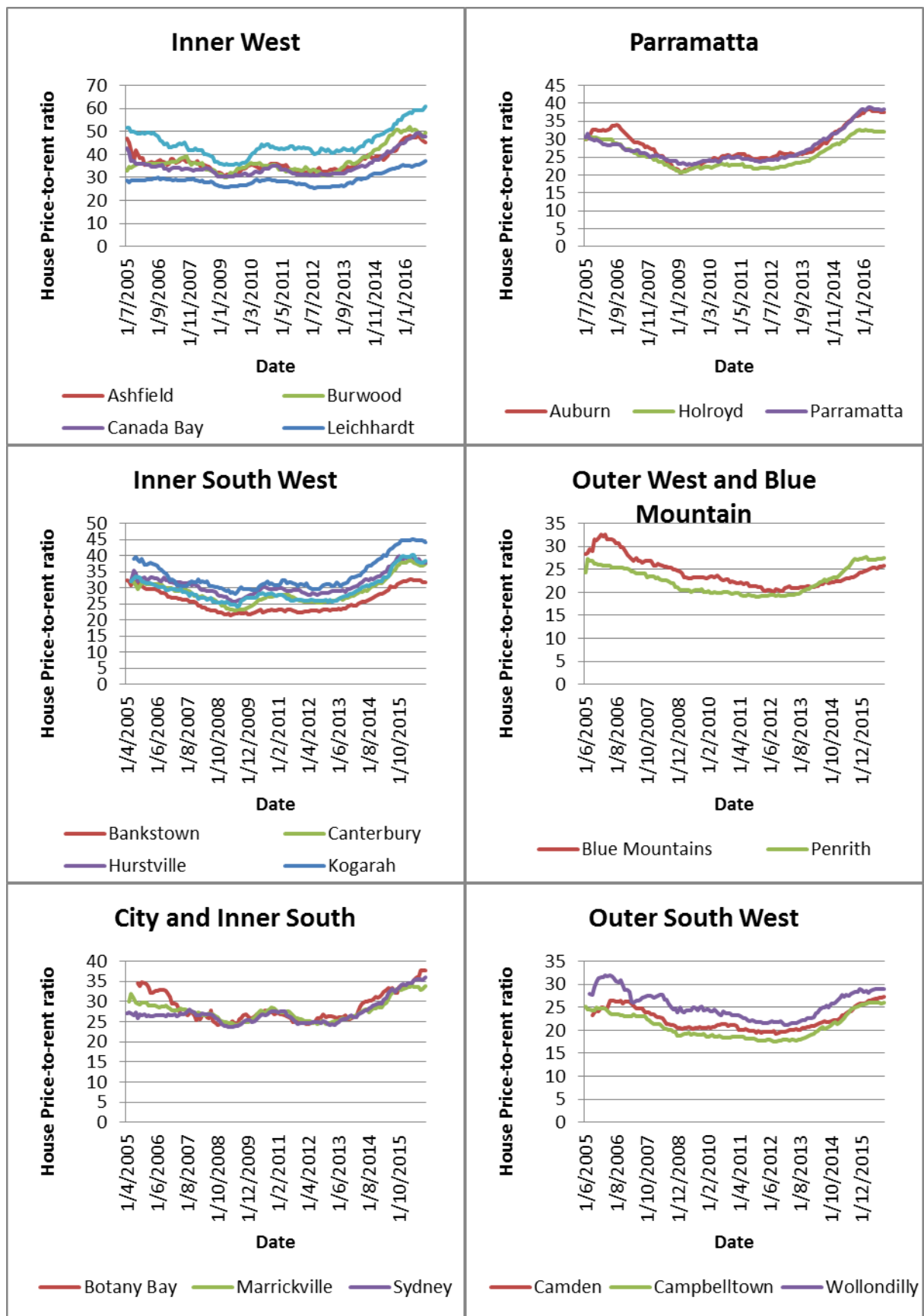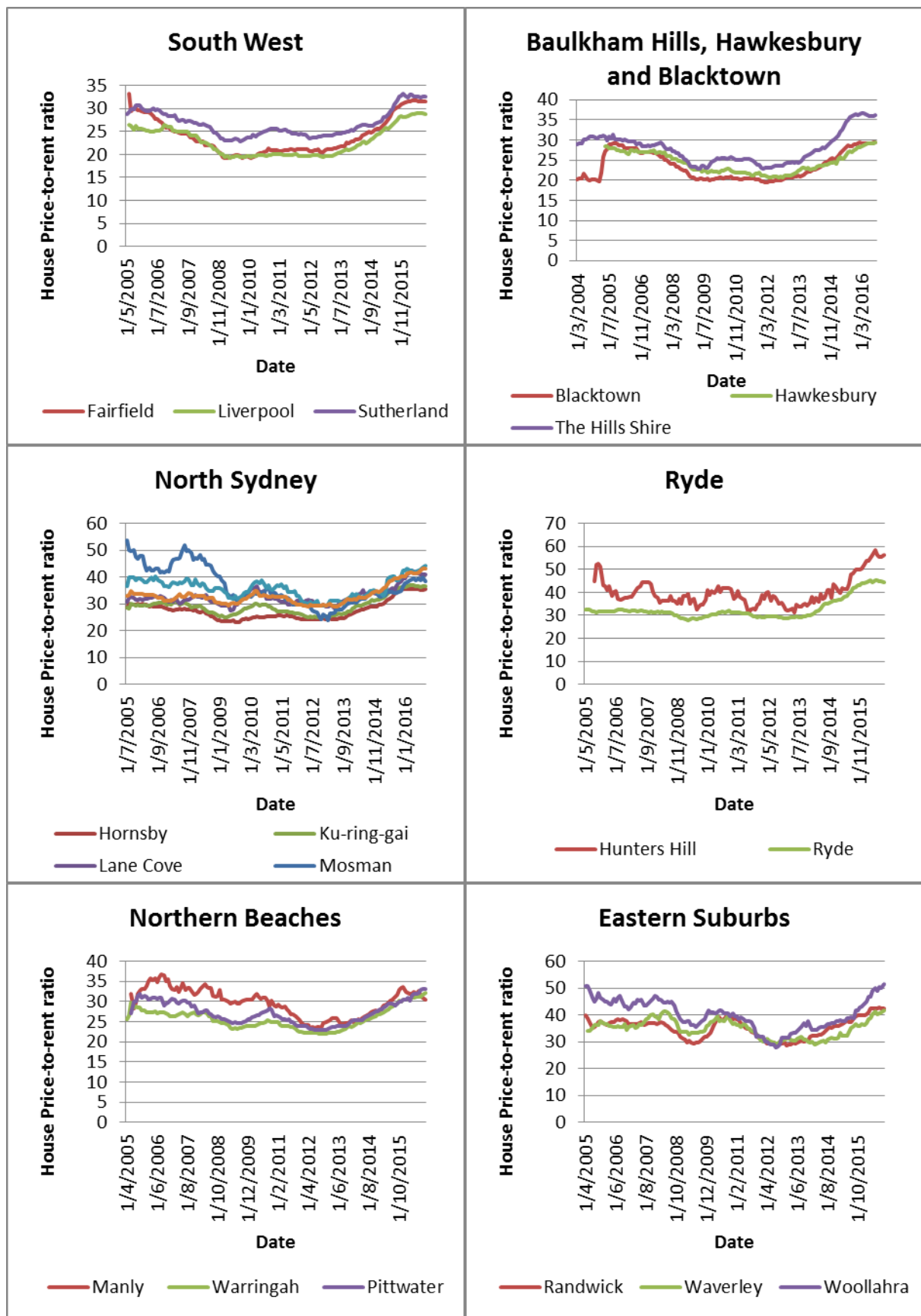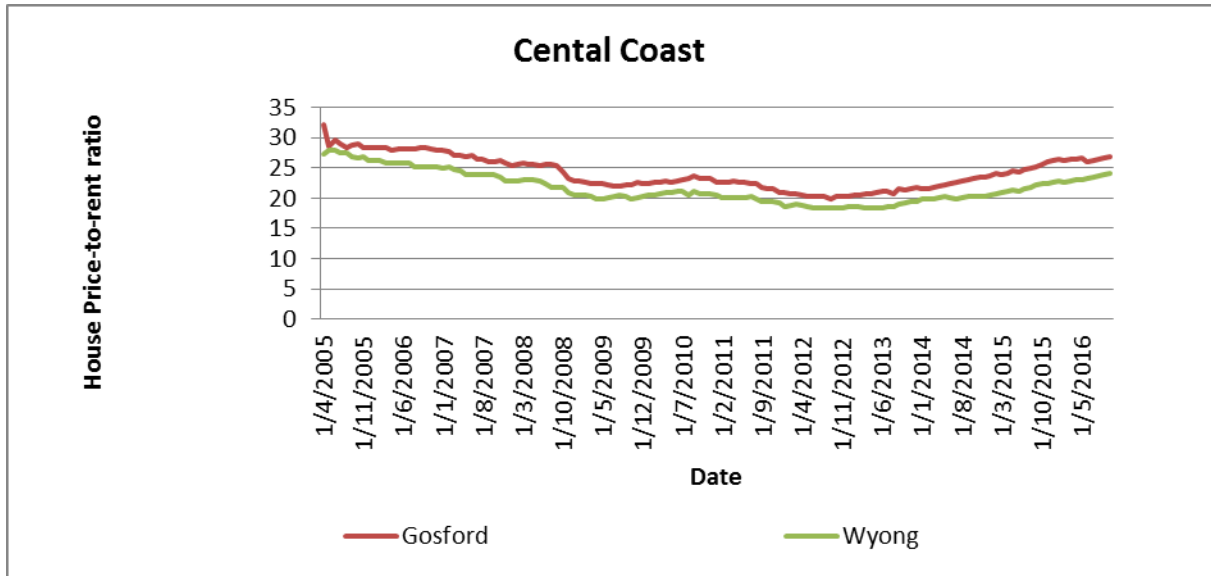
Source: SIRCA CoreLogic Data

■   Graph 4.5.2 Price-to-rent ratio for units

Inner South West

Unit Price-to-rent ratio vs Date

Legend: Bankstown, Canterbury, Hurstville, Kogarah

Outer West and Blue Mountain

Unit Price-to-rent ratio vs Date

Legend: Blue Mountains, Penrith

City and Inner South

Unit Price-to-rent ratio vs Date

Legend: Botany Bay, Marrickville, Sydney

Outer South West

Unit Price-to-rent ratio vs Date

Legend: Camden, Campbelltown, Wollondilly

South West

Unit Price-to-rent ratio vs Date

Legend: Fairfield, Liverpool, Sutherland

Baulkham Hills, Hawkesbury and Blacktown

Unit Price-to-rent ratio vs Date

Legend: Blacktown, Hawkesbury, The Hills Shire

North Sydney

Unit Price-to-rent ratio vs Date

Legend: Hornsby, Ku-ring-gai, Lane Cove, Mosman

Ryde

Unit Price-to-rent ratio vs Date

Legend: Hunters Hill, Ryde

Northern Beaches

Unit Price-to-rent ratio vs Date

Legend: Manly, Warringah, Pittwater

Eastern Suburbs

Unit Price-to-rent ratio vs Date

Legend: Randwick, Waverley, Woollahra

Cental Coast

Unit Price-to-rent ratio vs Date

Legend: Gosford, Wyong

4.6 Total number of dwellings in Local Government Areas

The number of dwellings in Local Government Areas shows a supply side effect on housing affordability. Areas with large numbers of dwellings generally imply higher dwelling supply. According to the fundamental theory of demand and supply, prices for those areas tend to be lower resulting in being more affordable.

Graph 4.6.1 shows the total number of houses for Sydney Local Government Areas from 2006 to 2016. As at 2016, the Central Coast has the largest number of houses (110094), followed by Blacktown with 95060, Canterbury-Bankstown with 78855, Penrith with 59355 and Sutherland Shire with 59073 while Hunters Hill has the smallest number of houses with 3534, followed by Mosman with 5238, Strathfield with 6107, Lane Cove with 6466 and Burwood with 6689. With reference to the graph, a flat trend is shown for most LGAs indicating that the numbers of houses have not changed dramatically for most areas. The median percentage change in number of houses from 2006 to 2016 was 2.85%. Camden had the highest percentage increase in houses with 54.7% followed by Wollondilly with 17.4% and Liverpool with 17.2%. On the other hand, it is important to note that some LGAs were observed to have percentage decreases in houses with North Sydney having the largest percentage decrease in number of houses with -6.1% followed by Waverley with -4.75% and Inner West with -1.04%.

Graph 4.6.2 presents an overview of the total number of apartments for Sydney Local Government Areas from 2006 to 2016. As of 2016, Sydney has the largest number of units with 65879, followed by Blacktown with 35994, Parramatta with 29082, Northern Beaches with 28497 and Randwick with 28104 while Wollondilly has the smallest number of units of 108, followed by Camden with 195, Hawkesbury with 491, the Blue Mountains with 582 and Hunters Hill with 1005. The median percentage change of apartments was 25.8%. During the observed period, Ku-ring-gai had the largest percentage increase of apartments with 128.3% followed by

Canada Bay with 84.5% and Campbelltown with 77.9%. Nevertheless, there are a few LGAs that

experienced a percentage decrease in units with Hawkesbury experiencing the largest

percentage decrease of 37.7%, followed by Wollondilly with -25.0% and Camden with -22.6%.

With reference to the two graphs 4.6.1 and 4.6.2 showing the total number of dwellings for

Sydney LGAs, Hunters Hill had a limited supply of houses and units. This partly explained the

reason why Hunters Hill experienced high price fluctuation.

Graph 4.6.1 Number of houses from 2006 to 2016

Inner South West

Number of House / Year

- Canterbury-Bankstown
- Georges River
- Rockdale

Outer West and Blue Mountains

Number of House / Year

- Blue Mountains
- Penrith

City and Inner South

Number of House / Year

- Botany Bay
- Sydney

Outer South West

Number of House / Year

- Camden
- Campbelltown
- Wollondilly

South West

Number of House / Year

- Fairfield
- Liverpool
- Sutherland

Baulkham Hills - Hawkesbury - Blacktown

Number of House / Year

- Blacktown
- Hawkesbury
- The Hills Shire

North Sydney and Hornsby

Legend: Hornsby, Ku-ring-gai, Lane Cove, Mosman, North Sydney, Willoughby

Ryde

Legend: Hunters Hill, Ryde

Northern Beaches

Legend: Northern Beaches

Eastern Suburbs

Legend: Randwick, Waverley, Woollahra

Central Coast

Legend: Central Coast

Source: Census Australian Bureau of Statistics

Graph 4.6.2 Number of units from 2006 to 2016

South West

Number of Unit vs Year

Fairfield — Liverpool — Sutherland

Baulkham Hills - Hawkesbury - Blacktown

Number of Unit vs Year

Blacktown — Hawkesbury — The Hills Shire

North Sydney and Hornsby

Number of Unit vs Year

Hornsby — Ku-ring-gai — Lane Cove — Mosman — North Sydney — Willoughby

Ryde

Number of Unit vs Year

Hunters Hill — Ryde

Northern Beaches

Number of Unit vs Year

Northern Beaches

Eastern Suburbs

Number of Unit vs Year

Randwick — Waverley — Woollahra

Source: Census Australian Bureau of Statistics

4.7 Total number of private dwelling completions for Sydney Local Government Areas

Graph 4.7.1 shows the number of net private dwelling completions for units from July 2012 to October 2016. Most LGAs had their monthly private dwelling completions confined to less than 400 units with Sydney having a high volume of private dwelling completions with the highest record of 1059 units completed in September 2014 followed by Rockdale with 643 units to be completed in November 2014 and Hurstville with 589 units in June 2016. Parramatta was found to have a large increase in unit completions from 95 units in July 2012 to 534 units in October 2016 which is consistent with the planning proposal for Parramatta CBD targeting to add 7,500 additional dwellings from 2011 to 2036 (Parramatta City Council 2016).

Graph 4.7.2 shows the number of net private dwelling completions of houses between July 2012 and October 2016. With reference to the graph, the median monthly record was 7 houses being completed for all LGAs with Camden having the largest amount of house completions with 502 houses in June 2016; 459 houses in December 2015 and 453 houses in March 2016.

Blacktown also had a high level of house completion with 405 houses being completed in March 2013. Liverpool had the third highest house completion record with 283 houses being completed in March 2013. These LGAs were located at the south-western and north-western part of Sydney which has available land for development.

Graph 4.7.1 Net private dwellings completion for units

Inner South West

Outer West and Blue Mountain

City and Inner South

Outer South West

Net Private Unit Dwellings Completion vs Date

Legend: Camden, Campbelltown, Wollondilly

South West

Net Private Unit Dwellings Completion vs Date

Legend: Fairfield, Liverpool, Sutherland

Baulkham Hills, Hawkesbury and Blacktown

Net Private Unit Dwellings Completion vs Date

Legend: Blacktown, Hawkesbury, The Hills Shire

North Sydney

Ryde

Northern Beaches

Eastern Suburbs

Randwick   Waverley   Woollahra

Cental Coast

Gosford   Wyong

Source: NSW Department of Planning and Environment.

Graph 4.7.2 Net dwelling completions for houses

Inner West

Net House Dwellings Completion

Legend: Ashfield, Burwood, Canada Bay, Leichhardt, Strathfield

Parramatta

Net House Dwellings Completion

Legend: Auburn, Holroyd, Parramatta

Inner South West

Net House Dwellings Completion

Legend: Bankstown, Canterbury, Hurstville, Kogarah, Rockdale

Outer West and Blue Mountain

City and Inner South

Outer South West

South West

Baulkham Hills, Hawkesbury and Blacktown

North Sydney

Source: NSW Department of Planning and Environment.

4.7.1 Percentage of dwelling completions on total dwellings as at October 2016

Graph 4.7.3 shows the percentage of unit completions on the total number of units as of October 2016. A mild percentage increase of unit completions on total units is shown with a median value of 0.1%. During the observation period, the LGA with the highest percentage increase of dwelling completions was Wollondilly with 8.4% in April 2016 followed by Botany Bay with 4.8% in December 2012 and Burwood with 4.6% in March 2013.

Graph 4.7.4 presents the percentage of house completions on the total number of houses as of October 2016. Camden had a high consistent record of house completion with 2.3% in June 2016 and 2.1% in December 2015 followed by Wollondilly with 0.9% in June 2015 and Liverpool with 0.6% in March 2013.

Graph 4.7.3 Percentage of unit completion on total units as at October 2016

Outer West and Blue Mountain

City and Inner South

Outer South West

South West

Baulkham Hills, Hawkesbury and Blacktown

North Sydney

Ryde — % of Unit Completion on Total Units vs Date (Hunters Hill, Ryde)

Northern Beaches — % of Unit Completion on Total Units vs Date (Manly, Warringah, Pittwater)

Eastern Suburbs — % of Unit Completion on Total Units vs Date (Randwick, Waverley, Woollahra)
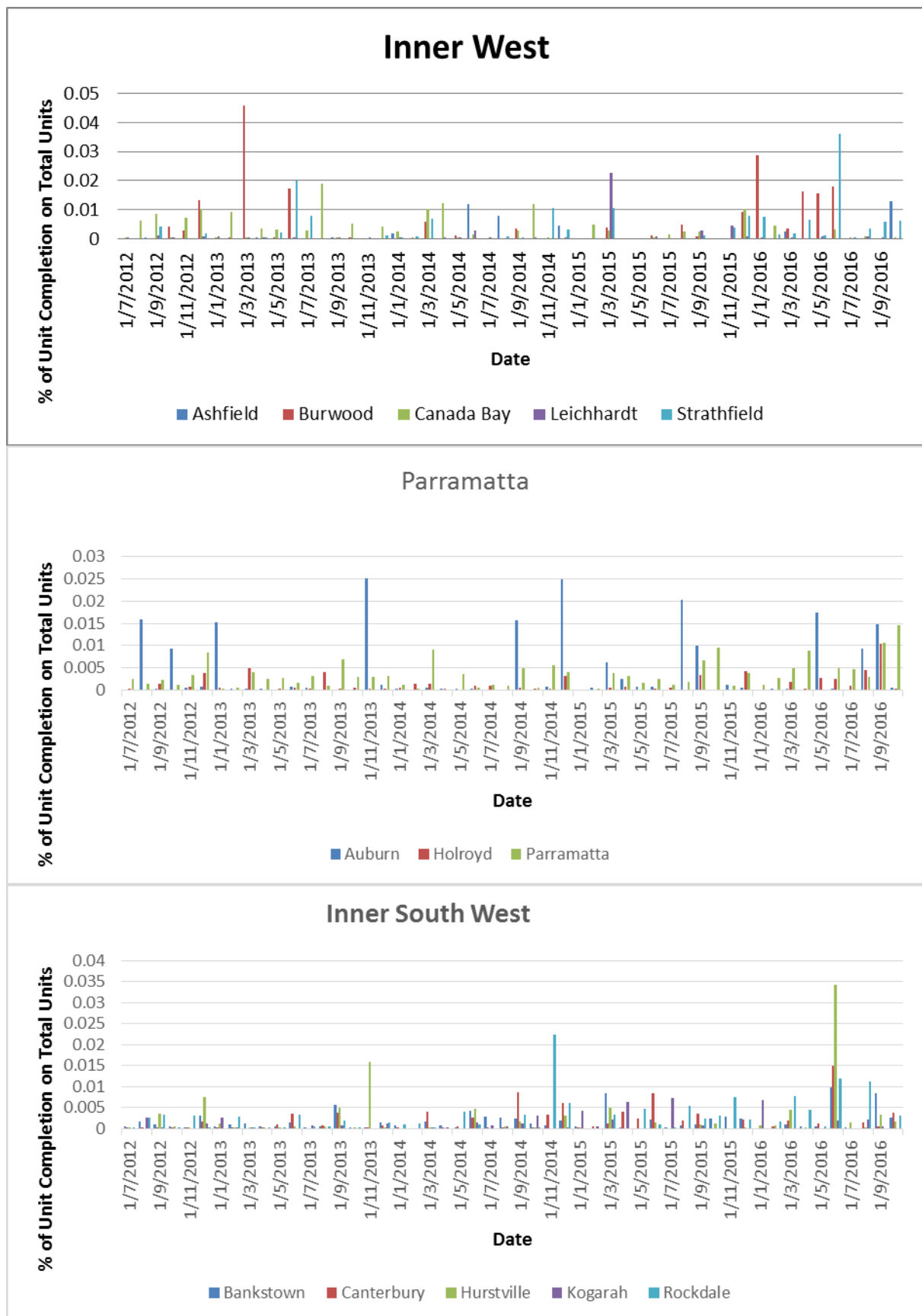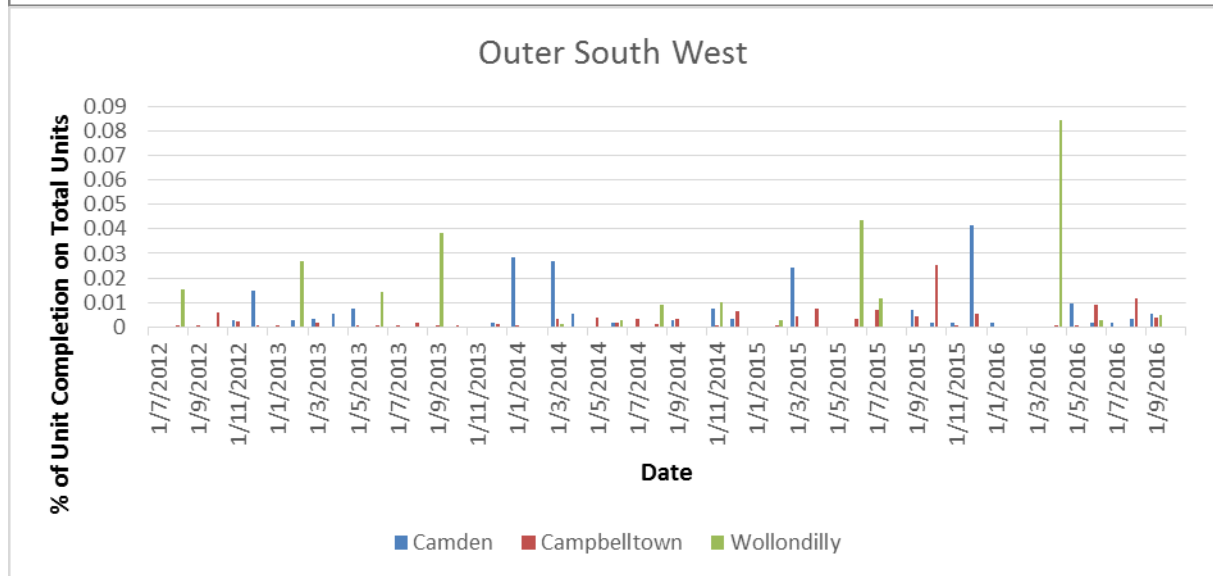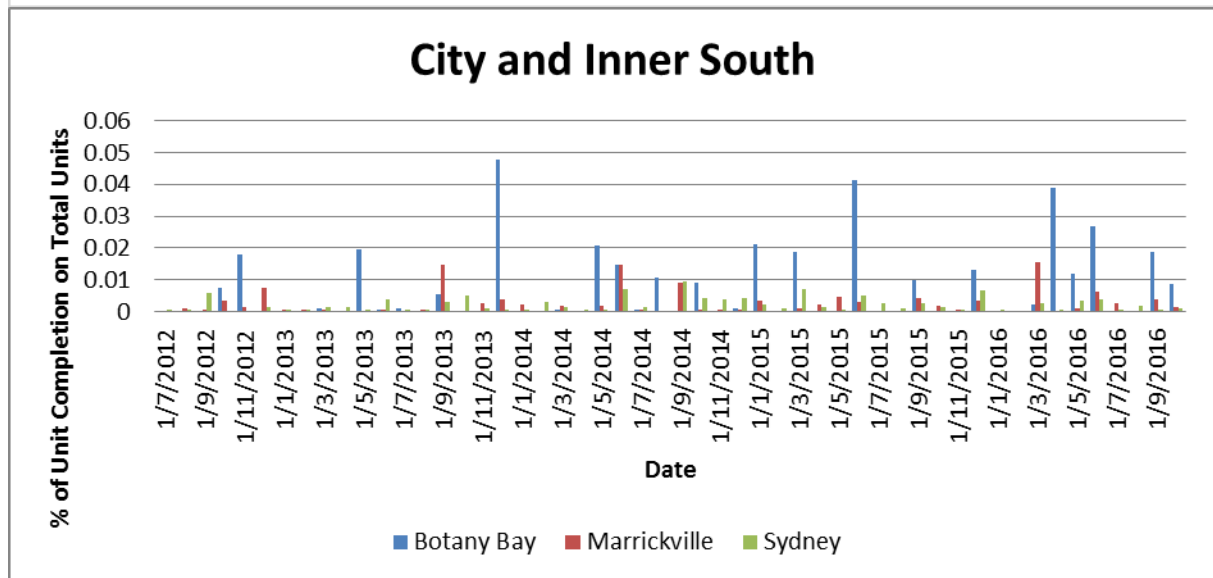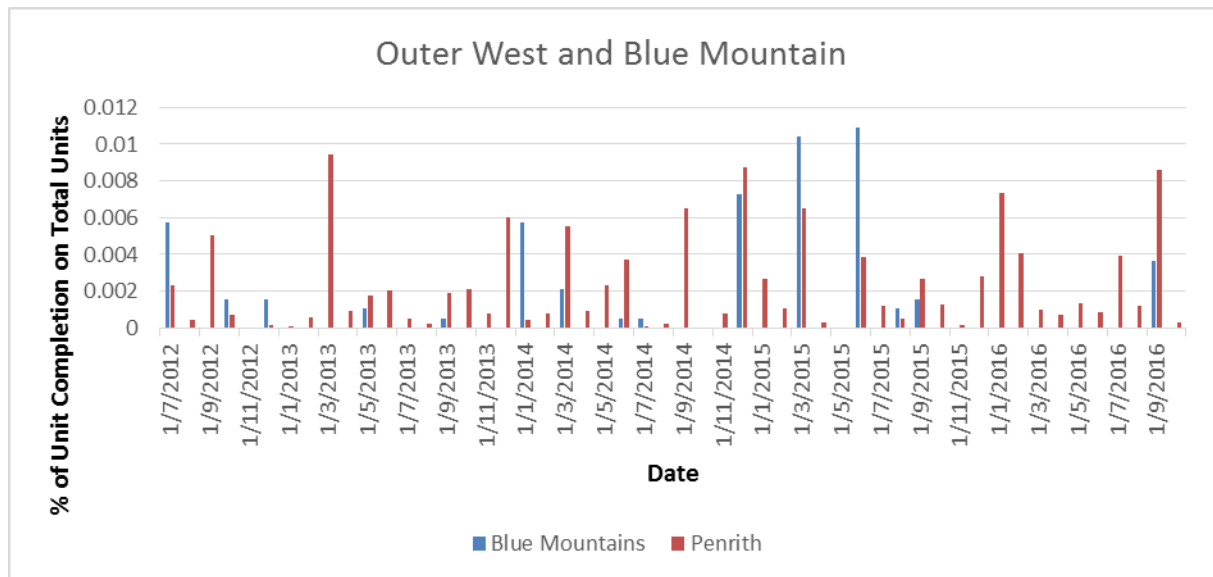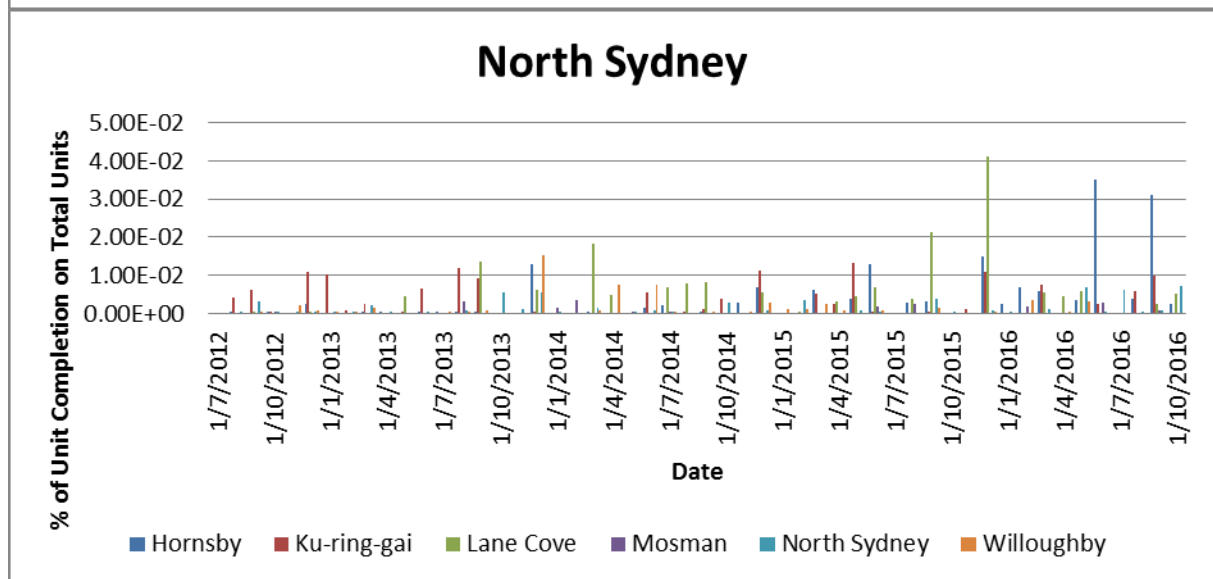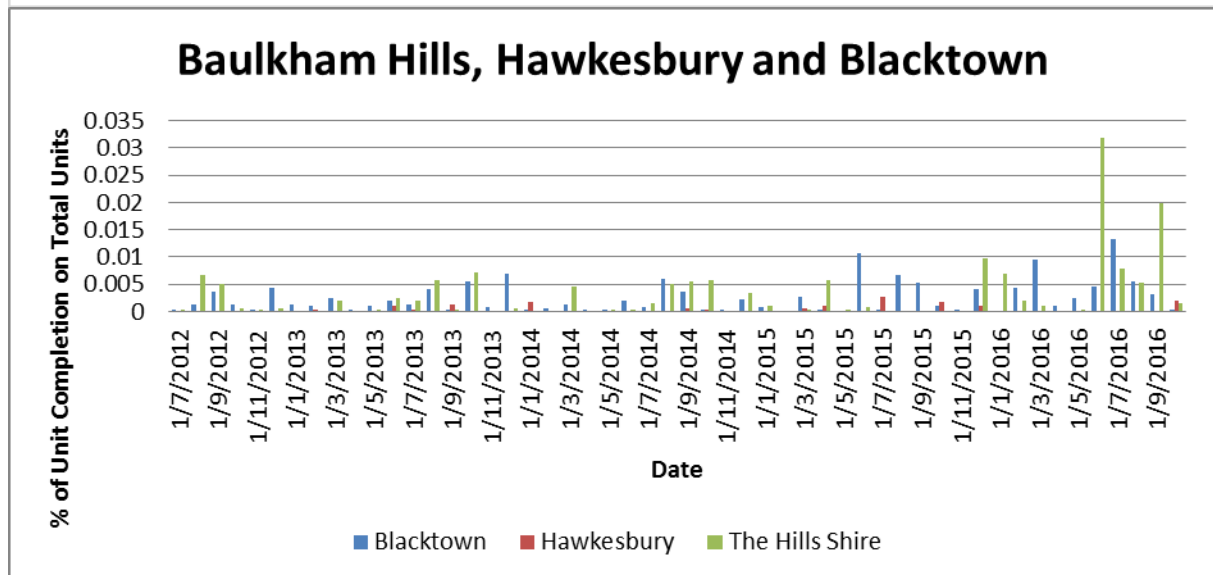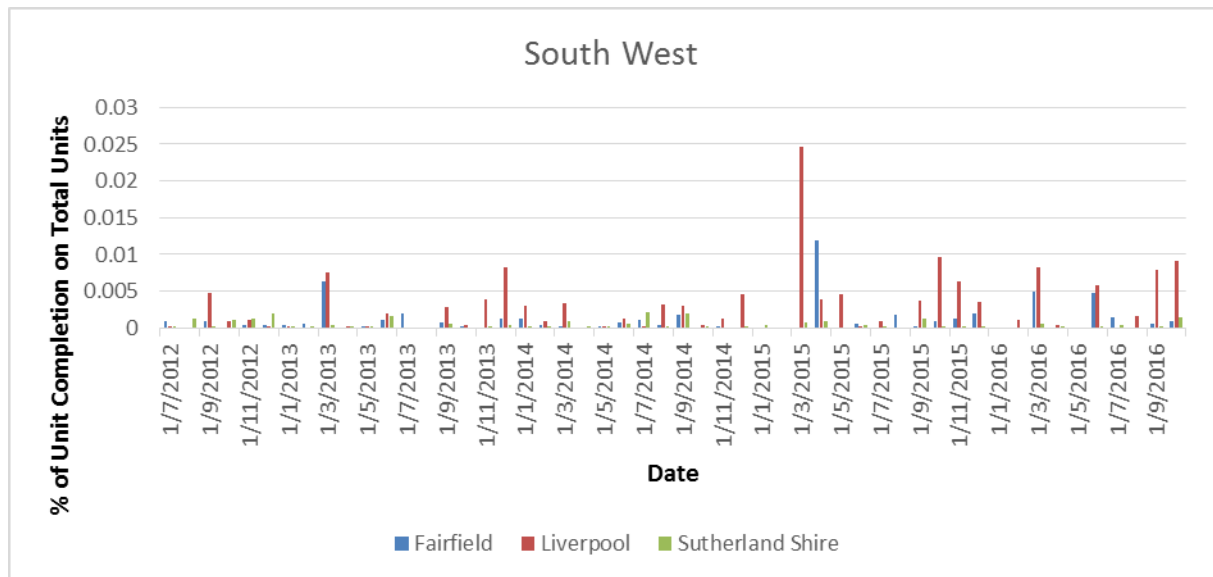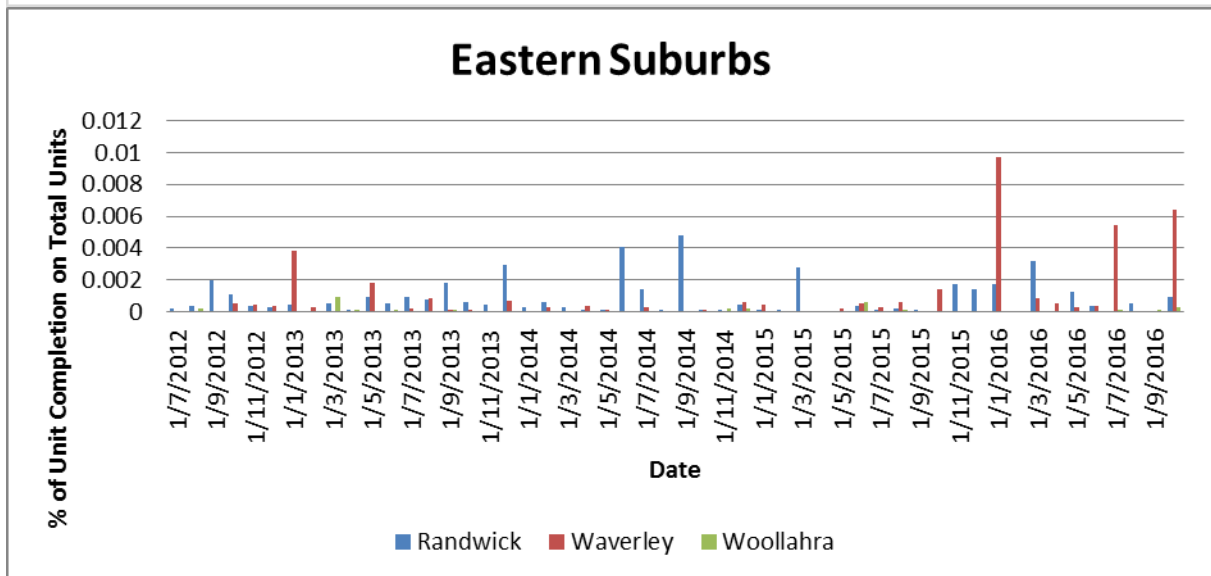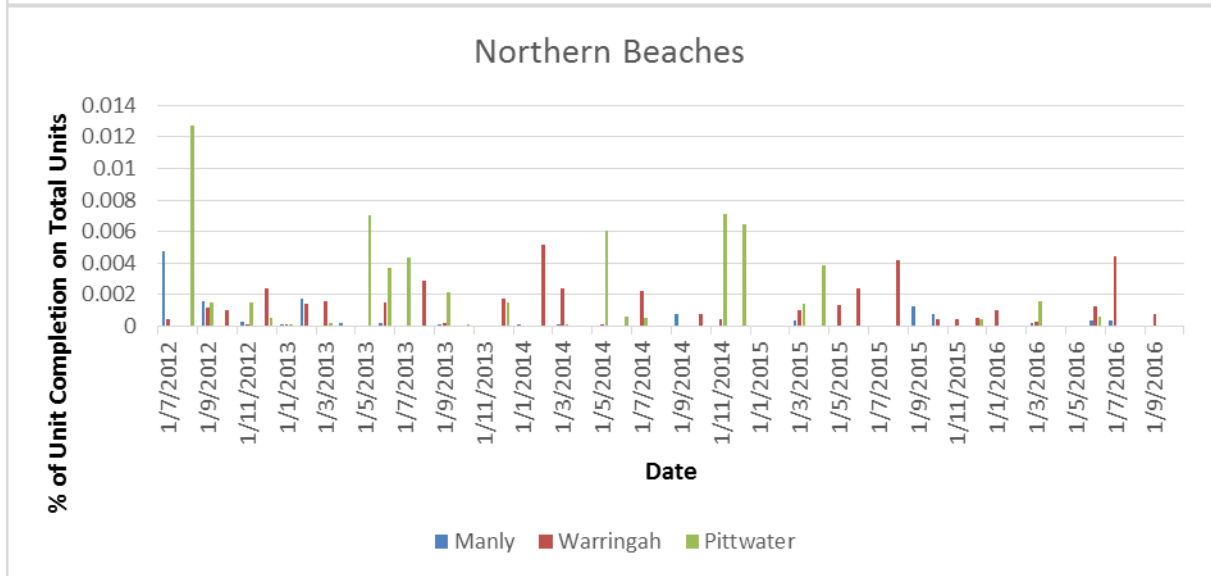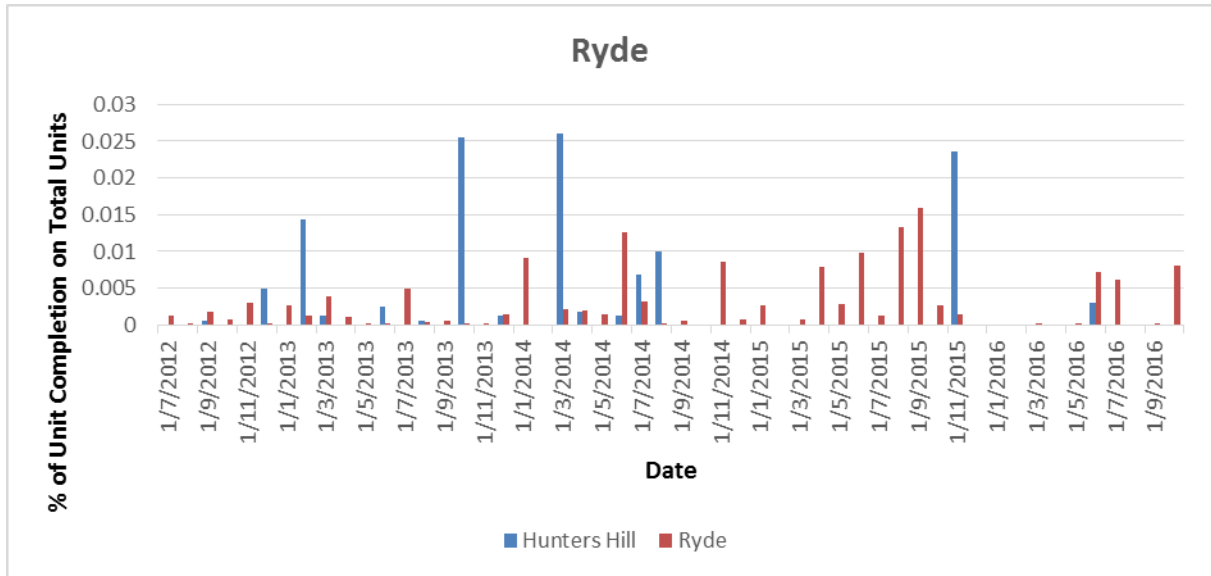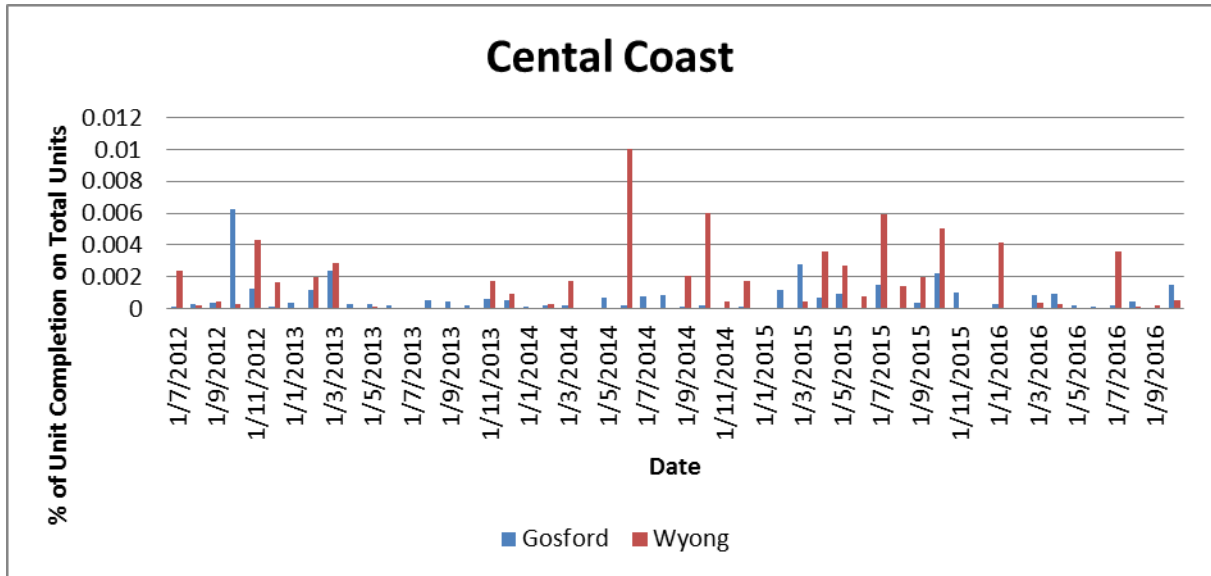
Source: SIRCA CoreLogic data

