Our Cities

The challenge of change

2010 | Background and research paper

Australian Government

Contents

List of Figures

Abbreviations

ABS	*Australian Bureau of Statistics*
Air NEPM	*National Environment Protection Measure for Ambient Air Quality*
BITRE	*Bureau of Infrastructure, Transport and Regional Economics*
BTRE	*Bureau of Transport and Regional Economics*
CBD	*central business district*
COAG	*Council of Australian Governments*
CO2-e	*carbon dioxide equivalent*
DCCEE	*Department of Climate Change and Energy Efficiency*
DHS	*Department of Human Services*
EU	*European Union*
GL	*gigalitres*
GDP	*gross domestic product*
MFP	*multifactor productivity*
NBN	*National Broadband Network*
NHSC	*National Housing Supply Council*
OECD	*Organisation for Economic Co-operation and Development*
SD	*statistical division*
SLA	*statistical local area*
UCL	*urban centres and localities*
UN HABITAT	*United Nations Agency for Human Settlements*

Adelaide, SA

Chapter 1

Introduction

The Australian Government is committed to improving the productivity, sustainability and liveability of our cities. This long-term policy endeavour is vast, complex and should not be underestimated.

Urban policy is grounded in a geographic consideration of place and the people that interact with that place. It considers how policy settings and investment decisions of governments, businesses and individuals impact on, or are affected by, places. Urban policy is about understanding and trying to guide the complex systems that make up our cities. The aim of urban policy is to effectively manage change in a way which supports sustainable development: to meet the needs of the current generation without compromising the ability of future generations to have their needs met (Bruntland 1988).

1.1 Towards a national urban policy

The *State of Australian Cities 2010* report presented a snapshot of the many contemporary challenges facing our major cities across the three dimensions of productivity, sustainability and liveability, as an important first stage towards developing a national approach to urban policy.

The report defined 'major cities' as those with a population greater than 100 000 at the 2006 Census. Recent estimated resident population data from Australian Bureau of Statistics (ABS 2010) show that Albury-Wodonga has now exceeded 100 000 population and is therefore included as a major city in this background paper.

This background paper considers the issues raised in the *State of Australian Cities 2010* report and accompanies the National Urban Policy discussion paper *Our Cities: Building a productive, sustainable and liveable future*, which presents the options the Australian Government is considering in preparing a national approach to improve the wellbeing and prosperity of communities within our cities.

1.2 Purpose of this background paper

The purpose of the background paper is to describe in more detail the various aspects of productivity, sustainability and liveability as they relate to how our cities are developing. It aims to support a deeper understanding of the interrelationships between these three dimensions and to outline some of the implications of the challenges that informed the approach presented in the discussion paper.

1.3 Structure of the document

The following chapter presents the historical context for the development of Australian cities and Australian Government involvement in urban policy. Chapter 3 describes the contemporary settlement patterns which signal a change in the nature of urban development patterns in Australia.

Chapters 4, 5 and 6 set out in more detail the factors that contribute to the dimensions of productivity, sustainability and liveability respectively, including some examples of policy interventions that have been applied in Australia and overseas to address common urban challenges within these dimensions. These are by no means definitive as there are many good examples of effective urban management to be considered. Finally, Chapter 7 considers the governance frameworks that support urban management in Australia across the three levels of government—Federal, State/Territory and Local.

Together with the discussion paper, this document aims to inform discussion and debate about the best ways that the Australian Government, in partnership with States, Territories, Local government, industry and communities, can support the sustainable development of our cities.

Canberra, ACT

Chapter 2

Our cities in transition

Our cities are complex systems of interacting economic, social and environmental forces that constantly evolve.

Today's cities are strong and growing. Their future is still influenced in a sometimes subtle but constant way by factors that trace back to that first fledgling colony in Sydney, a few tents clustered around a flagpole, precariously perched on a small cove, in a land that our Aboriginal and Torres Strait Islander peoples have belonged to for millennia.

2.1 Historical dominance of cities in Australia

The dominance of the city is not a new phenomenon in Australia's history. More than 100 years ago, Adna F Weber in his work, the Growth of Cities in the Nineteenth Century, noted that

> *The most remarkable concentration, or rather centralisation, of population occurs in that newest product of civilisation, Australia, where nearly one third of the entire population is settled in and around capital cities.*
>
> *Weber 1899—1963 reprint edition.*

At that time Weber ranked Melbourne as the 22nd most populous city in the world, just 50 years after its establishment.

The early colonial settlements determined the location of our metropolitan areas. Then the trade and manufacturing expansion in the latter part of the nineteenth century consolidated the pattern of Australian urban settlement, and the rail networks centred on the capital cities reinforced their primacy within each state.

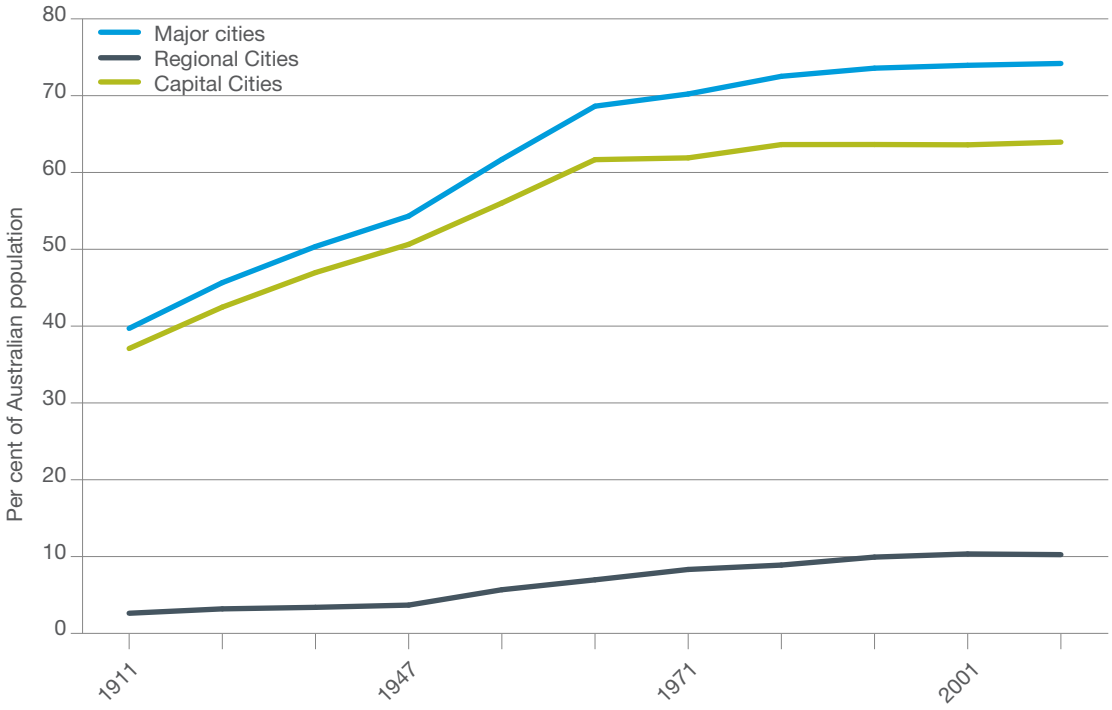
Despite different rates of progress, by 1911 almost half the populations of New South Wales and Victoria resided in Sydney and Melbourne, while Adelaide and Perth accounted for approximately 40% of their respective state populations. Today these capital cities, along with Brisbane, account for 60% of Australia's total population.

Figure 1 shows the growth in the percentage of the population residing in Australia's capital and regional cities over the last century. Figures 2 and 3 show how the different rates of growth are reflected in the changing proportion of the population residing in each capital city and the regional cities respectively.

Following the impetus for national reconstruction after the Second World War, manufacturing expanded dramatically, supported by a large-scale immigration program to supply the labour and build the infrastructure for industry. The combined population and economic growth generated major city expansion. The share of Australia's population in major cities increased from 54% in 1947 to 70% by 1971 (ABS 2008).

Since 1971, the rate of growth in the share of the Australian population in major cities has continued to increase but at a slower rate. However, regional cities have had a proportional increase in their share of the population during this period. Some cities, like the industrial cities of Newcastle, Wollongong and Geelong, reached their population share 'peak' in the 1970s, while others, especially the coastal Queensland cities like the Gold Coast, Sunshine Coast and Cairns, continue to grow. The capital cities are all expected, by mid-century, to further increase their proportion of population within their respective States and Territories. The exception may be in Queensland where regional cities along the coast have experienced a recent surge in growth.

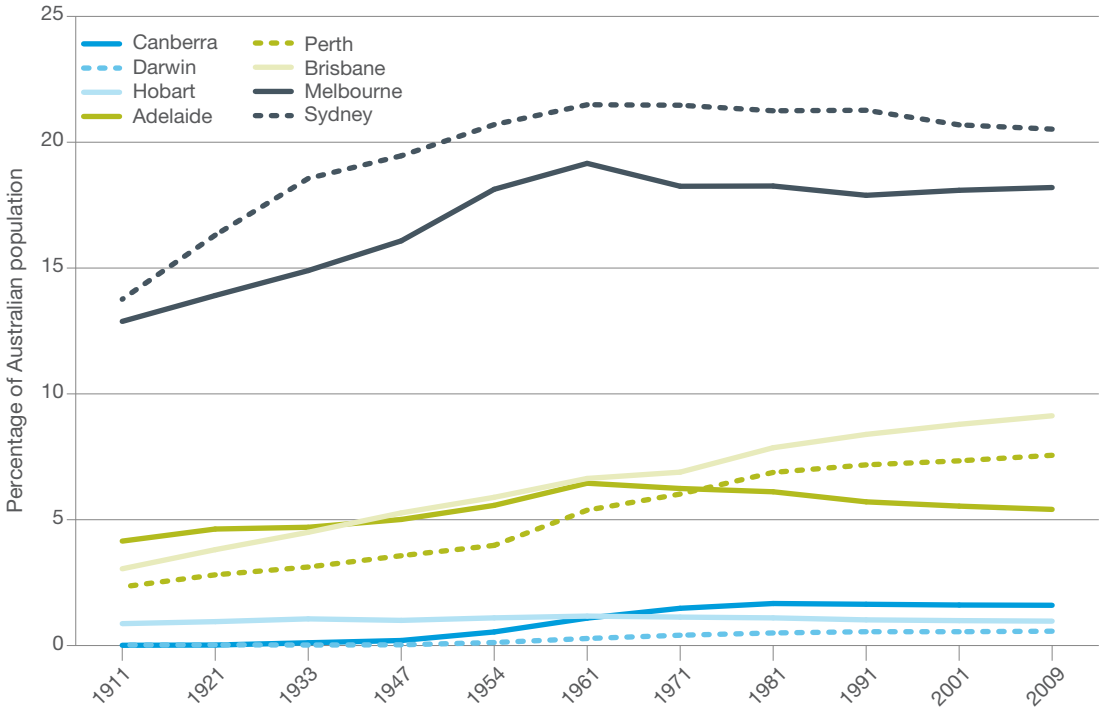
Figure 1 Percentage of population in major cities 1911–2009



NOTE Major cities refer to all cities with a population greater than 100 000 people.
Regional cities refer to non-capital cities with a population greater than 100 000

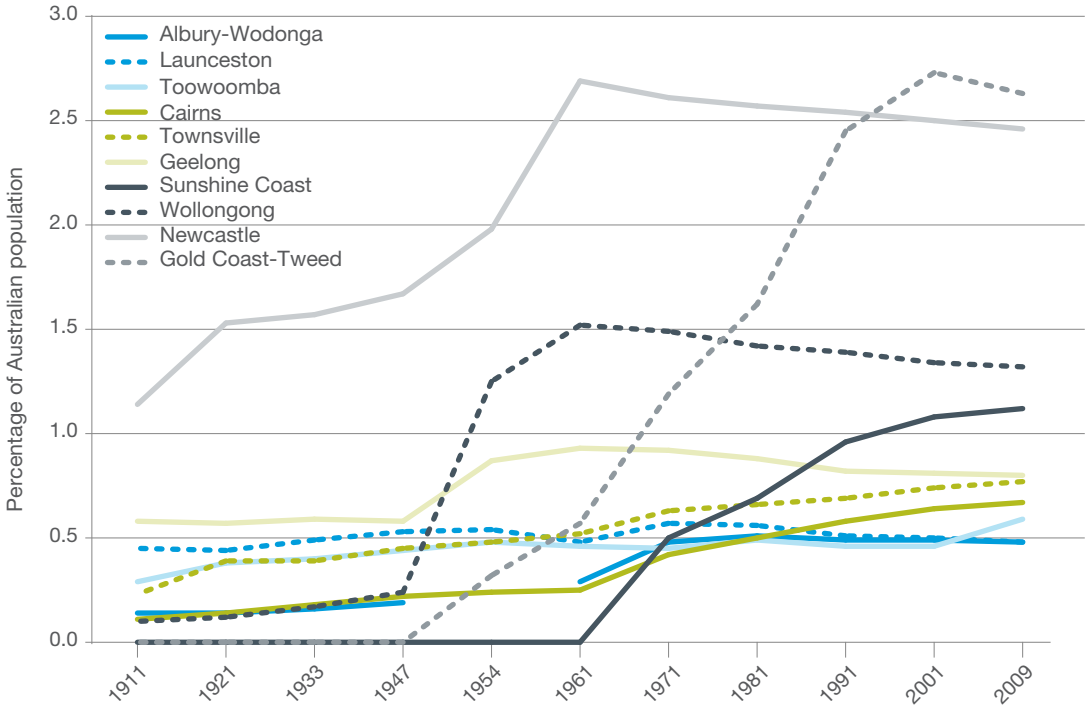
Source: ABS (2008); ABS (2010)

Figure 2 Share of Australia's population in capital cities, 1911–2009



Source: ABS (2008); ABS (2010)

Figure 3 Share of Australia's population in regional cities, 1911–2009



Source: ABS (2008); ABS (2010)

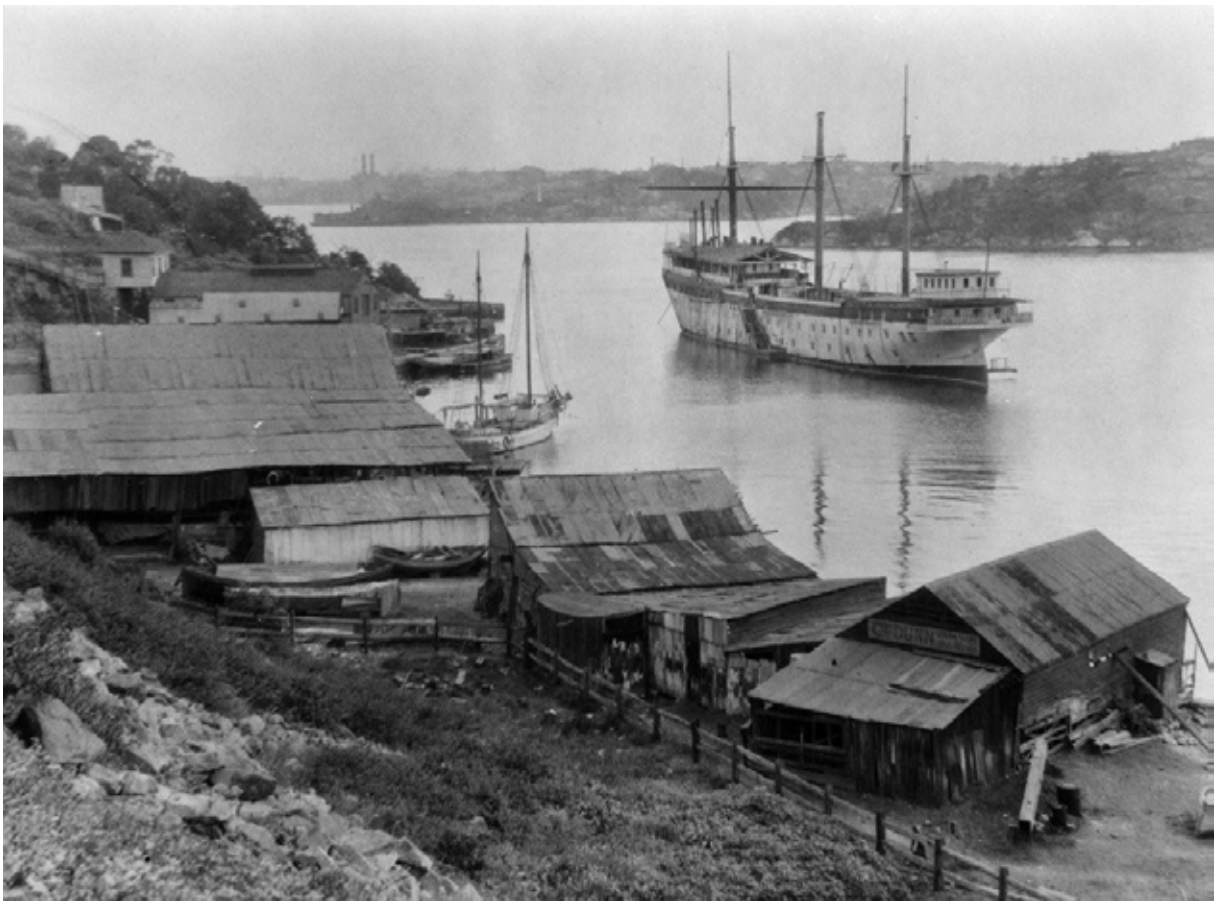
2.2 Transport infrastructure shaping our cities

The growth and change in our cities reflects their geography and resources; technology and innovation; and their social and political past. As our cities evolve, they continue to be shaped by the lasting heritage of buildings, infrastructure, transport networks and land-use patterns constructed decades earlier. The nature and distribution of transportation and housing are primary influences of urban structure (the shape and extent of the urban area) and urban form (the type and density of buildings).

In Australia, safe sea ports located on river mouths, which were critical for trade for the colonies on this isolated continent, were the logical location for establishing Australia's major cities.

The rivers of many cities, both coastal and inland, provided early transport arteries and influenced land-use and land-tenure patterns. The Swan River in Perth was a thriving transport corridor, with landholders needing to access a part of the foreshore in order to trade goods and services. This resulted in narrow blocks of land, each stretching to access the river system. In all the capital cities river geography also influenced the construction of railways and roads, which in turn guided the location of centres of commerce.

Freight and public transport infrastructure, in particular, was a strong force in shaping cities as development followed train and tram lines. This almost spider web-like infrastructure radiating out from the central business districts (CBDs) laid the foundations of the residential development up to the mid twentieth century. Until the 1950s, public transport was the main mode of travel in the capital cities (Bureau of Infrastructure, Transport and Regional Economics (BITRE) 2009).



Shipping on Parramatta River, New South Wales, c. 1900

The advent of the motor car freed households from their dependence on fixed transport infrastructure and allowed homes to be built and jobs to be created further afield. What once were quite compact centres clinging to rail and tram networks have, since the 1950s, expanded over large land areas by world standards, as illustrated in Sydney's urban growth (depicted in Figures 4 and 5).

The rapid expansion of private motor vehicle ownership in Australia from the 1950s conferred a new level of personal freedom and independence on the majority of the population. Private motor vehicles became the dominant mode of transport in Australia and the basis for changed urban form, transport networks and provision of services across the nation's cities.

Another major component of city infrastructure is housing. The nature of housing and the design of neighbourhoods have changed over time reflecting, initially: our largely European heritage; changes in planning ideologies; building innovation; availability of resources for construction; networks and modes of transport; levels of affluence; and, more recently, changing demographics and the availability of land.

Figure 4 Sydney urban area and rail network, 1915–1945

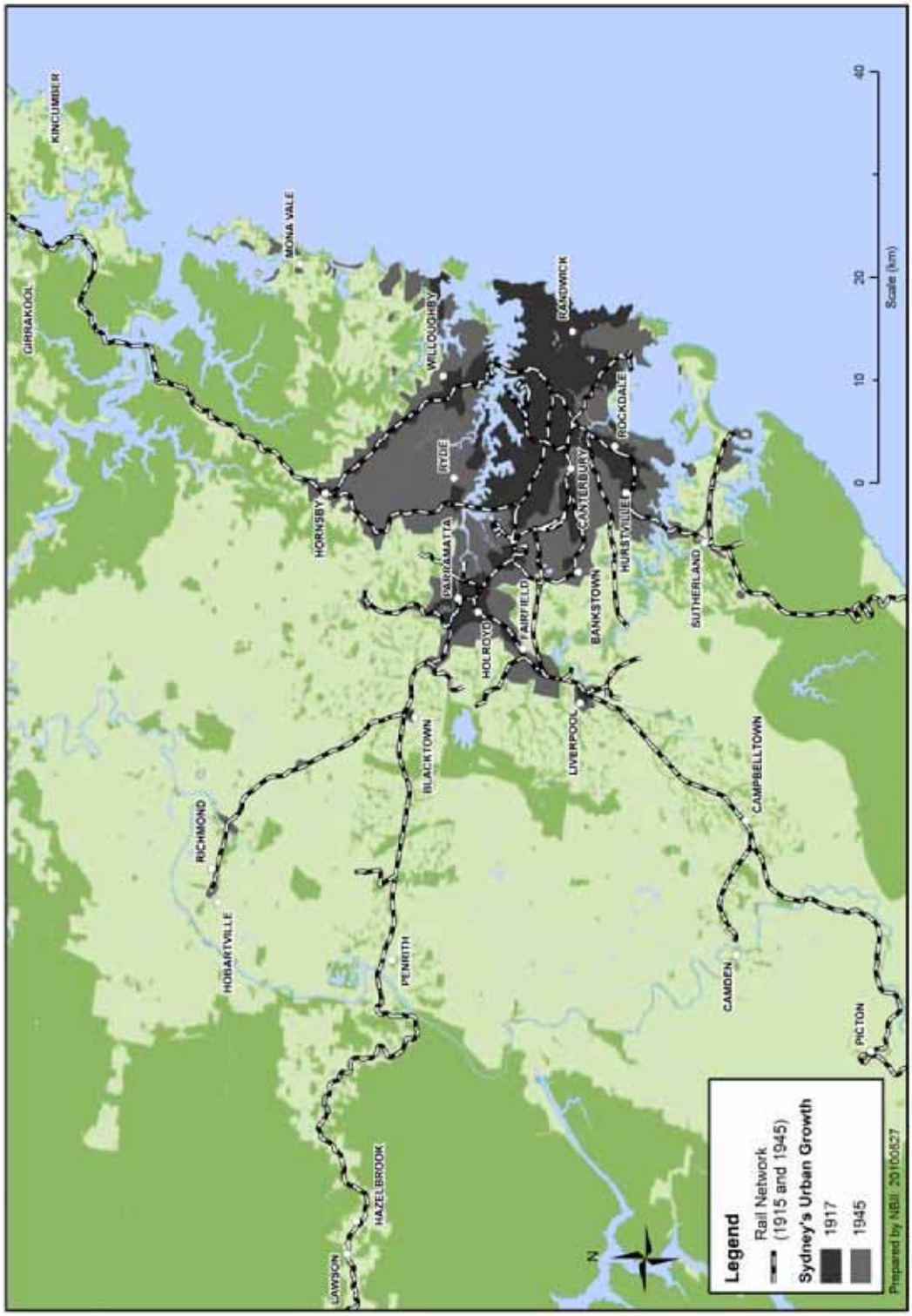
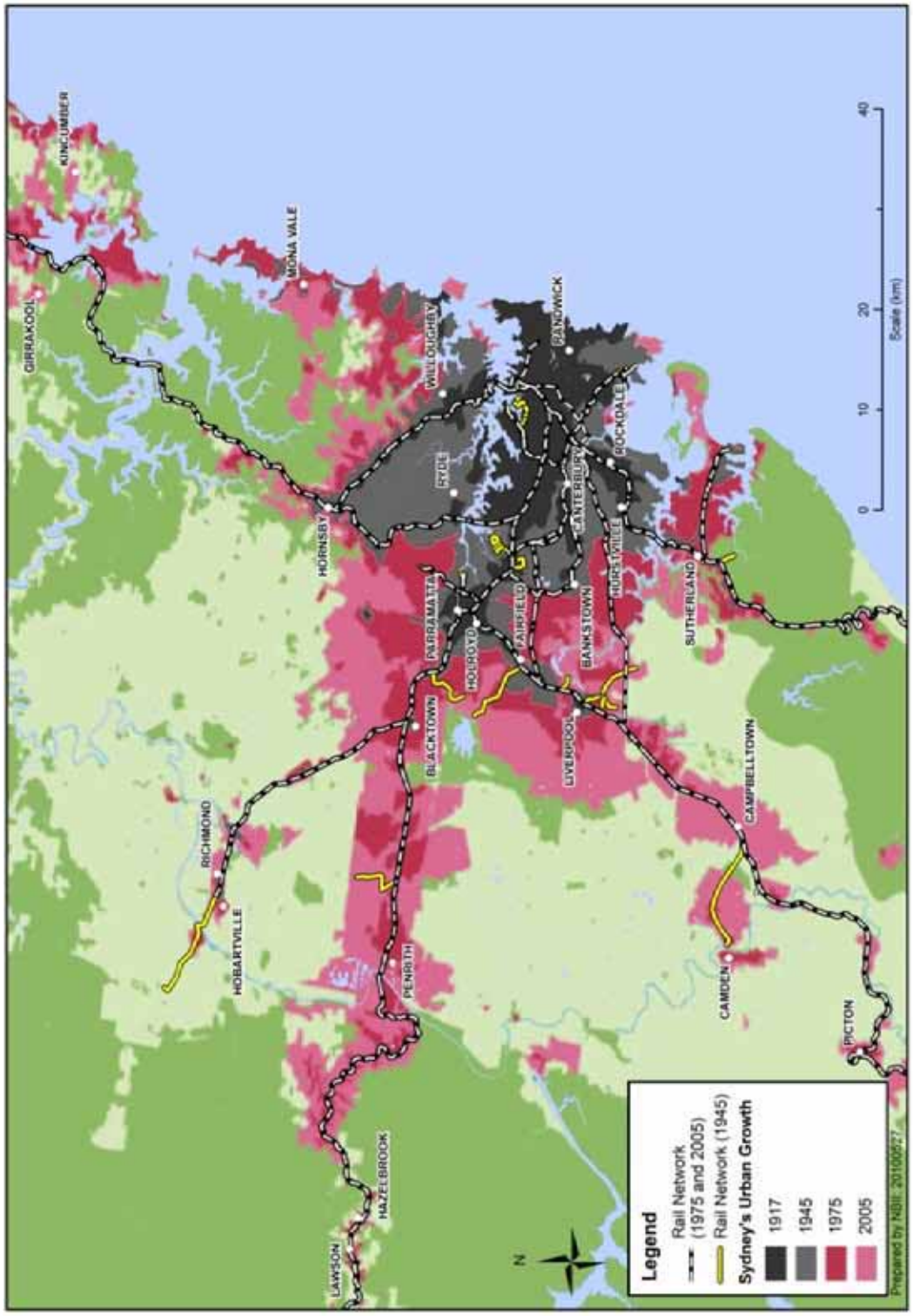


Figure 5 Sydney urban area and rail network to 2005



Source: Department of Infrastructure and Transport with data from New South Wales Department of Planning and Meyer (2010)

Colonel Light Gardens Tram 257, Adelaide, South Australia, c. 1950

2.3 The evolution of national urban policy

The growth of Australian cities has been accompanied by varying levels of involvement by successive Australian governments in the cities. Since Federation in 1901, the Australian Government has invested in the country's cities but the Australian Constitution leaves State and Territory Governments with the principal responsibility for managing them. The States and Territories confer some of this responsibility to Local Government authorities.

The Australian Government's interest and involvement in cities has been driven by the strong link between cities and the economy. The points of intervention in cities by the Australian Government have generally coincided with the points of transformation in the national economy. The major interventions are summarised in Table 1.

From the period of post-war reconstruction and the rise of the manufacturing sector, through the transformation from a manufacturing economy to a service-based economy, and from an inwardly domestic-oriented economy to an active participant in the global economy, these points of transformation have all been catalysts for Australian Government intervention.

Allied with economic transformation has been the need to renew infrastructure. If Australia is to remain economically competitive, and its population is to continue to reap the benefits of economic growth, the country must have the necessary policy environment and adequate infrastructure.

Table 1 Australian Government involvement in cities since World War Two—a select summar

1920s–30s	Investment in state and territory urban road systems by the Australian Government
1943	Creation of the Commonwealth Housing Commission
1945	Commonwealth – State Housing Agreements
1950s -	Australian Government pressure on states to sell public housing to sitting tenants
1945	Creation of the Commonwealth Department of Works and Housing
1960s -	Implementation of first home owners scheme
1954	Major commitment to building Canberra and establishment of the National Capital Development Commission (1958)
1970s -	Major commitment to building Darwin, reflecting Australian Government responsibility for territories, including the Australian Capital Territory and the Northern Territory
1964	Creation of the Commonwealth Bureau of Roads to examine urban and rural roads needs
1972	Creation of the National Urban and Regional Development Authority, which became the Cities Commission
1972	Creation of the Department of Urban and Regional Development and allied initiatives, including the Area Improvement Program, the Australian Assistance Plan, the Sewerage Backlog Program, local traffic calming programs and the creation of land commissions
1972	Creation of the Department of Environment with urban responsibilities including the development of the Environmental Impact Statement
1973	Expansion of Australian Government assistance to local governments by way of the reconstituted Commonwealth Grants Commission
1975	Creation by the Australian Government of the Heritage Commission which had concern for built (that is, urban) as well as natural heritage
1975–83	Creation of the Department of Environment, Housing and Community Development
1991–96	Creation of the Building Better Cities Program
1990	Development of the national Building Code of Australia
1995	Creation of National Competition Policy directions that have restructured urban service provision
1998	Creation of the Development Assessment Forum as part of the micro-economic reform agenda—emphasis on decision-making efficiency and harmonisation of development approval processes across the nation
2008	Formation of Infrastructure Australia, the Major Cities Unit, the Building Australia Fund and the Australian Council of Local Governments
2009	Establishment of the Australian Centre for Excellence in Local Government
2009	Agreement by the Council of Australian Governments (COAG) to a national objective and criteria for the planning of Australia's cities

Source: Augmented from Brendan Gleeson (2006)

2.4 Changing demands on government

Local Government, the tier that most reflects the needs of local communities, is a good example of the changing demands on government over time. Various colonial governments established Local Governments during the nineteenth century to provide services such as road maintenance, drainage and sewage disposal. These services were funded by property rates. As cities grew, so did the number of Local Government areas that surrounded the city centres. The majority of cities retained this patchwork of Local Government jurisdictions into the late twentieth century. This changed gradually with amalgamations which were at times both opposed and supported by communities and political parties. The exception was Brisbane which, in 1925, merged 20 local councils into one large City of Brisbane.

Today there are 157 local government entities in Australia's now 18 major cities. The roles and expectations of Local Governments have substantially broadened over time, yet there remains concern that the prevalence of small Local Governments inhibits both the efficiency of local services delivery and the effectiveness of city-wide governance.

The coming together of communities to form larger and more effective entities, or the grouping of Local Government into regional coalitions, can be the foundation of planning strategies over wider city areas. Regional groupings can also produce economic benefits for constituent entities, through economies of scale, for purchasing and more effective use of capital equipment.

2.5 Settlement patterns of Australian cities

The settlement patterns within Australian cities, including the patterns unique to each city, have implications for how we address current issues and challenges. Government policies have helped to shape these patterns—directly and indirectly. Examining the history of the development of our cities reveals how dramatically they have changed and the effects of different government intervention.

2.5.1 Nineteenth century: City pattern foundations

Founded in 1788, Sydney and, later the same year, Parramatta, were the first locations in Australia to be settled by Europeans. Hobart was established in 1804. This was followed by Brisbane (1824), Perth (1829), Adelaide (1836), Melbourne (1837), Darwin (1869) and eventually Canberra (1901).

Aboriginal tracks, water courses and undulating coastal topography formed the basis of road layouts in Australia's early colonial settlements. The construction of municipal buildings, roads and bridges were constructed by convict labour.

Located as they were on hilly terrain Sydney, Hobart and Brisbane generally took on the layout of the local topography rather than the layout of strictly gridded streets. By contrast, Perth, Melbourne and Adelaide had streets that were, from the outset, planned with a more spacious and regular layout.

The establishment of tram and rail networks in the boom years of the 1870s and 1880s supported the growth of residential suburbs, which featured houses with gardens. These suburbs were served by transport lines radiating from the city centre. There was a dominant middle class with strong aspirations and means for home ownership. By the end of the nineteenth century approximately 50% of Australians were owner-occupiers compared with only 10% in the United Kingdom.

Each of Australia's cities grew in its own unique way. Melbourne and Perth, for example, enjoyed the Gold Rush booms of the 1860s and 1880s. Other cities benefited from agricultural, commercial and industrial expansion throughout the latter half of the century.

In the closing decades of the nineteenth century, the colonial capitals underwent a transition from being compact walking cities, where housing was clustered within walking distance of the commercial centres and port docks, to public transport cities.

In 1901, the Australian colonies were united into a single Federation. Before Federation each of the colonies was governed like a small country with its own government, railway gauges and even their own military. Governance was two tiered—an administration for the colony and an administration for the local, with the latter responsive to street-by-street or ward demands and biases and the will of a few individuals often paramount. Wider community considerations, much less than colony-wide considerations, were the exception rather than the rule. Effective planning was often a similar casualty.

Colonial politicians such as Alfred Deakin, Henry Parkes and Edmund Barton waged a long campaign to turn the six colonies of 3.7 million people into a country in its own right.

At the turn of the century Sydney and Melbourne each had a population of more than half a million, while Adelaide, Brisbane and Perth were each in excess of 100 000.

In spite of their individuality, the colonial capitals shared common characteristics, namely:

- high levels of urbanisation and metropolitan primacy
- residential suburbs
- high levels of home ownership
- transport-led development
- transport infrastructure directed to hinterland and export activity
- population growth primarily from immigration rather than natural increase.

Melbourne, Victoria, c. 1935

2.5.2 Early twentieth century (1901–1945): A burgeoning Federation

Federation created a national governance structure. In the early post-Federation years, however, the States gave little of themselves to the national government. While the First World War may have forged an Australian ethos, the leaders of the Australian States thought of their States first and the Federation second. Local Government was even more remote. Planning for the cities in a national context was never a consideration.

Post-war, the cities experienced the growth of manufacturing, which became an economic force during the 1920s. The need for domestic markets and labour supply reinforced both the primacy and growth of major cities like Sydney, Melbourne and Adelaide.

The factors behind population growth in the cities altered with more than 40% resulting from natural increase. The biggest growth factor (53%) was, however, migration from rural areas caused by rationalisation of the agricultural sector.

The major technological advance in the cities was the expansion and electrification of public transport systems and the widespread provision of domestic electric power. Brisbane led the way as the second city in the world to install electric lights.

While the quality of life for residents changed, and improved, the transport city pattern of the nineteenth century remained with residential suburbs extending like the arms of a star-fish along the train and tram routes radiating from the city centre. This residential spread reinforced the division of the cities between established working class in the inner-city and the middle-class suburbs spreading outwards along transport routes.

The Great Depression of the early 1930s hit the traditional working class inner areas severely with widespread unemployment and reduced housing conditions. An outcome of the poor housing conditions of the inner suburbs was the establishment of housing commissions—Victoria in 1938, and New South Wales in 1942. These followed the South Australian Housing Trust, which was set up in 1936. Public housing created new suburbs on the urban edge.

The growth of manufacturing continued and was rapidly expanded during the Second World War leading to a major change in Australian employment patterns. In 1947, the Australian Census showed, for the first time, that more Australians worked in manufacturing than in primary production.

Governance also changed, but overarching national planning still did not replace State andLocal planning. The war-time transfer of income taxing powers from the States to the Australian Government laid the basis for Federal – State financial relationships into the second half of the twentieth century and beyond. It also laid the foundation (though not immediately used) for Australian Government planning in the national good.

Local Government still reflected local issues and aspirations, although in Brisbane the larger city-wide Brisbane City Council was established through amalgamation. Queensland was alone in taking this step in 1925.

2.5.2.1 Early Australian Government involvement—linking the cities

In the country's early years, direct Australian Government intervention in the cities was generally limited to roads and inter-city transport. The emphasis was on cities as distribution centres for Australia's agricultural produce, both domestically and internationally, rather than on cities as centres of workforce and residence.

With the development of the manufacturing sector, particularly resource-processing, population centres grew steadily around urban manufacturing locations so that by the Second World War just over half of Australia's population was located in the current listing of most populous cities.

2.5.3 Mid twentieth century (1945–1971): Post-war reconstruction and economic boom

Following the Second World War, Australian cities underwent a period of dramatic change that resulted in extensive physical expansion. The physical expansion of the largest cities was associated primarily with the interrelated factors of rapid population growth, economic development, housing investment and the emergence of the car as the primary mode of transport.

Post-war immigration and the high birth rates that signified the 'baby boom' saw the population of Australia's five largest cities double in 24 years from 1947 to 1971 as they absorbed 89% of the country's population change over that time.

With stable economic conditions and high levels of employment, natural increase accounted for between one-third and one-half of total growth in capital city populations.

Migrants arriving in Australia, 1962

However, immigration was an equally significant component of population growth and vital to ensure there was an adequate labour supply to underpin economic growth. Net immigration comprised more than 55% of the growth in Sydney, Melbourne and Adelaide, 48% in Perth and 33% in Brisbane and Hobart.

This level of migration, principally from war-torn European countries, dramatically altered the ethnic composition of the already diverse city populations. Net internal migration was much less than the pre-war period, except in Brisbane and Sydney.

The second major change in cities was the continued development of the manufacturing industry, supported by capital inflow from overseas and tariff protection. Expansion in the manufacturing sector was underpinned by the substantial immigration program. Almost three-quarters of the increase in the labour force in the 1950s were provided through immigration.

The automotive, iron and steel, as well as other electrical and chemical industries, spearheaded Australian manufacturing growth during the 1950s and 1960s. Productivity increases from economies of scale saw manufacturers increasingly locate expansion in major urban centres where the labour force lived.

The strongest beneficiaries were Sydney, Melbourne and Adelaide, which had the highest share of jobs in manufacturing. However, all of the largest centres benefitted from this economic transformation of the Australian economy. In 1971, manufacturing represented more than 30% of all jobs in Melbourne; about 30% in Sydney and Adelaide and around 20% in Brisbane and Perth.

2.5.3.1 Government investment in housing

The abundance of labour-intensive manufacturing jobs in the cities had the effect of concentrating and retaining population growth from migration in the cities.

The need for housing for growing populations was a primary concern for all governments at this time. Immediately following the war, there was considerable interest by the National Government in urban and regional development. The end of wartime austerity created new and growing demands by Australians.

The report of the Commonwealth Housing Commission, formed in 1943, included a number of statements on national regional and city planning. For the first time, the need for a national strategy was recognised.

> *We consider that national, regional and town planning is an urgent national need.*
> *Commonwealth Housing Commission, 1943*

The same report urged governments to decentralise industry and create 'satellite towns' because of the deteriorating living conditions in the major cities. It also gave rise to the Commonwealth State Housing Agreement Act, 1945, which provided the States and Territories with low-cost housing programs to be financed by the National Government.

2.5.3.2 Urban expansion around car-based transport

The investment in housing to support population growth coincided with the other key factor in the city expansion in the post-war period: the advent of the car. Growth in ownership and use of private motor vehicles led to dramatic change in how urban transport systems were planned, funded and managed. Public transport cities became car-dependent cities, enabling residential development to spread further outwards creating new low-density suburbs.

The growth of car ownership in Australia was rapid—from 100 cars per 1 000 persons in 1945 to almost 500 cars per 1 000 persons in 1971. During this time, 78% of households in Sydney and Melbourne owned at least one car.

Cars sales, Brisbane, Queensland, c. 1960

The growth of the motor vehicle also marked the dilution of the star-shaped public transport city. Tram and train tracks radiating along residential corridors from a dominant city centre, were transformed and engulfed by the automobile. So too were the areas of previous inaccessible land between public transport routes. These were acquired and developed for housing to meet the needs of new migrant and baby boom households. Extended and wide planning, much less the provision of infrastructure, was not a recognisable aspect of these developments.

During the latter part of this period, the areas on the outskirts of the larger cities made accessible for development by the car, experienced rapid residential development, often in advance of necessary infrastructure. It also began the genesis of new forms of retailing as local, large shopping centres vied for customers with the established central city retailers. The suburban mall was born.

