

Melbourne's North— *the new knowledge economy*

NORTH Link
NETWORKING FOR
ECONOMIC DEVELOPMENT

MELBOURNE'S NORTH
THE BEST FOR BUSINESS

NACC
NORTHERN MELBOURNE
AREA CONSULTATIVE
SUBCOMMITTEE

VICTORIA
THE PLACE TO BE



Melbourne's North – the new knowledge economy

Melbourne's North – the new knowledge economy is a study commissioned by NORTH Link and the Northern Metropolitan Melbourne Area Consultative Sub-Committee with seed funding from the Victorian Government Department of Innovation, Industry and Regional Development and matching funding from industry, education and local government in Melbourne's North. It was prepared by National Institute of Economic and Industry Research.

The report provides a detailed analysis of the Melbourne's North regional economy and builds on the previous report, *Growing Melbourne's North – developing an integrated economy*. It concludes that the region can achieve significant economic and social benefits if stakeholders share resources and cooperate across local government boundaries to form a discrete economic zone. The report includes recommendations and benchmarks that will support growth and quality employment outcomes for the region into the future as it undergoes the transition into a knowledge economy.

Consultants

National Institute of Economic and Industry Research (NIEIR)

Carmine Consulting

Cover and Layout

Ox Design

ISBN

978-0-9803994-4-3

Copyright © 2009

Melbourne's Northern Economic Wedge Inc, trading as NORTH Link.

This work may be reproduced in whole or in part for research or training purposes, subject to the inclusion of an acknowledgement of the source and no commercial usage or sale. Reproduction for purposes other than those indicated above requires written permission of NORTH Link.

Requests should be forwarded to NORTH Link, PO Box 103, Coburg 3058 or to m.butera@latrobe.edu.au

Disclaimer

Every effort has been made to ensure that this report is free from error or omission. The information contained in this report has been derived in good faith from sources believed to be reliable and accurate. However, neither NORTH Link nor the Northern Metropolitan Melbourne Area Consultative Sub-Committee nor any persons involved in the preparation of this report accept any liability whatsoever for its contents or information.

Enquiries and copies of full report

Mr Mick Butera

Executive Director, NORTH Link

c/- Institute for Advanced Study

La Trobe University

Main Drive, BUNDOORA 3086

Telephone: 03 9479 3337

Facsimile: 03 9467 8310

Email: m.butera@latrobe.edu.au



Acknowledgments

Consultants

Peter Hylands and Peter Brain from NIEIR for their enthusiastic completion and interpretation of the research data and interviews that have resulted in the authorship of this groundbreaking report and recommendations.

Project Steering Group

Bruce Burns

Associate Director, Northern Melbourne Institute of TAFE

Mick Butera

Executive Director, NORTH Link

Tony Coppola

Executive Officer, Northern Metropolitan Melbourne Area Consultative Sub-Committee

Jane Edwards

Julie Eisenbise

Director Global Business Development, RMIT University

John Francis

Director Economic Development, City of Whittlesea

Kate Harrington

Economic Development Coordinator, Banyule City Council

Peter Harrison

General Manager Student Services Group, Government Liaison, Kangan Batman TAFE

Michael Hedt

Regional Manager Northern & Western Metro Region, Department of Innovation, Industry and Regional Development

Sue La Greca

Manager Economic Development, City of Darebin

Grant Meyer

Manager Economic Development, Hume City Council

Daniel Murphy

Acting Manager Sustainable Development, Moreland City Council

Greg O'Brien

Emeritus Professor, La Trobe University

Neville Slade

Manager Major Projects & Business Services, Shire of Nillumbik

Vivien Williamson

Manager Strategic & Economic Planning, City of Yarra

Project sponsors

This project has been developed with seed funding from the Victorian Department of Innovation, Industry and Regional Development. The project has been made possible with matching financial and intellectual support of the following organisations:

- Banyule City Council
- City of Darebin
- City of Whittlesea
- City of Yarra
- Darebin Enterprise Centre
- Hume City Council
- Kangan Batman TAFE
- La Trobe University
- Moreland City Council
- NORTH Link
- Northern Metropolitan Melbourne Area Consultative Sub-Committee
- Northern Melbourne Institute of TAFE
- RMIT University
- Shire of Nillumbik.