Graph 4.7.4: Percentage of net house completion on total number of dwellings as at October 2016

Parramatta

Inner South West

Outer West and Blue Mountain

City and Inner South

Outer South West

South West

Baulkham Hills, Hawkesbury and Blacktown

North Sydney

Ryde

Northern Beaches

Eastern Suburbs

Cental Coast
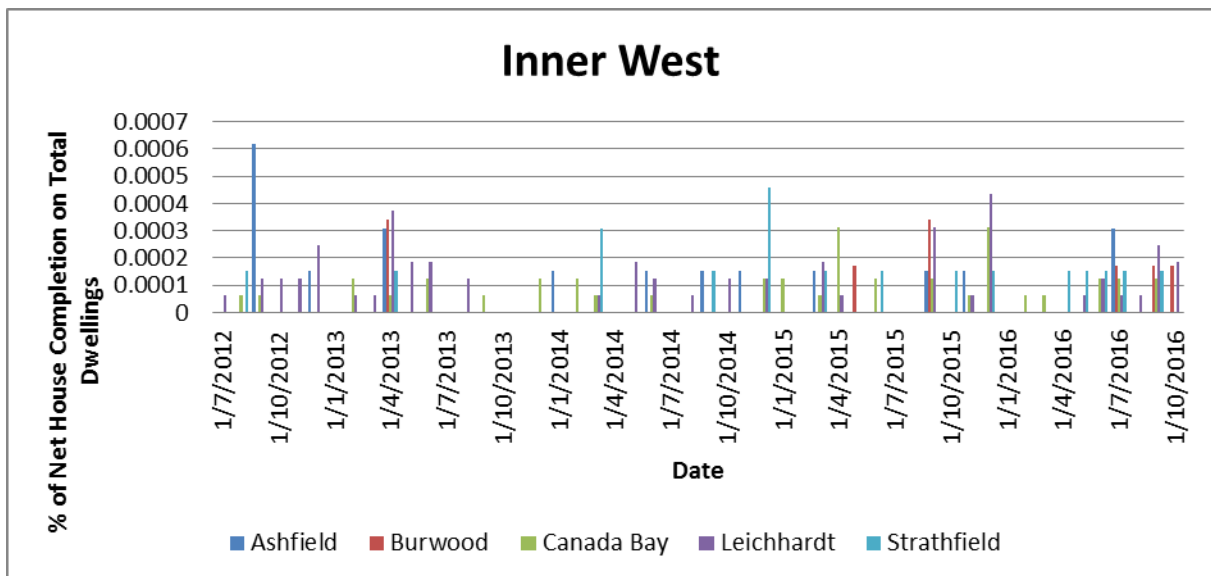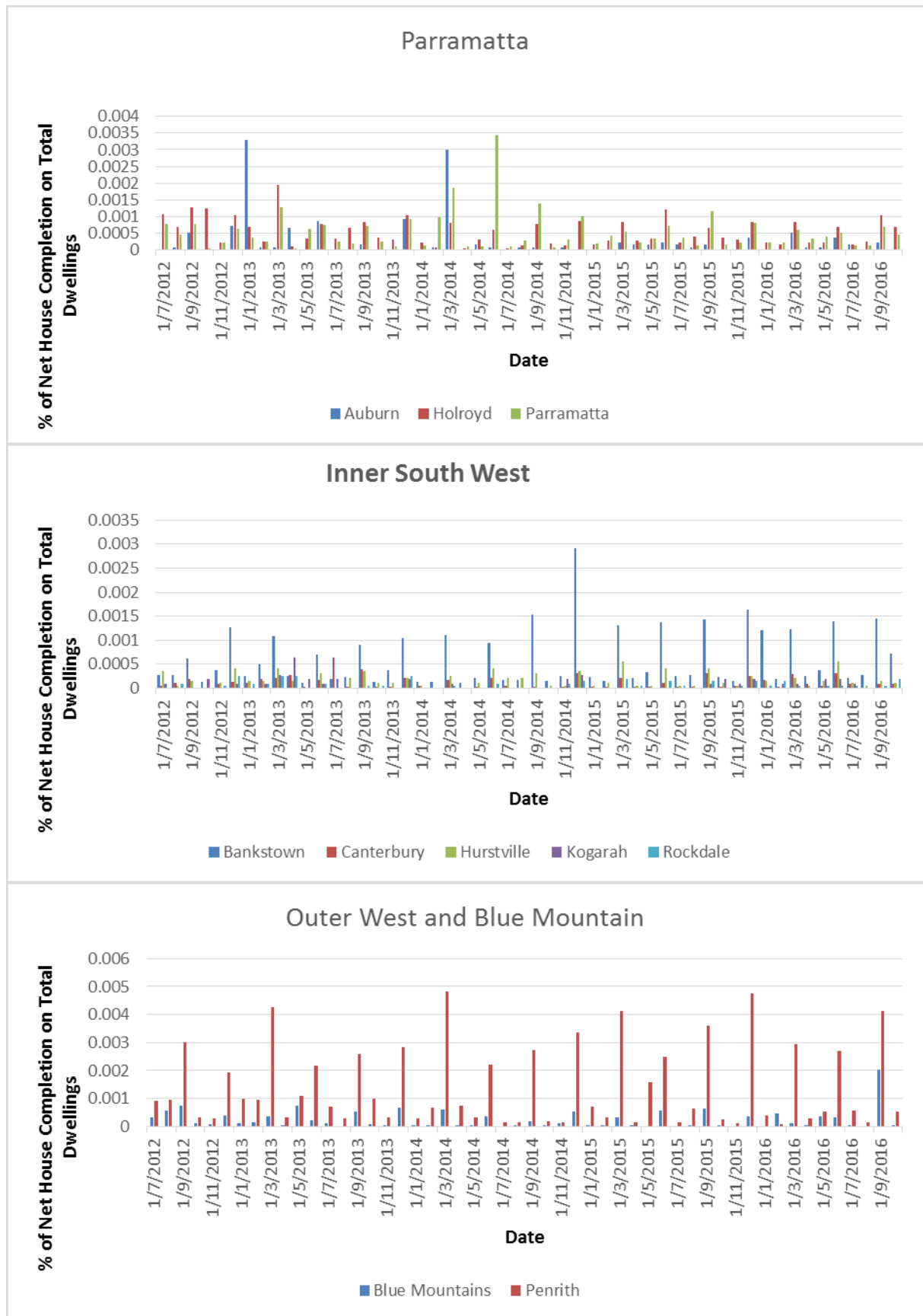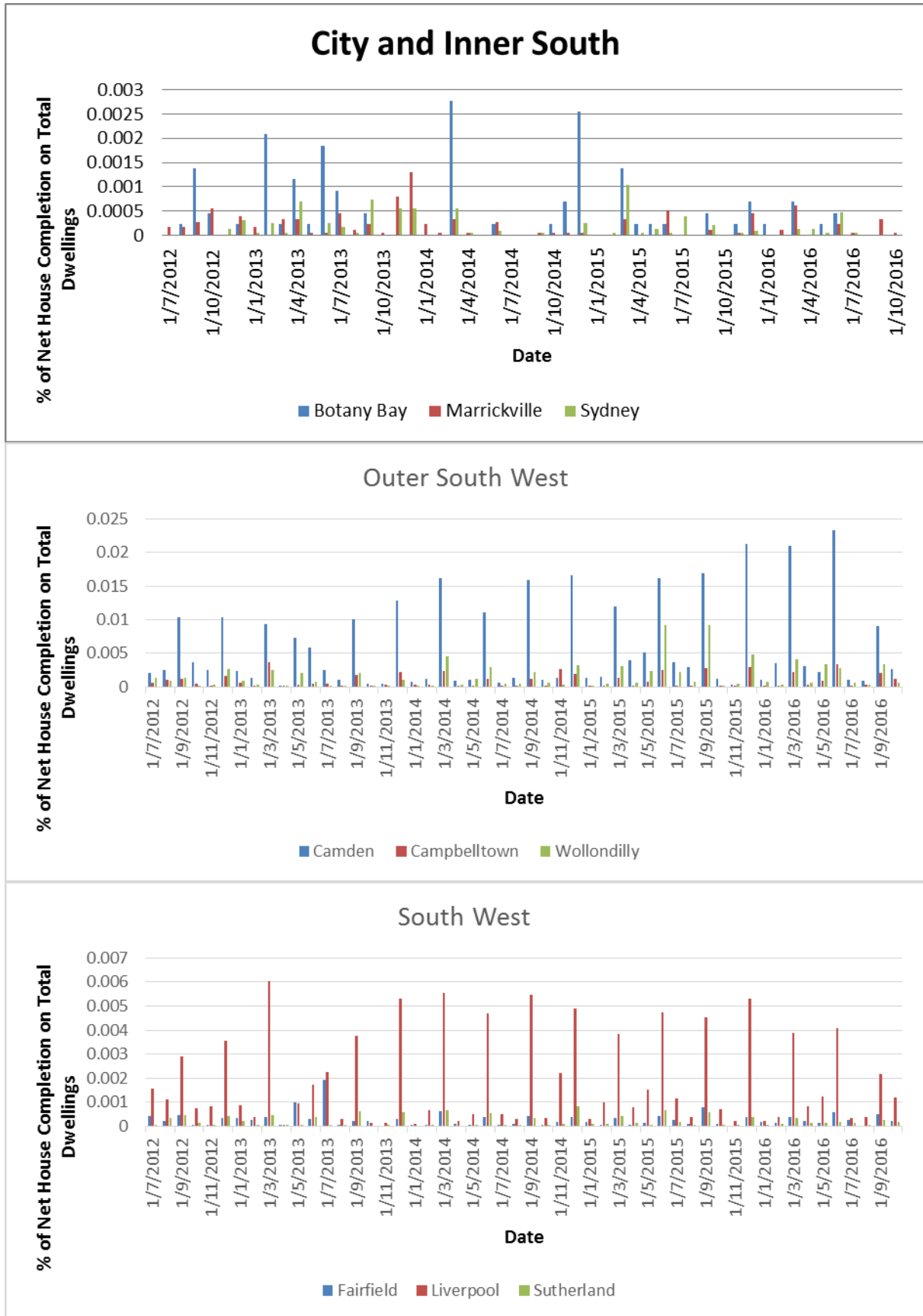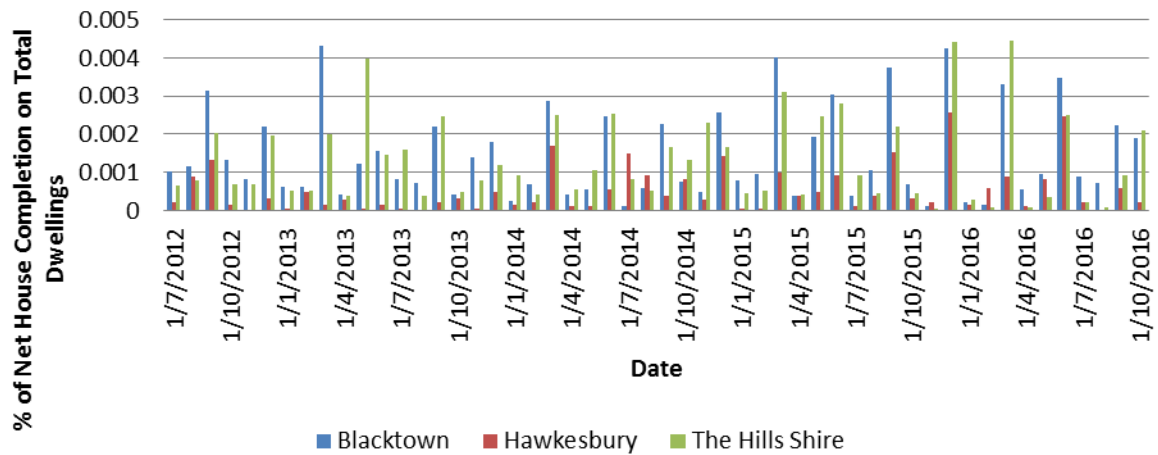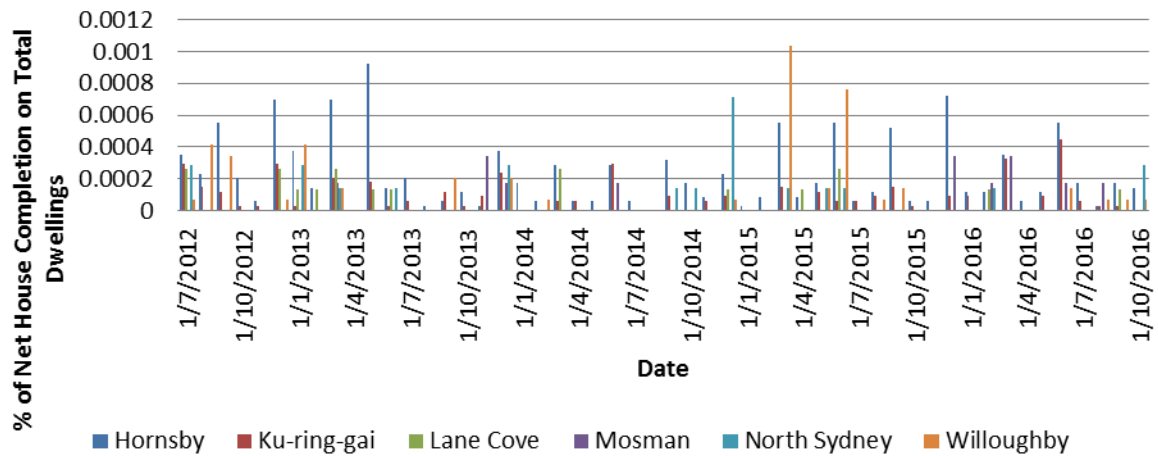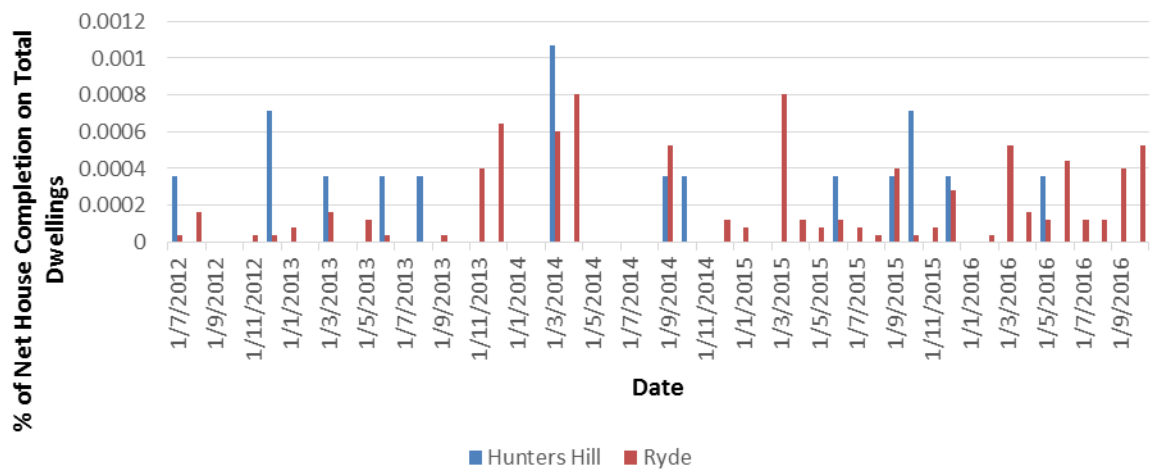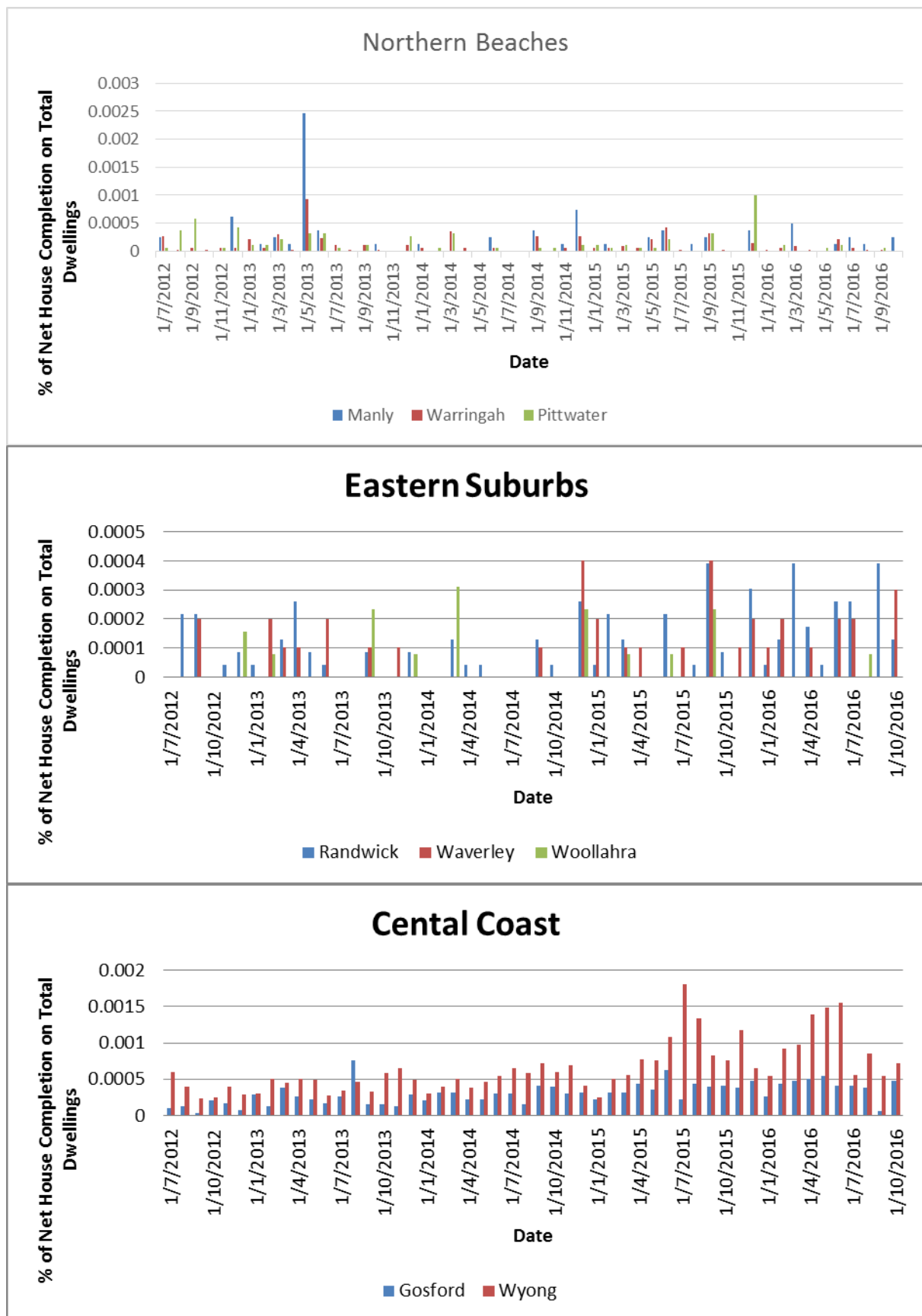
4.8 Dwelling approvals for Sydney Local Government Areas

Dwelling approvals provide the leading indicator of the number of dwelling completions likely to be seen in the next few years. In this case, it may be able to forecast the movement of housing affordability in the foreseeable future.

Graph 4.8.1 shows the number of house approvals for Sydney Local Government Areas from January 2002 to October 2016. It can be seen that more house approvals occurred during the period between 2000 and 2004. The number dropped between 2005 and 2011 and rose again after that. There were a number of LGAs with a high record of house approvals.

During the period between 2002 and 2004, the Hills Shire had a high number of house approvals with 276 houses approved in February 2002. Sydney also had 234 approved in August 2002 and Blacktown had 228 houses approved in October 2001. During the period between 2005 and 2010, the house approval was in downturn partly due to the effect of the Global Financial Crisis but Blacktown still had a high house approval record. From 2011 onwards, the house approval rebounded due to low interest rates with Blacktown continuing to have a high house approval record with 391 approved in October 2016 followed by Camden with 318 houses approved in August 2015 and Liverpool with 235 houses approved in June 2016.

By looking at the geographical location of the LGAs that have high house approvals, we see that they are located on either the north-western or south-western part of Sydney which is free from geographical constraints. Moreover, it is important to note that Blacktown is the LGA which had consistently high records of dwelling approvals during the study period. This can be explained by the introduction of the North West Growth Centre being classified as one of NSW's new Growth Centres introduced in 2006. The growth centre aims at streamlining the supply of

greenfield land for urban development by accommodating up to 70,000 new homes and is divided into 16 Precincts, 12 of which being located within the Blacktown LGA (Blacktown City Council 2013). Therefore, the plan partly explains the high record of dwelling approvals for Blacktown.
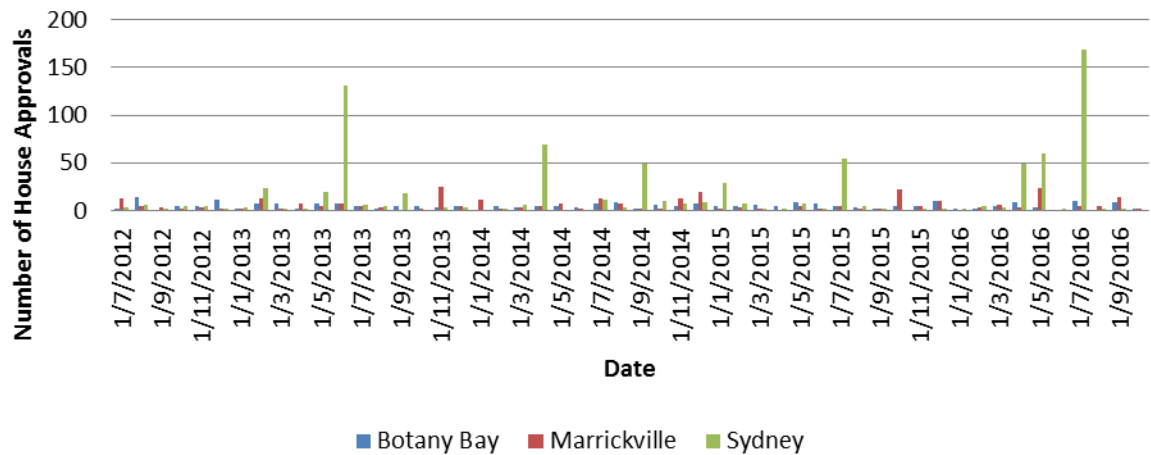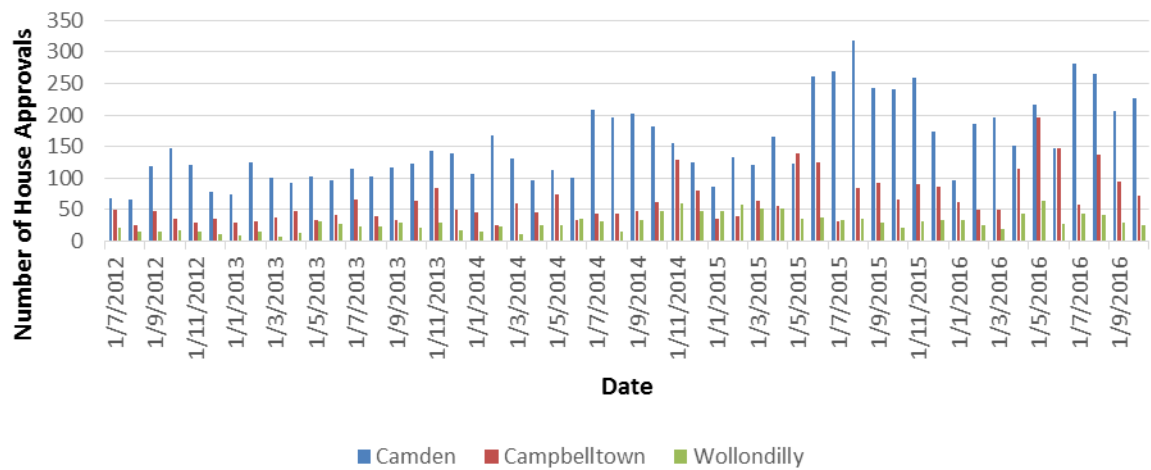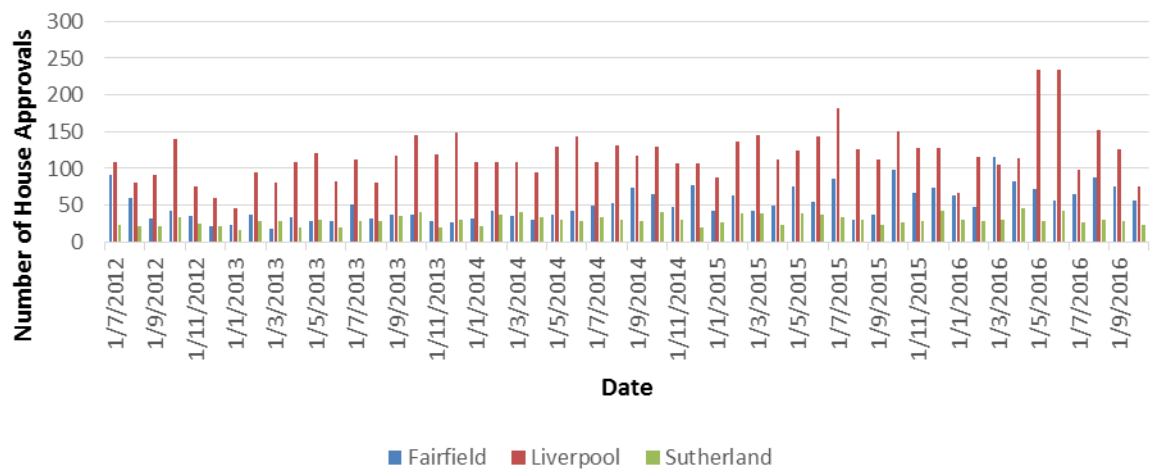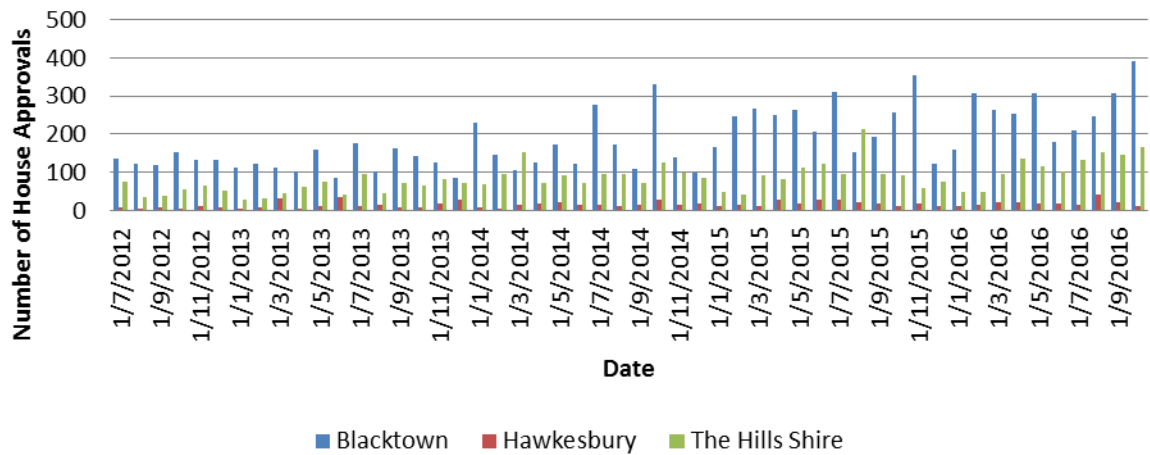
Graph 4.8.2 shows the unit approvals for Sydney Local Government Areas during the period from January 2000 to October 2016. It shares the same trend with house approvals in the period from 2005 to 2010 showing the lowest unit approvals starting to increase after 2010. Across the whole observation period, Sydney had a high consistent record of unit approvals with 1221 units approved in October 2002 and 1173 units approved in July 2015. Ryde also had a high unit approval record of 1110 units in December 2015. Auburn is an emerging LGA with a rising number of unit approvals since 2010 with 1070 approved in April 2016.

Graph 4.8.1 Number of house approvals for Sydney local government areas

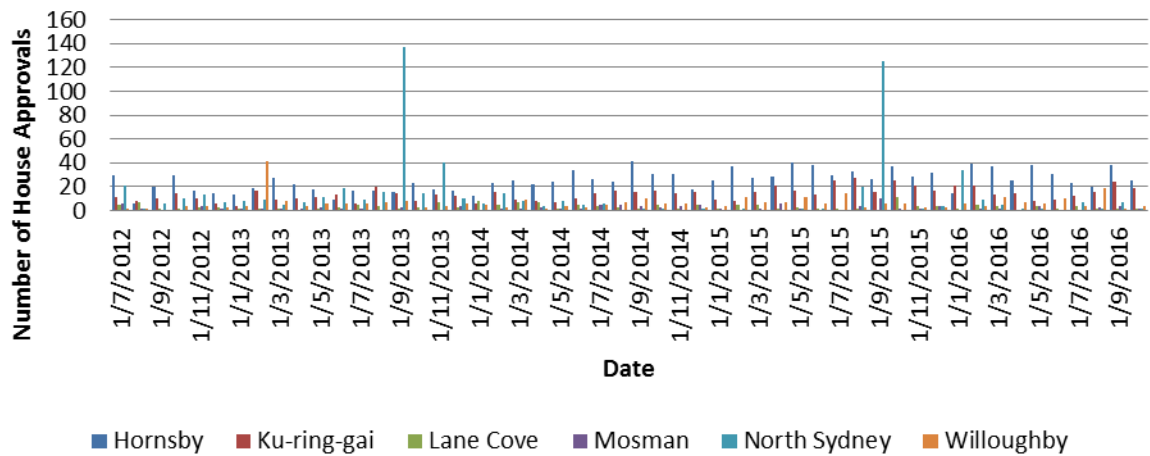Parramatta

Inner South West

Outer West and Blue Mountain

City and Inner South

Number of House Approvals vs Date

Legend: Botany Bay, Marrickville, Sydney

Outer South West

Number of House Approvals vs Date

Legend: Camden, Campbelltown, Wollondilly

South West

Number of House Approvals vs Date

Legend: Fairfield, Liverpool, Sutherland

Baulkham Hills, Hawkesbury and Blacktown

Legend: Blacktown, Hawkesbury, The Hills Shire

North Sydney

Legend: Hornsby, Ku-ring-gai, Lane Cove, Mosman, North Sydney, Willoughby

Ryde

Legend: Hunters Hill, Ryde

Northern Beaches

Legend: Manly, Warringah, Pittwater

Eastern Suburbs
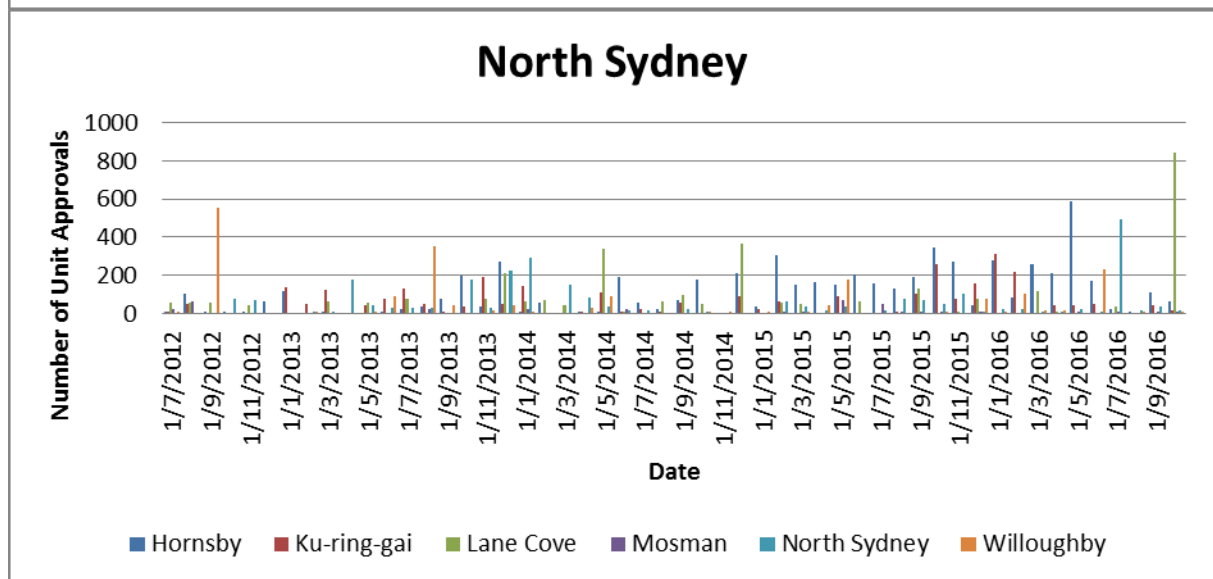
Legend: Randwick, Waverley, Woollahra
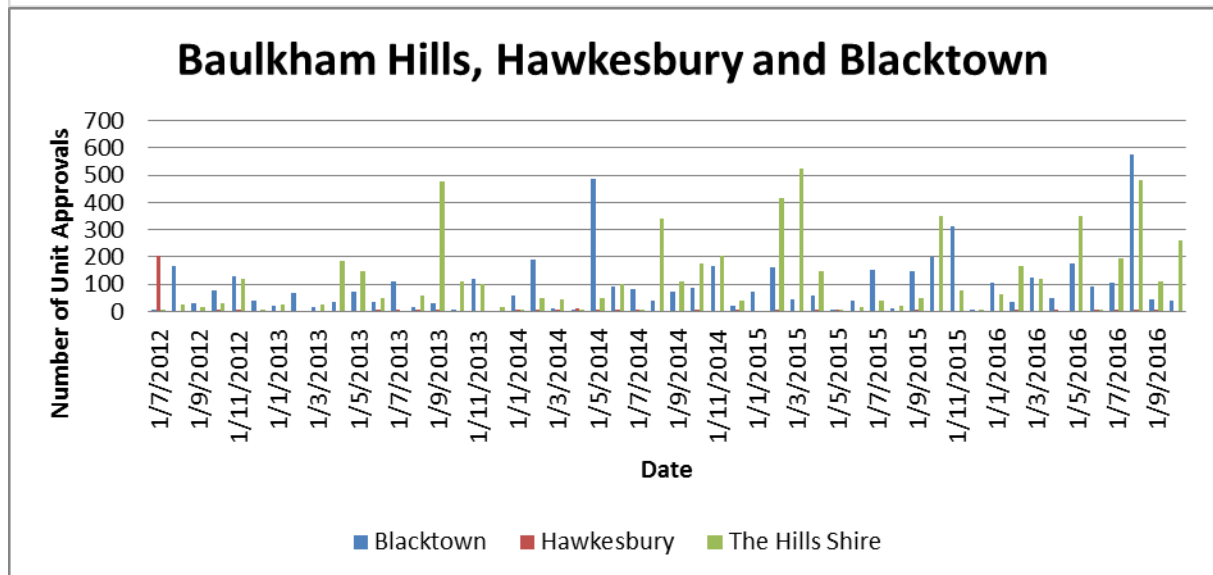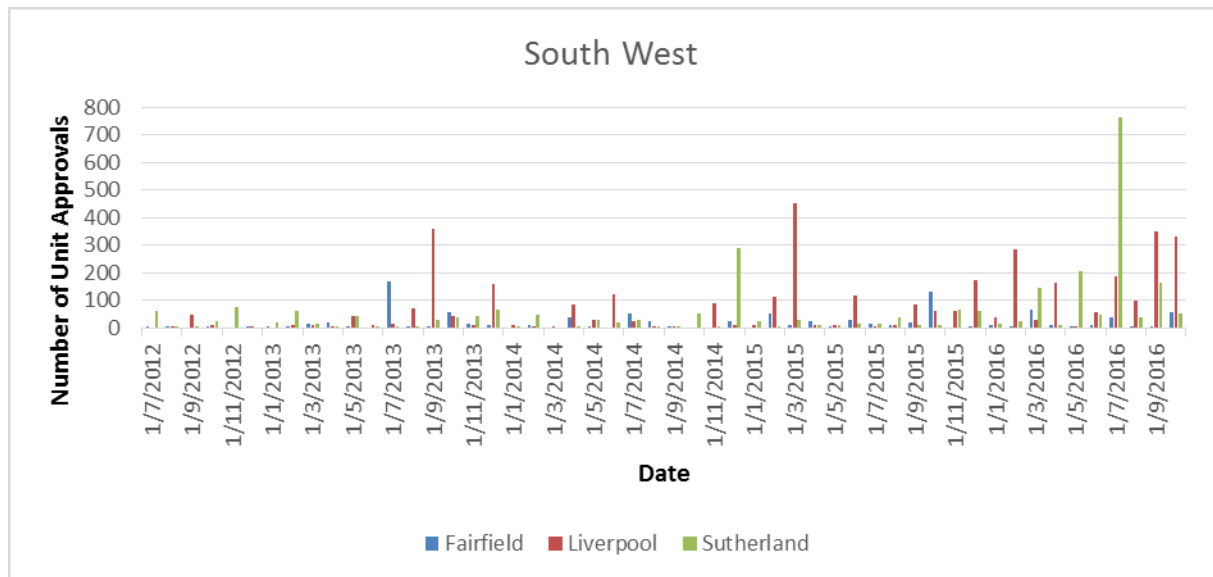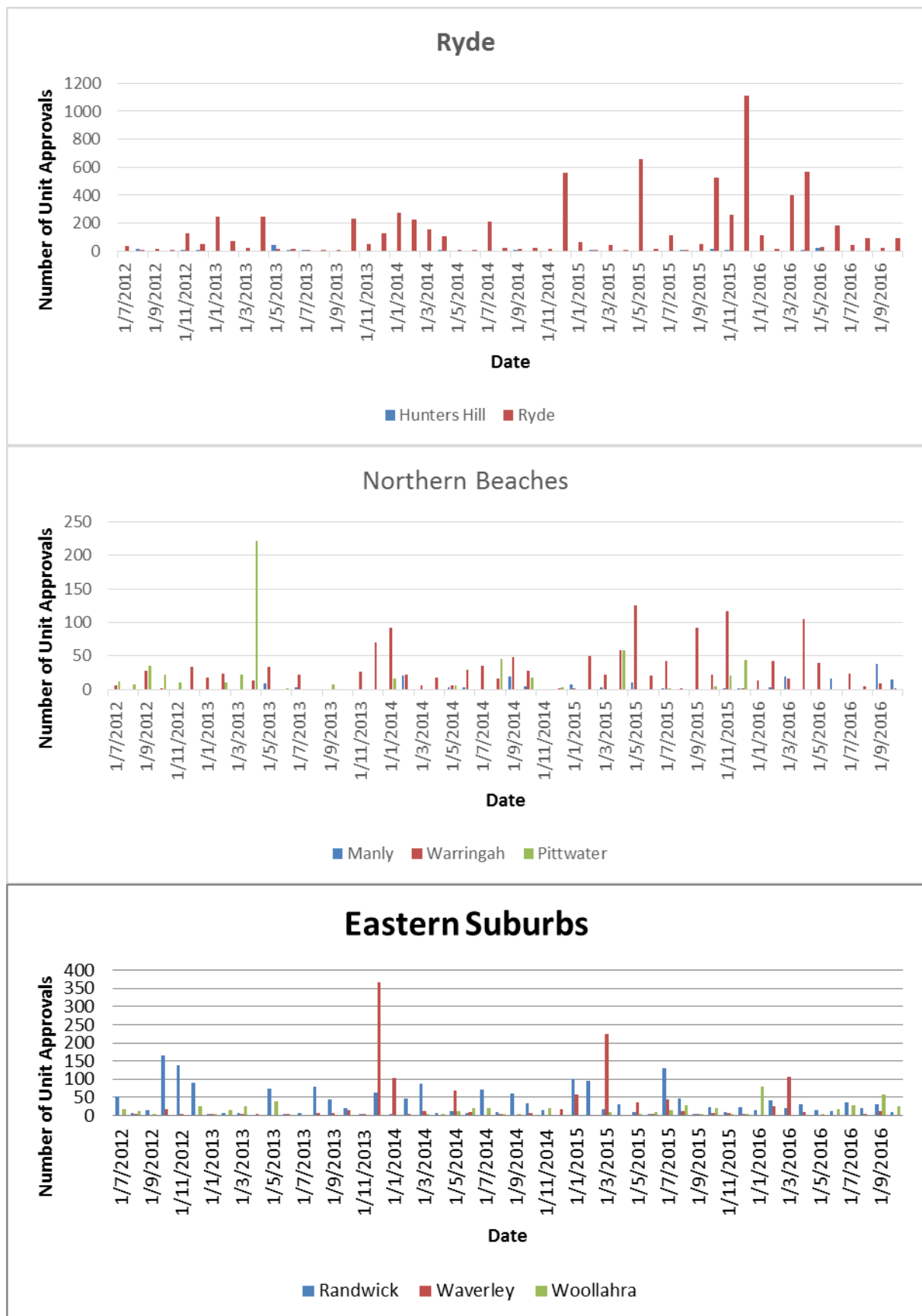
Cental Coast

Legend: Gosford, Wyong

Source: NSW Department of Planning and Environment.

