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Productive cities

Opportunity in a changing economy

Jane-Frances Kelly and Peter Mares



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Overview

Most Australians live and work in cities. They are essential to generating growth and to creating and distributing opportunities. Cities are shaped by where people live, where they work, and how they get around. When these three things are in tune with the structure of the economy, cities operate efficiently and productively, and drive growth and innovation.

This report examines housing, income and travel data in Australia's four largest cities and reveals strains in the triangle of work, home and transport that could threaten national prosperity.

Addressing these issues will provide a significant boost to national productivity, because as the economy becomes more knowledge intensive, deep labour markets and good links between firms become more important.

Firms engaged in high-knowledge activities benefit from connections that enable them to collaborate and learn from one another. They locate in places with deep labour markets to ensure that they can attract the talent and skill they need.

This report reveals, however, that labour markets are shallow in significant parts of Australia's biggest cities. In many suburbs – particularly outer suburbs – residents can reach fewer than 10 per cent of all metropolitan jobs with a reasonable commuting time.

Increasingly, employees with high-level qualifications and high incomes live close to the heart of our cities. Meanwhile, workers with trade skills or low skills, and people on lower incomes, tend to live further from the centre. Rising house prices have exacerbated this divide. If this polarisation continues, then many

people risk being locked out of the parts of the city that offer the richest access to jobs.

How can governments respond? Governments are frequently called upon to create jobs in outer suburban areas by offering incentives to business to relocate or by building new employment clusters from scratch. Yet there is little evidence that such policies work. A better option is to move people closer to jobs. This can be done in two ways. First, the supply and diversity of dwellings in existing suburbs can be increased. Previous Grattan research has shown that people want more housing choice. It can be created if the disincentives developers face are addressed, if suburbs are not locked down by restrictive zoning and planning rules and if residents are engaged up front in decisions affecting their neighbourhoods.

Second, the transport system's capacity to connect people and jobs can and must be improved. That means better road systems and better public transport. Facing up to the challenges of road use pricing would go a long way to ensuring that space on city roads goes to the most important and most productive uses, and could raise revenue to help increase public transport capacity.

The shape of our cities is above all an economic issue. Giving knowledge-intensive firms access to more workers would make them more productive. It would also give workers more opportunities to find rewarding jobs. Better functioning cities would unleash higher productivity, and provide everyone with more opportunities. In this case, what is good for the economy is also good for the fair go.

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Glossary

Clusters are groups of inter-related businesses located close together. They are predominantly made up of firms that export goods or services beyond the city in which they are based.

Deep labour pools offer employers a large number of potential workers with a wide variety of skills and experience. A deep labour pool is the labour supply side of a **deep labour market**.

Human capital refers to the skills and knowledge obtained by an individual through education and on-the-job learning. Increasing human capital increases **productivity**.

Innovation is the process through which new methods, ideas, technologies and products are created and incorporated into the production process.

Job matching is the process by which jobs and employees match to each other. Improved job matching increases **productivity** by optimising the fit between the skills required for a particular position and the worker who fills it. Improved job matching also encourages further skills development and increases **human capital**. Better job matches occur in **deeper labour markets**.

Knowledge-intensive activities require significant expertise and intellectual effort. They are problem-solving activities, usually specific to particular situations and circumstances (that is, they are not routine). The concept of knowledge-intensive activities is related to but different from a range of other terms such as 'innovative', 'creative economy', 'high-skill', 'high value adding' and 'human capital intensive'.

Knowledge spillovers are transfers of knowledge between individuals and between firms. They may occur as firms trade, as employees move between organisations or through informal links.

Labour market participation refers to all people who are currently employed or who are actively seeking work.

Productive knowledge is knowledge that is used as part of the production process and that increases the **productivity** of both individuals and firms. Also known as 'applied knowledge'.

Productivity is a measure of how efficiently goods and services are produced. For example, labour productivity is the value of an employee's output for each hour worked.

Spatial polarisation occurs when economic and social forces cause different demographic groups to separate into different areas of a city.

Specialisation For individuals, specialisation means developing expertise in a narrow field rather than broad general skills.

Deep labour markets (thick labour markets in economics literature) contain a large number of both employers and potential employees. They also have a wide array of different types of jobs and a diverse mix of skills, and so help employers to find the employee that best matches a role (see **job matching**).

1. Introduction

We will neglect our cities to our peril, for in neglecting them we neglect the nation. **John F. Kennedy**

When President Kennedy made this statement in an address to Congress in 1962, he was acknowledging a new era. In “a few short decades”, he said, America had “passed from a rural to an urban way of life”.¹

Australia has been a primarily urban nation for much longer than the United States, yet often we do not seem to recognise this reality. Even with the large contribution of mining and agriculture to national wealth, 80 per cent of economic activity takes place in Australia’s major cities.²

Cities are also the places where most Australians live and work. They provide a wide range of job opportunities, which, as well as increasing the chance of a good match between employer and employee, spreads and reduces the risk to individuals: if they lose one job, there are more opportunities to find another.

Adapting to changing economic circumstances, Australia’s largest cities have evolved from compact colonial cities where jobs and houses were close together and most people walked to work, to cities that spread outwards into suburbs. This transition was made easier by changing transport technologies: first trams and trains, then buses and cars. The transition further separated the worlds of

work and home, an arrangement that was well suited to a 20th century economy driven largely by manufacturing, when industry could often be a dirty and noisy neighbour.

Initially this led to the ‘hollowing out’ of inner cities as both residents and jobs moved to the suburbs. In the decades after 1980 however, the trend began to turn around, as services began to replace manufacturing as the main source of new jobs. Combined with factors such as traffic congestion and rising fuel prices, this helped to prompt a resurgence of CBDs and inner suburbs as places to live and work.

There is a close relationship between the structure of the economy, the nature of transport systems and the shape of cities. For the economy to function efficiently, these three things need to be in tune. In the 20th century, the outward spread of residential neighbourhoods was compatible with the dispersion of manufacturing into suburban locations, since the rise of the car increased mobility and efficiently connected workers and jobs.

In the 21st century, however, the established structure of our cities and their transport systems is less well suited to the needs of the economy. This is not just a shift from manufacturing to services. More significant is a rising level of knowledge-intensive activity in all sectors of the economy, which increases the importance of efficiently connecting firms, jobs and residents.

The more knowledge intensive the economy, the greater the premium on skills and on a constant process of learning, adapting

¹ Kennedy (1962)

² Major Cities Unit (2011) p.57 Major cities in this context includes 18 cities with populations of more than 100,000 people.

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and innovating. While knowledge-intensive activity makes up a relatively small proportion of overall output and jobs, it generates growth and expands exports. It is crucial to national prosperity.

Since the vast majority of knowledge-intensive economic activity takes place in Australia's cities, the productivity of our economy, and its capacity to generate and distribute opportunities to all, depends on how well our cities link workers with employers and businesses with one another. Improving these linkages has the potential to increase productivity and national prosperity, and make Australia a more attractive destination for global talent and leading international firms. Understanding this casts the debate about productivity growth in a new light, giving it a spatial dimension that has previously been absent.

About this report

Chapter 2 looks at how the Australian economy is changing, and Chapter 3 looks at who lives where in the four largest Australian cities. Chapter 4 considers the consequences of these residential patterns, while Chapter 5 considers what could make our cities function more effectively in a 21st century economy. We have also produced a set of supplementary maps, which detail who lives where in each of Australia's largest cities: Sydney, Melbourne, Brisbane and Perth. These maps are available on the Grattan Institute website.³

What this report is not about

The report is not about social inequality at a national level, nor is it about social cohesion, nor the role of education in increasing opportunity. These three subjects are vital, but not the focus here. The report is also not a value judgment about the direction of global economic forces.

This report is only a start in understanding productivity in our cities. But the future prosperity of advanced economies will depend on learning much more about how cities can enable a productive economy that provides opportunities for all. (See Appendix 1: Questions for further research.)

³ <http://grattan.edu.au/>

2. Australia's changing economy

This chapter considers two significant trends in the Australian economy that are particularly important for cities. The first is the agglomeration of knowledge-intensive activities, predominantly in the centre of our largest cities, and to a lesser extent in other employment centres. The second is increasing skill levels and specialisation of jobs throughout the economy, and therefore across our cities.

Knowledge-intensive activities are only a small proportion of all jobs in our cities, but as we will see, they are particularly important for national prosperity. In this case, what is good for the centres of our cities is good for the country as a whole.

While city centres have the biggest concentrations of jobs, most residents of Australia's major cities do not work in the CBD. The majority of jobs are dispersed throughout the metropolitan area, including in secondary employment hubs that often form around sites like airports, universities and major hospitals.

Regardless of where people work however, the effective functioning of the labour market is important for both employers and employees.

2.1 The rise of knowledge-intensive activities

Shifts in national economies are often described as trends in individual sectors. The most prominent is the decline in manufacturing and the rise of services in 'post-industrial' advanced economies. National Accounts reflect this tendency by

categorising economic activity by sector. But classifications of businesses into agriculture, manufacturing and so on mask the composition of the activities within them. Economists increasingly argue that one of the most significant long-term shifts in advanced economies is towards knowledge-intensive *activities*. These take place across all sectors of the economy (see Box 1).

Knowledge-intensive activities provide "largely customised, problem solving services... which require application of significant intellectual effort or capital".⁴ Carrying out these roles are the people described by Nobel Laureate Robert Lucas Jr. as an emerging "idea generating and problem solving class".⁵

This is about more than just higher-qualified individuals, however. On average, larger firms are significantly more productive than smaller firms.⁶ Such firms achieve not only economies of scale and scope, but can also *combine different capabilities* to make more complex products and services.

This is because an important characteristic of productive (or applied) knowledge is that it involves not only individuals, but also interactions between them in businesses and networks. These interactions give rise to the kind of learning that leads to higher productivity.

⁴ Spiller (2009)

⁵ Lucas (2009)

⁶ Acs, *et al.* (1999), Selden (1999), Snodgrass and Biggs (1995)

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Box 1: Measuring knowledge-intensive activities

Various attempts have been made to measure knowledge-intensity at an economy-wide level. Educational attainment remains the most common measure, despite the severe limitation that it does not measure the application of knowledge, or interactions between people, businesses or networks.

Meanwhile, skills intensity (measured by workforce qualifications) and information technology capital intensity (measured by capital investment) have been rising in all industries in the EU, the US and Japan.⁷ Beyond skills and ICT intensity, R&D investment and patenting activity are widely used as measures of knowledge intensity.

More recently, ‘productive knowledge’ has been viewed in terms of a set of capabilities.⁸ The OECD, the UK’s Nesta and the Commonwealth Government of Australia have all adopted this approach.⁹ This wider range of capabilities goes beyond educational attainment to more closely align with the actual activities of organisations and societies.

Since data does not exist for knowledge-intensive activities as a category, they can be hard to measure as a part of the economy. One gauge of shifting economic activity is the change in the work people do as measured by occupation. Figure 1 shows much

higher growth in high-skilled compared to low-skilled occupations over the last 15 years.

Figure 1: Cumulative growth in employment by occupation (1997-2012)



Source: ABS 6310.0, 6401.0, 6310.0 1220.0

⁷ Jorgenson and Timmer (2011)

⁸ Bahar, *et al.* (2012)

⁹ See OECD (2012), Department of Industry (2012) Nesta (2012). Nesta, formerly the National Endowment for Science, Technology and the Arts, is now an independent charity that works to increase the innovation capacity of the UK.

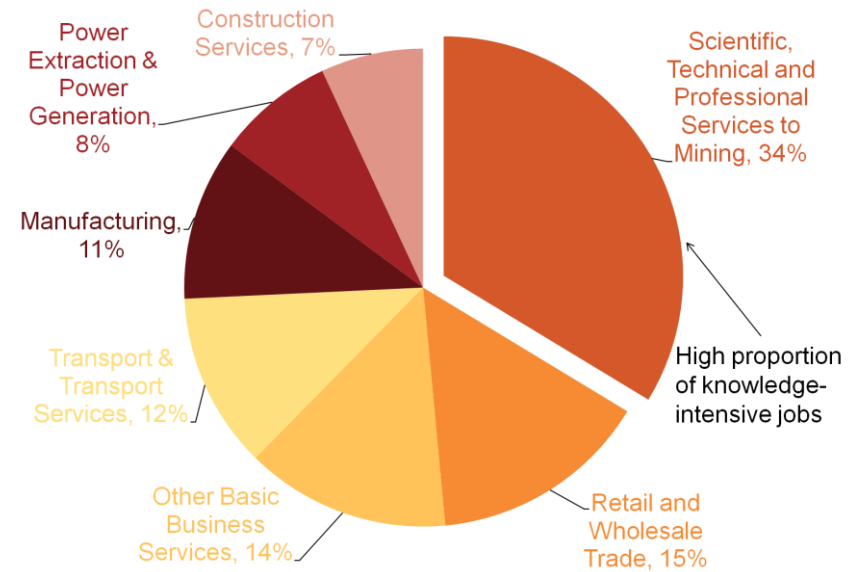
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Knowledge-intensive activities are a particularly large part of the value chain. A compelling example is the story of the design and production of the Apple iPhone. Although American workers are involved only in the initial, knowledge-intensive, innovative phase, the “majority of the iPhone’s value came from the original idea, its unique engineering, and its beautiful industrial design”¹⁰:

Apple engineers in Cupertino, California conceived and designed the iPhone. This is the only phase of the production process that takes place entirely in the United States. It involves product design, software development, product management, marketing, and other high-value functions. At this stage, labor costs are not the main consideration. Rather, the important elements are creativity and ingenuity... The last phase of production is the most labor-intensive: workers assemble the hardware and prepare it for shipping. This part, where the key factor is labor costs, takes place on the outskirts of Shenzhen... If you buy an iPhone online, it is shipped directly to you from Shenzhen. Incredibly, when it reaches the American consumer, only one American worker has physically touched the final product: the UPS delivery guy.¹¹

Closer to home, value chain analysis of Queensland’s mining sector suggests that a large part of the value is generated from services sectors, which contain a high proportion of knowledge-intensive jobs (see Figure 2).

Figure 2: Value chain breakdown of Queensland resource sector



Source: SGS Economics & Planning (2012)

Knowledge-intensive activity is highly complementary to Australia’s extensive mining and agriculture sectors. As the Australian Treasury states:

Australia's economic development has seen the benefits of a rich natural resource endowment being transformed into a diverse economy that is service-oriented yet maintains a core

¹⁰ Moretti (2012) p. 11

¹¹ Ibid. p. 9

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*of technologically advanced sectors engaged in agricultural, mining and other industrial production.*¹²

The Reserve Bank of Australia has also found that while the resource economy accounted for around 18 per cent of GDP in 2011-12, more than a third of this contribution to the economy came from businesses providing goods and services to the resource sector. The business services sector – consisting of professional, scientific and technical services; information, media and telecommunications; financial and insurance services; rental, hiring and real estate services; and administrative and support services – was responsible for more than 12 per cent of the GDP associated with the resource economy. The contribution of knowledge-intensive jobs across all sectors is likely to be even greater.

Knowledge-intensive activities matter. Nobel Laureate Robert Lucas Jnr even argues that human capital (in the sense of individual, organisational and social learning) is all that is needed to drive economic growth in advanced economies.¹³ We need to better understand and measure knowledge-intensive activities.

The economics of agglomeration

Firms whose core activities are knowledge-intensive – including the headquarters of large firms – tend to locate in close proximity, often in the centre of cities. Such clusters are now known as ‘agglomerations’, but our understanding of the phenomenon begins more than a hundred years ago, when economist Alfred

Marshall realised that the economic life of a city was greater than the sum of its parts.

Crucially, Marshall identified the ways in which the benefits of agglomeration arise. Two of these, *learning* and *matching*, are particularly relevant to knowledge-intensive activities.¹⁴

Firstly, he noted that the co-location of similar firms enhanced the transfer of skills and innovation among different organisations – a process often known today as ‘knowledge spillovers’:

*The mysteries of the trade become no mysteries; but are as it were in the air, and children learn many of them unconsciously. Good work is rightly appreciated, inventions and improvements in machinery, in processes and the general organization of the business have their merits promptly discussed: if one man starts a new idea, it is taken up by others and combined with suggestions of their own; and thus it becomes the source of further new ideas.*¹⁵

This is why knowledge-intensive activities rely heavily on face-to-face communication in order to generate ideas (see Box 2).