This structural shift, with important impacts on urbanisation patterns, was strongly influenced by federal economic policies, particularly import controls, tariff and immigration policies. The more direct involvement by the Australian Government in the cities was through home-ownership schemes, which supported the supply of the single detached dwelling as the predominant type of housing for Australian families for decades.

2.5.4 Late twentieth century (1971–1991): Economic restructuring and globalisation

By the 1970s, more than 60% of Australia's population lived in the capital cities, compared to 50% in 1947. However, growth also occurred in particular non-metropolitan areas such as Newcastle, Wollongong and Geelong taking the total share of the population in major cities to 70% by 1971.

The economic transformation resulted in a long boom in economic activity, which saw incomes rise steadily; unemployment levels remain low and economic growth remain at historically high levels. This economic security, combined with the growth in the use of the motor vehicle, had a profound impact on the nature of our cities.

Car ownership meant people felt less location-bound by existing public transport infrastructure, and, with incomes more secure, home-ownership 'dreams' became a reality. This resulted in a dramatic expansion of development in new areas of the major cities—the era of 'suburbanisation'.

The result was a more dispersed employment and residential pattern for the major cities, which became increasingly car-dependent.

Most cities had rudimentary plans to guide suburban and urban development but little in the way of strategic integrated planning of development and infrastructure requirements. Federal involvement was still limited to roads and home ownership incentive schemes.

However, the rapidity of suburban development resulted in a significant backlog of infrastructure. Many new suburbs did not have sewerage or basic amenity such as sealed roads or footpaths, so city issues came to the forefront of policy discussion, including at Federal level.

Particular attention was placed on sewerage—or the lack of it. In 1971, less than half of Perth's population was connected to mains sewerage. For the other major cities, connected houses and flats ranged between 56% (Wollongong), 76% (Brisbane), 84% (Sydney) and 87% (Melbourne) (ABS 1971).

In mid 1972, the Australian Government established the National Urban and Regional Development Authority to advise the government and the Grants Commission on funding to the States and Territories for urban and regional development issues.

After the 1972 elections the incoming government created the Department of Urban and Regional Development to develop and implement a national urban and regional development strategy and a host of urban policy initiatives, including the establishment of Australian and State and Territory land commissions and the administration of a new cities program.

2.5.4.1 Urban impacts of economic restructuring

The 1970s and 1980s were characterised by considerable economic and community restructuring. Australia entered the global economy at a time when its national government began to be active in the country's cities.

Australia faced the realities of globalisation with the rise of multinational corporations and a new trade regime associated with reduced levels of tariff protection.

During this period of adjustment, Australia lost several hundred thousand manufacturing jobs in the 1970s. This sectoral shift was, however, accompanied by a rise in employment in the service sector, particularly in business, finance and community services. Part-time employment in the retail and wholesale industries also grew.

Unemployment rates rose and many Australians suffered a loss in real income when jobs in manufacturing, construction, transport and storage, utilities and communications fell sharply. Some regional cities that had primarily relied on manufacturing industries—like Newcastle, Wollongong and Geelong—experienced significant economic decline.

Demographically, substantial changes occurred which affected the characteristics of cities. These included a decline in fertility rates associated and birth rates, an increase in the participation of women in the paid workforce and a decrease in household size.

Immigration underwent resurgence, but unlike previous periods when immigration was sourced in Europe, the new wave saw refugees, family reunions and a rise in settlers from South-East Asia and the Middle East. The population within Australian cities became even more culturally diverse.

A change of government in 1975 saw a less interventionist approach to cities. Responsibility for programs aimed at infrastructure provision and strategic planning were left to the States and Territories.

During the 1980s, the growth of the manufacturing sector waned and was replaced by an increasingly service-oriented economy, which slowed population growth in the major cities.

Microeconomic competition reform and the increasing global influence of the world economies through reductions in trade barriers saw the Australian economy transformed again to be more globally competitive.

However, cities could not match the pace of this economic transformation due to the longevity of the built environment. Buildings have life spans of decades and with cities physically very much a product of the past, as of the present, change is gradual. The decline of manufacturing did, however, create opportunities for urban renewal as factories and industrial areas, especially in inner-city areas, were converted to, or replaced by, residential development.

The benefits of compact cities, particularly in terms of infrastructure provision, over the earlier concepts of ‘sprawl’ and decentralised ‘new cities’, began to be acknowledged. There was renewed emphasis on revitalising existing cities and the need to create better cities rather than just ‘new’ cities.

The environmental consequences of increased car-dependency also began to be recognised. Increasingly, environmental concerns and resource-use began to influence thinking and the increasing awareness of the role of the cities in meeting national goals (related to efficiency, equity and environment), led to renewed interest in cities.

2.5.5 Turn of twenty-first century (1991–2010): Into the Information Age

The last decade of the twentieth century and the first decade of the twenty-first century saw all of the influences on the way of life for city dwellers that were at play during the 1970s and 1980s expand in an almost incomprehensible manner. This included economic change, corporate restructuring, technological change, the early stages of globalisation, environmental concerns and cultural diversity.

Across cities, the way of life in local communities has been altered by global forces including the impacts of climate change, the increasing reliance on high speed Internet-fostered communications, the transition to a service-based economy with information technologies, and finance services and trade which were becoming a non-stop operation in world markets where trade and business never sleep.

Inner-city suburbs were rejuvenated and housing replaced almost the last of the old factories. Inner-city resident populations grew and so did the aspirations of the residents. Agitation for street closures, traffic calming, cycle ways, green spaces and noise reduction grew between 1991 and 2010. At the same time cities also expanded in outer areas.

Cities themselves have been injected into international competition where one city vies with others to be the home base for global operations spread throughout the world in areas such as finance, information technology, trade, insurance, transport and manufacturing. New jobs in new industries have replaced those in manufacturing, necessitating changes in the personal and employment lives of growing numbers of people.

Population growth has brought increased demand on services and infrastructure. It has also created congestion and put pressure on the natural environment.

In the two decades, cities also experienced demographic changes which created more pressure on the health services. This includes an ageing population, a decline in the proportion of families with children, a reduction in household size, and changes in ethnic composition.

What did not change was the primacy of the cities. Indeed, this became more entrenched, although the core national cities increased population shares while other traditional or established cities, especially those with an industry base impacted by the decline in manufacturing, fell. There was also a rise in population moves to ‘sunbelt’ or ‘sea-change’ creating new coastal areas of urbanisation.

2.5.5.1 Building Better Cities

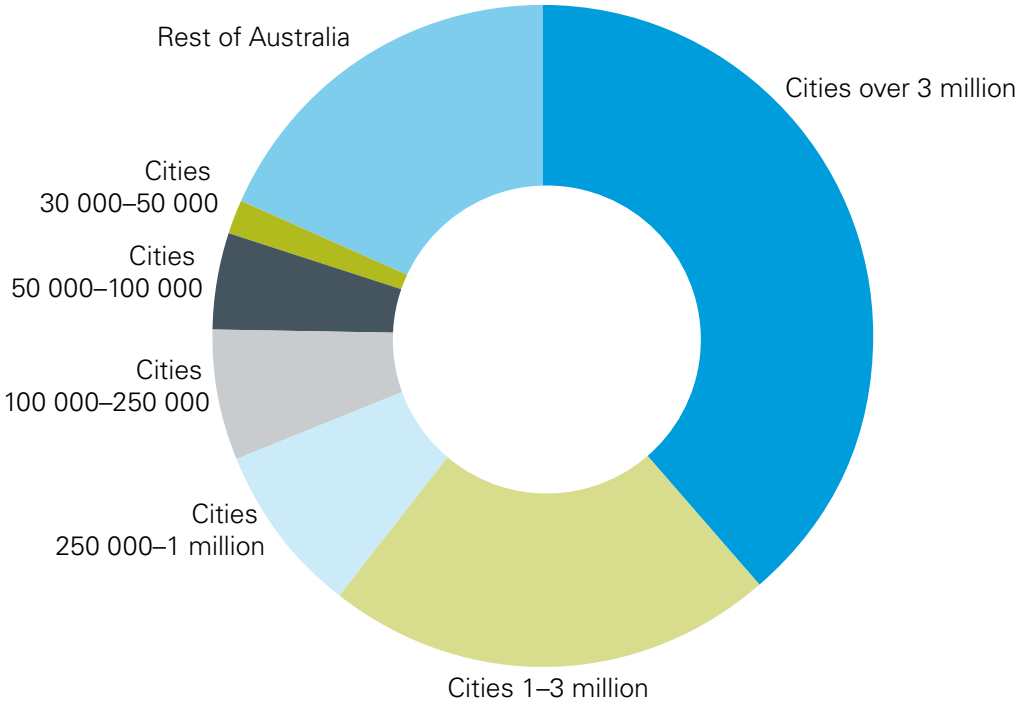
In 1991, the Australian Government introduced the *Building Better Cities Program*, a joint initiative with the States and Territories for urban redevelopment in the nation’s cities. The overall purpose of the program was to promote improvements in the efficiency, equity and sustainability of Australian cities.

In many ways the *Building Better Cities Program* anticipated and mirrored a renewed interest in cities by national governments worldwide in response to the need for increased competitiveness in the increasingly global economy. In particular, with its explicit emphasis on innovation and the productivity advantages of clustered developments such as the Australian Technology Park, the program demonstrated a shift in attitude towards cities as contributors to national objectives and not merely as entities creating problems. Cities were increasingly recognised as part of the solutions to the economic, environmental and social challenges.

2.6 Australian cities: 2010 and beyond

The *State of Australian Cities 2010* report provided substantial detail on the growth and change that had been occurring in the 17 Australian cities that had populations greater than 100 000 at the 2006 Census.

Figure 6 Population distribution in Australia, 2009

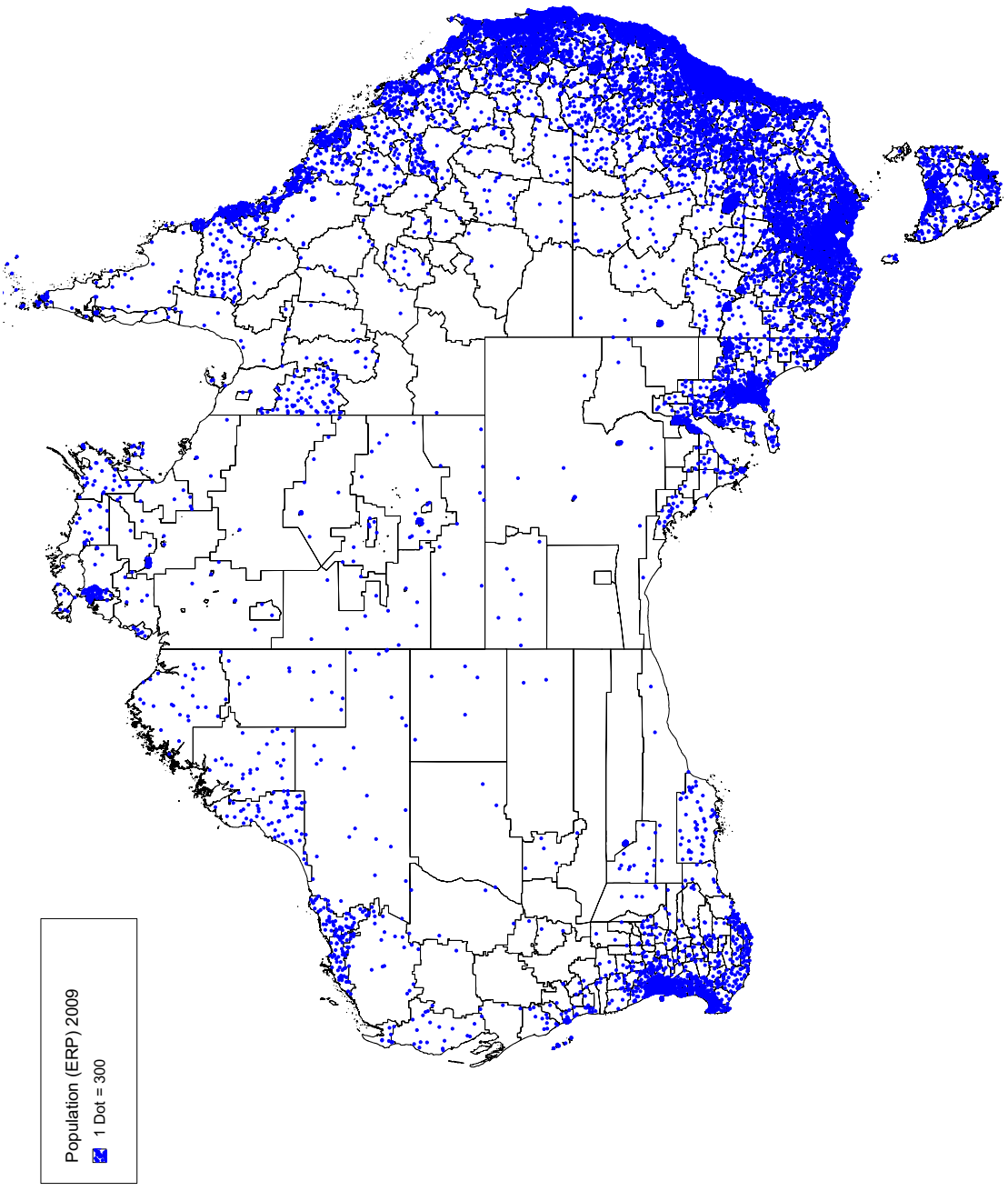


Source: ABS (2010)

The *State of Australian Cities 2010* report confirmed how urbanised a nation Australia has become, with 75% of our community living in cities with populations greater than 100 000 people. Less than 20% of Australians live in smaller communities or rural and regional areas with populations less than 30 000 (Figure 6).

Outside of Australia's capital cities, our population is distributed mainly within larger regional cities and centres. Intercity and regional transport networks and infrastructure service these cities. Figure 7 shows how Australia's population is distributed and concentrated along the eastern seaboard.

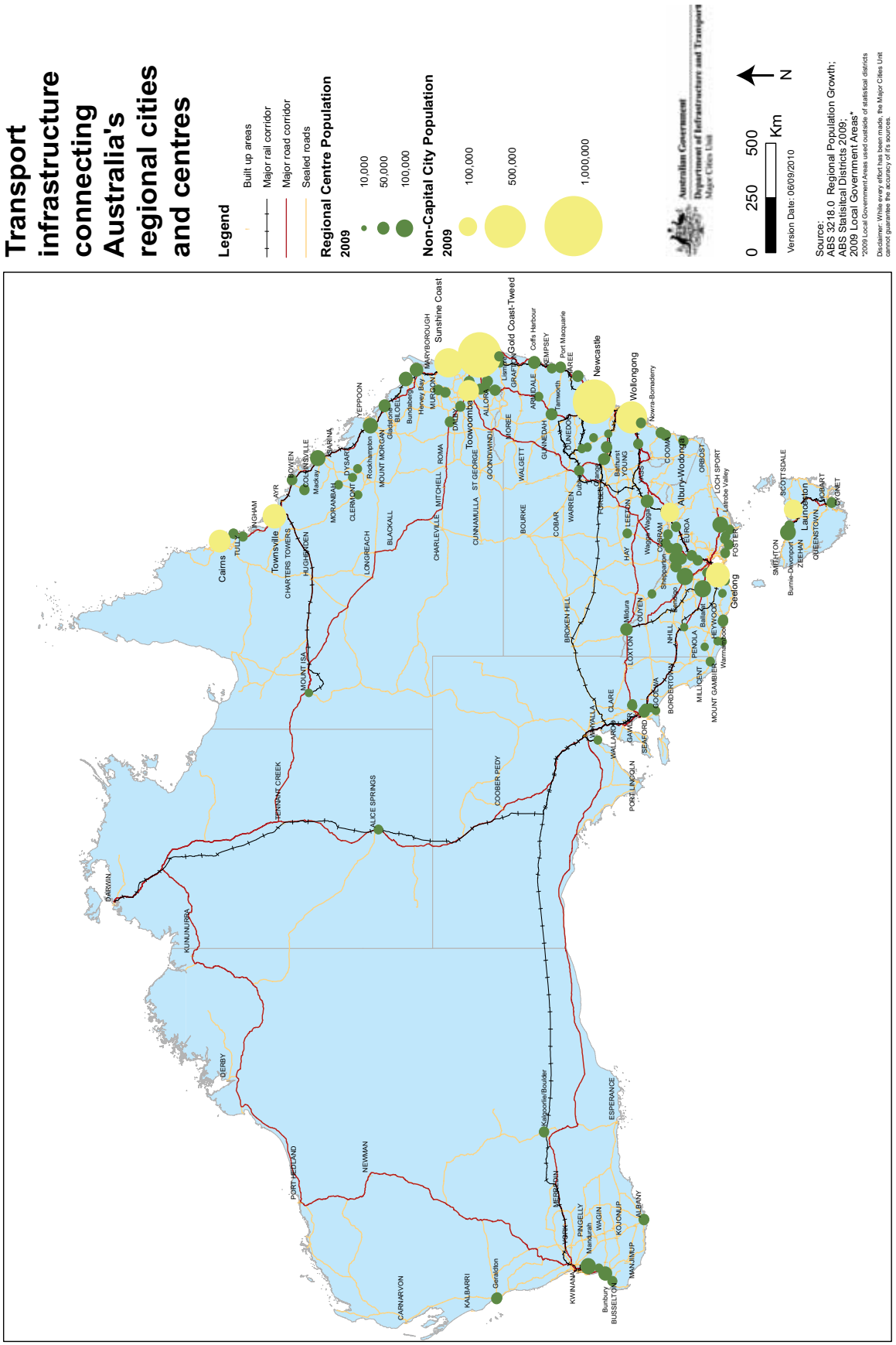
Figure 7 Australia's population distribution



Source: BITRE analysis of statistical local area (SLA) population data from ABS (2010), cat. no. 3218.00

The changes in our cities over the coming decades will no doubt be as dramatic as they have been over the past century. While some may lament a bygone era of one type of lifestyle over another, or argue that past settlement patterns have only created problems for our future, on reflection, the past century has seen substantial advancements in many aspects of urban life which have made Australian cities among the most liveable in the world. This includes a reduction in industrial-related air and water pollution, improved safety and working conditions in most occupations, improved efficiencies and safety in passenger and freight transport, high rates of home ownership and the emergence of a vibrant, cosmopolitan urban culture.

Figure 8 Transport infrastructure connecting regional cities and centres in Australia



Chapter 3

Contemporary urban Australia

With strong projected population growth in major urban centres, the number of major cities with populations greater than 100 000 is expected to increase in the next decade. Some of our regional cities are becoming increasingly connected into closely linked groups of metropolitan regions. Major centres exist within the largest capital cities, such as Parramatta in western Sydney, whilst other centres like Mandurah south of Perth, are emerging as significant cities in their own right.

3.1 Australia's metropolitan regions

Urban Australia is dominated by a number of metropolitan and regional groupings of cities. The Greater Sydney (including Parramatta), Newcastle and Illawarra regions increasingly function as an interlinked metropolitan region. Many businesses serve the entire region. Large numbers of people commute within the region, for example, a large proportion of employed people who live in Wollongong, work in Sydney. The ports in Wollongong and Newcastle supplement Sydney's freight network.

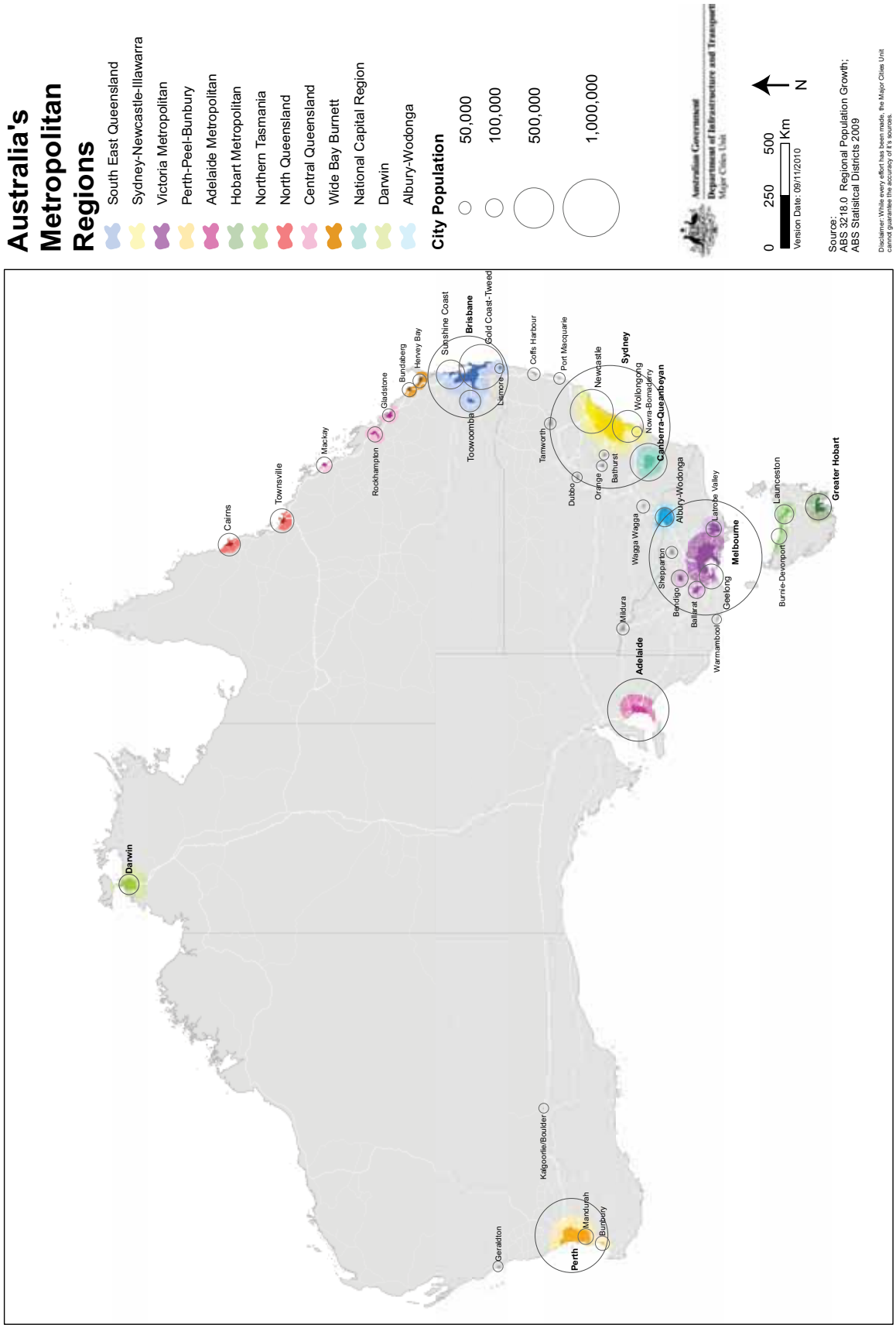
Similarly, Victoria's largest cities of Melbourne, Geelong, Latrobe, Ballarat and Bendigo increasingly operate as an interlinked system. Many people commute to Melbourne from Geelong, Bendigo, Ballarat and the Latrobe Valley. The Avalon Airport on the outskirts of Geelong operates as Melbourne's second airport for low-cost airlines.

The same points can be made about South East Queensland (including New South Wales northern rivers) and the Perth-Mandurah-Bunbury regions. In addition, many residents of Brisbane and Perth have second houses or spend time in seaside cities such as the Gold Coast and Sunshine Coast, or Mandurah respectively.

Regional cities also support each other in similar ways. Townsville acts as a large government, defence and mining industry base for North Queensland. Cairns is supported by this and acts as the major tourism base for the North Queensland region. Gladstone, Rockhampton and Mackay support the central Queensland economy by providing a base for agricultural, tourism, mining, metal production and manufacturing industries. These cities also house ports and airports to export goods and bring people to the area. The cities on the northern Tasmanian coast of Burnie-Devonport and Launceston form a grouping that plays a similar role for Tasmania's economy.

Regional groupings of high-growth regional centers are developing around Bundaberg and Hervey Bay in the Wide Bay Burnett region of Queensland and Port Macquarie on the mid north coast of New South Wales. With an increasing focus on lower cost jet air services, the airports of these cities are serving an expanding regional catchment. Similarly, the facilities and services that these cities provide attract people from the broader region.

Figure 9 Australia's metropolitan regions and regional centres (with populations greater than 30 000 people)



3.2 Managing future population growth and change

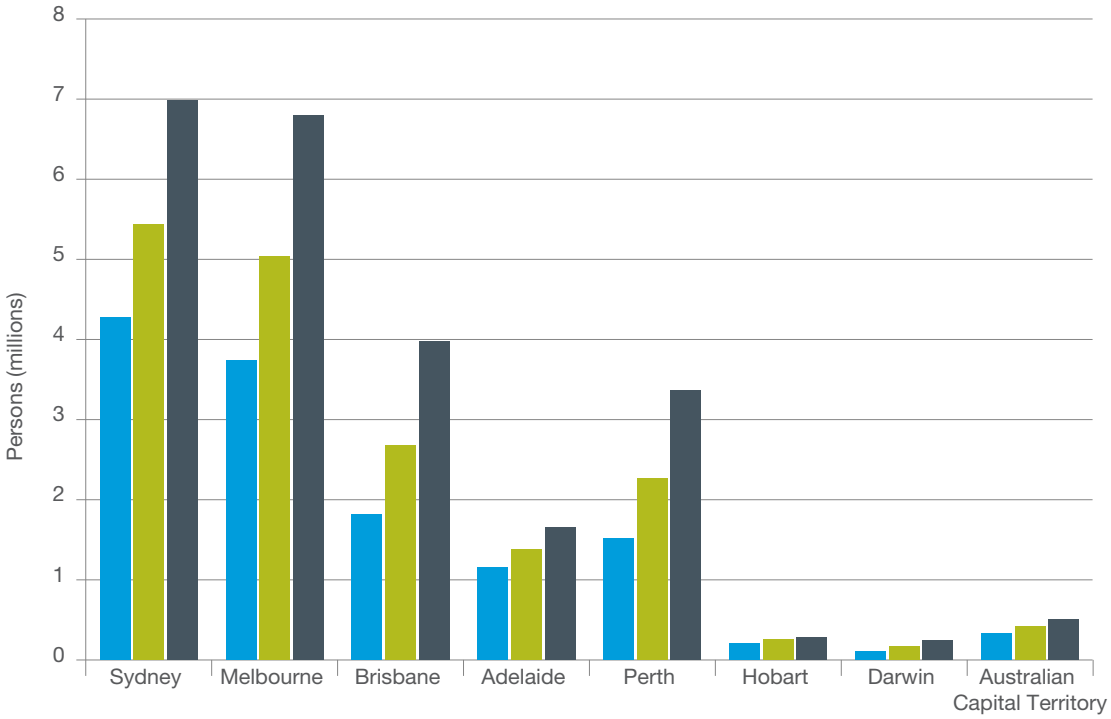
Although the percentage population growth rate over the next 40 years is projected to be less than it was for the past 40 years, it is still expected to be substantial. Australia is projected to reach a population of approximately 36 million by mid century as stated in the *2010 Intergenerational Report* (Treasury, 2010).

This will be the result of net overseas migration and an increase in the number of births, which is currently at a historical high. This follows the trend of rising fertility rates for the last six years after its long downward trend after the high growth period following the Second World War (Lattimore and Pobke 2008).

3.2.1 Population distribution

It is projected that the four largest capital cities, Sydney, Melbourne, Brisbane and Perth, are where most population growth will occur, as shown in Figure 10.

Figure 10 Population projections for capital cities, 2006–56



Source: ABS 2008a (ABS 2010)

The population projections affirm the dominance of our largest two cities, Sydney and Melbourne, which are projected to each nudge seven million people at mid century and the very significant growth anticipated for both Brisbane and Perth, which are each expected to more than double in size over this period.

Population growth is not evenly distributed. In our capital cities the inner-city areas, as well as outer metropolitan areas, have higher than average growth rates, while some middle suburbs currently have slower growth or even declining populations.

Many regional cities are also experiencing rapid growth (Figure 11 and Figure 12). These growing cities could also become major cities over time. Other regional cities, which have slower growth or even declining populations, may have the potential for a resurgent population.

There may be opportunities for taking some pressure off the major cities by providing for increased employment and housing growth in medium-sized regional cities (see Box 1). Such an approach would also contribute to the Government's commitment to regional Australia and support regional development in a strategic and coordinated manner, complementing the work of the Regional Development Australia committees.

BOX 1 Regional cities

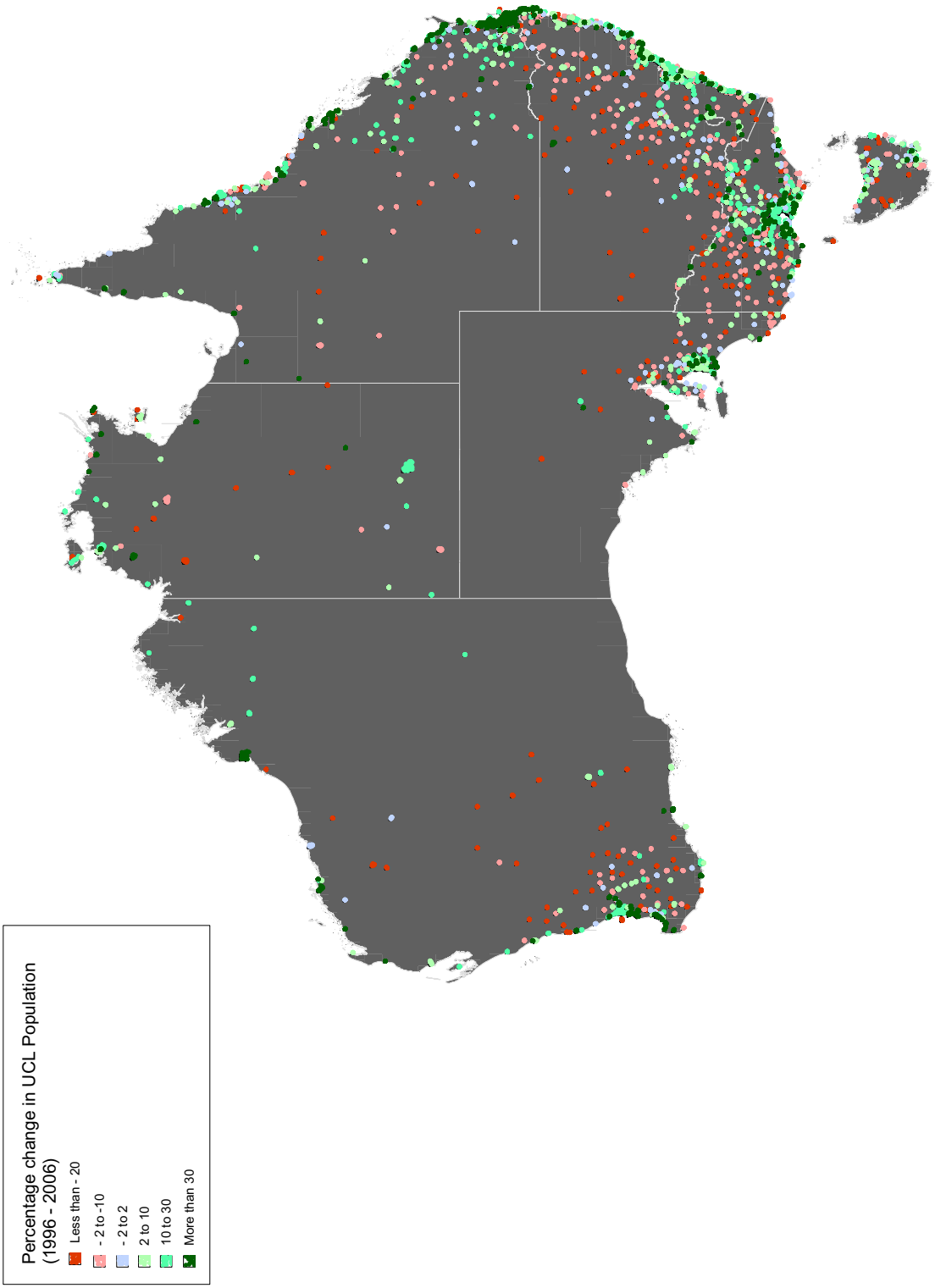
Many regional centres are experiencing positive jobs and population growth. They therefore need more homes to be built but are constrained by lack of funding for necessary supporting infrastructure. These constraints can limit regional employment growth and make housing less affordable for local home buyers.

The Australian Government announced, as a 2010 election commitment the establishment of the *Building Better Regional Cities Program*. The program is designed to support thriving regional cities by accommodating their growing communities and relieving population pressures in the capital cities.

The program will invest $200 million to provide participating councils with new funding for local infrastructure projects that will support the development of up to 15 000 more affordable homes over three years.

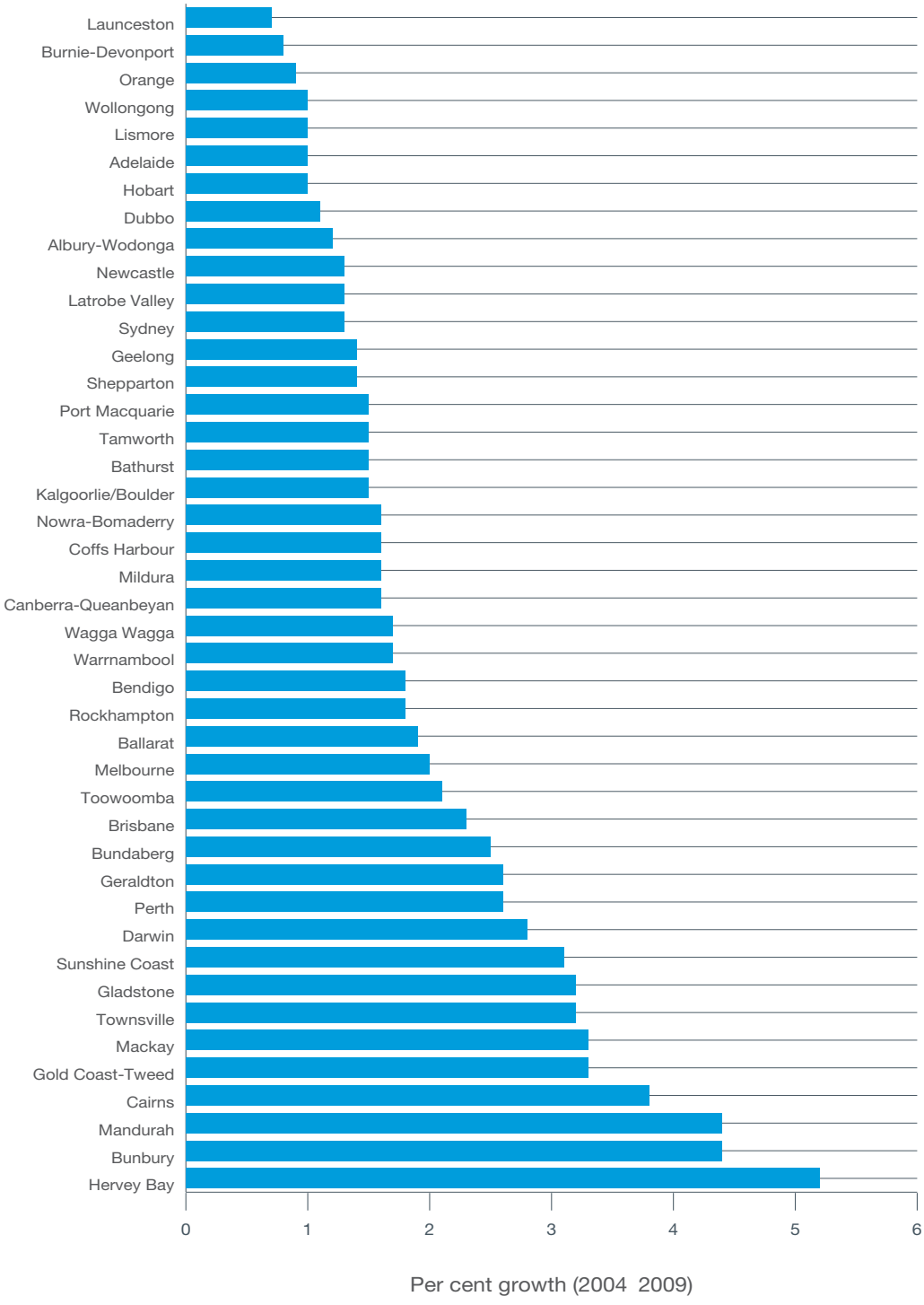
The capacity of regional cities to absorb greater populations and adequately provide more affordable housing will depend on how well resourced the cities are, or plan to be, to support their projected population growth.

Figure 11 Regional growth centres: red dots indicate declining populations, green and aqua dots indicate high rates of population growth



Source: BITRE analysis of ABS Census of Population and Housing 1996 and 2006 customised data on request, for urban centres and localities (UCLs)

Figure 12 Average annual population growth rates in Australian major and regional cities (2004–09)



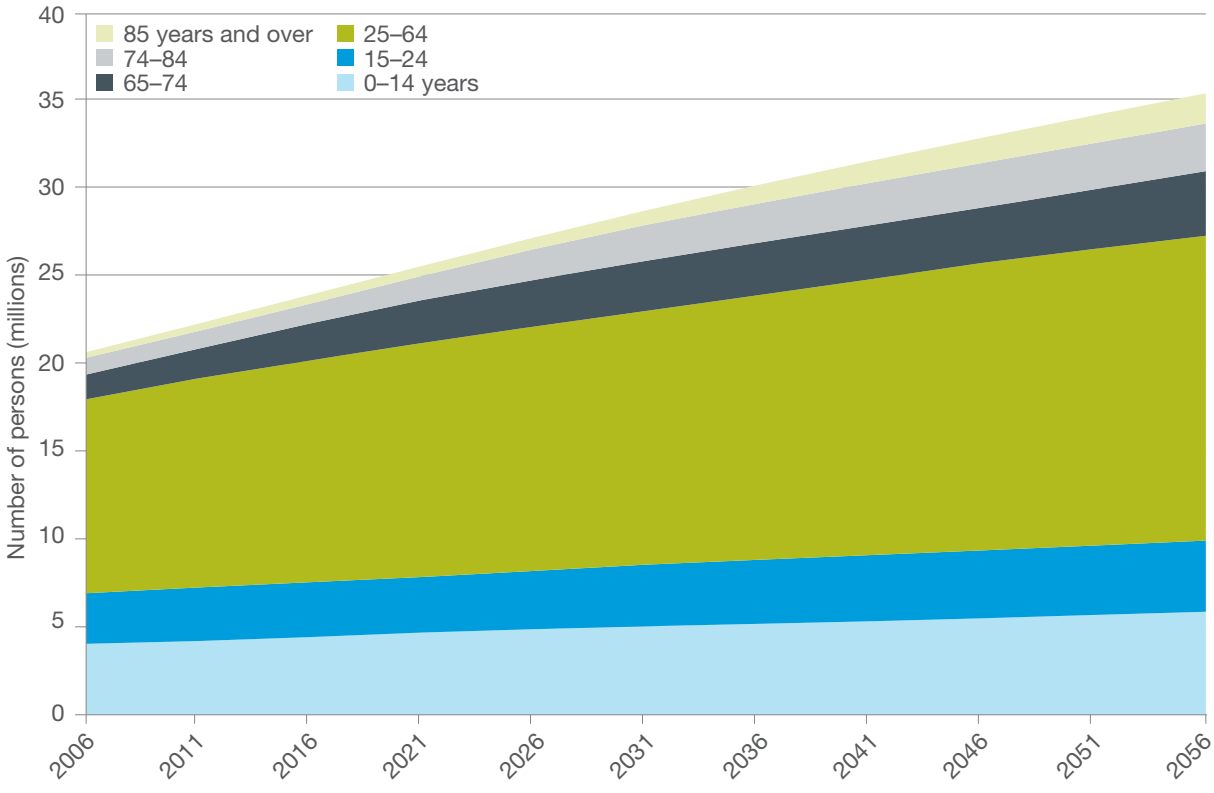
Source: ABS (2010)

3.2.2 Population ageing

Along with population growth, Australia is witnessing a rapid ageing of the population. Figure 13 illustrates the composition of the population growth by age structure over the next 40 years and shows the substantial increase expected in the number of older Australians alongside the proportionally much smaller increase in the number of younger people.