Graph 4.8.2 Unit Approvals for Sydney Local Government Areas

Inner West

Parramatta

Inner South West

Outer West and Blue Mountain

City and Inner South

Outer South West

South West

Baulkham Hills, Hawkesbury and Blacktown

North Sydney

Ryde

Number of Unit Approvals vs Date

Legend: Hunters Hill, Ryde

Northern Beaches

Number of Unit Approvals vs Date

Legend: Manly, Warringah, Pittwater

Eastern Suburbs

Number of Unit Approvals vs Date

Legend: Randwick, Waverley, Woollahra
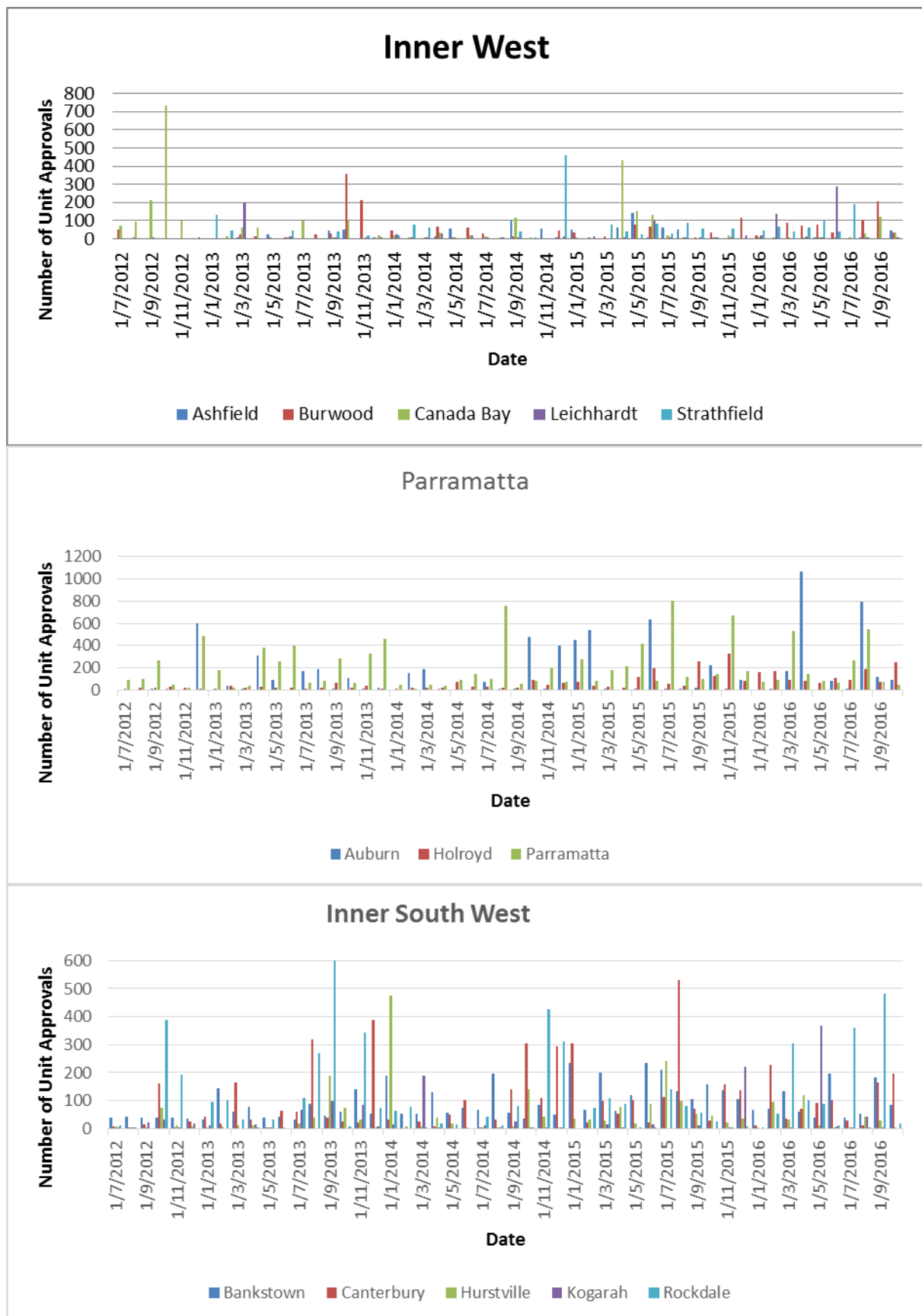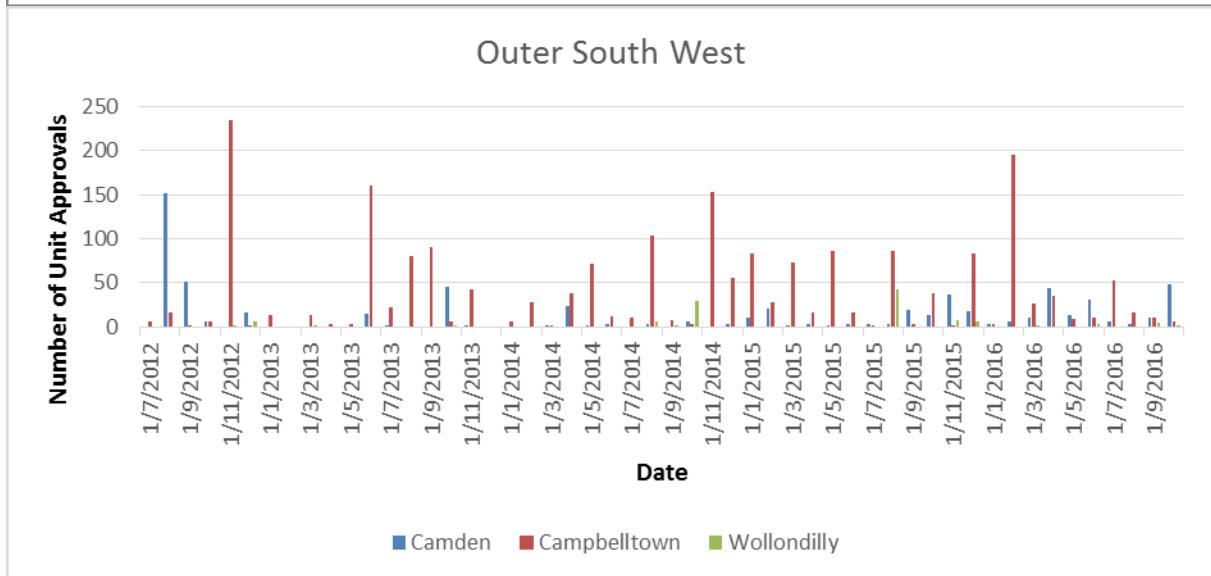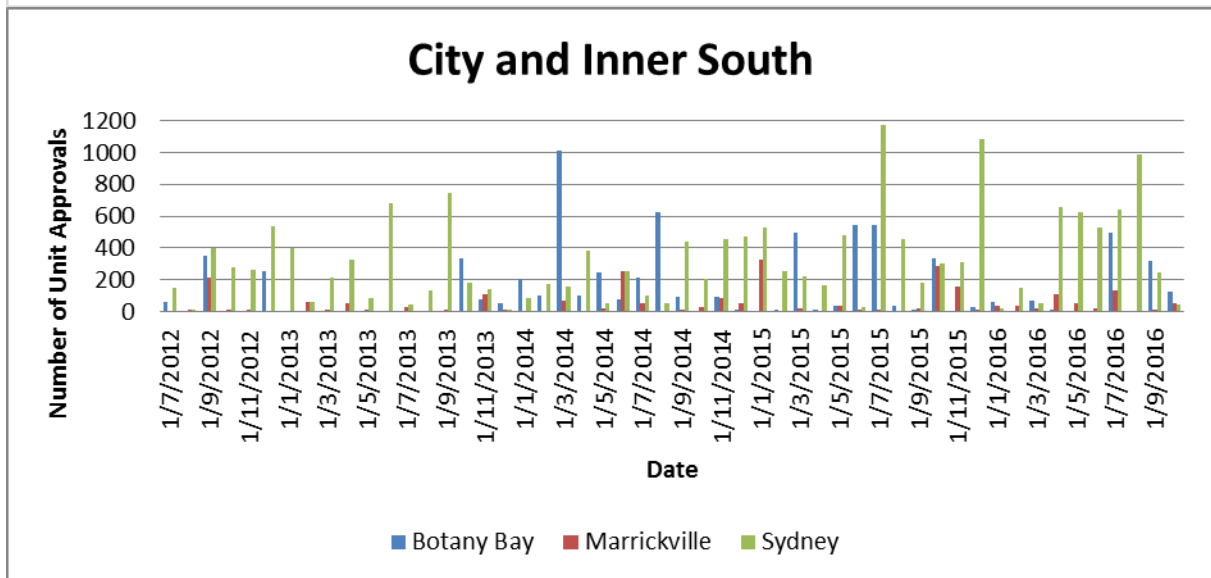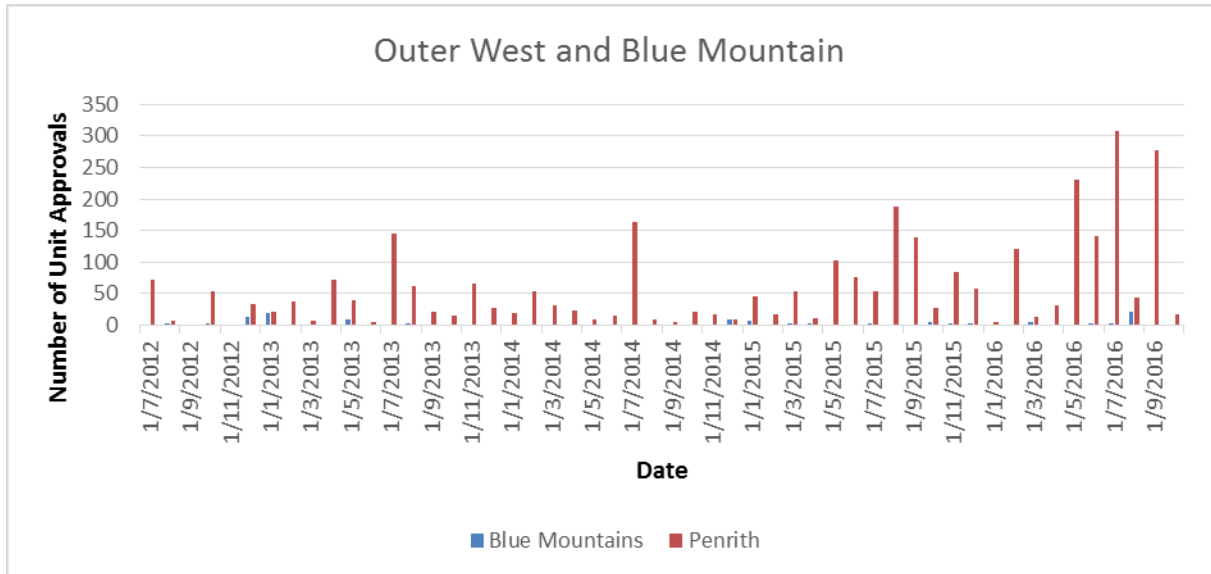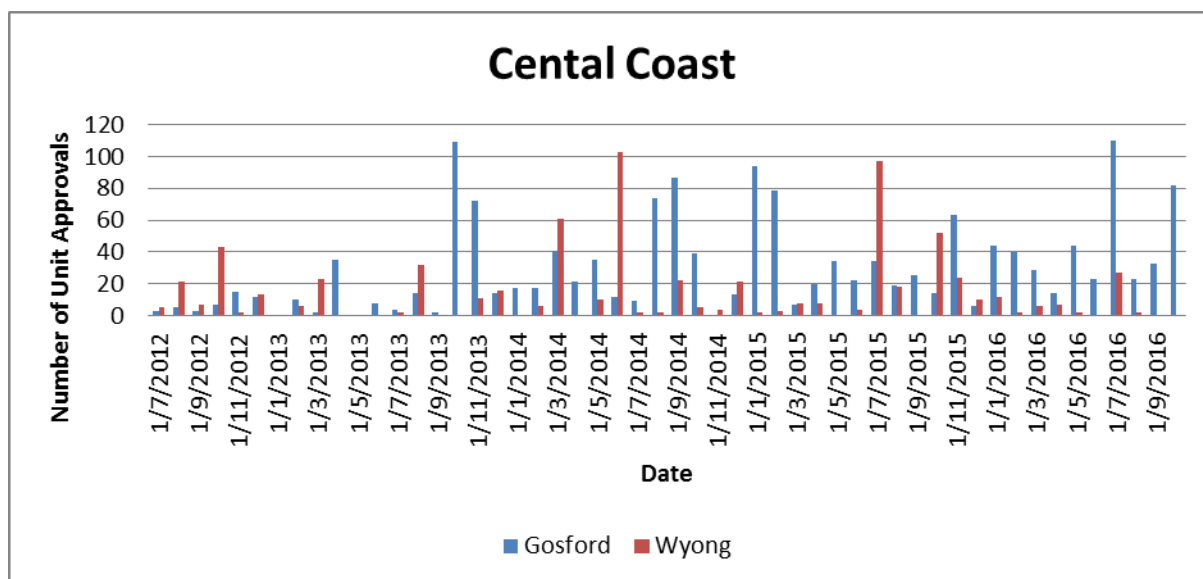
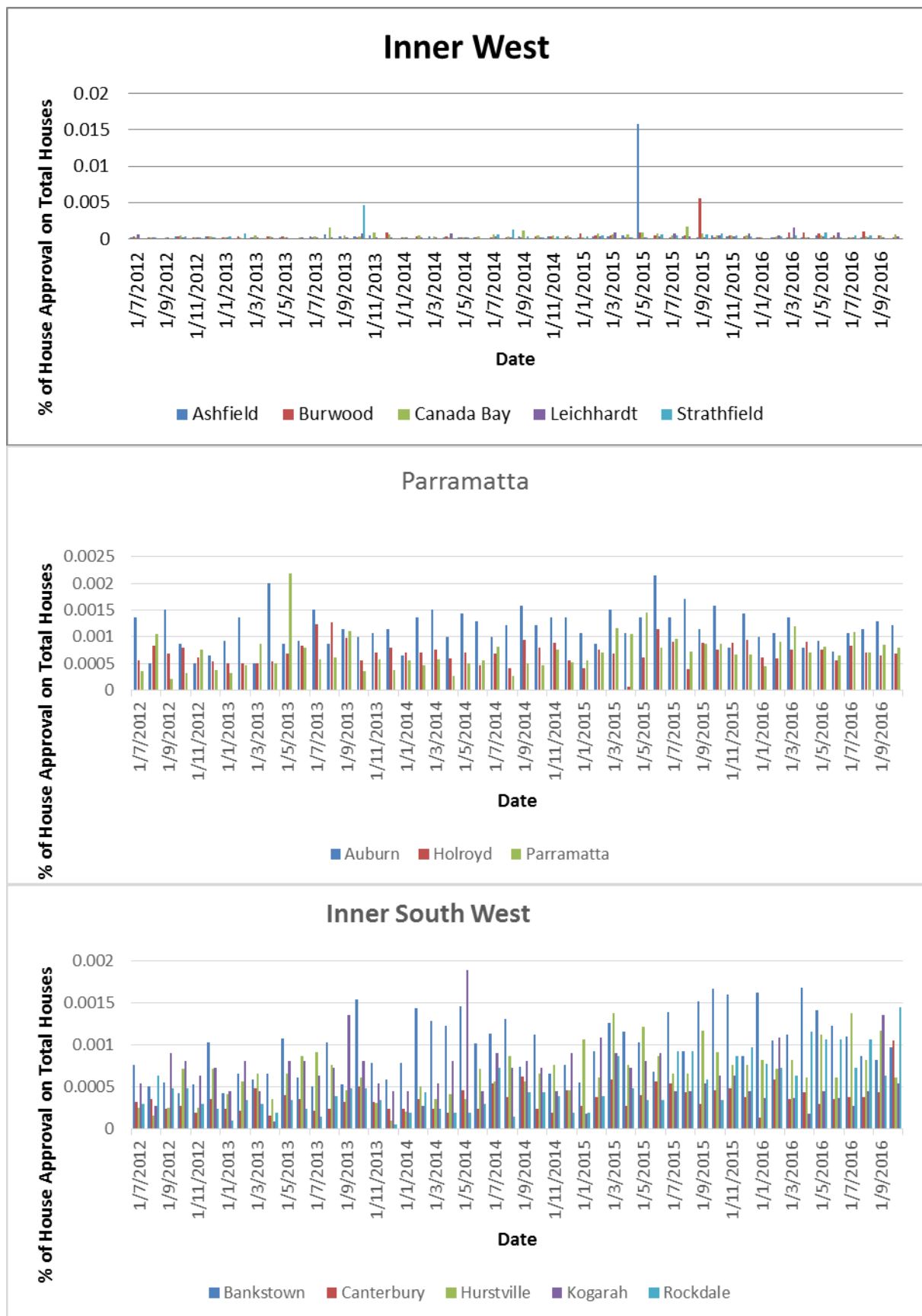Source: NSW Department of Planning and Environment.

4.8.1 Percentage of dwelling approvals on total number of dwellings as of October 2016
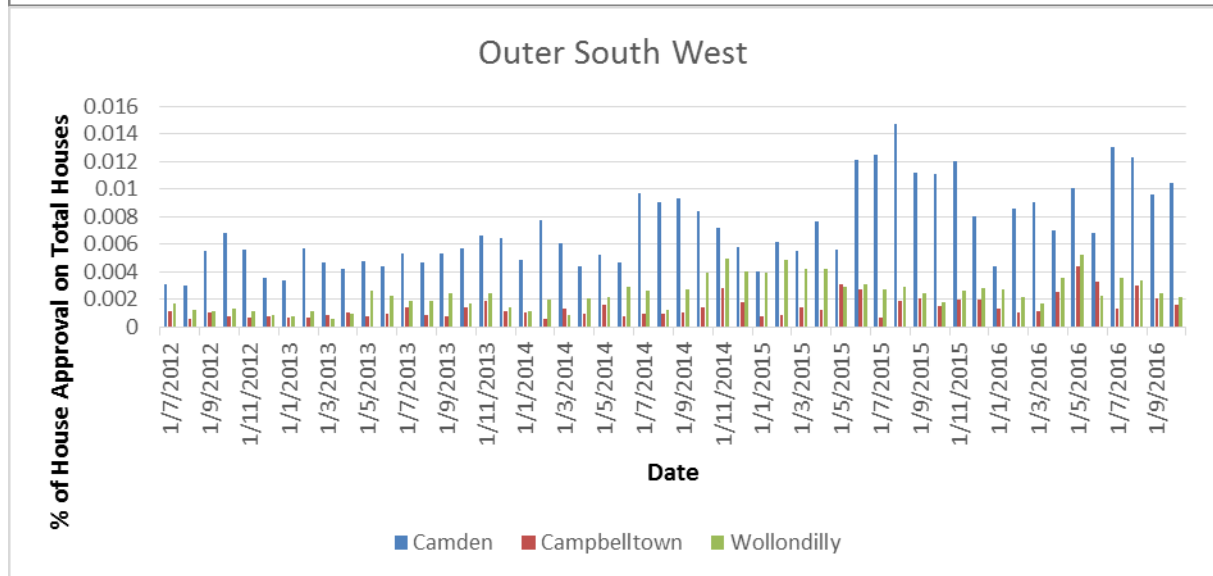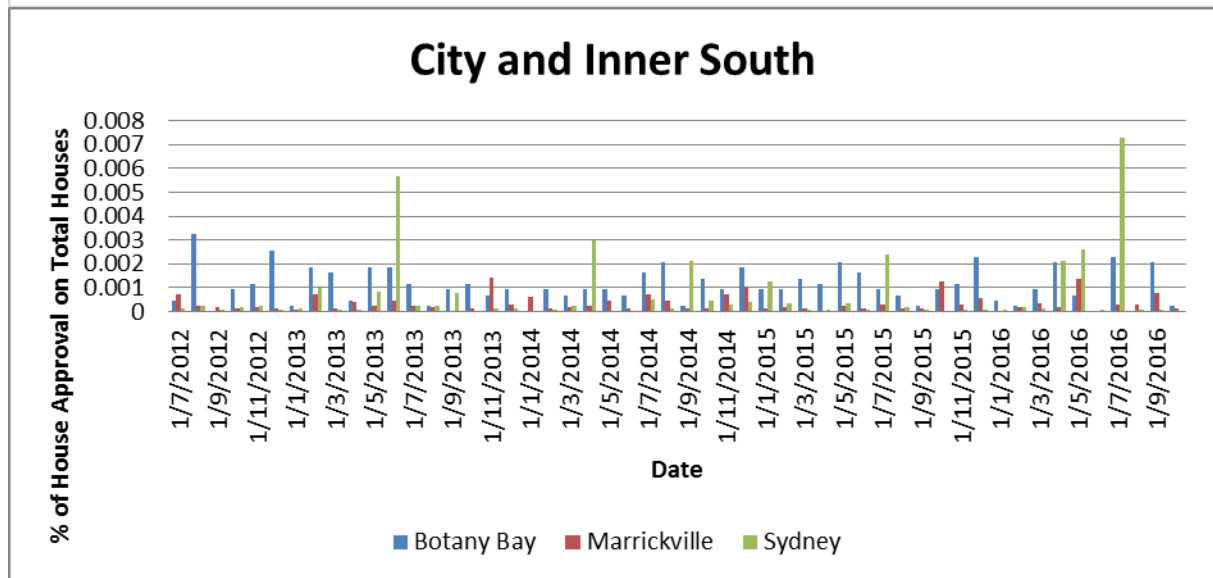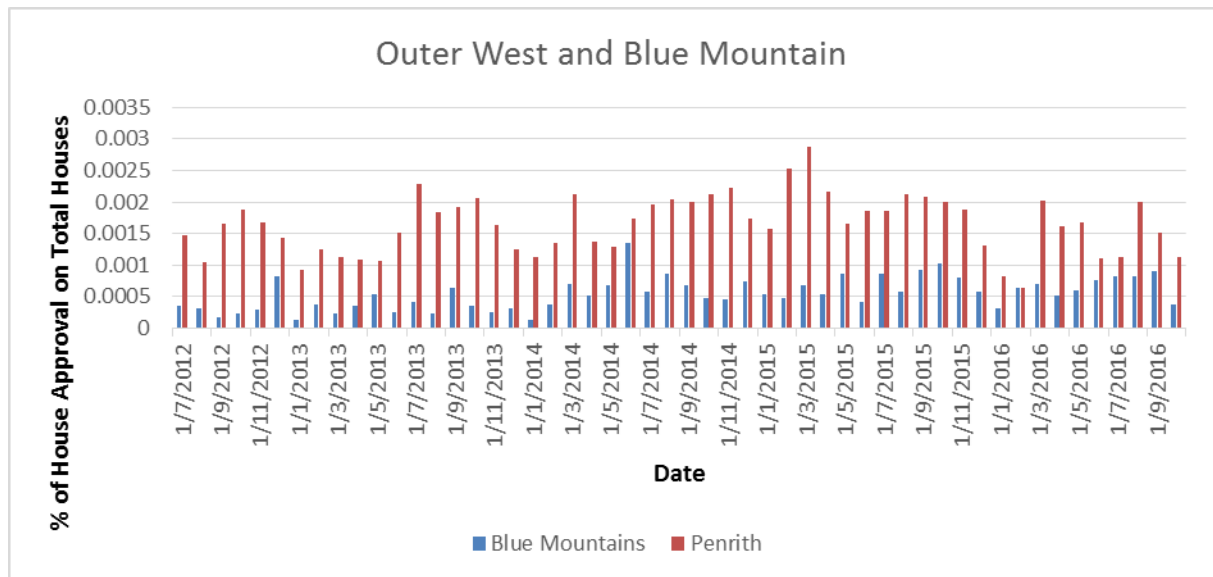
Graph 4.8.3 shows the percentage of house approvals on the total number of houses as of

October 2016. The median monthly percentage change was 0.06% with North Sydney having

the highest record of 2% in September 2013 followed by Ashfield with 1.6% in May 2015 and

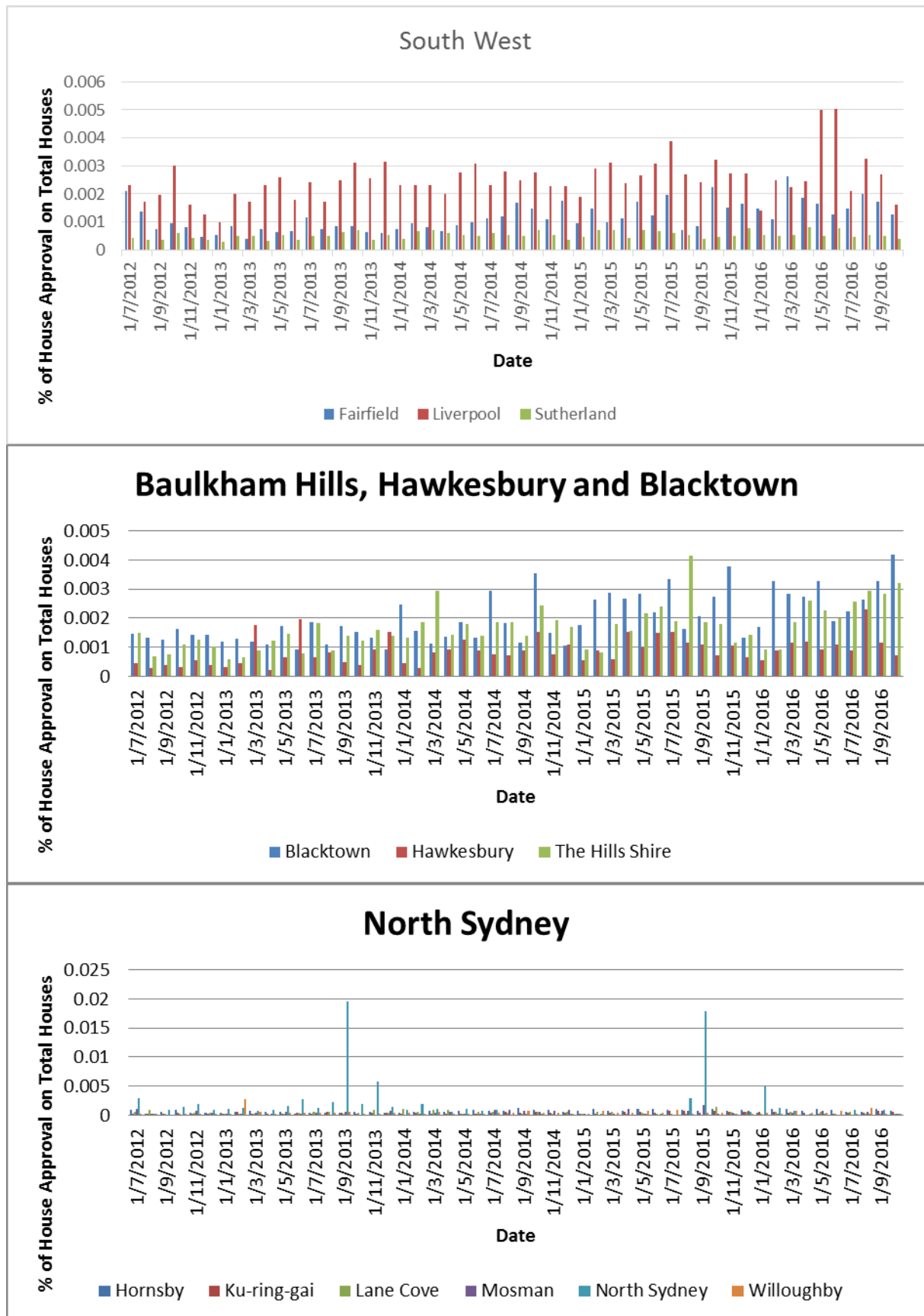Camden with 1.5% in August 2015.

Graph 4.8.4 shows the percentage of unit approvals on the total number of units as of October

2016. The median monthly percentage change was observed to be 0.1% with the highest record

of Botany Bay with 13.2% in March 2014 followed by Camden with 13.1% in August 2012 and

Lane Cove with 8.8% in October 2016.

These results provide an overview of possible trends in housing affordability in the next few

years. LGAs which had a high record of dwelling approvals are expected to have housing

affordability improvements in a few years once they are completed.

Graph 4.8.3 Percentage of house approval on the total number of houses as of October 2016

Inner West

% of House Approval on Total Houses

■ Ashfield   ■ Burwood   ■ Canada Bay   ■ Leichhardt   ■ Strathfield

Parramatta

% of House Approval on Total Houses

■ Auburn   ■ Holroyd   ■ Parramatta

Inner South West

% of House Approval on Total Houses

■ Bankstown   ■ Canterbury   ■ Hurstville   ■ Kogarah   ■ Rockdale

Outer West and Blue Mountain

City and Inner South

Outer South West

South West

Baulkham Hills, Hawkesbury and Blacktown

North Sydney

Ryde

(Chart: % of House Approval on Total Houses vs Date. Legend: Hunters Hill, Ryde)

Northern Beaches

(Chart: % of House Approval on Total Houses vs Date. Legend: Manly, Warringah, Pittwater)

Eastern Suburbs

(Chart: % of House Approval on Total Houses vs Date. Legend: Randwick, Waverley, Woollahra)

Cental Coast

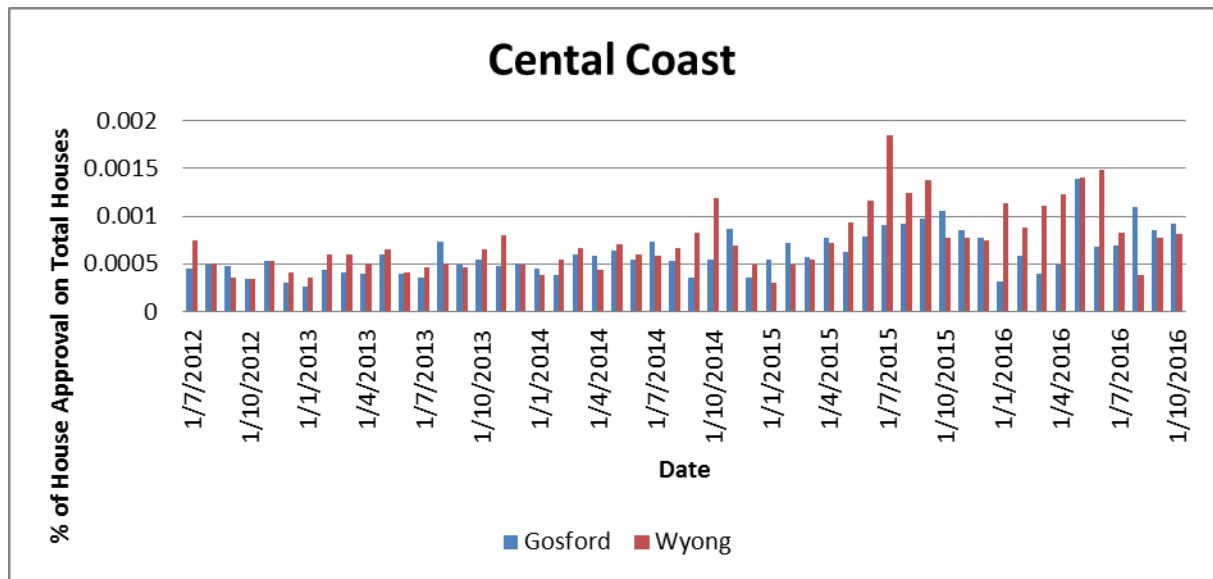Chart showing % of House Approval on Total Houses by Date, comparing Gosford and Wyong, from 1/7/2012 to 1/10/2016.

Graph 4.8.4 Percentage of unit approval on the total number of units as of October 2016

Inner West

Parramatta

Inner South West

Outer West and Blue Mountain

City and Inner South

Outer South West
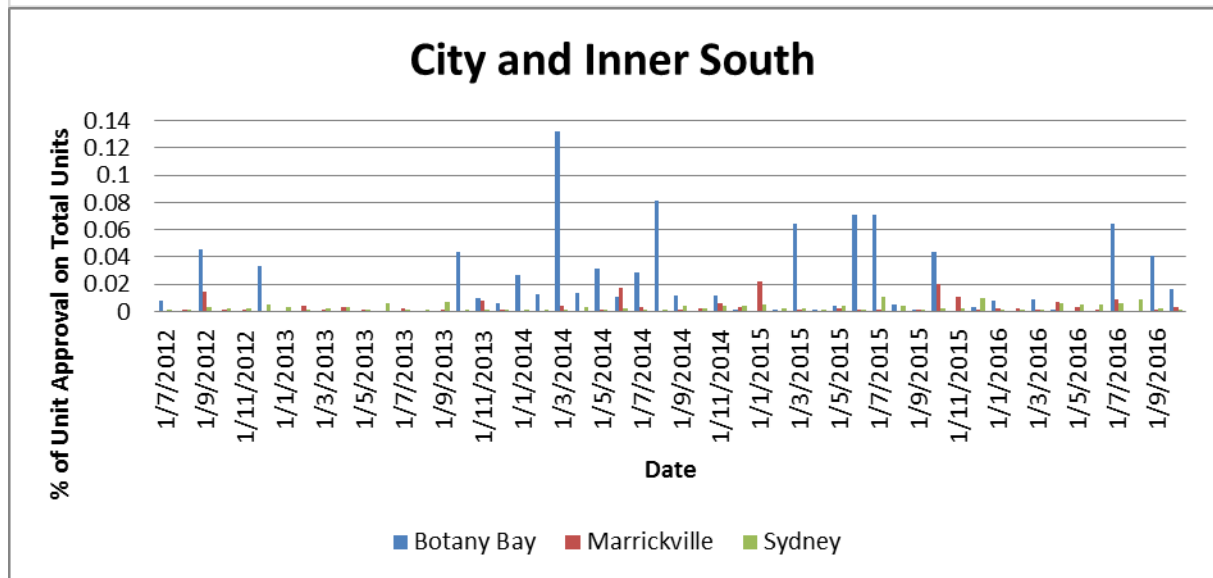
South West

Baulkham Hills, Hawkesbury and Blacktown

North Sydney

Ryde

% of Unit Approval on Total Units

Date

Legend: ■ Hunters Hill ■ Ryde

Northern Beaches

% of Unit Approval on Total Units

Date

Legend: ■ Manly ■ Warringah ■ Pittwater

Eastern Suburbs

% of Unit Approval on Total Units — Date

Randwick   Waverley   Woollahra

Cental Coast

% of Unit Approval on Total Units — Date

Gosford   Wyong

4.9 Population for Sydney Local Government Areas

An increase in population is often found to increase the demand for housing which ultimately increases dwelling prices. If the increase in income cannot catch up with the increase in dwelling prices, the housing affordability problem is likely to intensify.

Graph 4.9.1 shows the population for each Sydney Local Government Area from 2001 to 2016 on an annual basis. From the graph, we see an upward trend in the population of LGAs over the observed period. In 2016, the LGA which had the highest level of population was

Canterbury-Bankstown with 359671, followed by Blacktown with 348138 and Central Coast with 334867 while Hunters Hill had the lowest level of population with 14843 followed by Mosman with 30646 and Burwood with 36505.