¹² Treasury (2011)

¹³ Lucas (1988) Lucas (1990)

¹⁴ These, along with ‘sharing’, are discussed by Duranton and Puga (2004).

¹⁵ Marshall (1890) IV, X, 3

Box 2: Face-to-face communication

It might be assumed that the importance of agglomeration benefits would have diminished since Alfred Marshall's day, given the rise of sophisticated communications technologies and the supposed 'death of distance'.

In an ever-more networked society, much of the work carried out in city offices could in theory be done just as easily from an outer suburban office or even a private home. Counter-intuitively however, proximity seems to be even more important in knowledge-intensive, serviced-oriented economies than it is in economies based on heavy industry and manufacturing.

Urban economist Edward Glaeser calls this "the central paradox of the modern metropolis" – even as the cost of connecting across distance falls, so the value of being close to other businesses rises.¹⁶ One physical manifestation of Glaeser's paradox is the close clustering of financial firms in the inner city. If there were no benefits to agglomeration, such firms might be expected to decamp to less expensive premises in a suburban office park.

New technology such as high-speed broadband will make it easier for employees to work more flexibly and telecommute. But modern communications technology will never completely replace face-to-face discussions as a way to exchange ideas and generate new ones. Even if our work-related journey habits change in character, we will still need to move about the city and gather together in workplaces.

¹⁶ Glaeser (2011) p. 6

Secondly, Marshall noted the advantages of what are now called 'deep labour markets'¹⁷ – that is, of a large number of employers and of workers being in close proximity to one another:

*Employers are apt to resort to any place where they are likely to find a good choice of workers with the special skill which they require; while men seeking employment naturally go to places where there are many employers who need such skill as theirs and where therefore it is likely to find a good market.*¹⁸

Deep labour markets benefit both workers and employers by creating "a constant market for skill"¹⁹. If one enterprise fails, a worker has a good chance of finding an alternative job nearby. Equally, if an employer loses staff, or wants to expand production, a deep labour market makes successful recruiting easier.

Perhaps even more importantly for productivity, deep labour markets improve the chances of optimising the match between workers and jobs in terms of skills and tasks. The better the match, the higher the productivity of an enterprise will be. As a result, deep labour markets encourage workers to invest in upgrading their skills because they can be more confident of finding an employer who fully values their enhanced capabilities when they change jobs.²⁰ Deep labour markets thereby increase the overall stock of human capital.

¹⁷ Also referred to in economic s literature as 'thick labour markets'

¹⁸ Marshall (1890) IV.X.9

¹⁹ Ibid.

²⁰ Moretti (2011) p. 1287

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Since Marshall's time, ideas about agglomeration have been refined and developed by other economists, but his core insights remain influential.

For example, analysis of new data from the US Cluster Mapping Project finds that:

- industries in strong clusters have higher jobs and wages growth, and higher start-up rates and patenting rates.
- industry performance is enhanced by strong, related clusters in the same region, and by the presence of similar clusters in adjacent regions.
- new industries are more likely to emerge near strong clusters, and in industries with links to existing strengths.²¹

Increasing levels of specialisation make learning and matching even more important. When specialisation is a broader trend across advanced economies (see page 14), in which knowledge-intensive products and services are jointly developed by a number of highly specialised firms, it makes sense that these firms locate close to each other to reduce coordination costs.²²

Maximising the productivity of knowledge-intensive firms

To maximise their productivity, knowledge-intensive firms need access to a skilled workforce, deep labour pools, and a rich surrounding 'ecosystem' from which to learn.

²¹ Delgado, *et al.* (2012)

²² Becker and Murphy (1992)

Since many roles in knowledge-intensive firms are filled by highly qualified individuals, these employers need access to a skilled workforce (whether of locally educated workers, or as a result of skilled migration).

Empirical studies have established links between deep labour markets and productivity through allowing greater specialisation, improving the fit of workers with organisations, lowering the cost of searching for a job and reducing labour market churn.²³

Finally, firms require a rich surrounding ecosystem from which to learn.²⁴ To benefit from networks of other productive and well-connected people and businesses, knowledge-intensive activities cluster in inner cities rich in skilled workers and leading firms.

That is why encouraging high-skilled firms to locate outside a major agglomeration hub is likely to fail. CBDs in particular will therefore have an even more important role in future. Therefore one of the most significant barriers to the clustering of firms could be the availability of affordable land in the centre of our largest cities.²⁵

²³ Abel and Deitz (2012)

²⁴ Moretti (2012) p. 14-15

²⁵ This is likely to lead to differing patterns of agglomeration in Sydney (where inner city business development options are limited) and in Melbourne (where such options are more abundant).

Box 3: Why pay CBD rents?

When the global engineering and consultancy firm SKM needed to revamp its ageing and energy-wasting Melbourne office, it ended up making the expensive decision to move 850 staff into the centre of the city. The old office in the suburb of Armadale was only about seven kilometres to the southeast of the CBD, was close to a train station and two tram routes, had good access to arterial roads and offered ample parking. The new office is on a congested street, has no car parks and costs 75 per cent more per square metre. So why did SKM move rather than renovate?

A central location allows the firm to recruit from a deeper talent pool. Previously, some skilled workers and top graduates from the west or north of Melbourne were put off a job at SKM because of the prospect of cross-city travel.

Clients are far more likely to come to SKM at its new address. Most external meetings can be reached with a brief walk or tram ride. These short trips in the CBD are much more productive than taxi trips from the old suburban HQ. In the rich, supportive ecosystem of the CBD, SKM employees say they often bump into professionals from other high-knowledge firms, building personal networks and sharing knowledge.

In the city, SKM can coordinate more easily with other firms and with government on major projects. Client functions are simpler to organise and more successful, and SKM staff are better able to take part in the activities of professional organisations. Despite the cost, SKM has little doubt that the move made good business sense.

Why agglomeration matters for national prosperity

Recent economic research has sought to demonstrate empirically the benefits of agglomeration in cities. Research in the UK found that a 10 per cent increase in the level of agglomeration is associated on average with a 1.25 per cent increase in aggregate productivity.²⁶ Researchers in Australia have reached similar conclusions.²⁷

More importantly, knowledge-intensive activities matter because of their link to trade and to innovation, and therefore to productivity growth.

Australia has a relatively small population, and so does not have large markets for many goods without international trade. Accessing international markets allows Australian producers to benefit from economies of scale. Knowledge-intensive activities that cluster typically sell to markets beyond their local region.

Along with such trade comes significant international competitive pressure. The tradable sector must innovate to survive. Unsurprisingly, then, the sectors most likely to experience productivity growth are those that are traded internationally.

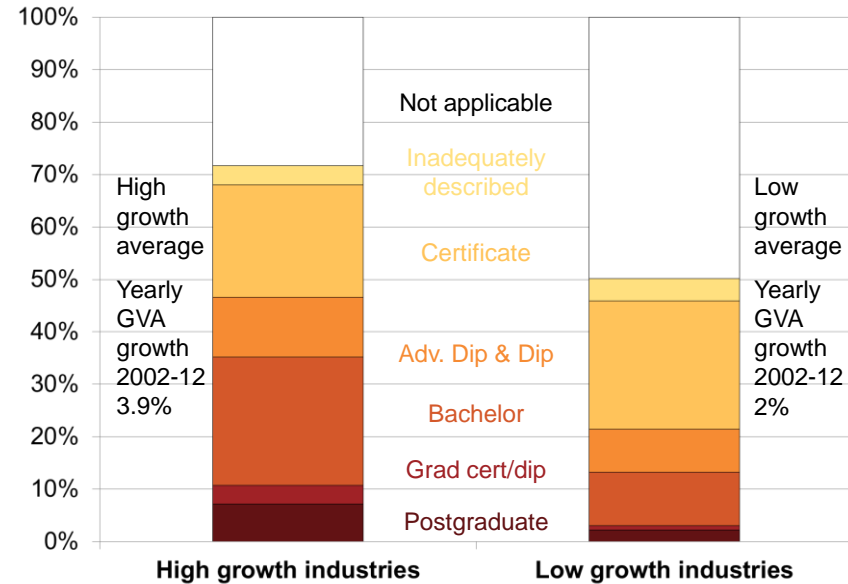
²⁶ Graham (2006) p.26. The potential benefits of agglomeration will not be applicable to every Australian city. It is likely that small urban centres benefit from some level of agglomeration, however these effects are likely to be small. As such, our report is likely to be most relevant for Sydney, Melbourne, Brisbane and Perth and it is on these cities that we focus.

²⁷ See for example Trubka (2011); SGS Economics and Planning (2012); Hensher, et al. (2012)

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Knowledge-intensive activities also tend to be highly skilled. Figure 3 compares the composition of the workforce for high-growth and low-growth industries. The former employ a more skilled and educated workforce, with around 35 per cent of employees having a post-school qualification at the bachelor level or higher.

Figure 3: Employees in high-growth industries have higher levels of education²⁸



Source: ABS Census 2011

²⁸ High growth industries are Mining, Utilities, Health, Professional and scientific, Wholesale, Construction, Education, Public sector, Arts and Recreation and Finance. Low growth industries are Agriculture, Manufacturing, Other Services, Retail, Transport, IT & Media, Hospitality, Real Estate and Administration.

Finally, knowledge-intensive activities seem to benefit low-skill workers, too. Recent US research found that as knowledge-intensive activities increase in a local economy, so do wages, not just for the skilled workers but also for those with limited skills.²⁹

2.2 The majority of jobs are not in the centres of our cities

While the CBDs of Australia’s biggest cities are the most concentrated sites of employment, not every firm or every job is or should be located close to the centre. Figure 4 shows the distribution of jobs by distance from the CBD in Melbourne. This spatial pattern of a spread of employment through Australian cities is unlikely to change. Many jobs – such as teaching, running a medical practice or cutting hair – provide services directly to people. Sometimes referred to as ‘population-serving jobs’, these must be located close to where people live.

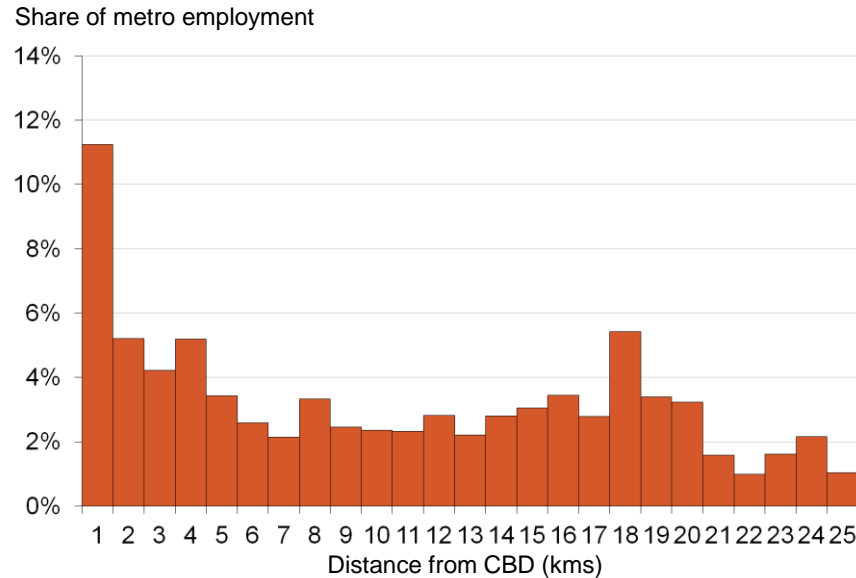
In addition, many firms have much less to gain from agglomeration than from access to affordable land – particularly if they are likely to be affected by congestion and other downsides of agglomeration. The warehousing and distribution industry is an example.

But all these industries, wherever they are in the city, benefit from well-functioning labour markets for both higher and lower skill employees. This is because of two related trends also evident in all advanced economies: increasing skill levels and increasing specialisation.

²⁹ Moretti (2012) p. 99

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Figure 4: Share of jobs by distance from the CBD, Melbourne, 2006



Source: Davies (2011) using 2006 Census data

Across advanced economies, the labour force is becoming increasingly qualified. In 2002, about 20 per cent of Australia’s population aged 20-64 had a bachelor degree or higher qualification. By 2012, this had risen to 28 per cent, a remarkable rise over the course of a single decade. The proportion of people with no post-school qualifications fell from 47 to 36 per cent over the same period.

One reason for this increase in skills is the related trend of increasing specialisation. The productivity gains associated with

the specialisation of roles, or division of labour, was first recognised by Adam Smith in *The Wealth of Nations*:

*The greatest improvement in the productive powers of labour ... seem to have been the effects of the divisions of labour.*³⁰

Today, as in the 18th century, an important influence on the degree of specialisation within an economy is the size of firms and markets. Small businesses rely on a small number of ‘jacks-of-all-trades’ doing a broad range of tasks. On the other hand, large corporations have many employees, often in highly specialised roles, who collaborate to focus their combined expertise on complex problems. New levels of specialization emerge inevitably from our growing technological capabilities and knowledge of the world.

While this broad trend has been evident since the days of Adam Smith, the rate of specialisation has accelerated in recent decades. Medical practitioners are now differentiated by their expertise in a particular type of disease, body part or age group. Similarly, engineers might now be chemical, mechanical, electrical, materials, biomolecular or many other kinds.

These trends mean that knowledge and skill are of ever greater importance right across the economy and our cities. The efficient functioning of labour markets to match skills to jobs and to constantly increase workers capabilities is of importance at every level of economic activity – in cities and suburbs alike.

³⁰ Smith (1776)

3. Who lives where in Australian cities

As residents, our daily experience of the city is largely physical. Around us we see houses, shops, office blocks, parks, roads and railway lines. These and other familiar structures and systems are duplicated in maps that we use to orient ourselves and move about. Less apparent is the social and demographic structure of the city. It is obvious that some suburbs are richer than others or that the CBD has a lot of office jobs, but it is harder to get a sense of who lives where by income or educational qualifications.

To better understand the shape of Australia's four largest cities the Grattan Institute has generated maps, charts and diagrams that illustrate the distribution of income, house prices, employment and education. To observe change over time, we have drawn on ABS data from the five Censuses between 1991 and 2011. A full set of maps for Sydney, Melbourne, Brisbane and Perth is available in supplementary materials on Grattan's website.

In this chapter we use individual maps and charts to illustrate the overall picture, identify emerging trends and differences between cities. The chapter does not draw causal links or make judgements – it simply documents who lives where. Many more things could be mapped. Health maps might show the distribution of risk factors such as smoking or chronic diseases like type 2 diabetes. But because this report focuses on the economic performance of cities, it uses the economic indicators of income levels, house prices, qualifications, employment participation and access to jobs.

Box 4: Reading the maps

Maps of each city are restricted to the relevant Urban Centre Zone as defined by the Australian Bureau of Statistics. This captures built-up suburbs where residents actually live and avoids diluting the maps with large, sparsely populated areas (such as agricultural zones, planned growth areas or national parks).

To provide sufficient clarity and detail, the main boxed map is a magnified view that takes in as much of each city as possible but necessarily excludes some outlying suburbs. A smaller map provides context by showing the entire metropolitan area within the boundary of the Great Capital City Statistical Area.

Maps based on census data from 2011 and 2006 are presented at a State Suburb (SSC) level. This classification is small enough for maps to be sufficiently detailed, yet large enough to generate meaningful statistics. The use of suburbs also accords with lived experience of the city. Before 2006, SSC-level data was not available in all states, so to provide consistency, maps that track changes over longer time periods use data at the level of Statistical Local Area (SLA).

Note: Data has been excluded where relevant populations were too small for meaningful analysis (generally fewer than 50 relevant people). For more detail on ABS geographical classifications see: Pink (2011a) and Pink (2011b)

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Some charts in this chapter analyse data in relation to distance from the city centre. Since city centres have the highest concentrations of jobs in Australian cities, it is relevant to see if there is an observable relationship between proximity to the centre and chosen indicators such as employment participation or house prices. It should be noted, however, that distance in kilometres is not an ideal measure of proximity since what matters is the time a journey takes, not its length. In the absence of better data however, distance is a reasonable proxy for access.

3.1 Who lives where by income?

Every city contains people of different means but it is hard to compare accurately who earns what. For example, a university student on a low declared income may appear 'poor' in statistical terms, even when living at home with affluent parents who provide every conceivable comfort. A retiree may have a low annual income despite having accumulated extensive assets during a long professional career.

