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.

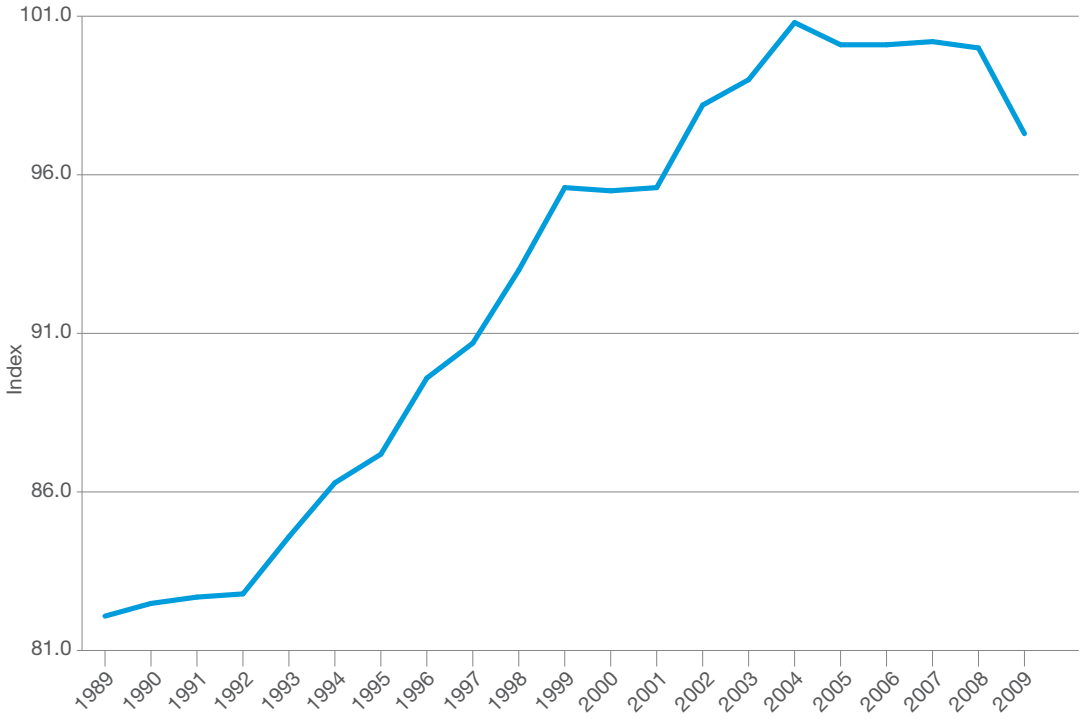
According to the Productivity Commission (2009), over the last four decades, annual MFP growth in the 'market sector' of Australia's economy has averaged 1.1%. This places Australia below the middle of Organisation of Economic and Cultural Development rankings over the period.

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.