Graph 4.9.1 Population distribution of the Sydney LGA level from 2001 to 2016

City and Inner South

Population vs Year (2001–2015)
— Botany Bay — Sydney

Outer South West

Population vs Year (2001–2015)
— Camden — Campbelltown — Wollondilly

South West

Population vs Year (2001–2015)
— Fairfield — Liverpool — Sutherland

Baulkham Hills - Hawkesbury - Blacktown

Population vs Year (2001–2015)
— Blacktown — Hawkesbury — The Hills Shire

Ryde

Population vs Year (2001–2015)
— Hunters Hill — Ryde

Northern Beaches

Population vs Year (2001–2015)
— Northern Beaches

North Sydney and Hornsby
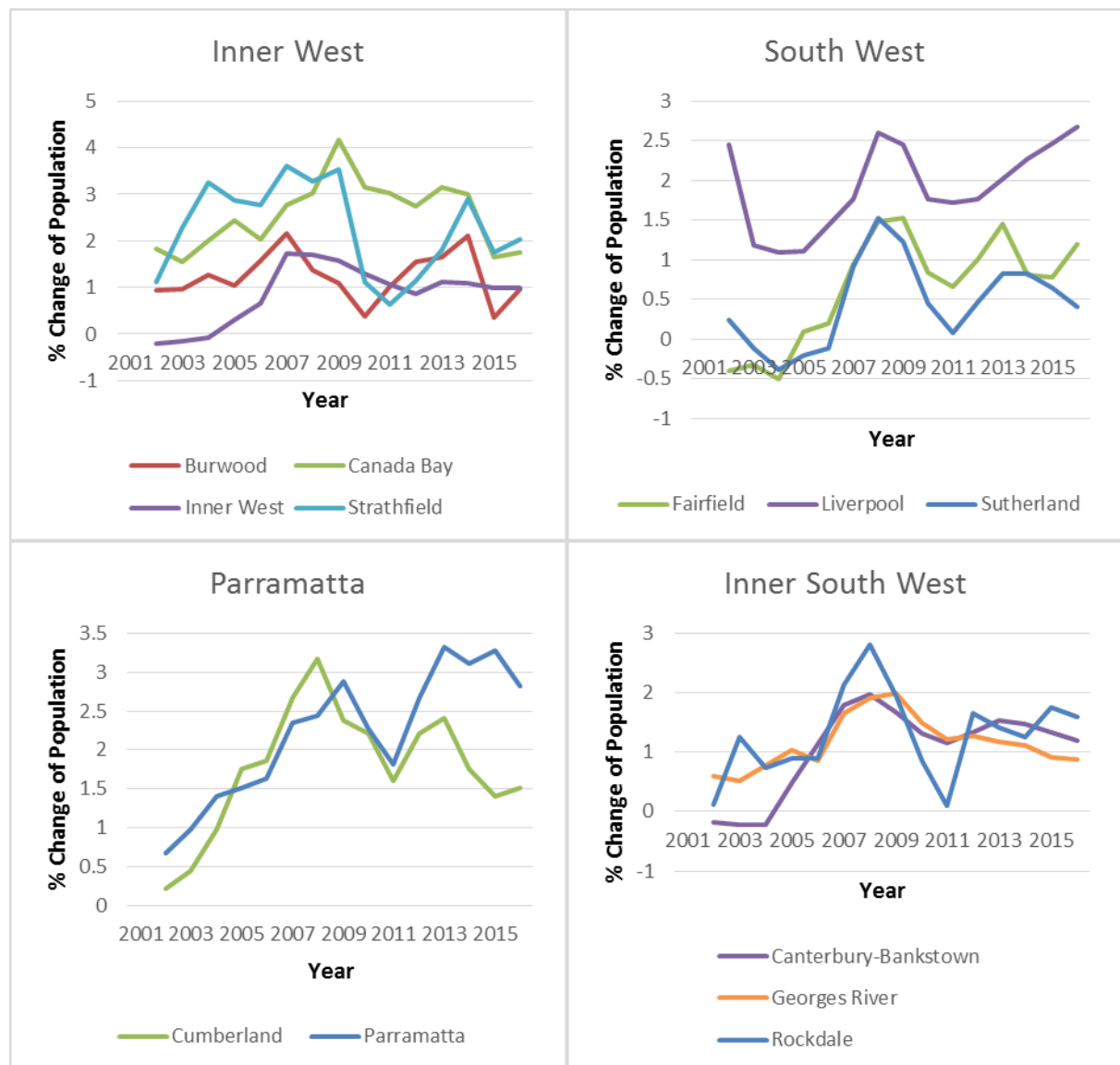
Eastern Suburbs

Central Coast

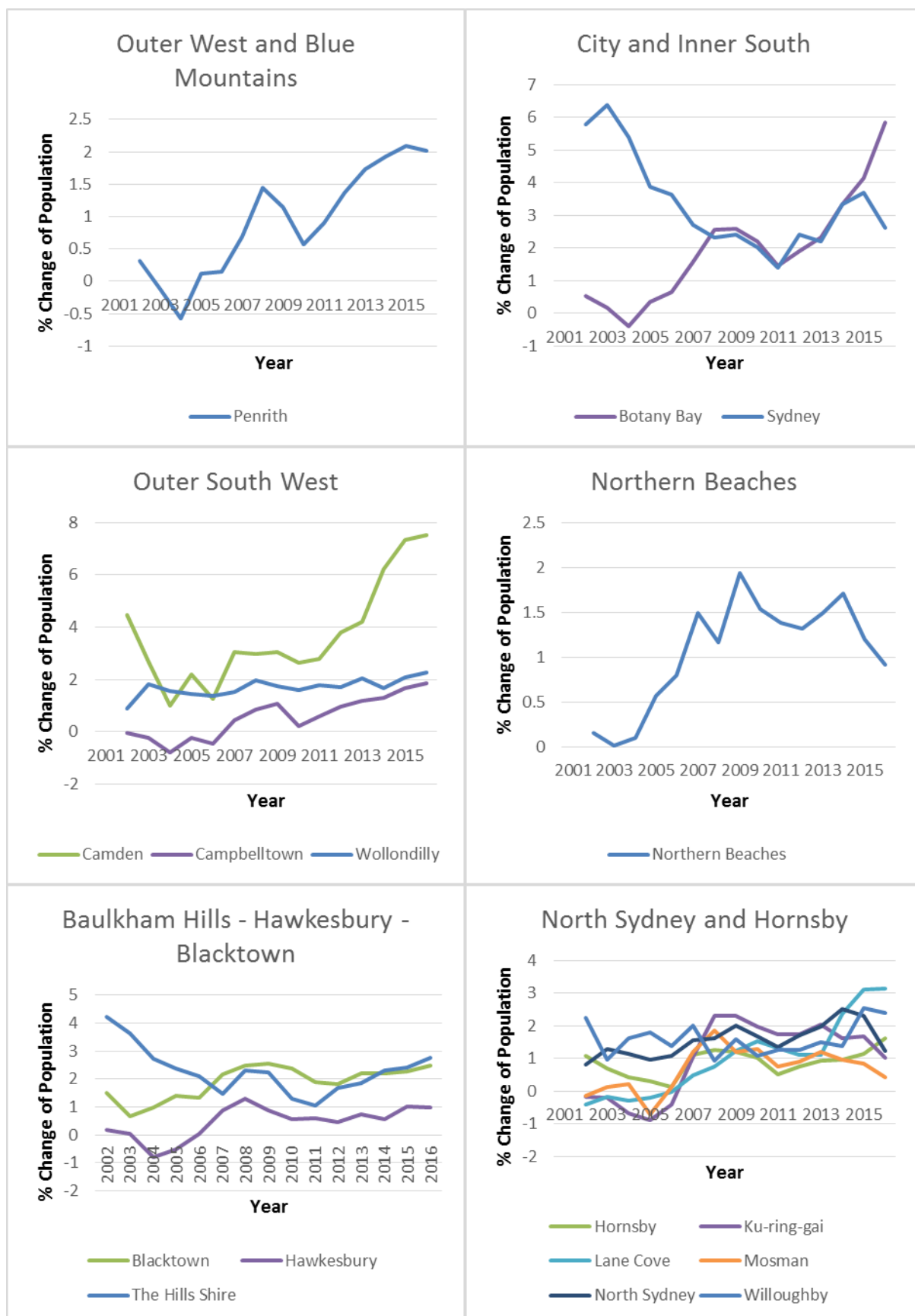Source: NSW Department of Planning and Environment.

4.9.1 Yearly percentage population change during the period between 2001 and 2016

Graph 4.9.2 shows the yearly percentage population change during the period between 2001

and 2016. In most LGAs, yearly population growth is higher since 2006 than before. The

population percentage change is normally within the range of 0% to 3%. All negative population

growth records occurred before 2007 with Ku-ring-gai having the largest drop of -0.9% between

2004 and 2005 followed by Hawkesbury of -0.8% between 2003 and 2004 and Campbelltown of

-0.78% between 2003 and 2004. The top three LGAs which have the highest record of yearly

percentage change are Camden with 7.54% between 2015 and 2016, Sydney with 6.39%

between 2002 and 2003 and Botany Bay with 5.84% between 2015 and 2016. This is consistent

with the high completion rate for units in 2002 in Sydney LGAs.

Graph 4.9.2 Yearly percentage population change from 2001 to 2016

Outer West and Blue Mountains

Penrith

City and Inner South

Botany Bay — Sydney

Outer South West

Camden — Campbelltown — Wollondilly

Northern Beaches

Northern Beaches

Baulkham Hills - Hawkesbury - Blacktown

Blacktown — Hawkesbury — The Hills Shire

North Sydney and Hornsby

Hornsby — Ku-ring-gai — Lane Cove — Mosman — North Sydney — Willoughby
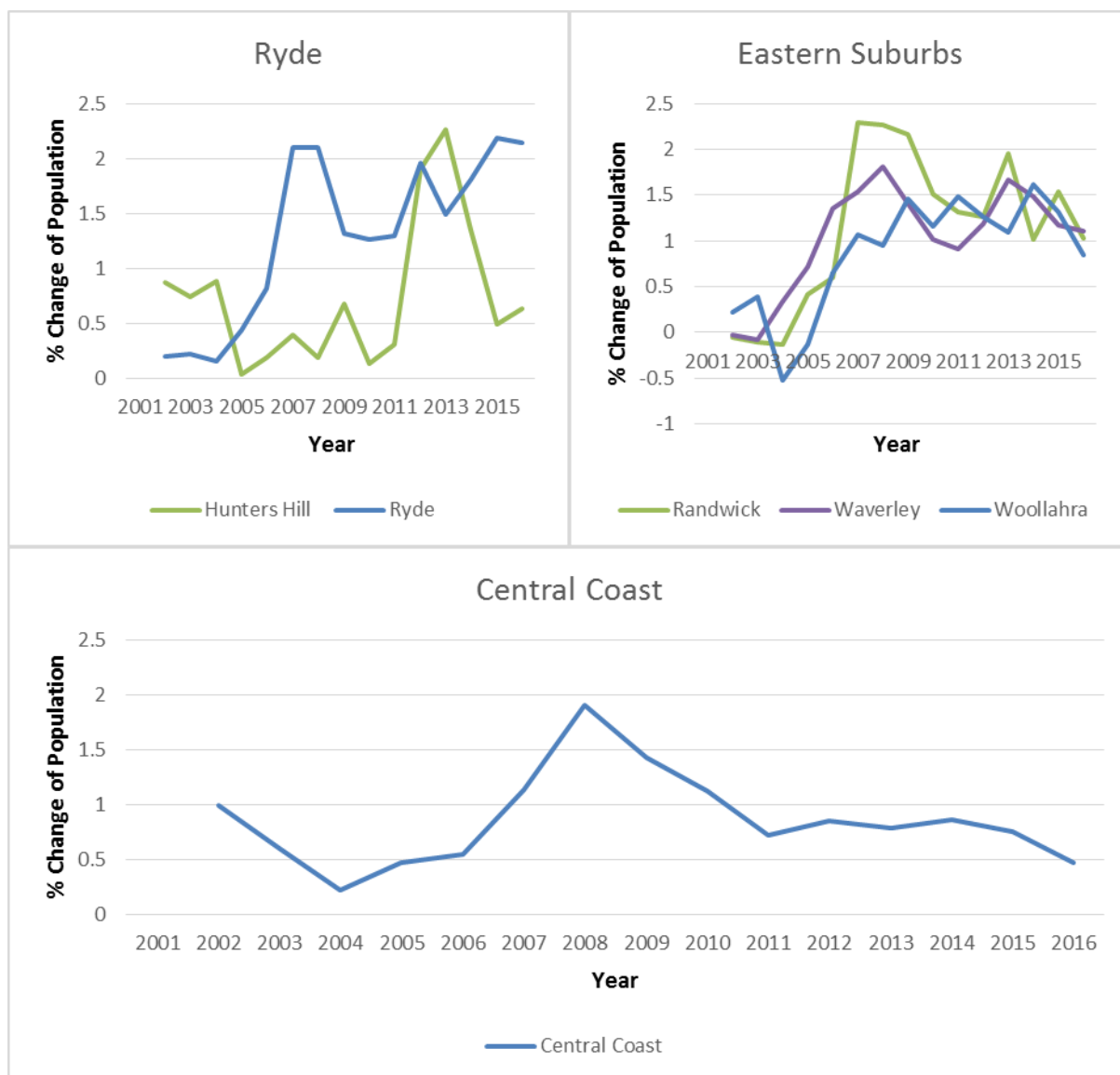
Source: NSW Department of Planning and Environment.

4.9.2 Percentage population change from 2001 to 2016

Graph 4.9.3 shows the percentage population change from 2001 to 2016. The LGAs with median

population percentage increases were Georges River with 18.9% and Randwick with 18.4%.

Camden had the highest percentage change of population with 71.6%, followed by Sydney with

63.6% and Canada Bay with 46% while Sutherland Shire and Hawkesbury had the lowest

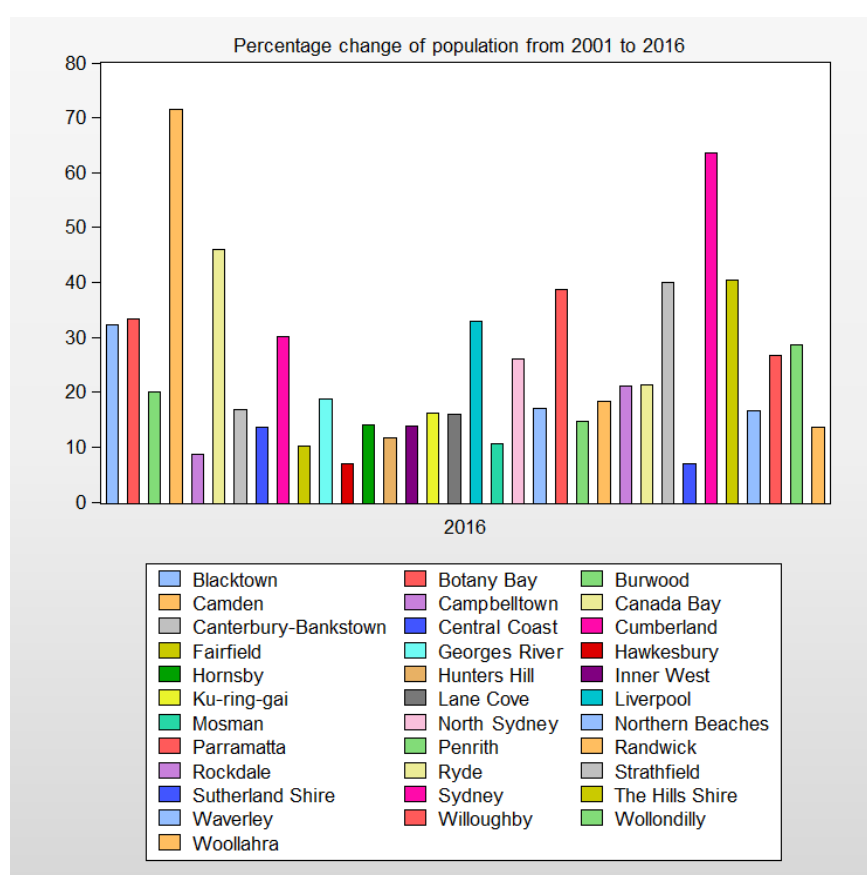percentage change of population with 7.0%followed by Campbelltown with 8.6%.

Graph 4.9.4 shows the percentage population change from 2006 to 2016. The LGAs with median

population percentage increases were Willoughby with 17.1% and Rockdale with 16.6%.

Camden had the highest percentage population change with 53.1% followed by Canada Bay

with 32.4% and Botany Bay with 31.6% while Sutherland Shire had the lowest population

growth with 7.61% followed by Hawkesbury with 8.19% and Hunters Hill with 8.64%.


These observations are consistent with the earlier housing completion analysis which showed

Camden as having the highest number of house completions and Sydney as having the highest

number of unit completions.

Graph 4.9.3 Percentage change of population from 2001 to 2016

Source: Australian Bureau of Statistics 2017, 3218.0.

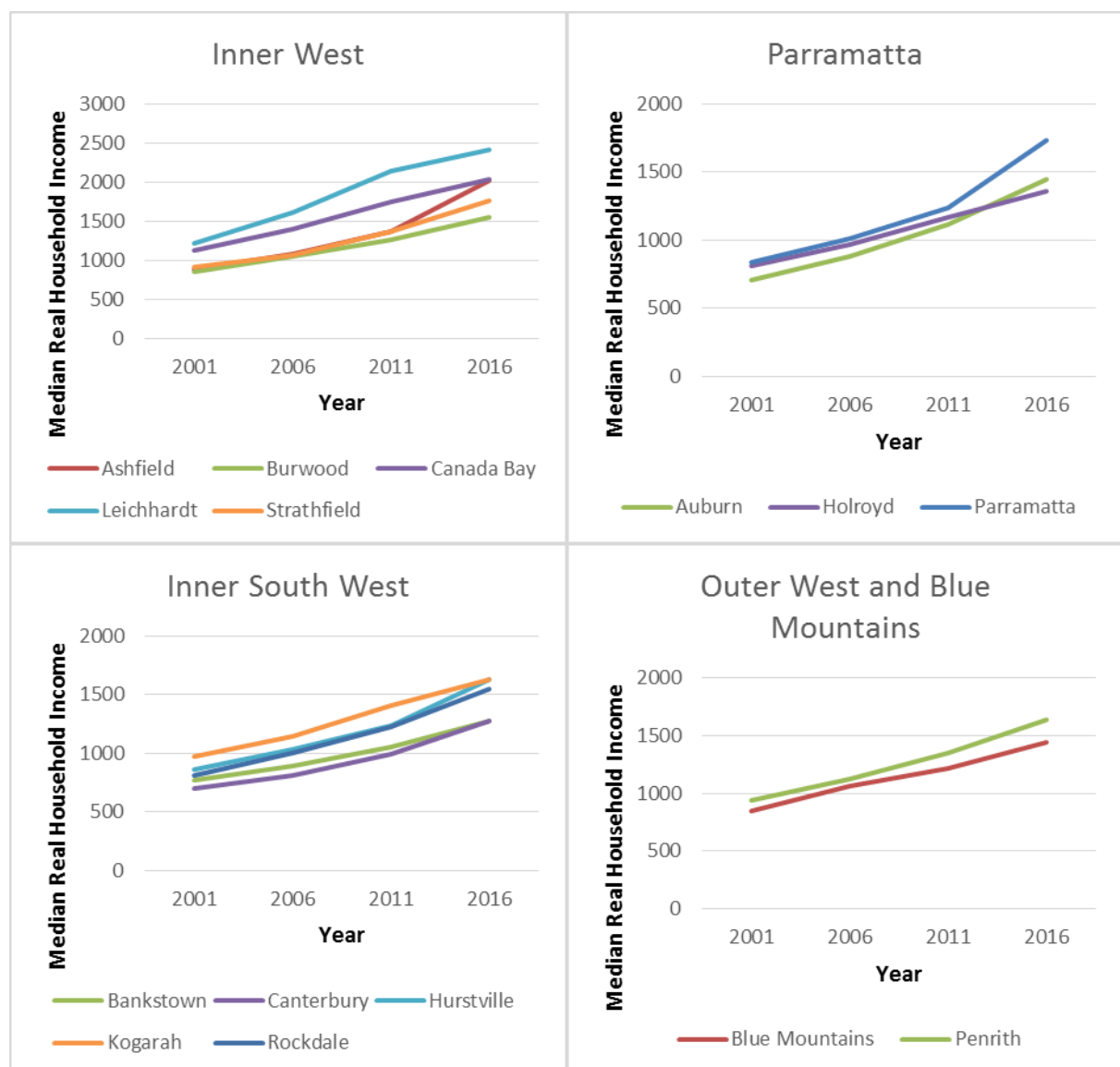Graph 4.9.4 Percentage change of population from 2006 to 2016
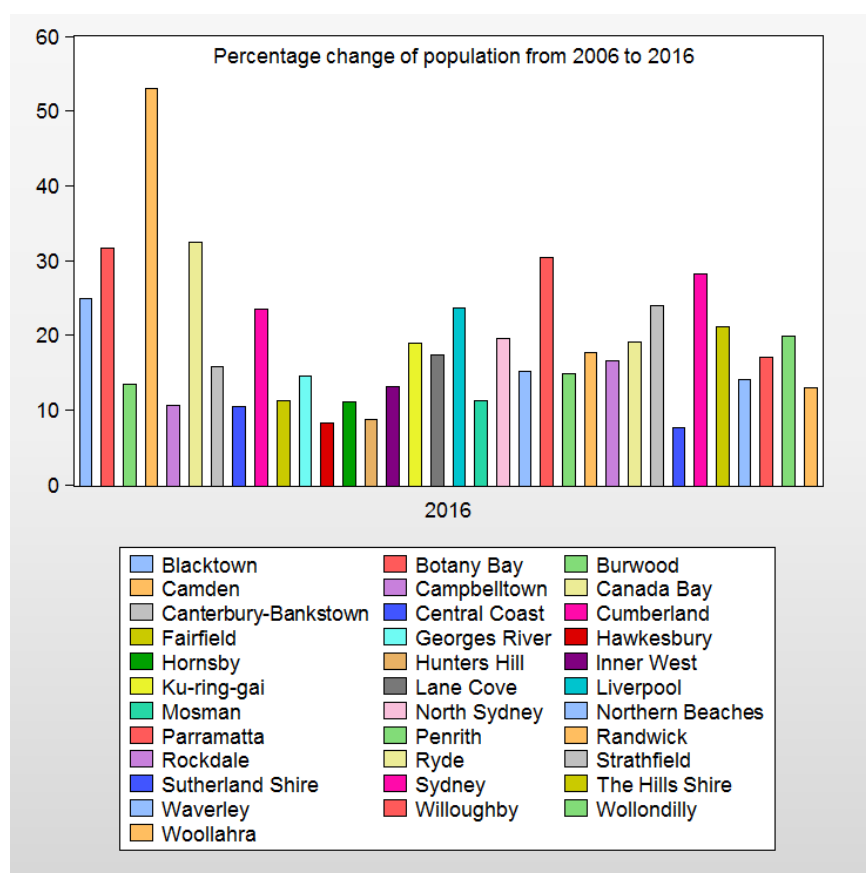
Source: Australian Bureau of Statistics 2017, 3218.0.

4.10 Median gross household income in real terms for Sydney Local Government Areas

Household income plays a significant role in determining housing affordability. It also impacts on housing demand and the ability of a household to get a mortgage loan (Duan 2011). Graph 4.10.1 provides an overview of median gross household income in real terms for Sydney Local Government Areas from 2001 to 2016. As shown in the graph, there was an increasing trend on real gross household income with the LGAs of Ku-ring-gai, Mosman and Woollahra having the highest median household income earned over the period. In 2016, Woollahra had the highest median gross household income with $2649 per week followed by Ku-ring-gai with $2603 and Manly with $2583. They were concentrated in the North-Eastern part of Sydney. On the contrary,

LGAs with lower household income tend to conglomerate on the outer ring of Sydney, namely Wyong, Canterbury, Gosford, Fairfield and Bankstown. In 2016, Fairfield had the lowest median gross household income of $1205, followed by Wyong with $1240 and Bankstown with $1280. Graph 4.10.4 shows the geographical location of high household income groups, indicated as green, and low household income group, indicated as red, in 2016 respectively. It is observed that high income groups concentrate on the inner ring while low income group tends to be located in the outer ring.

Graph 4.10.1 Median real household income for Sydney LGAs from 2001 to 2016

City and Inner South

Median Real Household Income vs Year (2001–2016)
Legend: Botany Bay, Marrickville, Sydney

Outer South West

Median Real Household Income vs Year (2001–2016)
Legend: Camden, Campbelltown, Wollondilly

South West

Median Real Household Income vs Year (2001–2016)
Legend: Fairfield, Liverpool, Sutherland

Baulkham Hills - Hawkesbury - Blacktown

Median Real Household Income vs Year (2001–2016)
Legend: Blacktown, Hawkesbury, The Hills Shire

North Sydney and Hornsby

Median Real Household Income vs Year (2001–2016)
Legend: Hornsby, Ku-ring-gai, Lane Cove, Mosman, North Sydney, Willoughby

Ryde

Median Real Household Income vs Year (2001–2016)
Legend: Hunters Hill, Ryde

Northern Beaches — Median Real Household Income by Year (2001, 2006, 2011, 2016): Manly, Warringah, Pittwater

Eastern Suburbs — Median Real Household Income by Year (2001, 2006, 2011, 2016): Randwick, Waverley, Woollahra

Central Coast — Median Real Household Income by Year (2001, 2006, 2011, 2016): Gosford, Wyong
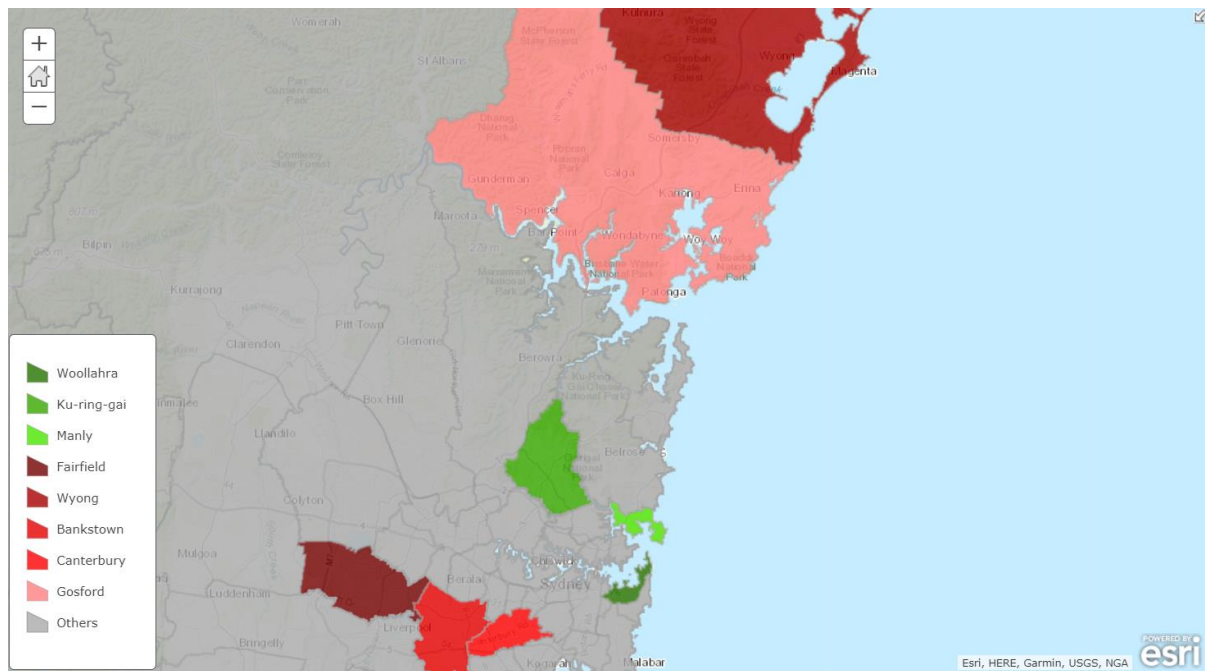
Source: Australian Bureau of Statistics 2017, Census data

Map 4.10.4 Distribution of high and low household income groups in 2016[2]
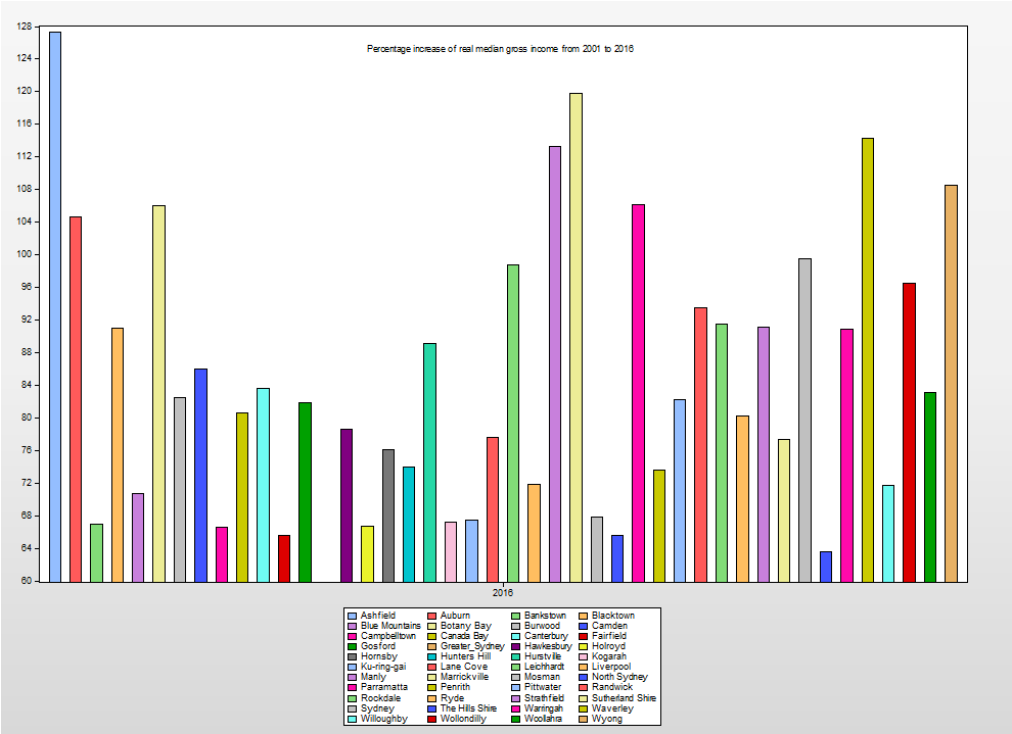

4.10.1 Percentage increase of real income

Graph 4.10.2 provides an overview of the percentage increase in real income for LGAs from 2001 to 2016 which ranged from 64% to 127%. Ashfield with 127.4% had the largest percentage increase in real income followed by Marrickville with 119.8% and Waverley with 114.3% while the Hills Shire had the lowest percentage increase in real income at 63.5% followed by North Sydney with 65.5% and Fairfield with 65.6%.

Graph 4.10.3 illustrates the percentage increase in real income from 2006 to 2016 which ranged from 25.7% to 87.2%. Ashfield had the highest percentage increase in real income with 87.2% followed by Marrickville with 76.4% and Parramatta with 71% while Ku-ring-gai had the lowest percentage increase in real income with 25.7% followed by the Blue Mountains with 35.7% and Mosman with 36.3%.

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[2] LGAs coloured red are considered low income while those coloured darkest green are considered wealthiest and the strength decreases as the colour lightens.

Graph 4.10.2 Percentage increase in real income from 2001 to 2016

Percentage increase of real median gross income from 2001 to 2016

Graph 4.10.3 Percentage increase in real income from 2006 to 2016

Percentage increase of real median household income from 2006 to 2016
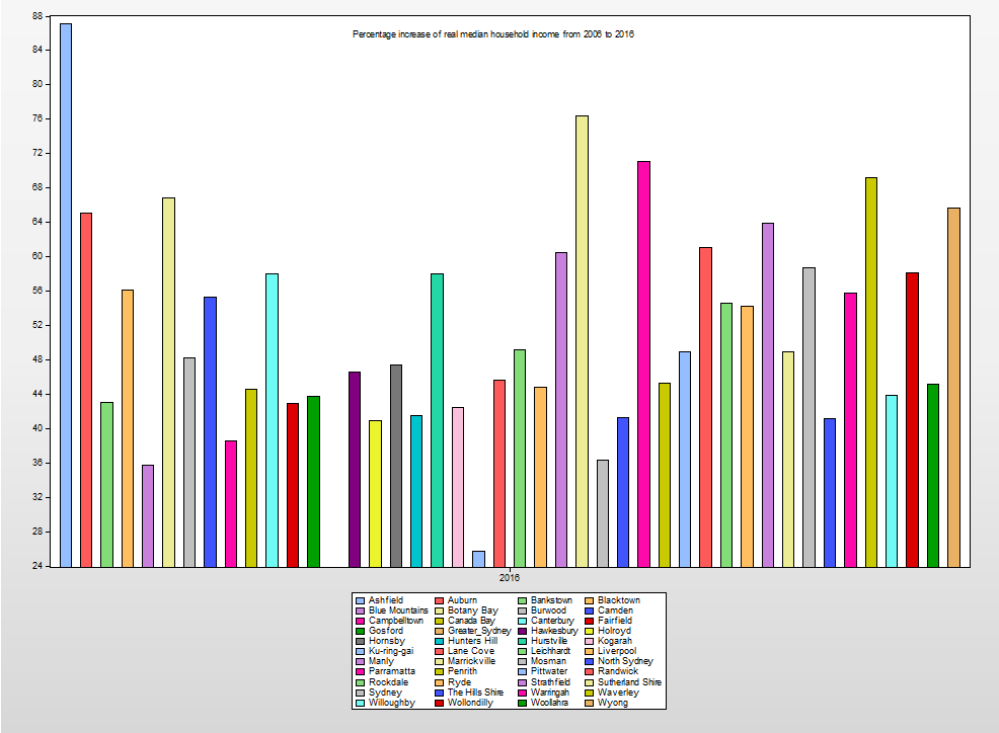
4.11 Conclusion

This chapter has provided descriptive analyses on variables affecting housing affordability including property sales prices, rental prices, housing approval and completion, population and household income. It is observed that percentage increases in dwelling prices and rents outpace percentage increases in income.

Chapter 5: A model of housing affordability in Sydney

This chapter presents measures of housing affordability for renters and homeowners in various Sydney local government areas.

5.1 Measurements of housing affordability for renters

5.1.1 General rental affordability

Rent-to-Income Ratio (RIR) (equation 1) is used for measuring rental affordability at the LGA level:

$$RIR = \frac{median\ rent}{median\ gross\ income} \qquad (1)$$

Due to data availability, the measure will start from 2006 to 2016 using Census data. By using the above equation, rental affordability for houses and apartments will be computed separately.

5.1.2   Rental affordability according to number of bedrooms

The general housing affordability measure provides an overview of rental affordability without taking into account dwelling sizes. Therefore, it is worth measuring rental affordability from another angle by taking dwelling size into consideration. According to SGS Economics and Planning (2016), the majority of households with children rent 3 bedroom dwellings while households without children usually rent 2 bedroom dwellings. Therefore, apart from computing general rental affordability, rental affordability of houses with 2 or 3 bedrooms will

also be computed. However, rental affordability for units can only be computed with 2 bedrooms due to data availability.

These rental affordability results will be compared with general rental affordability (i.e. Rent-to-Income Ratio) to see if they provide similar results.

5.1.3 Interpretation of the rent-to-income ratio

The benchmark for the RIR score is 30, where households with that score spend 30% of their income on rent. The higher the score, the larger proportion of income is spent on rent which results in housing affordability deterioration.

5.1.4 Comments on the rent-to-income ratio

Rent-to-Income Ratio is regarded as an important indicator when it comes to policy implications. It is used as a tool for housing analysis, setting rent levels in public housing, as a criterion for tenant selection, in assessing eligibility for housing allowances and in setting grants (Freeman, Chaplin & Whitehead 1997). Due to its simplicity, data is readily available even at micro levels. Therefore, this measure plays a significant role in providing policy implications at a more local level. However, this data fails to take into account the appropriateness of rental dwellings. For instance, a couple with two children earning a weekly household income of $1400 renting a one bedroom dwelling with a weekly rent of $420 is regarded as affordable but the dwelling size is not reasonably sufficient for accommodating two children no matter how low the rental cost is.

5.2 Housing affordability for homeowners

5.2.1 Median multiple

House price to household income ratio (i.e. Median Multiple) is adopted in this study:

$$\text{Median Multiple} = \frac{median\ dwelling\ prices}{median\ weekly\ household\ income} \qquad (2)$$

Using equation (2) above, housing affordability for houses and apartments are computed separately for the period from 2001 to 2016 using Census data.

This measure is adopted globally by different organisations such as the World Bank, the United Nations and the Demographia International Housing Affordability Survey for macro analysis. It is also ideal for micro level comparison. Karamujic (2015) used this approach when examining the problem of housing affordability for homeowners in Melbourne at the LGA level. Nevertheless, this measure fails to take into account of the maintenance cost for housing. Moreover, it takes no account of interest rates and mortgage repayment variations which limits its applicability to making comparisons over time.

The median multiple illustrates the multiple of weekly household income required to buy a dwelling. The higher the ratio, the less affordable the dwellings are.

Decision rule: According to Demographia International Housing Affordability Survey Housing Affordability Ratings (Demographia 2017) with its median multiples being calculated as median house price divided by median annual household income, the ratings are interpreted as follows:

Housing Affordability Rating	Median Multiple
Affordable	3.0 and below
Moderately Unaffordable	3.1-4
Seriously Unaffordable	4.1-5
Severely Unaffordable	5.1 and above

This analysis broadly follows this benchmark. Since the median multiple is calculated using median weekly household income instead of annual income, all benchmark ratings are computed using 52 times Demographia International Housing Affordability Survey Housing Affordability Ratings:

Housing Affordability Rating	Median Multiple
Affordable	156 and under
Moderately Unaffordable	156.1-224
Seriously Unaffordable	224.1-260
Severely Unaffordable	260.1 and above

5.2.2 User cost of housing approach

As well as the computation of median multiple, I am going to estimate housing costs as a percentage of median household income at the Sydney local government level using census data from 2001 to 2016. The measure can be stated as follows in general:

Housing user cost as percentage of median disposable income

$$= \frac{Nominal\ housing\ cost}{Nominal\ disposable\ household\ income} \times 100\%$$

The nominal housing cost is computed using the following formula:

$$\text{Nominal housing cost} = P\alpha r_n^m + P(1-\alpha)r_n^e + P(r+t+pt) - Pra$$

Where

P = house price as at the start of year

α = mortgage loan as percentage of house price

r_n^m = nominal mortgage rate

r_n^e = nominal rate of return after tax on owner's equity foregone

r = annual running cost as a percentage of house price

t = annual transaction cost incurred as a percentage of house price

pt = annual property tax incurred as percentage of house price

ra = nominal appreciation for a constant quality home as percentage of house price

In order to increase the explanatory power of the study, housing affordability for existing home owners and first home owners will be assessed separately.

Decision rule: It is considered as unaffordable if housing user costs as a percentage of median disposable income exceeds 30%.

5.2.2.1 Housing affordability for existing homeowners

When measuring housing affordability for median income existing home owners, some assumptions have to be made.

Firstly, it is assumed that existing home owners borrow 50% of the dwelling value.

Secondly, the nominal mortgage rate in this model will be the standard variable housing mortgage rate published by the Reserve Bank.

Thirdly, nominal after-tax return on equity is assumed to be 11.9% times the highest individual income tax rate threshold. According to Brailsford, Handley and Maheswaran (2008), the nominal pre-tax return on equity in Australia is observed to be 11.9% over the period between 1988 and 2005. Since capital gains from equity investment are regarded as part of an individual income, it is taxed under the individual tax system. In this analysis, nominal after-tax return on equity will be adjusted using the highest individual tax rate threshold for each census year. For example, the nominal after-tax return on equity for Mosman houses in 2001 is calculated as follows:

$$
\begin{aligned}
&\text{Nominal after} - \text{tax return on equity for houses in Mosman in 2001} = \\
&\text{median nominal house price in Mosman in 2001} \ \times 0.5 \times 11.9\% \times 47\%
\end{aligned}
$$

Fourthly, it is assumed that housing running costs, property maintenance and property taxes takes up 2% of the total property value. According to Fox and Tulip (2014), property maintenance costs take up 1.5% of property value and transaction costs including stamp duty are found to be 0.5% of property value on average during the period of 2004 to 2014.

Finally, capital appreciation is calculated by averaging annual capital gain from the past five years. The equation is presented as follows:

Capital appreciation

$$= [(P_t - P_{t-1}) + (P_{t-1} - P_{t-2}) + (P_{t-2} - P_{t-3}) + (P_{t-3} - P_{t-4}) + (P_{t-4} - P_{t-5})]/5$$

where

P refers to the dwelling values.

It is important to note that median dwelling values are only available from 2000 onwards. Therefore, capital appreciation data for 2001 is only obtained by taking the difference between 2001 and 2000.

5.2.2.2 Housing affordability for first home buyers

When calculating housing affordability for first home buyers, the same assumptions are generally shared with existing home owners but small adjustments have to be made.

Firstly, the median household income for the first-home owner is assumed to be 75% of the median household income.

Secondly, a dwelling value that first home buyers buy is assumed to be 30% below the median dwelling price.

Thirdly, it is assumed that the purchase is financed 80% from a mortgage loan and 20% from own equity.

5.3 Data sources

5.3.1 Data on median household income and disposable income

Median household income is sourced from the National Census Surveys taken by the Australian Bureau of Statistics (ABS). Household income is calculated by summing the individual incomes reported by all household members aged 15 years and over and present in range forms. Median incomes for each range are sourced from the Survey of Income and Housing conducted by the ABS when computing median household income. Data for median household income is excluded when there is a member aged 15 years old or older who failed to state their income or was temporarily absent on Census night. Median household income was collected in August for every selected Census year.

Median disposable household income is discounted by individual income tax rates, which are applicable to individuals who are Australian residents for tax purposes, collected from the Australian Taxation Office. Since income tax rates are updated on a financial year basis, care has to be taken when computing median disposable household income. For instance, when calculating the median disposable household income in 2001, individual income tax rates of 2001-02 should be adopted.

5.3.2 Data on median dwelling prices

Median dwelling prices for units and houses are provided by SIRCA CoreLogic RP Data on a monthly basis from 2001 to 2016. Since the median sale prices are recorded on a monthly basis, data on dwelling prices, selected when computing the Median Multiple, correspond to the month when the Census was held (i.e. August for each Census year).

5.3.3 Data on median rents

Median weekly rent for houses and apartments presented on a monthly basis is collected from SIRCA CoreLogic RP data. This dataset captures the median value of advertised weekly rents on a monthly basis. August data is selected for the rent data when computing the Rent-to-Income Ratio. Moreover, it is important to note that monthly median rent may not be available at the LGA level if there are less than ten observations available.