On this basis it can be argued that differences in wealth are a more meaningful indication of who has what than differences in income – but it is notoriously difficult to get accurate measures of wealth in Australia. What is known is that the most important component of wealth for most Australians is property. Owner-occupied housing accounts for almost half the net worth of households.³¹ House prices, discussed later in this chapter, thus provide a rough proxy for the distribution of wealth in cities.

³¹ BITRE (2009) p. xix

Analysis in this section is restricted to the distribution of individual incomes of people of 'prime working age' – that is, between 25 and 65 years old. This ensures a focus on that segment of the population more likely to be available for employment, and excludes most people who are still engaged in post-school education and most retirees. The selection of this cohort is also made in the knowledge that 75 per cent of the growth in real household income over the past 20 years has come from increased earnings in the labour force.³²

The maps show median income by suburb with darker colours indicating higher incomes.³³

The census asks respondents to report income within a range of brackets and the top bracket includes all incomes above \$104,000 per annum. This captures a broad range of incomes and makes it hard to produce a detailed picture of income distributions at the top end.

Despite this caveat, the maps reveal a consistent pattern of polarization in Australia's four largest cities. Individuals on higher incomes tend to cluster in inner suburbs and in suburbs with desirable natural attributes (such as beaches, trees and hills).

Figure 5 provides a snapshot of income distribution in Sydney at the 2011 Census. Individuals with incomes above \$70,000 are

³² Greenville, *et al.* (2013) p. 5

³³ Income is measured by place of usual residence, based on the total personal income (INCP) field in the census, which measures pre-tax income on a weekly basis, including government transfers like family tax benefit or rent assistance and non-wage income (like interest and dividends). We have annualised by multiplying by 52.

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clustered around the inner suburbs. Beachside suburbs and Hills District suburbs (to the northwest) also tend to have higher median incomes (above \$60,000), while median incomes tend to be much lower (below \$40,000) in suburbs to the west and southwest.

Figure 5: Median individual income by suburb, Sydney 2011

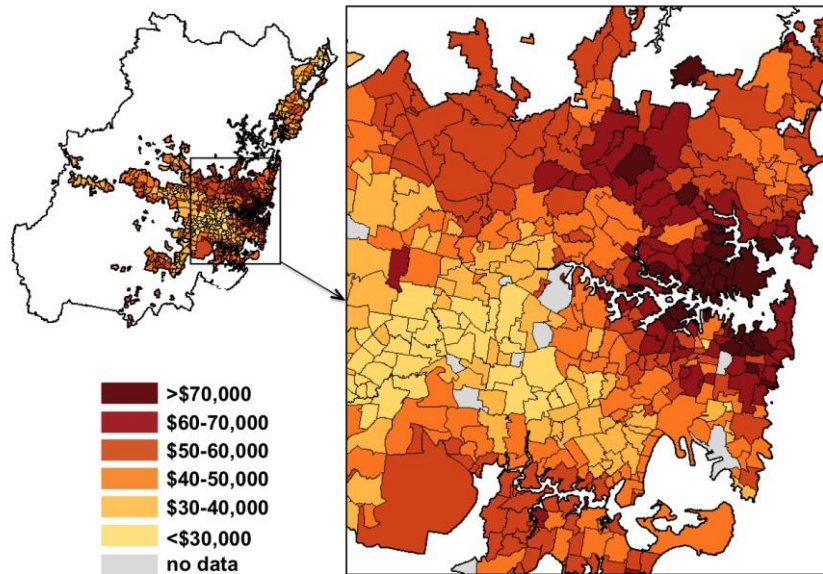
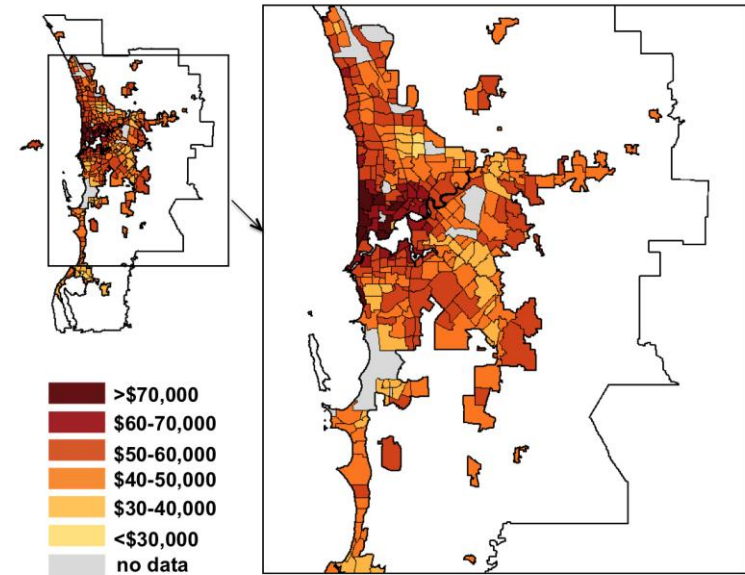


Figure 6 reveals a similar pattern for Perth: suburbs with high median incomes are close to the centre of the city or the beach, while incomes are lower in more distant suburbs, particularly those located away from the coast.

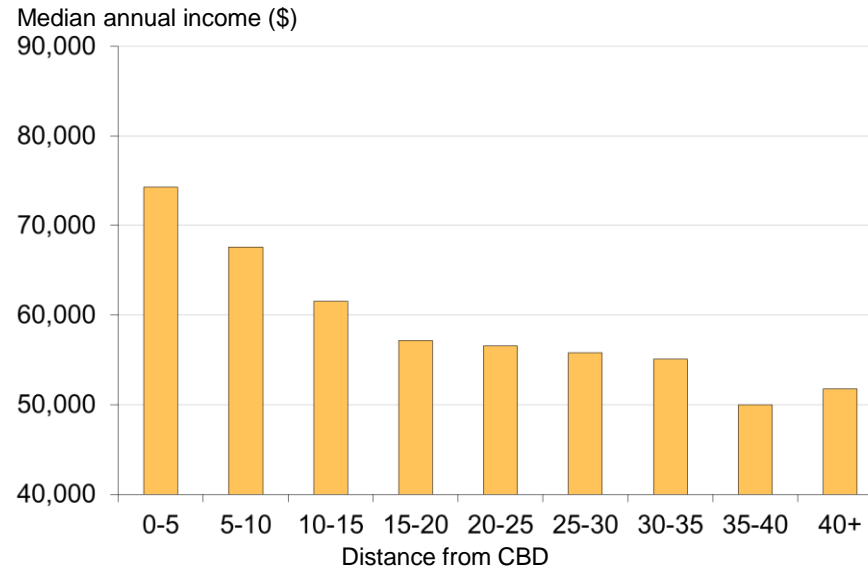
Figure 6: Median individual incomes by suburb, Perth, 2011



The clustering of higher incomes in inner suburbs (and in those with desirable natural features) is also evident in Melbourne and Brisbane. Figure 7 shows the inverse relationship between income and distance from the CBD in Brisbane: as distance from the CBD increases, median incomes decline.

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Figure 7: Median income of individuals working full time by distance from CBD, Brisbane, 2011

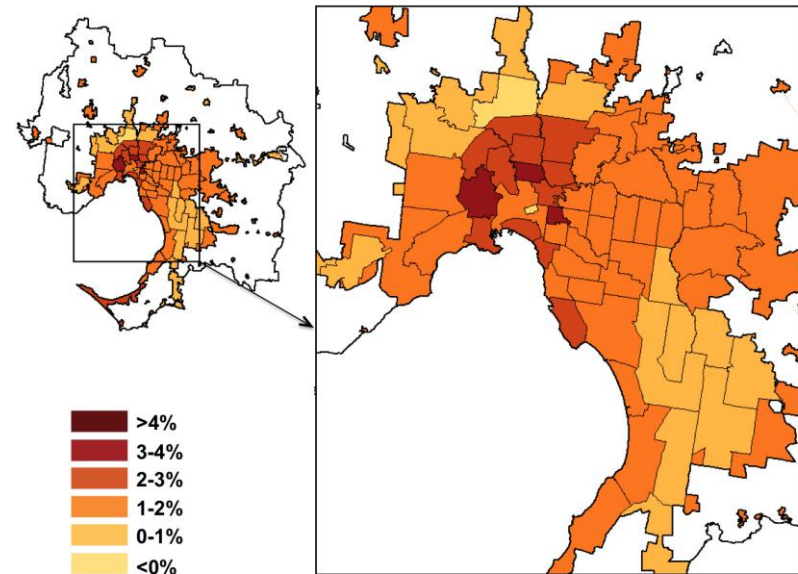


An important question is whether the geographical distribution of income has become more polarized over time. To check whether this is the case, income data for Australia’s four biggest cities was gathered from four census periods (from 1996 to 2011).³⁴ Changes over time were then analysed at the level of Statistical Local Area to see if income had grown at different rates in different parts of the city. Specifically, did incomes grow faster closer to the central cores of Australian cities than in suburbs

³⁴ It was not possible to include the 1991 or earlier censuses because the data was not readily available at SLA level.

more distant from the CBD?³⁵ Figure 8 maps the change in median incomes between 1996 and 2011 in Melbourne.

Figure 8: Average annual growth in median income by SLA, Melbourne 1996-2011



It shows that incomes generally did rise faster in suburbs closer to the city centre than in suburbs further away.³⁶ A similar picture emerges in Sydney and Brisbane, and the pattern is also evident,

³⁵ To provide consistency across time periods, data was analysed at the level of the Statistical Local Area (SLA) rather than suburb level.

³⁶ It should be noted that CBD itself does not share in the high rate of income growth in all cities. Income in the innermost suburbs also grew more slowly than suburbs slightly further out

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if less pronounced, in Perth.³⁷ (See supplementary maps of individual cities on the Grattan Institute website³⁸ for more detail.)

3.2 How are house prices distributed?

The previous section showed that high-income individuals are increasingly clustered in suburbs close to the central business districts of Australia’s major cities – a pattern that has become more pronounced over time as incomes have generally risen faster closer to the centre of cities. Similar trends are evident in the distribution of property prices.

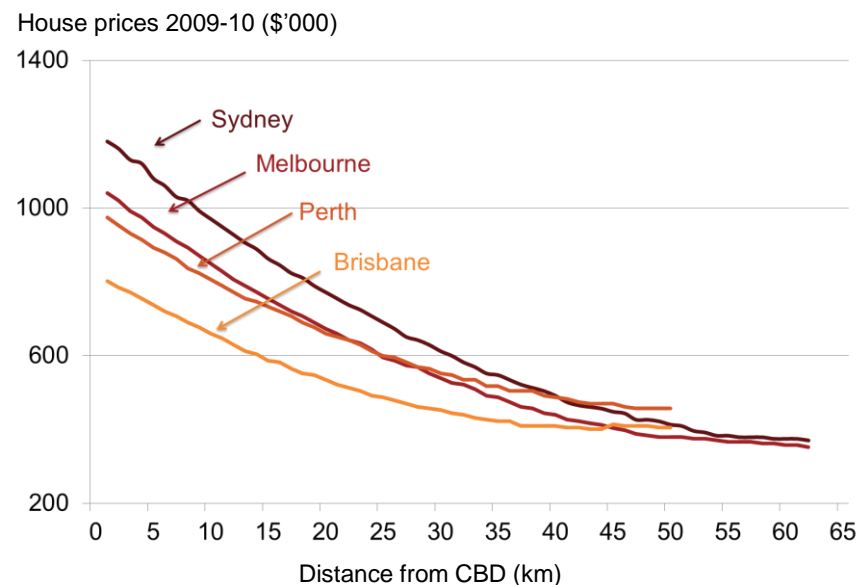
The premium placed on proximity to the city centre is evident in steep house price gradients in Sydney, Melbourne, Brisbane and Perth as documented by researchers at the Reserve Bank of Australia. The closer to the CBD, the more valuable the property – see Figure 9.³⁹

Over recent decades this relationship has strengthened, with average annual growth in house prices about two per cent higher in inner suburbs (within five kilometres of the CBD) than on city fringes.⁴⁰

Given that housing represents a substantial share of household wealth, this suggests that, by virtue of where they live, inner city homeowners have been able to build wealth more quickly than

homeowners in the outer suburbs and those unable to afford to buy a house at all.

Figure 9: Median house price gradients for Australian cities



Source: Kulish et al. (2011) p.20

It also means that, over time, home buyers on average incomes have had little option but to enter the housing market at points increasingly distant from the CBD, with reduced prospects of moving closer in subsequent years. Using data from the ABS and the Victorian Valuer General, SGS Economics and Planning calculates that in 1994-95 a Melbourne household on a median income could afford to spend \$170,000 on a house. At the time, this was enough to buy a house in about three quarters of the

³⁷ Perth showed strong income growth throughout the entire metropolitan region, perhaps as a result of the resources boom. Nevertheless, there was still evidence that income growth was higher close to the city centre.

³⁸ <http://grattan.edu.au/>

³⁹ Kulish, et al. (2011)

⁴⁰ Richards (2008)

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city’s suburbs, including those about 10 kilometres from the CBD. In 2009-10, the equivalent household could afford to spend \$382,000 – but houses were available at that price point in fewer than a quarter of Melbourne’s suburbs. Most were 35 kilometres or more from the city centre.⁴¹

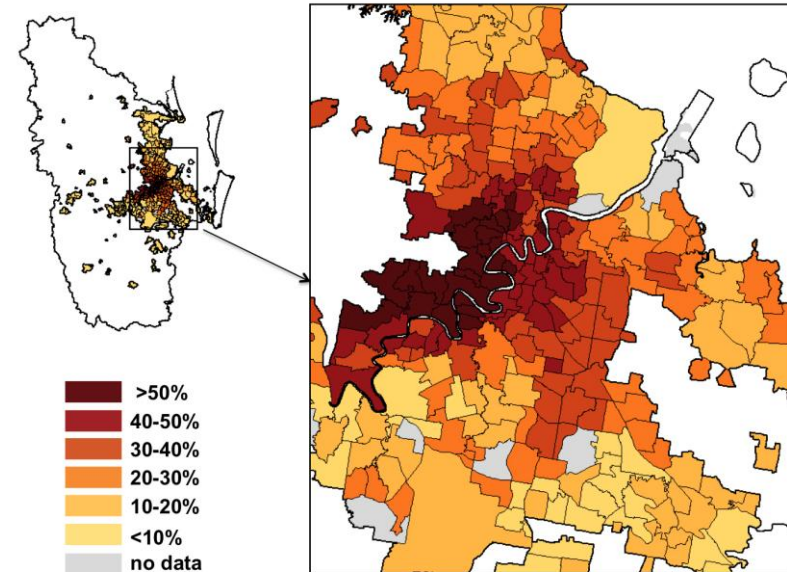
3.3 Who lives where by education qualification?

Over the past two decades, Australians have become much better qualified. The proportion of people aged 15 to 64 with a post-school qualification rose from 42 per cent in 1998 to 59 per cent in 2012, while the share of the population who had not completed any formal study or training after leaving high school fell from 53 to 41 per cent. Attainment of university qualifications – the share of the population with a bachelor degree or higher – rose from 14 to 25 per cent over the same period.

Of all the maps in this report, the maps of educational attainment show the clearest patterns of geographical concentration in inner and outer suburban areas.

Figure 10 shows how residents with university qualifications cluster in suburbs close to the centre of Brisbane.

Figure 10: Percentage of individuals with a university degree, Brisbane, 2011



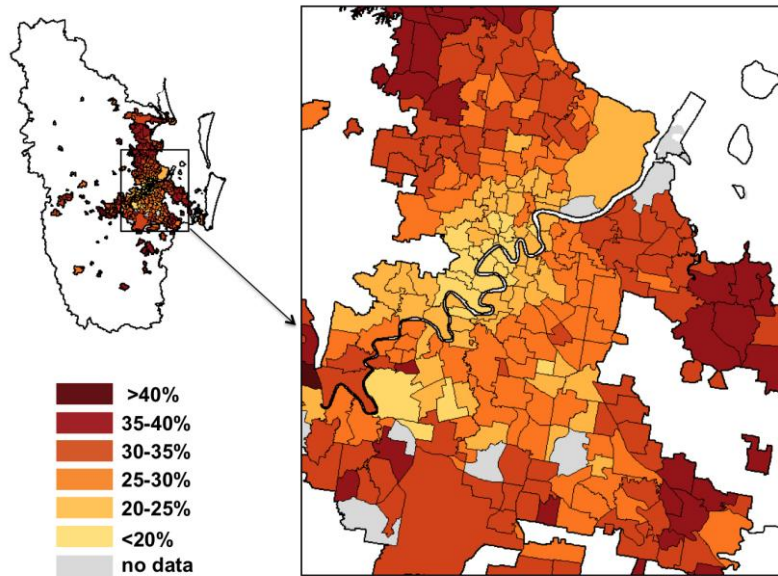
A map of vocational qualifications⁴² reveals an almost inverse picture (Figure 11). The suburbs with the highest concentrations (above 40 per cent) of residents with qualifications at certificate and diploma level are located towards the edge of the metropolitan area, while suburbs with the lowest levels of vocational qualifications (below 20 per cent) cluster in the centre.