As highlighted in the *2010 Intergenerational Report* (Treasury 2010) this change in the population structure means there will be relatively fewer people of working age to support an increasing number of older Australians, and this poses a major challenge to national economic growth.

Figure 13 Population projections by age group in Australia



Source: ABS (2008a)

3.3 Changing patterns of urban development

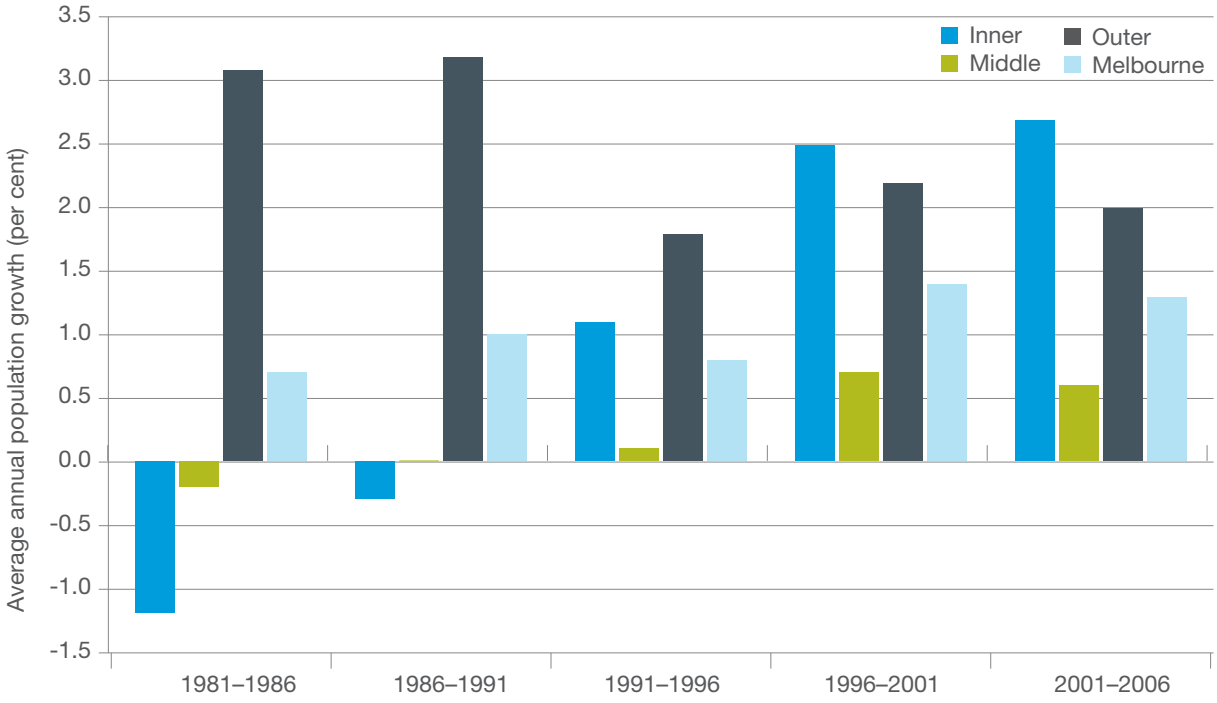
A noticeable adjustment has been added to the post-war trend of expanding residential development into new greenfield areas.

Over the last decade or two there has been increasing residential development in the CBDs and adjacent inner localities, at the same time as growth in outer metropolitan areas. This is most evident in the growth in Australia's largest capital cities, but is also clearly evident in the smaller cities.

The trend to inner-city living reflects changing preferences for dwellings and location—living closer to employment that is concentrated in central areas, having access to the diversity of experiences and amenity of the inner-city, and State and Local Government planning frameworks that encourage these 'infill' residential developments.

Figure 14 illustrates the shift in Melbourne from the declining inner sector population in the 1980s to solid growth in the 1990s, and the highest growth rate of all sectors between 2001 and 2006.

Figure 14 Average annual rate of population growth, Melbourne (1981–2006)



Source: BITRE analysis of DPCD (2008d) Suburbs in time—Suburbs in Melbourne

As a consequence of these trends there has been an increase in the densities in the largest cities, as shown in Table 2.

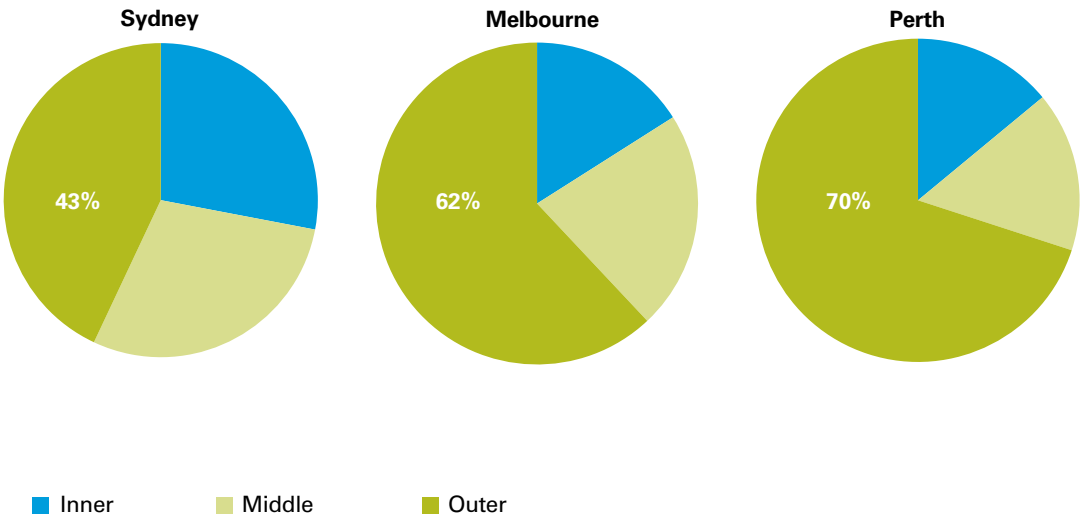
Table 2 Population statistics, three capital cities (2001–06)

Indicator	Sydney	Melbourne	Perth
Population 2006	4 281 988	3 743 015	1 519 513
Population change, 2001–06	+ 153 716	+ 271 390	+ 126 508
Rate of population growth, 2001–06	0.7%	1.5%	1.8%
Population density, 2006 (UCL)	2 036 per km^2	1 566 per km^2	1 258 per km^2
Change in population density, 2001–06	+13 per km^2	+35 per km^2	+23 per km^2

Source: BITRE (2010b) and BITRE analysis of ABS cat. no. 3218.0 data for statistical divisions (SDs) and Census of Population and Housing 2001 and 2006 data for urban centre localities (UCLs)

The trend towards urban consolidation was more pronounced in Sydney than in Melbourne or Perth between 2001 and 2006, with the inner and middle sectors accounting for a greater share of population growth in Sydney as shown in Figure 15. Population growth share of 'new growth areas' in Sydney, Melbourne and Perth was 24%, 51% and 62% respectively.

Figure 15 Urban growth by location, Sydney, Melbourne and Perth (2001–06)

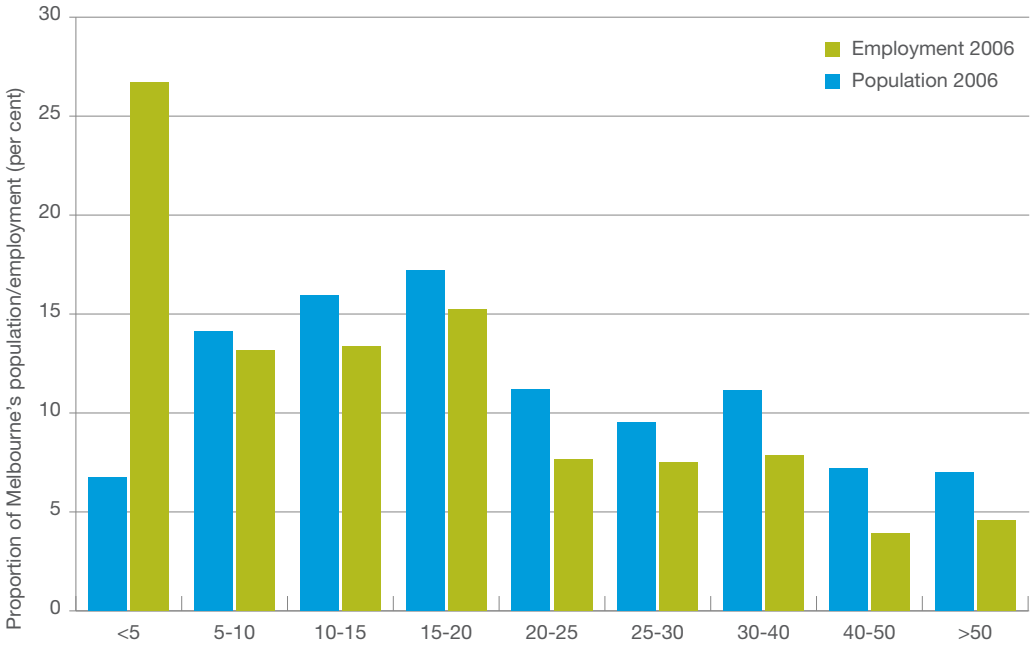


Source: BITRE (2010b) and BITRE analysis of ABS cat no. 3218.0 SLA data and Census of Population and Housing 2001 and 2006 data for suburbs.

Note: Based on capital city SDs, BITRE classified a suburb as a 'new growth area for the 2001 and 2006 period if it experienced very rapid and substantive growth in dwellings over the period. The specific criteria are detailed in BITRE 2010b p 44.

The shift in population growth reflects transitions of communities as households change through life stages. Suburbs which previously housed young families experience decreased population over time, as in the case with Melbourne's older suburbs, as children become adults and move to rental properties closer to education and work opportunities in the inner areas (Figure 16).

Figure 16 Proportion of population and employment located at various distances from Melbourne's city centre (2006)



Source: BITRE analysis of Census collection district CCD and destination zone DZ data from ABS 2001 and 2006 Census of Population and Housing.

3.4 Migration impacts on urban settlement

Migration to Australia has the potential to alter population dynamics, within and across cities and regions. In practice, almost 90% of new migrants settle in cities (Department of Immigration and Citizenship (DIAC) 2010). As a result of the series of waves of migration over the past half century our largest cities have been enriched by the cultural, religious and linguistic diversity of their migrant and humanitarian communities. In Sydney and Melbourne around a third of residents speak languages other than English at home.

The reasons for this are the resources and opportunities for employment that cities have to offer migrants in their quest to get established quickly and successfully.

Two trends are emerging, however. First, there is a slow drift of established migrants away from cities. Second, a greater share of recent arrivals are settling in regional Australia. Over the past decade the proportion of new migrant arrivals settling in regional Australia has increased to around 15%.

Both of these trends, however, are associated with the relationship between population and employment growth. It is not clear as to the direction of causality between the two. In some locations the demand for labour attracts population, while in other locations employment growth is generated by an influx of population.

It is notable, however, that during the period of rapid national employment growth, between 2001 and 2006, there was significant net outward movement from capital cities (-90 200 persons). There was also net outward movement from remote Australia (-28 200 persons), with other metropolitan (+53 600 persons) and coastal (+67 300 persons) areas the beneficiaries. Despite the net outward movement, population growth in cities was above the national average, something largely explained by high immigrant arrivals.

There is no inevitability in population projections, distribution or urban settlement patterns. Rather, there is a need for continual monitoring and evaluation of trends and research into causes and consequences so policies and plans can be adjusted to meet the changing needs and circumstances of populations.

Perth, WA

Chapter 4

Productive cities

Australia's productivity performance represents the most significant ongoing longer-term economic challenge facing the nation. Productivity is the key driver of economic growth and prosperity over the long term.

Productivity measures the efficiency with which labour and capital are combined to produce goods and services, and thus implicitly captures the effects of innovation, technological advances, organisational changes, new processes and the movement of factors of production. It reflects the diffusion and transmission of new information and communication technologies, as well as new products and the quality of labour.

Productivity growth contributes to the growth in per capita income. Such income growth and its distribution help families to provide for themselves, industries to grow, and governments to fund infrastructure and social services to support our communities.

Many factors contribute to productivity: skills of workforce; openness of economy and trade barrier liberalisation; micro-economic reforms; and workplace relations. Cities are centres of economic activity, where the workforce, industry and the institutions that support their activity are concentrated.

The locational distribution of the workforce and industry relative to each other, and the infrastructure that connects them and supports economic activity more generally, influences productivity. How efficiently our cities connect people, industries, business and markets, and how effectively their economic and human capital is utilised, affect the productivity performance of our cities and their contribution to national productivity growth.

There is a multi-faceted and wide-ranging interdependence between cities and regional Australia. Good connections between cities and with regions around Australia for freight, passenger, migration, service provision and business support, are as important to national productivity as connections within cities.

The Productivity Commission (1997) estimated that productivity growth in the 1990s accounted for about two-thirds of the increase in Australia's average real income of the previous three decades and about half of the increase in Australia's output. The Productivity Commission has pointed out that even relatively small increases in Australia's annual rate of productivity growth, if sustained, will make a substantial difference to future generations. It is important, therefore, that our cities are planned and managed to generate productivity growth.

The *2010 Intergenerational Report* (Treasury, 2010) illustrated that if productivity growth increased to an average of 2% per annum over the next 40 years, the economy would be over 15% larger, with gross domestic product (GDP) per person around $16,000 higher, than otherwise. However, such a growth rate would be one-quarter higher than the average experienced over the past 40 years. So the challenge is how, with an ageing population, productivity can continue to be improved.

4.1 Cities as centres of economic activity

Our cities play two distinct roles in increasing national productivity. Firstly, since the majority of national jobs and wealth comes from cities, cities have to be places that can house people as the labour base for economic growth. Secondly, cities are places of business, commerce and trade and have to operate efficiently to ensure the market economy can operate to maximum capability.

Whilst much recent attention has been directed to the trade and national income gains from the mining industry, it is notable that between 2001 and 2006, mining employment in Australia increased by only 31 716 jobs. In the major cities, employment growth was more than 625 000, nearly 20 times that of the mining industry. In Perth during the same period, employment in mining increased by more than 7000 people, nearly one-quarter of the entire Australian mining workforce increase. Even then, a large proportion of this mining workforce resided in Perth metropolitan area.

Australia's settlement pattern, though dispersed over a large continent, gives the nation some advantage. As the population is largely distributed across the five biggest cities, Australia does not rely on one metropolitan area to drive its economy. This creates multiple opportunities for economic growth.

In Australia, the services sector accounts for more than 75% of economic activity, 85% of employment and 20% of exports. The service sector is the fastest growing source of high-value jobs in the developed world, including Australia, contributing to an increasing share of GDP (ABS 2008c). Knowledge-based industries in Australia's major cities are propelling the growth in the service sector. Over the last decade, 75% of all Australian patents were sourced in capital cities, 54% from Sydney and Melbourne alone. In particular, 85% of high tech and information technology patents came from the capital cities (National Economics 2008).

In addition to the economic activity generated within the major cities through market action, global engagement, productivity and innovation, the cities also act as critical gateways for the products of their hinterlands and export markets.

Finally, the nature of Australia's major cities—with parks, open spaces, visual magnets like the Opera House and Federation Square, and sweeping landscapes along rivers and bays—makes them attractive to overseas visitors and skilled migrants. This generates significant foreign exchange earnings. More than 86% of all visitor nights of international visitors to Australia since 2000 were spent in major cities and, as a consequence, 90% of all expenditure by international visitors to Australia was generated in these cities, including 75% in the capital cities alone. Most significantly for economic growth, 87% of the time spent by international visitors to Australia for business purposes was spent in our major cities (Tourism Forecasting Committee 2010).

As the global face of Australia, these major cities reflect a true cultural diversity. Despite having only 75% of the resident population, the country's major cities are home to 89% of those born overseas. Nearly 30% of city residents were born overseas compared to just 10% in the rest of Australia. A total of 93% of new arrivals (within last decade) reside in the major cities. In consequence, more than 93% of Australians who speak another language live in the major cities. Overall, more than 20% of major city residents speak another language, compared to less than 5% in the rest of Australia (Australian Government 2010a). Thus, the major cities are the locus for Australia's economic and social interaction with the rest of the world.

Significantly, given our Asian regional location, and the rise of East and South Asia as centres of the global economy (particularly China and India) it is notable that nearly 7% of city residents specifically speak an Asian language, compared to only 0.6% of those residing in the rest of Australia (ABS 2006). Australia's cultural diversity offers our economy a competitive advantage in dealing with Asia. As a gateway to Asia, our skills and languages mix offers an opportunity to better utilise our diverse population for productive benefit of Australia.

4.2 Productivity performance

There are difficulties in measuring productivity, particularly services, and thus international comparisons of productivity performance are often subject to interpretation.

In assessing Australia's long-term rate of productivity growth during the productivity surge in the 1990s (Table 3), the Productivity Commission concluded that:

> *Australia's long-term rate of productivity growth has been below potential. Over the second half of the twentieth century, Australia does not appear to have kept up with global productivity trends. Australia had one of the slowest rates of productivity growth among OECD countries.*
> *(Productivity Commission 1997, 9)*

Table 3 Labour productivity—annual average growth rate (percentage)

	Australia	Organisation for Economic Cooperation and Development (OECD)a	European Union (EU) 15b	United States	Canada	New Zealand
1960–1970	3.1	4.6	5.4	2.6	2.8	1.9
1970–1980	1.8	2.9	3.8	1.6	1.4	0.8
1980–1990	1.1	2.0	2.1	1.4	1.0	2.1
1990–2000	2.3	1.9	1.9	1.6	1.7	1.2
2000–2007	1.7	1.7	1.2	2.0	1.2	1.3

a OECD is an aggregate of the 24 longest standing member countries.

b EU 15 is an aggregate of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and the United Kingdom.

Data source: Calculations are based on The Conference Board and Groningen Growth and Development Centre, total economy database, September 2008.: <http://www.pc.gov.au/research/productivity/estimates-trends/international-comparisons>, accessed 12 May 2010.

4.2.1 Multifactor productivity

While much attention is assigned to labour productivity—the output per hour worked—because of its connection to standards of living, of particular relevance here is the more technical concept of 'multifactor productivity' (MFP), which reflects the interaction of labour and capital.

MFP measures the amount of output obtained from combined units of capital and labour and as such represents the most comprehensive measure of productivity. Examples of MFP growth include improved production techniques, better management practices and organisational change.

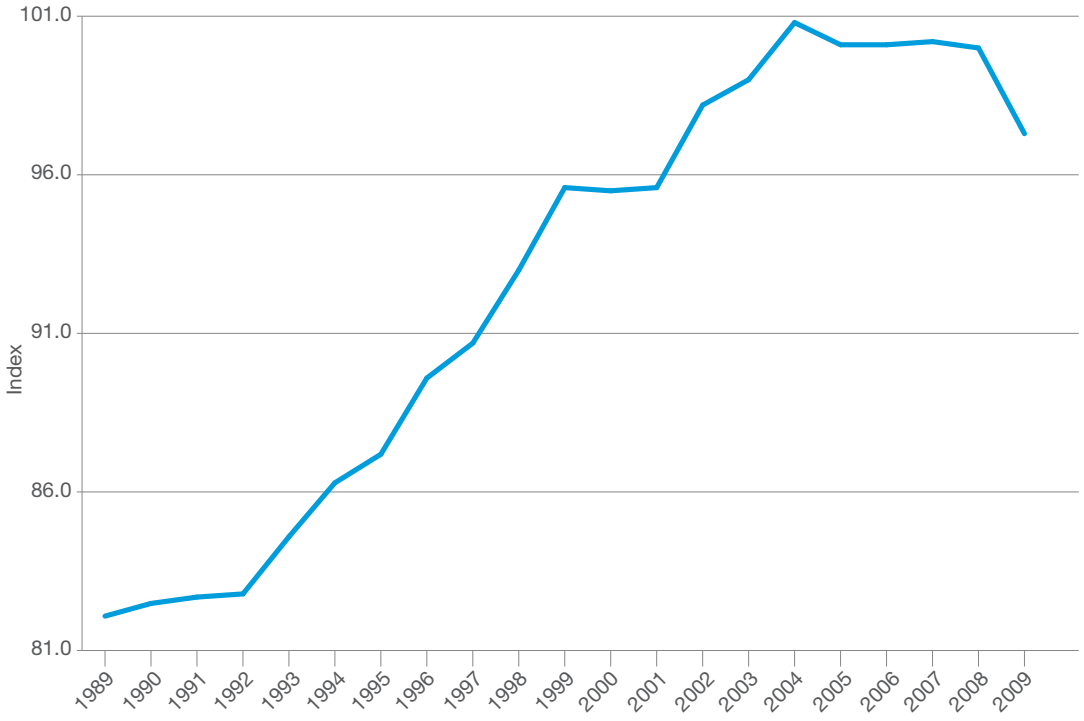
According to the Productivity Commission (2009), over the last four decades, annual MFP growth in the 'market sector' of Australia's economy has averaged 1.1%. This places Australia below the middle of Organisation of Economic and Cultural Development rankings over the period.

Although this is only a fair performance, comparatively, over the four decades, MFP growth has accounted for just over 35% of GDP (real income) growth, taking into account the growth in labour and capital (Productivity Commission 2009: xi).

From 1970 to 1994, Australia's rate of MFP growth was about 20% below the average of member countries of the OECD. It was only just on a par with that of the United States (which, as the productivity leader, had less opportunity for high productivity growth). It was 40% below the average of other Group of 7 countries and over 50% below the average of smaller OECD countries (Productivity Commission, 1997: 13)

Notably, though, during the 1990s, Australia's annual MFP growth rate rose far more rapidly. Over the period 1993–94 to 1998–99, it averaged 2.3%, more than twice the long-term average rate of 1.1%. Australia's international ranking rose from 12th to second amongst key OECD nations. In the subsequent period to 2003–04, this rate was not sustained and the average MFP returned to its long-term 1.1% average.

Figure 17 Australia's multifactor productivity index, 1989 to 2009



Source ABS 2010c

Of greater concern is the fact that since 2003–04 the average declined further. According to the Productivity Commission, in the current partially completed productivity cycle since 2003–04 it has averaged -0.2%. (Productivity Commission, 2009: xiii). Given the aspiration target of 2% growth to meet the challenges posed by the 2010 Intergenerational Report, this represents a significant cause for concern. In 2007–08, labour productivity (output per hour worked) in Australia's 'market sector' increased by only 1.1%, while MFP fell by 0.4%. In 2008–09, labour productivity was unchanged but MFP declined to 2.8%.

Analysis by the Productivity Commission (2010) showed that the three sectors that collectively had a large impact on recent MFP trends were mining; agriculture, forestry and fishing; and electricity, gas, water and waste services.

Negative average annual growth in mining (-4.2%) in the most recent complete cycle, 2003–04 to 2007–08, was associated with ongoing decline in the quality and accessibility of mineral coupled with the recent boom in the demand for, and associated rise in the price of, certain mineral resources. This led to less efficient, but now profitable, short-term production opportunities being taken up. It also has led to lower measured productivity, but higher profits and gross domestic income.

Exceptionally low rainfall years of 2002–03 and 2006–07, on top of generally low rainfall and reduced rate of runoff per unit of rainfall since the turn of the century, has had a significant effect on MFP growth in agriculture, forestry and fishing.

In the most recent cycle, 2003–04 to 2007–08, average annual MFP growth in agriculture, forestry and fishing was been -1.2%. This outcome was a direct consequence of the severe drought induced fall in the sector's value added of 15.3% in 2006–07, with MFP growth of -17.1% in that year.

Electricity, gas, water and waste services is the other sector that has exhibited strong declines in MFP since 1998–99. This was one of the sectors that exhibited the largest productivity gains from the economic reforms in the 1980s and 1990s. These gains have since gradually declined to the lowest MFP growth in the most recent cycle, at -4.4%. The combined effects of Australia's growing population, increasing demand for energy consumption, and (recently) less reliable rainfall are giving rise to significant increases in the demand for capital (and labour) inputs in this sector, with gross fixed capital formation (chain volume measure) in 2007–08 almost twice that in 2003–04 and almost four times that in 1995–96. As the Productivity Commission noted:

> … once the influence of these three 'special' sectors is removed from the market sector aggregate, average annual MFP growth in the 2003–04 to 2007–08 cycle rises to 0.8% (compared with -0.2% for the full market sector)—a full 1 percentage point per year higher, and equal to the long-term average. Commission estimates indicate that these three sectors accounted for almost 80% of the recent decline in MFP growth relative to the 1998–99 to 2003–04 cycle (2010, 68).

Overseas studies suggest that the Australian business service sector has an internationally comparatively high level of MFP although data is not separately published for business services industries by the ABS, just the total 'market sector' (ABS 2009). However, most recently a World Economic Forum report—The Global Competitiveness Report 2010–11—showed that Australia had slipped in its ranking by one place and suggested that the sophistication of businesses and capacity for innovation here could be improved (World Economic Forum 2010).

4.3 Performance of Australia's cities

Calculations show that in the five years from 2001 to 2006, Australia's major cities contributed 84% to the growth of the national economy, with the capital cities contributing 75% of this total. This was accompanied by an 81% share of the employment growth over this period.

4.3.1 Decline in economic growth relative contribution

There are, however, indications that the major cities may be losing their edge in contributing to economic growth.

Over the 33-year period from 1976 to 2009, the major cities recorded economic growth that was, on average, 0.201% greater than the national average. This was largely concentrated in the larger capital cities, which recorded a 'premium' of 0.212%. Though not quite as large as the capital city contribution, regional cities have still recorded an above-national, long-term growth of 0.114%. However, over the past decade, the contribution of the major cities has resulted in an average economic growth of only 0.037% more than the national average.

For the capital cities this had fallen to 0.049%; for the regional cities, this had declined such that they averaged 0.054% less than the national average (most likely due to the drought in many regions during the period). This result may have occurred because of events in the past decade that affected the industry specialisation of cities, such as the early impact of the recent global financial crisis (ABS 2009 and ABS 2006 or more details see The State of Australian Cities Report (Australian Government 2010a) pp 52-53).

However, other contributing factors may have included increased inefficiencies and productivity losses arising from transport congestion affecting the movement of freight, and the costs associated with the provision of services such as water, power and waste associated with the growth of cities.

It is notable that the decline in relative contribution of the cities occurred simultaneously with the decline in national productivity.

As a result of recognition of the increasing economic importance of cities in national and international trade national governments in the United Kingdom, and Europe, and more recently in North America have become explicitly re-engaged with the cities to achieve national economic objectives. In Asia, historically cities have had a much higher involvement with national governments in supporting the objectives of those national governments in formal and informal governance arrangements.

4.4 Cities and productivity

Whilst cities are the canvass of economic interaction on which productivity trends manifest themselves, they can also be the paintbrush that can affect productivity. The reason for this is that cities as economic entities add competitive value to the businesses located within them. Cities can provide benefits to business through efficient connectivity, referring to how easily people and businesses can interact with one another. Connectivity for productivity is related to ability for businesses to access labour, resources, markets and business services. Cities, particularly large cities generally have abundant skilled and specialised labour, and the capacity to attract such labour.

There is an important two-way relationship between cities and the businesses located within them. Increasingly businesses need to be globally competitive. To do so businesses require efficient connections with centres of activity through transport, freight systems and communications. To realise their growth potential, businesses also need to access innovation, skilled labour markets and research and financial services that cities are largely concentrated in cities.

Through agglomeration economies—that is, the benefits that result from the clustering of activities—and flow-on effects of innovation and specialisation, cities achieve a considerable productivity premium. This may be enhanced through strategic management of skills development and investment in amenity; and cost-effectively delivered in cities through integration of land-use, transport and infrastructure provision.

These external benefits to businesses imparted by cities come from an amalgam of agglomeration economies (economies of scale; city size); localisation economies (clusters of activities linked by supply chain or competitiveness); and specialisation economies (complementarities and inter-firm synergies).

However, if cities impart productivity benefits to businesses in the market through externalities (that is, impacts on a business of economic activity that the businesses themselves are not directly involved in) and agglomeration economies, then equally when those cities do not function as efficiently, they have the potential to also reduce or even detract from overall national productivity performance.

If governments working together in partnership can obtain productivity improvements to city economies then, given their significance to the national economy, it is possible that significant gains to national productivity could also ensue.

At a recent speech to the conference on the Economics of Infrastructure in a Globalised World, held in Sydney in March 2010, the Secretary of the Australian Government's Treasury, Ken Henry, succinctly summarised this argument in the following terms:

> Cities have emerged as the dominant form of social organisation simply because concentrated areas of population are significantly beneficial in terms of productivity and the delivery of welfare. These benefits arise from a range of agglomeration economies: as businesses locate in close proximity to one another, they are able to share knowledge and labour inputs while also residing close to businesses and individuals to whom they sell products, resulting in high levels of specialisation that can promote productivity growth.
>
> A greater degree of specialisation creates higher levels of wealth, higher incomes and increases the range of goods and services available to consumers by promoting a more efficient organisation of production. The concentration of population and wealth in cities facilitates the emergence of cultural and educational institutions while improving efficiency in the delivery of government services. There are also benefits for infrastructure provision in cities through economies of scale and economies of density—at least up to some point.
>
> It would be prudent to ask whether there is a "productivity dividend" to be gained from a more efficient distribution of Australia's population, and further, whether there might be an accompanying urban amenity dividend to be realised through improved organisation, and possibly higher densities, of Australia's cities.

The Secretary then concluded:

> Getting it right with cities and infrastructure has significant potential, not just from a pure economic perspective, but also from a social and environmental sustainability perspective. Getting it wrong is likely to be very costly socially and environmentally. It is easy to observe some undesirable outcomes already manifest in some Australian cities, with inadequate infrastructure and chronic congestion.

4.5 Competitive cities in a globalised economy

As the world becomes more urbanised and the economy more globalised, trade inevitably is less from nation-to-nation and more from city-to-city. Through agglomeration economies and ancillary effects on innovation and specialisation, cities achieve a productivity premium which is considerable and may be expanded through strategic management regarding land use, skills, amenity and infrastructure. Importantly, Australian cities have a competitive advantage in attracting scarce globally skilled labour, harnessing creativity and innovation, and enhancing their liveability as places to live, visit and do business.

This raises the possible need for specific city-based strategies to optimise the productivity benefits of Australia, encompassing infrastructure, connectivity, urban form and human capital components.

At a more localised level, a recent study of the Brisbane Technology Park conducted for the Queensland Department of Employment Economic Development and Innovation (Pracsys 2009) demonstrates a high-level of innovative behaviour at Brisbane Technology Park, as measured by patent applications in a number of areas, including fine organic chemicals, medical engineering, pharmaceuticals, materials processing, instrumentation and biotechnology. Patent activity was considerably higher than both Queensland and Australian industry averages. This resulted, in part, in higher levels of productivity compared to the average for Australia's economy and a much higher level of export value per worker compared to the rest of Australia.

4.5.1 Diseconomies of scale

Cities require less fixed infrastructure per capita relative to rural areas because of the economies of scale that accompany infrastructure networks in cities. Still, increasing population density can lead to significant congestion costs that offset the benefits of these economies of scale. These effects are often most acutely felt in road transport infrastructure, but can also occur in electricity and communications infrastructure.

The Treasury, Intergenerational Report 2010, page 33

The increased concentration of activity can, however, also have significant downsides.

Unless supported by a transport system that facilitates good connectivity increased congestion can occur. Where the location of economic activities and requirements, like the workforce, customers, suppliers and distribution chains, are not in line with existing transport system, then potential locational economies can become diseconomies. This also applies to connectivity through information systems, requiring upgrading to enable productivity to be sustained, hence the Australian Government's investment in the National Broadband Network (NBN).

4.6 Connectivity

While connectivity refers to how easily people and businesses can interact with one another, a more connected city does not necessarily mean a more mobile city. For example, advances in information and communications technology have changed the way business is conducted, and will continue to improve efficiency in almost all sectors of the Australian economy. Likewise, connectivity within cities can also be achieved by placing people closer to the jobs, facilities, goods and services they desire—or putting these closer to where people live. This highlights the important role of integrated land-use and infrastructure planning in managing the need for physical travel.

Infrastructure Australia, the Australian Government's adviser on infrastructure needs, has identified transforming our cities; as one of its key themes. Infrastructure Australia has been working to progress issues where existing policy can support a cities' agenda with a major focus on urban transport.

Ports and freight are, one of the most pressing current transport concerns in Australia, with the handling of freight impacting on every major city in Australia, including on their roads, rail and public transport. These concerns are considered to be of national significance.

Freight networks should effectively connect freight nodes, the most important of which are seaports. Container ports and major airports are, by their nature, located in major cities and therefore there is a strong link between freight policy and metropolitan planning, particularly in areas surrounding the ports, as well as associated landside logistics operators and transport routes. For this reason, Infrastructure Australia is currently developing a national ports policy and a national freight network plan.

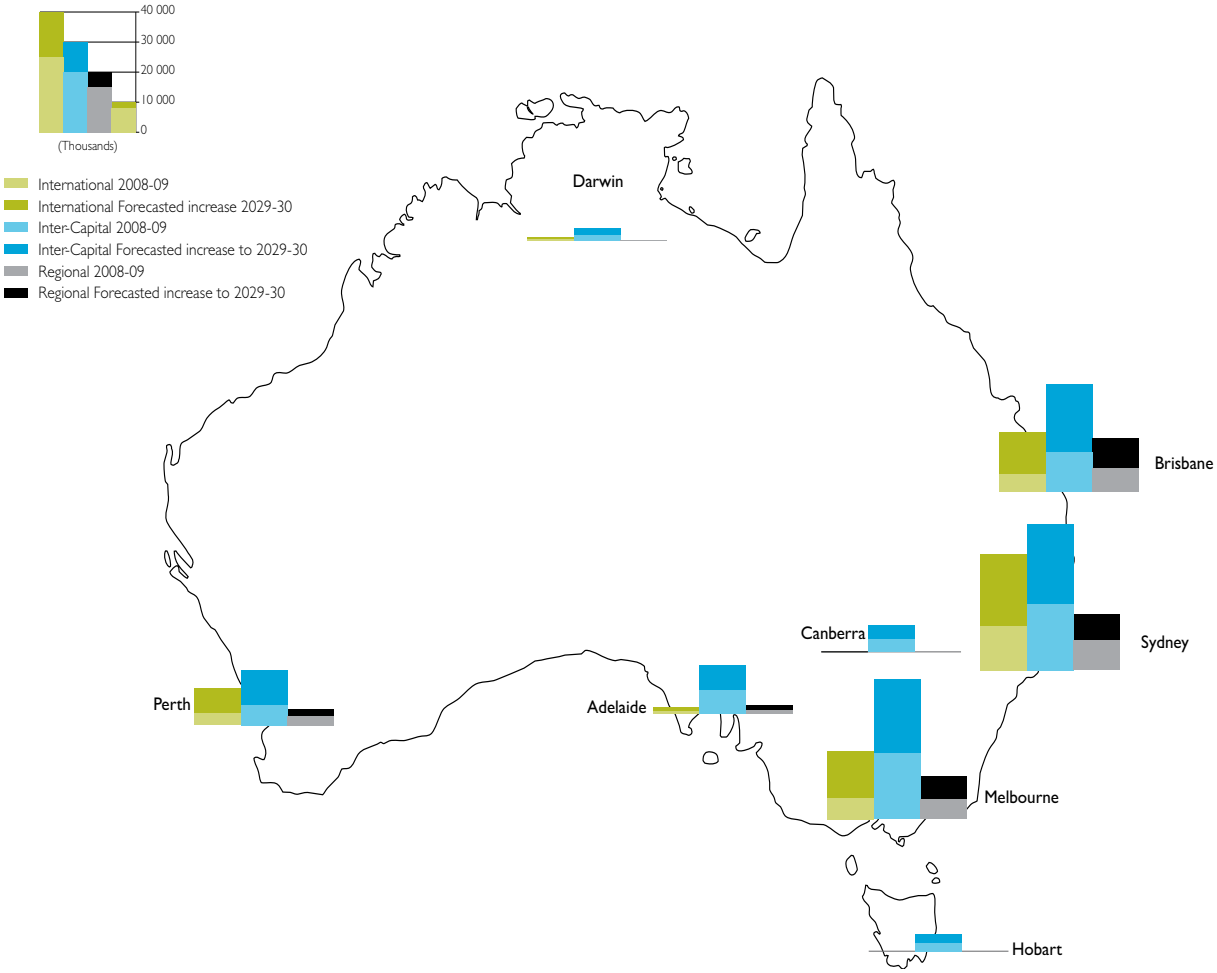
4.6.1 Improving connectivity between cities

Flows of people and freight between our cities are growing and rapidly placing pressure on the capacity of air, road and rail infrastructure.

Air and car, the largest modes of transportation, are projected to grow, on average, by 3.5 and 2.4% a year. Inter-regional passenger travel between major cities is projected to grow by 2.8% a year between 2005 and 2030—a doubling over 25 years illustrated in Figure 18 for air passengers.

The projected growth in air travel places airports at the core of intercity and intracity connectivity and the relationship with surrounding landuses a major determinant of efficiency of flows of freight and passengers. The Australian Government has already demonstrated its commitment to the development of the aviation industry through the 2009 release of the National Aviation White Paper (Department of Infrastructure and Transport, 2009). This represents the first every comprehensive aviation policy statement issued by an Australian Government, bringing together all strands of aviation policy, including land use planning matters related to airports. It provides planning, regulatory and investment certainty for the aviation industry out to 2020 and beyond.

Figure 18 Air passengers in capital cities



Source: BITRE 2010a

Inter-regional freight movements between major cities are projected to also grow by 2.8% a year, in tonnage terms, again a doubling over 25 years. Road is the dominant transport mode for intercity freight, projected to grow by 3.3% a year while intercity rail freight is projected to grow by 1.9% a year (BITRE 2010b).

In the context of the growth in interstate passenger and freight travel between the largest capital cities, the Australian Government has committed $20 million to undertake a strategic implementation study for a high speed rail network along the east coast between Brisbane and Melbourne.

High speed trains were first established in Europe around 30 years ago, but are now well-advanced in Europe and Japan. High speed rail is now expanding rapidly, most recently in the United Kingdom, the United States of America and in China where new state of the art high speed rail networks to service major cities are being built.

European experience shows that high speed rail can offer good accessibility for communities and the potential to generate economic activity in outlying areas (European Union 2009) but they require special trains, dedicated tracks and networks, and modern signalling systems capable of serving the network and therefore are very costly. High-speed trains include those operating on 'conventional' track (at speeds of up to 225 km/h) and those operating on 'dedicated high-speed' track (at speeds of 250-350 km/h).

The Australian Government has committed to a strategic study on the implementation of high speed rail (HSR) on the east coast of Australia. The high speed rail study will identify possible undeveloped land corridors and/or existing corridors to support a high speed railway network and establish high-level estimates of construction cost. It will undertake investigations in targeted areas to determine the need for tunnelling or alternative corridor alignments. The study will assess viability of the project in the context of public and private financing options and of possible economic returns. It will identify the level of patronage that would be compatible with an economically-competitive and viable project and survey potential travel patterns to help inform station location options and market analysis on the relative value of city centre and other city rail terminals, including possible links to airports. The study is expected to be completed in 2012.

4.6.2 Improving connectivity within cities

Connectivity between cities and connectivity within cities are equally important for both people and freight. Flows of supplies to businesses and products to consumers, information and services, residents and visitors traverse our cities as they do between them.

Creating better connections within cities requires a range of actions that are directed towards:

- reducing congestion
- improving urban transport systems
- integrating strategic land-use and infrastructure planning
- using infrastructure more effectively
- expanding telecommunications networks.

Urban transport networks and services are at the heart of physical connectivity in the cities. Information and communications technologies and systems determine the connectivity of ideas and innovation. To be globally competitive, cities require both systems to be optimally efficient.

4.6.3 Urban passenger transport

In creating better connectivity within cities, a key challenge is to reduce dependence on motor vehicles while maintaining access between and within locations. In overcoming this conflict, the Australian Government recognises that it has a role, working with State and Territories, in investing in major mass transit systems, identifying and protecting new transport corridors and supporting means to shift from private vehicles to public transport.

Improvements in urban transport, delivered to the community, would positively and visibly impact on all of these goals. It is clear that there is substantial opportunity to change urban transport for the better throughout Australia. The need for change is becoming increasingly urgent.

The Australian Government understands the community's interests and concerns in urban transport performance that the current performance of urban transport needs to be improved.