5.3.4 Data on median rent based on number of bedrooms

Weekly rent data classified by number of bedrooms is available from the department of Family & Community Services on a quarterly basis. The rental statistics are sourced from the rental bond lodgment form collected by Renting & Strata Services Branch (RSSB) of the Office of Fair Trading. Rent data is not assessable for a specific LGA if the numbers of new bond applications in that area are less than 10 in a month due to confidentiality issues. The rental data are available on a quarterly basis. Since the Census was held in August, rental data for the September quarter are chosen to calculate the rental affordability measurement. It is important to note that data provided by RSSB is not the total number of rental properties since there are always some vacant rental properties at any given point in time and bonds are not strictly required by a landlord from their tenant.

5.3.5 Data on standard variable mortgage rate

Standard variable housing loan lending rates are available from the Reserve Bank of Australia.

The data are presented on a monthly basis. Data for August in each census year will be

extracted to measure housing affordability.

5.4 Results

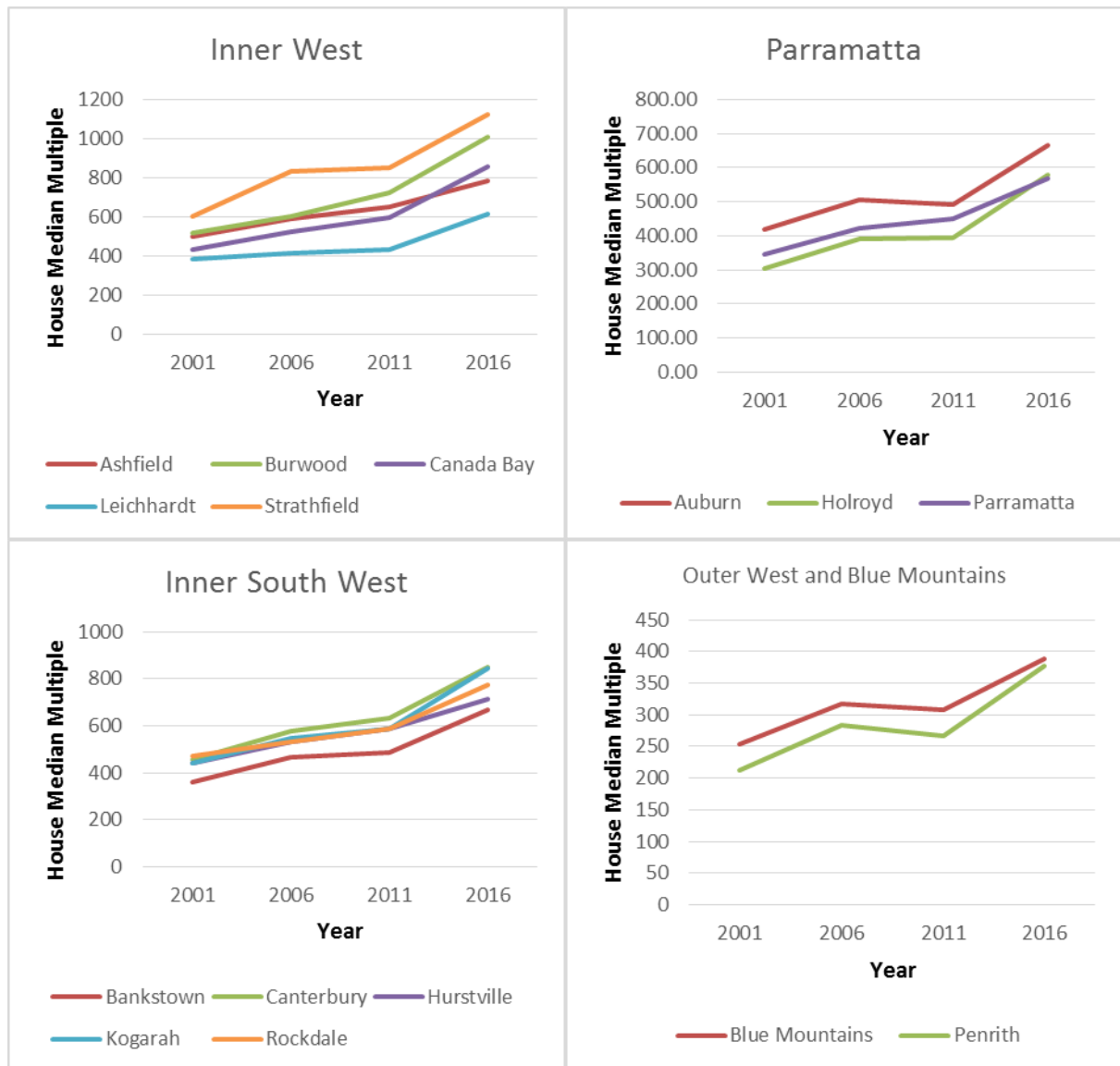*5.4.1 Result for housing affordability for homeowners*

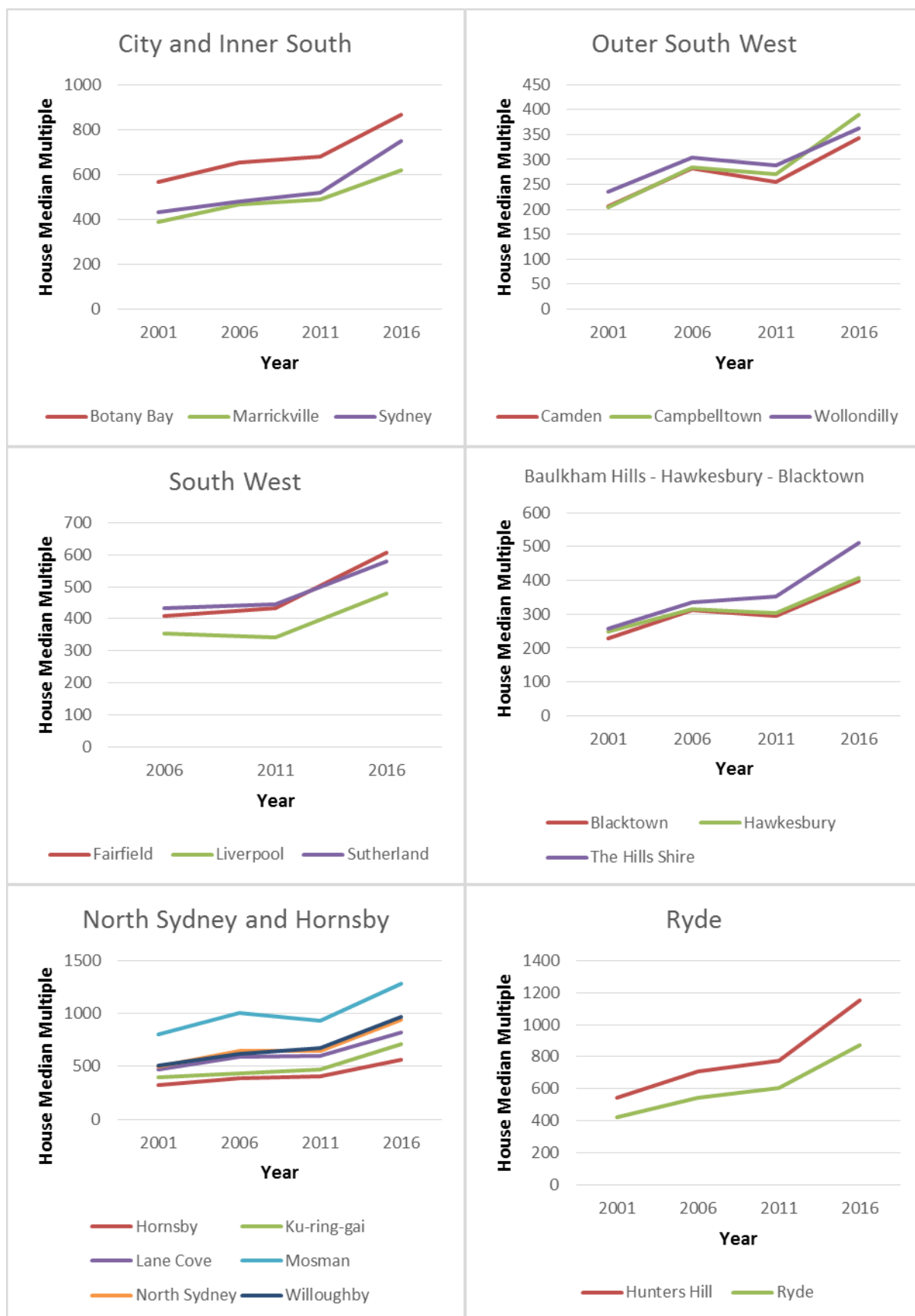5.4.1.1 Median Multiples for houses

Figure 5.4.1 shows the result of median multiples of houses for homeowners. In 2001, the median multiple indicators among the LGAs ranged from 204.6 in Campbelltown to 805.9 in Mosman. By 2016, the range increased to 343 in Camden to 1280.7 in Mosman. The broad range suggests the presence of a significant spatial price arbitrage between LGAs. In 2001, some LGAs were deemed as 'moderately unaffordable': Campbelltown, Camden, Penrith, Blacktown, Wollondilly, Hawkesbury, the Blue Mountains and the Hills Shire. These LGAs are concentrated in the Western part of Sydney. This finding concurs with the Productivity Commission (2004) which found that outer regions are considered comparatively affordable. The LGAs which have the highest median multiples were: Mosman, Woollahra, Waverley, Randwick and Strathfield. The data show that the housing affordability deterioration continued in 2006, when all LGAs were classified as 'severely unaffordable' and this trend continued in 2011 and 2016. In 2016, the LGAs which have the lowest Median Multiples were: Camden, Wollondilly, Penrith, the Blue Mountains, Campbelltown, Wyong, Blacktown and Hawkesbury, which are also concentrated on the outer ring of Sydney as shown in Map 5.4.19.

Figure 5.4.2 shows the percentage increase of median multiples for housing from 2001 to 2016. During the observed period, Hunters Hill had the largest percentage increases in median multiples with 111.2% followed by Ryde with 107.1%, Fairfield with 100.6%, The Hills Shire with 98.4% and Canada Bay with 97.5% while Wyong had the smallest percentage increase with

31.7% followed by Manly with 43.9%, Gosford with 47.0% and the Blue Mountains with 53.2%,

Botany Bay with 53.3046% and Wollondilly with 54.2046%.
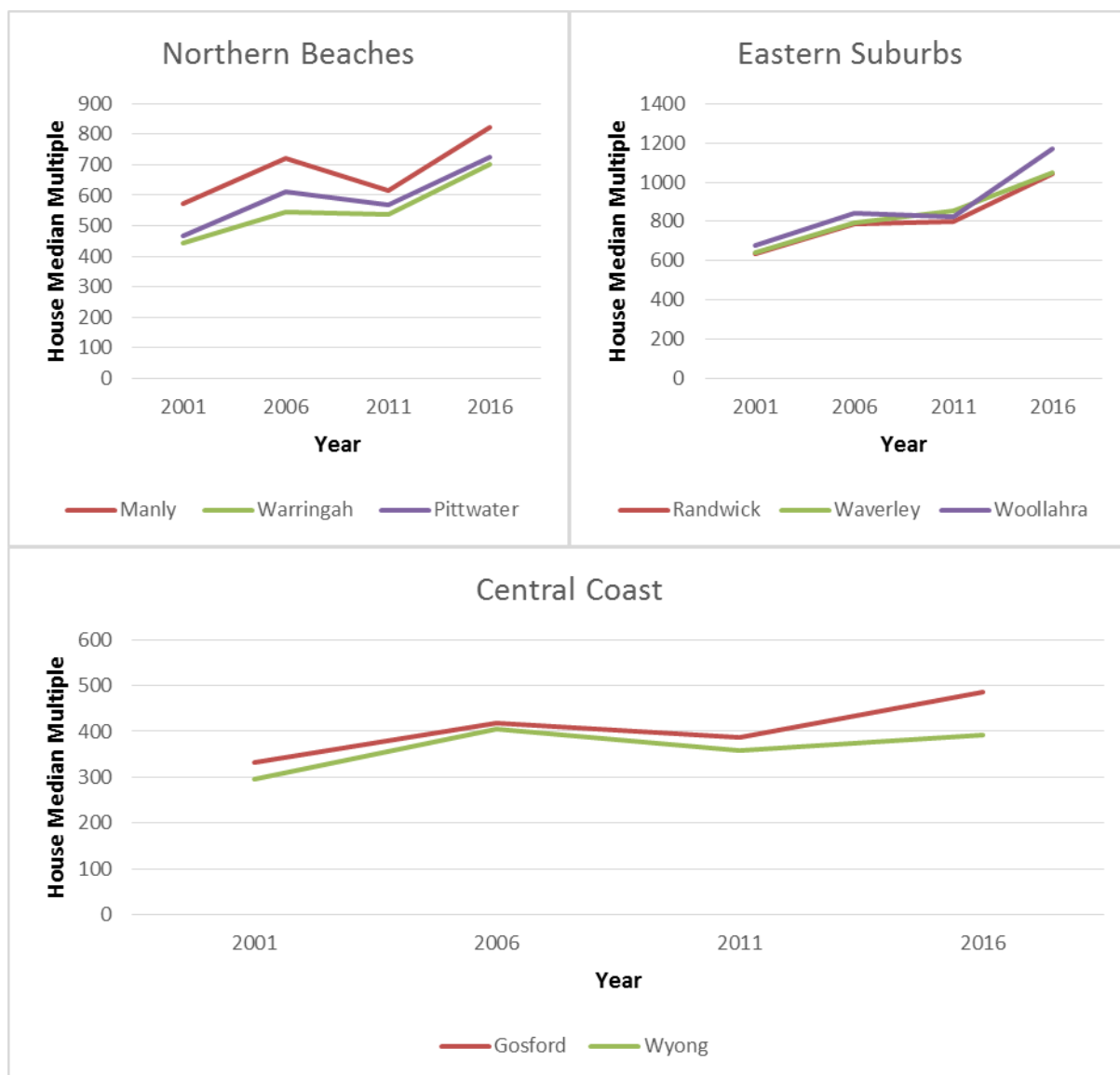
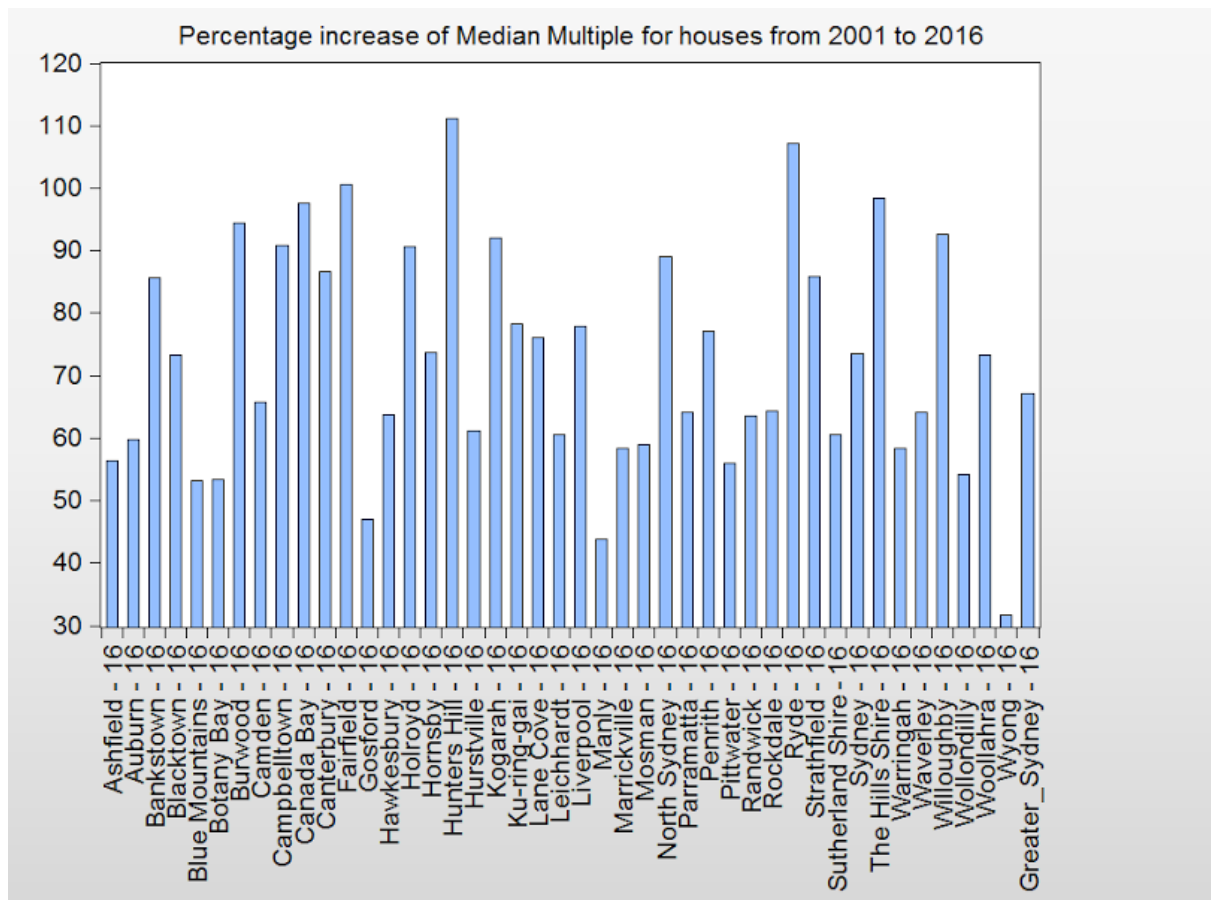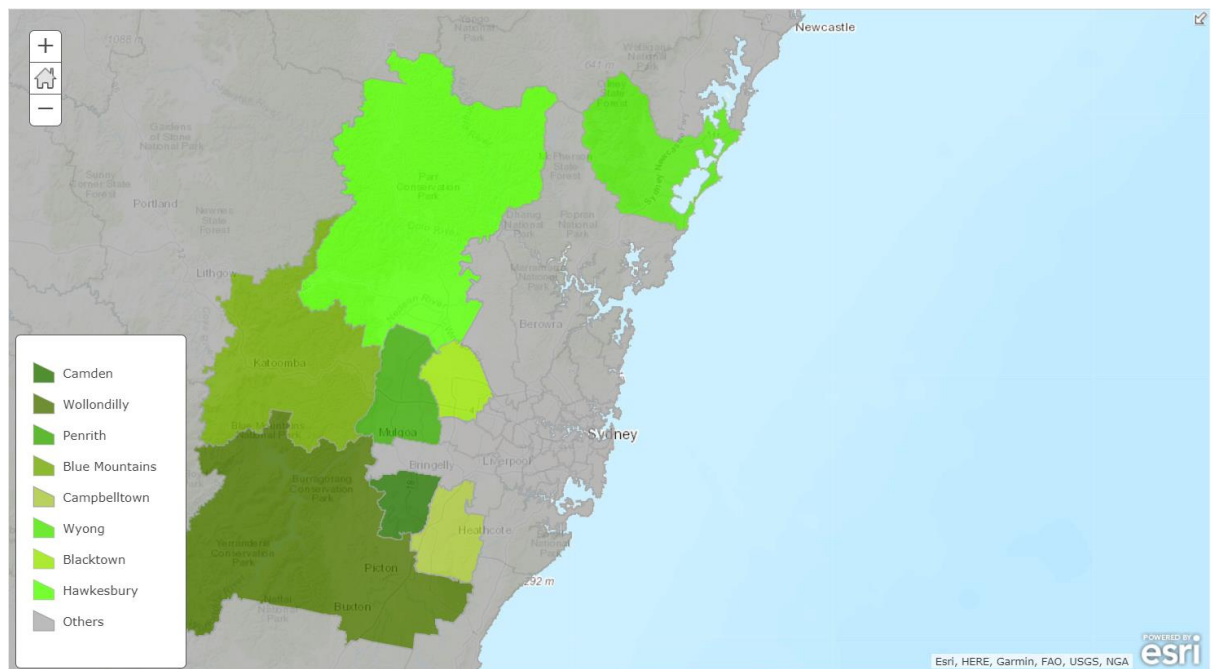Figure 5.4.1: Median multiples for houses

City and Inner South

Botany Bay — Marrickville — Sydney

Outer South West

Camden — Campbelltown — Wollondilly

South West

Fairfield — Liverpool — Sutherland

Baulkham Hills - Hawkesbury - Blacktown

Blacktown — Hawkesbury — The Hills Shire

North Sydney and Hornsby

Hornsby — Ku-ring-gai — Lane Cove — Mosman — North Sydney — Willoughby

Ryde

Hunters Hill — Ryde

139

Northern Beaches

Eastern Suburbs

Central Coast

Figure 5.4.2

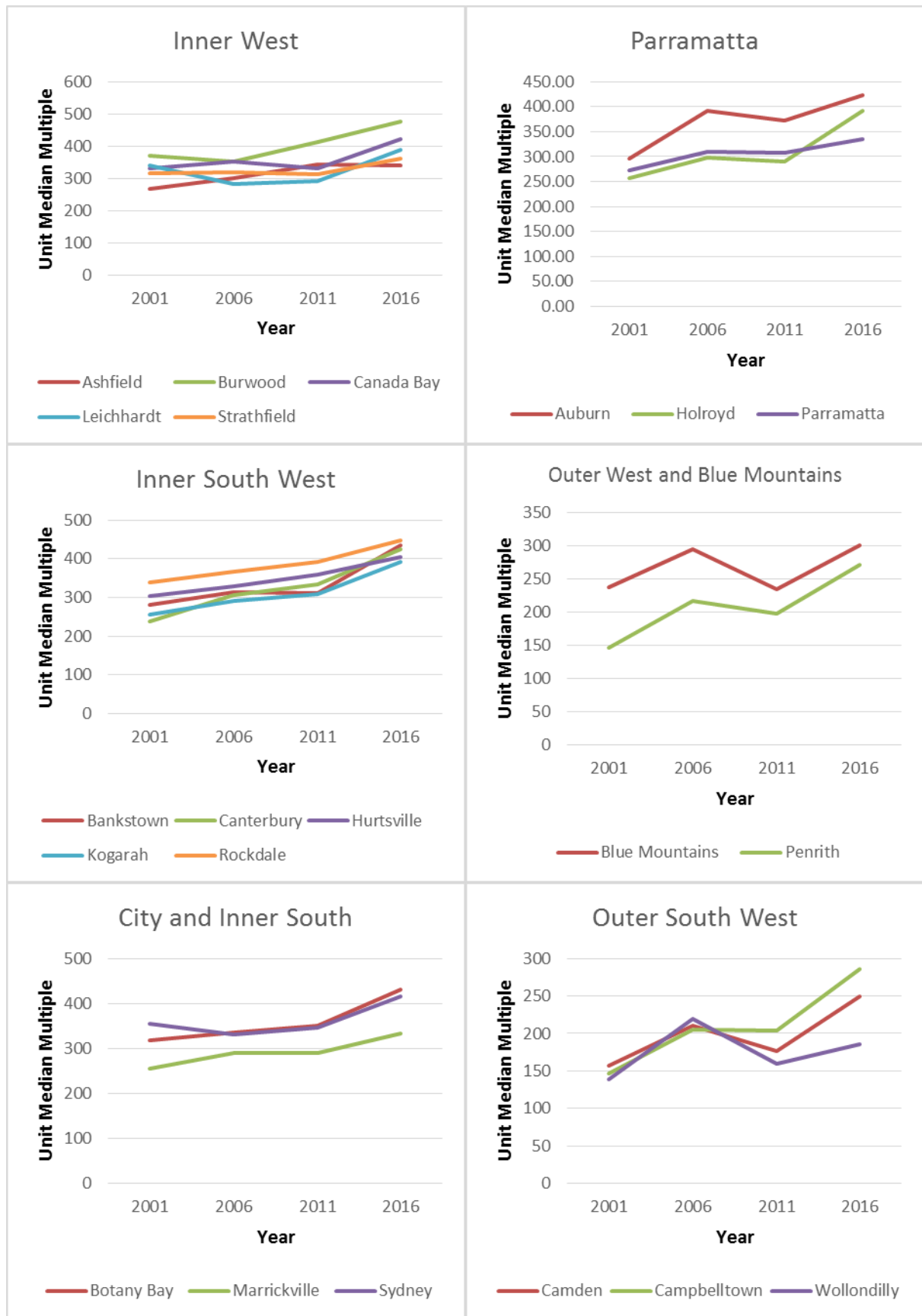Map 5.4.19 Geographical distribution of LGAs which are comparatively affordable[3]

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[3] LGAs with darker green imply that they are considered as most affordable and the affordability decreases with lighter green.
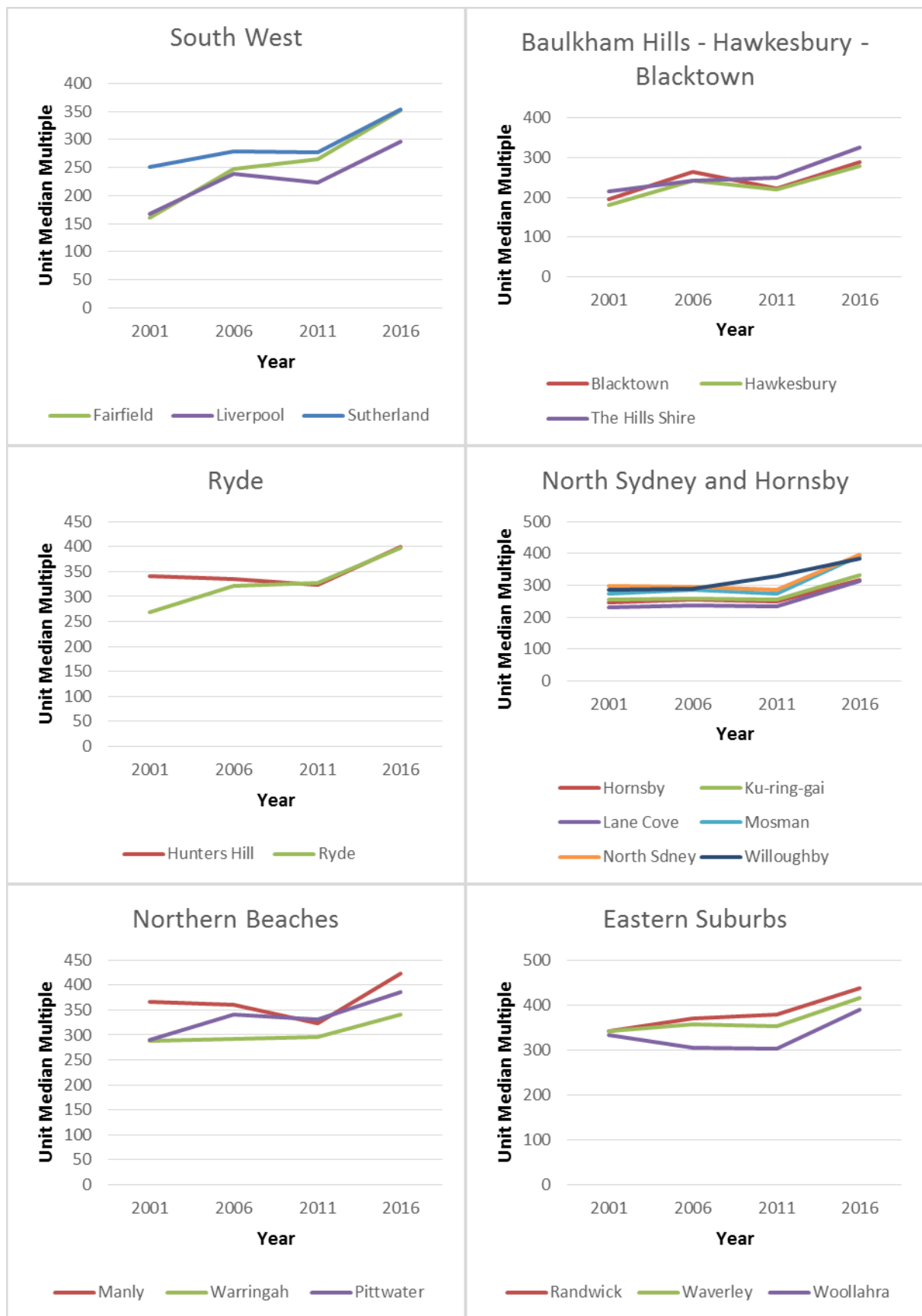
5.4.1.2 Median Multiples for units

Figure 5.4.3 shows the result of median multiples for units. As shown on the graph, the Median Multiple indicator among the selected suburbs in 2001 ranged from 139.4 in Wollondilly to 371.6 in Burwood. By 2016, the range increased to 185.7 in Wollondilly to 478.0 in Burwood. Out of the selected LGAs in 2001, only three LGAs were deemed as 'affordable': Wollondilly, Campbelltown and Penrith. This finding is also consistent with the Productivity Commission (2004) illustrating outer regions are comparatively more affordable. The graph shows that the housing affordability deterioration continued in 2006, when none of the LGAs had a ratio of less than 156. In 2016, Wollondilly had the lowest median multiples of units of 185.7 followed by Camden with 249.1, Penrith with 271.4, Hawkesbury with 280.3 and Campbelltown with 285.5. Areas that are comparatively affordable are mainly located at the Western part of Sydney as shown in Map 5.4.20.

Figure 5.4.4 shows the percentage change of median multiple. Between 2001 and 2016, the Median Multiple for Greater Sydney has increased by 32.4%. LGAs which have the smallest percentage increase in the Median Multiple are Wyong (4.3%), Strathfield (14.3%), Leichhardt (14.2%), Manly (15.5%) and Woollahra (17.0%) while LGAs whose Median Multiples have the largest percentage increase in the Median Multiple are Fairfield (118.9%), Campbelltown (95.5%), Penrith (84.6%), Canterbury (78.8%) and Liverpool (77.1%)

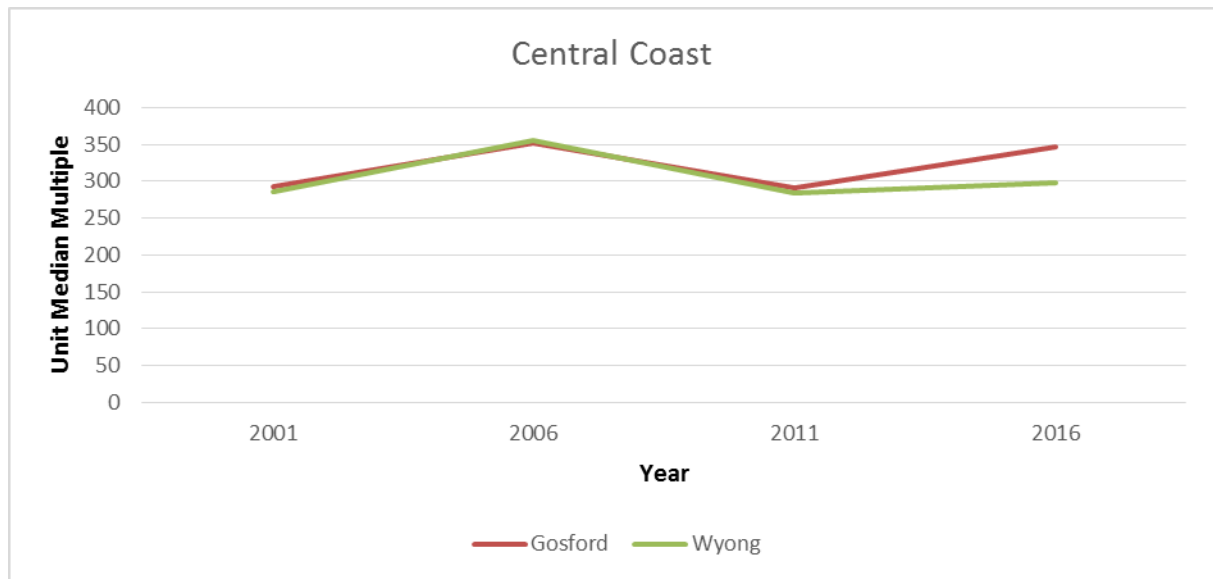Figure 5.4.3: Median Multiple for units

South West

Unit Median Multiple vs Year

Legend: Fairfield, Liverpool, Sutherland

Baulkham Hills - Hawkesbury - Blacktown

Unit Median Multiple vs Year

Legend: Blacktown, Hawkesbury, The Hills Shire

Ryde

Unit Median Multiple vs Year

Legend: Hunters Hill, Ryde

North Sydney and Hornsby

Unit Median Multiple vs Year

Legend: Hornsby, Ku-ring-gai, Lane Cove, Mosman, North Sdney, Willoughby

Northern Beaches

Unit Median Multiple vs Year

Legend: Manly, Warringah, Pittwater

Eastern Suburbs

Unit Median Multiple vs Year

Legend: Randwick, Waverley, Woollahra

Central Coast

Figure 5.4.4: Percentage changes of median multiples for units from 2001 to 2016

Percentage changes of median multiples for units from 2001 to 2016
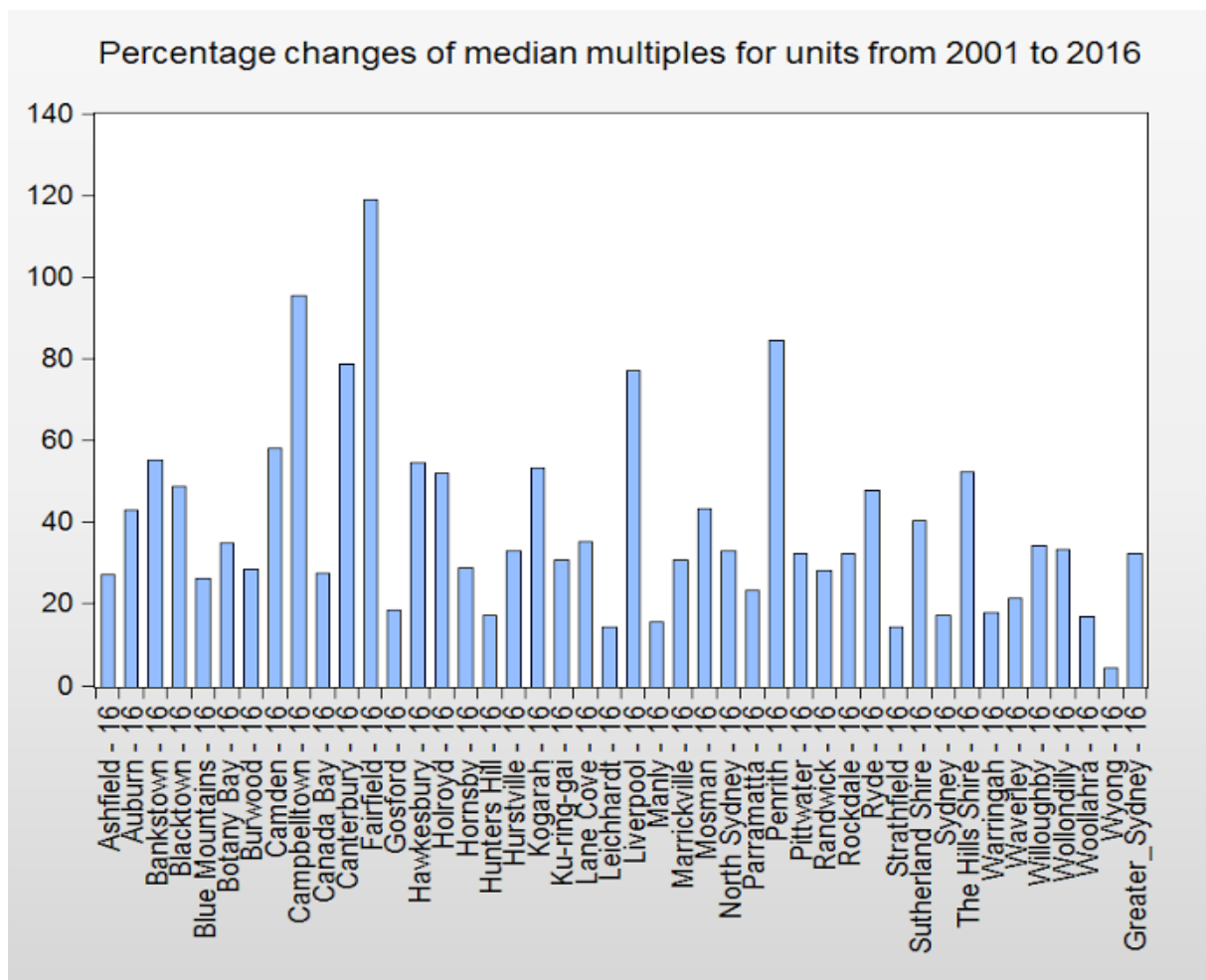
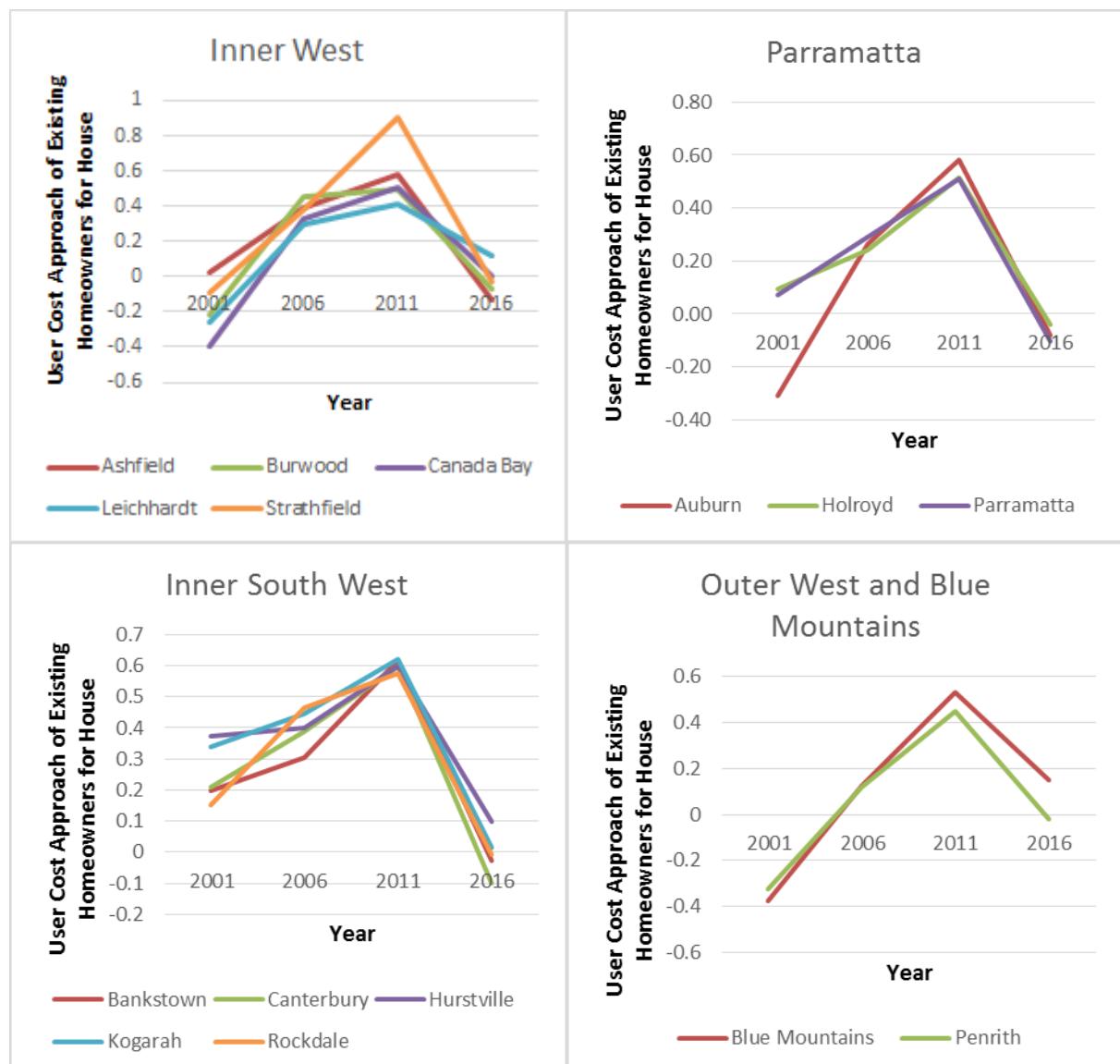Map 5.4.20 Geographical distribution of LGAs that are comparatively affordable[4]
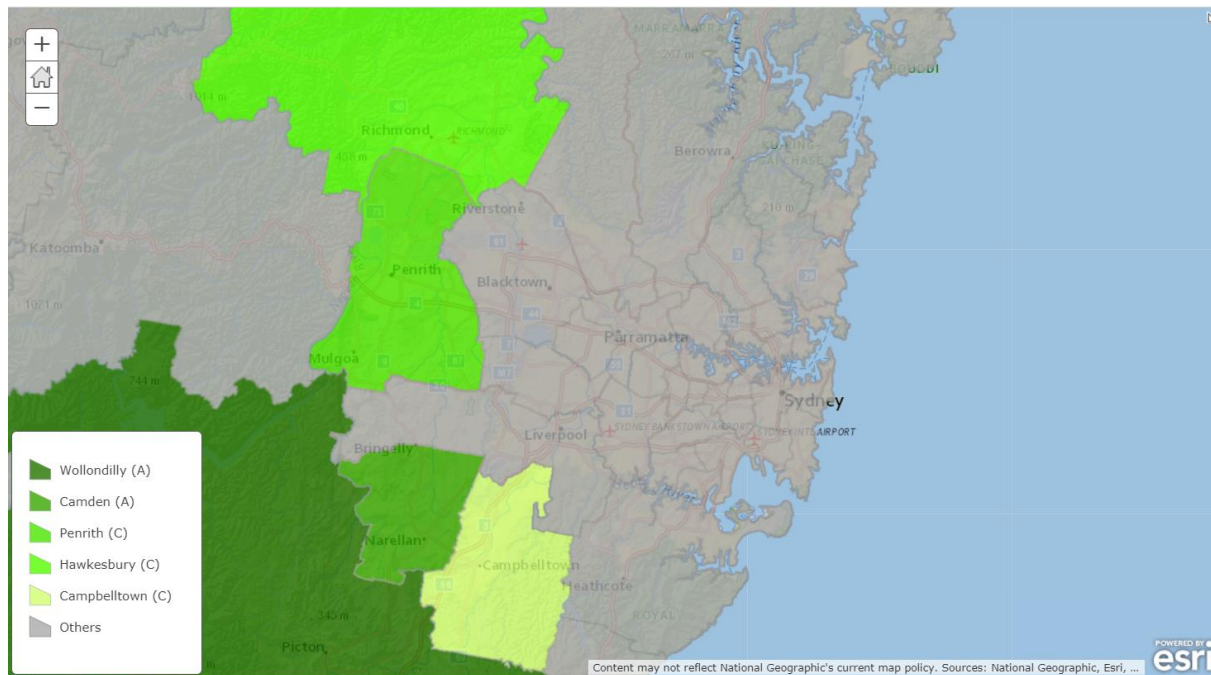
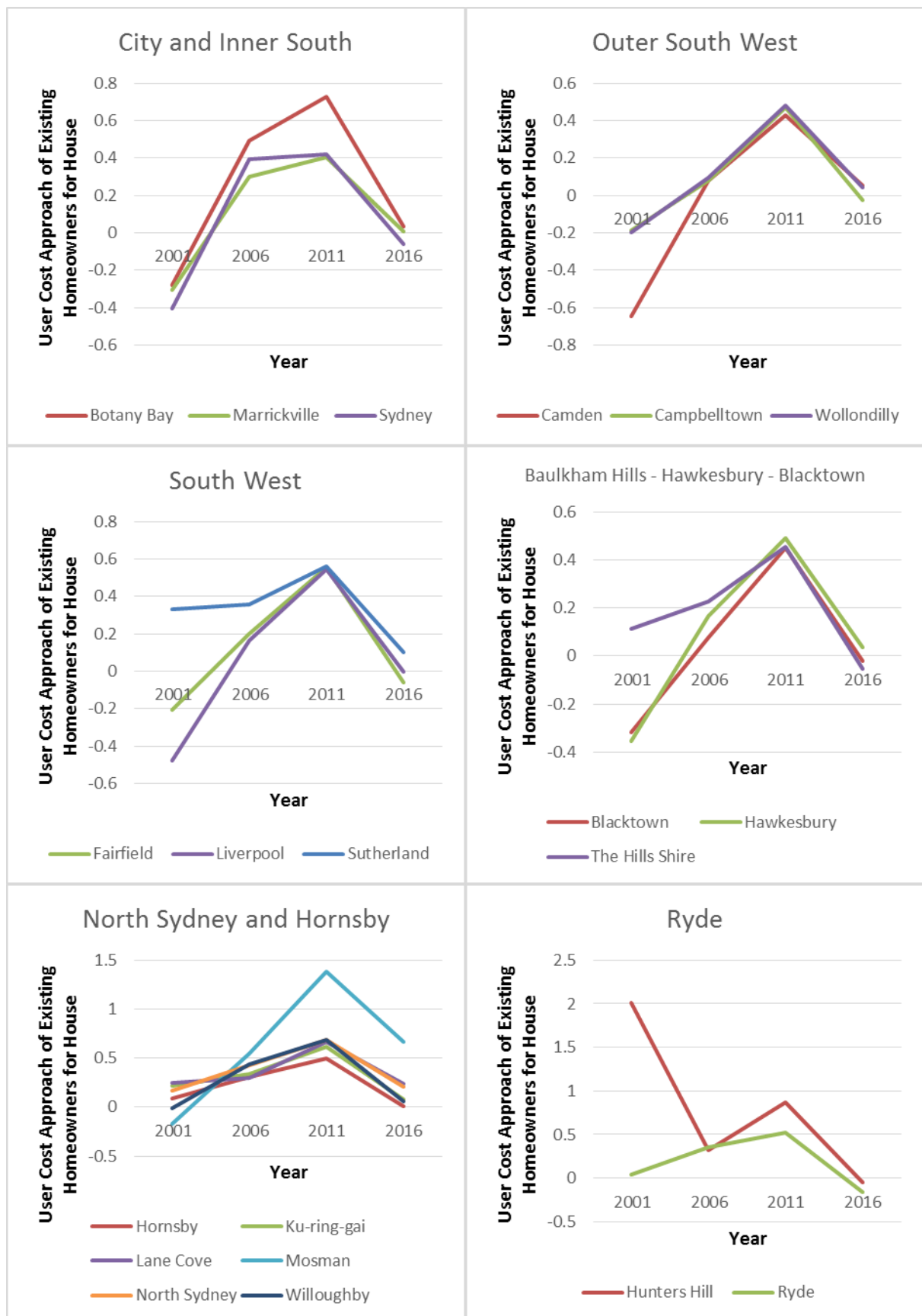## 5.4.1.3 User cost approach of existing homeowners for houses