⁴¹ SGS Economics & Planning (2011) Prices are expressed in the dollar values of the relevant year.

⁴² A vocational education and training qualification such as a certificate or a diploma, usually from a TAFE college or private education provider other than a university.

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Figure 11: Percentage of individuals with vocational qualifications, Brisbane, 2011

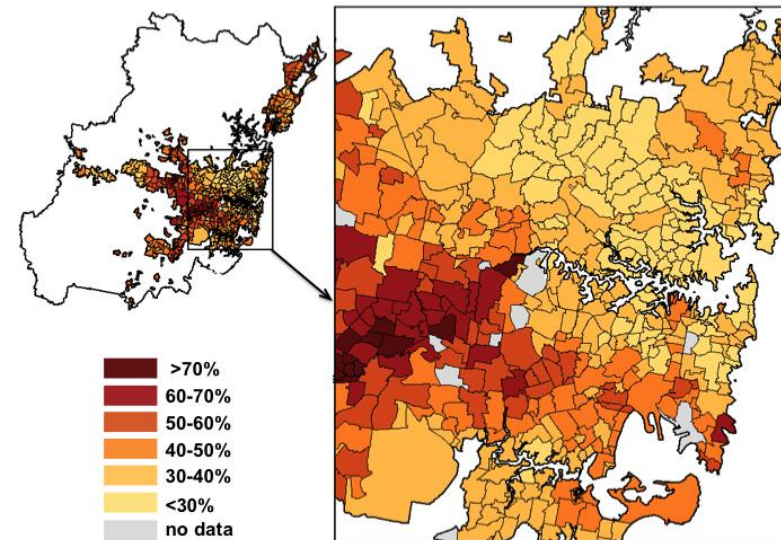


These patterns are replicated in the other three cities under analysis.

Clustering is again evident among the population with no post-school qualifications. In this case however, the relationship to distance from the centre of the city is less clear cut. On the one hand, there are no inner suburbs in any of Australia's four biggest cities where the proportion of residents with no post-school qualifications rises above 70 per cent.

On the other hand, the highest concentrations of residents who have completed no formal study beyond secondary school are not located at the edge of the metropolitan area, but rather in outer suburbs that are one ring closer in.⁴³ In Sydney for example, these suburbs are in the southwest of the metropolitan area (Figure 12).

Figure 12: Percentage of individuals with no post-school qualifications, Sydney, 2011



⁴³ As documented later in this chapter, there is a strong overlap between the maps showing areas where more than 70 per cent of residents have not completed any formal education or training beyond school and those showing concentrations of low-levels of participation in the labour force

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So are Australian cities becoming more or less polarised with respect to educational qualifications? There is, for example, a gap between inner and outer suburbs in the proportion of residents with university degrees. Has this gap got larger or smaller over time?

Figure 13: Share of residents with a university degree by distance from the city centre, Brisbane, 1996-2011

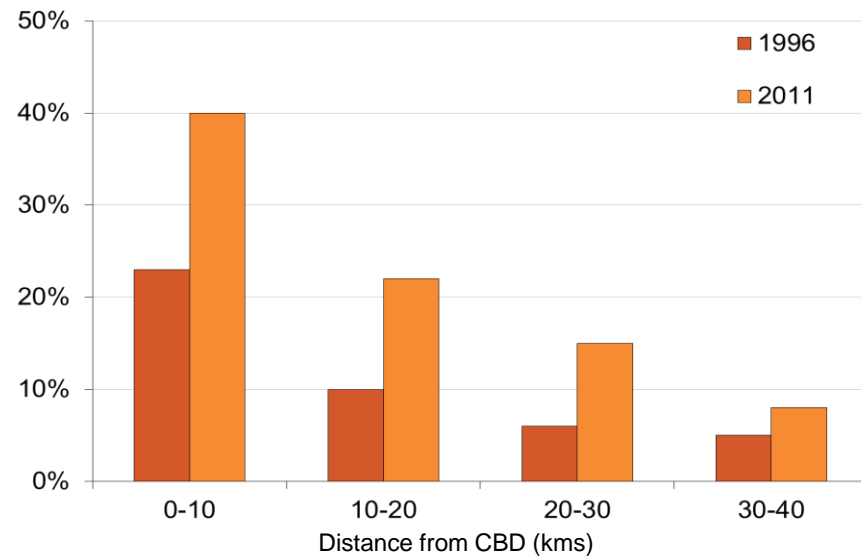
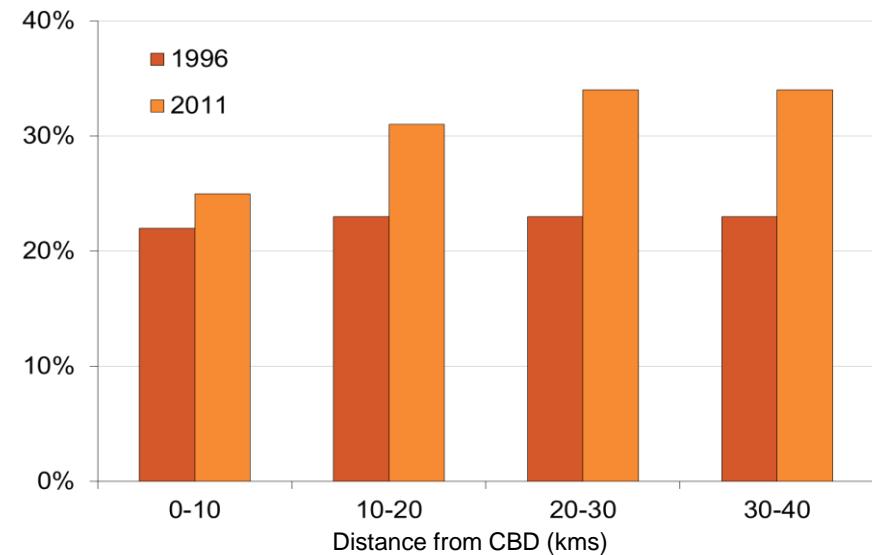


Figure 13 shows that while there has been strong growth in the proportion of residents with university qualifications in all parts of the Brisbane, the attainment gap has actually widened between inner and outer areas. The data varies between cities but all show

a sustained gap between inner and outer areas in the share of residents with a university degree.⁴⁴

Figure 14: Share of residents with a vocational qualification by distance from the city centre, Brisbane, 1996-2011



⁴⁴ Sydney, however, shows a slightly different pattern in that growth in university attainment has been weakest amongst residents living in the ring 20-30km from the city centre and much stronger amongst residents located 30-40km from the CBD.

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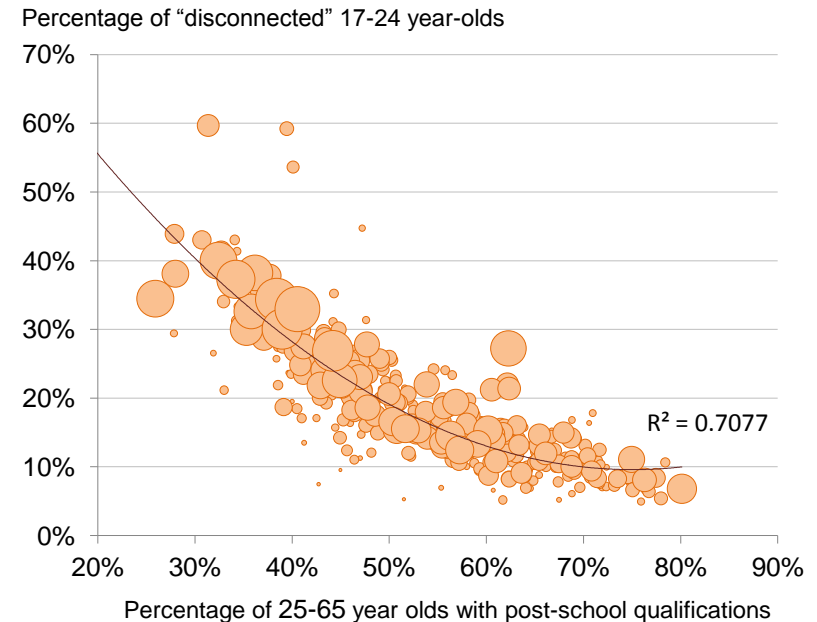
Shift the focus to the change in the proportion of residents with a vocational qualification (Figure 14) and the reverse trend emerges: growth in the proportion of residents completing a vocational education or training course is stronger in areas more distant from the centre of Brisbane. Again, a similar relationship is observed in Melbourne, Perth and Sydney.

By contrast, there is no obvious spatial component to the drop in the proportion of residents who have no qualifications beyond high school. A substantial decline in the proportion of these residents is evident between 1996 and 2011 in all areas of all four cities, with no discernible differences in terms of distance from the CBD.

There is however a strong correlation between levels of 'disconnected youth' and levels of adult educational attainment. The term "disconnected youth" refers to young adults (aged 17-24) who are not in employment, education or training (sometimes described as 'neither earning nor learning').

As Figure 15 shows, the higher the proportion of post-school qualifications held by residents aged 25 to 65 in a Brisbane suburb, the lower the levels of disconnection. Conversely, the lower the level of adult educational attainment in a suburb, the higher the proportion of youth who fall outside both the labour market and the education system. Similar charts can be made for all of Australia's major cities.

Figure 15: Relationship between disconnected youth and adult education levels, Brisbane, 2011



3.4 Working – and getting to work

Data from the 2011 census were used to map participation rates in Australia's four largest cities for adults of prime working age (25 to 65).

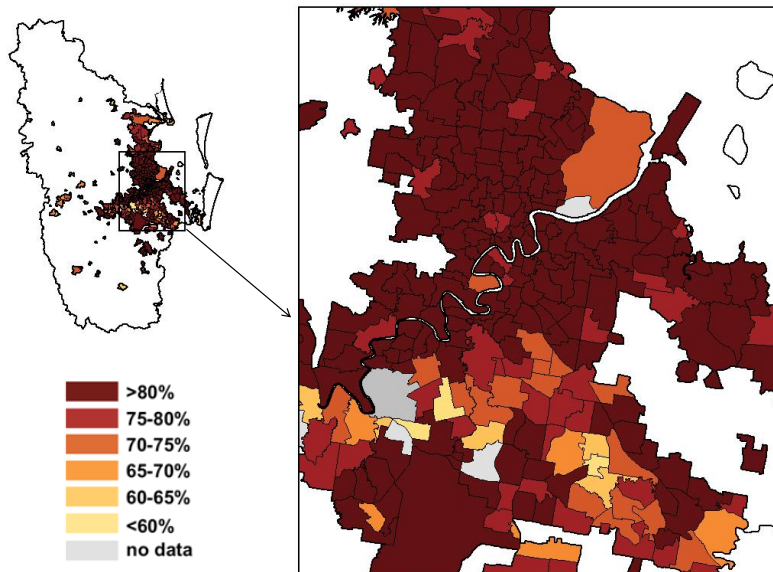
In contrast to the distinct geographical patterns that emerge in relation to incomes, house prices and post-school educational qualifications, the spatial distribution of workforce participation is

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more mixed. There is no strong correlation with proximity to the city centre: participation rates do not fall away with distance.

In fact, as is evident in the map of participation in Brisbane Figure 16), many suburbs on the edge of the metropolitan area have participation rates at the top end of the scale: that is, above 80 per cent. These match or exceed participation rates in suburbs much closer in.

Figure 16: Labour force participation rates, Brisbane, 2011



On the other hand, Brisbane, Sydney and Melbourne all show distinct clustering of suburbs with participation rates below 60 per cent. While these suburbs are not on the urban fringe, they are generally at a significant distance from the centre of the city.

In Melbourne these suburbs are in the west, north and southeast, while in Brisbane and Sydney they are in the west and southwest (see Figure 17).

Clustering is not so apparent in Perth, although there, too, lower participation rates are evident only in suburbs that are distant (though not the most distant) from the city centre.

In all cities there is a strong overlap between suburbs with low levels of workforce participation and suburbs where a high proportion of residents have no formal educational qualifications beyond secondary school.

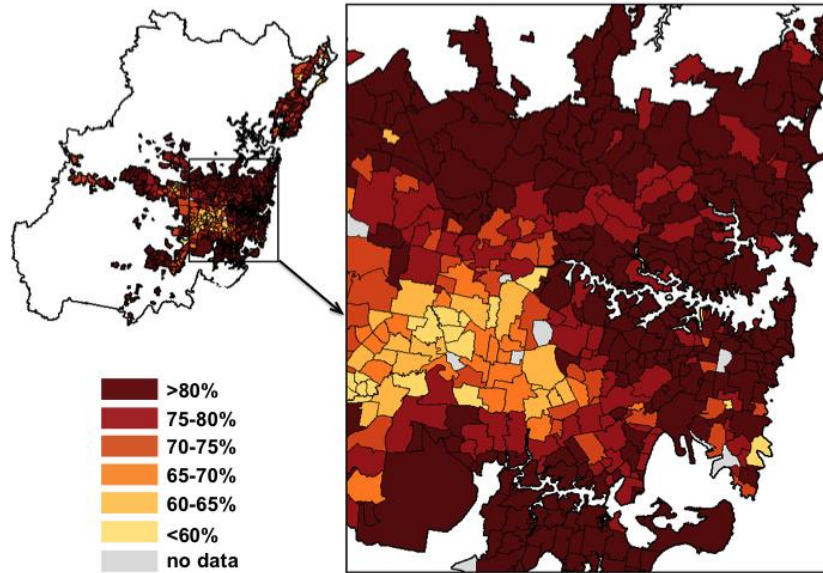
Taken together with the wide geographic spread of suburbs with high participation rates, this suggests that there are other determinants of the degree to which individuals are engaged the labour market apart from physical location and proximity to jobs. (See Chapter 4 for further discussion.)

Another way to think about the distribution of employment is to map relative 'access' to jobs. By combining transport models with job locations, it is possible to map access to jobs from different suburbs by different modes of transport.

This analysis maps access to jobs after a one-way car journey of up to 45-minutes or a one-way journey by public transport of up to an hour.

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Figure 17: Labour force participation rates, Sydney, 2011



These durations were chosen to represent a ‘reasonable’ upper limit on commuting times in an Australian context, based on current travel patterns. In 2006, the average journey to work for full-time employees in Australia’s four largest cities ranged from 35 minutes in Sydney to 26 minutes in Perth.⁴⁵ While on average, residents of outer suburbs have longer journey times than residents of inner areas the differences are modest. (Inner city residents take longer to travel short distances because there is

⁴⁵ Wilkins, *et al.* (2009)

more congestion and they are more likely to walk, cycle or use public transport.)⁴⁶

A higher limit was chosen for travel by public transport because these journeys generally take longer than trips by private car..

Figure 18 is a map of access to jobs in Melbourne by car. It shows that across large parts of the metropolitan area (darkest shaded areas) it is possible to access more than half of all the jobs in the city with a one-way driving time of 45 minutes or a total commute of up to 90 minutes per day.

There is however, a distinct advantage in proximity to the city centre and the proportion of jobs that can be accessed falls away markedly with distance. In some outer suburban growth areas just 10 per cent of all Melbourne jobs can be reached within a 45 minute drive (lightest shaded areas).