As transport responds to patterns of population and industry, there is a strong association between transport and land-use planning. However, it also is true that the impact of land-use planning on transport is slow. While reform is essential, changes in travel patterns resulting from improved urban planning require long term planning and commitment. Moreover, it is possible to improve the efficiency and effectiveness of the response of transport to patterns of population and industry. While urban land-use planning has a significant long-term role in addressing the transport challenge, a transformation in our transport systems is urgently needed.

The Australian Government intends to focus on three basic deficiencies in urban transport in Australia—congestion, lack of accessibility and lack of transparency in reporting of transport systems performance.

4.6.4 Reducing road congestion

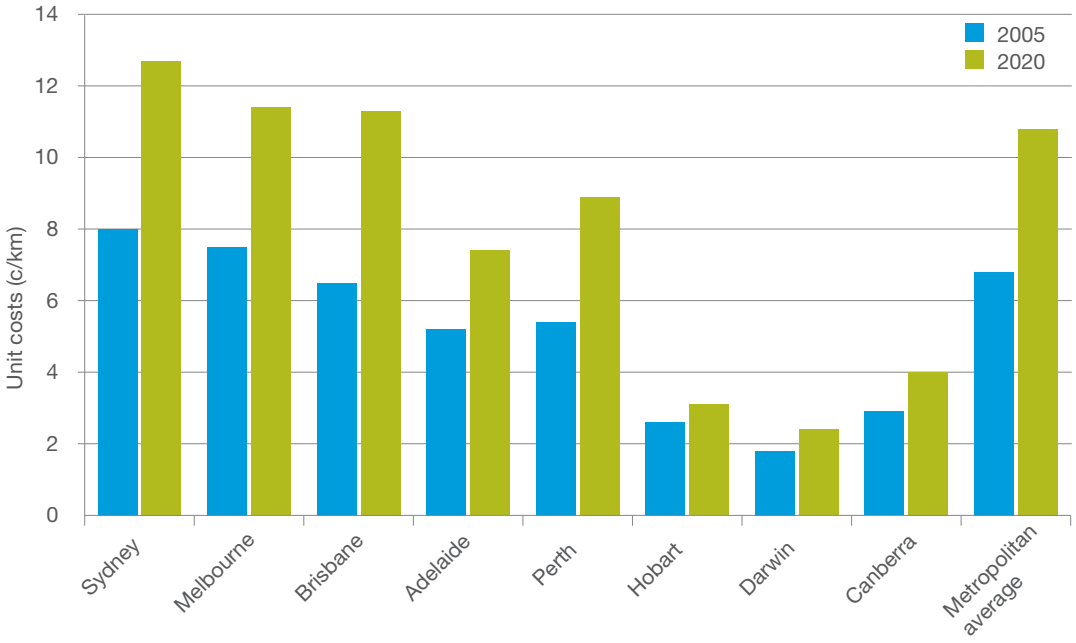
The first deficiency is congestion, which is felt by almost every city resident every day and impacts on the quality of life and limits family and social time. Congestion impacts severely on productivity, adding to the costs of providing services and moving goods in Australia. Road congestion is one important area where the capacity and efficiency of infrastructure affects productivity in Australia's cities

The outward expansion of Australia's cities over the past 50 years has been supported much more by the construction of roads than by investment in public transport. Whilst there are continuing calls for the States and Territories and the Australian Government to fund more roads to alleviate growing congestion problems, of itself this will only lead to further congestion in the long run. The work of Infrastructure Australia points to the need to change the current model of urban growth and road investment as it has been implemented over the previous half century.

On present trends the cost of urban traffic congestion is projected to increase significantly. The projection will rise to $20.4 billion a year by 2020 according to base case projections (BITRE 2007).

This economic cost is over and above other externalities, such as the social costs to households in time not spent with family, friends, exercise and other leisure activities. The projected cost of congestion, when analysed at a city level, as shown in Figure 19, reveals that our larger cities, which are also the fastest growing, will bear the greatest costs of congestion.

Figure 19 Average unit costs of congestion for Australian metropolitan areas



Source BTRE (2007)

The report by the Australian Treasury on the review of the tax and transfer system Australia's Future Tax System (Treasury 2009) notes that the typical costs associated with congestion include travel delays, variable travel times (unreliability), higher vehicle operating costs (including higher rates of fuel consumption), reduced productivity, increased driver and passenger stress, additional greenhouse gas emissions, poorer urban environment and air quality (as vehicles under congested conditions emit more pollutants than vehicles under free-flow conditions) and, as a consequence, higher health costs.

Congestion cannot be solved simply by indiscriminate road building. A mix of policies is needed to address congestion at the city-wide level, including adopting new approaches to freight, spreading of peak flows, locations and times, creating better network design and ensuring greater use of rail and improved public transport.

For households and individuals, congestion costs can be reduced by travelling at different times of the day, by taking a different route, by choosing to catch a bus or train, to cycle or walk, to share a private car or taxi, or by using the telephone or internet instead.

4.6.5 Flexible work arrangements

Congestion is largely about peak hours and road use by cars, especially on routes to city centres. One way to reduce road congestion is to 'spread the peak'—reduce the need to travel at peak times by using communication technologies for work, education and to conduct business. Another way is to adopt flexible work flexible hours, so workers can avoid peak traffic times. A recent pilot study of a flexible workplace program with 900 workers in Brisbane's CBD resulted in more than 30% of commuters travelling out of the morning and afternoon travel peak hours (Cleary et al. 2010).

The Australian workforce has changed dramatically in the past 40 years with the rapid increase in women's participation since the 1970s and an increased proportion of employees working part-time work or casual hours. Whilst many people have the benefit of flexible working arrangements, the ABS survey of working time arrangements (ABS 2010) showed that 58% of employees did not have a say in their start and finish times and only 39% were able to work extra hours in order to take time off.

More flexible working arrangements has productivity dividends for businesses beyond reduced congestion. In today's competitive business environment, employees seek jobs that not only offer financial security, but that offer autonomy, meaning and the opportunity for development and advancement. Employees want time to pursue personal interests and enjoy time outside of the workplace.

The multinational information technology company, IBM is good example of a company that has responded to the changing needs of its workforce. It has created a supportive, flexible work environment in which employees have flexibility to work from home by telecommuting and choosing their hours. Implementing these flexible employment practices has resulted in the retention of experienced workers for longer, while maintaining high levels of productivity and a positive environment for everyone.

For example, our investment in the Kwinana Freeway in Perth to install advanced technologies like variable speed limits and real time lane management systems – to optimise traffic flows, improve road safety and reduce emissions.

4.6.6 Improving accessibility by public transport

The second area for improving urban transport in our cities is to focus on accessibility to jobs and community facilities.

As already noted in Chapter 2, Australian cities, particularly post-war cities, have been planned and funded on the basis that the direct and indirect costs of motor vehicles will remain stable. However, when the full economic costs of motor vehicle use are not reflected in the structure and level of prices, such planning may be based on flawed assumptions. As a result, some areas in our cities have inadequate public transport services and, therefore, have less accessibility to jobs and services. Further, for many urban residents, the services that are available are not convenient or relevant. This is especially the case in the outer suburbs of most cities, in the largest regional centres and especially outside of peak hours. Accessibility is discussed in more detail in Chapter 6.

4.6.7 Improving reporting of urban transport performance

A third issue for improving urban transport is to provide greater transparency in reporting to the public on urban transport performance.

Because urban transport affects nearly everyone, adequate public reporting is one way governments can influence transport organisations to lift their game. Such public reporting is fundamental to identifying, assessing and justifying urban transport projects. It is essential to generate the community trust that underpins the necessary investments and changes in urban transport.

4.7 Communications

If rail and roads are the symbols of connectivity in previous centuries, today it is the convergence of information and communications in high-speed, accessible infrastructure.

It has been observed that, just as the flow of goods into ports and rail yards made them key points of production and distribution in the industrial age, the flow of information will determine the future of cities (Townsend 1997).

The Internet is being integrated into the financial, marketing, information and communication strategies of every major corporation, education or political institution, community or government agency.

In 1998, only 6% of businesses had a web presence. By 2003 this had increased to 23% and in 2008, it had reached 36%. Whilst an Internet web presence has almost doubled for large corporations to almost universal applicability, the growth of a web presence has been particularly strong for smaller businesses. For businesses with between five and nine employees, web presence increased from 8% to 48% in the last decade.

Nearly a quarter of businesses can now receive orders over the Internet and 43% place orders on the Internet. Significantly, between a quarter and a third use the Internet for information gathering or research, which they use to assess or modify their range of products, services, processes or methods. These businesses also use information and research to monitor competitors and develop new and improved products, services, processes or methods.

The Internet also has the ability to dramatically alter future work practices. Already 39% of businesses have Internet capability to allow work from home. This is in addition to the growth in home-work businesses. Eight per cent can use the Internet for on-line banking, invoicing and making payments.

Critical to this is connectivity to the web is the capacity to carry the information load required without delays in access or transmission—that is, the capacity of the information highway.

While some businesses are increasingly gaining access to high-bandwidth connections through dedicated services, this has a high-access cost attached to it. Most users are constrained by low and slow bandwidth.

For a city and its residents to compete globally in a world dominated by rapid flows of information, the infrastructure connecting the city to the commercial telecommunications network must be able to meet current and future requirements. This warrants dramatically increasing bandwidth by:

- increasing capacity
- upgrading to a higher bandwidth infrastructure
- developing technologies that squeeze more bandwidth out of existing infrastructure
- developing compression technologies that squeeze data into fewer bytes.

For these reasons the Australian Government announced the rollout of the NBN in July 2010.

4.8 The National Broadband Network

High-speed broadband has a significant impact on productivity, and on the way cities work, including how government and health services are delivered and rates of ‘teleworking’. All of these changes can help reduce travel, improve business efficiency and support a better work-life balance for families

Research indicates that people generally prefer to deal with government online and report higher satisfaction when they do. Currently, 62% (69.5 million) of Centrelink transactions (111.9 million) are made onsite which involves people presenting at a Centrelink office. Under the Department of Human Services (DHS) reforms, the working target is to have 80% of Centrelink and Medicare transactions accessible online. The service delivery reforms DHS is planning for should lead to a substantial increase in the portion of services delivered online such that this becomes the most common service delivery channel (from presently being the least common). Other Australian Government, State/Territory and Local GovernmentLocal Government agencies are likely to move in a similar direction adding to the potential impact on traffic patterns and parking needs.

The rollout of the NBN is expected to facilitate an improved delivery of health services. These improvements could be achieved by an increase in online consultations by doctors; training and supervision for health professionals using online technologies and in building electronic health records systems and to use health care identifiers for patients, providers and hospitals.

Widespread access to broadband is also likely to enable more flexibility for employees and support small business, including home-based businesses. At present, only around 6% of Australians regularly work from home. This compares to around 11% in the United States. High speed broadband has the potential to enable a substantial increase in the level of teleworking. If an extra 10% of Australians teleworked 50% of the time, Access Economics (2009) estimates traffic would be reduced at peak periods by 5%, resulting in a reduction of $470 million in congestion costs annually.

One of added benefits from an expanded high speed broadband network will be in the application of technologies that can be used to optimise traffic flows, improve road safety and reduce emissions. These types of technologies, or 'Intelligent Transport Systems' combine computers, communications, positioning and automation technologies to provide real-time data about suggested routes, congestion, collision detection and avoidance. One system trialled by National ICT Australia is predicted to improve the flow of vehicles through the intersection in peak periods by 5%, which translates into a flow-on significant improvement in travel times and safety.

The development of the NBN to date is being progressed by the corporation NBN Co Limited, established by the Australian Government to build and operate the NBN. The Government has introduced legislation to ensure that NBN Co Limited provides wholesale-only, open and equivalent access. The national network rollout of the NBN is expected to be completed in eight years, with the Tasmanian rollout completed in five years. Australia's first three communities—Tasmania's Midway Point, Smithton and Scottsdale—began receiving NBN services in August 2010.

4.8.1 Urban implications of high speed electronic communications

To complement the rollout of the NBN, the Australian Government wants fibre-to-the-premises infrastructure installed in new residential developments. The Government considers it counterproductive to rollout fibre nationally and leave new developments behind. Installing fibre in new developments will give property buyers early access to the benefits of next-generation broadband and help avoid future retrofitting costs.

In many parts of Australia developers have already recognised the value that home owners place on fibre. Developments including University Hill in Victoria, Forde and Crace in the Australian Capital Territory, Lochiel Park in South Australia and Bingara Gorge outside of Sydney, are just a few already installing fibre-to-the-premises infrastructure. The Government's policy builds on these existing practices.

Aside from personal connections, the Internet enables businesses to market directly to the national and global economy and to cluster, in a virtual sense, around whichever Australian or global research-based institution serves their sector best. Thus firms in the knowledge economy can obtain significant productivity benefits through their capability to use the communications network as their virtual economic cluster.

For other businesses, communications technology can rapidly improve process and management efficiency through computer-based software innovation applications. In certain circumstances this has enabled business to separate the component functional divisions of their organisation into different locations linked through communications technology. This has freed these organisations to take advantage of an optimum location for each of their divisions, rather than enforcing a compromised location for the entire organisation.

However, paradoxically, for some parts of organisations, particularly those with a strategic function, globalisation has brought an increased need for 'face-to-face' contact, to be aware of, and engaged in, spatially based and location-specific knowledge networks.

4.9 Innovative cities

There is another economic role that cities play which is having an increasing influence. This relates to innovation and the role of cities as 'incubators of innovation'.

Innovation—through the generation of ideas and transmission of new technologies—can underpin productivity gains. Because these gains can occur through connectivity and collaboration, different types of innovation can occur in specific locations. Evidence provided by the Australian Local Government Association – National Economics State of the Regions 2007–08 report suggests that over the past decade, 75% of all Australian patents were sourced in capital cities. In particular, 85% of high-tech and information technology patents came from the capital cities and more than 80% of innovative start-ups were located in these cities (National Economics 2008). Clearly, cities are important as generators of innovation.

It has long been recognised that cities can promote creativity and attract creative skilled global labour. This is important in a world where, with global 'ageing' of the population, the supply of skilled labour is becoming scarcer.

The mixture of creative people and the financial and business activity within cities also forges important innovations in both ideas, and the application of those ideas into products and processes. Cities are where innovation happens.

Highly-educated communities, specialist suppliers, and skills for new product development, together with a high level of clustered interaction encouraging information transfer, provide cities with the ideal mechanisms to initiate innovation and the capacity for rapid technology diffusion.

By working with business and the community within cities, governments have the capacity to enhance the productivity premium of cities and expand national economic output. Policies aimed at complementing innovation-based productivity can gain greater traction if they have firm roots in cities.

Increasingly, this has been recognised in other advanced countries, as national governments have introduced policies to enhance city competitiveness through innovation-based productivity.

Governments cannot determine invention and innovation, but they can create the economic and spatial climate in which ideas are encouraged and introduced into the economy.

Ideas come from the interaction of people, and innovation from the interaction of business. Cities are meeting places where ideas are exchanged and best-practice standards promoted in both a competitive and complementary supply-chain environment.

A number of international cities have developed innovation strategies to drive economic development through concentrating activity in particular sectors, such as arts and culture. Other economic strategies leverage world class communications infrastructure to create partnerships with community organisations to promote information technology literacy in marginalised communities, and increase participation. Other initiatives to encourage innovation and generate economic growth include hosting events to promote learning and creativity and partnerships with firms, and research and educational institutions to promote and market innovative potential of industry clusters, such as tourism, finance, multimedia, culture and information industries in particular cities.

City-based innovative capability stems from the integration of skills, connectivity, quality of life and social cohesiveness in a strategic, decision-making context. It involves the Australian Government working with other levels of government, as well as business and the community to maintain and expand the natural advantages that our cities offer.

Australian companies and entrepreneurs are making great strides to generate new products and services globally. To ensure an adequate supply of capital to fund innovation, particularly in the emerging fields of renewable energy and sustainable development, appropriate tax and regulatory policies need to be considered. The United States, China and Europe have all addressed this problem in different ways, including through tax credits, direct funding and cooperative banking institutions. Added to incentive-based initiatives can be using land use planning to the development of clusters of economic activity which enhance innovation and productivity.

A key focus of the Australian Government is on innovation capability and supporting the research and innovation infrastructure and skills base, developing public sector research capability, and supporting private sector skills and capabilities, including managerial skills, where there are market and system failures.

Australia's 10-year strategy for building its innovation system is set out in *Powering Ideas: An Innovation Agenda for the 21st Century*, released in May 2009. Powering Ideas sets a 10-year reform agenda to improve skills and expand research capacity, to increase incentives for innovation in business, government and the community sector, and to boost collaboration over the next 10 years. These incentives can be maximised where there are opportunities to cluster research centres and business close together such as in close proximity to universities and teritiary education facilities.

4.9.1 Utilising smart infrastructure

Smart infrastructure initiatives and technologies present us with an opportunity to build intelligence into the systems on which the Australian economy depends, such as transport, communication, health, energy and water systems. The potential benefits of next generation smart transport infrastructure, especially cooperative systems, are expected to be substantial.

Smart infrastructure is being applied to transport systems to: support traffic management to reduce congestion; provide improved information provision to transport users to encourage and support use of mass transit options; and to inform maintenance decisions to improve safety and reduce maintenance costs.

The Australian Government is actively supporting investment in smart infrastructure. In November 2009, the House of Representatives Standing Committee on Infrastructure, Transport, Regional Development and Local Government established an inquiry on smart infrastructure and subsequently announced a smart infrastructure conference, *ThinkSmart 2010*, held in Canberra in March 2010. The conference focused on ways to maximise the potential benefits of embedding smart technology into Australia's infrastructure. The Government has also established annual smart infrastructure awards to champion excellent design and innovative solutions to Australia's infrastructure challenges.

Examples of award-winning applications of smart infrastructure include the VicRoads M1 corridor electronic Freeway Management System, designed to help maintain efficient and safe traffic operations, today and for the future. The system uses coordinated freeway ramp signals, lane-use management signs, a control system, and a dedicated communications system to manage 160 000 vehicles a day.

4.10 Cities of knowledge

A city's competitive advantage also relates to its capacity to concentrate research and development activities and generate innovation (OECD 2006). Cities that build and retain their human capital will be the strongest, most resilient and competitive.

'Talent' in a productivity sense, is a highly educated, adaptable and creative work force. In the early twenty-first century this group have been making choices about where to live and work.

Box 1 Attracting talent

Leading economists refer to a circular process whereby innovation and business opportunity attract talented workers, who then generate new activities and new growth.

As noted by Sir Peter Hall, advisor to the government of the United Kingdom, city strategies that maintain and enable this circular process support economic dynamism and growth. Over the past 25 years Australia's capital cities have experienced this phenomenon. The challenge now is to sustain it.

Other leading international economists all subscribe to a similar strategy for successful twenty first century cities—the need to foster an environment where creative people can connect and flourish, where the existing establishment can be challenged, where there is wide access to civic services and where diversity is embraced. Leading urbanists now focus on how to nurture these less definable qualities of a place and its people, as a key ingredient in attracting the talented people needed for a city's economy to grow.

In the medium term, the worldwide ageing of populations, particularly in the western world, implies intensifed competition to attract and retain talented workers as magnets for further economic investment.

However, it would be wrong to think of this workforce purely in terms of 'creative' workers. Significant skills shortages are starting to emerge in traditional trades and service occupations. While this is partly related to the long-term strength of the economy and the growth of new industries, it is also related to regional and location imbalances of skills and under-investment in the training of workers by industry.

This issue is integrally tied to our education and skill training system. As pointed out in the *2010 Intergenerational Report,* the issue cannot be separated from the demographic ageing of our population. Over the next 40 years, the proportion of our population aged 65 years and over will almost double from 13% to nearly 23%. The rate of our natural population growth will slow enormously.

Whilst much attention is directed to the impact on government services and rising health costs, a secondary challenge is around our ability to maintain and increase living standards.

By 2050, the proportion of working-age people in the total population is expected to fall by 7% to 60%.

Aside from the increased demand for people as carers and providing support services to the aged (the proportion aged over 85 will increase from 2% to 5%, there will be pressure on our labour supply, particularly in the area of relatively globally-mobile skilled workers, who are highly educated, adaptable and innovative.

Already this is beginning to be observed—in the 2001–2006 Census period, virtually all net growth in the labour force was in people aged 50 and over.

Even cities, which generally have a slower ageing rate because of the influx of younger people and migrants, experienced virtually all growth in the over 40 age group and absolute declines in the younger age cohorts.

Without a continuation of population growth, it is likely Australians will face a decrease in their relative living standards. The challenge is to manage population growth through appropriate strategic long-term planning of our cities.

Hence, the Australian Government has placed great emphasis on addressing the infrastructure challenge now—through our NBN rollout, by educating our young people through the Education Revolution, and by addressing the pressing need to increase our productivity outcomes, particularly in the critical area of transport and energy infrastructure.

Moreover, other nations that face the challenge of an ageing population are increasingly attempting to bolster their labour supply by attracting talented workers, as well as globally competitive businesses. So we are going to have to be doubly aware of the liveability of our cities and social infrastructure (such as health services) as well as our capacity to create innovation and employment opportunities to retain a skilled labour force.

4.11 Social capital and cohesion

Factors such as transport, communications and innovation all contribute to the productivity of cities However, on their own, these factors cannot determine the capacity of a city to be 'a great place to live' unless the nature and quality of inter-relationships between the city's inhabitants lies closer to what may be called the 'community' or 'soul' of a city. It is the basis of a city as a distinctive entity, irrespective of the boundaries of administrative government.

Increasingly, economic and social commentators are referring to the quality of the relationships between individuals as the 'social capital' that affects the capacity to address and resolve common problems. As Weekes and Richardson (1998) conclude:

> In the context of globalisation and rapid change, the key to competitiveness lies in the ability of communities and economies to use information as the basis for innovation and to transform conflict into productive compromise.

Governments cannot legislate, per se, for this social capital. There is no 'law of values'. It is only the community of the city that defines the performance indicators—it may be how we treat our old, our young, our disadvantaged, or it may be how we progress on other mutually, if tacit, agreed goals. A central and related indicator is the notion of the sustainability of these benefits which requires us to set aside appropriate regenerative investment.

Social cohesion is of particular importance in the urban environment. Social capital is more difficult to develop and sustain in large groups. In many cases, interactions between parties are not repeated. In large urban centres, people tend to cluster together in small communities and networks for support.

More formally, high levels of intra-group social capital and very little inter-group social capital (referred to as 'bridging social capital') may have profound effects on inequality, private sector development, government and public welfare. The challenge is to design and implement effective social policies to reverse poverty, inequality and violence.

Central to this is the perception and reality of social 'fairness' in the receipt of the benefits of globalisation process and the burden of the costs of transition. This can be regarded in terms of equality. There are two perspectives here: first, the equality of opportunities within the city and second, equality between each city and other cities and/or regions. The nature of the governance systems can serve to further complicate this interaction.

Increasingly, researchers[1] have noted the concurrence of globalisation with rising inequality, both within global cities as well as between global cities and other areas.

Rising levels of inequality have been associated with a breakdown in social capital that can ultimately lead to civil unrest As the OECD has noted:

> Pressures on social cohesion are likely to evolve over the next two decades as unemployment, earnings inequality, demographic shifts, technological progress, open trade, and greater competition, in less constrained marketplaces, continues to contribute to economic and social turbulence. OECD, 1998

In summary, the often quoted dictum—'think globally—act locally'—only has potential if the 'local' is a community that can act together. Whilst the explicit term 'social capital' appears of relatively recent origin, it is not dissimilar to what urbanist Jane Jacobs (1965) referred to over 40 years ago as '… an intricate, almost unconscious network of voluntary controls and standards among the people themselves, and enforced by people themselves'.

For any city, building social capital represents possibly the greatest challenge to its continuous development. This is because it is difficult to identify and is probably best recognised only when it is lost, at which point it is difficult to regain. This is the 'glue that binds'—the substance that provides the city with common purpose and aspiration.

1 For example, Fainstein (1998) & Sassen (1996)

Geelong, VIC

Chapter 5

Sustainable cities

Human settlements place pressure on the environment through the demand for water, energy, land and other resources, and through the production of wastes (including greenhouse gas emissions). Many of Australia's cities are also vulnerable to the potential impacts of a changing climate.

The principle of sustainable development was popularly defined by the 1987 Brundtland Report *Our Common Future* as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. In this regard, the concept of sustainability encompasses social and economic considerations as well as environmental aspects.

Fortunately, Australian cities can, in many ways, lead the nation towards a sustainable future. To date, opportunities for more sustainable outcomes in cities have, however, tended to focus on symptoms and not the underlying causes of unsustainable practices. Along with opportunities for improvement in specific sectors such as waste, water and energy, cities can influence sustainability through larger systems such as settlement patterns, including the location of employment areas in relation to residential areas, and the availability of public transport.

A sustainable human environment requires greater attention to urban design and a reduction in net consumption. In some areas of Australia where pressures are high, progress has been made in recognising the importance of urban form and infrastructure; the challenge is implementing this insight.

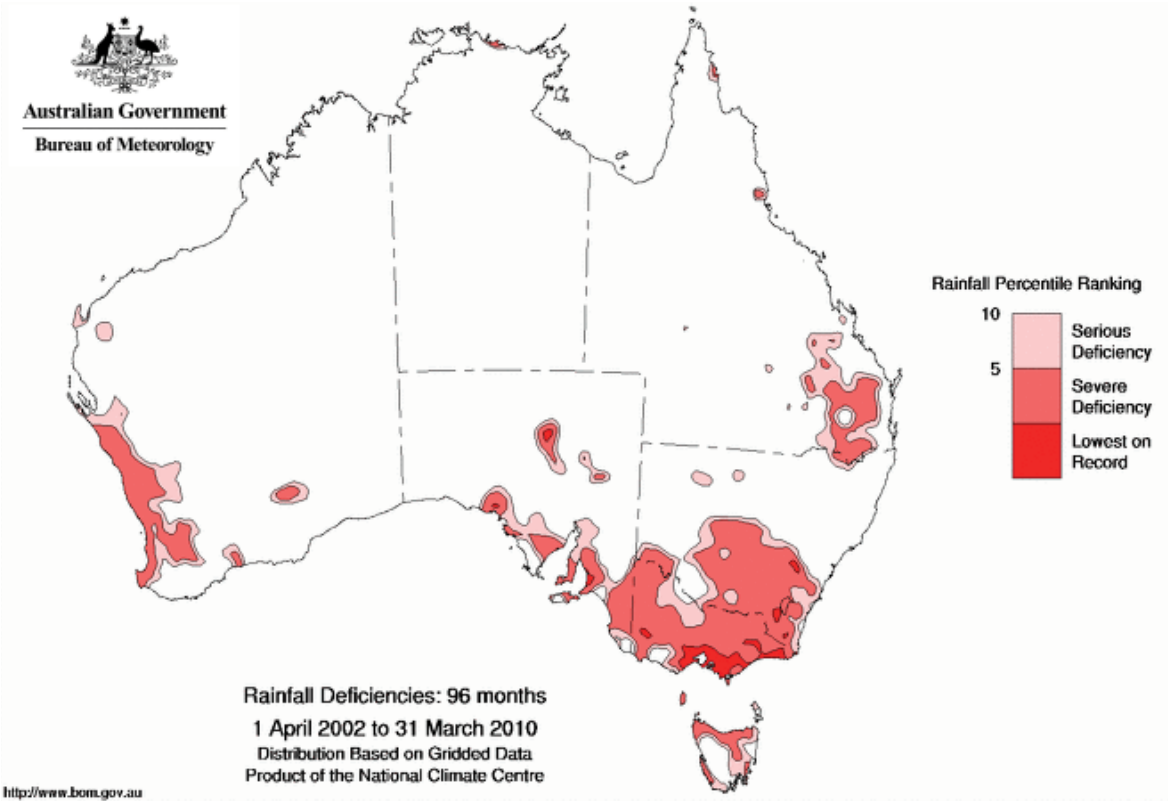
Beeton, R (et al.) Australia State of Environment Report 2006, page 7

5.1 Water

Australia's rainfall is characterised by extreme variability. Since 2002, severe rainfall deficiencies have been experienced in southern, eastern and south-western Australia, where the largest capital cities are located (Figure 20).

Urban water supplies are coming under increasing pressure from natural variability, changes in both temperature and rainfall, and population growth. During the financial year 2008–09 low rainfall and inflow to storages continued to adversely impact settlements on the eastern seaboard in Victoria and South Australia, with Melbourne and Adelaide reporting reductions in total water supplied due to low availability of water (National Water Commission 2010).

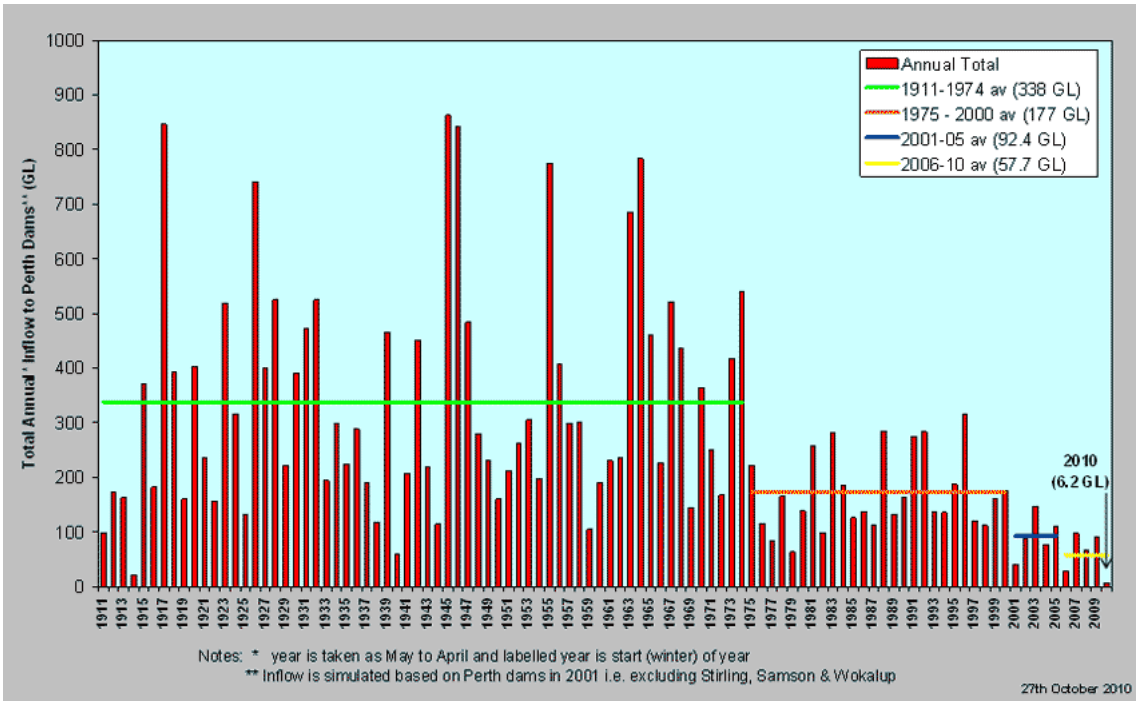
Figure 20 Rainfall deficiencies—April 2002 to March 2010



Source: Bureau of Meteorology (2010a)

There has also been a marked reduction in surface water available for storage in Perth; where the average annual inflow into Perth's dams experienced four-step change reductions from 338 gigalitres (GL) over the period 1911 to 1974 to an average of 57.7 GL between 2006 and 2010 (Figure 21).

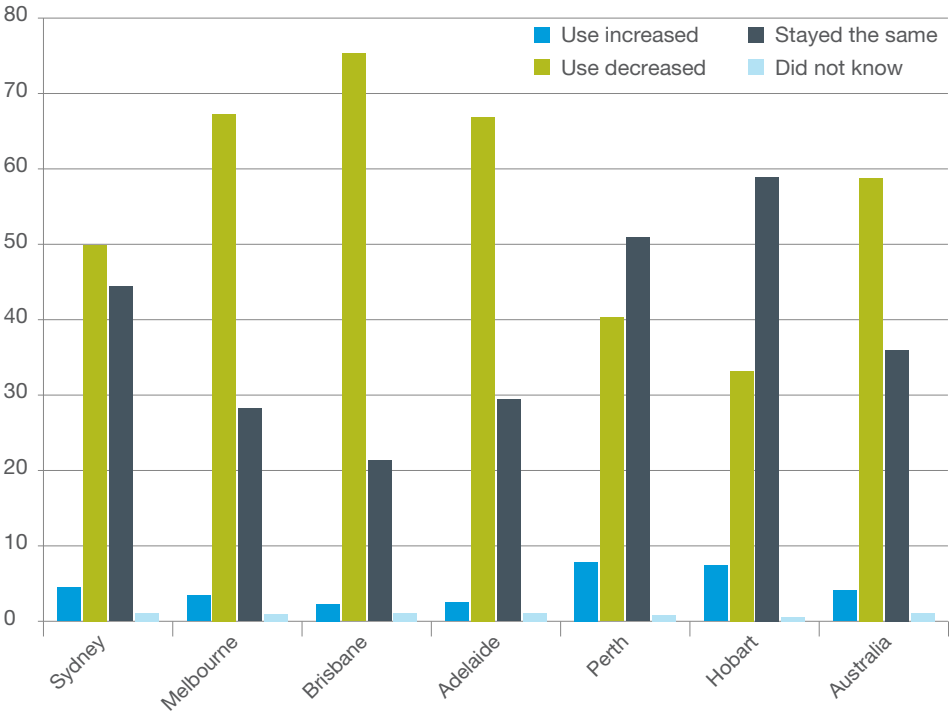
Figure 21 Western Australia inflows to dams 1911–2010



Source: Western Australia Water Corporation (2010)

In the longer term, the Bureau of Meteorology predicts that—under the influence of climate change—reductions in rainfall are likely to continue in the decades to come in the southeast and southwest of the continent (BoM 2010b). Recent pressures on potable water supplies, and associated conservation measures, have resulted in a dramatic change in water consumption in many of our cities, as illustrated in Figure 22.

Figure 22 Changes in personal water use in the 12 months to 2007–08

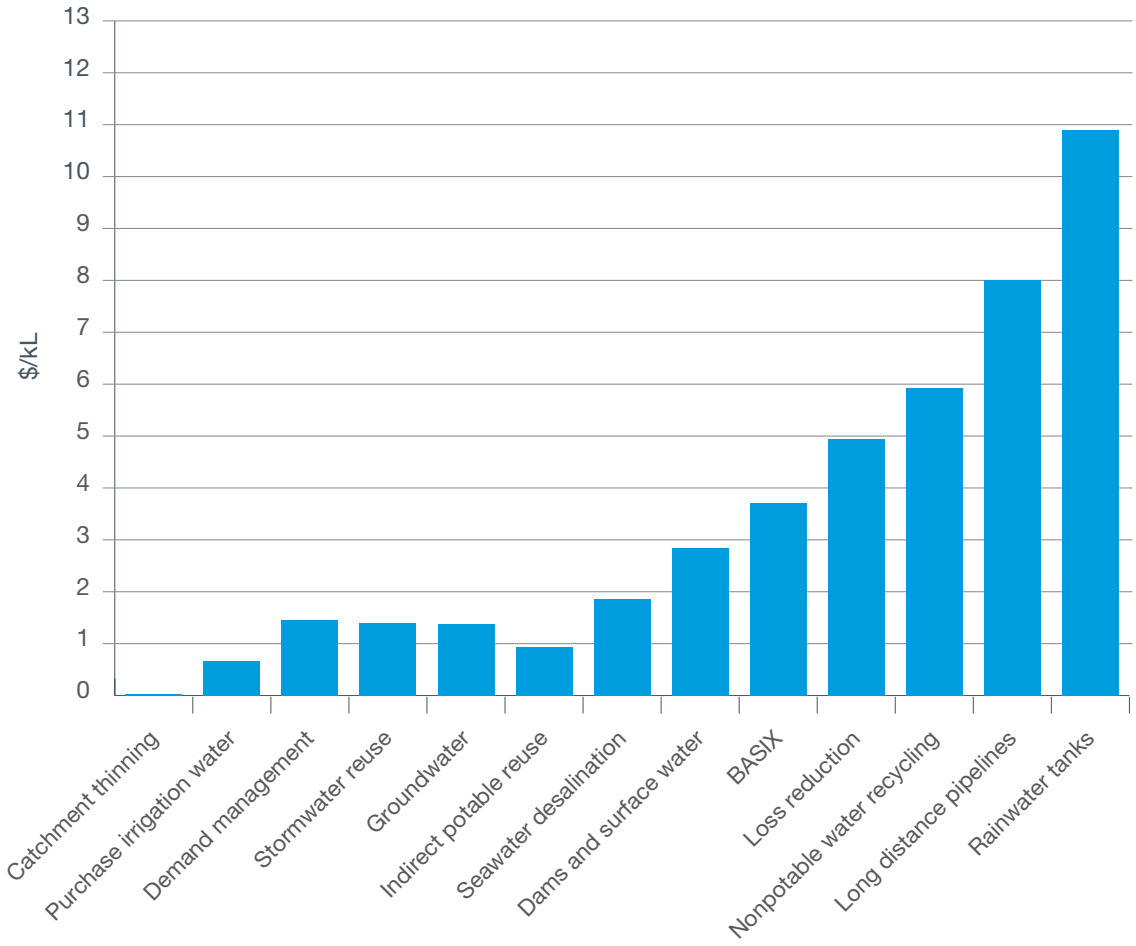


Source: ABS (2009b)

However, the consumption of water by households and industries in cities has to be considered in the context of other sectors in the economy. Irrigated agriculture, for instance, is by far the highest user of water in the nation (ABS 2006a).

Resolving issues of water security can be expensive if potential options are not considered (Figure 23). In response to population growth and long-term changing climatic conditions, the urban water industry has recently made unprecedented investment in infrastructure to provide our cities and towns with a more diversified and secure portfolio of water supply sources. Total reported capital expenditure by the water industry (mostly by major (100 000+ customers) and bulk utilities) increased from $4.5 billion in 2007–08 to $8.1 billion in 2008–09; representing an 80% increase (National Water Commission 2010). Investments include the development of new water sources that are less climate dependent (predominantly desalination and recycling), and other major projects (including pipelines).

Figure 23 Levelised costs of alternative water sources by selected cities



Source: Marsden Jacob Associates (2007)

Note: Marsden Jacob Analysis based on water supply plans for Sydney, Adelaide, Perth and Newcastle. The lower bound of indirect potable reuse estimate is based on Toowoomba. Comparable costings for Melbourne are not available and no costings are available for Queensland.

5.2 Energy

According to the International Energy Agency (2009) Australia is one of the highest consumers of energy per capita in the world, with aggregate energy consumption having steadily increased over the past three decades (Shultz 2009).

The trend of increasing energy use presents a major challenge for long-term sustainability. Most energy used in Australia is from non-renewable sources, including coal, petroleum products and natural gas. This poses at least two major threats: first, a threat to energy security from a heavy reliance on finite and depleting resources; and second, a broader climate change threat from a heavy reliance on sources that are major contributors to carbon emissions.

The National Energy Security Assessment (Department of Resources Energy and Tourism 2009) found Australia's level of energy security has decreased in the face of increasing energy prices, threats to international energy markets (such as global financial shocks and growing resources nationalism), and changes in supply and demand, particularly those relating to crude oil production.