Figure 5.4.5 shows the user cost approach of existing homeowners for houses. Housing unaffordability for houses intensified after 2001 and reached its peak in 2011. The problem alleviated in 2016. In 2001, only 6 LGAs were considered unaffordable with Hunters Hill being considered severely unaffordable with house user cost taking up 202% of the median household income. Manly came in second with 51.8% while Pittwater was the third with 43.2%. The three LGAs that were considered most affordable were Woollahra with a value of -95.7%, followed by Randwick with -66.5% and Camden with -64.6%. The negative value indicates that the owners are gaining revenue from owning a dwelling due to the effect of capital appreciation and the fall in interest rates. The housing unaffordability problem intensified in 2006 with 25 LGAs being identified as unaffordable. It became more serious when all LGAs were identified as unaffordable in 2011. In 2016, the situation has improved with two LGAs considered as
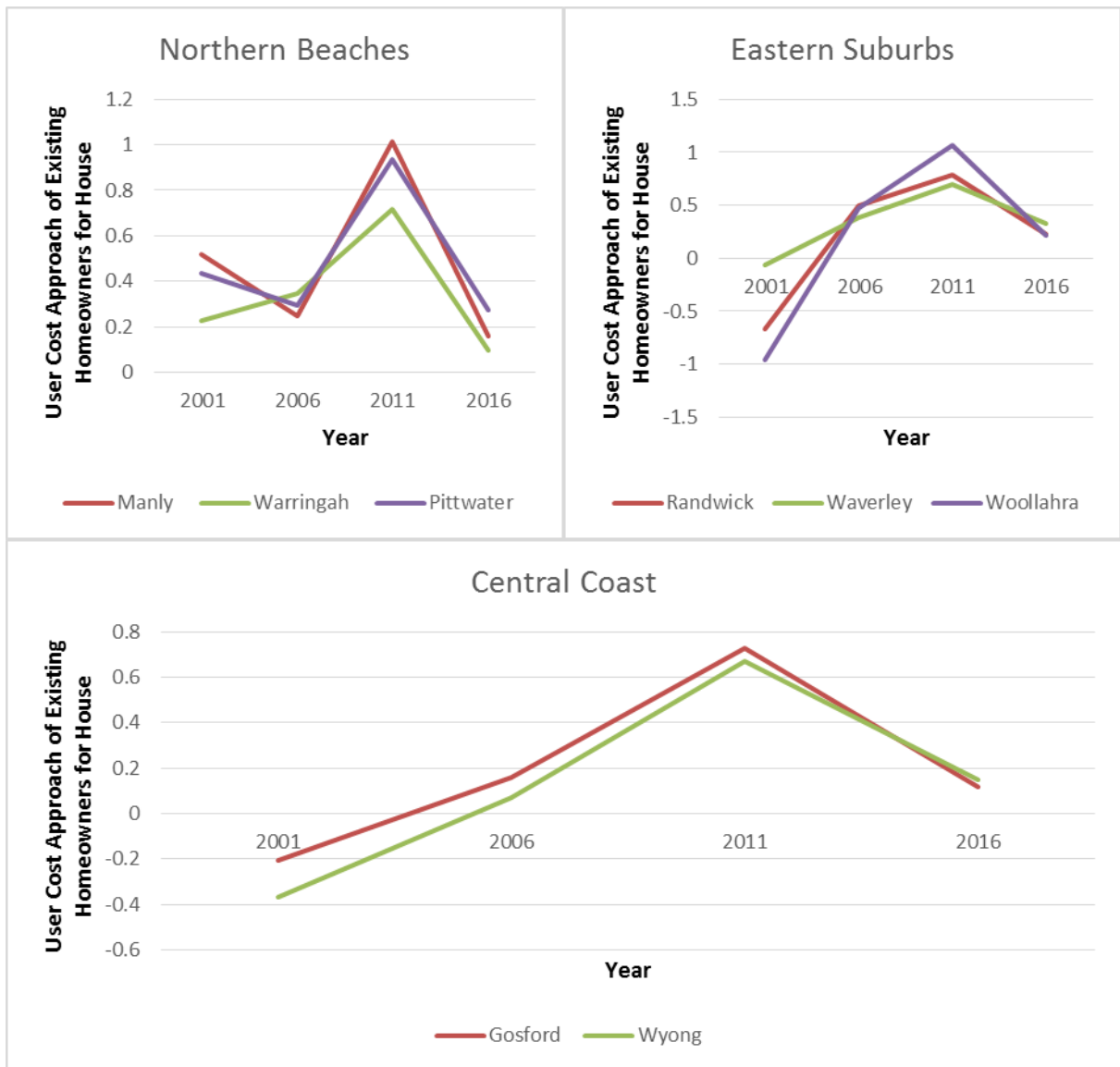
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[4] LGAs with darker colour imply higher affordability.

unaffordable namely Mosman with 66.6% followed by Waverley with 32.6%. Ryde is considered

most affordable with -16.4% followed by Ashfield with -13.6% and Parramatta with -10.5% each.

With reference to Map 5.4.21, LGAs which are under housing stress are located in the eastern

part of Sydney while affordable ones, which are shown in green, are concentrated on the
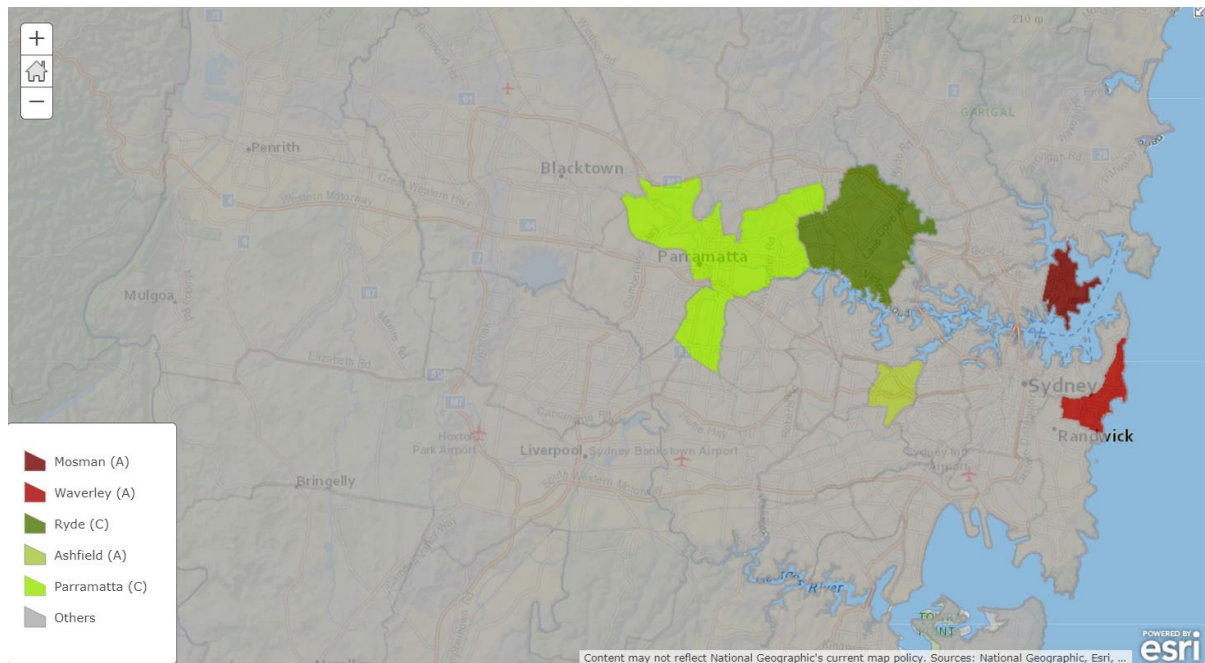
western part of Sydney in 2016.

Figure 5.4.5 User cost approach of existing homeowners for houses

City and Inner South

Outer South West

South West

Baulkham Hills - Hawkesbury - Blacktown

North Sydney and Hornsby

Ryde

Map 5.4.21 Geographical distribution of the user cost approach of existing homeowners for houses in 2016[5]
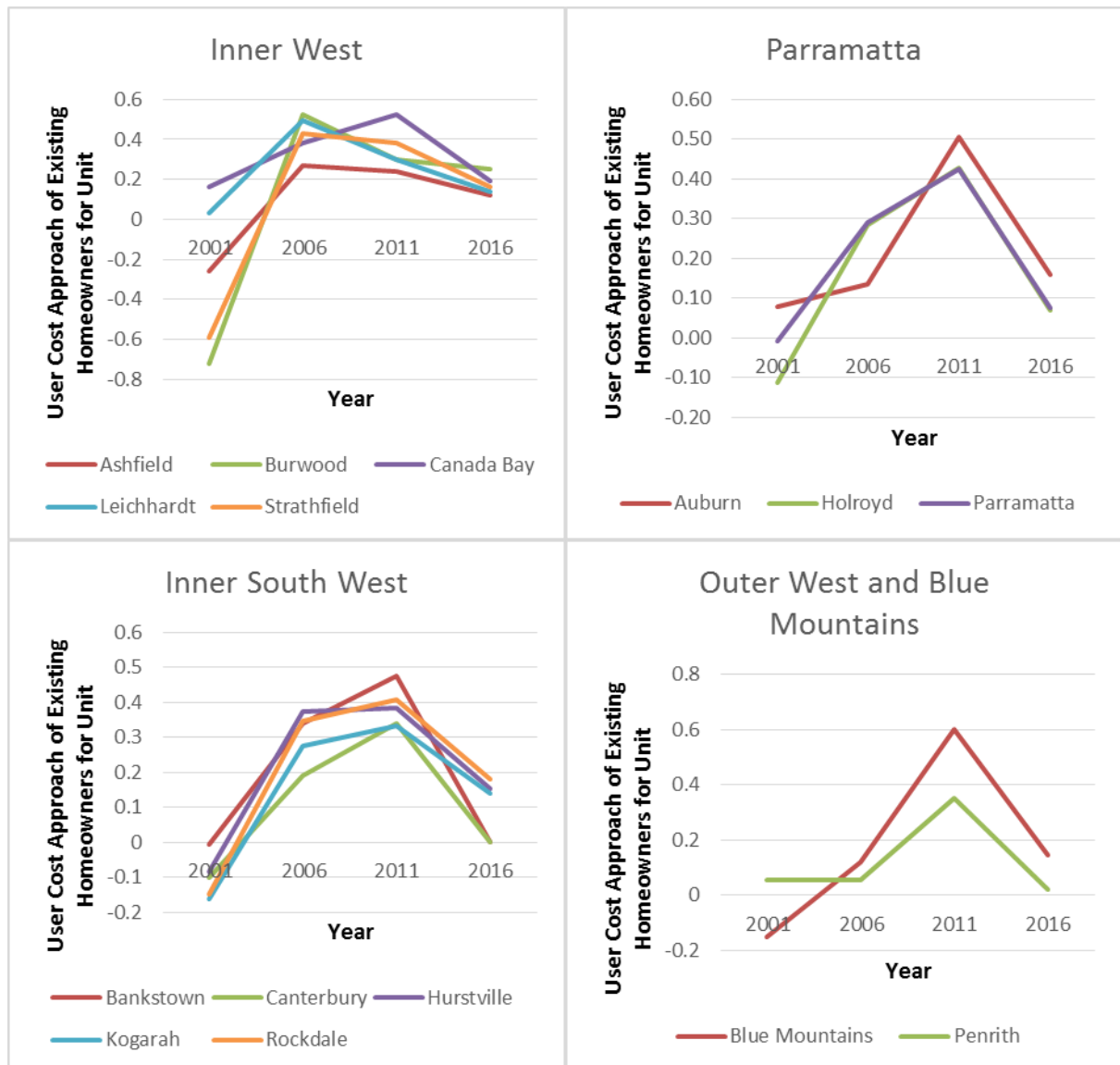

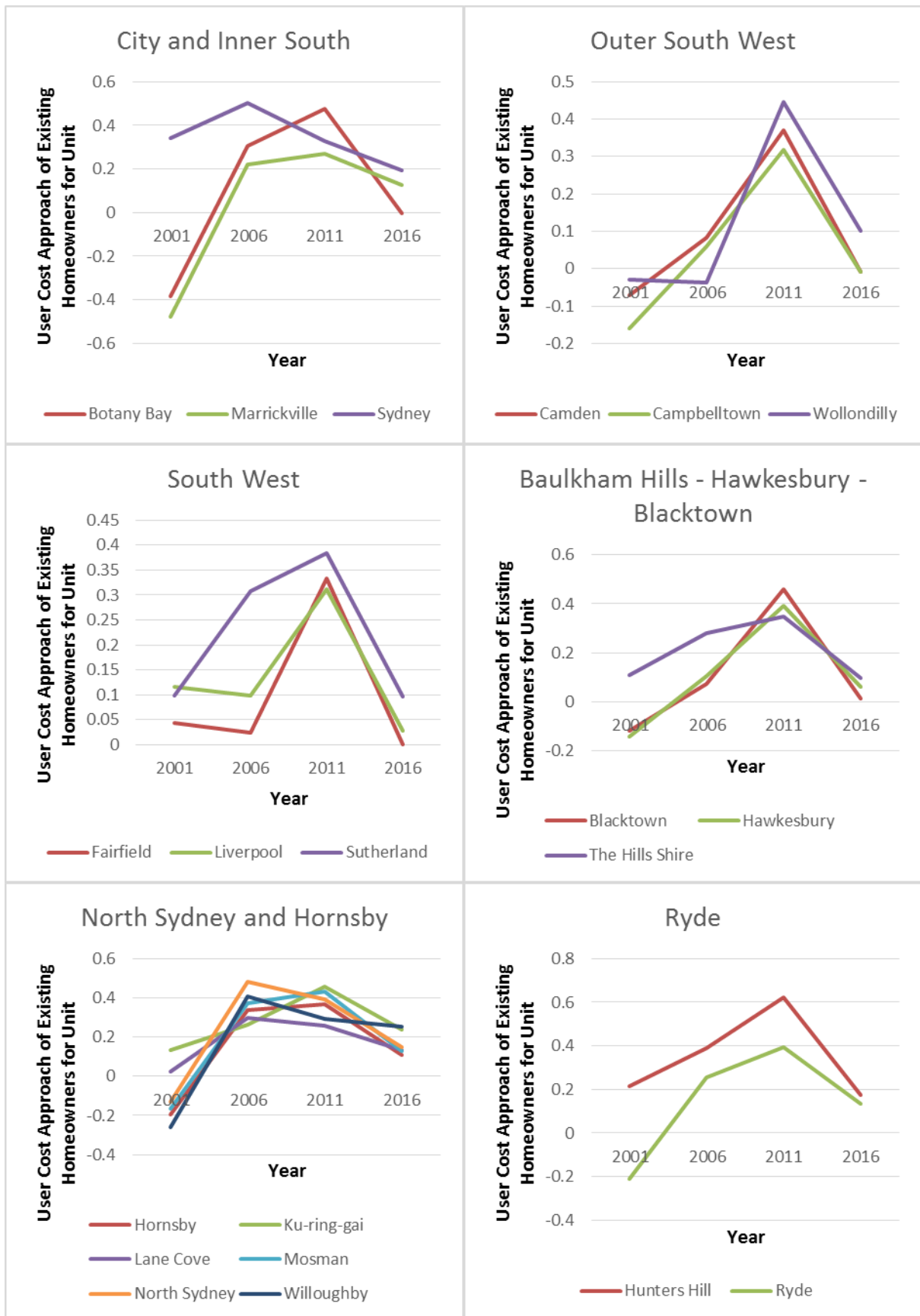## 5.4.1.4 User cost approach for existing homeowners for units

Figure 5.4.6 shows the user cost approach of existing homeowners for units. The unit analysis shares a common trend with that of houses. In 2001, only Sydney was considered unaffordable with 34.0%. Burwood was the most affordable LGA with -72.1% followed by Strathfield with -58.9% and Marrickville with -47.6%. The situation intensified in 2006 with 20 LGAs being classified as unaffordable. Burwood was considered comparatively most unaffordable with 52.6% followed by Sydney with 50.1% and Leichhardt with 49.4% while Wollondilly was considered most affordable with -3.7% followed by Fairfield with 2.4% and Penrith with 5.4%. The deterioration reached a peak in 2011 with 38 LGAs being classified as unaffordable. In 2016, there was an improvement in housing affordability with all LGAs being classified as affordable. Pittwater was the least affordable LGA with 26.3% followed by Willoughby with 25.5% and Burwood with 24.9% while the most affordable LGAs go to Campbelltown with -0.9%, Camden

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[5] LGAs coloured red are considered unaffordable while those coloured darkest green are considered most affordable and the strength decreases as the colour lightens.

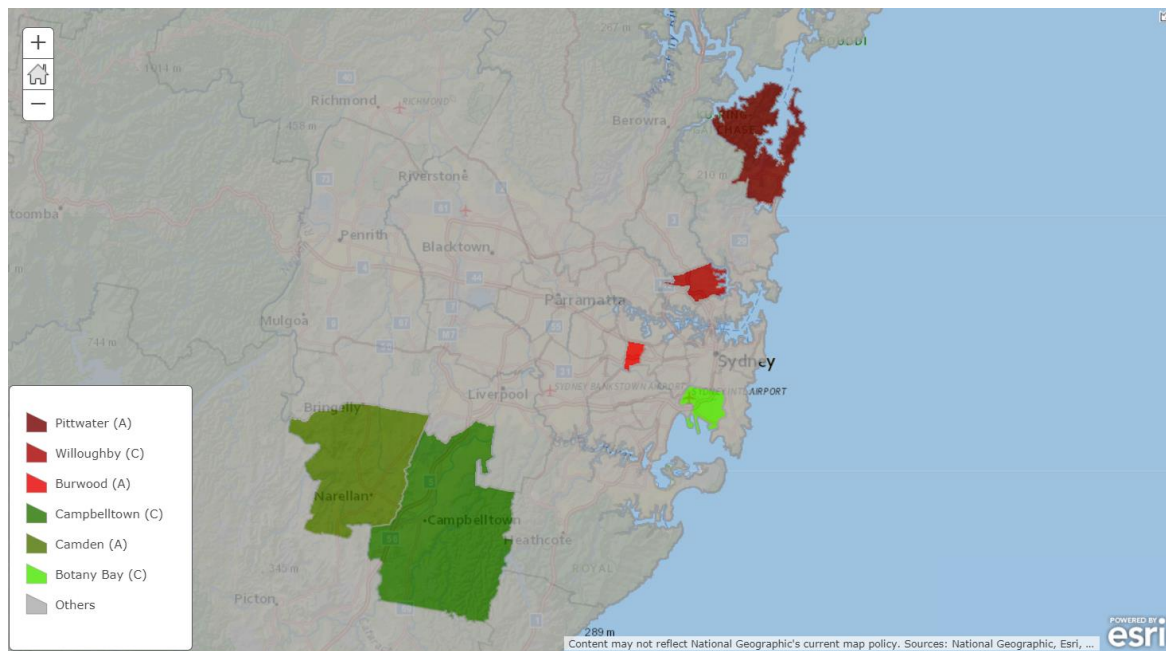with -0.9% and Botany Bay with -0.2% as shown on Map 5.4.22.

Figure 5.4.6 User cost approach of existing homeowners for units

City and Inner South

Outer South West

South West

Baulkham Hills - Hawkesbury - Blacktown

North Sydney and Hornsby

Ryde
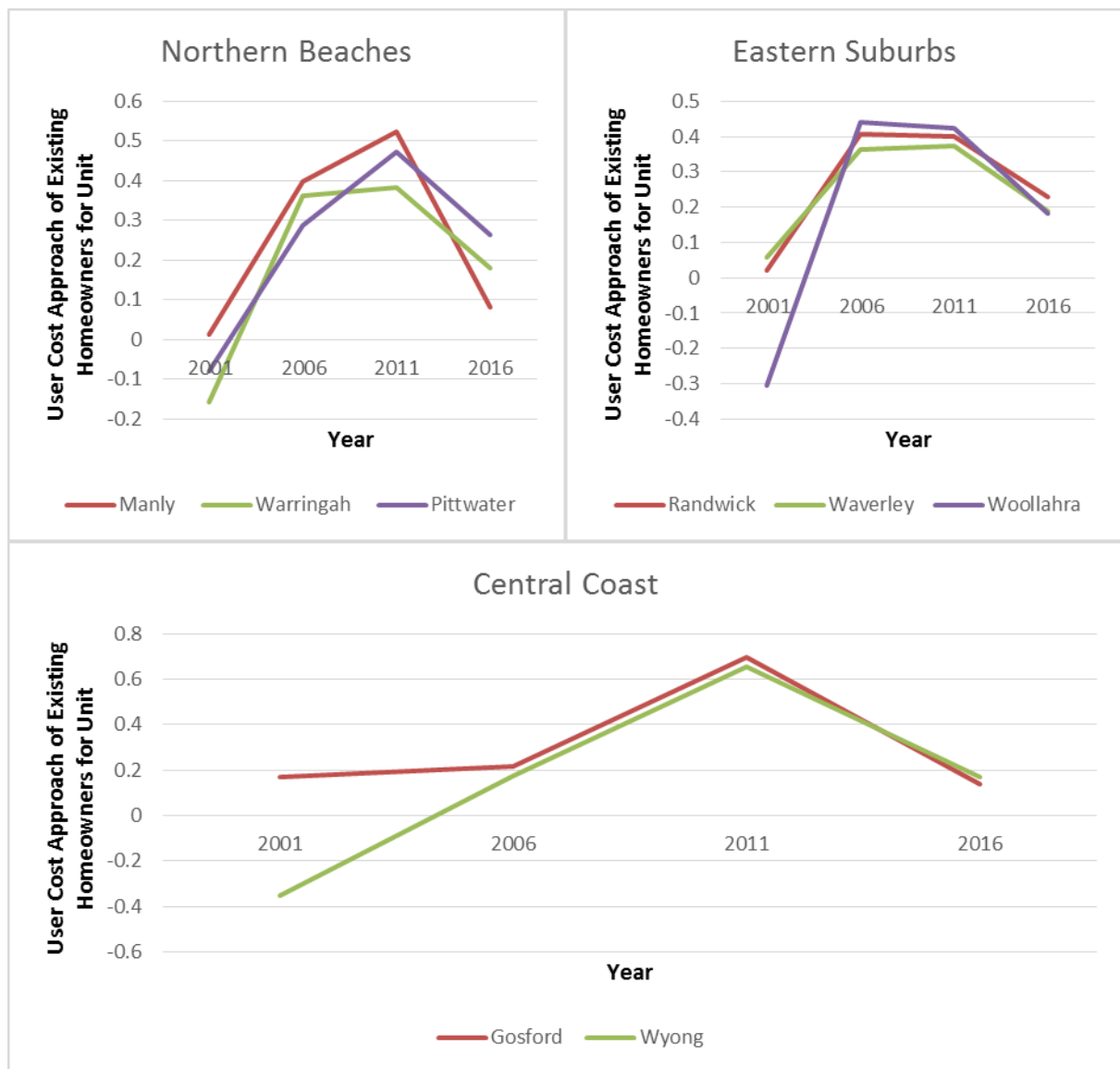
Map 5.4.22 Geographical distribution of the user cost approach of existing home owners for units in 2016[6]
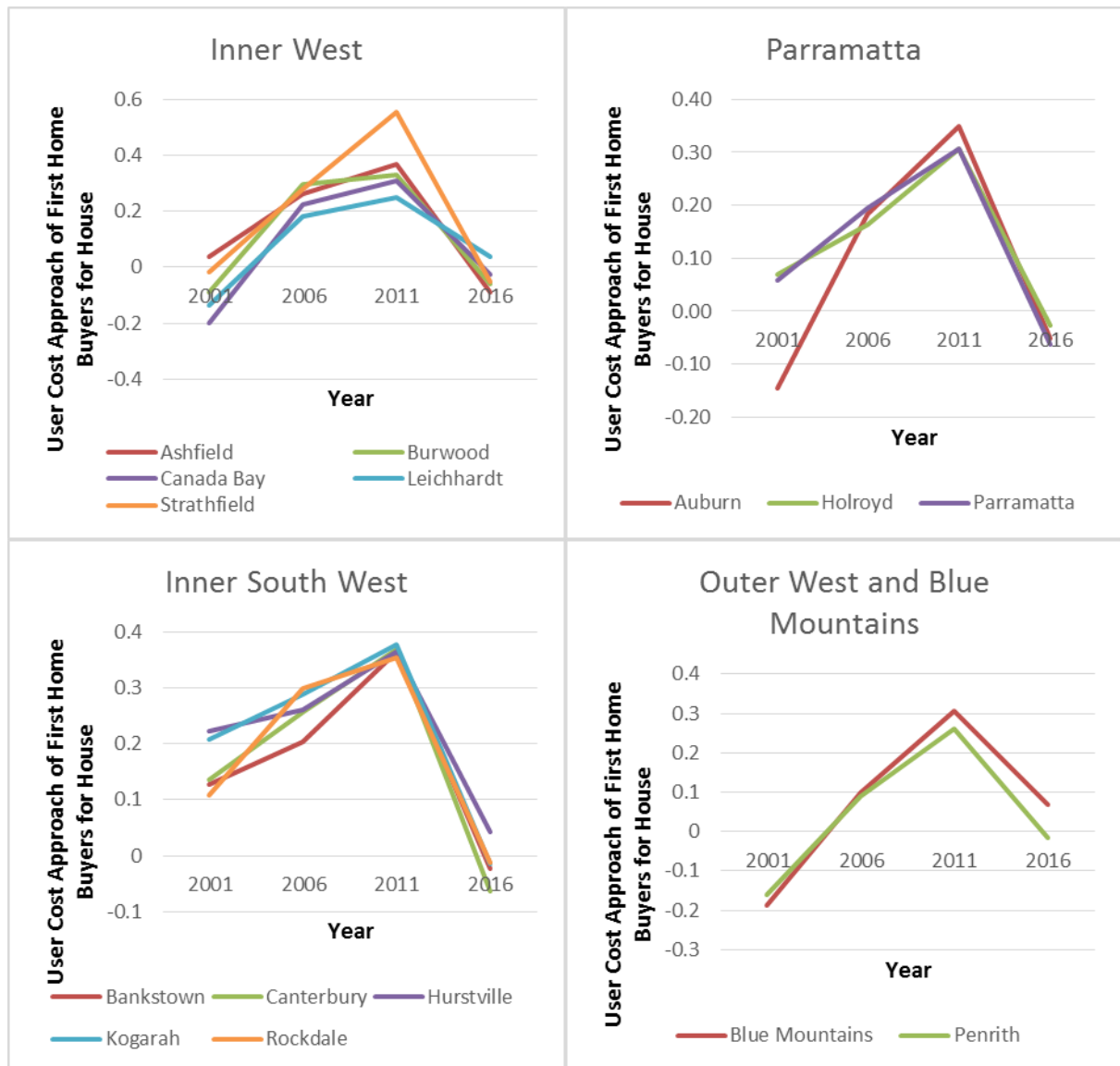

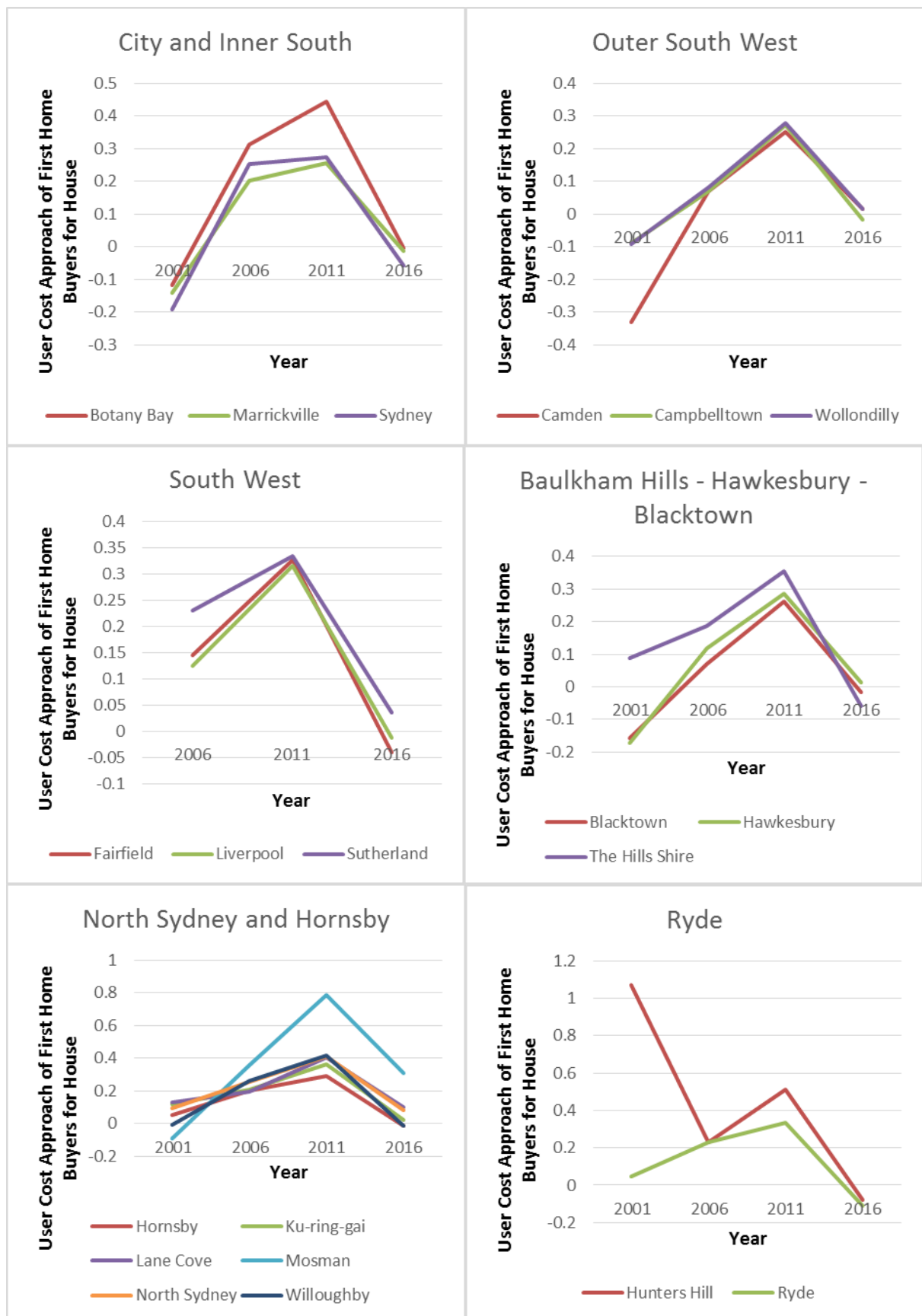## 5.4.1.5 User cost approach of first home buyer for houses

Figure 5.4.7 shows the user cost approach of first home buyers for houses and the result roughly shares similar patterns with existing homeowners. In 2001, 1 LGA was considered unaffordable with Hunters Hill being identified as the most unaffordable LGA with 107.0% while Woollahra was considered the most affordable LGA with -50.8% followed by Randwick with -34.4% and Camden with -33.1%. The situation intensified since then with 3 LGAs being classified as unaffordable in 2006 with Mosman being the most unaffordable LGA with 35.5%, followed by Randwick with 32.0% and Botany Bay with 31.3%. The problem of housing unaffordability further intensified with only 11 LGAs being identified as affordable in 2011. However, the situation improved in 2016 with only 1 LGA classified as being unaffordable namely Mosman with 30.8%. Ryde was deemed as most affordable with -11.0% followed by Ashfield with -9.0% and Hunters Hill with -7.7%. With reference to Map 5.4.23, LGAs that are

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[6] LGAs coloured red are considered unaffordable while the ones coloured green are considered affordable.

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more affordable are concentrated in the Western part of Sydney while unaffordable ones are located in the eastern side.