Staff

The final proof reading and cross checking was an enormous undertaking due to the sheer volume of the report. The staff of NIEIR and NORTH Link performed a most demanding task magnificently.

Special thanks also to Karen Stephens of Carmine Consulting and Jane Edwards for their invaluable efforts in finalising the Foreword, Executive Report and final proof reading.

Foreword

The rapid growth forecast for Melbourne's North makes this a critical time – one of challenges as well as opportunities.

Immediate action is required from all stakeholders to develop a regional approach and influence policy settings at all levels of government – local, state and federal. Effective strategic interventions are essential to ensure the development of a knowledge economy and the future prosperity of the region.

This 2009 *Melbourne's North – the new knowledge economy* report, prepared by the National Institute of Economic and Industry Research (NIEIR), provides a framework for policy and action required to achieve knowledge-based economic development. It summarises the issues involved and provides recommendations on the way forward.

Melbourne's North is the region covering the local government areas of Banyule, Darebin, Hume, Moreland, Nillumbik, Whittlesea and Yarra. It is highly diverse, and its inner areas are transitioning to a knowledge economy and the creative industries as manufacturing, logistics and warehousing activities increase in the outer areas.

While the region has many advantages, it also faces significant challenges. Along with the rest of the world, it is currently experiencing economic transition and uncertainty. Unparalleled population growth, a decline in manufacturing and transport congestion present issues that require urgent action. However, with the correct strategic interventions, this report shows that the region has an opportunity to capture more than its share of Melbourne's forecast growth.

Melbourne's North can be characterised by:

- diversity, including its diversity of population, culture, educational and ethnic background, and built form
- a growing creative class, particularly in the inner suburbs
- a knowledge-based infrastructure, including universities and TAFE institutes
- strategic assets including Melbourne Airport, the soon-to-be-relocated Melbourne Wholesale Fruit and Vegetable Market and a range of new developments.

However, benchmarking exercises conducted for this report show that the north is operating inefficiently compared with similar regions elsewhere.

Issues that need to be addressed include:

- congestion and transport problems
- declining manufacturing and lower-skilled jobs
- provision of amenity in new outer residential areas
- costs of climate change to industry and efficiency of built form
- diffusion of the knowledge economy to outer areas
- education pathways and reskilling
- economic strategies, broadband provision and capacity to attract knowledge intensive industries.

There needs to be urgent and immediate action by the region as a whole to influence policy settings and ensure that opportunities can be harnessed for the benefit of local residents and industry.

Opportunities exist for:

- increased advanced manufacturing and development of industry clusters
- greater integration between tertiary institutions and business for R&D
- attracting more knowledge intensive industries
- upskilling and retraining of workers
- strategic development of Activity Centres and Central Activity Districts
- increasing the number of business incubators
- development of quality and sustainable communities and workplaces built to the highest design and environmental standards.

The task ahead is to create a fully integrated economy in Melbourne's North, building on the resources the region now has and making strategic interventions to create new regional opportunities.

Chris Heysen
Chair, NORTH Link

Executive Report

Melbourne's North is facing an unprecedented period of population growth, with some experts predicting that the region will become home to more than 500,000 additional residents by 2025.

This rapid growth, combined with increasing levels of development – new residences, new retail centres, new infrastructure and new businesses – can bring opportunities. But the scale of this growth at a time when the global and local economies are in a state of flux can also create strong social and economic challenges.

A region in transition

Melbourne's North, stretching from the inner suburbs to the semi-rural outer metropolitan fringe, presents an integrated regional economy. It features excellent road, rail, freight and public transport infrastructure, notable for the presence of Melbourne Airport and significant transport hubs in the outer areas. The region's economy is in the process of evolving from a manufacturing past to a knowledge economy that includes retention of high-tech manufacturing. Its population encompasses many cultures and offers a workforce with an increasing level of skills and qualifications. Diversity and creativity feature strongly in the inner areas, some of which are noted for their arts and entertainment offerings (Yarra, Northcote, Brunswick), while the outer areas are increasingly home to both business and residential development. The region's residential areas include several high quality precincts (Ivanhoe, Springthorpe, Eltham), yet also retain housing affordability. Across all areas, there is a range of amenity and natural attractions.

However, the region is facing a critical time of change and this has accelerated the need for immediate, collaborative action. Together, the region needs to work with all levels of government on an ongoing basis to make absolutely sure that the correct policy settings are in place to secure the future.