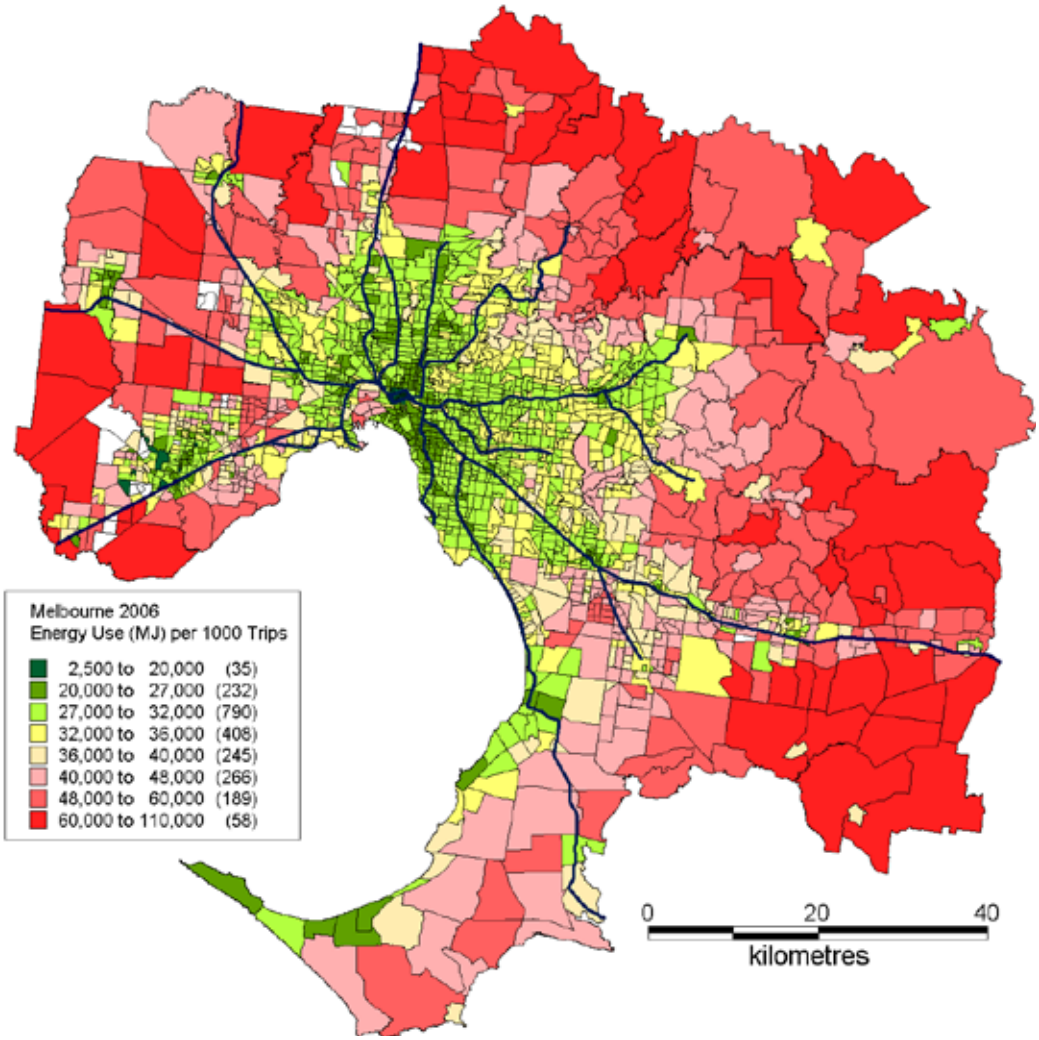
Australia's cities are significant end users of energy and because cities can harness economies of scale in achieving better efficiency and diversifying fuel types and sources, there are significant opportunities in cities to improving energy security and reducing the rate of climate change.

A particularly significant opportunity relates to the dependency on motor vehicles, which accounts for around 80% of transport use in Australian cities (ABS 2009c). Passenger motor vehicle use is estimated to be responsible for around 60% of petroleum-based energy consumed by the transport sector, with the remainder used for the distribution of goods and services (Sandu & Petchy 2009).

Alternative urban development forms can significantly influence transport energy use (Figure 23) and greenhouse gas emissions. Modelling of land-use scenarios for Melbourne undertaken by the Victorian Government (Whiteman et al. 2009), illustrate the long-term benefits of a compact inner city and a small number of larger polycentric outer cities in achieving urban sustainability outcomes. Better integrated land-use and infrastructure planning, that focuses on major transport hubs has the potential to reduce the overall travel task and, hence, energy demand and greenhouse gas emissions.

The benefits of urban inner-city redevelopment are also reinforced by a recent Australian study examining the costs of urban sprawl (Trubka et al. 2010a). This study illustrates the significant infrastructure and transportation cost savings that can be made by focusing investment on redevelopment rather than in outer fringe development. It suggests that 1000 inner-city dwellings can save approximately '$86 million up-front for infrastructure and $250 million for annualised transportation costs over 50 years' (Trubka et al. 2010a).

Figure 24 Transport energy trip efficiency—Melbourne (2006)



Source: Whiteman et al. (2009)

Note: Greenhouse gas emissions per 1000 trips has a similar footprint.

Residential and commercial buildings are responsible for approximately 20% of Australia's total energy consumption (Prime Minister's Task Group on Energy Efficiency, 2010). Residential energy use alone is growing at a rate of 2.2% per annum, attributed to population increase, greater ownership of appliances and information technology equipment, and increases in the average size of homes (Australian Bureau of Agriculture and Resource Economics 2009).

There is scope to improve the energy efficiency of the building sector through, for example, reforming building standards, retrofitting existing buildings, and regulating higher energy efficiency standards for appliances.

Australia also has access to a range of high-quality renewable energy resources. At present, this accounts for around 5% of total energy consumption but the Australian Government's new Renewable Energy Target will see this figure rise to 20% by 2020 (Office of the Renewable Energy Regulator 2010). This will be a significant contribution, both to securing energy and reducing the rate of climate change.

5.3 Waste

Australian cities are not only vast consumers of natural resources, they are also producers of waste.

The main solid waste streams include commercial and industrial waste, construction and demolition waste and solid municipal waste. Australians produce solid waste at a high rate relative to other OECD countries (Productivity Commission 2006). While national recycling rates have increased, both total volume and per person generation of waste have also increased.

For our cities to become more sustainable, the linear flow of resource inputs into cities and the production of waste needs to be disrupted. This can be achieved by closing material cycles by, for example, treating and reusing wastewater, recycling materials such as glass, plastics, paper and metals, composting organic waste, and using materials produced as waste by one industry process as an input into another (Newman and Jennings 2008).

Air pollution is also a form of waste. The National Environment Protection Measure for Ambient Air Quality (Air NEPM) sets national standards for the six key air pollutants to which most Australians are exposed: carbon monoxide, ozone, sulphur dioxide, nitrogen dioxide, lead and particles. The standards are legally binding on each level of government. State and Territory governments have passed complementary legislation and developed strategies aimed at sources of air pollution not covered in Air NEPM, targeting residential and industry sectors.

Whilst air quality standards are still exceeded on occasion in some cities, particularly with fine particles and ozone levels, Australian cities have low levels of air pollution when compared with cities of similar sizes overseas. However, air pollution from all sources remains a significant concern for urban communities.

The economic cost of premature mortality associated with motor vehicle pollution was estimated to amount up to $2.6 billion in 2005 and the economic cost of morbidity up to $1.2 billion (BTRE 2005). The combined economic cost of motor vehicle-related mortality and morbidity over the same period was estimated to be between $1.6 billion and $3.8 billion (BTRE 2005).

Australia's largest cities are increasingly prone to photochemical smog and particulates from internal combustion engines (cars, trucks and motorbikes), and industry. Motor vehicle transport is a major emitter of air pollutants in urban Australia.

Addressing issues of urban air quality and pollution will require further improvements to emissions standards in motor vehicles and higher fuel quality, as well as encouraging a passenger shift to lower polluting forms of transport such as urban rail and active travel (walking, cycling and using public transport).

5.4 Climate change

Climate change is a diabolical policy problem. It is harder than any other issue of high importance that has come before our polity in living memory. Climate change presents a new kind of challenge. It is uncertain in its form and extent, rather than drawn in clear lines. It is insidious rather than (as yet) directly confrontational. It is long term rather than immediate, in both its impacts and its remedies.

The Garnaut Climate Change Review 2008, page xviii

5.4.1 Greenhouse gas emissions

Australia contributes approximately 1.5% of the total global greenhouse gas emissions, per capita emissions (including from land use, land-use change and forestry) in 2008 at 27.4 tonnes of carbon dioxide equivalent (CO2-e). This is the highest of all member countries of the OECD and more than four times higher than the world average (Department of Climate Change and Energy Efficiency (DCCEE 2010a).

Since 1990, national greenhouse gas emissions in Australia have also continued to grow with a net increase of approximately 5% (DCCEE 2010b). This has largely been contained by the land use, land-use change and forestry sector which has shown a strong decline of 79.8% between 1990 and 2008; largely as a result of reduced emissions from deforestation. If the land use, land-use change and forestry sector is excluded from the calculations, the figures for Australia's net growth in emissions jumps to more than 30%.

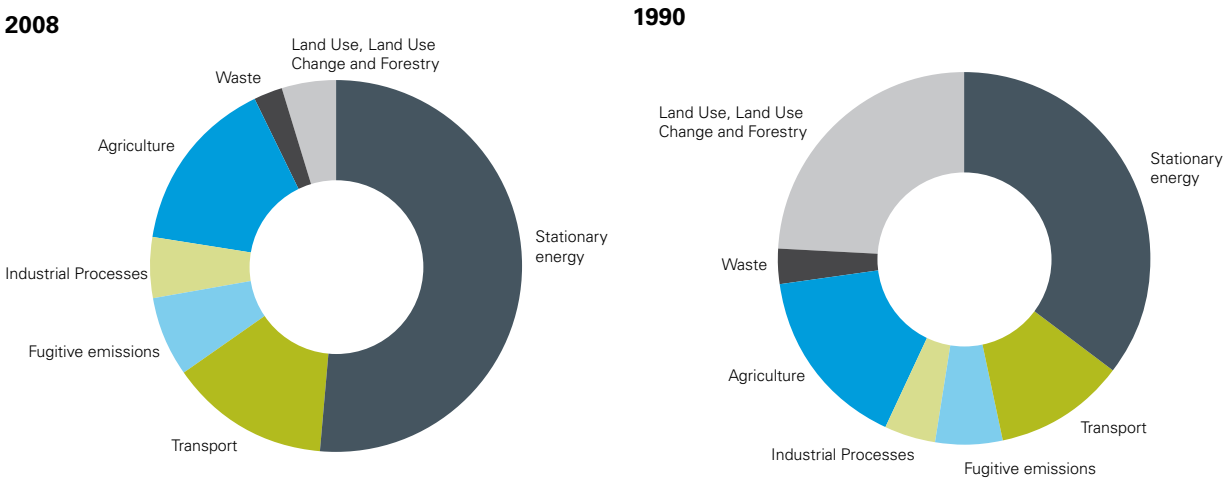
The Australian Government is working towards the introduction of a carbon price to lower emissions.

Within our cities, stationary energy and transport are the two key sectors representing the highest proportion of emissions, approximately 50% and 14% respectively in 2008 (Figure 25). Emissions in both sectors, but particularly stationary energy, have grown substantially since 1990 and, as such, provide the greatest opportunity for reducing greenhouse gas emissions.

Most Capital City Councils have adopted greenhouse gas emission reduction targets, and have been active in taking voluntary measures to mitigate climate change, including residential and commercial building energy efficiency retrofits, street lighting efficiencies, transport improvements, use and promotion of the generation of renewable energy, and encouragement of greater employment and residential densities. A focus on urban redevelopment, rather than outer fringe development, has been estimated to have the potential to save approximately 4.4 tonnes of greenhouse gas emissions per household (Trubka et al. 2010b).

However, much more still needs to be done within communities, business and governments at all levels to mitigate climate change impacts.

Figure 25 Change in Australia's CO_2-e emissions 1990–2008



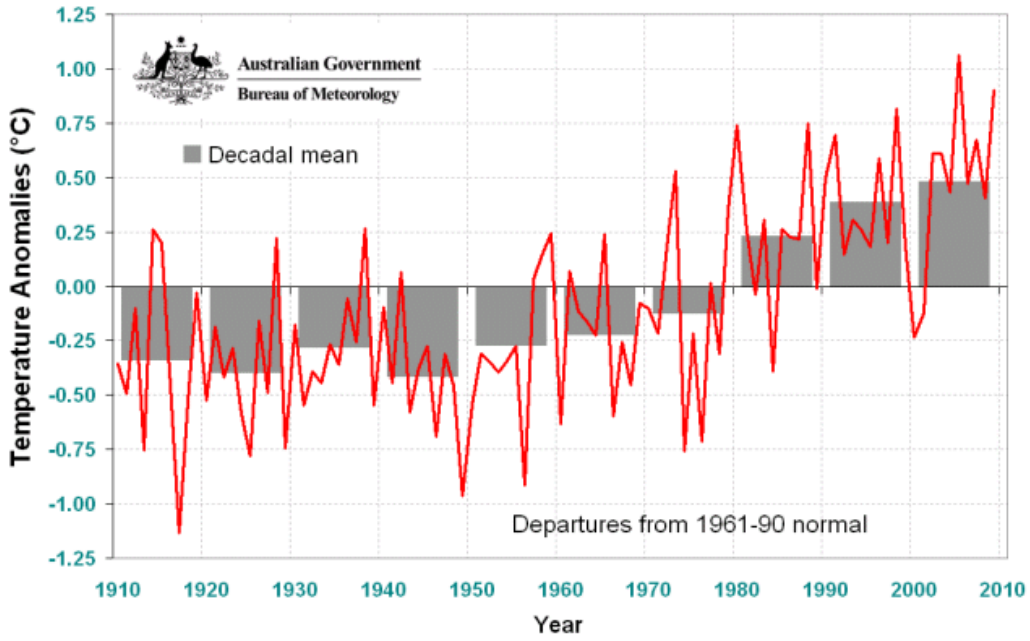
Source: DCCEE (2010b)

5.4.2 Changes in climatic conditions

Consistent with the trend of increasing greenhouse gas emissions, Australia's annual mean temperatures are also rising, as illustrated in Figure 26.

Climate change is already projected to alter the frequency, intensity and/or geographical distribution of various extreme weather events in Australia, including extreme rainfall, cyclonic activity and bushfires. Of particular concern is the disproportionate effect that a small change in the mean temperature can have.

Figure 26 Annual and decadal mean temperature anomalies for Australia (compared with 1961–90 average)

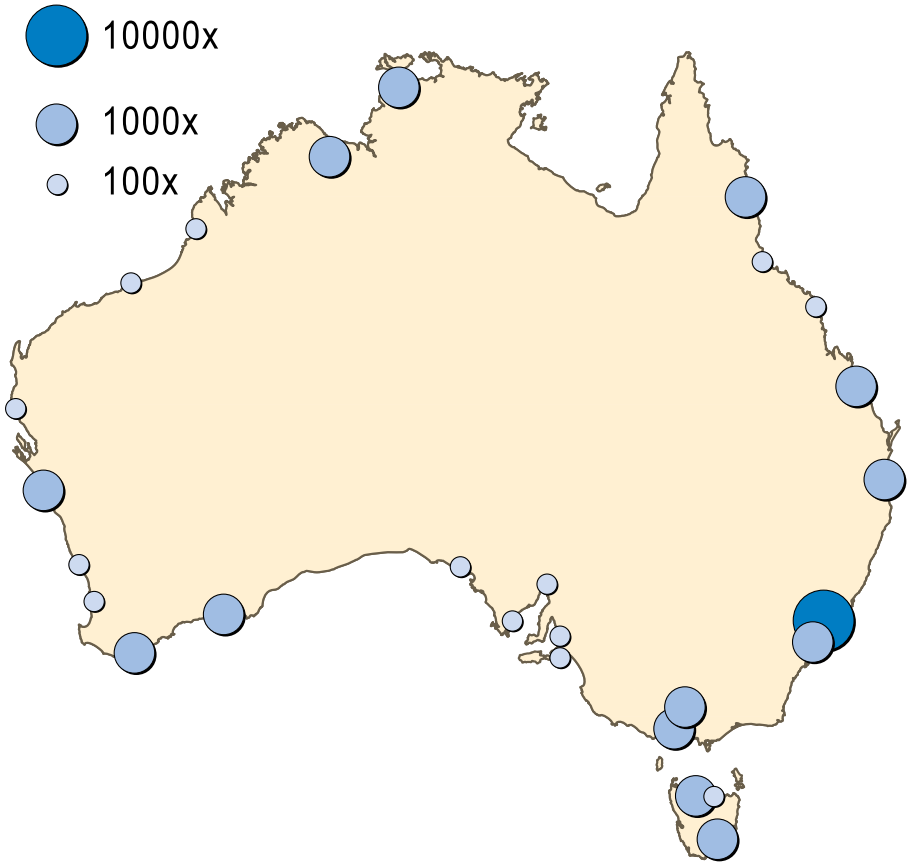


Source: Bureau of Meterology (2010c)

With 85% of the Australian population residing within 50 km of the Australian coastline (DCC 2009b) and with most of the nation's major cities also located in this zone, the natural and built environments and the communities they support are at particular risk of sea level rise, storm surge and, in some regions, cyclonic activity.

Figure 27 shows the estimated frequency of extreme sea level events occurring and identifies all major cities potentially affected. In the case of a 0.5 m sea level rise, events which occur once every few years are more likely to occur once every few days by 2100 (Antarctic Climate and Ecosystems Cooperative Research Centre (ACECRC) 2008). However, regional variation will mean that areas surrounding Sydney and Brisbane are more likely to experience larger increases in the frequency of extremes than Adelaide or Perth.

Figure 27 Estimated increases in the frequency of extreme sea level events under a sea level rise of 0.5m by 2100



Source: Antarctic Climate and Ecosystems Cooperative Research Centre (2008)

Given that global sea levels are projected to rise by as much as 1.1 metres by 2100 (DCC 2009b), the resulting inundation from these extreme events presents significant challenges for the planning and provision of infrastructure within Australian cities. Modelling undertaken for the DCCEE in preparing *'Climate Change Risks to Australia's Coast: A First Pass National Assessment'* (DCC 2009b) provides some illustration of this risk. The extent of inundation projected for the Gold Coast and Darwin, for example, will affect local communities, infrastructure assets and natural ecosystems.

Significant economic infrastructure located in low-lying areas is also vulnerable to inundation, as illustrated by modelling undertaken of some major Australian city airports. Such vulnerability is likely to result in disruption to airport operations and may have adverse consequences on local and regional economies as well as overall national productivity. Sustainable management of these key assets is fundamental for an effective climate change response.

Inland cites in Australia are also vulnerable to other specific risks from climate change. Modelling of the bushfire regime in the Australian Capital Territory (Cary 2002), for example, illustrates an increase in the size of the geographic region affected by bushfires and a reduction in the average interval between fires. This reflects scientific consensus that bushfire intensity will increase as average and extreme temperatures increase. There is already evidence of this shift, particularly in southern and eastern Australia.

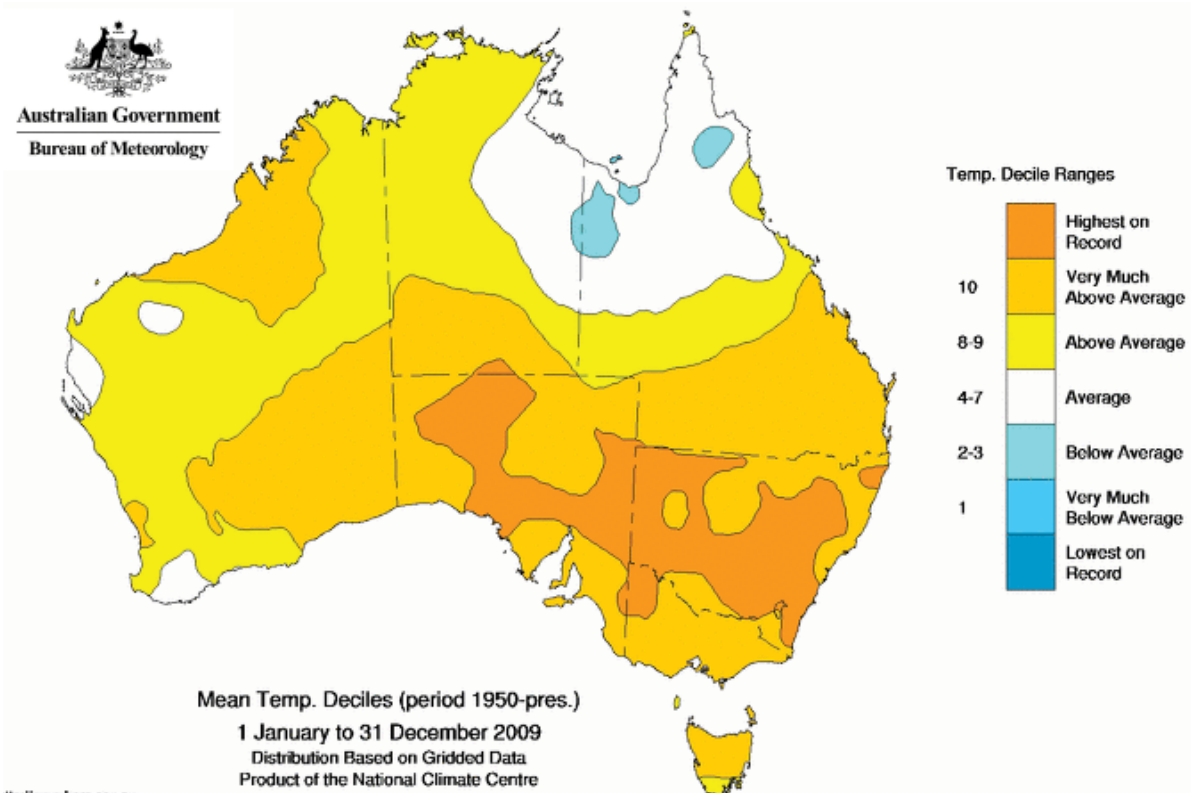
It is not, however, the single definable impact that is of greatest concern. Typically, regions within our major cities will be affected by cumulative or varying impacts across the landscape. For example, while inner-city areas may be more vulnerable to extreme rainfall and runoff as a result of a higher proportion of impervious surfaces; for outer areas, bushfire risk is typically of greater concern.

A vulnerability study undertaken by the Sydney Coastal Councils Group (Preston et al. 2008) is a good illustration of this and also of the need for decision makers in jurisdictions to be aware of the complexities and interconnected issues associated with planning for climate change. Although overall vulnerability provides a useful illustration for decision makers, individual jurisdictions will often be faced with competing priorities when dealing with climate change impacts. According to the Sydney Coastal Councils Group study, Rockdale, Botany Bay and North Sydney, for example, all have vulnerabilities associated with extreme heat, extreme rain and ecosystems that need to be balanced and sustainably managed.

Whilst it is not yet possible to attribute particular individual events to climate change, a number of recent events highlight the consequences of failing to prepare for changing climate—consequences that are likely to become more common. In early 2009, for example, Victoria experienced a record breaking heatwave and devastating bushfires, as Melbourne recorded a new temperature maximum of 46.4°C and other records were set across the State (Bureau of Meteorology 2010c). Transport infrastructure was placed under significant pressure from buckling railway tracks due to extreme heat and the security of Victoria's power supply was jeopardised. Millions of residents experienced power failures due to the combined impacts of bushfires and the shutdown of the Basslink Interconnector, after its design parameters for temperature were exceeded.

Human health impacts were also reported, with an additional 374 heat-stress related deaths occurring (primarily within the age group 75 years and over) over what was expected based on previous year estimates (Victorian Government DHS 2009). Increased heat stress resulting from extreme temperatures places considerable pressure on health and medical systems (Figure 28). An ageing population and increasing urbanisation will likely exacerbate this problem.

Figure 28 Mean temperatures for 2009 compared against historical temperature records



Source: Bureau of Meteorology 2010c

Infrastructure is also vulnerable to climate change, with projections indicating significant economic implications due to potentially reduced output and consumption of resources and services. Economic modelling for the Garnaut Climate Change Review (2008) suggests that climate change impacts on infrastructure could reduce Australia's gross national product by 1.23% by 2050 and by 2.42% by 2100, the highest potential economic impact of any impact area (Garnaut 2008b).

Impacts on infrastructure are likely to be associated with structural damage particularly through increased loadings from a climate impact (for example, increased wind gusts resulting from intense cyclonic activity, storm surge or increased temperatures) or material degradation. Concrete degradation, for example, is likely to be exacerbated by rising CO2 levels, air temperatures and other factors. One study projects an increase in the likelihood and extent of corrosion damage of 720% under the worse case emissions scenario and the probability of complete failure being 18% (Peng and Stewart 2008). These issues will present ongoing challenges for asset management and maintenance processes.

For these reasons, asset and emergency management are also fundamental considerations that should be embedded in urban planning practices. The planning systems should seek to reduce the exposure of communities to climate change impacts and adopt technologies to reduce long-term asset management costs.

The impact of climate change on residential and commercial buildings is described by Garnaut (2008a) as being medium to high risk. A study of residential buildings in south-east Queensland undertaken by the Commonwealth Scientific and Industrial Research Organisation's (CSIRO) Climate Adaptation National Research Flagship, highlights the importance of improving planning and building regulation to take account of climate impacts.

Estimates produced indicate that a tightening of planning regulations today could reduce the cost of damage of a 1 in 100 year storm surge event in 2070 from $3.9 billion in net present value terms to $1.5 billion (Table 4). Additional reductions in damage costs could be expected if tighter planning regulations were also combined with stronger action to retrofit properties.

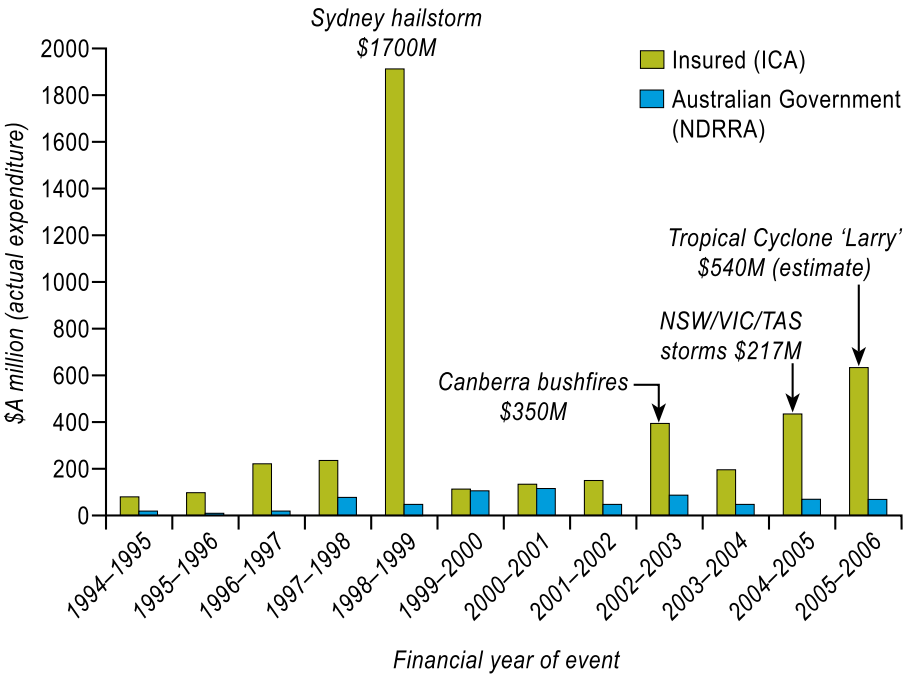
Table 4 Adapting to storm surge in south-east Queensland—estimated costs and benefits for a 1:100 year storm tide event in 2070

Adaptation option	Population at risk 2070	Residential buildings at risk 2070	Total cost of impact 2070
Business as usual (no changes to planning/ building regulations and assuming same rate of growth)	772 296	121 367	≈$3.9 billion
Planning regulations tightened to prevent further at risk development (no changes to building regulations)	273 000	47 900	≈$1.5 billion
Planning regulations tightened and measures to adapt existing housing stock (to maintain existing level of risk)	226 500	35 200	≈$1.1 billion

Source: Wang et al. (2010)

As illustrated in Figure 29 the cost of past natural disasters represents significant risks to the Australian economy. Anticipation of increased property damage as a result of climate change is expected to be reflected in higher insurance premiums and maintenance costs for both private and public property.

Figure 29 Costs of natural disasters in Australia 1994 TO 2006



Source: Middelmann, M. H. (Editor) (2007) *Natural Hazards in Australia: Identifying Risk Analysis Requirements*. Geoscience Australia, Canberra.

The insurance industry has a crucial role to play in adaptation and mitigation. A key tool available to insurers is the use of differentiated premium pricing to encourage actions which reduce risk. Accurate pricing of risk is fundamental to creating the right market signals and will make a significant contribution in discouraging 'risky' development and promoting more resilient construction.

Insurers have wide experience in employing such practices in household fire, burglary and auto insurance. As an example, pay-as-you-drive insurance products provide discounts of up to 50% for policyholders who drive less than the average driver. By offering financial incentives to the general community based on car usage, this type of insurance positively reinforces less resource-intensive behaviour and delivers positive outcomes against a number of other objectives important within our major urban areas, including reduced road congestion and greenhouse gas emissions.

Early planning and cost-effective mitigation and adaptation responses have the potential to deliver productivity benefits, reduce vulnerability and lessen the economic, social and environment cost burden on future generations.

5.5 Land consumption and conversion

Some of Australia's most productive and environmentally significant land is on the urban fringe of our major cities. These areas are often used for activities such as poultry farming, aquaculture and agriculture (including grazing) as well as for vineyards, turf farms and hydroponics—they provide many essential goods for our cities and regions. Ecologically significant land within these 'peri-urban' areas also provides valuable habitat for plant and animal species and recreational opportunities for the general population.

However, Australia's peri-urban areas often face competing pressures and decision makers are required to balance competing priorities as residential or other forms of land use encroach on valuable arable land. Whilst urban development may be seen as a more valuable higher-order land use, the economic implications of such urbanisation are significant. Historically, peri-urban areas have contributed to the total value of the national agricultural industry by an estimated 25%, despite comprising less than 3% of Australia's agricultural land. (Houston 2005).

Inland Australia faces significant constraints in providing quality arable land in the absence of the productive areas surrounding our metropolitan regions due to water availability and poor accessibility to regional and local markets.

Food security is a key concern in this regard. Although Australia has often faced weather variability and sometimes harsh conditions for food production, the country continues to maintain a reliable food supply for its cities and regions. With the projected impacts of climate change, however, and the growth of our urban regions consuming more agricultural land, food production practices and availability may be adversely affected.

Canberra, ACT

Chapter 6

Liveable cities

Liveable cities offer a high quality of life, and support the health and wellbeing of the people who live and work in them. Liveable cities are socially inclusive, affordable, accessible, healthy and safe. They also feature attractive built and natural environments. Liveable cities provide choice and opportunity for people to live their lives, and raise their families, to their fullest potential.

> *A healthy, well educated population is a major asset for any city, and knowledge is a prerequisite for enhanced civic participation in the social, political and cultural spheres.*
>
> *United Nations Human Settlements Programme, (UNHABITAT) State of the World's Cities 2010–11 report page xii*

6.1 Housing our growing and changing population

Secure and appropriate housing is fundamental to health, wellbeing and quality of life. Housing constitutes the foundation upon which communities are formed and maintained. The nature of residential development in cities is also fundamental to their urban structure and form, which together influence liveability, productivity and sustainability.

The efficient supply of suitable, affordable and well-located housing is a priority of the Australian Government for our cities. In April 2009, COAG—noting that the housing market faces significant pressures from strong demand, driven by population growth and a robust economy—endorsed a housing supply and affordability reform agenda to remove barriers to supply and ensure efficient use of Australia's existing housing stock.

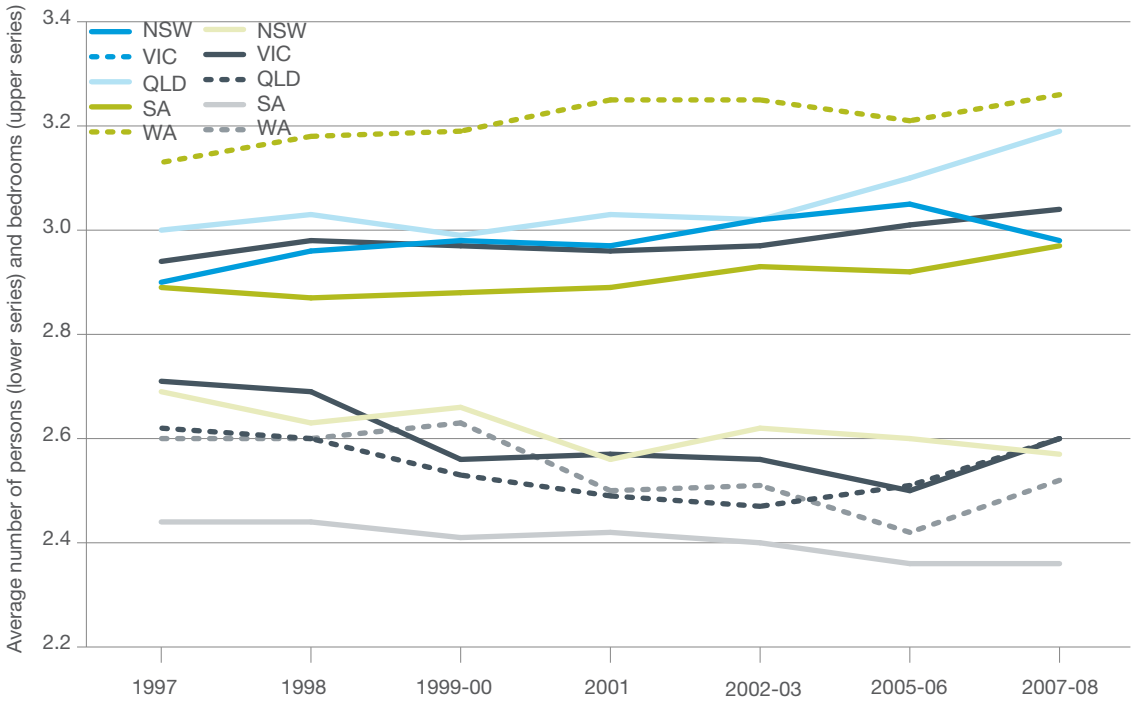
Two social trends have increased the growth in the number of households faster than the growth of the population. Firstly, the ageing population has meant a greater proportion of older people living longer, and secondly there are more people living alone, rather than forming couple households. These trends, together with overall population growth, have increased the number of households to the extent that the number is projected to increase to 11.8 million by 2029. This means there will be a need for 3.2 million additional homes to meet this underlying demand. The National Housing Supply Council (NHSC 2010) predicts the shortfall in housing supply will increase to 640 600 dwellings by 2029 if the market fails to respond to increasing demand.

Importantly, however, the trends have led to a decrease in the average size of households, which is changing the nature of the demand towards a more diverse mix of dwellings.

In the decade from 1994, Australia experienced declines in the average number of persons in a household from 3.1 to 2.6, yet the proportion of new homes with four or more bedrooms increased from 17 to 28% (BITRE 2009). Therefore, despite challenges associated with adequate supply and affordability in parts of the housing market, Australians, on average are increasing the amount of housing they are consuming.

In the past five years, however, there are signs of changing housing consumption patterns in New South Wales, with a decline in the average number of bedrooms following the decline in the size of households (Figure 30). Nevertheless, the mismatch in the dwelling stock compared to household composition is reflected in the proportion of lone-person households living in single detached houses. Almost half (49.9%) of all lone-person households in the five largest capital cities in 2008 lived in single detached dwellings (ABS 2009).

Figure 30 Number of persons per household and bedrooms per dwelling in five states (1994– 2008)



Source: ABS (2009a)

6.1.1 Housing affordability

By definition, liveable cities are places where people want to live, and the growth in demand for housing in our major cities is testimony to this. A strong demand for housing presents the first main challenge to liveability in our cities—the shortfall in affordable housing supply.

Two thirds of this projected demand is expected to be in the four largest cities Melbourne (19%), Sydney (16%), Perth (10%), Brisbane and south-east Queensland (21%) which corresponds to projected population growth trends. New South Wales and Queensland are estimated to have the most rapidly widening demand-supply gap of all States and Territories under medium growth and supply scenarios.

The shortfall in housing supply is likely to put continued upward pressure on house and unit prices and have follow on effects of a higher number and proportion of households for whom housing becomes unaffordable. More low-income households in private rental may also require housing assistance.

The NHSC report highlights the difficulty for low-income households. In 2006, there were 236 000 more private rental dwellings than in 1996 but 125 000 fewer dwellings with rents less than $232 per week (in 2006 dollars, considered affordable).

The shortfall in affordable rental dwellings for low-income renters is estimated to be 500 000 and more than 20% of low-income private renters paid rents in excess of 50% of their household income. The variation in the shortfall in housing across the States and Territories is also reflected in the availability of affordable rental properties for low-income households across the cities (Wulff et al. 2009). The lack of availability of affordable rental properties for low-income households is most acutely felt in Sydney and the Gold Coast.

Multiple factors influence the delivery of an efficient supply of suitable and affordable housing. Housing supply, and the higher house prices that result from restrictions on this supply, are influenced by land zoning and building code regulations and other standards related to building quality; the imposition of charges for infrastructure, the availability of facilities and services; the often lengthy approvals processes; taxation, including stamp duties, land tax and the goods and services tax on input costs; and the costs of labour and materials which rise in a buoyant economy. Much of this policy framework is determined by the States, Territories and Local Government, hence the need for reform through COAG.

6.1.2 Housing diversity

Housing diversity refers to whether the range of dwelling types meets the needs of different households. Apart from size and types of dwellings, diversity includes:

- suitability of the structure of the building for the physical abilities and life stage of occupants, and adaptability so dwellings can accommodate the needs of members of the household—with minimal alterations at minimal cost—as they change over time
- locations that enable members of a household to maintain their livelihoods and supports their health and wellbeing
- security of tenure
- affordability—both initial capital and ongoing costs.

The majority of housing in Australian cities has long been single detached houses. The proportion of single detached dwellings being built continues to substantially outstrip other housing forms except in Sydney and Melbourne. At the 2006 Census of population and housing, 80% of new dwellings in Perth were separate houses, 62% in Brisbane, 44% in Melbourne and 33% in Sydney.

Most family households live in separate houses. However, as noted above, over the last 20 years the number of family households in Australia has declined. With declining fertility rates and increasing longevity, the age structure within cities is changing dramatically, reflecting the ageing population of the nation as a whole. The ABS (2008b) has projected that by 2056 there will be 8.1 million people aged over 65 years. This will be nearly a quarter of Australia's population (23%).

It must be questioned whether the current mix in the supply of dwellings will match these changing demographics. Whilst most existing housing stock and most new homes being built are single detached dwellings, we know that nearly all growth in households to mid-century are going to be in one- and two-person households. The NHSC estimates that to 2029 the growth in lone-person households will be more than twice that of the growth in two-parent family households in all States, except Queensland where the ratio is expected to be just less than double.

Recent research shows that older Australians are looking for affordable, practical housing in their own neighbourhood, close to transport, local services and shops, and with access to support services that will help them remain independent.

If we are going to successfully house Australia's people into the future, we need to see a better match between the homes on offer and the size of the households that are needed—particularly for the aged. A change in the composition of new housing, as is occurring in Sydney, is warranted in the rest of the country.

Similarly, unless the construction of residential buildings incorporate universal design (Box 2)—features that enable them to adapt to the changing needs of the occupants without expensive retrofitting—much dwelling stock will not be suitable. Universal design is a set of principles for planning for people across the life course. It has:

> *… the distinct advantage of considering the widest range of ages and abilities of older residents and their households; the features are built in from the start, which can accommodate temporary health conditions and visitors; and it minimises the need for custom modifications, with their associated problems, at a later date.*
>
> *Quinn, Judd, Olsberg and Demirbilek, 2009*

Such universal design features have been incorporated into Australian Standards but are not yet a requirement for general housing.

The Australian Government now requires that new dwellings funded through the social housing initiative meet universal design standards. This approach has proved successful, with almost all new social housing dwellings (more than 16 700) built under Stage 2 of the Social Housing Initiative incorporating these standards.

Box 2 Universal housing design

Universal design is a set of planning and design principles that aim to create environments that are comfortably useable by people from childhood into their older years to the greatest extent possible, without the need for major adaptation or specialised design which can add substantially to the cost of housing. It recommends the inclusion of key easy-living features that aim to make homes easier and safer to use for all occupants. This includes people with disability, ageing Australians, people with temporary injuries and families with young children.

With an ageing population comes increasing rates of disability. The Australian Institute of Health and Welfare has estimated that around 2.3 million Australians will have a high level of disability by 2030. Accommodating an ageing population requires that housing and neighbourhoods be planned and built to be physically suitable to ensure that people of all ages and abilities can fully participate in their communities throughout their lives.

An increasing proportion of new housing will need to be produced that is more accessible or adaptable for older people. This would also support the Australian Government's access for all commitment under the *Disability Discrimination Act 1992*, the *Human Rights and Equal Opportunity Commission Act 1986*, and the *National Disability Strategy 2009*.