Figure 5.4.7 User cost approach of first home buyers for houses

City and Inner South

Outer South West

South West

Baulkham Hills - Hawkesbury - Blacktown

North Sydney and Hornsby

Ryde

Northern Beaches — User Cost Approach of First Home Buyers for House vs Year (Manly, Warringah, Pittwater)

Eastern Suburbs — User Cost Approach of First Home Buyers for House vs Year (Randwick, Waverley, Woollahra)

Central Coast — User Cost Approach of First Home Buyers for House vs Year (Gosford, Wyong)

Map 5.4.23 Geographical distribution of the user cost approach of first home buyers for houses in 2016[7]
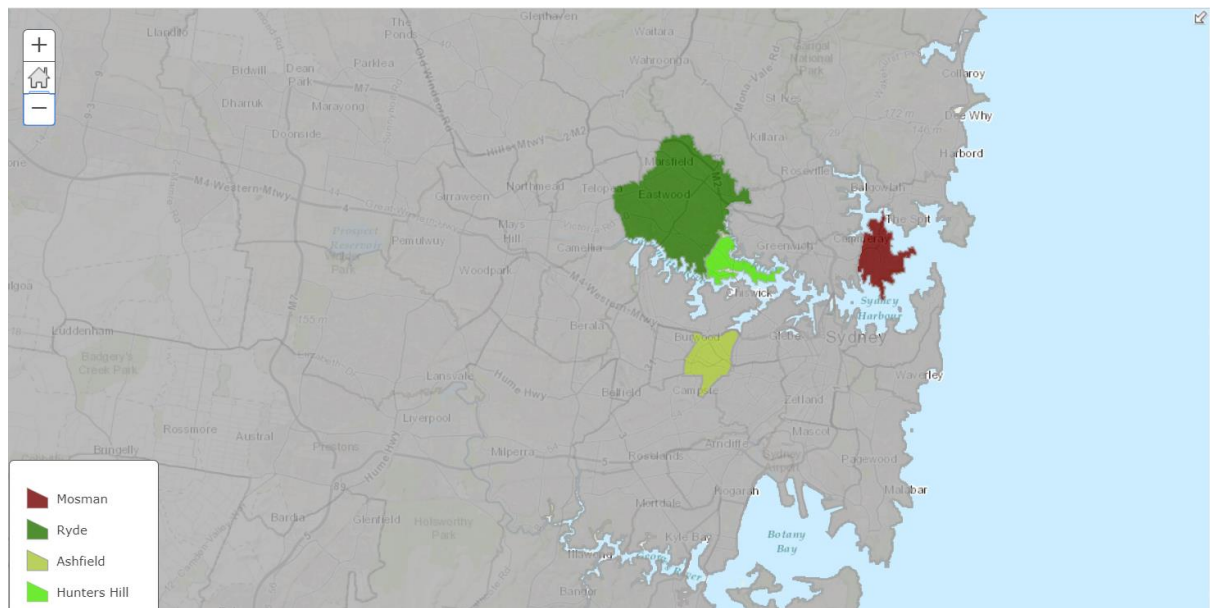
5.4.1.6 User cost approach of first home buyers for units

Figure 5.4.8 shows the user cost approach of first home buyers for units. In 2001, no LGAs were classified as unaffordable with Sydney being regarded as the least affordable with 20.2% compared to other LGAs followed by Gosford with 10.7% and Hunters Hill with 9.9%. However, the situation worsened with 1 LGA being classified as unafforable in 2006. The problem intensified in 2011 with 7 LGAs being classified as unaffordable. The problem lessened in 2016 with all LGAs being considered as affordable with Burwood being the most unaffordable with 12.5% compared to others, followed by Pittwater with 12.3% and Willoughby with 12.2%, while Camden was identified as most affordable with -1.3%, Campbelltown with -0.8% and Bankstown with -0.7% as shown in Map 5.4.24.
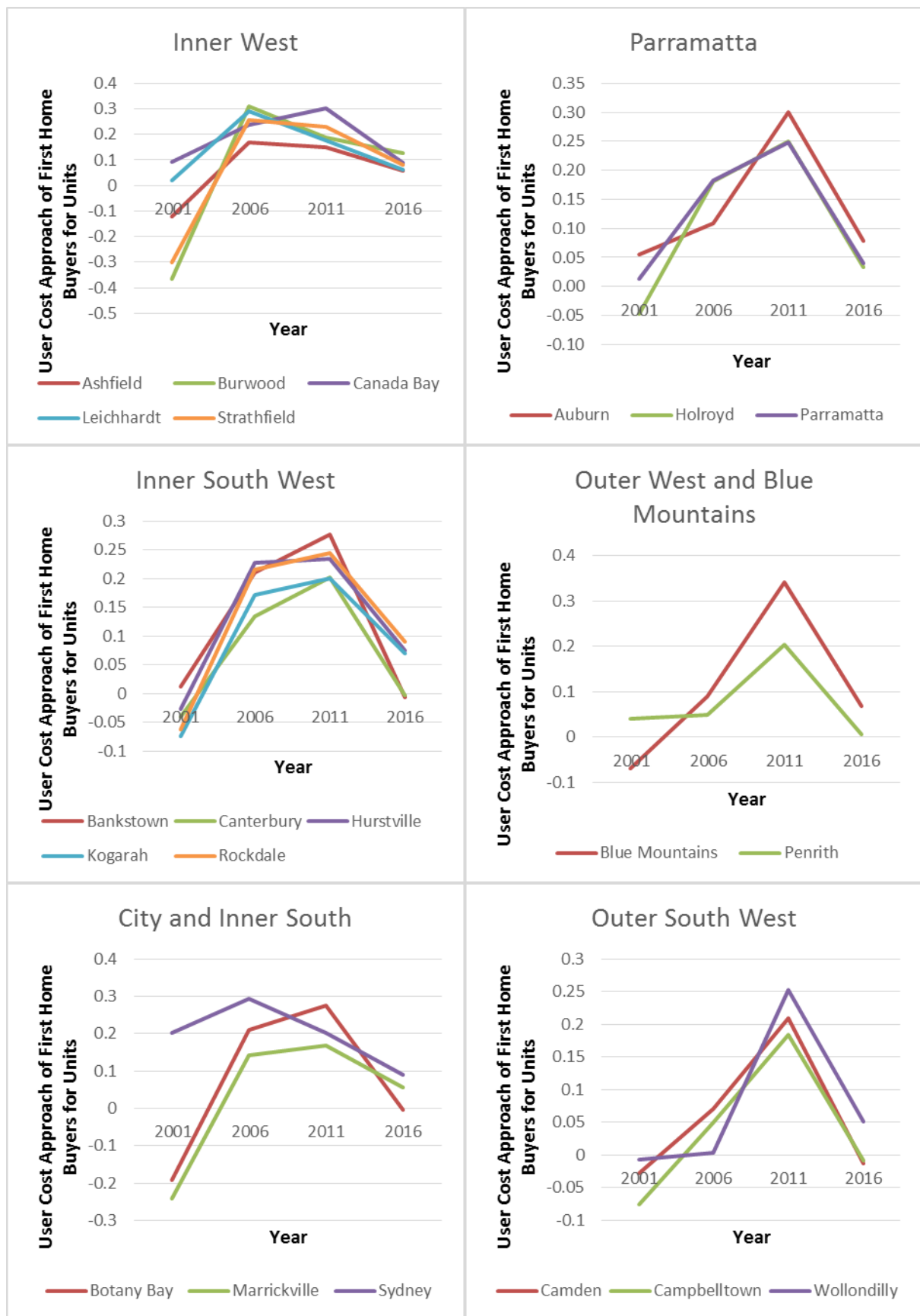
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[7] LGAs coloured red are considered unaffordable while those coloured darkest green are considered most affordable and the strength decreases as the colour lightens.

Figure 5.4.8 User cost approach of first home buyers for units

South West

Baulkham Hills - Hawkesbury - Blacktown

North Sydney and Hornsby

Ryde

Northern Beaches

Eastern Suburbs
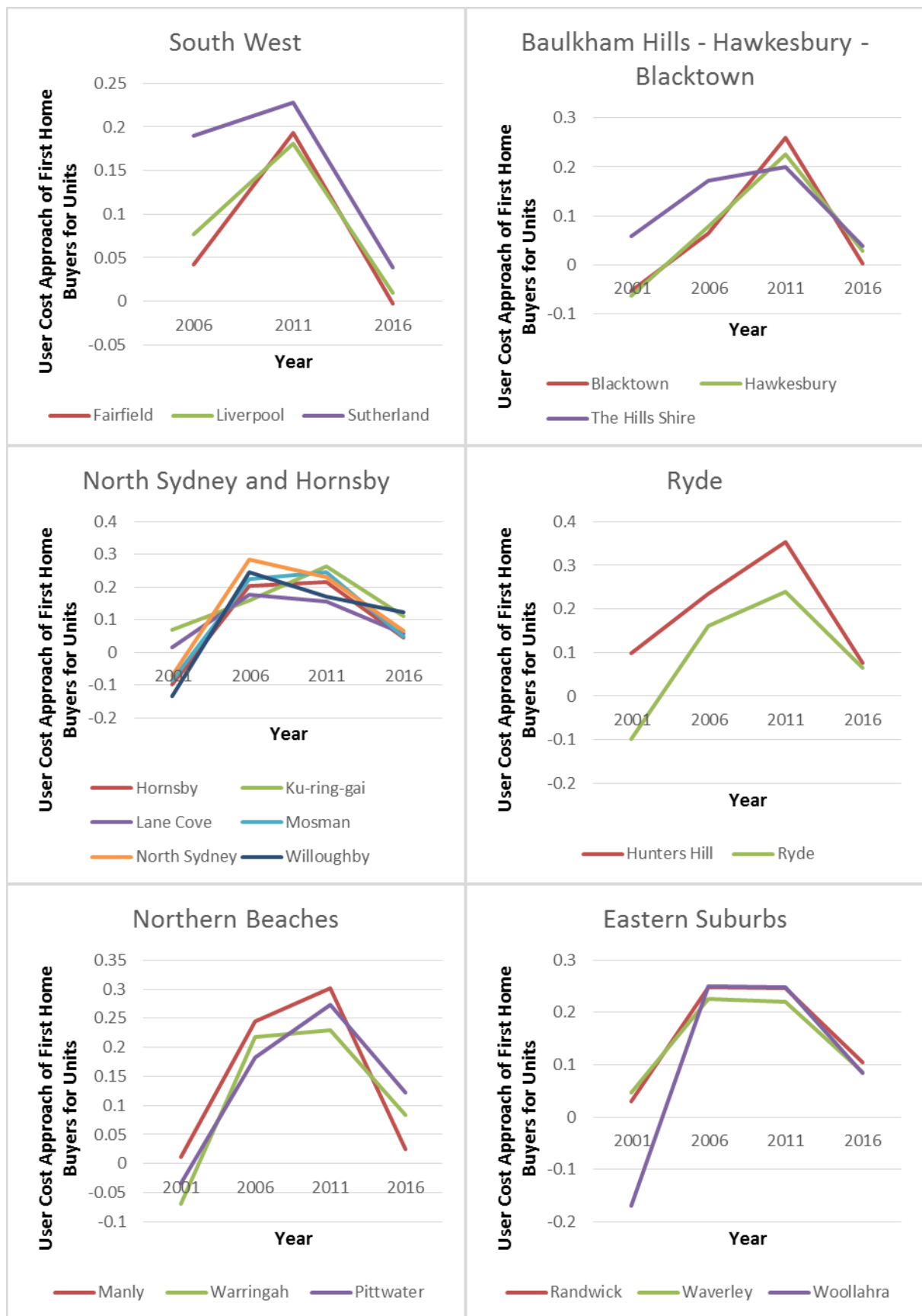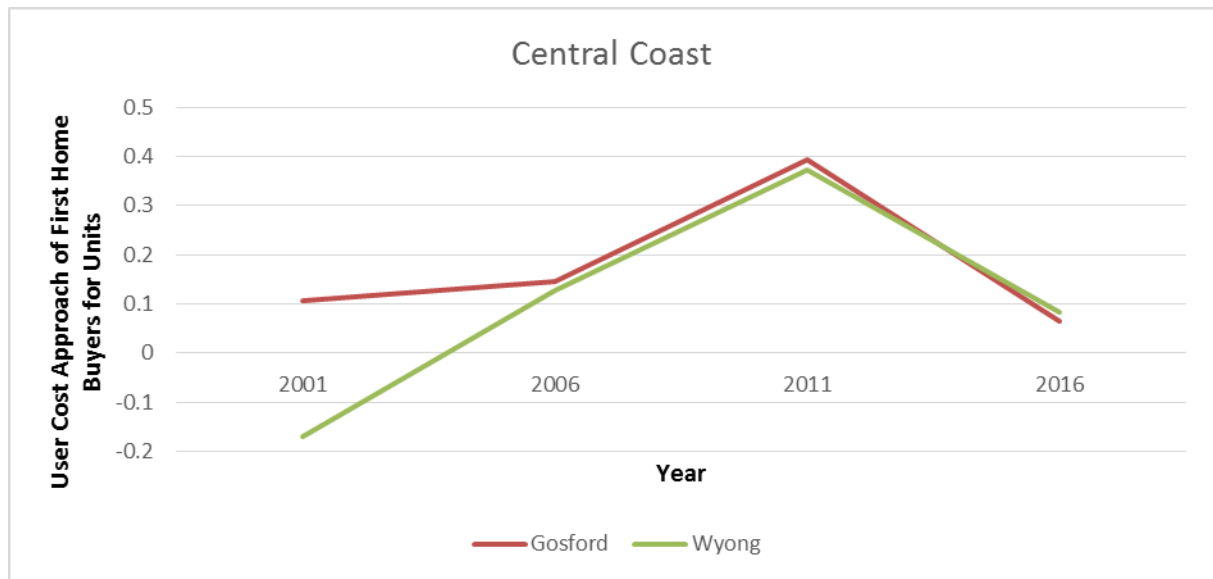
Map 5.4.24 Geographical location of the user cost approach of first home buyers for units in 2016[8]

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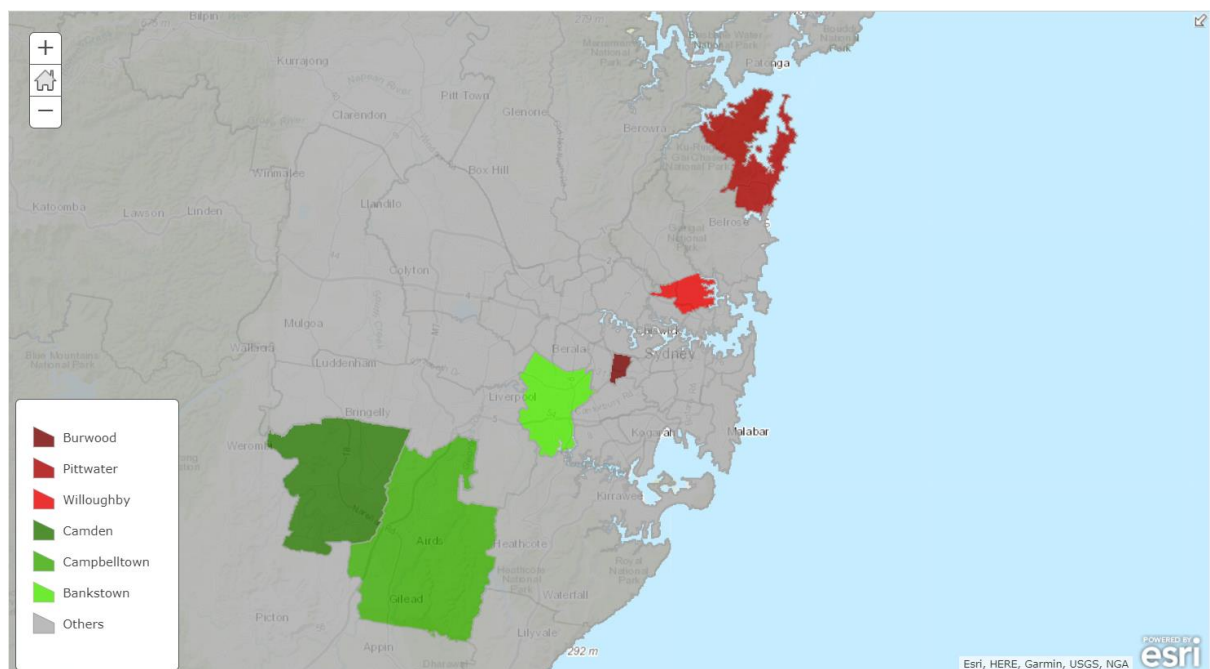
[8] LGAs coloured red are considered unaffordable while the ones coloured green are considered affordable.
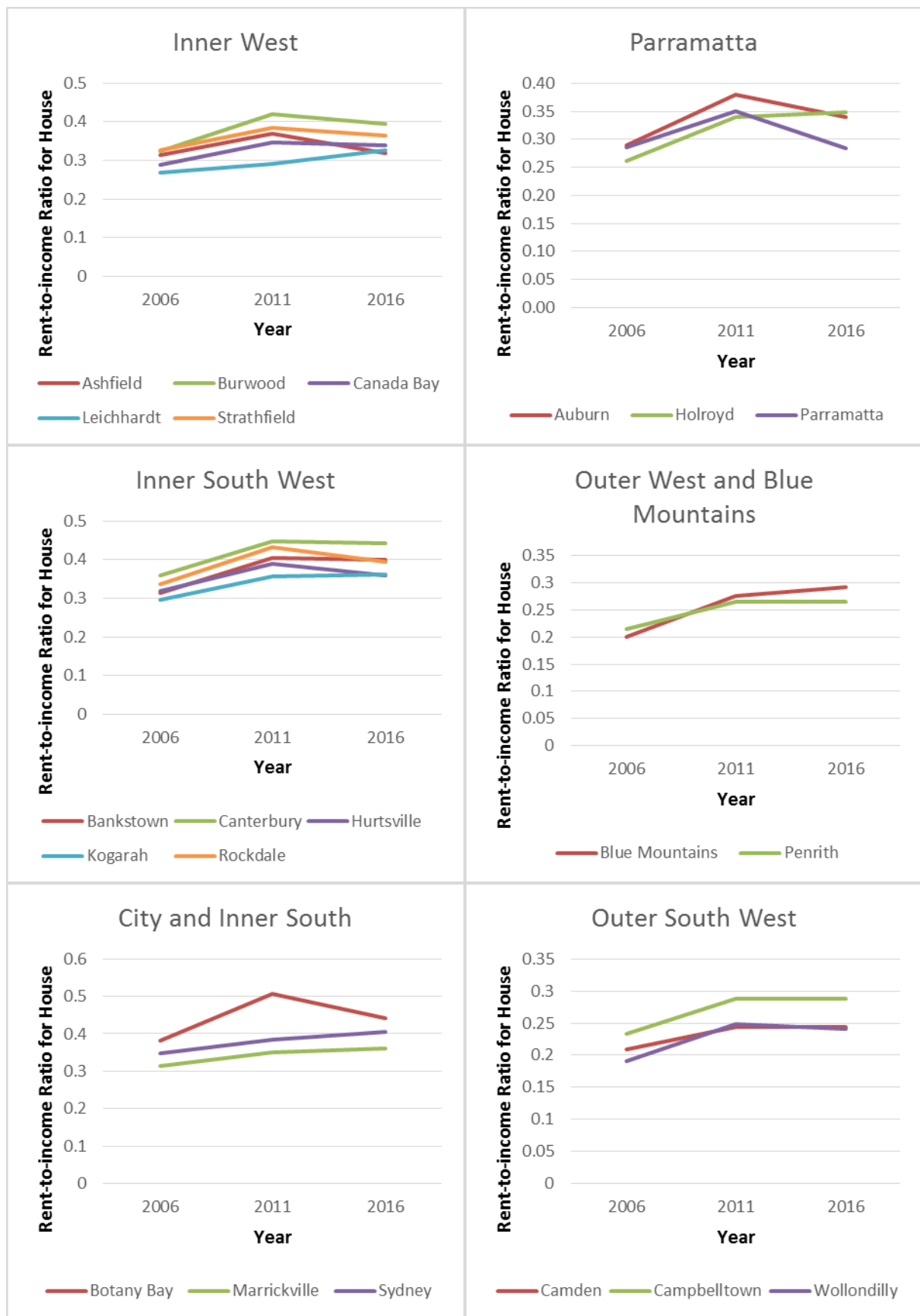
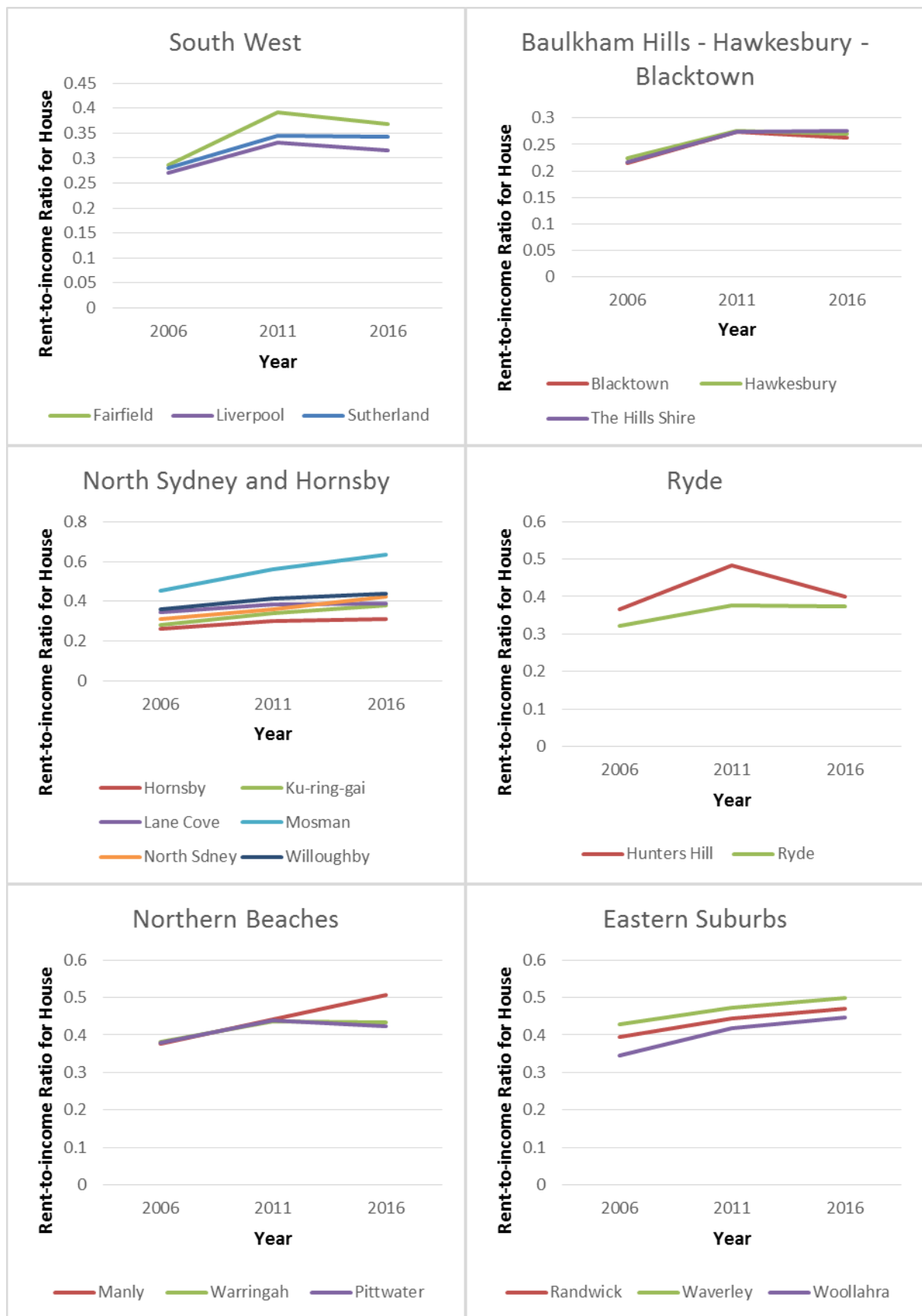*5.4.2 Result for housing affordability for renters*

5.4.2.1 Rent-to-income ratio for houses

As shown in Graph 5.4.9, the rent-to-income ratio for houses among the selected LGAs in 2006 ranged from 0.1907 in Wollondilly to 0.4507 in Mosman. By 2016, the range increased to 0.2405 in Wollondilly to 0.634417 in Mosman. Out of the selected LGAs in 2006, there are 21 LGAs which were deemed affordable. The results show that housing affordability deterioration continued in 2011 when only nine suburbs remained affordable, namely Camden with 24.4%, Wollondilly with 24.9%, Penrith with 26.5%, Blacktown with 27.4%, The Hills Shire with 27.5%, Hawkesbury with 27.5%, the Blue Mountains with 27.8%, Campbelltown with 28.9% and Leichhardt with 29.2%. They are mainly located in the Western regions except Leichardt being located near the City. Interestingly, this situation remained in 2016 with nine LGAs being classified as affordable namely Wollondilly with 24.1%, Camden with 24.4%, Blacktown with 26.3%, Penrith with 26.5%, Hawkesbury with 27.0%, The Hills Shire with 27.5%, Parramatta with 28.4%, Campbelltown with 28.9% and the Blue Mountains with 29.3%. These areas are concentrated in Western part of Sydney as shown on Map 5.4.25.

Graph 5.4.10 shows the rent-to-income ratio for houses from 2006 to 2016. The Blue Mountains had the greatest percentage increase with 46.7 followed by Mosman with 40.8% and North Sydney with 37.0% while Parramatta had the smallest percentage decrease with 0.7%.

Graph 5.4.9 Rent-to-income ratio for houses

Inner West
Parramatta
Inner South West
Outer West and Blue Mountains
City and Inner South
Outer South West

South West

Rent-to-income Ratio for House — Year

Fairfield · Liverpool · Sutherland

Baulkham Hills - Hawkesbury - Blacktown

Rent-to-income Ratio for House — Year

Blacktown · Hawkesbury · The Hills Shire

North Sydney and Hornsby

Rent-to-income Ratio for House — Year

Hornsby · Ku-ring-gai · Lane Cove · Mosman · North Sdney · Willoughby

Ryde

Rent-to-income Ratio for House — Year

Hunters Hill · Ryde

Northern Beaches

Rent-to-income Ratio for House — Year

Manly · Warringah · Pittwater

Eastern Suburbs

Rent-to-income Ratio for House — Year

Randwick · Waverley · Woollahra

Graph 5.4.10 Percentage change of rent-to-income ratio for houses from 2006 to 2016

Map 5.4.25 Geographical location of rent-to-income ratio for houses in 2016[9]
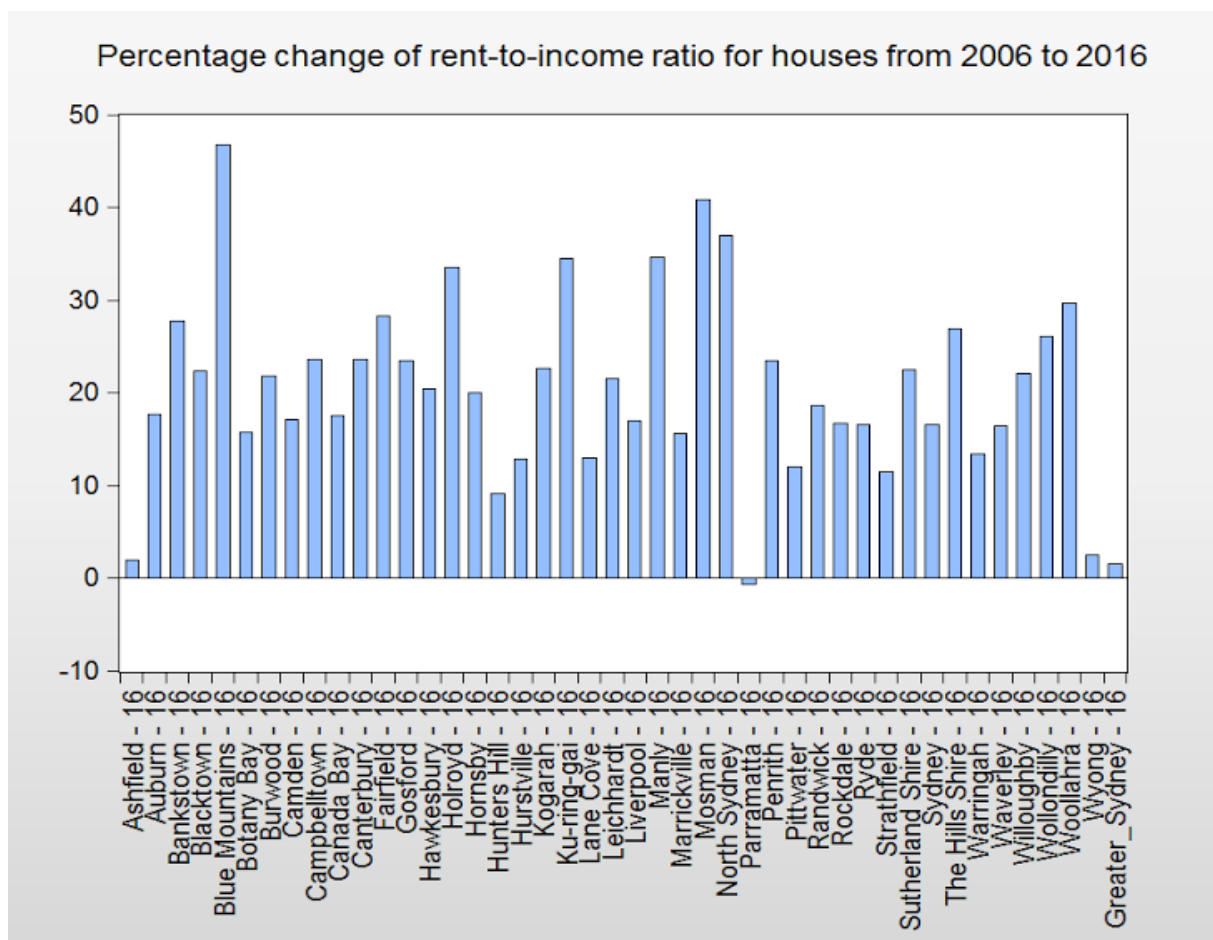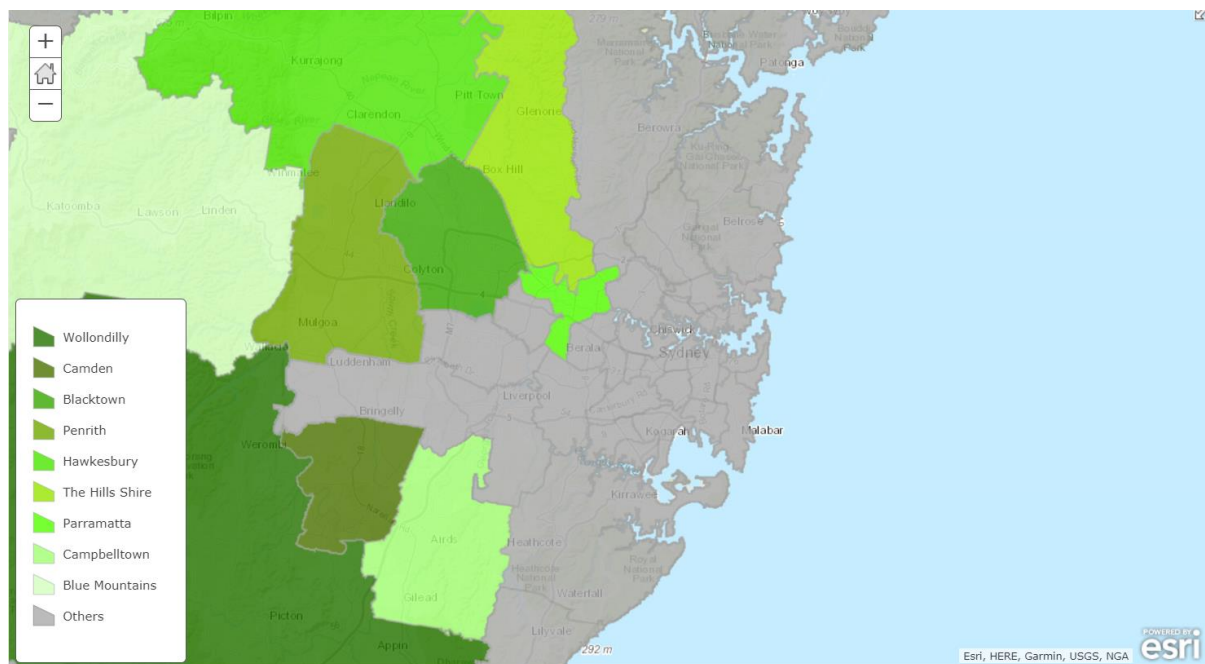

5.4.2.2 Rent-to-income ratio for units[10]:

Graph 5.4.11 shows that the rent-to-income ratio among the selected LGAs in 2006 ranged from 0.1636 in Ku-ring-gai to 0.3223 in Auburn. By 2016, the range increased to 0.1870 in Wollondilly to 0.3505 in Burwood. The broad range suggests the presence of a significant spatial rent arbitrage between LGAs. Out of the selected LGAs in 2006, only one LGA, namely Auburn, was deemed as unaffordable. The results show that housing affordability deterioration intensified in 2011 with 13 LGAs being classified as unaffordable. Interestingly, this situation improved in 2016 with only ten LGAs being classified as unaffordable, namely Burwood with 35.1% followed by Auburn with 33.4%, Bankstown with 33.1%, Rockdale with 33.0%, Randwick with 31.3%, Holroyd with 31.2%, Sydney with 31.2%, Canterbury with 30.8%, Waverley with 30.1% and Gosford with 30.1%. From this, it can be seen that areas where are deemed as unaffordable are

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[9] LGAs that have comparatively affordable housing are shown with darker green indicating that the region is more affordable.
[10] Data is not available for Camden and Wollondilly in 2011.

mainly concentrated in the inner ring of Sydney as shown in Map 5.4.26.

Graph 5.4.12 shows the percentage increase of rent-to-income ratios for units from 2006 to 2016. There is a large range of percentage increases, from 0.16 in Wyong to 46.29 in the Blue Mountains. The Blue Mountains has the largest percentage increase in rent-to-income ratio followed by Ku-ring-gai with 43.6% and Campbelltown with 36.1% while Wyong had the least followed by Ashfield with 2.4% and Hunters Hill with 2.4%.

Graph 5.4.11 Rent- to- income ratio for units

City and Inner South

Botany Bay — Marrickville — Sydney

Outer South West

Camden — Campbelltown — Wollondilly

South West

Fairfield — Liverpool — Sutherland

Baulkham Hills - Hawkesbury - Blacktown

Blacktown — Hawkesbury — The Hills Shire

North Sydney and Hornsby

Hornsby — Ku-ring-gai — Lane Cove — Mosman — North Sdney — Willoughby

Ryde

Hunters Hill — Ryde

Northern Beaches

Rent-to-income Ratio for Unit

Legend: Manly, Warringah, Pittwater

Year: 2006, 2011, 2016

Eastern Suburbs

Rent-to-income Ratio for Unit

Legend: Randwick, Waverley, Woollahra

Year: 2006, 2011, 2016

Central Coast

Rent-to-income Ratio for Unit

Legend: Gosford, Wyong

Year: 2006, 2011, 2016

Map 5.4.26 Geographical distribution of rent-to-income ratio for units in 2016[11]
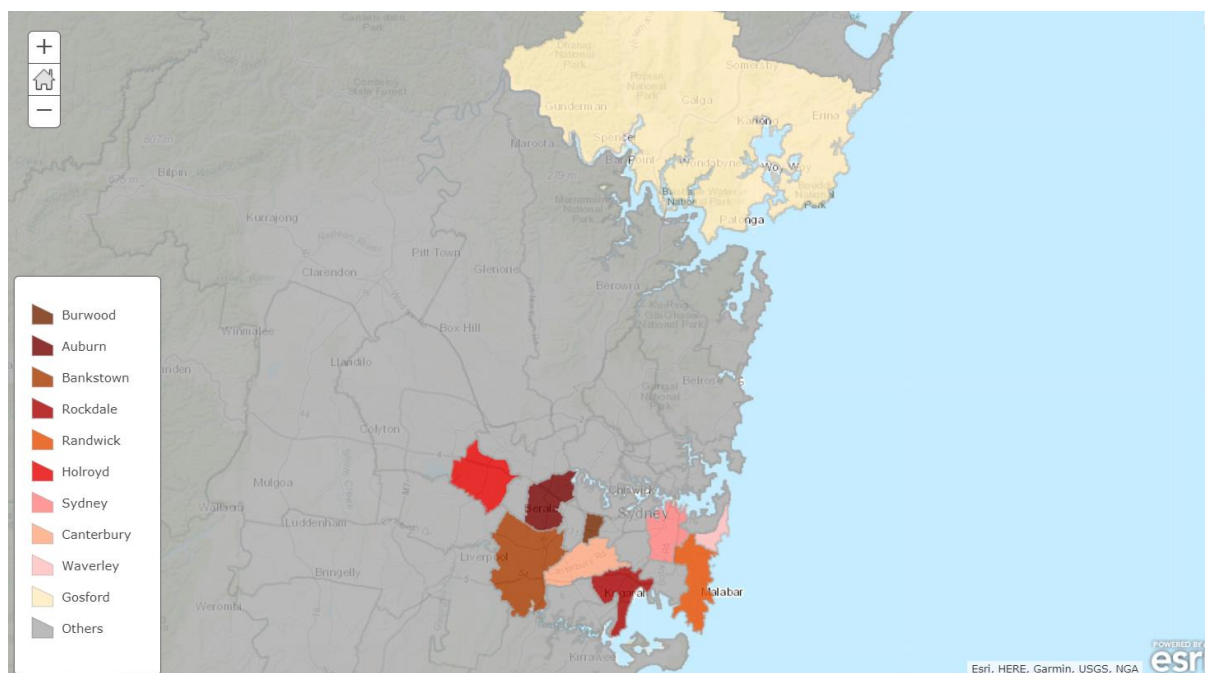
Graph 5.4.12 Percentage change of rent-to-income ratio for units from 2006 to 2016

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[11] LGAs with darker red imply lower affordability.

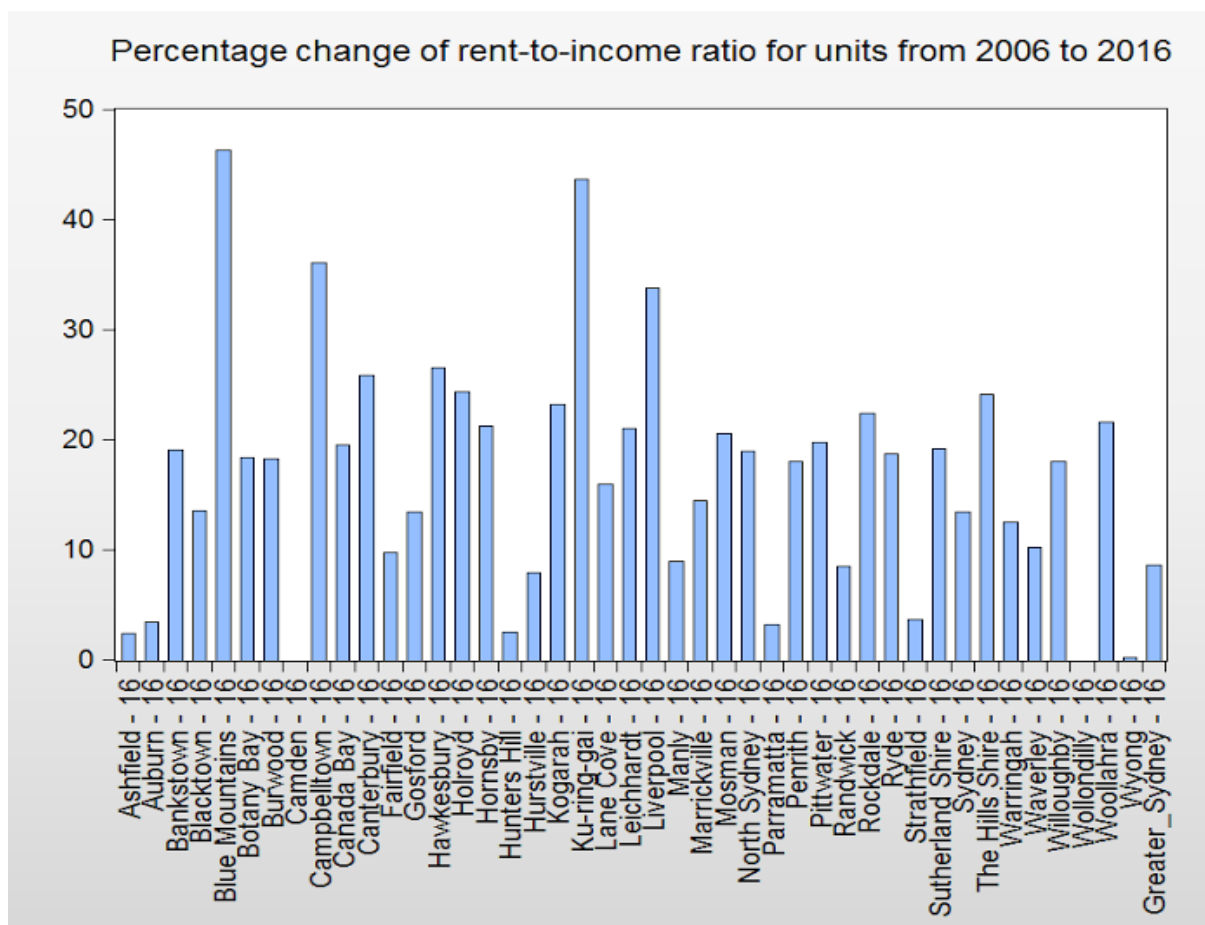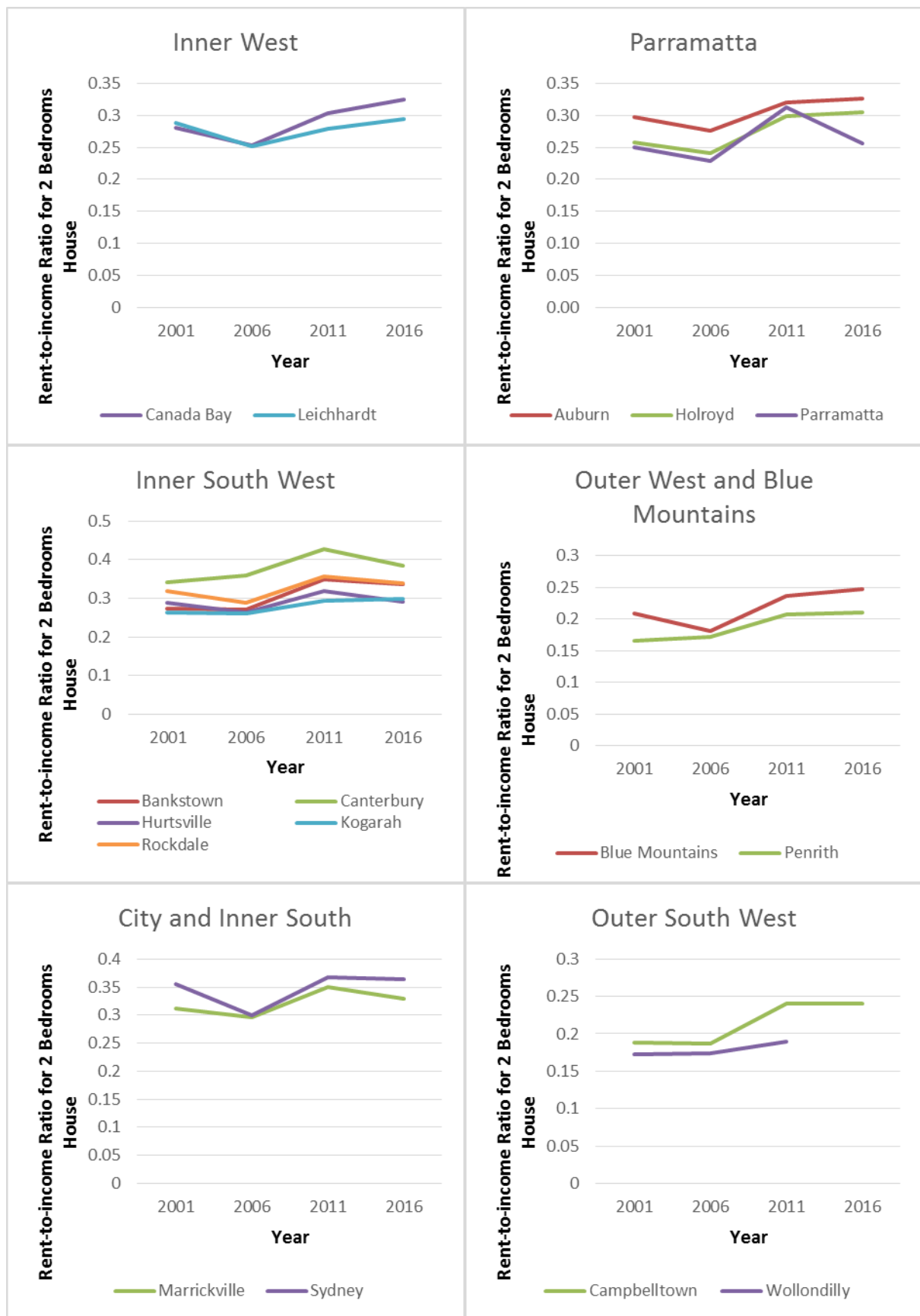Graph 5.4.13 shows the rent-to-income ratio among the selected LGAs in 2001 ranged from 0.16 for the Hills Shire to 0.42 for Waverley. By 2016, the range increased to 0.19 in the Hills Shire and 0.40 in Woollahra. The broad range suggests the presence of a significant spatial rent arbitrage between LGAs. Out of the selected LGAs in 2001, 13 LGAs were deemed unaffordable. Improvement occurred in 2006 with 5 LGAs being classified as unaffordable. The results show that housing affordability deterioration intensified in 2011 with 16 LGAs being classified as unaffordable. In 2016, 17 LGAs were classified as unaffordable.