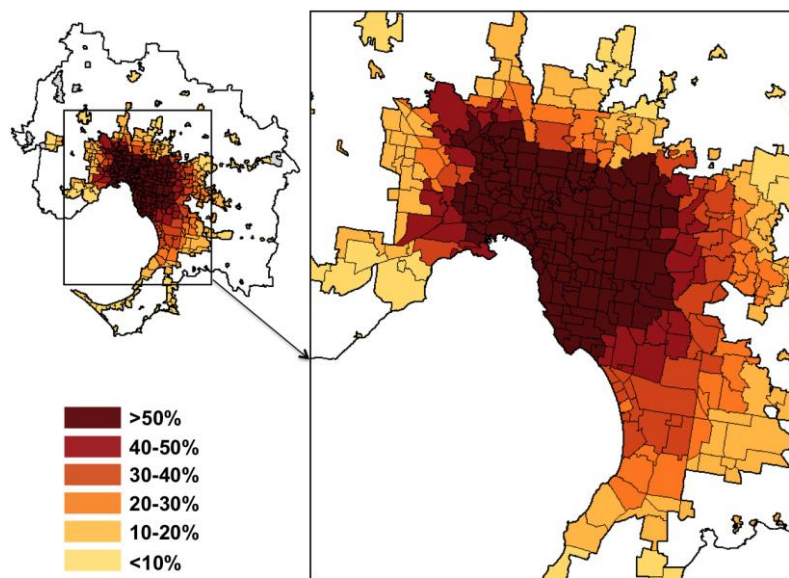
Applying the same travel time approach to work journeys in other cities shows that Brisbane has a similar level of access to jobs as Melbourne does. Access in Perth is greater: except for a few suburbs to the far north, south and east, it is possible to reach more than half the jobs in Perth from any point in the greater metropolitan area within 45 minutes. But in Australia’s biggest city, Sydney, access is more limited – see Figure 18.⁴⁷

⁴⁶ BITRE (2010); BITRE (2011a); BITRE (2012)

⁴⁷ Note that these comparisons should be seen as indicative, rather than exact, since each map is generated using a different, city-specific travel model.

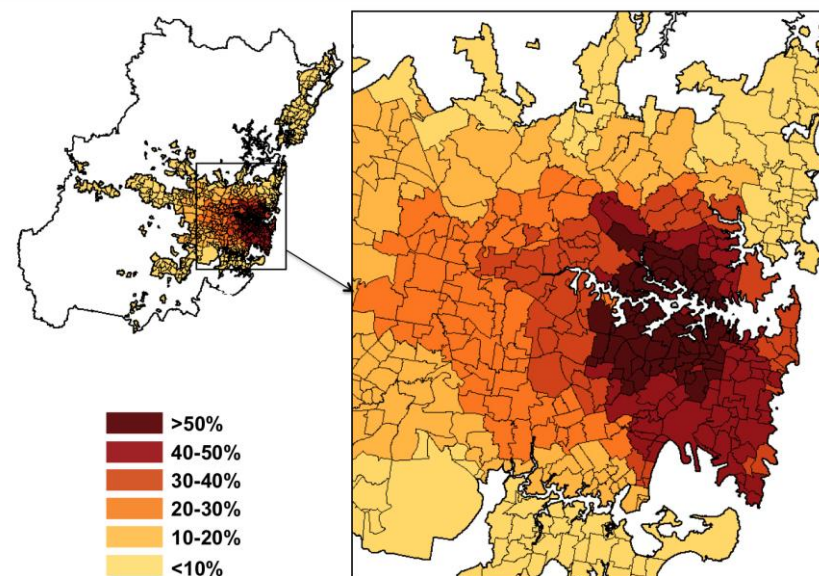
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Figure 18: Percentage of Melbourne jobs that can be reached in a 45 minute journey by car



Source: SGS Economics and Planning using Strategic Travel Model supplied by the Victorian Department of Transport

Figure 19: Percentage of Sydney jobs reached in a 45 minute journey by car



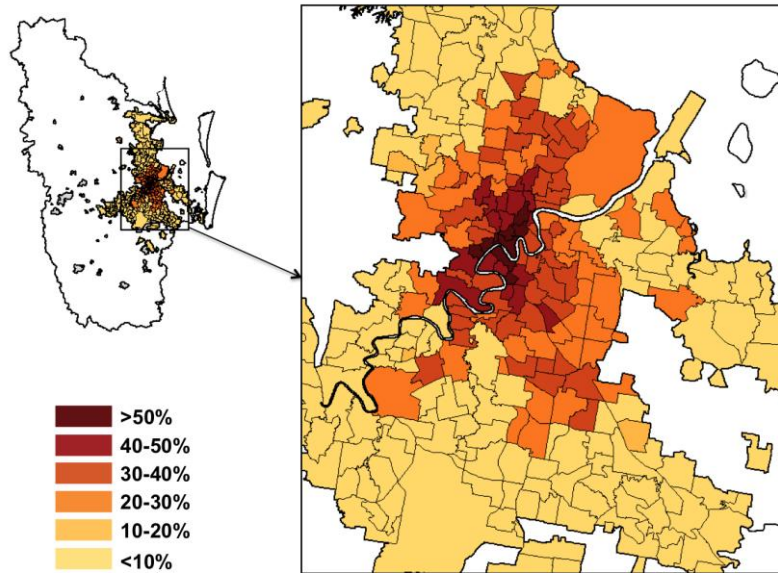
Source: SGS Economics and Planning using Strategic Travel Model supplied by the NSW Bureau of Transport Statistics

If work journeys are made by public transport, however, then access to jobs is much lower in all four cities and the advantage of proximity to the city centre is much more pronounced. In most of greater metropolitan Brisbane, fewer than 10 per cent of jobs can

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be reached in a public transport journey of an hour⁴⁸ - see Figure 20.

Figure 20: Percentage of Brisbane jobs that can be reached in a one hour journey by public transport.

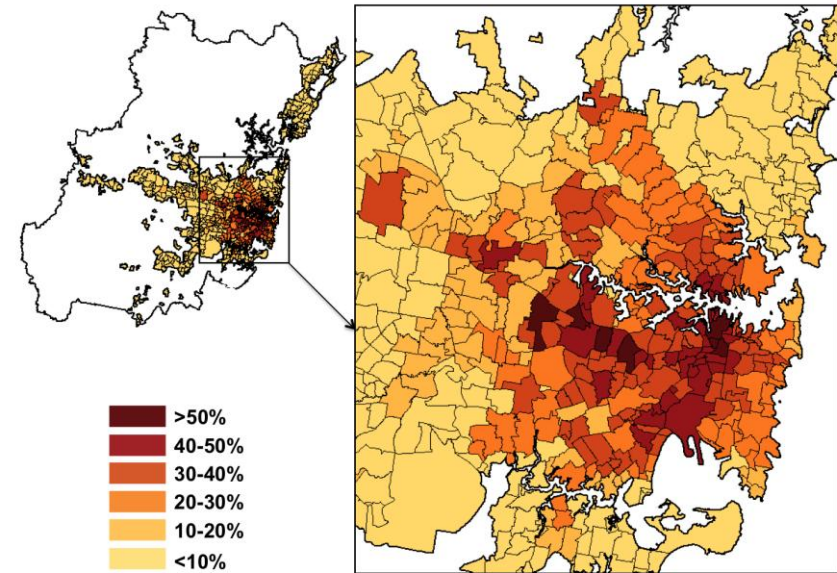


Source: SGS Economics and Planning using Brisbane Strategic Transport Model

Similar patterns are evident in Perth and Melbourne: good public transport access to jobs rapidly diminishes in a radius outwards from the inner suburbs.

The picture is slightly different in Sydney, however, as a result of the city's topography (the presence of the Harbour) and the influence of other major employment centres outside the CBD, such as Chatswood in the north and Parramatta to the west. The impact of rail lines in improving access to jobs is also more distinct in Sydney than in other capitals – Figure 21.

Figure 21: Percentage of Sydney jobs that can be reached in a 60-minute journey by public transport



Source: SGS Economics and Planning using Strategic Travel Model supplied by the NSW Bureau of Transport Statistics

⁴⁸ This includes waiting time and time spent getting to and from stops as well as 'in vehicle' time.

4. What are the consequences of these residential patterns?

4.1 Economic consequences

Productivity

Much recent economic research shows that bringing firms closer together increases productivity.⁴⁹ Cities and nations, businesses and individuals all stand to gain from the economic benefits of agglomeration. Deeper labour markets improve job matching and enhance skills, which results in higher levels of human capital development. Agglomeration also speeds the spread of new learning throughout the economy as knowledge spills over from firm to firm, and worker to worker.

A city that is “large but dysfunctional” however, “will not optimise its potential for agglomeration economies” because it will constrain the ability of people and firms to connect with one another in productive ways.⁵⁰

Therefore, to take full advantage of the opportunities afforded by the shift to knowledge-intensive activities in advanced economies, we need to pay attention to our cities’ “system-level connectivity” – their capacity to efficiently bring people, jobs and firms closer together. If we fail to do this we will hold back productivity growth by restricting both the development and the sharing of knowledge and skills.

As Figures 19 to 21 show, the links between firms, jobs and workers in Australia’s biggest cities are patchy and vary dramatically between different areas.⁵¹

Unsurprisingly, workers who live in the CBD of each city can access the highest proportion of jobs in the overall metropolitan area within reasonable travelling times.⁵² A worker who lives in the centre of Melbourne can access 90 per cent of jobs in the metropolitan area by car within 45 minutes, and 46 per cent of jobs within a one-hour journey on public transport. From the centre of Sydney a worker can access 53 per cent of all metropolitan jobs by either car or public transport.

In some suburbs, however, workers have access to a far smaller proportion of jobs. In parts of Sydney, only 14 per cent of jobs can be accessed by car and only 11 per cent by public transport. As our maps of access to jobs show, there are sizeable areas of our largest cities where less than 10, 20 or 30 per cent of jobs can be accessed within reasonable travelling time. At the extreme, there are suburbs in Melbourne, Brisbane and Perth where the share of jobs that can be accessed within 60 minutes by public transport falls below 1 per cent.

⁴⁹ Graham (2006); Glaeser (2011); Trubka (2011)

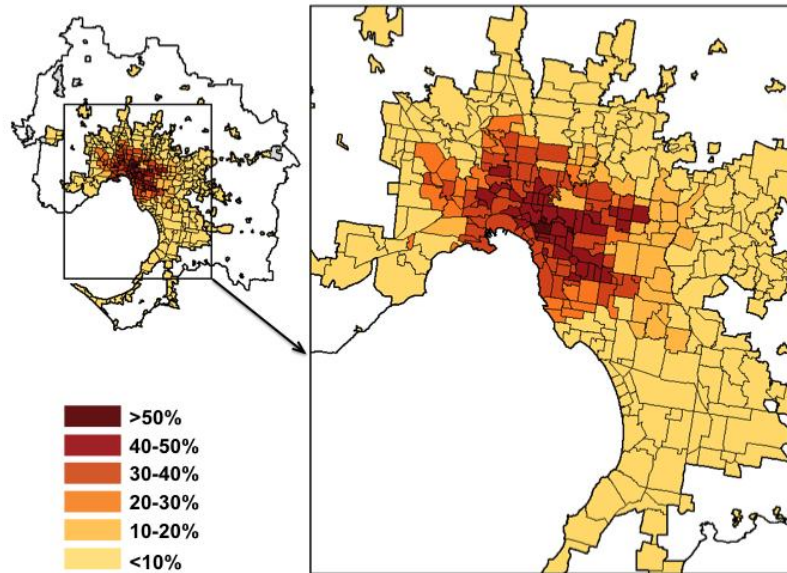
⁵⁰ SGS Economics and Planning (2012) p.19

⁵¹ See also Supplementary Maps for Sydney, Melbourne, Brisbane and Perth.

⁵² Assumed to be a 45-minute one-way car trip or a one-way 60-minute public transport trip at peak time. These durations were chosen to represent a reasonable upper limit on commuting times in an Australian context, based on current journey to work patterns.

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Figure 22: Percentage of jobs that can be reached in one hour by public transport, Melbourne, 2011



Source: SGS Economics and Planning using Strategic Travel Model supplied by the Victorian Department of Transport

While they are not the most disadvantaged areas of our cities in terms of income and education levels, outer suburbs have much poorer access to jobs than inner suburbs. On average, residents of outer suburbs also have lower incomes and qualification levels than inner urban residents. This makes outer suburban residents far more vulnerable in an economic downturn, when they would have access to a much lower proportion of available jobs than residents elsewhere in the city.

Considering labour markets from an employer’s perspective, we can ask what proportion of the city’s labour force an employer can draw on from a given location.

Again, employers in the centre of our cities can generally draw on the largest proportion of the labour force, although the proportions vary widely by city and transport mode – see Figure 23.

Figure 23: Proportion of labour force accessible to employers⁵³

	What share of jobs in the entire metro area can CBD residents reach?		What share of the entire metro labour force can CBD-based firms access?	
	By car (45 mins)	By public transport (60 mins)	By car (45 mins)	By public transport (60 mins)
Sydney	53%	53%	23%	37%
Melbourne	90%	46%	45%	34%
Brisbane	79%	61%	54%	42%
Perth	89%	74%	93%	58%

Source: SGS Economics and Planning

This is particularly important, as knowledge-intensive firms that have most to gain from improved job matching tend to locate in city centres. Expanding the labour pool accessible to knowledge-intensive firms, for both higher and lower skilled roles, would not only improve productivity, but would also make opportunities in these firms accessible to a broader proportion of the city’s workers.

⁵³ Note that direct comparison between cities is not possible because data in each case is calculated using a city-specific transport model.

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Outside the CBD, there is also wide variation in other parts of our largest cities. There are middle suburbs of Brisbane where firms can access 48 per cent of the labour force by car, but only 6 per cent by public transport. Similarly, in Melbourne there are suburbs that provide access by car to a third or almost a half of the metropolitan labour force, but less than 1 per cent by public transport. Finally, large parts of Sydney appear to have poor connectivity, with many areas providing access to less than a quarter of the metropolitan workforce by car or public transport.

Considering the perspectives of employer and employee together, our analysis shows large parts of urban labour markets that are very shallow, suggesting that human capital appreciates at a much lower rate in some parts of the city. This is a particular problem in an increasingly skilled economy.

Workforce participation

The patterns of workforce participation revealed in maps in the previous chapter show a more mixed picture than the distribution of income, qualifications and house prices, all of which are more strongly correlated with distance from the city centre. Even so, it is clear that the closer residents live to the centre of cities, the greater the number and range of jobs that are within easy reach. This access to employment is further enhanced by better public transport provision in the urban core.

Yet participation rates in many fringe suburbs with access to fewer jobs are just as high as participation rates in the inner city. This suggests that ease of access to jobs is not the major factor in determining whether or not an individual is active in the labour market.

It is difficult to isolate the specific effects of location on levels of workforce participation and the extent to which distance from jobs (or difficulty of getting to jobs due to poor transport links) reduces engagement with the labour market. It is likely, however, that problems of access will compound other barriers to workforce participation.

There may be one group who find it so difficult to access employment appropriate to their skills and availability that they withdraw from the labour market. Many studies show that one of the best ways to generate more economic growth, raise levels of household wealth and lift government revenues would be to increase female participation in the workforce. In 2012, only 67 per cent of Australian women aged 15 to 64 were in paid work, compared with 78 per cent of men. The female labour participation rate in Australia is well below comparable countries such as Canada and New Zealand.⁵⁴ It is estimated that if Australian women did as much paid work as women in Canada, Australian GDP would be \$25 billion higher.⁵⁵

The major barriers to increased female participation are financial: the interaction of income tax, withdrawal of family payments and childcare costs can make it economically unattractive for women to re-enter the workforce after having a child. These disincentives have a stronger effect on women from lower income households.

There is also a clear spatial dimension to female workforce participation, as can be seen in Figure 24. Suburbs in which

⁵⁴ Daley, *et al.* (2012) p.38. Note that these authors measure participation rates for the age range 15-64 whereas this report uses the age range 25-65.

⁵⁵ *Ibid.* p. 39

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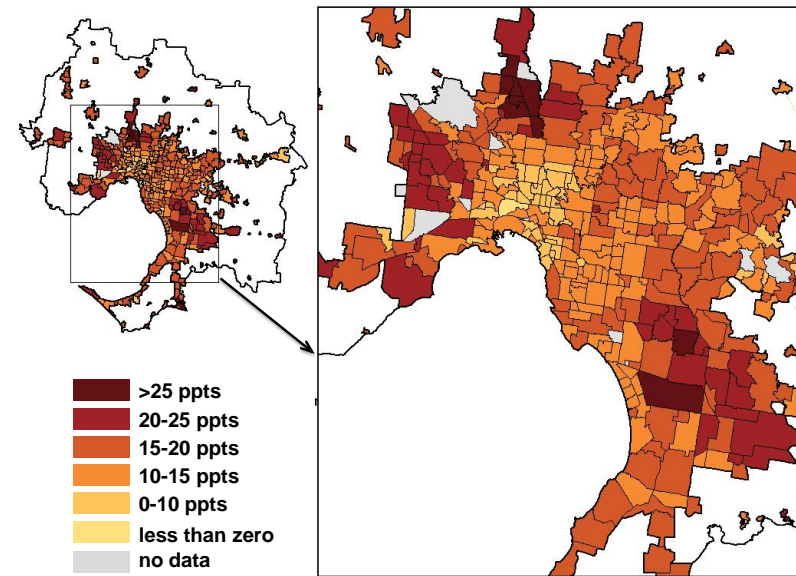
female participation falls more than 20 per cent below male workforce participation are located in outer suburbs to the west, north and southeast of Melbourne. Similar patterns are evident in Brisbane, Sydney and Perth.