Now is a time of opportunity but also a crucial tipping point – the right decisions must be made at every level. It's time to look at what has worked, within Australia and overseas, and in other regions facing significant change and potential disadvantage. If correct decisions are not made now, then significant opportunities will be missed and residents will lose employment, income and quality of life. The region could take decades to recover – if recovery is possible.

But with collaborative effort, careful planning and the correct strategic interventions, Melbourne's North has an opportunity to capture more than its share of Melbourne's forecast growth.

Much, however, still needs to be done to keep pace with the region's future needs. Transport infrastructure has to improve, and barriers to efficient public transport, road and rail infrastructure must be removed. Education should provide a focal point, with increased career guidance and pathways for young people, retraining for the unemployed and integration with local industry to grow research, knowledge and skills. Employment and business opportunities can be increased by creation of a regional manufacturing strategy, support for business incubators, increased commercial accommodation, retention of employment lands in inner areas, efficient broadband services, clustering and regional business networks. Outer regions

should consolidate community, business, amenity and retail, and with climate change set to be a major factor in the future, the built environment should comprise the highest possible environmental standards.

This report details issues and actions that stakeholders must consider and take to ensure this region grows and prospers. It provides a detailed analysis of the region's economy that is intended as a catalyst for discussion, strategic thinking, and formal planning and policy processes.

The report points to three critical drivers that are key to the region's future:

- knowledge development (residential, business and economic)
- unprecedented population growth
- local, state and federal policy settings.

With 2009 a year of challenge and change globally, it is imperative that this opportunity to initiate change and foster growth is not lost – otherwise the residents of the north will be left behind in terms of income, hours of work, 'power' job opportunities and knowledge/education.

A knowledge economy

Overseas examples have pinpointed the importance of a knowledge economy to regional prosperity. An obvious example is Silicon Valley in the US, but the Silicon Fen (or Cambridge Cluster) in Cambridge, UK, is another example of rapid knowledge economy development based on research, industrial development and both large and small scale investment. The important characteristic of these economies is their ability not only to generate but to commercialise new knowledge.

Melbourne's North already has a knowledge-based infrastructure. Its universities, TAFE institutes, research facilities, schools and knowledge intensive industries are essential to future growth. While investing more in secondary education, career guidance and pathways will give local young people the opportunity to use their skills and creativity to help grow the local economy, greater vertical integration of education and industry will increase opportunities for research and innovation, creating a sound economic base from which to develop greater protection from off-shoring and other supply chain risks. With unemployment an issue across the country, retraining of workers who have lost their jobs will be of paramount importance. The north needs to create the capacity to retrain its workers as a matter of urgency and ensure the resources are there to provide this service.

Creativity is also pivotal to a knowledge economy. In today's economy, successful regions develop an advantage based on their ability to quickly mobilise talented and creative people, resources and capabilities that can turn innovations into new business ideas and commercial products. Studies have shown that these people are attracted to regions that tolerate and accept diversity – same sex households, migrants and artists of all types – and that this kind of area is ideal for nurturing the creativity and innovation that characterise the knowledge economy. Melbourne's North now has a growing creative class living and working in the inner areas, where the increasing of amenity and culture has created suburbs that people want to live and work in.

Business incubators throughout the region have proved to be a successful way of developing and growing local industry. Offering accommodation and support for start-up businesses, these incubator services can be extended to offer young people the opportunity to start businesses in areas like ICT, design and new media. Support, such as new financial services and micro-loans, are vitally important in the early phases of new business development. There is an important correlation between the region's incubators and appropriately targeted finance. A system of incubators backed by sound business advice and access to finance for small and start up businesses has the potential to give Melbourne's North an advantage over other regions that are not well served by research organisations and incubators.

Commercial accommodation is also an issue. These businesses will need a different style of building if they are going to stay in the region, and the lack of suitable accommodation has also been identified as a barrier to businesses seeking to relocate to the north. While a comprehensive analysis of the commercial accommodation issue was addressed in the 2007 *Northern Exposure – an analysis of office and commercial accommodation issues in Melbourne's North* report, and some headway has been made, there are still significant barriers to be overcome in this area.