Graph 5.4.14 shows the percentage change of rent-to-income ratio of houses with two bedrooms from 2001 to 2016 ranges from -3.02% for Ashfield to 36.25% for the Blue Mountains. The Blue Mountains had the greatest percentage increase with 36.25% followed by North Sydney with 35.5% and Liverpool with 30.47% while Ashfield had the smallest percentage increase of -3.02% followed by Pittwater with 3.55% and Canterbury with 7.47%.

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[12]Due to data unavailability, the following LGAs will be excluded from the analysis: Botany Bay, Burwood, Camden, Ku-ring-gai, Hunters Hill and Mosman. Data for Wollondilly in 2016 is also unavailable for this analysis.

Graph 5.4.13 Rent-to-income ratio for houses with 2 bedrooms

South West

Rent-to-income Ratio for 2 Bedrooms House

Years: 2001, 2006, 2011, 2016

Legend: Fairfield, Liverpool, Sutherland

Baulkham Hills - Hawkesbury - Blacktown

Rent-to-income Ratio for 2 Bedrooms House

Years: 2001, 2006, 2011, 2016

Legend: Blacktown, Hawkesbury, The Hills Shire

North Sydney and Hornsby

Rent-to-income Ratio for 2 Bedrooms House

Years: 2001, 2006, 2011, 2016

Legend: Hornsby, Willoughby

Ryde

Rent-to-income Ratio for 2 Bedrooms House

Years: 2001, 2006, 2011, 2016

Legend: Ryde

Northern Beaches

Rent-to-income Ratio for 2 Bedrooms House

Years: 2001, 2006, 2011, 2016

Legend: Warringah, Pittwater

Eastern Suburbs

Rent-to-income Ratio for 2 Bedrooms House

Years: 2001, 2006, 2011, 2016

Legend: Randwick

Central Coast

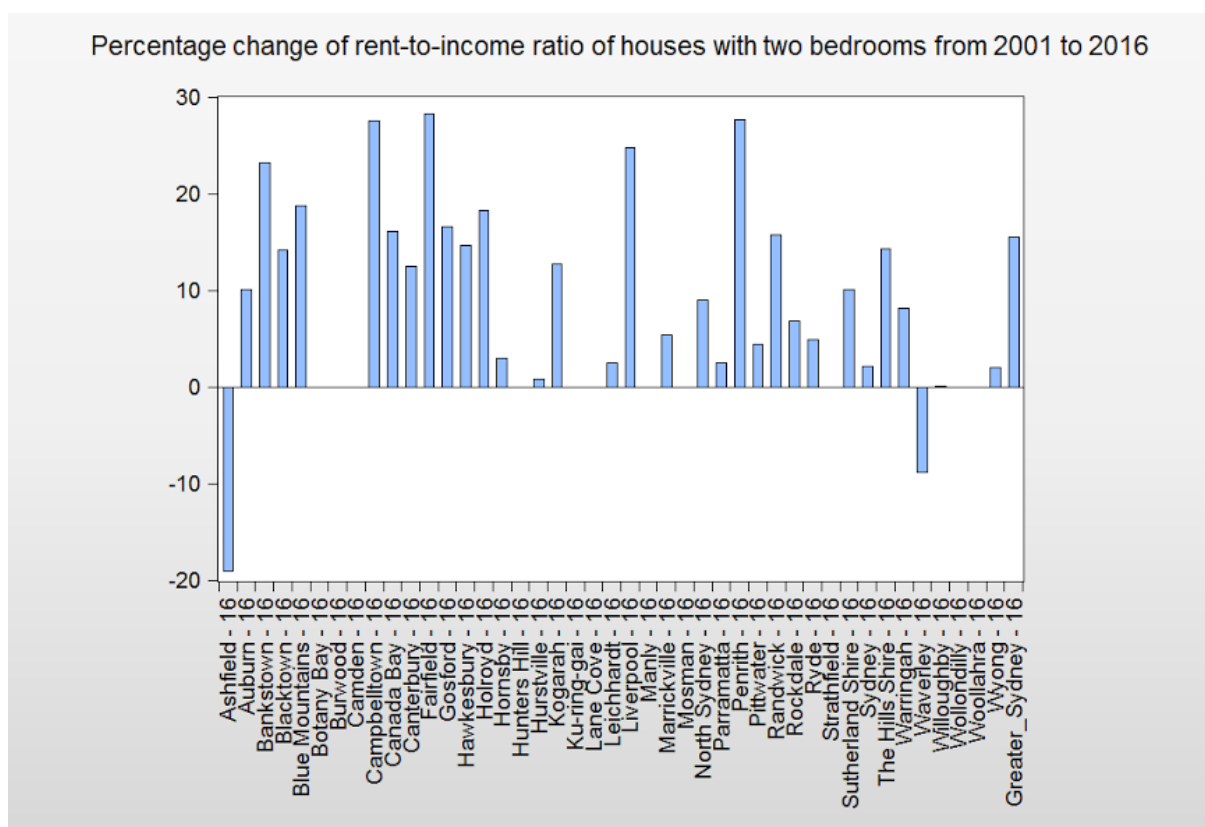Graph 5.4.14 Percentage change of rent-to-income ratio of houses with two bedrooms from 2001 to 2016

Percentage change of rent-to-income ratio of houses with two bedrooms from 2001 to 2016
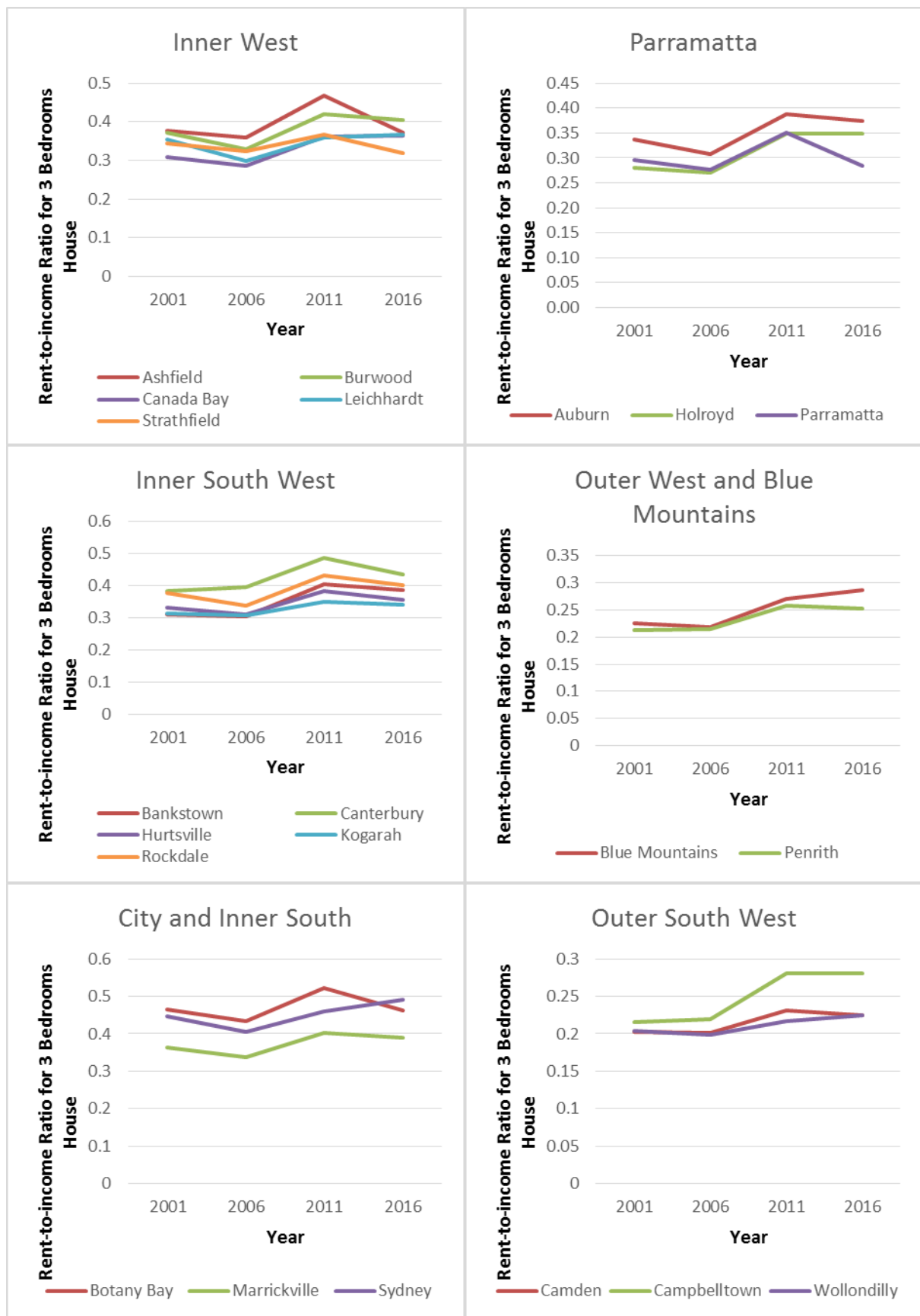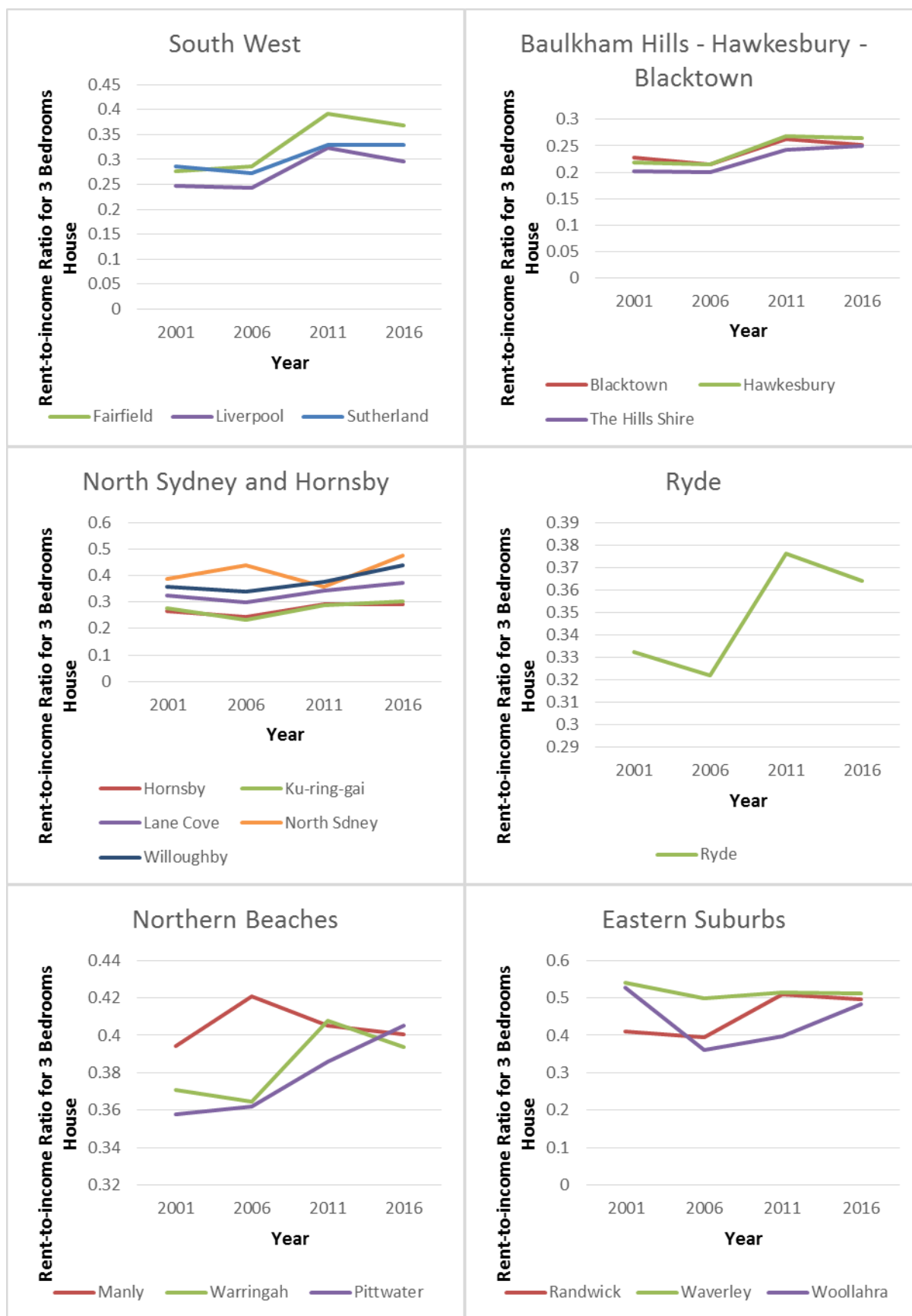
Graph 5.4.15 shows the rent-to-income ratio among the selected LGAs in 2001 ranged from 0.2011 in the Hills Shire to 0.5396 in Waverley. By 2016, the range increased to 0.224479 in the Hills Shire to 0.5113 in Waverley. The broad range suggests the presence of a significant spatial rent arbitrage between LGAs. Out of the selected LGAs in 2001, 17 LGAs were deemed as affordable. Improvement occurred in 2006 with 20 LGAs being classified as affordable. The result shows that housing affordability deterioration intensified in 2011 with only 11 LGAs being classified as affordable. In 2016, 12 LGAs were classified as affordable. There is a large range of percentage increase in LGAs from 2001 to 2016 ranges from -19.1132 in Ashfield to 28.27683 in Fairfield.

Graph 5.4.16 shows the percentage change in the rent-to-income ratio among the selected LGAs. Woollahra had the greatest percentage increase in the rent-to-income ratio with 34.26% followed by the Blue Mountains with 31.37% and Willoughby with 29.21% while Manly had the smallest percentage increase with -4.73% followed by Strathfield with -1.59% and Waverley with 2.55%.

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[13]Due to the data unavailability, Hunters Hill and Mosman are excluded in this analysis.

Graph 5.4.15 Rent-to-income ratio for houses with 3 bedrooms

Inner West

Legend: Ashfield, Burwood, Canada Bay, Leichhardt, Strathfield

Parramatta

Legend: Auburn, Holroyd, Parramatta

Inner South West

Legend: Bankstown, Canterbury, Hurtsville, Kogarah, Rockdale

Outer West and Blue Mountains

Legend: Blue Mountains, Penrith

City and Inner South

Legend: Botany Bay, Marrickville, Sydney

Outer South West

Legend: Camden, Campbelltown, Wollondilly

South West

Rent-to-income Ratio for 3 Bedrooms House vs Year

Fairfield — Liverpool — Sutherland

Baulkham Hills - Hawkesbury - Blacktown

Rent-to-income Ratio for 3 Bedrooms House vs Year

Blacktown — Hawkesbury — The Hills Shire

North Sydney and Hornsby

Rent-to-income Ratio for 3 Bedrooms House vs Year

Hornsby — Ku-ring-gai — Lane Cove — North Sdney — Willoughby

Ryde

Rent-to-income Ratio for 3 Bedrooms House vs Year

Ryde

Northern Beaches

Rent-to-income Ratio for 3 Bedrooms House vs Year

Manly — Warringah — Pittwater

Eastern Suburbs

Rent-to-income Ratio for 3 Bedrooms House vs Year

Randwick — Waverley — Woollahra

Graph 5.4.16 Percentage change of rent-to-income ratio for houses with three bedrooms
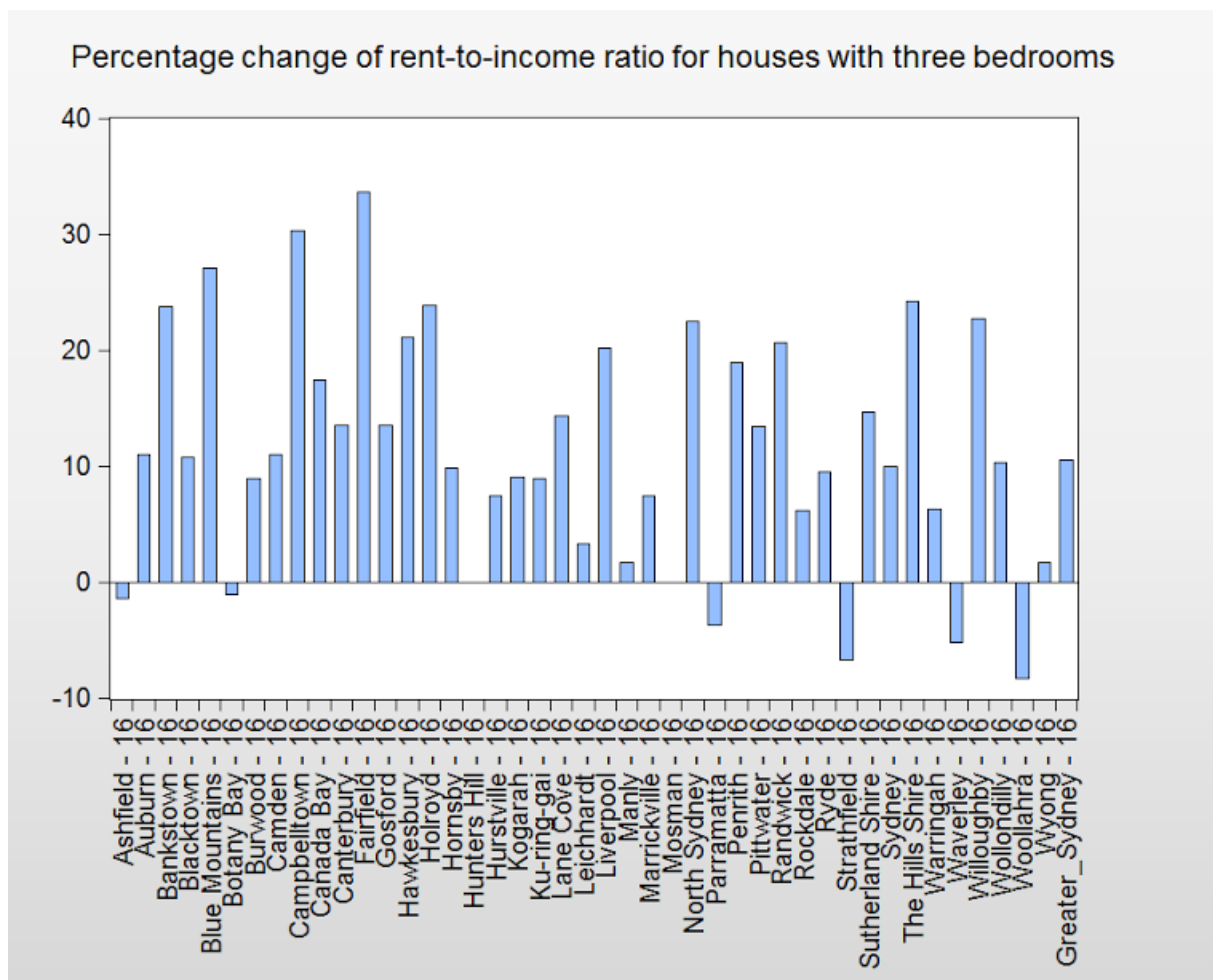
5.4.2.5 Rent-to-income ratio for units with two bedrooms[14]

Graph 5.4.17 shows the rent-to-income ratio among the selected LGAs in 2001 ranged from 0.1424 in Wollondilly to 0.4213 in Sydney. By 2016, the range increased to 0.1930 in Penrith to 0.3894 in Sydney. The broad range suggests the presence of a significant spatial rent arbitrage between LGAs. Out of the selected LGAs in 2001, 5 LGAs were deemed as unaffordable. Improvement occurred in 2006 with only one LGA being classified as unaffordable. The result shows that housing affordability deterioration intensified in 2011 with only 12 LGAs being classified as unaffordable. In 2016, 11 LGAs were classified as unaffordable. Sydney and Burwood were classified as the least affordable LGAs with 38.9% each and Botany Bay had 37.5% while Penrith was the most affordable LGA with 19.3% followed by Camden with 19.5% and Hawkesbury with 20.4%.

Graph 5.4.18 shows the percentage change in the rent-to-income ratio. There is a large range of percentage increases in LGAs from 2001 to 2016, from -4.2200 in Ashfield to 60.4586 in Campbelltown. Campbelltown had the greatest percentage increase of the rent-to-income ratio followed by the Blue Mountains with 59.24% and Ku-ring-gai with 58.04% while Ashfield had the smallest percentage increase of -4.22% followed by Strathfield with 4.26% and Sydney with 4.71%.

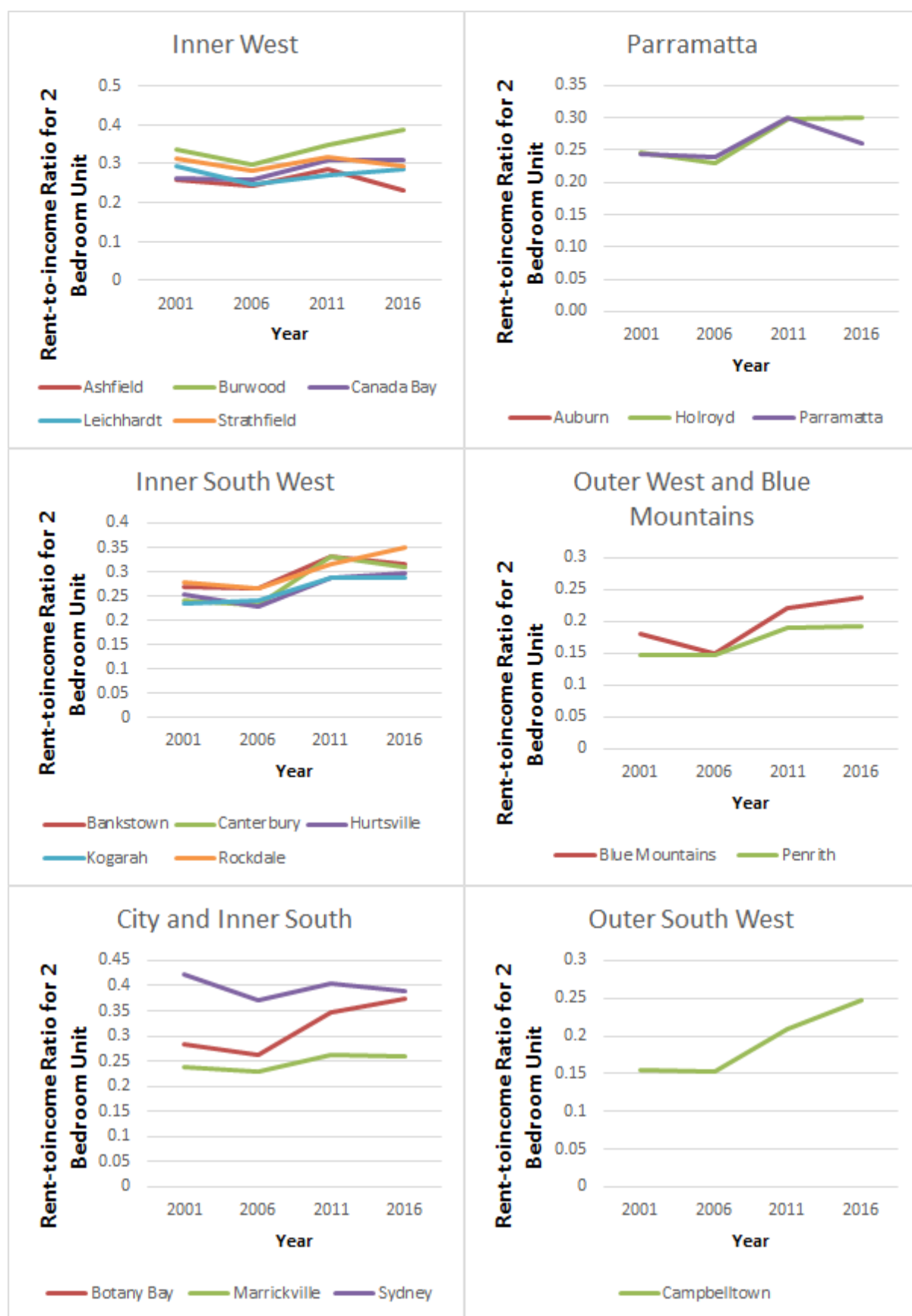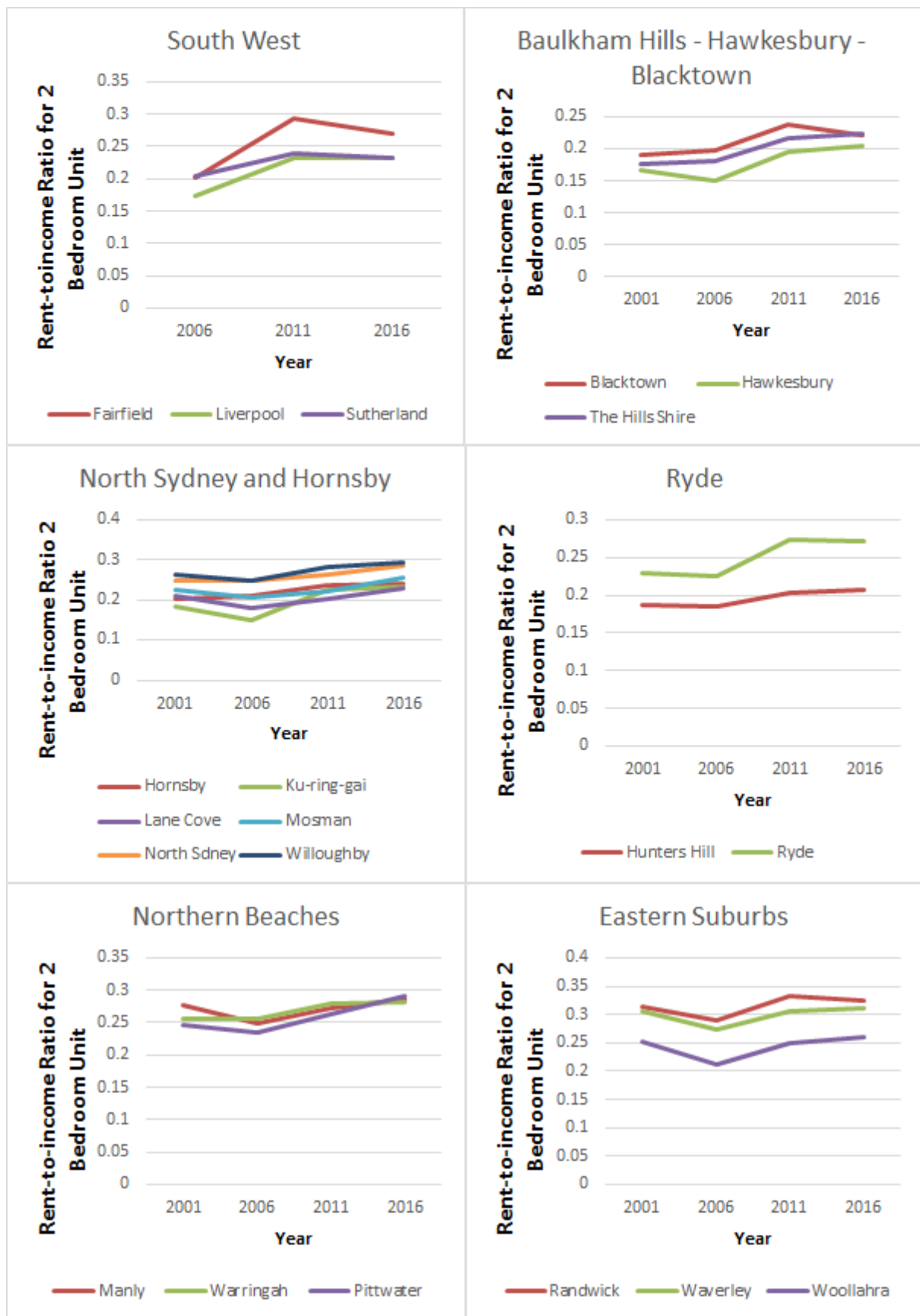[14]Due to data unavailability, Auburn, Camden and Wollondilly are excluded in the analysis.

Graph 5.4.17 Rent-to-income ratio for units with two bedrooms
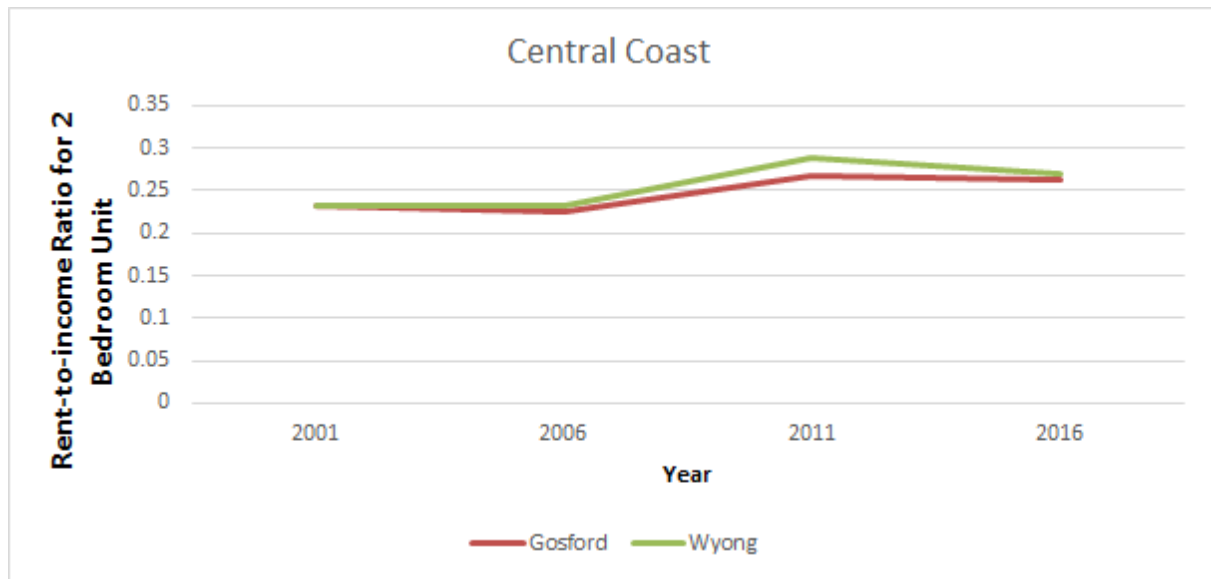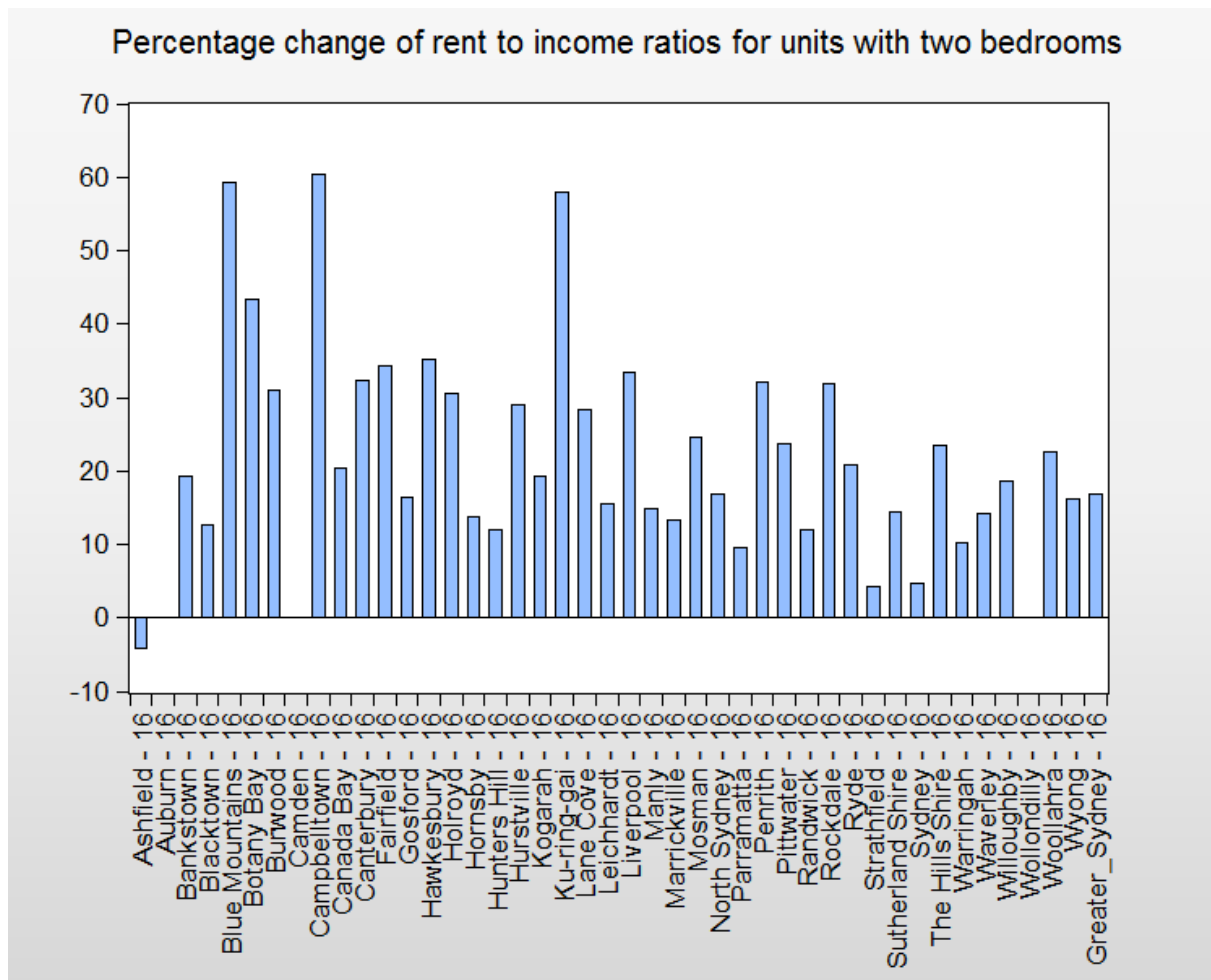
Graph 5.4.18 Percentage change of rent to income ratios for units with two bedrooms

5.5 Conclusion

This chapter has suggested empirical models to measure housing affordability for homeowners and renters at the Sydney Local Government Area level. The Ratio Approach is adopted when measuring housing affordability for both homeowners and renters while the User Cost Approach is also taken when measuring housing affordability for first home buyers and existing homeowners. When looking at housing affordability using the Ratio Approach, an increasing trend in housing unaffordability is shown from 2001 to 2016 and areas located in the outer West of Sydney are considered more affordable. However, when we look at the result of affordability for renters using the Ratio Approach and housing affordability for homeowners using the User Cost Approach, both measures share an upward trend of housing unaffordability before 2011 and affordability improvement in 2016. This phenomenon can be explained by capital appreciation and low interest rates after 2011. In terms of geographical distribution, it is commonly observed that the Western part of Sydney is considered more affordable.

Chapter 6: Policy implications, limitations and review

This chapter aims to provide policy implications with reference to the analysis carried out in previous chapters. Limitations of this study are also mentioned.

6.1 Policy implications

Firstly, increasing dwelling supply helps improve housing affordability. With reference to section 4.6 looking at the total number of private dwelling completions for Sydney Local Government Areas, it is observed that Parramatta has a huge increase in unit completions during the period between 2012 and 2016. This result is consistent with an improvement in housing affordability for homeowners and renters. From this, it can be seen that increasing dwelling supply helps improve housing affordability. However, different LGAs are subjected to various building height limits according to their local regulations. This measure will affect housing affordability to some degree.

Secondly, low income households do not necessarily suffer from housing stress. Schwabe's Law is introduced in section 1.5 stating that lower income group tends to spend a higher proportion of income on housing. However, this phenomenon is not observed in this study. It is found that LGAs which are facing housing affordability problems are not ones with lower household income. The reason is that households who have comparatively low incomes may choose to live in an area where lower rent can be offered. Therefore, the lower income group does not necessarily spend a higher proportion of their income on housing expenditure. It can also be partly explained by the effort provided by the government to assist low income households with their housing needs and the development of north-western and south-western part of Sydney.

Thirdly, more housing policies can be implemented targeting first home buyers. When examining housing affordability for first home buyers and existing homeowners respectively using the User Cost approach, it is observed that first home buyers are more prone to housing affordability stress due to lower incomes and higher mortgage repayments. The NSW government has introduced various kinds of measures in assisting first home buyers including one-off grants and stamp duty exemption to eligible first home buyers. Additionally, tax reductions can also be introduced to help first home buyers in repaying mortgage payments.

6.2 Limitations

Moving forward, future research is necessary on this important issue by building on the contributions and insights illustrated in this study and previous research.

Firstly, data frequency can be extended to provide a more comprehensive analysis on housing affordability. In this research, only Census data (i.e. 2001, 2006, 2011 & 2016) are used. Therefore, data are missing in between the Census years. Further research can be extended by manipulating those years in between so as to look at the yearly difference in housing affordability.

Secondly, housing affordability can be compared using more approaches such as the residual approach to increase the robustness of the findings. Chapter 3 has discussed three approaches available when measuring housing affordability. In this study, only two of them have been used, namely the 'ratio' approach and 'user cost' approach. Further research can also measure housing affordability using the 'residual' approach for comparison.

Thirdly, this study fails to take into account the effect of supply elasticity on effectiveness of housing affordability. If both LGAs have the same percentage increase in demand side factors such as population and income, their housing affordability may not change in the same way due to supply elasticity differential. Therefore, estimates of supply elasticity at the LGA level would be useful to examine the effectiveness of demand-side policy such as negative gearing and capital gains tax in addressing the housing affordability problem.

6.3 Review

In this thesis, a quantitative study has been undertaken to look at housing affordability for homeowners and renters using a number of measures, by firstly carrying out descriptive analyses on factors affecting housing affordability and secondly computing housing affordability for homeowners and renters.

Descriptive analysis of factors affecting housing affordability is carried out including property sales prices, rental prices, housing approval and completion, total number of dwellings, population and household income. It has been found that the percentage increase in household income cannot catch up with that of property prices and rental prices. An increasing trend in total number of houses and units is also shown with units having a higher percentage increase over the period between 2006 and 2016.

Housing affordability for homeowners and renters has also been computed using the ratio approach. The user cost approach has been used when looking at housing affordability for existing homeowners and first home buyers by taking into account mortgage interest payments, opportunity cost of owning a dwelling, dwelling running cost and capital appreciation.

Most LGAs displayed an improvement in affordability for homeowners and renters after 2011. When computing the price-to-income ratio, which is also referred to Median Multiples, as a form of measurement for housing affordability for homeowners, an upward trend was shown from 2001 to 2016 indicating a persistence of housing unaffordability as the percentage increase in income cannot catch up with the percentage increase in dwelling price. However, different stories emerged when the user cost approach is adopted. The User Cost Approach showed an improvement in housing affordability after 2011. This analysis suggests that existing homeowners are less likely to suffer from an affordability crisis compared to first home buyers. The major causes are falling interest rates and the effects of capital appreciation. Similar results are also found when looking at the housing affordability for renters. The housing affordability problem is found to be alleviated in 2016, but some LGAs are still considered as unaffordable base on the analysis conducted in previous chapter. Therefore, continued attention has to be taken on the issue of housing affordability in Sydney.

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