In 2009 the Australian Government convened the National Dialogue on Universal Housing Design, bringing together representatives from all levels of government, as well as key stakeholders groups from the ageing, disability and community support sectors and the residential building and property industry. The National Dialogue's strategic plan focuses on increasing national awareness of the issues around universal housing design and to set out a program to help all Australians realise its benefits in their own homes. An aspirational target that all new homes will be of an agreed universal housing design standard by 2020 was agreed to.

On 13 July 2010, the former Parliamentary Secretary for Disabilities and Children's Services launched the *Liveable Housing Design Guidelines*. These were developed to assist the residential building and property industry and governments. They also provide useful information for consumers seeking to introduce liveable design features into a new home and could also be readily applied within an existing home.

It is not the Australian Government's intention to prescribe a one-size-fits-all approach to housing development. Its preferred approach is for a greater diversity in the supply of dwelling types across cities to provide more housing options for different sized and types of households.

The NHSC has investigated the extent of the mismatch between the nature of housing stock and demographic needs and identified impediments to the provision of more diverse housing stock.

The second *State of Supply 2010* report (NHSC 2010, p. 113) noted that among the barriers to the construction of more compact residential development with a more diverse housing mix are:

- the higher construction costs for alternate housing types compared to those for detached dwellings, including the time and finance required to acquire, aggregate and prepare the land for construction
- lengthy and sometimes uncertain planning and development assessment processes
- community opposition to change in the type of dwellings to be constructed in certain locations.

The challenge to increase both the supply and diversity of housing to meet the needs of growing and changing populations will require a different approach to residential development. Important considerations will include: residential development and building designs that are adaptable and accessible for households across the life course; that are attractive and compatible with the surrounding area; and located close work and leisure opportunities, transport and services, and green open space.

6.1.3 Living affordability

The size, type, structure, tenure and location of housing all contribute to the cost of living for households. The size and design of housing are major factors in determining household energy and water consumption. The proximity of housing to a range of employment, services and facilities determines how far and how often members of households have to travel.

Whilst there has been a strong consciousness in Australia about the need to supply, affordable housing, the affordability equation for households is more complex. The concept of living affordability, which includes the costs of transportation and operational costs of housing, as well as the cost of land and house construction, is becoming increasingly important, especially with likely increases in energy prices.

In addition to the post-war expansion of residential development into new greenfield areas, the past 15 years has seen a trend towards increasing residential development in the CBDs and adjacent inner localities. This is most evident in the growth of Australia's largest capital cities, particularly Melbourne, but it is also occurring in smaller capitals such as Adelaide and Perth.

The NHSC notes that the trend to inner-city living reflects changing preferences for dwellings located closer to employment concentrated in CBDs. State and Local planning frameworks further encourage infill residential development.

There is high demand for housing in established areas that are well serviced by public transport, have good access to employment, and have a wide range of facilities. Such demand increases the land value of inner urban property and reduces the availability of affordable housing.

Housing developed in outer areas is generally more affordable because of its upfront capital costs, particularly on a square metre basis, but these households are usually located at a considerable distance from employment and services and so must manage greater travel costs. Larger homes also require more heating and cooling, which increases the cost of running a household. Most households have to make substantial trade-offs (travel time, amount of personal space and household finances) when deciding where to live.

As noted in the *State of the Australian Cities 2010* report (Australian Government 2010), without adequate provision of local jobs, services and public transport options, many households in outer growth areas are highly vulnerable to anticipated fuel price increases. Likewise, public and community housing is often situated in places with low employment opportunities. Ensuring that housing programs assist people to move into areas with high job prospects, less concentration of poverty and good access to services, would help to address some of these issues.

Urban infill (Box 3) provides more housing in inner-city areas, which goes some way to solving the problem of housing supply. However, purchase costs and a desire for more space continue to be an overriding factor for many families.

Box 3 Targeting more housing to be built in existing urban areas

Metropolitan plans in each capital city aim to strike a balance between housing development in new greenfield locations and existing urban areas. For example, in the draft New South Wales State Plan 2010, for the Sydney Metropolitan Region, the target for new homes to be provided within existing urban areas is 70%. In fact, this target is already being well exceeded with more than 70% of new homes being built within the existing urban footprint. Melbourne, South-East Queensland, Perth and Adelaide all have targets in their metropolitan plans for at least 47% of new dwellings to be in existing areas. However, such urban infill also needs to be accompanied by improved urban amenity for existing and new residents (for example with attractive building designs and public spaces, access to conveniently located jobs, shops, education and other services and facilities, as well as quality transport). The metropolitan plans generally seek to accommodate a diversity of household types and levels of affordability in a more compact, sustainable city form.

Opportunities exist to produce a greater diversity of dwelling types in a wider range of house and unit prices across Australian cities. Options include: reforming planning systems to improve timeliness of decisions and to position a variety of residential developments in close proximity to activity centres and transport infrastructure; releasing surplus government land for development in existing areas to support job-creation activities and affordable housing; and minimising local opposition to more intense development by enhancing amenity for local communities such as nature reserves, streetscape and park improvements, cycling and pedestrian facilities, and improved public transport.

6.2 Accessibility—connecting people and places

Accessibility in cities means connecting people to places, goods, services, resources and opportunities in a timely and equitable way. Conversely, lack of accessibility is a major source of dissatisfaction for communities and businesses alike.

For individuals, lack of accessibility may mean hours stuck in traffic congestion, high vehicle running costs, lack of public transport options, or streets that cannot be navigated by foot, wheelchair or bicycle. Lack of accessibility can also mean that individuals may not be able to reasonably access jobs, schools, shops and services, or they may miss out on cultural, recreational or social opportunities. This has consequences for the liveability of a city: accessibility is associated with quality of life.

For businesses, lack of accessibility means an inability to run business effectively or cost efficiently. This has consequences for the productivity of the nation as a whole.

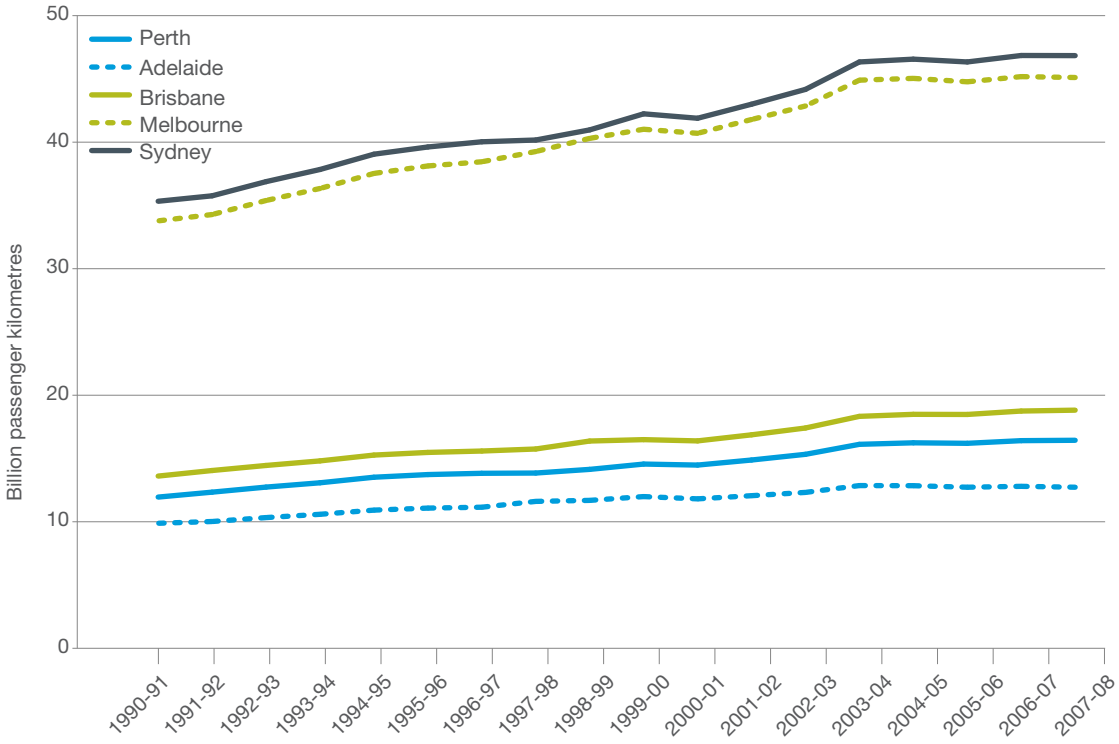
Better accessibility does not necessarily mean greater mobility. For example, advances in information and communications technology have changed the way business and social networking is conducted and will continue to improve efficiency in most sectors of Australia's economy. In addition, greater connectivity in cities can be achieved by locating people closer to the jobs, facilities, goods and services they desire or, conversely, locating facilities and services closer together in mixed-use activity centres and to major public transport interchanges with easy access. This highlights the important role of integrated land-use and infrastructure planning in reducing the distance, time and number of times people need to travel.

6.2.1 Changing travel patterns

In many respects, the private car provides unparalleled efficiency, flexibility and convenience for individuals and families. On the other hand, the levels of dependence on the private car has significant downsides that have implications for the future planning and management of our cities.

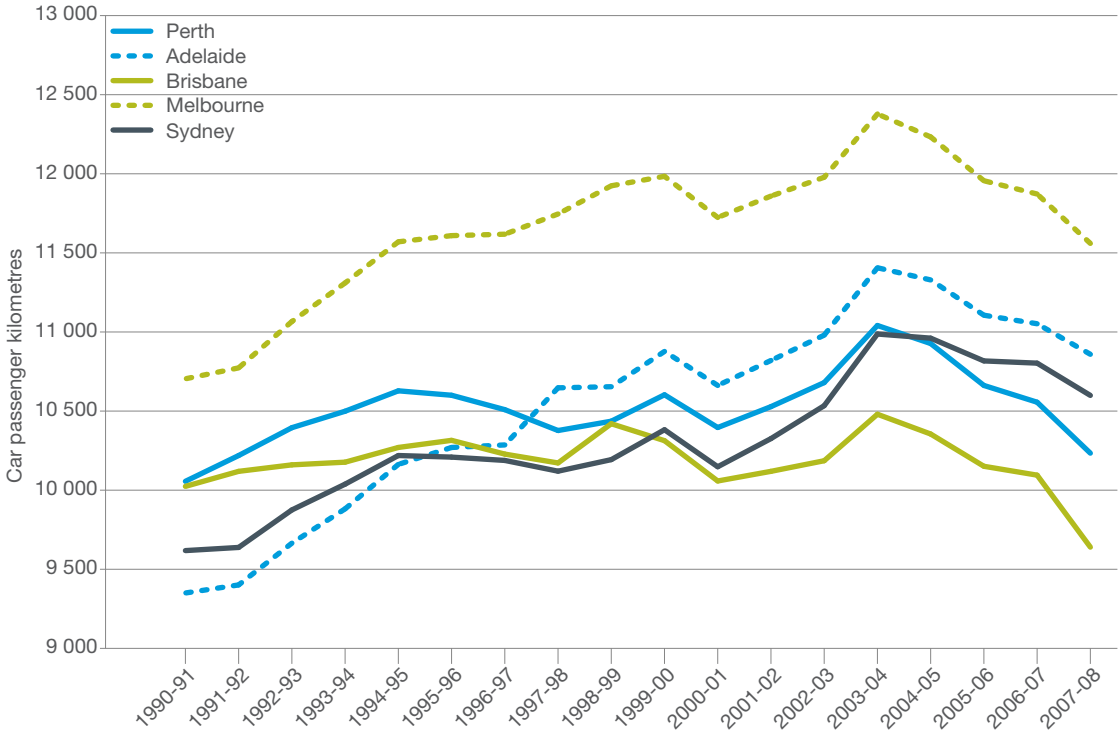
Since the 1950s car use has steadily increased to a peak of around 2004, when car travel began to decline slightly in most major cities (Figure 31 and Figure 32). In the last five years, however, there has been a noticeable change in how we travel in our cities, as described in the report *Moving People* by John Stanley and Simon Barrett (2010). *Moving People* reports an increasing use of public transport and active travel modes (cycling and walking) or not travelling at all in some cases.

Figure 31 Total car passenger km for capital cities by financial year (1991–2008)



Source: BITRE, Australian Transport Statistics Yearbook 2009, cited in Stanley and Barrett, 2010

Figure 32 Estimated car passenger km per capita by financial year (1990–2008)



Source: BITRE, Australian Transport Statistics Yearbook 2009 and ABS 2010 Regional Population Growth, cat. no. 3218.0, cited in Stanley and Barrett 2010

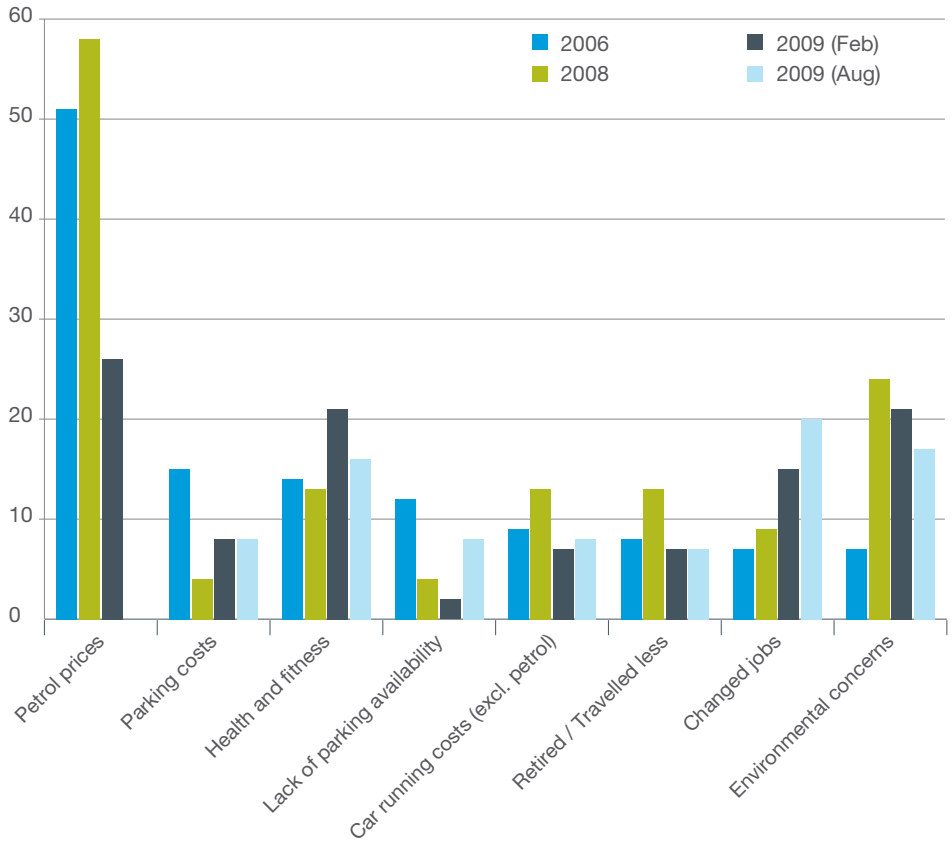
This trend reversal has coincided with noticeable increases in petrol prices but it also reflects other factors, including population growth in inner urban areas.

Figures 31 and 32 demonstrate that the size and growth rate of a city does not determine the amount of car travel per person. For example, Brisbane's and Perth's populations have grown at a greater rate than Adelaide's, yet their average per capita car travel has stayed relatively stable over the past two decades, while Adelaide's has increased.

The fall in car travel per person has balanced the growth in the numbers of people living in our cities, so that the total amount of car travel has changed very little since 2004. Nevertheless, the fact that our cities were able to accommodate some 900 000 additional residents during the period 2004 to 2009 without increased car travel is a positive sign for a more sustainable future.

Ongoing analysis of travel patterns is being undertaken by States and Territories to detect changes to these trends. At the same time, it is important to understand why these changes have been happening. The Victorian Department of Transport has been tracking reasons for changing travel patterns through a series of surveys that commenced in 2006. In that year, 335 randomly chosen Melbourne residents were asked if they had reduced their car travel in the preceding 6 months. Nearly 30% reported having done so, either a little or a lot. When asked what had prompted the change, half of all respondents attributed the change to the rapid increases in petrol prices that had recently occurred. Similar surveys were conducted again in 2008 and in 2009 (twice). The top eight reasons for decreased car use in each survey are shown in Figure 33.

Figure 33 Responses to Victorian transport choice survey



Source: Victorian Department of Transport (2010)

The Victorian research suggests that economic factors (petrol prices, parking costs and other car running costs) are important for many people, even in 2009 when the period of rapid escalation in petrol prices had passed.

A similar number of people reported making a change, not for economic reasons, but for various lifestyle reasons. Some cite the desire to include more exercise in their daily routine. Others report the desire to 'do the right thing' for the environment. This is the transport equivalent of purchasing Fair Trade goods or putting solar panels on roofs even when it is not economical to do so.

6.2.2 Reducing car dependency

A key challenge is to reduce dependence on private motor vehicles without compromising access between and within locations.

In the past, the solution to congestion has been to build new roads or create new lanes on existing networks. Roads have taken priority in funding over other modes of transport. An efficient road network is integral to city structure and functioning, as well as an essential part of the national freight network. When well planned and designed, roads can support cycling, effective bus transit and light rail options. However where the road system is not integrated within a broader transport and land-use plan, international and domestic evidence suggests that new roads are not a solution to congestion. In some cases it can even worsen the problem (Zeibots 2007). The Australian Government's advisory body, Infrastucture Australia, stated in its 2010 report to COAG:

In most cases, additional road capacity designed to facilitate private vehicle movements into urban CBDs is unlikely to lead to sustained reductions in congestion, and is likely to damage the environment and reduce urban amenity. However, some additional road capacity—for example the completion of networks serving freight needs—will, if properly managed, lead to improved long-term outcomes.

Infrastructure Australia Report to the Council of Australian Governments 2010, page 20

In its 2010 report, Infrastructure Australia also noted there are other costs beside congestion-related ones that result from transport systems relying predominantly on car travel. The environmental cost reduces liveability. Cars do not only emit greenhouse gases, they emit other fine particulates. A significant proportion of transport emissions are from cars, so switching the private motor vehicle fleet to hybrid and electric vehicles will help reduce emissions. Road safety is another concern related to car use for motorists, passengers and pedestrians alike. This is discussed later in this chapter (section 6.4.4).

The financial costs of car-dependency are considerable for households. Cars are expensive to purchase, maintain and operate, and households that are heavily car dependent may need to own more than one car. Such households are largely located in outer areas further away from higher frequency public transport services. When combined with high cost of housing, these households—already financially stretched— can become highly vulnerable to rising petrol prices and inflation (Dodson and Sipe 2008).

6.2.3 Access to employment

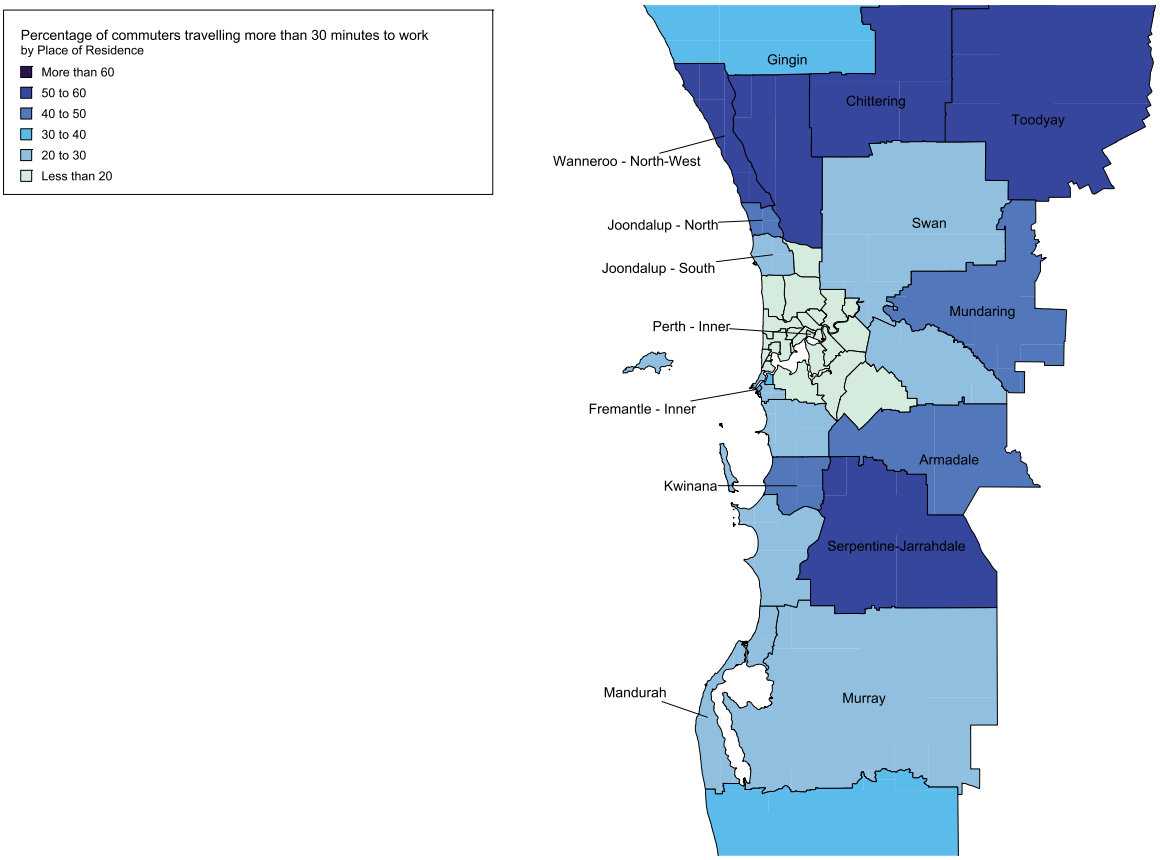
For our cities to become less car dependent there is a need to consider how well the public transport network enables people to access the resources and opportunities they need throughout their lives. An important access issue for Australian cities relates to how people get to and from work. Concerns about the time and costs associated with travelling to and from work are significant for many Australian households. For some households, getting and retaining a job is made significantly more difficult due to lack of transport availability.

The outward urban expansion of cities for housing has often occurred in areas with fewer public transport services. The distribution of residential development and employment away from higher frequency public transport services, as is especially the case in some outer growth areas, means that journeys to and from work and study involve long distances and lengthy travel times for many people.

A recent study of commuting in Perth by the BITRE (2010) showed that the population of Perth is concentrated in the outer suburbs, while employment is concentrated in the inner and middle suburbs. In 2006, the outer sector of Perth had 50% of the population, but just 30% of the jobs. A lack of jobs, relative to population, is most evident in the south-east and north-west sectors. Overall, however, 87% of Perth-employed residents live within 1 km of a regularly serviced rail or bus stop (one with a service that runs at least every 15 minutes in the morning peak period), but the proportion falls to 80% for outer-sector areas (66% for outer north-east and 69% for outer south-east) and 56% for the Peel region.

Similarly, public transport access to outer-sector jobs in outer Perth is lower, with 69% of jobs within 1 km of a regularly serviced bus or rail stop and 56% for Peel (compared to 99% for inner and 94% for middle- sector jobs) (BITRE 2010). Figure 34 shows the percentage of employed residents in Perth who do not live within 30 minutes of their job. As shown, some outer suburbs and per-urban locations have a high proportion of residents who commute long distances and the majority of employed residents are estimated to commute more than 30 minutes one way.

Figure 34 Percentage of employed residents in Perth not living within 30 minutes of their job

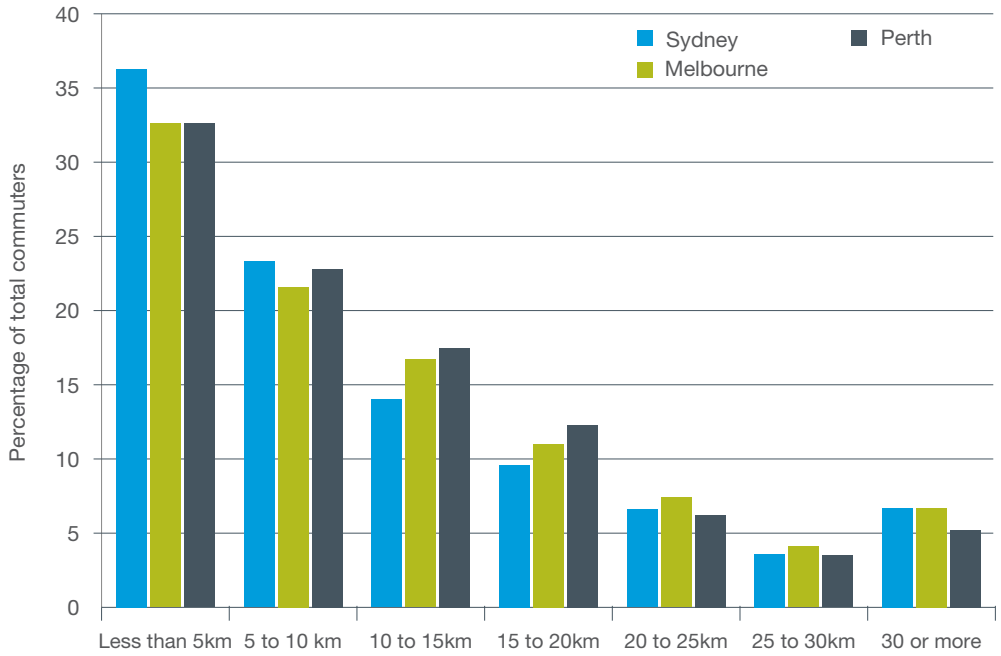


Source: BITRE (2010)

Note: Based on straight line distance between origin-destination SLA pairs and estimates of average travel speeds in different sectors, with TransPerth timetables used to identify origin-destination pairs that have a direct rail connection that takes 20 minutes or less.

While the majority of employed residents in Sydney, Melbourne and Perth live within 10 km of their workplace, a substantial minority (around 15%) live more than 20 km away, as shown in Figure 35 (BITRE 2010).

Figure 35 Comparison of distance travelled to work in Sydney, Melbourne and Perth



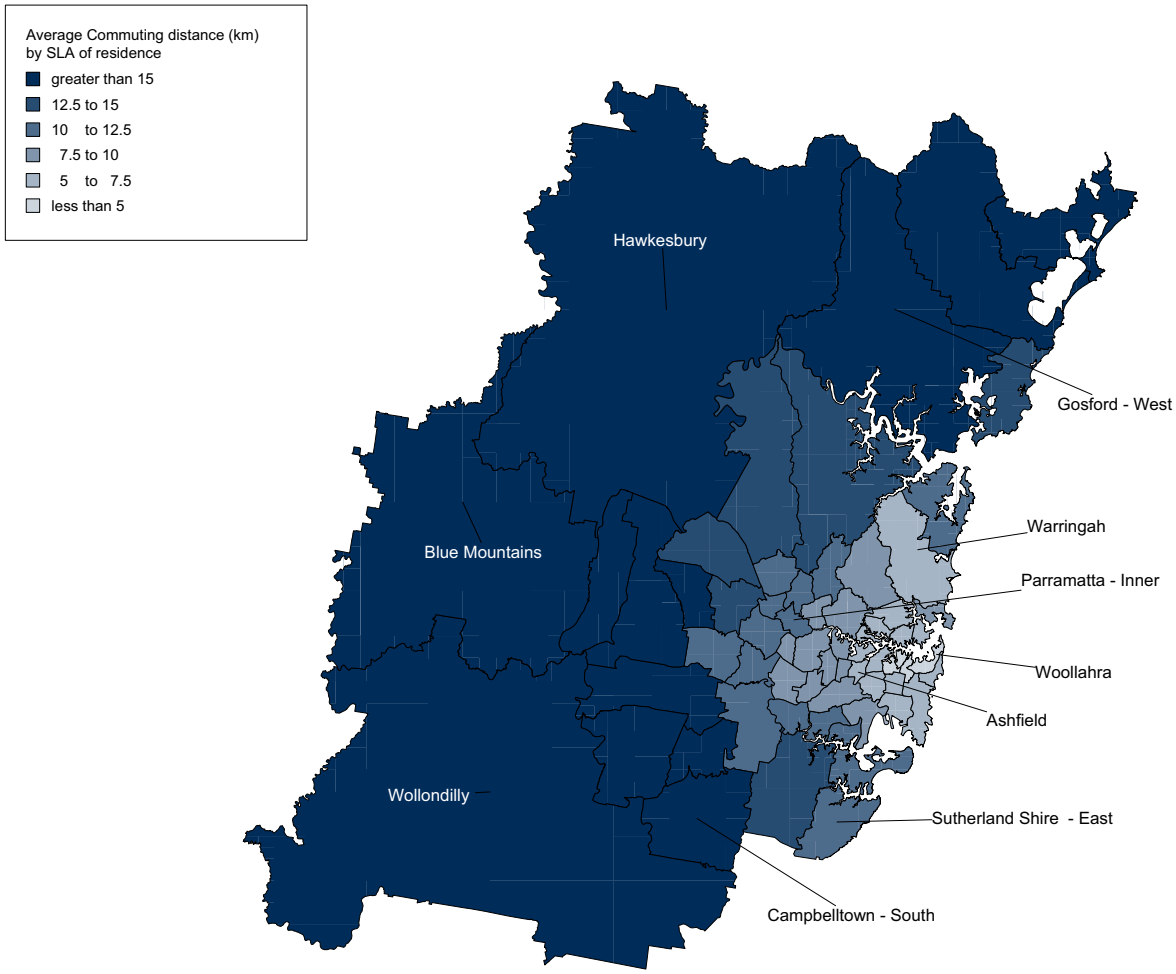
Source: BITRE analysis of ABS census of population and Housing (2006)

Note: Commuting distances are based on straight line distance between origin and destination SLA. Methodology and limitations are detailed in BITRE 2010, p.180.

In the past, residential development and employment development have not been well coordinated. As a result, outer suburban growth areas generally have poorer access to jobs or limited choice of quality jobs (Spiller 2008). A 2009 study for the National Growth Areas Alliance found that outer metropolitan growth areas were disadvantaged compared to metropolitan averages on resident skills and local employment opportunities in the cities of Sydney, Melbourne, Adelaide and Perth, with average job to population ratio of 27% for growth areas alliance member councils compared to 43% for the metropolitan areas (SGS Economics and Planning 2009).

It is these areas of cities where access to employment often involves the longest journeys, as illustrated in Figure 36. This figure shows that average commuting distances (darker blue) tend to rise with distance from central business district.

Figure 36 Average commuting distance to place of work in Sydney



Source: BITRE (2010) analysis of ABS Census of Population and Housing 2006 data

Note: Commuting distances are based on straight line distance between origin and destination SLA. Methodology and limitations are detailed in BITRE 2010, p. 180.

In Brisbane there is similar strong job growth in the north-east of the city, while most population growth is occurring to the south west. This planning outcome creates a huge travel task as people travel across the city from home to work. Influencing where jobs and housing are located is a continuing challenge for metropolitan planning in all Australian cities. Integrating planning of employment areas with residential and transport services is critical to enabling more households to access the new employment opportunities generated by the industries locating in employment zones without an inacceptably high travel task.

Where families need to travel long distances for work, flexible hours and working conditions that help them balance work with caring responsibilities have shown to improve children's wellbeing (Strazdyns 2008) and is one option that can reduce congestion at peak hours. Extending the times that public transport services run at peak-hour frequencies is another way people can access a wider range of employment opportunities within cities.

Attracting industry to outer areas to generate a greater diversity of employment is also part of the solution to improve access to employment and to reduce car travel. This long-term option will require considerable effort. An analysis of employment opportunities in Western Sydney (O'Neill et al 2008) has shown that a strongly growing national economy is not, on its own, sufficient to generate the targeted number of jobs needed for Western Sydney to support likely population growth.

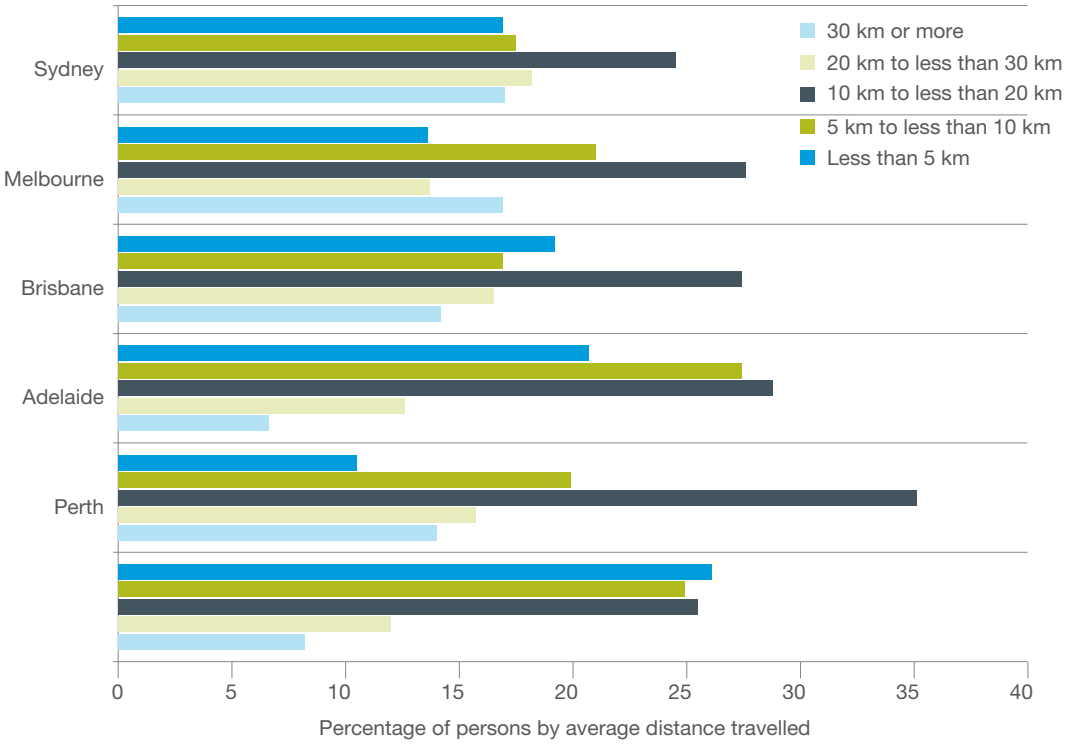
As with many other growth areas in other metropolitan regions, Western Sydney has high concentrations of unemployed or underemployed households. The evidence from the last decade shows that falling national unemployment rates have not been accompanied by the structural shifts in Western Sydney needed to allow it to shift from a manufacturing-based economy to the next phase of jobs generation in services and other industries. Improvements to the quality of housing, and investment in commercial centres planned around public transport hubs, are part of the necessary ingredients to attract businesses and people with different skills to these areas, in order to invigorate their centres and boost local job opportunities.

6.2.4 Access to education

Our future workforce will need more people with multiple and higher-level skills and qualifications. Deepening skills across all occupations is crucial to achieving long-term productivity growth. An estimated 4.6 million additional qualifications may be required over the next 15 years due to employment growth. As a result, enrolments in higher education and vocational education training will need to expand by 3% per annum (Skills Australia 2010).

Higher levels of participation and increasing skill levels are engines of economic growth. The Organisation for Economic Co-operation and Development (OECD) has noted that the 'quality' of the labour force, as seen in education and skills, also has measurable effects on economic growth. Currently, the working-age populations of most countries in OECD countries have between 10 and 14 years of education per capita, compared with about seven and 11 years in 1970. This improvement in education is estimated to have increased GDP per capita in the range of 10% to 20%, bringing high returns to individuals and their society as a whole (OECD 2003).

Figure 37 Average distance to work or full-time study, selected capital cities



Source: ABS (2009c)

Access to education and training including early childhood education is important for people to fulfil their personal ambitions and become productive members of society, and to help people out of socio-economic disadvantage. The Australian Government has a major investment in universal access to preschool, providing $955 million over five years to the States and Territories through the National Partnership Agreement for Early Childhood Education.

Governments can influence accessibility to education through careful consideration of where educational facilities are to be located, how they are linked into existing and new transport systems, particularly public transport, and the ease and affordability of travel for students.

The need for substantial amounts of land for universities and large training institutions has meant that those built in the last half century have tended to be located away from main centres and transportation hubs, unlike more centrally long-established universities. While these newer institutions may be located close to residential areas they may not be accessible from major centres.

Examples of options for improving access to universities include providing frequent and affordable bus services from major centres to campuses, such as the 'Gong Shuttle' free bus service in Wollongong. Where there are higher density populations expanding transit systems to link up educational institutions have been put into place or planned, such as in Queensland where the Gold Coast Light Rail will link up with Griffith University. One other alternative is the relocation of university campuses closer to city centres, as proposed in Newcastle and evidenced in Adelaide with the University of South Australia.

6.2.5 Increasing transport options

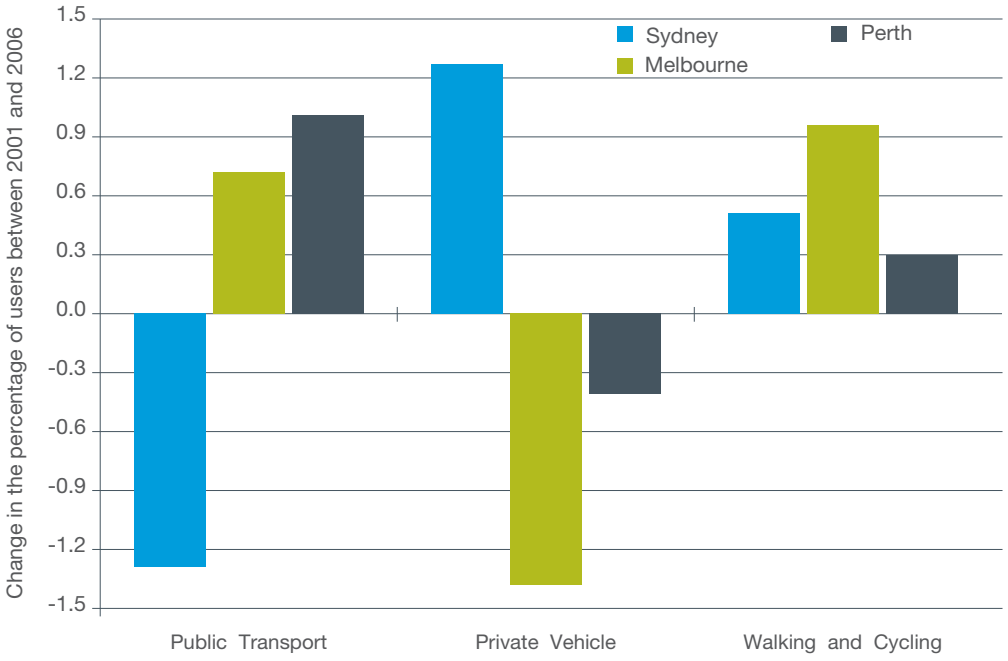
The 2009 Senate inquiry into public passenger transport concluded that, as our cities grow, public transport must inevitably play a greater role to combat traffic congestion and to improve urban amenity. Land needed for roads and car parking could be put to more attractive and sustainable uses. Importantly the inquiry highlighted the importance of public transport in reducing transport disadvantage and social isolation, and in reducing the need for urban fringe dwellers to spend an excessive proportion of their income on car maintenance and running costs (Australian Senate 2009).

The experience in many Australian cities has been that the community will embrace alternatives to car travel if options exist. As Figure 38 shows, there was an increase in walking and cycling mode share between 2001 and 2006 in Sydney, Melbourne and Perth, and an increase in public transport mode share in Melbourne and Perth. The three main reasons cited for this recent increase include a rising inner-city population, higher fuel prices and employment growth concentrated in the CBD. Changes in community attitudes, road congestion, increased parking costs and fare policy changes have also contributed (Gaymer 2010).

It is likely that the influence of rising fuel prices and growth of employment and population in CBDs will continue to be strong. Community attitudes toward sustainability, as noted above, may also strengthen to support the trend towards increased patronage in public transport.

Decisions about using public transport are also influenced by the design of neighbourhoods around people's home and work environments as well as transport interchanges. For example, studies have shown that people are most likely to catch a bus if there is a stop located within walking distance of their home (Burke and Brown 2007). Perceptions of safety around stations and transits stops also influence if and when people might choose to use public transport. Connections between modes at interchanges can deter public transport use, especially if wait times and poorly connected routes and services extend the travel time much beyond the time taken to drive. To ensure maximum use, public transport investment needs to take account of these multiple social and physical factors.