In the near future, the local manufacturing industry will need to deal with the impact of climate change, with its problems and costs. This means that the application of research and innovation to improve efficiency is even more important – ignoring this issue now will only create competitive disadvantage in the future. The region has the recognised manufacturing skills, educational capacity and know-how to become a premier manufacturer of environmental protection products. Growth in this sector will rely on the existing skills of the inner parts of Melbourne's North for design and research, while the new outer areas are well placed to manufacture these products. However, many of these opportunities will only be available to innovative companies if government encourages the growth of environmental protection industries and reviews its stand on issues such as input tariffs.

Local industry can significantly benefit from networks formed by business collaborations and research activities with universities and TAFE institutes. These will lead to greater levels of innovation, improved skills and integration of local industry with global networks. The region can also gain advantage from harnessing Victorian Government funding to encourage manufacturing by driving innovation and growth, with programs that aim to accelerate innovation, grow exports, create high-performance workplaces and attract R&D investment.

The lack of an equitable telecommunications service has been recognised as a barrier to the development of a knowledge economy in many areas, and this is no different in the north. The outer and rapidly developing parts of the region are particularly affected. It is important that businesses and households have equitable, affordable and high standards of connection to broadband services – both businesses and households must be able to compete in an increasingly globalised economy.

Population growth

The population in the region is set to increase markedly, with well in excess of 25% of Melbourne's population growth (forecast population of 5 million) targeted for Melbourne's North, particularly Hume and Whittlesea.

Over recent years, population growth has been most rapid in Hume and Whittlesea, with both exceeding forecasts. The trend towards increasing residential density and redevelopment of industrial areas to residential has also led to accelerated population growth in Yarra, Moreland and Darebin.

Population growth increases the need for frequency of public transport. It makes it even more essential that employment zones are retained in the inner areas, despite these sites being so attractive for residential developments, so that there is the flexibility to embrace new opportunities. Higher population figures also emphasise the need to ensure that resident skills keep pace with the high skill demand of local industry. If this does not occur, then any new positions created in the region could go to new population entrants or to people living in other regions, creating disadvantage for local residents. A key goal of any strategic development in the region will be to achieve employment levels comparable to the share of population.

Along with population growth comes the need for adequate amenity, which incorporates the tangible benefits that increase the attractiveness or value of a property, or that contribute to its comfort or convenience. In the context of regional planning, amenity includes buildings, services, transport, retail, parklands and design. While the inner north provides a good mix of amenity, it is essential that the amenity mix in the outer suburbs is planned to maximise positive outcomes for residents.

Policy settings – local, state and federal

The policy initiative of continued economic integration across a region becomes critical when major issues such as climate change, transport and rapid population growth are being faced. The only way to effectively address this is to work collaboratively on a regional level to inform and influence decision makers.

Getting the policy settings right is imperative and must take in all levels of government – local, state and federal. As development increases, it is important to encourage and foster diversity across the region, from the inner city areas of Yarra, Moreland, Darebin and Banyule, to the rural sectors of Nillumbik, Whittlesea and Hume.

The benefits of creating a more integrated local economy are evident. While knowledge economies are usually centred on metropolitan areas, the right policy development can create a framework to broaden the base of the knowledge economy through knowledge diffusion activities across the region. Issues to consider include the development of appropriate land planning regimes, the development of greater amenity to attract the kinds of knowledge intensive business activity suited to the inner and middle suburbs, the appropriate level of infrastructure (including office space and telecommunications), and greater level of highly skilled and niche business services. Attracting knowledge intensive industries to the outer areas would allow residents to work closer to home, improving the employment capture of skilled residents and increasing productivity by reducing travel time and improving quality of life.

Transport is so important to the successful development of the region that it is a high priority policy issue affecting many other areas of concern. Congestion and transport issues have the potential to slow future economic development and integration as well as reduce the quality of life for both workers and residents, so additional investment in roads and public transport (in the outer areas in particular) is crucial.

Climate change is going to be of increasing concern, and government policy in this area can have a significant effect. While there will be costs and problems associated with manufacturing, there will also be opportunities for research, design and manufacture surrounding new regulations that will inevitably come into force. And if new communities in the north are developed to high standards with energy savings across all buildings and on transport, these savings will make local economies more competitive and sustainable.