Along with the factors outlined above, another factor in explaining the gap between male and female labour force participation in these suburbs could be “the spatial leash”:

*Women with children are on a tighter ‘spatial leash’ than men, especially when their children are young and they want to be accessible to them in the event of illness or other needs.*⁵⁶

Despite changes in gender relationships over the decades, women still do the majority of care work in Australian households – be that looking after children or frail older family members. These caring roles mean that women are more likely to reduce their work hours from full-time to part time or casual and to be constrained in how far (or more correctly how long) they can travel to a job.⁵⁷

Figure 24: Differences in male and female workforce participation by suburb, Melbourne 2011



⁵⁶ Pocock, *et al.* (2012) p. 90

⁵⁷ *Ibid.* p. 76

4.2 Consequences beyond the economy

The increasing polarisation of Australian cities – by income, house price and qualification level – may also have serious consequences beyond the economy. The growth in importance of major city centres as generators of knowledge-intensive employment and economic output seems to have polarising tendencies that could disproportionately affect lower-income households. Notably, it is much harder to access opportunities from some parts of our cities, there are concerns about the impact of increasing concentrations of disadvantage, and concerns about the implications of polarisation for broader social cohesion.

Harder to access opportunities

While it is hard to isolate the effect of distance on labour market participation, residents of outer suburbs often face larger hurdles to access opportunities. Inner urban areas generally offer more public transport options than outer suburbs. Most suburbs in outer Melbourne do not have direct access to the city's rail or tram networks, leaving buses as the main mode of public transport albeit an inadequate one. In outer Melbourne average bus headways – the time gap between services – are almost double bus headways in inner and middle suburbs.⁵⁸

This helps to explain why 57 per cent of the one million adult residents in the inner zone of Melbourne's public transport system (Zone 1) use public transport compared to just 29 per cent of the

2.1 million adult residents of the outer zone (Zone 2).⁵⁹ In inner Sydney 40 per cent of all trips are made by car, compared to 81 per cent in outer southwestern Sydney.⁶⁰ In Brisbane only 7 per cent of travel in outer suburbs is by public transport compared with 10 per cent in middle suburbs and 16 per cent in inner suburbs.⁶¹

The combination of residential patterns, distance to work and other activities, and the highly variable access to public transport systems in Australian cities, produces very different levels of car ownership in different suburbs. The further from the centre of the city, the more cars people own.⁶² This has important implications for household budgets, since transport is the third largest category of expenditure, after housing and food. Cars represent by far the largest component of travel costs.⁶³ Where public transport use is lower, the proportion of household budgets devoted to travel costs rises.⁶⁴

If outer-suburban residents have to own more cars due to lack of other options, this imposes additional costs of up to thousands of dollars a year.⁶⁵ These households are particularly vulnerable to increases in petrol prices.⁶⁶

⁵⁸ Loader and Stanley (2009)

⁵⁹ ABS (2011b) Public transport users are defined as those residents over 18 who reported using public transport in the previous month.

⁶⁰ Bureau of Transport Statistics (2011)

⁶¹ Tiebei, *et al.* (2013)

⁶² Currie and Senbergs (2007)

⁶³ ABS (2011a)

⁶⁴ Litman (2013)

⁶⁵ Dodson and Sipe (2007)

⁶⁶ As measured by the VAMPIRE index (Vulnerability Assessment for Mortgage, Petrol and Inflation Risks and Expenditure" – see Dodson and Sipe (2008) p. 48

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...because they rely on cheap petrol to access employment and services. This impact is compounded by the lack of alternative modes, such as public transport, walking and cycling, and by the wide dispersion of employment and services that necessitates long, often circumferential, journeys.⁶⁷

While car ownership is widespread in Australia, there are groups of the population who do not drive, including many young adults, older people and people with disabilities. If mobility is based primarily on private cars, these people risk being excluded from everyday activities that are essential to well being.⁶⁸

Disadvantaged areas may increase in number

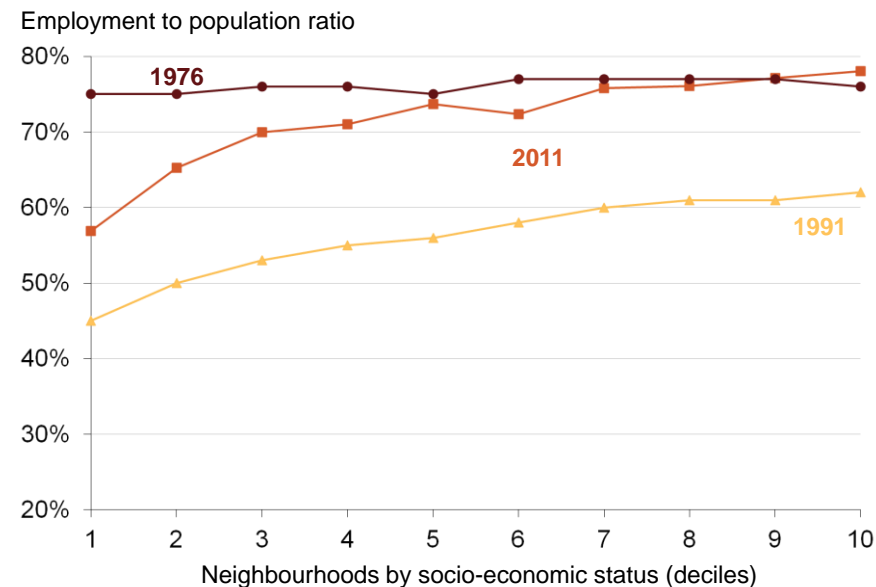
In 1995, economists Bob Gregory and Boyd Hunter showed that the spatial distribution of employment (expressed as a ratio of employment to population) changed dramatically between 1976 and 1991. In 1976 there was little difference in levels of employment between different neighbourhoods. While some suburbs were richer than others, this was not driven by differences in the proportions of the population who were in jobs.⁶⁹

By 1991, the picture was very different. As Figure 25 shows, by 1991 there was a significant fall in male employment, linked to the impact of the early 1990s recession. But the fall was not equally distributed across neighbourhoods. Instead of a flat line showing similar ratios of employment to population across

neighbourhoods, the data now reveals a clear gradient linked to socio-economic status.

Using the same approach to analyse data from 2011 reveals that while employment rates have gone back up since 1991, the same gradient has, if anything, become more pronounced.

Figure 25: Male workforce participation by neighbourhood socio-economic status 1976-2011



Note: Gregory and Hunter use data at the CD (collection district level) for major urban areas (population > than 100,000). Grattan used data at the State Suburb (SSC) level for 6 cities (Syd, Mel, Bris, Adel, Per, Can) Source: Gregory and Hunter (1995) Grattan Institute using ABS data

⁶⁷ Dodson and Sipe (2007)

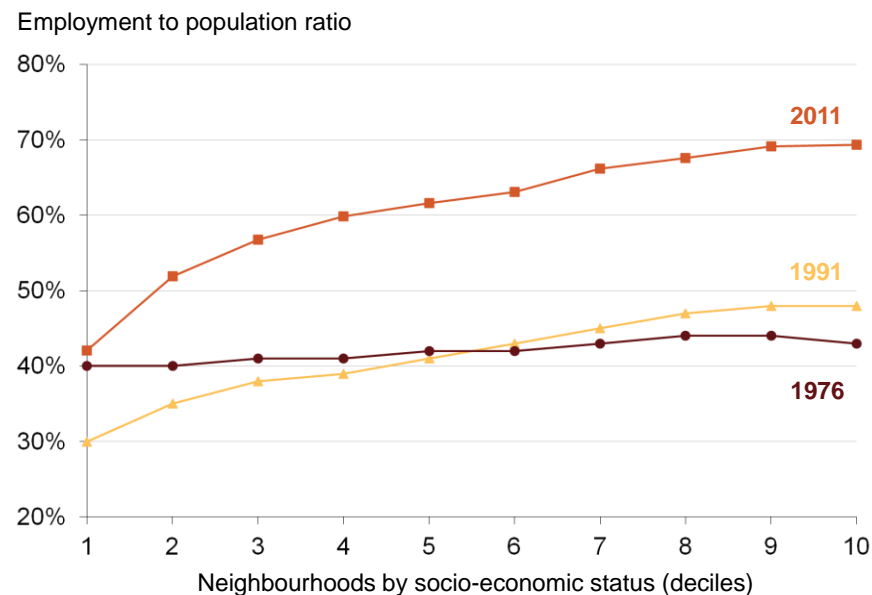
⁶⁸ Loader and Stanley (2009)

⁶⁹ Gregory and Hunter (1995)

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A similar pattern is evident for women (Figure 26). While the ratio of employment to population has risen overall, the gap between suburbs of different socio-economic status is large and shows a distinct gradient that has become steeper between 1991 and 2011.

Figure 26: Female workforce participation by neighbourhood socio-economic status 1976-2011



Note: Gregory and Hunter use data at the CD (collection district level) for major urban areas (population > than 100,000). Grattan used data at the State Suburb (SSC) level for 6 cities (Syd, Mel, Bris, Adel, Per, Can) Source: Gregory and Hunter (1995) Grattan Institute using ABS data

There is also evidence that suburbs are becoming increasingly homogeneous in terms of the price of houses within them.

In 1976, about a sixth of Melbourne’s suburbs could be described as “mixed price” – that is, having a relatively even number of sales across four price brackets (quartiles), from cheapest to most expensive⁷⁰. By 2009, however, only one in 50 of Melbourne’s suburbs were mixed price.⁷¹

There was a similar decline in the number of “mid-priced” suburbs – suburbs where a majority of house sales were in the two middle price quartiles. In 1976 about a third of Melbourne suburbs were mid-priced. By 2009 the proportion was closer to a fifth.⁷²

The result is that suburbs now fall into two price categories: “higher cost suburbs in the inner and middle suburbs and lower-cost suburbs on the urban fringe”.⁷³

Over time, the increasing homogenisation of neighbourhoods will tend to increase the number of disadvantaged areas in cities and also increase the concentration of wealth in particular suburbs. This type of polarisation can have social consequences that are often described as ‘area effects’ or ‘neighbourhood effects’. In other words, the immediate social, economic and cultural environment can influence the course of local residents lives, in part through shaping their outlook and attitudes. For example, a young person growing up in an area of entrenched unemployment

⁷⁰ Taylor and Watling (2011)

⁷¹ Ibid.

⁷² Ibid.

⁷³ Ibid.

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may come to regard living on government benefits and not working as normal.

The identification of area effects and the extent of their influence is a lively topic of debate amongst academics across a range of disciplines, but empirical research suggests they can have impacts in a range of areas, including:

- **Health:** there is research on area effects associated with specific diseases as well as more general health outcomes, including life expectancy.⁷⁴
- **Crime:** There is evidence that area effects result in higher crime rates, youth violence, fear of crime and drug use.⁷⁵
- **Education:** There is evidence that socio-economic segregation in schooling leads to worse educational outcomes for children from low socio-economic backgrounds and that the gap tends to grow with years of schooling. In mixed schools, however, students from low socio-economic backgrounds perform much better.⁷⁶

Will this polarisation dynamic continue?

As cities grow larger and more congested and commuting distances lengthen, higher-skilled, higher income households generally seek to live in more central locations. This “geographical sorting” increases the concentration of human capital in inner

urban areas, and house prices have increased more rapidly in these areas than in the city as a whole. High-skilled, high-income people can afford these higher housing costs. Lower income people however, risk getting locked out of these locations and potentially out of the housing market altogether.

The situation is exacerbated when housing supply is constrained by conservative regulatory practices, such as restrictive zoning.⁷⁷

Recent US research has found that housing supply is often rigid in cities with highly productive knowledge-intensive economies (such as San Francisco and Boston). This is due to the influence that affluent residents exert on local zoning and planning regulations, or in mounting effective (and expensive) appeals against specific development projects in their neighbourhoods. This is also evident in Australian cities.⁷⁸

If policy settings remain unchanged, our cities will continue to polarise, as residents are increasingly sorted into different suburbs based on income and qualification levels.

⁷⁴ Diez (2001)

⁷⁵ See for example, MacDonald, *et al.* (2009)

⁷⁶ NSW Department of Education and Communities (2011)

⁷⁷ Also see Ganong and Shoag (2012), Daimond (2012)

⁷⁸ Cook, *et al.* (2012) p.87

5. What could make a difference?

Government approaches to lifting productivity and increasing participation have mostly focussed on regulatory reform, workplace relations, changes to the tax system, and improving health, education and training. On the whole, these policies have not had a spatial dimension. Except for some discussion of the impact of urban traffic congestion on commuting times and freight movements, little consideration has been given to the relationship between productivity, participation and the structure of Australian cities.

To best take advantage of the benefits of agglomeration, CBDs will need access to deep labour pools. But residential patterns and transport systems mean that CBD employers have access to only a small proportion of workers in metropolitan areas (albeit that their best access is to more highly qualified residents). Workers, particularly in outer areas, only have access to a small proportion of jobs across the city. This is a particular risk in a downturn.

Increasing these proportions would involve bringing jobs closer to people, bringing people to live closer to jobs, and/or improving the transport links between them (which effectively brings people closer to jobs in terms of time). We will take each of these approaches in turn below.

If current settings remain unchanged, Australian cities are likely to continue to spread outwards, further separating places of residence and places of employment. This will discourage the growth of deep labour markets, and the productivity benefits they

bring, by diluting both workers' access to jobs and employers' access to workers.

5.1 Bringing jobs closer to people

Outer suburbs have a range of locational advantages, including cheaper rents, more available land and lower levels of traffic congestion. These factors are important considerations for many firms, particularly those in logistics, transport and manufacturing. For example, in selecting a site for a large warehouse, cheap land and proximity to a freeway entrance are likely to be more important than access to a large number of highly skilled workers.

Businesses will locate in outer suburban areas if the advantages outweigh the disadvantages for their industry, and so Government support is not generally needed in such cases. There is no public benefit in offering subsidies or other incentives to encourage firms to make decisions they would have made anyway.

As well as jobs in these industries, 'population-serving' jobs such as dentists, teachers, and hairdressers, will continue to be needed wherever people live.

In addition to the kind of natural employment growth described above, however, there are frequent calls for governments to intervene to create new jobs in outer suburban areas.⁷⁹ Recent

⁷⁹ For example, the National Growth Areas Alliance has sought Commonwealth support for 20 000 new jobs in two years. Noronha (2013).

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efforts to respond have often focused on creating knowledge-intensive jobs.⁸⁰

Yet the evidence that such policies create significant numbers of long-term jobs, or are cost effective, is weak. Unfortunately, there are few rigorous evaluations of past Australian efforts. Where they have occurred, performance is often found to fall short of targets.⁸¹ There is international evidence that localised job attraction schemes do not deliver clear economic benefits.⁸² Similarly, it is widely accepted that policies establishing new industry clusters from scratch are unlikely to succeed.⁸³

There is a further – and significant – complication for job creation policies targeted at outer suburbs. There is no reason to assume new jobs created in these areas will be filled by local workers. This is particularly the case for new jobs that require high skilled workers, as there are fewer such workers living in outer suburbs.

In addition, because relocation could reduce agglomeration benefits flowing from the co-location of knowledge-intensive jobs, policies to shift such jobs to outer suburbs could harm our cities' productivity and employment growth overall.

⁸⁰ Examples include the Commonwealth's \$45 million Suburban Jobs Program, which provided \$13.5 million to support a new knowledge intensive jobs precinct in western Sydney (2012); the \$30 million South Australian Innovation and Investment Fund (2008), following Mitsubishi's Tonsley Park plant closure; the \$30 million Illawarra Region Innovation and Investment Fund and the proposed East Werribee employment precinct in Melbourne's west.