Figure 38 Change in modal share for journey to work (2001–06)



Source: BITRE analysis of ABS Census of Population and Housing, 2001 and 2006 place of enumeration data.

6.2.6 Active travel

Active travel is another important transport option that provides an alternative to car travel. Active travel is about the use of human energy for transport: walking, cycling and, because it involves some component of walking to stations and stops, using public transport.

Active commuting, ideally suited to short trips of up to 5 km, builds frequent physical activity into people's lifestyles which has health benefits. For example, a recent study in the United States involving 2364 people showed that active commuting was positively associated with fitness in men and women (particularly associated with lower levels of body mass index in men) and lower rates of obesity and blood pressure (Gordon Larsen et al 2009). An earlier large-scale survey in the United States showed that each additional hour spent in a car per day was associated with a 6% increase in the odds of being obese, while each additional kilometre walked per day was associated with a 4.8% reduction in the odds of being obese (Frank, Andresen and Schmid 2004).

Cycling and walking have many other benefits over motorised movement of passengers, particularly when integrated into an overall transport strategy. Like public transport they can help reduce traffic congestion, air or noise pollution. It is energy efficient and produces negligible greenhouse gas emissions. Well-designed urban spaces, that incorporate walking and cycling, can encourage social interaction which is linked to wellbeing. Cycling and walking are also affordable means of transport compared to owning and maintaining a car.

A number of options relating to built environments can support and encourage walking and cycling. Proximity to work is the single major factor in determining if a person will commute by bicycle or on foot. Of the people who live within 5 km of their place of work or study, nearly a fifth walk or cycle on a regular basis. Other research has shown that compact development, a wide variety of land uses close to home and work, a well-connected street network and the quality of the urban environment (for example, having a safe and pleasant route), are all factors associated with encouraging people to walk and cycle (Frank, Sallis et al 2005).

Sydney, New South Wales

6.2.7 Cycling in Australian cities

Australia falls well behind many other developed nations on bicycle use but cycling is increasing. In 2008, more than 1.9 million people were cycling in Australia, an increase of 21% over three years.

In countries such as the Netherlands, Denmark and Germany over 10% of all daily journeys are made by bicycle, and in some cities the share is much higher. By comparison, Australia's cycling mode share is 1.5% of usual trips to work or study (ABS 2009) and 4.8% of day-to-day trips other than to work or study. This places Australia in the range of the United Kingdom and Canada in terms of commuter share.

Some local areas have much higher levels of cycling than the national average. For example, 17% of all journeys to or within the City of Melbourne are by bicycle, whilst in Yarra-North, Port Phillip-West and Southbank Docklands more than 5% of journeys are made on bicycles. These statistics show a wide diversity of cycling uptake but, at an aggregate level, cycling remains marginalised as a mode of transport in Australia.

Over the past few years many western European countries have successfully increased cycling's share of transport journeys, particularly over short distances. It is increasingly recognised as a clean, enjoyable and sustainable mode of transport in urban areas, and a means to encourage physical activity as a component of public health.

There is enormous scope to increase the modal share of cycling in Australia, particularly for those 20% who commute less than five kilometres to their place of work or study, or for those making other short local trips.

Some critics argue that increasing the numbers of cyclists on roads increases traffic congestion due to their slower pace. This argument underscores the need to appropriately integrate and design cycling infrastructure (such as separated paths and driver speed restrictions) to minimise adverse impacts on traffic congestion and improve safety. Most State and Territory Governments, and many Local Governments, are progressively promoting and improving facilities to encourage cycling, including committing more funds to build paths that separate cyclists from vehicle traffic (Box 4).

Currently, cycling in Australia does not encompass a broad spectrum of users: for example, in New South Wales, women represent only 17% of commuter cyclists. In planning for cycling and pedestrian infrastructure it is important to consider the broader community, including women and children, for whom safety is paramount. Well-considered land-use patterns, quality urban design, integration with public transport, slower road speeds and improved cycleways, especially when combined, can help to encourage greater community participation in cycling.

6.2.8 The National Cycling Strategy 2011 to 2016

In September 2010, the Australian Transport Council of Federal, State and Territory Transport Ministers endorsed a new five-year *Australian National Cycling Strategy for 2011 to 2016*. The short-term goal is to double the number of people cycling over the next five years. In releasing the strategy the Council stated it was 'serious about tackling climate change and traffic congestion as well as encouraging healthier lifestyles in our cities and regional communities.'

The National Cycling Strategy includes six key actions which aim to:

- promote the benefits of cycling for recreation and commuting
- work with employers to create cycle-friendly workplaces
- extend networks of safe cycle routes and end-of-trip facilities
- consider and address cycling needs in transport and land-use planning
- continue programs to target cyclist safety and road user perceptions
- develop national decision-making processes for investment in cycling
- share best practice across the country.

The Australian Government's commitment to cycling, jobs growth and building community infrastructure—through its $40 million National Bike Path Projects economic stimulus package—is considered an important component in progressing and realising the National Cycling Strategy's goal.

6.3 Amenity—creating people-friendly places

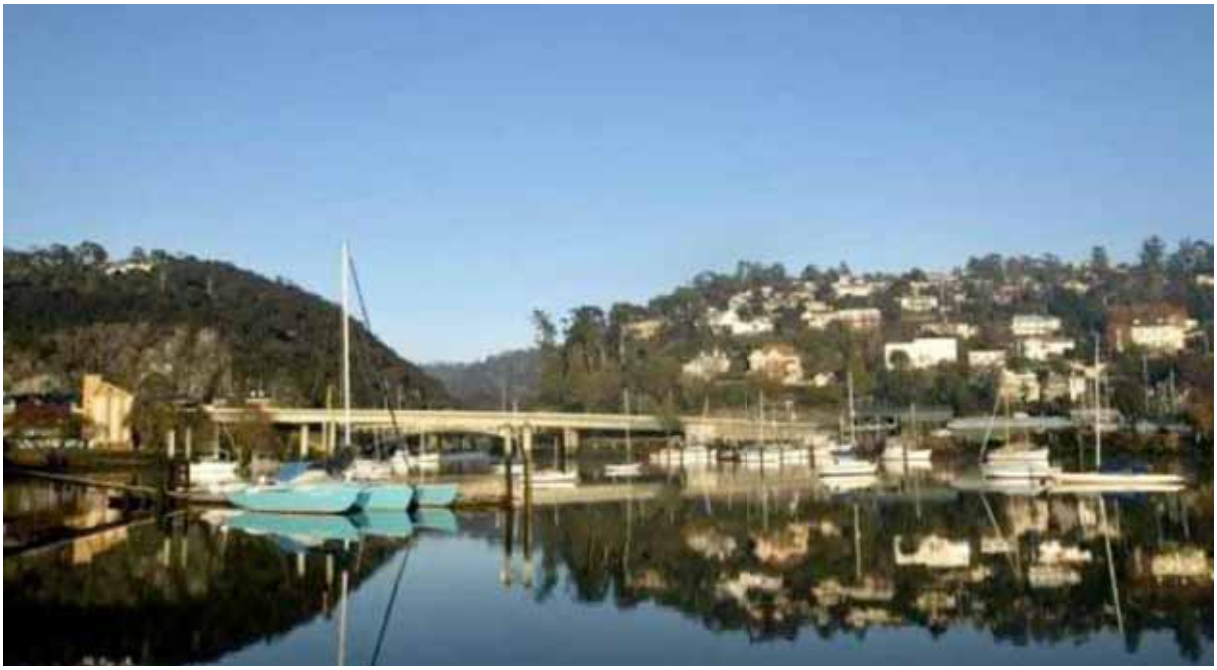
Cities are fundamentally places where people live out their lives, in households, neighbourhoods and communities.

The most important, overarching desire or concern among metropolitan residents is for the urban environments to be 'humanised' as much as possible. This means living in neighbourhoods which embody clear signs of thriving, harmonious communities.

At the same time, it is also clear that a range of tastes and lifestyles exist, and that different people are seeking different qualities: there are varied preferences about what types of environments people find harmonious. For example, people who consider themselves 'cosmopolitan' are more likely to be seeking a vibrant setting full of new experiences, while families are more likely to seek quieter, more spacious settings that will accommodate the needs of young children. As such, it is important that a city offers a variety of urban environments and provides for a variety of lifestyles.

Box 4 Cairns Central Business District to Aeroglen Cycleway

A new $6.1 million cycleway will be constructed from Aeroglen to the Cairns CBD providing a safe cycle route, 3 to 4 metres wide, with protection from traffic to encourage people of all ages to cycle. The project will benefit recreational cyclists and pedestrians along the esplanade corridor, as well as commuters working in the adjacent shopping precinct. Its is a good example of a partnership between the Cairns Regional Council and the Queensland Government with funding support from the Australian Government.



Launceston, Tasmania

Liveable cities, featuring high amenity places, are commonly characterised by:

- high-quality building design and public spaces;
- elements of the natural environment, such as nature reserves, waterways, flora and fauna;
- quality open space that includes parklands, trees, views and places for recreation;
- access to a range of facilities and services;
- convenient means of transport;
- and an absence of signs of danger or decay such as derelict buildings.

Enhancing the liveability of cities to support the health and wellbeing of people of all ages, backgrounds and abilities is an internationally recognised priority (Box 5 and Box 6).

6.3.1 Child-friendly cities

The guiding principle behind the United Nations Child-Friendly Cities Initiative is that safe and supportive environments nurture children of all ages with opportunities for recreation, learning, social interaction, psychological development and cultural expression, promoting the highest quality of life for its young citizens. The Child Friendly City Initiative aims to guide cities and other systems of local governance in the inclusion of children's rights.

The Child-Friendly Cities Initiative in Australia is an unfunded collective of organisations and councils led by researchers at Griffith and Wollongong universities that form part of an Asia-Pacific network of countries including New Zealand, Japan, Bangkok, India, China and Papua New Guinea. In Australia 32 local councils have signed up to the network. In New South Wales there are 10 in the Sydney metropolitan area, including the City of Sydney, Wollongong City Council, and three other regional councils. Victoria has 17 Child-Friendly Cities, including the City of Melbourne and Greater Geelong City Council, South Australia has one (City of Playford) and Tasmania one (City of Hobart).

Box 5 United Nations Child Friendly Cities Initiative

In 1996 the Child Friendly Cities Initiative was launched to act on the resolution passed during the second United Nations Conference on Human Settlements (Habitat II), which declared that the wellbeing of children is the ultimate indicator of a healthy habitat, a democratic society and good governance. A Child Friendly City is a local system of good governance committed to fulfilling children's rights, including their right to:

- influence decisions about their city
- express their opinion on the city they want
- participate in family, community and social life
- receive basic services such as health care and education
- drink safe water and have access to proper sanitation
- be protected from exploitation, violence and abuse
- walk safely in the streets on their own
- meet friends and play
- have green spaces for plants and animals
- live in an unpolluted environment
- participate in cultural and social events
- be an equal citizen of their city with access to every service, regardless of ethnic origin, religion, income, gender or disability.

The Australian Government is a signatory to the international human rights conventions, and has recently reaffirmed its commitment to our human rights obligations that support these directions (Attorney-General's Department 2010).

6.3.2 Age friendly cities

With an ageing population, it is important to encourage 'active ageing', where older people remain healthy, active and able to participate in, and contribute to, community life, helping them to remain independent for longer. Many aspects of urban settings, over and above the design of homes as discussed earlier, can contribute to or hinder active aging. This includes critical services and facilities such as in health and transport to basic access to buildings, public transport and along footpaths for the mobility or sight impaired.

Box 6 World Health Organization's Age Friendly Cities

The idea of an age-friendly city builds on World Health Organization's active ageing framework (2010) which was developed as a contribution to the Second United Nations World Assembly on Ageing in 2002. Active ageing promotes opportunities for health, participation and security in order to enhance quality of life as people age.

In an age-friendly city, policies, services, settings and structures support and enable people to age actively by:

- recognising the wide range of capacities and resources among older people
- anticipating and responding flexibly to ageing-related needs and preferences
- respecting their decisions and lifestyle choices
- protecting those who are most vulnerable
- promoting their inclusion in, and contribution to, all areas of community life.

Perth, Western Australia

6.4 Health, safety and community wellbeing

Progress towards a more productive economy and fairer society depends upon the health and wellbeing of our people. The way our cities are planned, designed and built has a profound influence on the health, wellbeing and quality of life of the people who live in them.

6.4.1 Designing places for improved public health

Central to the concept of liveability is the effect of urban environments on public health. Public health relates to health status of populations rather than individuals; and its focus is to prevent rather than treat disease. The Australian Government is committed to refocusing the health system towards prevention and has undertaken major reforms to improve the health of Australians, including funding of community-based programs to promote healthy lifestyles and participation in sport and active recreation (Australian Government 2010). Progress towards a healthier future for our people can be accelerated by designing and building cities and the local places within so them that they help support and encourage healthy, active living.

There were marked improvements in public health achieved during the twentieth century, in large part, attributable to planning and investment in cities. These improved health outcomes have included reductions in infant mortality; control of infectious diseases; better nutrition; reductions in fatalities from motor vehicle crashes; cleaner, safer water supplies; and reduced air pollution.

In the twenty-first century, main risk factors affecting the health of Australian people, as identified by the Australian Government's Preventative Health Taskforce (2009) are obesity, and tobacco and alcohol consumption. Of these, there is evidence that increased rates of obesity is related to contemporary urban living that gives rise to low levels of physical activity and poor diet (Preventative health Taskforce 2009a).

> *One of the greatest public health challenges confronting Australia... is the obesity epidemic. Australia is one of the most overweight developed nations, with over 60% of adults and one in four children overweight or obese. The prevalence of overweight and obesity has been steadily increasing over the last 30 years. Obesity is particularly prevalent among men and women in the most disadvantaged socioeconomic groups, people without post-school qualifications, Indigenous Australians and among many people born overseas.*
>
> *Australian Preventative Health Taskforce (2009)*

Sedentary lifestyles lead to diabetes and other related health problems which place a huge burden on our health system. The increase in car usage over the past few decades has also coincided with more sedentary lifestyles. Studies have shown that more time spent commuting by car is correlated with increased rates of obesity (Frank, Andresen and Schmid 2004). Reducing our cities' dependency on motor vehicles won't solve the obesity epidemic. However, car dependency is part of a greater picture that links the health, social, cultural, economic and environmental dimensions of our cities.

As well as obesity, reduced physical activity results in increased rates of cardiovascular disease, diabetes and related health problems. The direct and indirect cost of obesity in Australia is estimated at around $20 billion annually, while the direct cost of physical inactivity is $377 million (House of Representatives Standing Committee on Health and Ageing 2009).

In Australia, the proportion of adults classified as overweight or obese has increased from 64% in 1995 to 68% in 2007–08 for males and from 49% to 55% for females. This is a significant increase in weight gain over just 12 years.

Box 7 Reducing childhood obesity

One in four Australian children are overweight or obese; in the Unites States the ratio is one in three.

In response to this alarming situation in the United States, the Obama Administration has initiated a suite of actions aimed at solving the childhood obesity within one generation. These actions include funding to local authorities to construct safe bicycle and pedestrian networks, and other improvements to the urban environments through a Safe Routes to School program to encourage active travel. They have set their goal at returning to the expected levels in the population, before this epidemic began, meaning returning to a childhood obesity rate of just 5% by 2030 (White House Task Force on Childhood Obesity, 2010). A similar target and suite of actions for reducing childhood obesity has been set by the government of the United Kingdom (Her Majesty's Government 2009).

As noted in the technical report on obesity by the Preventative Health Taskforce (2009a) urban planning approaches influence community levels of physical activity and driving behaviours, thereby influencing health outcomes (Lee and Richardson 2008). Solutions to address the obesity-promoting environment such as changes in transport infrastructure and urban design can be more difficult and expensive than interventions targeting groups, families or individuals. However, these kinds of strategies are more likely to support and encourage physical activity among the greatest number of people in the population in the long term.

The House of Representatives Report on Obesity (2009) concluded that:

> *Urban planning is a significant contributor to the high levels of obesity in Australia, and planning guidelines and laws must be improved, with responsibility shared by federal, state, territory and local governments alike.*

Cairns, Queensland

Local Government is the main provider of urban design and amenity at a community scale; State Government sets out the strategic land-use planning; whilst the Australian Government provides significant tied and untied funding to local governments to deliver a range of infrastructure and services to communities. An opportunity exists for ensuring community infrastructure is based on the principles set out in the *Healthy Spaces and Places* guidelines, 2009 (Box 8).

Box 8 Healthy spaces and places

Healthy Spaces and Places is a national web-based guide for planning, designing and creating sustainable communities that encourage healthy living.

It has been prepared primarily for planners and designers, to help them tackle some of Australia's major preventable health issues by creating places where it is easier and more desirable for more Australians to be active – walking, cycling and using public transport – every day.

This resource was developed by a collaborative team comprising the Australian Local Government Association, the National Heart Foundation of Australia and the Planning Institute of Australia and funded by the Australian Government Department of Health and Ageing. It is available online at <http://www.healthyplaces.org.au/site/>.

Better designed built environments that encourage physical activity will support other public health initiatives that promote walking and cycling to people of different age groups in local communities such as walking school bus projects (Box 9).

In Australia's major cities, people in the lowest socio-economic groups tend to be concentrated in areas characterised by poor urban design, inadequate infrastructure and facilities, and lack of healthy, affordable food options. Renewal and retrofitting of these areas based on principles that support healthy lifestyles, including opportunities to exercise, access to affordable fresh food and accessibility to social support networks can help improve public health outcomes for these communities.

Box 9 Walking school buses

The Walking School Bus program is a community and Local Government initiative to encourage more children to walk to and from school. It involves engaging volunteers to supervise and escort groups of children between home and school. In Australia it has been that has been taken up in various Local Government areas

In Victoria, where the program has been funded since 2001 by VicHealth, the number of councils that have implemented Walking School Bus programs has grown from four to 58 council areas. An evaluation of the program for the period 2005 to 2007 found that the number of volunteer led 'buses' had grown to 487, which involved 974 volunteers and had an average of 3 935 children walking to school. (VicHealth 2007).

6.4.2 Heat and air quality

Urban environments are also associated with public health concerns, water and air quality, noise, temperature, vectors such as mosquitoes, access to natural environments and open space, and opportunities to socially interact.

Air pollution, though improved, still poses a health risk to many communities, and especially children and the elderly. The most commonly reported conditions among children and young adults were respiratory conditions (17% of children under 15 years and 28% of persons aged 15–24 years), with asthma being the most prevalent for children aged fewer than 15 (10%) and hay fever and allergic rhinitis for those aged 15–24 (17%). Respiratory conditions were also common among people aged 65 years and over (29%), other conditions were more prevalent in this age group (ABS 2009d).

Record breaking heatwaves in southern Australia in 2009 resulted in high death rates due to heat stress. Certain parts of our cities are more susceptible to these factors, with some places, such as south-western Sydney, at times being exposed to both high temperatures and high air pollution levels.

6.4.3 Road safety

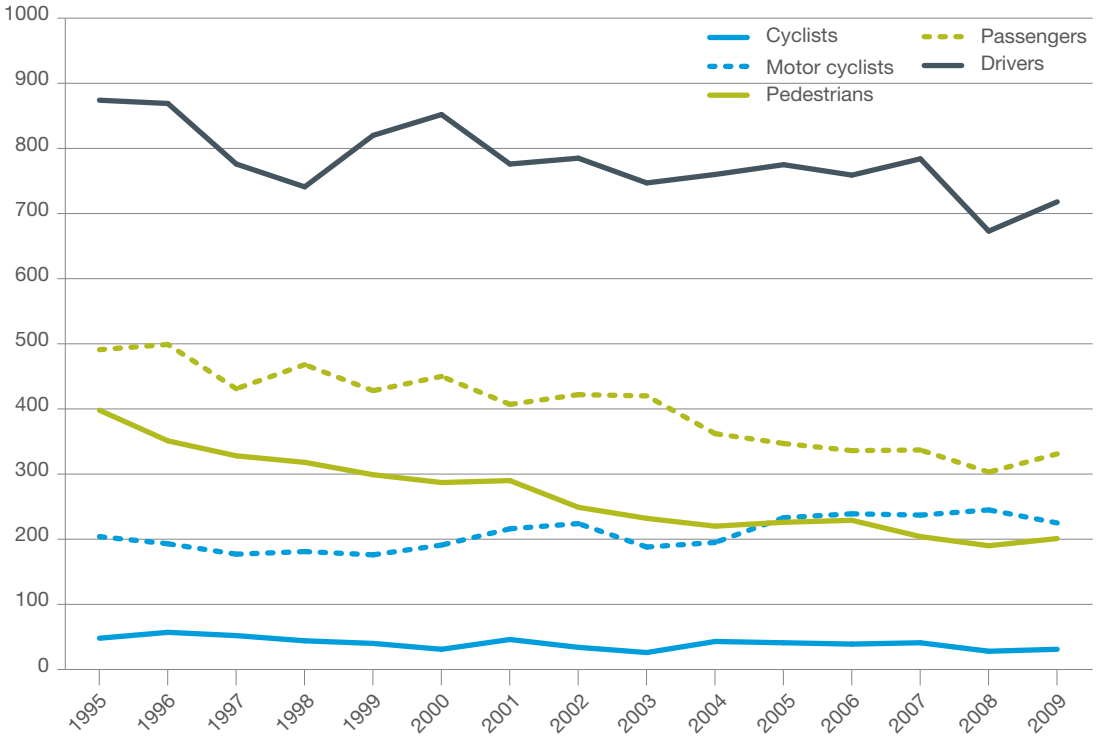
Australia's national road fatality rates have fallen by almost two thirds over 39 years from a peak of 3 798 deaths in 1970 to 1 507 in 2009 despite substantial growth in population and vehicle usage. The continued reduction in road deaths (Figure 37) has been achieved through concerted government action and a combination of road safety legislation, improvements to roads and vehicles, intensive public education and enhanced police enforcement aided by improved enforcement technology (BITRE 2010b).

Notwithstanding these improvements the Australian Government and States and Territories Governments remain committed to continuing to improve road safety outcomes. With changing patterns in travel towards active travel alternatives, however, consideration is warranted for a shift in emphasis in funding for road safety programs towards greater pedestrian and cyclist safety. The National Cycling Strategy 2011–2015 is one such example.

Box 10 National Road Safety Strategy 2011–2020

Transport Ministers from the Australian Government and States and Territories Governments and the President of the Australian Local Government Association have committed to a new National Road Safety Strategy for 2011 to 2020. The draft stategy was released for public comment on 1 December 2010. The underlying premise of the National Road Safety Strategy is that road safety is a shared responsibility between governments, industry and the community. It encompasses not just investment, design and maintenance of roadways, but the integration of the road network as part of broader transport and land-use systems. The approach aims to better align safe roads and speeds with the road environment, vehicles and people.

Figure 39 Road deaths by road user group (1995–2009)



Source: BITRE (2010g)

There is evidence to suggest off road cycle ways and 40 kilometres per hour speed limits in town centres would reduce risk of death and injury to cyclists. Between 1990 and 2005 the largest proportions of cyclist deaths have occurred on roads where the speed limit was 60 kilometres per hour: 55% in 1991–95, 42% in 1996–00 and 35% in 2001–05. By comparison in 2001–05, the years in which 50 kilometres per hour speed zones were introduced in many Australian cities and towns, 18% of cyclist deaths occurred in 50 km/h speed zones. One-fifth or more of cyclist deaths occurred in 100 kilometres per hour speed zones, though the proportion declined from 26% in 1991–95 to 21% in 2001–05 (ATSB 2006).

6.4.4 Personal safety

A sense of safety within communities is important to wellbeing and assists law enforcement. The issue of personal safety in urban environments is of particular concern to women and the elderly, even though victims of crime are more likely to be young men. The 2006 ABS General Social Survey showed that 26.5% of women reported feeling unsafe or very unsafe walking alone in their local area after dark compared to 9.1% of men (ABS 2006).

Perceptions of personal safety influence the decisions people make about where and how they travel. The safety of travelling on public transport is a concern for many people, especially around interchanges. The location, design and features in the built environment, such as lighting, and well maintained public spaces, can contribute to the perceptions of a safer environment. There are long standing principles of crime prevention through environmental design that address these issues and should continue to be promoted and incorporated in the design of places, and associated infrastructure.

6.5 Social inclusion

The Australian Government is committed to progressing towards a more socially inclusive society in which all Australians feel valued and have the opportunity to participate fully in the life of our society.

Achieving this vision means that all Australians will have the resources, opportunities and capability to learn by participating in education and training; to work by participating in employment, in voluntary work and in family and caring; engage by connecting with people and using their local community's resources; and have a voice so that they can influence decisions that affect them. In particular, the Government is committed to supporting children and families experiencing or at risk of disadvantage.

The Government released *A Stronger, Fairer Australia* in January 2010, outlining its vision for social inclusion—that no Australian is left behind—all should have access to the opportunities, resources, capabilities and responsibilities to learn, work, connect with others and have a say in community life.

Applying the concept of social inclusion to the urban context, liveable cities offer a wide range of opportunities for people to work, learn, socialise, be active, be creative and have freedom in cultural and religious expression.

Australian cities have relative equality in international terms. The consequences of this social egalitarianism are relative social cohesion and harmony. However, where different kinds of disadvantage—lower incomes, poorer housing, poorer health, lower education attainment, higher unemployment and higher crime rates—tend to coincide for individuals and families in a relatively small number of particular places, these concentrations of disadvantage tend to persist over time (Social Inclusion Unit 2009).

These localities were often built with insufficient infrastructure, with little regard for community development and building social capital and have become home to Australians at risk of social exclusion.

The potential for social isolation of individuals in our cities, particularly in the outer suburbs where jobs, education, health services can be a long way away and where transport options are limited, is one such issue. Isolation can impact on the individual's wellbeing and also on the cohesion and productivity of the community at large through being able to build 'social capital'. In response to the global recession, the Australian Government focussed its employment efforts on 20 priority employment areas.

These areas are highly vulnerable to the impacts of economic recession and the associated impacts on health, wellbeing and employment. These areas were determined by the Department of Education, Employment and Workplace Relations through analysis of labour market indicators. The criteria for identifying priority employment areas are shown in Box 10. The *2010 Intergenerational Report* very clearly described the importance of maximising workforce participation for our future economic prosperity. It is therefore important to harness the potential of these areas and their people to ensure both social and economic opportunity is realised.

Box 11 Priority employment regions

The Australian Government has identified 20 priority employment areas and 29 remote priority areas as experiencing or at particular risk of disadvantage based on an analysis of various labour market statistics which indicate a region's likelihood of experiencing disadvantage now or in the future.

These priority employment areas were identified based on the indicators that they:

- were already facing high levels of labour market disadvantage and a high unemployment rate
- were displaying a notable increase in unemployment since the onset of the global economic downturn and which may be 'at risk' of employment losses and increases in unemployment as the slowdown takes full effect
- were already experiencing a high proportion of their population receiving Centrelink benefits
- had populations with poor educational attainment levels/low skills
- had, in previous downturns, experienced entrenched disadvantage or a significant lift in the unemployment rate
- had a high concentration of industries that are likely to exhibit or are already exhibiting a significant decrease in employment (or rise in unemployment) due to the global economic downturn (for example, those with high concentrations of manufacturing, financial and insurance services, rental, hiring and real estate services, mining or accommodation and food services).

The 20 priority employment areas are located across most of the major cities including in:

- 14 local government areas in the Sydney metropolitan area across Canterbury-Bankstown, and South-Western Sydney and Western Sydney
- Wollongong and Shellharbour local government areas
- all of the local government areas of Newcastle
- local government areas in South-Eastern and North-Western Melbourne
- South-West Perth
- Northern and Western Adelaide
- Ipswich and Logan in Brisbane and in Cairns and Townsville in north Queensland
- Launceston in Tasmania.

Funding of research into emerging issues of importance to Australian cities is essential to the development of new policy responses for improving social inclusion in these priority areas.

The Australian Research Council sponsored a three year research study, commencing in late 2006, to investigate transport disadvantage, social exclusion and wellbeing in metropolitan, rural and regional Victoria. An international, collaborative research team was established including Monash University, the University of Westminster, the University of Ulster and the Brotherhood of St Laurence. Travel surveys were undertaken to allow an evidence-based examination of the issues. A series of papers have been published, including a potential methodology for incorporating social inclusion benefits in the assessment of transport projects.

An opportunity exists to ensure that investment in housing, services, facilities and transport is carefully targeted to assist the residents of areas to be able to take up opportunities in education, employment and civic life. This has been the emphasis of the Australian Government's Social Housing Initiative.

6.5.1 Enabling places for people with disabilities

Australia became one of the first western nations to ratify the *United Nations Convention on the Rights of Persons with Disabilities* (the Convention) on 17 July 2008. While not creating any new rights, all tiers of Australian Government now have an obligation to act in accordance with the rights provided for in the Convention. The Convention aims to enhance opportunities for people with disability to participate in all aspects of social and political life including access to employment, education, health care, information, justice, public transport, affordable housing and the built environment.

The National Disability Strategy announced in November 2008, is being developed under the auspices of COAG in recognition that support for people with disability is a shared responsibility across the Australian Government and the states and territories. The Strategy will drive future reforms in both the disability service system and, importantly, mainstream systems for people with disability, their families and carers. The National Disability Strategy aims to ensure that the principles underpinning the Convention are incorporated into policies and programs affecting people with disability, their families and carers.

On 15 March 2010, the Government launched the *Disability (Access to Premises – Buildings) Standards*, which for the first time set the minimum access requirements for people with a disability to publicly accessible buildings. The Standards cover features such as accessible lifts, stairs, ramps, toilets and corridors and include buildings such as office blocks, shops, hotels, motels, and common areas of new apartment buildings. These Standards will also provide greater certainty for people with disability as well as industry, and will cover new public buildings and those that are being significantly upgraded. The Standards will harmonise the technical requirements of the Building Code of Australia with broader accessibility requirements under the *Disability Discrimination Act 1992*. The Standard will commence on 1 May 2011.

In addition, the *Disability Standards for Accessible Public Transport (Transport Standards)* under the *Disability Discrimination Act* came into operation on 23 October 2002. They establish minimum accessibility requirements to be met by providers and operators of public transport conveyances, infrastructure and premises, in accordance with a staged compliance timetable set out in the Transport Standards.

Design measures that improve accessibility for people with disabilities such as height and placement of switches, mirrors, handles, often benefit women and older people, in terms of height and ease of use. Overall, a deliberate broadening of the scope of use of transport, buildings, public bathroom facilities, walkways and recreation areas, as not merely for able-bodied, full-time workers but for parents (mothers and fathers); women and men with disabilities and their carers; older women and men, would promote a more welcoming environment for all people.

6.5.2 Closing the Gap for urban Aboriginal and Torres Strait Islander communities

Urban Indigenous communities comprise 43% of Australia's Indigenous population. In many cities the Aboriginal and Torres Strait Islander communities comprise a similar proportion of the population around 2%, as at in the overall Australian population. However, there are some major cities, like Darwin, Cairns and Townsville, and some local government areas within cities which have substantial Indigenous populations. Three local government areas in western Sydney, Blacktown, Penrith and Campbelltown, combined, have more Indigenous people than any other location outside of the Northern Territory.

Indigenous Australians experience high levels of social exclusion in all areas of life, including employment, justice, housing and education, as well as higher than average rates of disability and chronic disease (DEEWR, 2009). Many urban Indigenous people experience disadvantage in respect to education and labour force participation compared to the non-indigenous urban population. In some respects this reflects the fact that many of the places in which there are higher proportions of Indigenous people in the population are the areas which have lower amenity, limited accessibility and fewer resources or opportunities.

COAG is committed to halving the employment gap between Indigenous and non-Indigenous Australians by 2018. To meet this target, major reforms are being implemented to promote Indigenous people's participation in the wider economy.

To help 'close the gap' for Indigenous people in urban areas, issues to be tackled include the accessibility to jobs and education from areas in which Indigenous communities are more highly represented, the distribution of services in these areas and the investment in improving amenity. Addressing these issues will also help improve the general health and wellbeing of our Indigenous communities.

When addressing the needs of communities in urban areas, such as provision of affordable housing and transport and improving access to employment, education and health services, the needs and specific cultural concerns of Indigenous people must be considered by engaging and enabling their participation. It could also be argued that increased amenity, such as better public transport, positively affects Indigenous people to a higher degree by removing obstacles to the access of services, whereas non-Indigenous people may utilise alternative strategies to access services.

Additionally, there are considerations specific to Indigenous Australians. For example, social housing is particularly important for Indigenous people, who experience significantly lower home ownership levels and may experience difficulty accessing private rental accommodation due to low incomes and/or discrimination. While social housing planning which avoids concentrations of disadvantage is important, there is a tension with the increased wellbeing of Aboriginal and Torres Strait Islander people that results from proximity to family and access to community activities (SCRGSP, 2009). Such culturally based considerations are relevant to planning for the range of services and infrastructure.

The liveability of our cities will be enhanced if all communities are enabled to participate fully and equally in helping to shape the future of our cities.

Canberra, ACT

Chapter 7

Well-managed cities

The prosperity of our cities and communities is dependent on the political structures and mechanisms used to manage and coordinate our urban systems.

The five largest city-regions in Australia are home to 70% of the nation's population (15 million people) and as this proportion will substantially increase over the next decades, managing these large, complex and dynamic systems, will become more difficult.

Many Australian cities suffer from a lack of integration between infrastructure investment proposals and prior strategic planning which should express desired outcomes for the national economy and our communities. Infrastructure proposals are at times considered as ends in themselves rather than a means to securing more productive, liveable and sustainable outcomes for our nation.

A concern with some metropolitan planning is that the relationship between the major cities and smaller regional cities and/or broader city-regions surrounding each of Australia's largest cities are not well acknowledged, despite implications and opportunities for population and employment distribution, management of urban expansion, and integration of infrastructure and transport.

Principal responsibility for land-use and infrastructure planning for metropolitan regions lies with States and Territories. Yet the work of State and Territory planning departments and infrastructure agencies have often been inadequately aligned. Additionally, there is not always a long-term commitment to the strategic directions of metropolitan plans or the use of them as frameworks against which annual budget proposals are evaluated and prioritised. As a result, there is not always sufficient integration of social, economic, and environmental policies and plans. This issue is a main target of COAG-agreed reforms for capital city strategic planning systems.

Likewise local authorities, representing the people who will be affected by plans and infrastructure investments, are often not integrated in planning and decision-making processes. This makes it difficult to align local strategies, and the development of local capital and asset management plans. Again, COAG has agreed to the importance of long term planning for cities being coordinated across all spheres of government.

These issues, and some of the problems from which they stem, are not faced by Australia alone, they mirror those of other major cities worldwide as identified by the OECD (2001):

- overly complex policy environments, with less than optimal inter-municipal coordination and weak legitimacy of political leadership, reducing the capacity to resolve area-wide policy problems and maintain a clear focus on key policy issues
- planning and environmental problems, particularly a lack of administrative control over functional areas that are appropriate in size for strategic policies for transport, urban sprawl, urban renewal, pollution control, climate change, water, environment etc
- hierarchical and rule driven public sector
- lack of transparency and accountability in decision-making processes
- lack of integration of sectoral policies at the urban and larger city-region level

- lack of clear economic development strategies, and difficultly in promoting public-private partnerships, particularly in the midst of economic downturns
- inadequate public finance, constricting infrastructure investment, and resulting in investment inequities across the metropolitan region.

There are concerns that some of the planning and governance challenges facing our cities will become even more complex and difficult as our cities grow.

7.1 International and national approaches to managing cities

The coordination challenges presented by urban systems are the subject of debate and change the world over. An OECD review of various models for metropolitan governance shows that central governments have had a leading role to play in reform processes. In some cases, governments have legislated for a specific model of metropolitan governance or, alternatively, to promote municipal cooperation on a voluntary basis, which is more common in federal countries (OECD and CDRF 2009).

Australia participates in the international Forum of Federations which explores the merits of various governance approaches, including coordination and decision-making models introduced within the United Kingdom, North America and Europe such as the Greater London Authority, Metro Vancouver, and the Metro-Council Portland, Oregon.

Although there are many models for regional planning and governance, these can be summarised into statutory and cooperative approaches. A statutory approach means that there is a regional government with powers to create regional laws or by-laws and a statutory approach to regional planning means that once a regional plan is agreed upon it becomes law.

A cooperative approach to regional governance means that smaller local authorities work together to achieve mutually beneficial goals and objectives. Any agreements made would be subject to follow through by each participating government. Similarly, the implementation of a cooperative regional plan would be subject to the statutory powers of the cooperating authorities. Table 5 outlines the strengths and weaknesses of each approach.

Table 5 Strengths and weaknesses of statutory and cooperative approaches

	Strengths	Weaknesses
Statutory planning	The strategic goals and objectives of the plan must be adhered to by law.	There may be less flexibility at local level.
Cooperative planning	Governments can tailor their approach to suit their specific requirements, goals and objectives.	Implementation of a plan is subject to the statutory powers of the cooperating authorities. This may result in less coordination and integration.
Statutory governance	A highly integrated model with scope to develop policy and legislation with a regional focus.	If regional government sits between local and state government, may lead to an overly complex legislative framework.
Cooperative governance	A good way of achieving better integration across different spheres of government.	Any agreements made are non-binding and subject to follow through by each local authority.

In many countries, there has been a move towards more collaborative approaches. These urban partnerships have been widely used particularly to address the multi-faceted problems in distressed urban areas and to redevelop brownfield sites. The OECD report states that 'it is increasingly agreed that such partnerships should be part of a more comprehensive process' that involve a multi-sectoral, integrated and metropolitan area-wide approach to achieve desired outcomes (OECD and CDRF 2009).

Within Australia good examples already exist for achieving integrated planning and infrastructure investment at the state level. Two notable examples, from which other States and Territories are learning, are the Western Australian Planning Commission and the South East Queensland Regional Plan and associated Infrastructure Plan and Program.

The COAG agreement for capital city strategic plans provides a new framework for the Australian Government to support city planning. In future Australian Government funding for significant infrastructure will be conditional on States and Territories having in place plans that meet the nine COAG agreed criteria. The agreed critieria forms the basis from which the Australian Government can support continuous national improvement and build and share knowledge of best practice planning approaches.

7.2 Governments working in partnership

The States and Territories and Local Government within the major cities, have the main carriage for how the cities are planned, managed and developed. The differences between and within cities in terms of issues and challenges and the way they need to be managed means that there are no simple or universal solutions.

State and Territory administrations and Local Government are actively improving city planning processes. Models of good practice are emerging in some of the capital city regions of Australia, improving the way cities are planned and the how to deliver infrastructure to manage growth and change in a sustainable way.

In Western Australia, the West Australian Planning Commission is a planning authority with sufficient administrative control to effectively produce and implement long term plans. The Commission has been operating for half a century through many changes of government. It provides a combination of planning policy advice to government and undertakes development approvals. It also has a critical role in protecting and progressively purchasing key infrastructure corridors and lands of environmental or community importance such as ecological communities, water catchment areas and foreshore reserve. The Commission, which has an independent chair, brings the heads of key state agencies together with representatives from local government, industry and community, independent experts in infrastructure, planning and environmental disciplines.

Melbourne has a good example of public participation in the planning process, where in developing Melbourne 2030, the Victorian Government undertook extensive community consultation. The Victorian Government has continued to engage the public in the review of urban growth plans.

A notable example of metropolitan cooperation is in Adelaide, where the retention of population and employment rather than population growth is the main issue. The 14 local government mayors meet on a regular basis to manage city wide issues. The coming together of metropolitan mayors to discuss city-wide issues has also commenced in other states.

The South-East Queensland Infrastructure Plan and Program which has in the past underpinned the South-East Queensland Regional Plan (recently reviewed with a de-centralisation policy) has often been used as leading practice example in Australia as it identified critical infrastructure needed to support growth over a 20-year period.

In New South Wales, the newly created integrated transport authority represents a significant potential improvement in the coordination and delivery of better service delivery standards for the people of Sydney and the rest of the state.

Sharing and learning from these Australian, along with international examples of good planning practice, is a foundation of national urban policy. By elevating the importance of cities in the deliberations of COAG, the Australian Government has created the opportunity for State and Territory administrations and Local Government, through its representative association, the Australian Local Government Association, to consider the application of their best practice in a national context.