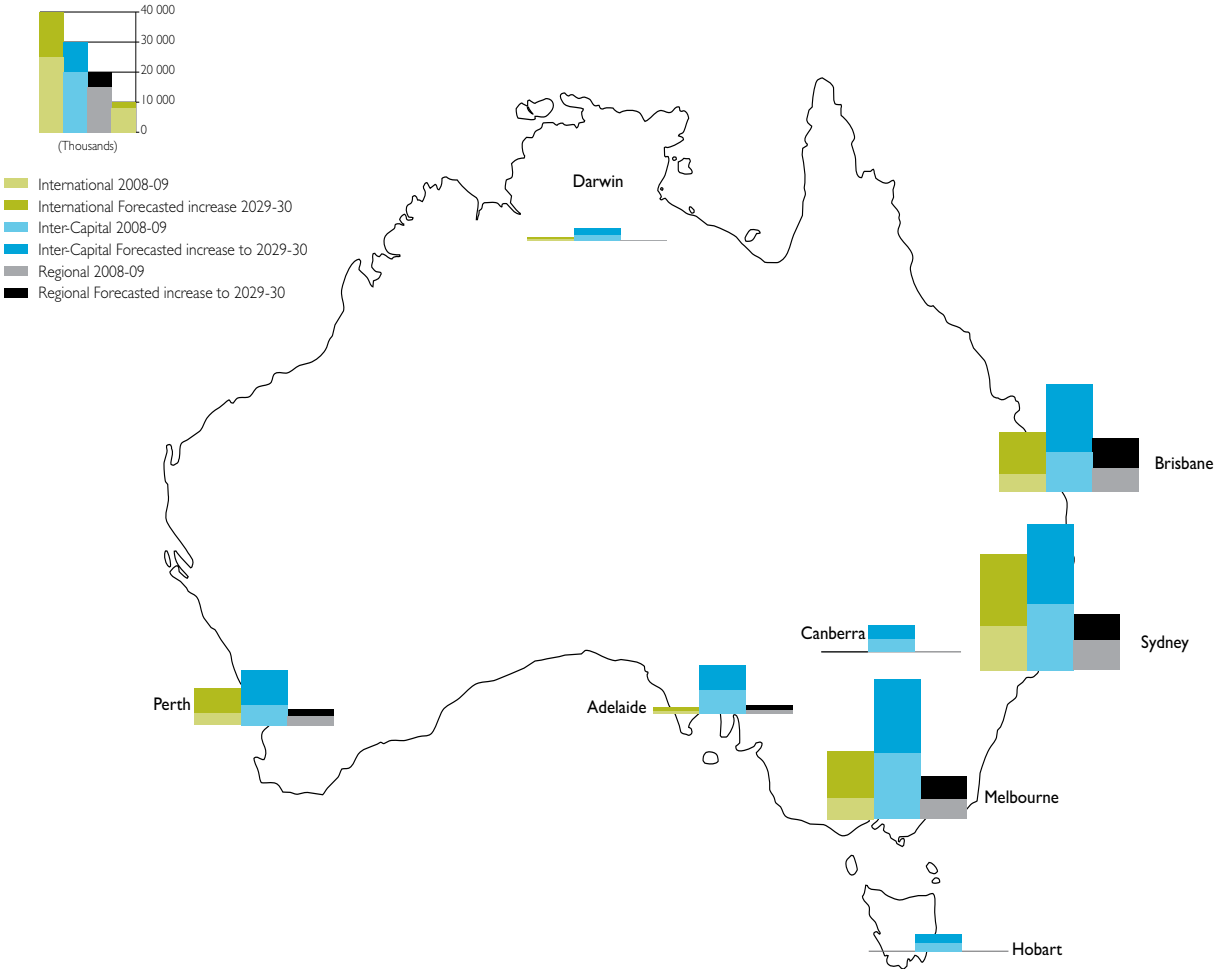
4.6.1 Improving connectivity between cities

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

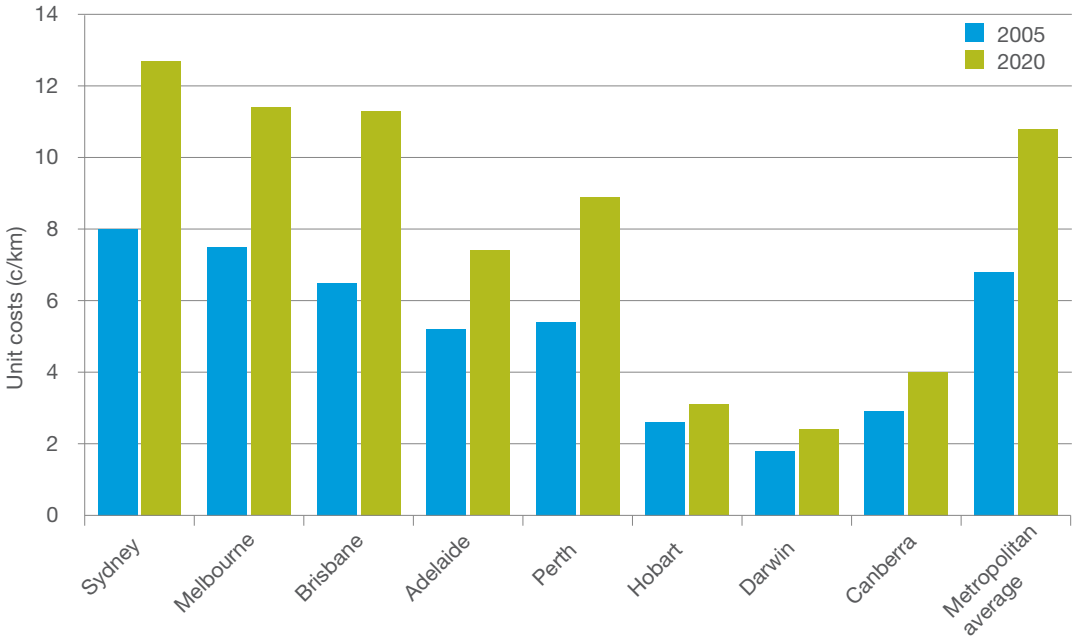
The first deficiency is congestion, which is felt by almost every city resident every day and impacts on the quality of life and limits family and social time. Congestion impacts severely on productivity, adding to the costs of providing services and moving goods in Australia. Road congestion is one 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)