⁸¹ Daley and Lancy (2011) p 24 and Productivity Commission (2012) p 86-7.

⁸² See for example Bartik (2012), Peters and Fischer (2002), Lynch (1996) and Wren (1994)

⁸³ See for example Muro and Katz (2010), Martin and Sunley (2003), Porter Porter (2000)

Governments have also been called on to relocate government offices and establish higher education facilities in outer suburbs to boost local jobs. In some instances, there may be a sound business case for doing so, particularly if large amounts of land are required. But when there is not a strong business case, decentralisation is harder to justify.

The economic benefits of decentralising higher education are not clear. Australia's existing regional university network is costly, requiring regional loadings to compensate for the higher costs of teaching and reduced economies of scale.

The benefits of government office relocations are also unclear. In particular, relocations may have a relatively small impact on the proportion of workers in outer suburbs who are employed locally. First, existing workers are often encouraged to relocate along with their office to ensure business continuity.⁸⁴ Second, as noted above, there is no guarantee that local workers will fill any new vacancies, particularly if new jobs are highly skilled and/or specialised.

While government intervention to shift high skilled jobs to the outer suburbs will also increase the number of local service sector jobs that are available, the effect on the economy as a whole is less clear. The multiplier effect works in both directions – new jobs

⁸⁴ Governments have offered large incentives to existing workers to relocate. For example, incentives associated with the relocation of the Victorian Transport Accident Commission to Geelong included a 'loyalty bonus' of \$15 000, housing assistance of over \$20 000, a one-off 10% salary bonus and reimbursement of some school and childcare costs. Ward (2007) p 13.

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created in one area must be weighed up against the resultant loss of similar jobs elsewhere.⁸⁵

Clearly, governments have a critical role in facilitating economic activity in outer suburbs. Decisions on infrastructure investment, transport links and workforce skills, for example, will affect jobs in these suburbs just as they do across cities. Furthermore, governments should ensure that barriers to creating new jobs are minimised where possible. However, specific attempts to “move jobs” to outer suburbs are likely to be unsuccessful and/or very expensive.

5.2 Enabling people to live closer to jobs

As discussed in section 3.2 above, there are steep house price gradients in all of Australia’s four largest cities. This leads to a process of ‘neighbourhood sorting’, in which wealthier households predominate in inner urban locations with better access to public transport and jobs.

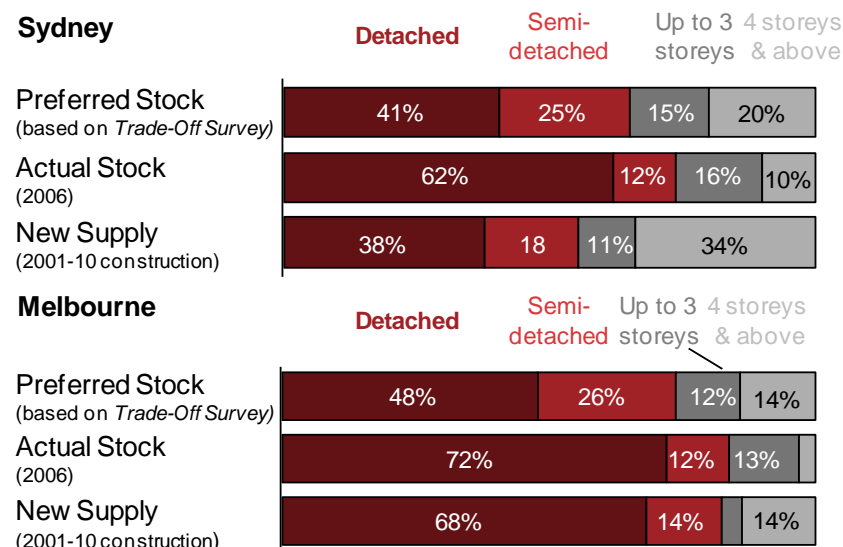
High prices in inner and middle suburbs ensure that many households cannot move closer to the centre of the city even if they want to.

A range of difficulties exacerbates the situation. Relative to what people want, not enough housing is being built in established areas; not enough diversity of housing type is being built; and resistance to change in existing suburbs, combined with restrictive planning practices, is combining to deny workers access to the best housing opportunities (see below).

⁸⁵ Banks (2002) p 8-9.

Previous Grattan Institute research for the report *The housing we’d choose* uncovered a mismatch in Sydney and Melbourne between people’s housing preferences, the housing stock, and the housing being built (Figure 27).⁸⁶ The shortage (relative to what people want) consists of non-detached housing in inner and middle suburbs.

Figure 27 – Comparison of preferences, stock and supply



We also demonstrated that developers and builders face strong disincentives to address such shortages (which helps to explain why they exist in the first place). Changing the incentives builders and developers face to provide much more of this housing would

⁸⁶ Kelly, et al. (2011)

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not only be good for the functioning of urban labour markets, it would also give people more of the housing they already say that they want.

The Grattan Institute report *Getting the housing we want* identified ways of breaking the deadlock by taking the interests of both residents and developers into account.⁸⁷ These solutions include setting up opt-in Neighbourhood Development Corporations, establishing a small-scale Redevelopment Housing Code, and enabling a step change in the level of innovation in medium-density construction.

Change in this field is difficult, yet genuinely engaging residents in the decisions about their neighbourhoods is critical to success as documented in the Grattan report *Cities: who decides?*⁸⁸ Also, increasing the diversity and quantity of dwellings in existing neighbourhoods need not equate to building high-rise towers as some residents fear. High-quality developments that increase the range of housing options on offer might include terraces, townhouses or two-storey apartment buildings.

Finally, broader planning settings must not be an impediment to the further development of inner and middle areas of our major cities. In particular, conservative zoning would lock down established areas, to the detriment of future (and current) residents, as well as the economy.⁸⁹

⁸⁷ Kelly, *et al.* (2011)

⁸⁸ Kelly (2010)

⁸⁹ Kelly, *et al.* (2012) p. 41-45

5.3 Improving transport links between people and jobs

Transport connectivity is important in supporting both high-productivity agglomerations and labour market participation more generally:

*Transport improvements can expand labour market catchments, improve job matching, and facilitate business to business interactions. Transport's contributions to such effects is most significant within large, high-productivity urban areas [of the UK]... [Transport also improves] the functioning of labour markets, increasing labour market flexibility and the accessibility of jobs. Transport can facilitate geographic and employment mobility in response to shifting economic activity e.g. in response to the forces of globalisation, new technological opportunities, and rising part-time and female participation in the labour market.*⁹⁰

For several decades after World War Two, cars provided a huge boost to mobility, and at the same time helped to underpin productivity gains.⁹¹ When petrol was cheaper and road space less congested, speed of travel compensated for distance and increased people's access to a wide range of jobs across the metropolitan area.

Cars continue to be the mainstay of the urban transport system, particularly in outer suburban areas. When houses, jobs and services are dispersed, cars enable greater distances to be covered more quickly, and provide enormous flexibility. Cars also

⁹⁰ Eddington (2007) p. 25

⁹¹ Rawnsley and Spiller (2012) p. 145

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enable the journey to work to be combined with other tasks such as shopping or collecting children from school or child care.

Yet there are emerging constraints on the capacity of cars to provide the same level of connectivity as in the past. Congestion costs are rising. The 'avoidable' cost of congestion in Australia's capital cities was estimated at \$9.4 billion in 2005, and projected to escalate to more than \$20 billion by 2020.⁹² While there is not yet evidence of a dramatic increase in individual commuting times, both morning and evening traffic peaks are getting longer.⁹³ Demand for passenger transport is expected to rise in line with population growth in coming decades, and demand for freight transport is expected to increase much faster (at average rates of 3.5 per cent a year until at least 2030).⁹⁴ Unless congestion is managed effectively, this will add significantly to business costs.

The challenge cannot be met solely by building more roads, though they will no doubt be needed. With new roads people drive more, and increased capacity is quickly absorbed.⁹⁵

Reliance on cars to reach jobs in city centres is particularly problematic, given the impossibility of channeling ever increasing numbers of vehicles through a fixed number of entry points and

⁹² BTRE (2007) Avoidable costs included private time lost, business time lost, extra vehicle operating costs and increased air pollution. More recent estimates (from the same source but using a different methodology) suggest that traffic volumes have not risen as sharply as anticipated. BITRE (2011b)

⁹³ In Melbourne for example, traffic volumes are growing fastest on freeways and arterial roads between 5am and 6.30am, which has the effect of making the peak period begin earlier and last longer. Dowling and Carey (2013)

⁹⁴ Major Cities Unit (2011) p. 63-64

⁹⁵ This is known as the 'fundamental law of road congestion' – Duranton and Turner (2011)

the need to accommodate those cars during the day. Because a parked car occupies about the same amount of space as a standard office work cubicle, driving to work "essentially doubles the amount of space that someone needs on the job".⁹⁶ This space is not available for other more productive uses.⁹⁷

In Australia's biggest cities, public transport services are also operating at full or near-full capacity during peak periods, particularly on routes into city centres.

For example, in Sydney track capacity has been reached on several rail lines during morning and evening peaks, and there is significant crowding on most peak services. A shortage of station capacity in the central city contributes to the bottleneck in the CBD.⁹⁸ Congestion slows down many bus services, leading to longer and less predictable travel times, especially along major routes into the city such as Parramatta Road and the Harbour Bridge.⁹⁹

Brisbane's inner city rail network is expected to reach capacity in 2016. Detailed analysis shows that four new tracks in two new corridors will be needed to handle passenger growth in the decade after that.¹⁰⁰ Meanwhile, Melbourne's major tram routes and a number of peak-hour bus services are regularly overcrowded, affecting the reliability and speed of services, and preventing some commuters from boarding vehicles.¹⁰¹ The

⁹⁶ Glaeser (2011) p. 178

⁹⁷ McCahill and Garrick (2012)

⁹⁸ Transport for NSW (2012) p. 93

⁹⁹ *Ibid.* p. 97

¹⁰⁰ Chandra, et al. (2008) p. vi

¹⁰¹ Eddington (2008) p. 85

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number of Melbourne trains reporting ‘load breaches’ (when passenger numbers are at or above capacity) has risen steadily since 2005.¹⁰²

Connectivity is crucial to efficient labour market functioning and will increase in importance as the economy becomes more knowledge intensive. Yet we rarely evaluate our transport system on the basis of the proportion of jobs, or type of jobs, it enables people to reach from different locations. Rather than accessibility and connectivity, the focus is generally on mobility, and in particular, speed (reduced travel times).¹⁰³

Yet as the maps in this report show, many outer suburban locations in Australia’s four biggest cities provide access to less than 20 per cent of available metropolitan jobs within a 45-minute car journey. If the trip is made by public transport, access is far more limited.

It is not possible to identify an optimal percentage of jobs that should be accessible to create efficient labour markets. Yet given the direction of the economy, improving connectivity – across cities as well as to the centre – will be essential to productivity growth.

Improving the capacity of the urban transport system to connect people and jobs will require different solutions in different places. Yet some general recommendations can be made.

Firstly, in order to address traffic congestion, it is not enough to rely solely on building new roads without also paying attention to managing the demand for road space. A more efficient use of road space could be achieved by introducing a pricing system such as road user charges, congestion charges or time-of-day tolling, as the Henry Review into Australia’s Future Tax System recommended.¹⁰⁴

By making the collective costs of driving more apparent at the time of travel, road pricing would also encourage us to think differently about cars. The spread of the internet and wireless technology – particularly smart phones – has already enabled the development of car-share schemes, real-time ride pooling and peer-to-peer car rentals. This is challenging the established view of the car as something owned and mostly driven by just one person, which sits idle when that driver is not behind the wheel.¹⁰⁵

A system of road user charging would also go some way towards raising the revenue needed to increase the capacity of public transport, extend its reach and improve its efficiency and connectivity throughout our cities. While expansions of the heavy rail network require very large up front investments and take a long time to be completed, buses can be deployed more quickly at lower cost. Yet a bus will only travel as fast as the traffic around it, unless it is allocated separate road space through priority lanes and priority signaling. The financial implications of allocating buses greater priority on city roads are minimal – although, as with road user charging, such measures will require governments to spend political capital.

¹⁰² Ibid. p. 77

¹⁰³ Tomer, et al. (2011)

¹⁰⁴ Treasury (2010)

¹⁰⁵ Dovey-Fishman (2012)

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In the United States, the cities that offer residents the best public transport coverage and provide the best links between people and jobs are not just cities with well developed, rail-based transit systems like New York and Washington. Other cities, like Las Vegas and Salt Lake City also score well in this regard, while relying much more heavily on buses to carry the majority of passengers.¹⁰⁶

This supports the argument that in terms of providing extensive coverage and good links between people and jobs, the organisation, operation and networking of public transport systems is just as important as the type of transport.¹⁰⁷

¹⁰⁶ Tomer, *et al.* (2011)

¹⁰⁷ Mees (2010)

6. Conclusion

This report describes the forces that are shaping advanced economies such as Australia's. It documents the challenges, threats and opportunities to which they give rise.

Australia's prosperity in a competitive world increasingly depends on knowledge and skill. The firms that will drive growth and trade are firms that engage in high levels of knowledge-intensive activity. The productivity of these firms rises when they are close to one another, and have access to deep labour markets.

This has huge implications for Australia's cities. High-value, high-knowledge, export-oriented businesses will tend to locate together in areas that are well connected by the transport system and the housing market to an appropriately skilled workforce.

Attempts to create high-knowledge jobs in the outer suburbs by enticing these firms to re-locate there are likely to fail. Instead, policy-makers must ensure that transport and housing markets improve access to the deep labour pools these firms need.

In most cities, nowhere near enough housing is being built where it is needed and where people want it. As a result, more people will struggle to live close to the richest job opportunities. Employers will have a shallower labour pool on which to draw.

While knowledge-intensive activities may be more concentrated in particular industries and in particular areas, they are not confined to one sector or to one part of the city. Knowledge and skills are of growing importance throughout the economy and the city.

This means that deep labour markets and connections between firms matter everywhere. With better job matching comes further skills acquisition, increasing the human capital of firms and workers. Well-connected firms, jobs and people speed the transfer of knowledge and skills. Yet in significant parts of Australia's four biggest cities, shallow labour markets and increasingly congested transport systems are holding back productivity by making it harder to get the best match between the skills of a worker and the demands of a job.

Because of our comparatively high education levels, and because the vast majority of Australia's population lives in cities, we are well-placed to reap the benefits of the increasingly knowledge-intensive, global economy. This report shows, however, that the nation will only take full advantage of these benefits if our cities do a much better job of connecting people, jobs and firms.

Increasing polarisation brings challenges beyond the economy. The increasing homogenisation of suburbs risks creating more concentrated areas of both disadvantage and wealth, which could weaken social cohesion.

This report outlines measures that would make our cities more productive while making opportunities more accessible to more residents. A changing economy requires us to think differently about productivity growth, and we have a lot more to learn. This report aims to be a starting point on that journey.

Box 5: Summary of recommendations – better connecting people, jobs and firms:

1. Increase the supply and diversity of housing in existing suburbs, by:

- addressing the disincentives developers face in building in established areas
- ensuring that established suburbs are not “locked down” by restrictive zoning and planning rules.
- engaging residents in decisions affecting their neighbourhoods

2. Increase the capacity of city transport systems, by:

- facing up to the challenges of road use charging
- using the revenue from road pricing to expand public transport, particularly buses.

These are not either/or options – both need to happen to keep Australia prosperous, and to ensure that Australia’s cities distribute opportunities to all their residents.

7. Appendix 1: Questions for further research

We still have much to learn about the spatial implications of who lives where in Australia's largest cities, both in relation to the economy and to access to opportunity. Below are some initial suggested questions for further research.

- How should knowledge-intensive activity be measured? Traditional measurements of economic activity focus on the contribution of industry sectors. However, it is becoming clearer that the type of activity *within* sectors is more relevant to understanding how value is produced.
- Where is agglomeration occurring and where are new firms being created in our cities, and why?
- What increases in GDP might be achieved from increasing agglomeration benefits by better connecting people and jobs?
- Which types of jobs are the most and least accessible, and to whom? Who is most cut off from opportunities? Which employers face the biggest difficulties in accessing deep labour pools?
- How large are the returns to improved job matching for firms and individuals? What kinds of jobs benefit most from improving job matching?
- How can jobs growth in suburban areas be encouraged? Suburban areas are advantageous locations for many firms, and 'population-serving' jobs are needed wherever people live. How can barriers to such jobs growth be minimised?
- How can transport systems in each city be improved to better connect people and jobs?
- What affect do negative gearing, stamp duty, and other tax policies affecting the housing market have on who lives where? For example, if stamp duty were replaced with a land tax, would this reduce the residential polarisation we see in our cities? What other effects would there be?
- What is the cost-effectiveness of improving the functioning of our cities compared with other policies designed to improve productivity, for example, further growth in post-school education?