7.3 Rigour in State and Territory annual budget cycles

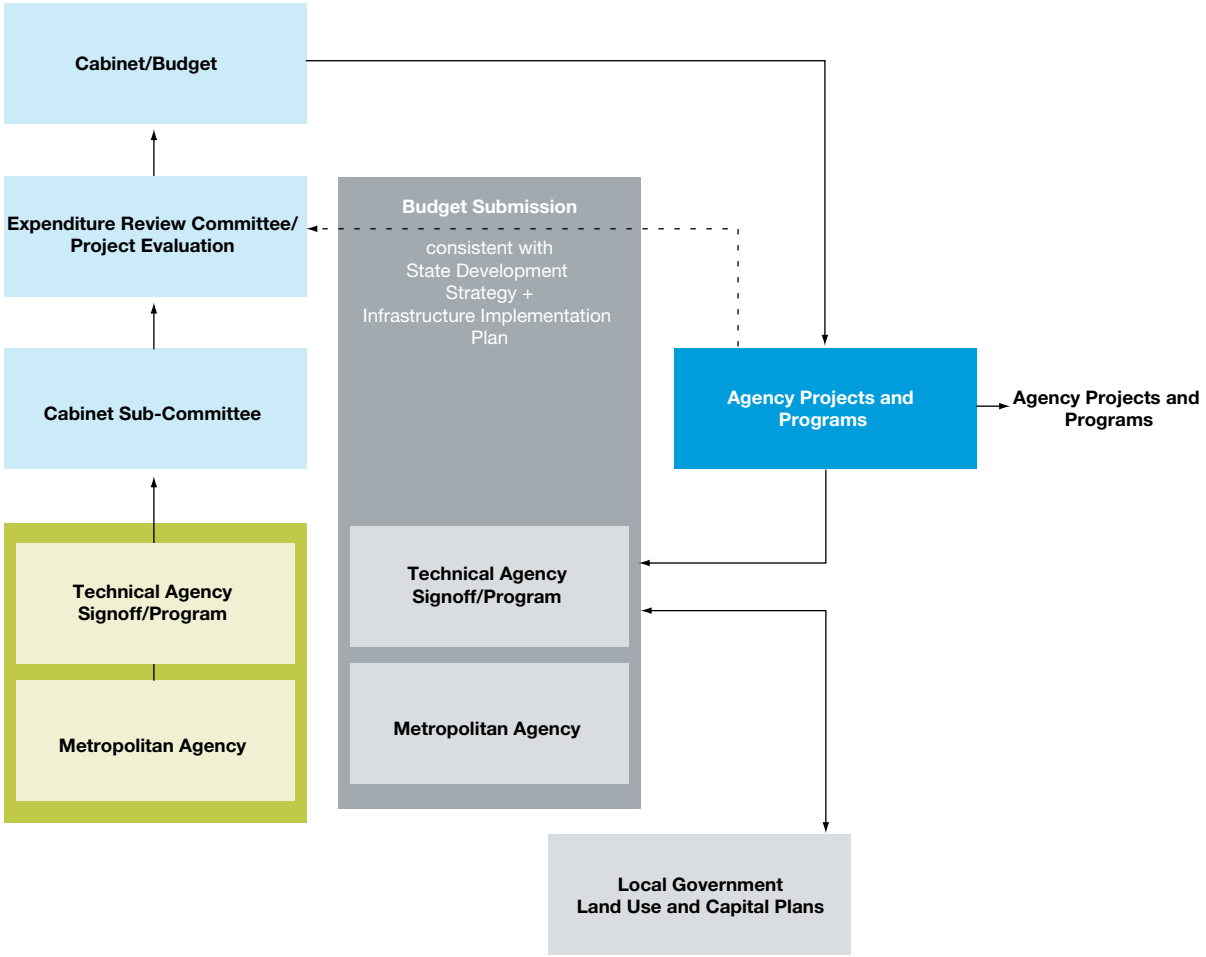
A major failing with many metropolitan plans is poor implementation due to inadequate administrative processes or inadequate policy commitment. This creates uncertainties and inefficiencies for all stakeholders, whether it be a local government seeking certainty of state investment in infrastructure to support an urban growth area; a developer wishing to market land as being close a public transport; individual community members making choices of where to live based on what facilities and services they will have access to; or lack of protection from encroachment of incompatible uses resulting in major pieces of economic infrastructure, such as a freight corridor or airport, not being able to be used to their maximum productive potential.

To create rigour and commitment to implementation, both need to have ownership of implementation. Ideally state agencies/departments, with input from relevant external stakeholders, including local government, would contribute to the development of a state development strategy and infrastructure implementation plan, which works in conjunction with a metropolitan/regional scale plan. This may be signed off by a city/region coordination/advisory entity with technical agencies in the state government; and reported directly to a state development cabinet sub-committee responsible for implementation of the metropolitan plan.

Agencies submit project and program proposals for budget consideration. These submissions should be consistent with their State Development Strategy and the Metropolitan Plan, as relevant. State Governments ultimately approve funding for project and program delivery but this should be on the basis of consistency with the planning frameworks. These plans should inform and be informed by local government land-use and strategic plans. This process is illustrated in Figure 40.

A number of jurisdictions have processes similar to this. Unfortunately some jurisdictions, despite earlier good intentions, have let such processes lapse. COAG reforms on city planning clearly seek to address capital city strategic planning ‘systems’, and will hopefully encourage a renewed commitment to the broader whole of government need to engage in the urban planning and resource allocation process.

Figure 40 State and local government plans inform state budgets



A factor in the successful implementation of the approach to local coordinating planning with State budgets, as illustrated in Figure 40, is likely to be the number of local government authorities within each city region. The fragmentation of the capital cities, except Brisbane, into numerous councils, and similarly some of the smaller regional cities like Wollongong, Newcastle and Launceston having multiple councils, presents a major challenge to the effective management of cities. Opportunities exist to consider more effective arrangements for local government in these cities, especially in Sydney with 43 councils, Melbourne with 31 and Perth with 30, compared to five in Brisbane.

7.3.1 Working with local government

The ability of Local Governments to manage and service their communities, varies considerably, and is frequently constrained by a lack of resources. there is a strong interest in helping to support local authorities become more economically sustainable, and therefore better able to support their communities. Responding to this need the Australian Government has allocated $25 million to local governments to support reform to financial management. There may be further opportunity to reconfigure some existing local government grants and programs to further assist this process.

7.3.1.1 AUSTRALIAN COUNCIL OF LOCAL GOVERNMENTS

Recognising the value of local government to their communities, and the importance of this sphere of government to the effective governance, the Australian Government established the Australian Council of Local Government (ACLG) in September 2008 to forge a new cooperative engagement between the Australian and local governments giving a voice to local government on matters of national significance.

The ACLG held its Inaugural Meeting on 18 November 2008 where more than 400 mayors and shire presidents from councils and shires across Australia and representatives from State and Territory governments met at Parliament House, Canberra.

The purpose of the ACLG is to:

- provide a forum for the Australian Government and local government, including the Australian Local Government Association (ALGA), to consider policies and initiatives in areas of mutual interest
- provide advice to the Australian Government on matters relevant to local government and local communities
- contribute to dialogue on issues of national significance that affect local government and local communities
- promote collaboration between the Australian Government and local government, as well as between local governments themselves to address emerging economic, social and environmental challenges
- encourage innovation and best practice in local government
- improve the provision of information and data to support the long-term development of local government.

This forum provides a mechanism for ongoing cooperation between the Australian Government on managing growth and change in urban areas and the important relationships between urban and regional communities.

The ACLG includes all local governments including the 157 local councils that comprise the 18 major cities. There is, however, great variation between local governments within and between cities and therefore frequently conflicting needs. Two very active and important , but quite different groups of local governments that have formed to highlight the aspirations and concerns of the constituents they represent are the Council of Capital City Lord Mayors and the National Growth Areas Alliance.


Launceston, TAS

Appendix

Appendix A Population growth regional cities

Table 11 Population growth for regional cities, statistical districts

Statistical District	Local Government Area/s	Regional Development Australia region	Estimated Resident Population at 30 June 2001	2004	2009p	Change 2008-2009	Per cent change 2004-2009p (a)	Public Hospital Group	Public University Campus	RPT Airport
Gold Coast-Tweed (QLD/NSW)	Gold Coast (Qld)*; Tweed (NSW)*	Gold Coast (QLD) Northern Rivers (NSW)	438136	491745	577977	86232	3.3	A1	Griffith; Bond; SCU	✓
Newcastle (NSW)	Newcastle; Port Stephens; Maitland; Cessnock; Lake Macquarie	Hunter	492549	507384	540796	33412	1.3	B1	UoN	✓
Canberra-Queanbeyan (ACT/NSW)	Australian Capital Territory (ACT); Queanbeyan (NSW)	Australian Capital Territory (ACT) Southern Inland (NSW)	360537	372325	403118	30793	1.6	A1	ANU; UC; ACU; RMC	✓
Wollongong (NSW)	Wollongong; Shellharbour; Kiama	Illawarra	269597	274697	288984	14287	1.0	A1	UW	×
Sunshine Coast (QLD)	Sunshine Coast*	Sunshine Coast	186391	210703	245309	34606	3.1	A1	USC	✓
Geelong (VIC)	Greater Geelong*	Barwon South West	159503	164031	175803	11772	1.4	A1	Deakin	✓
Townsville (QLD)	Townsville*	Townsville & North West	134073	143839	168402	24563	3.2	A1	JCU	✓
^	Gosford	Central Coast	160760	161580	166626	1948	0.6	A1	×	×
Cairns (QLD)	Cairns*	Far North Queensland & Torres Strait	112932	121916	147118	25202	3.8	A1	JCU	✓
^	Wyong	Central Coast	135498	140437	149382	2148	1.5	A1	×	×
Toowoomba (QLD)	Toowoomba*	Darling Downs & South West	109449	116133	128600	12467	2.1	A1	USQ	✓

Statistical District	Local Government Area/s	Regional Development Australia region	Estimated Resident Population at 30 June 2001	2004	2009p	Change 2008-2009	Per cent change 2004-2009p (a)	Public Hospital Group	Public University Campus	RPT Airport
Launceston (TAS)	Launceston*; West Tamar*; George Town*; Northern Midlands*	Tasmania	98526	101751	105445	3694	0.7	A1	UTAS	✓
Albury-Wodonga (NSW/VIC)	Albury (NSW); Wodonga (VIC)	Murray (NSW) Hume (VIC)	95621	98723	104609	5886	1.2	B2	CSU	✓
Ballarat (VIC)	Ballarat	Grampians	83599	85834	94088	8254	1.9	A1	Ballarat; ACU	✓
Bendigo (VIC)	Greater Bendigo	Loddon Mallee	79673	82371	89995	7624	1.8	A1	Latrobe	✓
Mackay (QLD)	Mackay	Mackay/ Whitsunday	64767	70976	83680	12704	3.3	A1	CQU	✓
Mandurah (WA)	Mandurah	Peel	59752	66810	83032	16222	4.4		Murdoch; Curtin; UND; UWA	×
Burnie-Devonport (TAS)	Burnie; Devonport; Central Coast; Kentish	Tasmania	77480	79063	82102	3039	0.8	B2	UTAS	✓
Latrobe Valley (VIC)	Latrobe	Gippsland	74996	74963	79964	5001	1.3	A1	Latrobe	×
Rockhampton (QLD)	Rockhampton	Fitzroy & Central West	67369	70281	77017	6736	1.8	A1	CQU	✓
^	Maitland	Hunter	56492	61039	69154	1236	2.5	B1	×	×
Bundaberg (QLD)	Bundaberg	Wide Bay Burnett	56806	60027	67840	7813	2.5	A1	CQU	✓
Bunbury (WA)	Bunbury; Harvey; Dardanup; Capel	Southwest	50008	53236	66117	12881	4.4	B2	ECU	×
Hervey Bay (QLD)	Hervey Bay	Wide Bay Burnett	39599	45808	58902	13094	5.2	B2	USQ	✓
Wagga Wagga (NSW)	Wagga Wagga	Riverina	52120	53322	58046	4724	1.7	A1	CSU	✓
Coffs Harbour (NSW)	Coffs Harbour	Mid North Coast	46099	48623	52517	3894	1.6	A1	SCU	✓
^	Cessnock	Hunter	47188	47734	50834	727	1.3	C2	×	×
Gladstone (QLD)	Gladstone	Fitzroy & Central West	39100	43124	50538	7414	3.2	C1	CQU	✓

Statistical District	Local Government Area/s	Regional Development Australia region	Estimated Resident Population at 30 June 2001	2004	2009p	Change 2008-2009	Per cent change 2004-2009p (a)	Public Hospital Group	Public University Campus	RPT Airport
Mildura (VIC)	Mildura	Loddon Mallee	45294	46286	50042	3756	1.6	B2	Latrobe	✓
Shepparton (VIC)	Greater Shepparton	Hume	44876	45678	48926	3248	1.4	A1	Latrobe	×
Tamworth (NSW)	Tamworth	Northern Inland	42510	43351	46695	3344	1.5	A1	UNE	✓
Port Macquarie (NSW)	Port Macquarie-Hastings	Mid North Coast	38130	40532	43561	3029	1.5	A1	UoN	✓
^	Ballina	Northern Rivers	38159	39567	42432	572	1.4	C2	×	✓
Orange (NSW)	Orange	Central West	36999	36956	38685	1729	0.9	A1	CSU	✓
Dubbo (NSW)	Dubbo	Orana	35191	35446	37491	2045	1.1	A1	CSU	✓
Geraldton (WA)	Geraldton-Greenough	Mid West Gascoyne	31425	31931	36343	4412	2.6	C1	GUC#	✓
Nowra-Bomaderry (NSW)	Shoalhaven	South Coast	30168	31378	33985	2607	1.6	B2	UW	×
Bathurst (NSW)	Bathurst	Central West	30615	31399	33793	2394	1.5	B2	CSU	✓
Warrnambool (VIC)	Warrnambool	Barwon South West	29629	30655	33374	2719	1.7	B2	Deakin	×
Lismore (NSW)	Lismore	Northern Rivers	30871	30793	32291	1498	1.0	A1	SCU	✓
Kalgoorlie/ Boulder (WA)	Kalgoorlie/ Boulder*	Goldfields/ Esperance	29383	29864	32150	2286	1.5	C1	Curtin	✓
^	Palmerston	Northern Territory	22120	23307	29346	1229	4.7	×	CDU	×
^	Mount Gambier	Limestone Coast	23503	23907	25216	287	1.1	C1	UniSA	✓

Source: Australian Bureau of Statistics 2010 Regional Population Growth, Australia, 2008-09 (cat. no. 3218.0)

p – preliminary estimates (a) Average annual growth rate.

A1 = Principle Referral; B1 = Large major city; B2 = Large regional and remote; C1, C2 = medium

^Local Government area (not an ABS statistical District) *part of this Local Government Area is within the ABS statistical district #Geraldton Universities Centre

Wollongong, NSW

References

Australian Academy of Technological Sciences and Engineering 1997, Urban Air Pollution in Australia. Commonwealth of Australia, Canberra.

Australian Bureau of Agriculture and Resource Economics (ABARE) 2009a, Australian Energy Statistics. Commonwealth of Australia, Canberra.

ABARE 2009b, End use energy intensity in the Australian economy – energy intensity in the residential sector. Commonwealth of Australia, Canberra. URL <http://www.abare.gov.au/interactive/09_ResearchReports/EnergyIntensity/ htm/chapter_6.htm> Last viewed 10 February 2010.

Australian Bureau of Statistics (ABS) 1971, Census of population and housing. Commonwealth of Australia, Canberra.

ABS 2001, Census of population and housing. Commonwealth of Australia, Canberra.

ABS 2006a, Census of population and housing. Commonwealth of Australia, Canberra.

ABS 2006b, Water Account Australia, 2004–05, cat. no. 4610.0, Commonwealth of Australia, Canberra.

ABS 2006c, ABS General Social Survey. cat. no. 4159.0, Commonwealth of Australia, Canberra.

ABS 2006d, Environmental Issues: people's views and practices, 4602.0 Chapter 4 'Use of Transport' (pp. 60-82). Commonwealth of Australia, Canberra.ABS 2007a, Environmental issues and trends 2007, cat. no. 4613.0, Commonwealth of Australia, Canberra.

ABS 2007b, Environmental Issues: People's views and practices. March 2007, cat. no. 4602.0, Commonwealth of Australia, Canberra.

ABS 2008a, Australian Historical Population Statistics. cat. no. 3105.0.65.001, Commonwealth of Australia, Canberra

ABS 2008b, Population projections, Australia, 2006 to 2056. cat. no. 3222.0 Medium growth assumptions Series B, Commonwealth of Australia, Canberra.

ABS 2008c, Australian Social Trends 2008. cat. no. 4102.0, Commonwealth of Australia, Canberra.

ABS 2008d, Year Book Australia 2008, cat. no. 1301.0, Commonwealth of Australia, Canberra.

ABS 2009a, Housing Occupancy and Costs, 2007-2008. cat. no. 4130, Commonwealth of Australia, Canberra.

ABS 2009b, Environmental views and behaviour, 2007–08, cat. no. 4626.0.55.001, Commonwealth of Australia, Canberra.

ABS 2009c, Environmental Issues: Waste Management and Transport Use, March 2009 (additional data cube) cat. no. 4602.055.002, Commonwealth of Australia, Canberra.

ABS 2009d, National Health Survey: 2007-08, Summary of results, Australia. cat. no. 4364.0, Commonwealth of Australia, Canberra.

ABS 2009e, Australian Social Trends, March 2009. cat. no. 4102.0, Commonwealth of Australia, Canberra.

ABS 2009f, Household Income and Income Distribution, Australia. 2007-08, cat. no. 6523.0, Commonwealth of Australia, Canberra.

ABS 2010a, Regional Population Growth, Australia.cat. no. 3218.0, Commonwealth of Australia, Canberra.

ABS 2010b, Working Time Arrangements, Australia. cat. No. 6342.0, Commonwealth of Australia, Canberra.

ABS 2010c, Measures of Australia's Progress, 2010: Is life in Australia getting better? Cat. no, 1370.0 Commonwealth of Australia, Canberra.

Antarctic Climate & Ecosystems Cooperative Research Centre (ACE CRC) 2008, Position Analysis: Climate Change, sea level rise and extreme events: impacts and adaptation issues.

Australian Government, Preventative Health Taskforce 2009a, Australia: the healthiest country by 2020.National Preventative Health Strategy – Overview, 30 June 2009. Commonwealth of Australia, Canberra URL <http://www.health.gov.au/internet/preventativehealth/publishing.nsf/ Content/national-preventative-health-strategy-1lp> Accessed 16 May 2010.

Australian Government, Preventative Health Taskforce 2009b, Australia: the healthiest country by 2020 Technical Report No 1, Obesity in Australia: a need for urgent action, Including addendum for October 2008 to June 2009. Commonwealth of Australia, Canberra. URL <http://www.health.gov.au/internet/preventativehealth/publishing.nsf/Content/tech-obesity> Accessed 16 May 2010.

Australian Government 2010a, State of Australian Cities 2010. Major Cities Unit, Department of Infrastructure and Transport. Commonwealth of Australia, Canberra.

Australian Government 2010b, Taking Preventative Action – A Response to Australia: The Healthiest Country by 2020 –The Report of the National Preventative Health Taskforce. Commonwealth of Australia, Canberra. <http://www.health.gov.au/internet/preventativehealth/publishing.nsf/ Content/taking-preventative-action> Accessed 16 May 2010.

Australian Sustainable Built Environment Council (ASBEC) 2008, The Second Plank: Building a Low Carbon Economy with Energy Efficient Buildings. URL <http://www.asbec.asn.au/files/ ASBEC%20CCTG%20Second%20Plank%20Report%202.0_0.pdf> Accessed

Australian Public Service Commission 2007, Tackling Wicked Problems: A Public Policy Perspective. Commonwealth of Australia, Canberra.

Australian Transport Safety Bureau (ATSB) 2006, Road Safety Report, Deaths of cyclists due to road crashes. July, Commonwealth of Australia, Canberra.

Beeton, R., Buckley K., Jones, G., Morgan, D., Reichelt, R. & Trewin, D. (2006 Australian State of the Environment Committee) 2006, Australia State of Environment 2006. Independent report to the Australian Government Minister for the Environment and Heritage. Department of the Environment and Heritage, Commonwealth of Australia, Canberra.

Bureau of Infrastructure, Transport and Regional Economics (BITRE) 2009a. Urban passenger transport. How people move about Australian cities. Information Paper 31. Commonwealth of Australia, Canberra.

BITRE 2009b, Dwelling and household analysis of 2006 Census data, unpublished data on request. Commonwealth of Australia, Canberra.

BITRE 2009c, Changes in Australia's industry structure: main cities 2001-06. Information Paper 32 Commonwealth of Australia, Canberra.

BITRE 2010a, Road deaths in Australia, 1925-2008. Information sheet No. 38. Commonwealth of Australia, Canberra.

BITRE 2010b, Population growth, jobs growth and commuting flows in Perth, BITRE Research Report 119, Commonwealth of Australia, Canberra.

Bureau of Meterology 2010a Drought Statement Archive (for the 1, 8 and 13 year periods ending 31st March 2010). URL <http://www.bom.gov.au/climate/drought/archive/20100408.shtml>

Bureau of Meterology 2010b, State of the Climate. URL <http://www.bom.gov.au/inside/eiab/State-of-climate-2010-updated.pdf>

Bureau of Meterology 2010c Annual Australian Climate Statement 2009.URL <http://www.bom.gov.au/announcements/media_releases/climate/change/20100105.shtml>

Bruntland, G. (ed.), (1987), 'Our common future: The World Commission on Environment and Development', Oxford University Press, Oxford.

Bureau of Transport and Regional Economics (BTRE) 2001, Report 104: The Black Spot Program 1996-2002: An Evaluation of the First Three Years. Commonwealth of Australia, Canberra.

BTRE 2005, Health impacts of transport emissions in Australia: Economic costs. BTRE Working Paper 63, Commonwealth of Australia, Canberra.

BTRE 2007, Estimating Urban Traffic and Congestion Cost Trends for Australian Cities, Working Paper 71, Commonwealth of Australia, Canberra.

Burke, M & Brown A. L. 2007, 'Distances People Walk for Transit.' Road and Transport Research, 16(3), 17-29

Burke, M Hatfield, E & Pascoe, J 2008, Urban planning for physical activity and nutrition: A review of evidence and interventions. Urban Research Program, Griffith University, Brisbane

Business Council of Australia 2007, Underserviced: Why Australia's Services Economy Deserves More Attention

Cary, G.J., 2002, 'Importance of a changing climate for fire regimes in Australia', Flammable Australia: The Fire Regimes and Biodiversity of a Continent [Bradstock, RA., Gill, AM., Williams, JE. (eds)], Cambridge University Press, 26-46

Cleary, N. Worthington-Eyre and Marinelli, p. 2010, 'More flex in the city: A case study from Brisbane of spreading the load in the office and on the road.' Paper presented to the Australiasian Transport Research Forum, 2010, 29 September—1 October, Canberra.

Cully, M 2010, 'The contribution of migrants to regional Australia', issues paper, Commonwealth of Australia, Canberra.

Data from Dunn and Bradstreet Cited in National Economics 2008, State of the Regions Report 2007-08, Australian Local Government Association, Canberra

Department of Climate Change (DCC) 2009a, Tracking to Kyoto and 2020: Australia's Greenhouse Gas Emissions Trends 1990 to 2008-2012 and 2020. August 2009, Commonwealth of Australia, Canberra.

DCC 2009b, Climate Change Risks to Australia's Coast: A First Pass National Assessment, Commonwealth of Australia, Canberra.

Department of Climate Change and Energy Efficiency (DCCEE) 2010a, Australia's Fifth National Communication on Climate Change: A Report under the United Nations Framework Convention on Climate Change. Commonwealth of Australia, Canberra.

DCCEE 2010b Australian National Greenhouse Accounts: National Greenhouse Gas Inventory accounting for the KYOTO target May 2010. Commonwealth of Australia, Canberra.

The Department of Education Employment and Workplace Relations (DEEWR) 2009, The Origins, Meaning, Definition and Economic Implications of the Concept of Social Inclusion/ Exclusion. Commonwealth of Australia, Canberra. URL <www.socialinclusion.gov.au>

DEEWR 2009, Indigenous Social Inclusion Exclusion. Commonwealth of Australia, Canberra.

Department of Environment, Water, Heritage and the Arts 2010, National strategy for ecologically sustainable development, endorsed by the Council of Australian Governments, December 1992. URL <http://www.environment.gov.au/esd/national/nsesd/strategy/index.html> Accessed 11 June, 2010.

Department of Immigration and Citizenship (DIAC) 2010 settlement database, data presented in Cully, M 2010, 'The contribution of migrants to regional Australia', issues paper, Commonwealth of Australia, Canberra .

Department of Planning and Community Development (DPCD) 2008, Suburbs in time – suburbs in Melbourne, DPCD, accessed 27 November 2009, <http://www.dse.vic.gov.au/DSE/dsenres.nsf/LinkView/7E446FFAF08BDE17CA2574C60007AC36278A988CAE2ACE31CA256D1A0022AE95> Accessed 29 November, 2010.

The Department of Prime Minister and Cabinet 2009. A Stronger, Fairer Australia. Social Inclusion Statement. Commonwealth of Australia, Canberra.

Dodson, J. & Sipe, N. 2008, Unsettling Suburbia: The new landscape of oil and mortgage vulnerability in Australia's Cities, Research Paper 18, Urban Research Program, Griffith University, Brisbane.

Frank, A & Schmid J 2004, Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars. American Journal of Preventative Medicine. Pp 87-96

Garnaut, R. 2008a, The Garnaut Climate Change Review – Final Report, Cambridge University Press, Melbourne.

Garnaut, R. 2008b, The Garnaut Climate Change Review – Modelling the costs of unmitigated climate change - Technical Paper No. 5 URL <http://www.garnautreview.org.au>

Gaymer 2010, 'Quantifying the impact of attitudes on shift towards sustainable modes', Paper presented to the Australian Transport Research Forum, 29 September-1 October 2010, Canberra.

Giles-Corti B & Donovan, R J 2002, 'Socioeconomic status differences in recreational physical activity levels and real and perceived access to a supportive physical environment.' Preventative Medicine 35(6):601-11.

Gleeson, B. 2006, 'Rescuing urban regions: the federal agenda.' Chapter 5 in Brown, A. J. And Bellamy, J. A. (eds) Federation and regionalisation in Australia: new approaches, new institutions. Australian National University Press, Canberra, p. 73.

Gordon-Larsen, P., Boone-Heinonen, J., Sidney, S., Sternfeld, B., Jacobs Jr, D. R. & Lewis, C.E., 2009 Active commuting and cardiovascular disease risk, Archives of Internal Medicine Vol. 169, no. 13, July 2009, pp. 1216 – 1223.

Healthy Spaces and Places: a national guide to designing places for healthy living. URL <http://www.healthyplaces.org.au/site/>

Henry, K. 2010, 'To Build, Or Not to Build: infrastructure Challenges in the Years Ahead and the Role of Governments. Address to the Conference on the Economics of infrastructure in a Globalised World: Issues, Lessons and future Challenges', 18 March 2010. URL <http://www.treasury.gov.au/documents/1763/PDF/Infrastructure_Conference.pdf>

Her Majesty's Government Cross-Government Obesity Unit 2009, Healthy weight, healthy lives: one year on. April 2009, Her Majesty's Government: London. URL <http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/DH_097523>.

House of Representatives Standing Committee on Health and Ageing 2009, Weighing it up – Report on Obesity. Parliament of Australia, Canberra.

Houston, P. 2005, 'Re-valuing the Fringe: Some findings on the value of Agricultural Production in Australia's peri-urban regions' Geographical Research 43 (2): 209-223.

Hulse, K. and Saugeres, L. 2008, Home life, work and housing decisions: a qualitative analysis. National research venture 1: Housing assistance and non-shelter outcomes. AHURI Research Paper No. 7. Australian Housing and Urban Research Institute, Melbourne.

Infrastructure Australia 2010, Getting the fundamentals right for Australia's infrastructure priorities -Report to the Council of Australian Governments, Commonwealth of Australia, Sydney URL <http://www.infrastructureaustralia.gov.au/publications.aspx>

International Energy Agency 2009a, Key world energy statistics 2009. URL <http://www.iea.org/textbase/nppdf/free/2009/key_stats_2009.pdf> Last viewed 2010.

Jacobs, J 1961, The Death and Life of Great American Cities Random House, New York.

Lattimore, R. and C. Pobke 2008, Recent Trends in Australian Fertility Productivity Commission Staff Working Paper. Productivity Commission. Canberra.

Lee MC, Orenstein MR, and Richardson MJ 2009, Systematic review of active commuting to school and children's physical activity and weight. Journal of Physical Activity & Health, 2008. 5(6): pp. 930–949.

Malcolm, P & Fahd, R 2009, Ground truthing of the Sydney vegetable industry in 2008.

Marsden Jacob Associates 2007, The Cost Effectiveness of Rainwater Tanks in Urban Australia. A Report Prepared for the National Water Commission. Commonwealth of Australia URL: <www.nwc.gov.au/resources/documents/cost-effectiveness-rainwater-tanks-body-waterlines-0407.pdf>

Mason, C. 2000, Transport and Health: en route to a healthier Australia? Medical Journal of Australia, 6 March.

Mercer 2009, Quality of Living Survey, URL <http://www.mercer.com/costofliving> last viewed 11 February 2010.

Middelmann, M. H. (Editor) (2007) *Natural Hazards in Australia: Identifying Risk Analysis Requirements*. Geoscience Australia, Canberra

National Centre for Safer Routes to School 2010, Homepage, U.S. Department of Transportation Federal Highway Administration and University of North Carolina Highway Safety Research Center URL <http://www.saferoutesinfo.org/index.cfm> Accessed 12 May 2010.

National Centre for Social and Economic Modelling (NATSEM) 2008, Advance Australia Fair? AMP/ NATSEM Income and Wealth Report.

National Economics 2008, State of the Regions Report 2007-08, Australian Local Government Association, Canberra.

National Housing Supply Council (NHSC) 2010, 2nd State of Supply Report. National Housing Supply Council, Commonwealth of Australia, Canberra.

National Water Commission (NWC) 2010, National Performance Report 2008–09: urban water utilities. Commonwealth of Australia, Canberra.

New South Wales Government 2010, New South Wales State Plan 2010 Investing in a better future, New South Wales Government, Sydney.

Newman, P & Jennings, I 2008, Cities as Sustainable Ecosystems: Principles and Practices, Island Press, Washington.

Office of the Renewable energy Regulator 2010, Renewable Energy Target Fact Sheet. <http://www.orer.gov.au/publications/ret-overview.html> Accessed 11 June 2010.

O'Neill, P, Piquer-Rodriguez, M, Phibbs, P, Crabtree, L & Johnston, K. 2008, North West and West Central Sydney Employment Strategies. Final Report prepared for the Western Sydney Regional Organisation of Councils. Parramatta, Urban Research Centre, University of Western Sydney.

OECD and CDRF 2009, Trends in Urbanisation and Urban Policies in OECD Countries: What Lessons for China? OCDE Développement Urbain, Rural et Régional 2010, no. 9.Organisation for Economic Cooperation and Development, Paris.

Peng, J. & Stewart, M. 2008 Carbonation-Induced Corrosion Damage and Structural Safety for Concrete Structures under enhanced Greenhouse Conditions. Centre for Infrastructure Performance & Reliability, University of Newcastle, Australia.

Perkins, A, Hamnett, S, Pullen, S, Zito, R & Trebilcock, D 2009, 'Transport, housing and urban form: The life cycle of energy consumption and emissions of city centre apartments compared with suburban dwellings', Urban Policy and Research, v. 27, no. 4, pp. 377–396.

Preston, B.L., Smith T.F., Brooke, C., Goddard, R., Measham, T.G., Whitycombe, G., McInnes, K., Abbs, D., Beveridge, B., and Morrison, C. 2008, Mapping Climate Change Vulnerability in the Sydney Coastal Councils Group. Prepared for the Sydney Coastal Councils Group.

Prime Minister's Task Group on Energy Efficiency 2010, Report of the Prime Minister's Task Group on Energy Efficiency. Department of Climate Change and Energy Efficiency, Commonwealth of Australia, Canberra

Productivity Commission 2006, Waste management, Report no. 38, Commonwealth of Australia, Canberra.

Productivity Commission 2009, Submission to the House of Representatives Standing Committee on Economics: Inquiry into Raising the Level of Productivity Growth in Australia, September.

Productivity Commission 2010, Annual Report 2009-10, Annual Report Series, Appendix A Recent developments in Australia's Productivity, Productivity Commission, Canberra

Queensland Government 2010, Cycling in Queensland 2010 Department of Transport and Main Roads. URL <http://www.transport.qld.gov.au/Home/General_information/Cycling/> Accessed 11 May 2010.

Quinn, J., Judd, B., Olsberg, D & Demirbilek, O. 2009, 'Dwelling, land and neighbourhood use by older home owners', AHURI positioning paper, no.111, Australian Housing and Urban Research Institute, Melbourne.

Raskall, P 2009, Estimates of economic output and growth in major cities of Australia, Unpublished paper.

Raskall, P 2002, 'Equity Issues in the 'New Prosperity' of the 1990s: the Case study of Sydney.' Australian Geographer. Vol 33 No 3 pp 281-299.

Resources, Energy and Tourism (RET) 2009, National Energy Security Assessment 2009, Commonwealth of Australia, Canberra.

Sallis, J F and Glanz, K 2009, Physical activity and food environments: solutions to the obesity epidemic. Milbank Quarterly, 2009. 87(1): pp. 123–154.

Sandu, S & Petchey, R 2009, End use energy intensity in the Australian economy, ABARE research report 09.17, Australian Bureau of Agricultural and Resource Economics.

Sassi F, Devaux M, Cecchini M, et al. 2009, The obesity epidemic: Analysis of past and projected future trends in selected OECD countries, in OECD Health Working Papers No. 45. March 2009, OECD. URL <http://www.olis.oecd.org/olis/2009doc.nsf/LinkTo/NT00000EFE/$FILE/JT03261624.PDF> Accessed 16 May 2010.

SGS Economics and Planning 2009, Cost benefit analysis of investment in growth areas Research report prepared for the National Growth Areas Alliance, Melbourne, Victoria.

Shah C. and Burke G. 2006, 'Qualifications and the future labour market in Australia' Report prepared for the National Training Reform Taskforce, Monash University, Centre for the Economics of Education and Training.

Shultz, A 2009, Energy update 2009, Australian Bureau of Agricultural and Resource Economics.

Social Inclusion Unit 2009, A stronger, fairer Australia. National Statement on Social Inclusion. Department of Families, Housing, Community Services and Indigenous Affairs, Commonwealth of Australia, Canberra.

Spiller, M. (2008): Liveability and Urban Consolidation; A Question of Governance. Presentation to IPAA "Spotlight on Spring Street Series". URL<www.vic.ipaa.org.au/.../news/.../081016_ spotlightonspringstreet.pdf>

Stanley, J. & Barrett, S. 2010, Moving people: solutions for a growing population. Australasian Railway Association, the Bus Industry Confederation and the International Association of Public Transport–UITP, Sydney.

Steering Committee for the Review of Government Service Provision (SCRGSP) 2009, Overcoming Indigenous Disadvantage: Key Indicators Report 2009. Productivity Commission, Canberra.

Steffen, W. 2009 Climate Change 2009, Faster Change & More Serious Risks. Commonwealth of Australia, Canberra.

Strazdins, L., Lucas, N., Mathews, B., Berry, H., Rodgers, B. and Davies, A. 2008, Parent and child wellbeing and the influence of work and family arrangements: a three cohort study, Australian National University, Canberra.

The Senate Rural and Regional Affairs and Transport References Committee 2009, Investment of Commonwealth and State funds in public passenger transport infrastructure and services, Final Report, August 2009. Commonwealth of Australia, Canberra.

The Treasury, Australian Government 2009, Australia's Future Tax System Report to the Treasurer, Part 2, Detailed analysis, volume 2 .Commonwealth of Australia, Canberra.

The Treasury, Australian Government 2010, Intergenerational Report 2010. Commonwealth of Australia, Canberra

Tourism Forecasting Committee 2010, Forecast 2010 Issue 1, Tourism Research Australia, Canberra

Trubka, R., Newman, P. & Bilsborough, D. 2010a The Costs of Urban Sprawl (1): Infrastructure and Transportation. Parsons Brinckerhoff and Curtin University of Technology Sustainability Policy Institute Fremantle

Trubka, R, Newman, P & Bilsborough, D, 2010b The Costs of Urban Sprawl (2): Predicting Transport Greenhouse Gases from Urban Form Parameters, Parsons Brinckerhoff & Curtin University of Technology Sustainability Policy Institute, Fremantle, Western Australia.

UNICEF 2010, Child-friendly cities. UNICEF Innocenti Research Centre, Florence, Italy. URL <http://www.childfriendlycities.org/en/overview/the-cfc-initiative> accessed 6 May, 2010>

VicHealth 2007, Information Sheet, Walking School Bus Snapshot data, November 2007, Victorian Health Promotion Foundation, Vic Health, Melbourne.

Victorian Government Department of Human Services 2009, January 2009 heatwave in Victoria: an assessment of health impacts URL <http://www.health.vic.gov.au/chiefhealthofficer/ downloads/heat_impact_rpt.pdf> accessed 29 July 2010

Wang, X., Stafford Smith, McAllister, R., Leitch, A., McFallan, S., Mehag, S. 2010, Coastal inundation under climate change: a case study in South East Queensland. CSIRO Climate Change Adaptation Flagship Working Paper No. 6 URL <http://www.csiro.au/resources/CAF-working-papers.html>

Weber, A. F. 1899, 1963 reprint. The Growth of Cities in the Nineteenth Century. Ithaca, N.Y, Cornell University Press.

Western Australia Water Corporation 2010, Yearly streamflow for major surface water sources: Impact on water availability - WA reduced inflows to dams, URL <http://www.watercorporation.com.au/D/dams_streamflow_large.cfm> accessed 10 November 2010

White House Taskforce on Childhood Obesity 2010, Solving the problem of childhood obesity within a generation. Report to the President, May 2010, Washington.

Reference: Whiteman, J & Alford, G 2009, 'Macro-Urban Form, Transport Energy Use and Greenhouse Gas Emissions: An Investigation for Melbourne'. Department of Transport, Victorian Government, Melbourne.

World Health Organization 2010, Active Ageing: A Policy Framework World Health Organization, Noncommunicable Diseases and Mental Health Cluster, Noncommunicable Disease Prevention and Health Promotion Department, Ageing and Life Course.

World Health Organization 2010, Active Ageing: A Policy Framework World Health Organization, Non-communicable Diseases and Mental Health Cluster, Non-communicable Disease Prevention and Health Promotion Department, Ageing and Life Course,Geneva

Wulff, M., Dharmalingam, A., Reynolds, M. and Yates, J. 2009, Australia's private rental market: changes (2001-2006) in the supply of, and demand for, low rent dwellings. Positioning Paper No. 122 Australian Housing and Urban Research Institute, Melbourne

Zeibots, M.E. 2007, Before and after the motorway: A review of methodologies used to investigate the occurrence of induced traffic growth in international and Australian cities, [prepared for Department of Environment and Climate Change], RailCorp and the Department of Planning], Institute for Sustainable Futures, UTS, Sydney, pp. 1-65.

Acknowledgements

In preparing this document much assistance was provided by

- Bureau of Infrastructure, Transport and Regional Economics
- Infrastructure Australia
- Council of Capital Cities Lord Mayors
- City of Sydney Council

This background paper has been informed by the generous contributions of many stakeholders and leading urban researchers.

In particular, the historical perspectives in Chapter 2 were informed by the classic works on Australian cities:

- Clive Foster, Australian cities: continuity and change, third edition, Oxford University Press, 2004
- G.M.(Max) Neutze, Urban Development in Australia: a descriptive analysis, Sydney Allen & Unwin, 1977
- Frank Stilwell, Reshaping Australia: urban problems and policies. Sydney, Pluto Press 1993.

Chapters 2 and 4 were co-authored by Phil Raskall, Director of Research Development at the Council of the City of Sydney.

Images sourced from

- National Archives of Australia
- National Library of Australia
- State Library of South Australia
- State Library of Western Australia
- State Library of Queensland
- State Library of Victoria
- Museum Victoria
- City of Sydney Archives
- Johnny Barker Collection: City of Sydney Archives
- State and territory planning departments and local councils