8. References

- Abel, J. R. and Deitz, R. (2012) *Agglomeration and Job Matching among College Graduates*, Federal Reserve Bank of New York
- ABS (2011a) *Household expenditure survey 2009-10*, Canberra, from <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6530.02009-10?OpenDocument>
- ABS (2011b) *Household Water and Energy Use, Victoria*, Canberra, from <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4602.2Chapter500October%202011>
- Acs, Z., Morck, R. and Yeung, B. (1999) 'Productivity Growth and Firm Size Distribution', in *Entrepreneurship, Small and Medium-Sized Enterprises and the Macroeconomy*, Z. Acs, B. Carlsson and C. Karlsson, Eds., Cambridge University Press, p 367-396
- Bahar, D., Hidalgo, C. A. and Hausmann, R. (2012) *International Knowledge Diffusion and the Comparative Advantage of Nations*, Working paper, John F. Kennedy School of Government, Harvard University, accessed 26 April 2013, from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2087607
- Banks, G. (2002) *Inter-state bidding wars: calling a truce* Productivity Commission
- Bartik, T. J. (2012) 'The Future of State and Local Economic Development Policy: What Research is Needed?', *Growth and Change* 43(4), p 545-562
- Becker, G. and Murphy, K. (1992) 'The Division of Labor, Coordination Costs, and Knowledge', *The Quarterly Journal of Economics*, vol. 107(4),
- BITRE (2009) *Household wealth*, Canberra
- BITRE (2010) *Population growth, jobs growth and commuting flows in Perth*, Bureau of Infrastructure, Transport and Regional Economics
- BITRE (2011a) *Population growth, jobs growth and commuting flows in Melbourne*, Research Report 125, Bureau of Infrastructure, Transport and Regional Economics
- BITRE (2011b) *Road vehicle- kilometres travelled: estimation from state and territory fuel sales*, Bureau of Infrastructure, Transport and Regional Economics
- BITRE (2012) *Population growth, jobs growth and commuting flows in Sydney*, Bureau of Infrastructure, Transport and Regional Economics
- BTRE (2007) *Estimating urban traffic and congestion cost trends for Australian cities*, Bureau of Transport and Regional Economics
- Bureau of Transport Statistics (2011) *2010/11 Household Travel Survey (HTS)* Sydney, from <http://www.bts.nsw.gov.au/Statistics/HTS/default.aspx#top>
- Chandra, L., Bachels, M., Nugent, M. and Martin, J. Queensland Government (2008) *Inner City Rail Capacity Study*, Pre-Feasibility Report, Queensland Transport, accessed 26 April 2013, from http://www.tmr.qld.gov.au/~media/Projects/C/CRRail/Pdf_inner_city_rail_capacity_study_pre_feasibility_report.pdf
- Cook, N., Taylor, E., Hurley, J. and Colic-Peisker, V. (2012) *Resident third party objections and appeals against planning applications: implications for higher density and social housing*, AHURI (Australian Housing and Urban Research Institute)
- Currie, G. and Senbergs, Z. (2007) 'Exploring forced car ownership in metropolitan Melbourne', Australian Transport Research Forum, Melbourne, from
- Daimond, R. (2012) *The Determinants and Welfare Implications of US Workers' Diverging Location Choices by Skill: 1980-2000*, Harvard University
- Daley, J. and Lancy, A. (2011) *Investing in Regions: Making a difference*, Grattan Institute
- Daley, J., McGannon, C. and Ginnivan, L. (2012) *Game-changers: Economic reform priorities for Australia*, Grattan Institute
- Davies, A. (2011) 'Suburban Employment Trends: A Melbourne Case Study', *M/C Journal*, 14(4),
- Delgado, M., Porter, M. E. and Stern, S. (2012) *Clusters, Convergence, and Economic Performance*, NBER Working Paper No. 18250, The National Bureau of Economic Research, accessed 26 April 2013, from <http://www.nber.org/papers/w18250>
- Department of Industry, I., Science, Research and Tertiary Education, (2012) *Australian Innovation System Report* Department of

Productive cities

- Industry, Innovation, Science, Research and Tertiary Education, accessed 26 April 2013, from <http://www.innovation.gov.au/Innovation/Policy/AustralianInnovationSystemReport/AISR2012/index.html>
- Diez, R. (2001) 'Investigating Neighborhood and Area Effects on Health', *American Journal of Public Health*, 91 (11), p 1783-1789
- Dodson, J. and Sipe, N. (2007) 'Oil Vulnerability in the Australian City: Assessing Socioeconomic Risks from Higher Urban Fuel Prices', *Urban Studies*, 44(1), p 37-62
- Dodson, J. and Sipe, N. (2008) *Shocking the suburbs: oil vulnerability in the Australian city*, UNSW Press
- Dovey-Fishman, T. (2012) *Digital-Age Transportation: The Future of Urban Mobility*, Deloitte University Press, accessed 2 May 2013, from <http://dupress.com/articles/digital-age-transportation/>
- Dowling, J. and Carey, A. (2013) 'City roads crowded with solo drivers', *The Age*, 15 April, accessed 19 April 2013, from <http://theage.drive.com.au/roads-and-traffic/city-roads-crowded-with-solo-drivers-20130414-2https.html>
- Duranton, G. and Puga, D. (2004) 'Micro-Foundations of Urban Agglomeration Economies', in *Handbook of Regional and Urban Economics, Volume 4*, J. V. Henderson and J. F. Thisse, Eds., Elsevier B. V., p Chapter 48
- Duranton, G. and Turner, M. A. (2011) 'The Fundamental Law of Road Congestion: Evidence from US Cities', *American Economic Review* 101(6), p 38
- Eddington, R. UK Department for Transport (2007) *Towards a Sustainable Transport System*,
- Eddington, R. Government of Victoria (2008) *Investing in transport: East West Link Needs Assessment*, accessed 26 April 2013, from <http://www.transport.vic.gov.au/research/research-and-policy-development-publications/investing-in-transport-report>
- Ganong, P. and Shoag, D. (2012) *Why Has Regional Convergence in the U.S. Stopped?*, Faculty Research Working Paper RWP12-028, Harvard Kennedy School
- Glaeser, E. (2011) *Triumph of the city*, The Penguin Press
- Graham, D. J. (2006) *Investigating the link between productivity and agglomeration for UK industries.*, Commissioned by UK Department for Transport, Imperial College London, accessed 1 August 2012, from http://www.transportworks.org/sites/default/files/assets/evidence_base_documents/Investigating%20the%20link%20between%20productivity%20and%20agglomeration.pdf
- Greenville, J., Pobke, C. and Rogers, N. (2013) *Trends in the Distribution of Income in Australia*, Productivity Commission
- Gregory, R. G. and Hunter, B. (1995) *The Macro Economy and the Growth of Ghettos and Urban Poverty in Australia*, Centre for Economic Policy Research, Australian National University
- Hensher, D. A., Truong, T. P., Mulley, C. and Ellison, R. (2012) *Assessing the wider economy impacts of transport infrastructure investment with an illustrative application to the north-west rail link project in Sydney, Australia*, Institute of Transport and Logistics Studies, The Australian Key Centre in Transport and Logistics Management, The University of Sydney
- Jorgenson, D. W. and Timmer, M. P. (2011) 'Structural Change in Advanced Nations: A New Set of Stylised Facts', *The Scandinavian Journal of Economics*, 113(1), p 1-29
- Kelly, J.-F. (2010) *Cities: Who Decides?*, Grattan Institute from <http://grattan.edu.au/publications/reports/post/cities-who-decides/>
- Kelly, J.-F., Breadon, P., Mares, P., Ginnivan, L., Jackson, P., Gregson, J. and Viney, B. (2012) *Tomorrow's Suburbs: Building flexible neighbourhoods*, Grattan Institute from <http://grattan.edu.au/publications/reports/post/tomorrow-s-suburbs-building-flexible-neighbourhoods/>
- Kelly, J.-F., Breadon, P. and Reichl, J. (2011) *Getting the housing we want*, Grattan Institute from <http://grattan.edu.au/publications/reports/post/getting-the-housing-we-want/>
- Kelly, J.-F., Weidmann, B. and Walsh, M. (2011) *The Housing We'd Choose*, Grattan Institute from <http://grattan.edu.au/publications/reports/post/the-housing-we-d-choose/>
- Kennedy, J. F. (1962) 'Special Message to the Congress Transmitting Reorganization Plan 1 of 1962', 30 January, accessed 19 April 2013, from <http://www.presidency.ucsb.edu/ws/?pid=8699>

Productive cities

- Kulish, M., Richards, Anthony and Gillitzer, C. (2011) *Urban Structure and Housing Prices: Some Evidence from Australian Cities*, Reserve Bank of Australia
- Litman, T. (2013) *Transportation Affordability: Evaluation and Improvement Strategies*, Victoria Transport Policy Institute,
- Loader, C. and Stanley, J. (2009) 'Growing bus patronage and addressing transport disadvantage— The Melbourne experience', *Transport Policy*, 16, p 106-114
- Lucas, R. E. (1988) 'On the Mechanics of Economic Development ', *Journal of Monetary Economics* 22(1), p 3–42
- Lucas, R. E. (1990) 'Why Doesn't Capital Flow from Rich to Poor Countries?', *American Economic Review*, 80(2), p 92–96
- Lucas, R. E. (2009) 'Ideas and Growth ', *Economica*, 76(301), p 1-19
- Lynch, R. (1996) *Do State and Local Tax Incentives Work?*, Economic Policy Institute
- MacDonald, J., Bluthenthal, Ricky N., Golinelli, D., Kofner, A., Stokes, R. J., Sehgal, A., Faint, T. and Beletsky, L. (2009) *Neighborhood Effects on Crime and Youth Violence: The Role of Business Improvement Districts in Los Angeles*
- Rand Corporation from http://www.rand.org/pubs/technical_reports/TR622
- Major Cities Unit (2011) *State of Australian Cities 2011*, Department of Infrastructure and Transport
- Marshall, A. (1890) *Principles of Economics*, Macmillan and Co Ltd
- Martin, R. and Sunley, P. (2003) 'Deconstructing clusters: chaotic concept or policy panacea?', *Journal of Economic Geography* 3 (1), p 5-35
- McCahill, C. and Garrick, N. (2012) 'Automobile use and land consumption: Empirical evidence from 12 cities', *Urban Design International*, 17(3), p 221-227
- Mees, P. (2010) *Transport for Suburbia: Beyond the Automobile Age*, Earthscan
- Moretti, E. (2011) 'Local Labor Markets', in *Handbook of Labor Economics, Volume 4b*, O. Ashenfelter and D. Card, Eds., Elsevier Ltd, p 1237-1313
- Moretti, E. (2012) *The New Geography of Jobs*, Houghton Mifflin Harcourt
- Muro, M. and Katz, B. (2010) *The New 'Cluster Moment': How Regional Innovation Clusters Can Foster the Next Economy*, Brookings Institution
- Nesta (2012) *Plan 1: The Case for Innovation-led Growth*, Nesta, accessed 26 April 2013, from http://www.nesta.org.uk/areas_of_work/economic_growth/plan_1/assets/features/plan_1_report
- Noronha, J. (2013) *Addressing Skills and Employment Gaps in Outer Metropolitan Growth Areas*, National Growth Areas Alliance, Essential Economics and Geografia from http://www.ngaa.org.au/media/827/addressing_skills_and_employment_gaps_in_omgas_-_summary_brochure.pdf
- NSW Department of Education and Communities (2011) *Discussion Paper: Australian School Funding Arrangements*, Sydney,
- OECD (2012) 'OECD Innovation Strategy', accessed 26 April 2013, from <http://www.oecd.org/site/innovationstrategy/>
- Peters, A. H. and Fischer, P. S. (2002) 'The Effectiveness of State Enterprise Zones', *Employment Research* 9(4), p 1-3
- Pink, B. (2011a) *Australian Standard Geographical Classification*, Canberra,
- Pink, B. (2011b) *Australian Statistical Geography Standard (ASGS): Volume 3 - Non ABS Structures*, Canberra,
- Pocock, B., Skinner, N. and Williams, P. (2012) *Time Bomb: Work, rest and play in Australia today*, NewSouth
- Porter, M. E. (2000) 'Location, Competition, and Economic Development: Local Clusters in a Global Economy', *Economic Development Quarterly*, 14(1), p 15-34
- Productivity Commission (2012) *Trade and Assistance Review 2010-2011*, Productivity Commission
- Rawnsley, T. and Spiller, M. (2012) 'Housing and urban form: a new productivity agenda', in *Australia's Unintended Cities: The Impact of Housing on Urban Development*, R. Tomlinson, Ed. CSIRO Publishing, p 135-152
- Richards, A. (2008) 'Some Observations on the Cost of Housing in Australia', Economic and Social Outlook Conference, Melbourne, accessed 27 March 2013, from <http://www.rba.gov.au/speeches/2008/sp-so-270308.html>
- Selden, J. (1999) 'Small and Medium Enterprises: their role in the economy', *Labour Market Trends*, 107(10), p 543-550
- SGS Economics & Planning (2011) *House prices creating a 'divided city'*, Urbecon, SGS Economics and Planning

Productive cities

- SGS Economics & Planning (2012) 'Regional cooperation & development: Towards a new partnership between city and country', Australian Local Government Association National General Assembly, Canberra, from <http://www.sgsep.com.au/sgs-staff-presentations-and-papers>
- SGS Economics and Planning (2012) *Productivity and agglomeration benefits in Australian capital cities*, COAG Reform Council
- Smith, A. (1776) 'An Inquiry into the Nature and Causes of the Wealth of Nations',
- Snodgrass, D. R. and Biggs, T. (1995) *Industrialization and the Small Firm Patterns and Policies*, International Centre for Economic Growth and the Harvard Institute for International Development
- Spiller, M. (2009) 'Talent Quest: Advanced Business Services and the Geography of Innovation', PhD, RMIT University
- Taylor, E. and Watling, R. (2011) *Long Run Patterns of Housing Prices in Melbourne*, Melbourne,
- Tiebei, L., Sipe, N. and Dodson, J. (2013) 'Investigating Private Motorised Travel and Vehicle Fleet Efficiency: Using New Data and Methods to Reveal Socio-Spatial Patterns in Brisbane, Australia', *Geographical Research*,
- Tomer, A., Kneebone, E., Puentes, R. and Berube, A. (2011) *Missed Opportunity: Transit and Jobs in Metropolitan America*, Metropolitan Infrastructure Initiative Series and Metropolitan Opportunity Series, Brookings Institution
- Transport for NSW NSW Government (2012) *NSW Long Term Transport Master Plan*, Transport for NSW, accessed 26 April 2013, from <http://www.transport.nsw.gov.au/sites/default/files/b2b/publications/nsw-transport-masterplan-final.pdf>
- Treasury (2010) *Australia's future tax system*, Canberra, from http://www.taxreview.treasury.gov.au/content/Content.aspx?doc=html/pubs_reports.htm
- Treasury Australian Government (2011) *Opportunities and Challenges in an Economy in Transition*, Budget Paper No.1, Statement 4, Treasury, accessed 1 May 2013, from <http://budget.gov.au/2011-12/content/bp1/html/index.htm>
- Trubka, R. (2011) 'Agglomeration Economies in Australian Cities: Productivity benefits of increasing urban density and accessibility', PhD, Curtin University Sustainability Policy Institute (CUSP), Curtin University
- Ward, S. (2007) *The decentralization of core government services*, The Urban Development Institute of Australia
- Wilkins, R., Warren, D. and Hahn, M. (2009) *Families, Incomes and Jobs, Volume 4: A Statistical Report on Waves 1 to 6 of the HILDA Survey*, Melbourne Institute of Applied Economic and Social Research,
- Wren, C. (1994) 'The build-up and duration of subsidy-induced employment: evidence from UK regional policy', *Journal of Regional Sciences*, 34(3), p 387-410