The manufacturing industry in the north continues to face restructure and the automotive industry in particular is facing crisis. Government policy on issues such as tariffs and encouraging innovation can have a huge effect on turning industry around. The Prime Minister used Kangan Batman TAFE at Broadmeadows to launch the Green Car Plan, which provides Australian car companies with the opportunity to receive government funding to design and sell environmentally friendly cars. Again, there is an opportunity here – the north's TAFE sector is well positioned to facilitate many of the changes required to create a more environmentally sustainable economy and all the things that go into creating green jobs.

With the growth in population, increasing development, a volatile economy and the demands of climate change approaching, it is vital that the region gets the local policy setting right and works collaboratively to inform state and federal governments so that it can grow and prosper in the future. What was suitable in the past won't work now. There is a real danger that, with industry demands for a higher skilled workforce, the resident population will be left behind – a local government area (LGA) can have a burgeoning unemployment problem while skilled jobs are created and left unfilled. There are already examples of this trend overseas.

As cities and their economies grow, parts of cities (particularly the inner areas) become gentrified. This means more knowledge-based business with high skill requirements move into a part of the city, along with higher skilled and wealthier residents. As this process occurs and property prices increase, pockets of disadvantage develop in places such as public housing estates. Companies providing low skilled jobs that were once accessed by low skilled residents move out of these areas or close completely. This kind of 'stranding' in pockets of disadvantage is a trend in most major western cities.

About the North

Melbourne's North comprises the semi-rural LGAs of Hume, Nillumbik and Whittlesea and the metropolitan LGAs of Banyule, Darebin, Moreland and Yarra.

The region is notable for its diversity – a resident population with a range of cultural, educational and ethnic backgrounds, and old and new suburbs offering different levels of amenity.

Diversity of businesses include inner areas that are moving rapidly towards a knowledge economy and creative development at the same time as manufacturing, logistics and warehousing activities develop in the outer parts of the region.

Previous work

The *Melbourne's North – the new knowledge economy* report builds on a growing base of research that has contributed to development activities across the region over recent years.

Historically, the region had not experienced a significant level of cooperation between LGAs and it was recognised that, to support economic growth and benefit all stakeholders, things had to change.

In 2002, the Northern Area Consultative Committee published the *Northern Regional Profile*, which provided a socio-economic snapshot of the region, including an extensive range of time series data from various sources on community, business, employment, education/training and investment.

Following on from that, the 2003 *Growing Melbourne's North – developing an integrated economy* report provided a detailed analysis of the northern Melbourne regional economy. Based on key social and economic indicators, it detailed important recommendations and benchmarks that supported economic growth and quality employment outcomes for the region.

Together with consultations conducted with community stakeholders, this research informed the strategic planning process for many stakeholders across the region. As well, the Growing Melbourne's North Working Group, comprising representatives from each of the seven LGAs, the Northern Melbourne Area Consultative Committee and NORTH Link, was formed to develop and implement regional projects.

The *Melbourne's North – the new knowledge economy* report is also an initiative of this group. It builds on the earlier studies, with a greater focus on knowledge-based economic development.

The region's strengths

The north of Melbourne has key strengths that can provide a strong basis for future growth.

Education

The region is home to five key tertiary education providers – La Trobe University, RMIT University, Australian Catholic University, Northern Melbourne Institute of TAFE and Kangan Batman TAFE – that provide a range of programs across campuses throughout the region.

Medical/research

There are three significant medical and research precincts – Austin Mercy in Heidelberg (home to two of Melbourne's major hospitals), St Vincent's Hospital in Fitzroy and La Trobe University in Bundoora, which will soon have the new Biosciences Research Centre and Institute for Molecular Science, adding to its already strong R&D centres.

Melbourne Wholesale Fruit and Vegetable Market

The Melbourne Wholesale Fruit and Vegetable Market will be relocated to Epping in 2011. This will provide a major benefit and ongoing opportunities to the region, with more than \$1 billion of planned investment in the redevelopment over the next 10 years.

Transport

Strategic transport assets include:

- Melbourne Airport and its precinct
- a network of key roads and highways, including the Western Ring Road and the Hume Freeway
- Merrifield, an \$8 billion development in Hume, which will become Victoria's largest fully master-planned and integrated business and employment hub; the development is more than 1.5 times the size of the Melbourne CBD, with over 400 ha of purpose built space to accommodate a broad range of business operators and the potential to create in excess of 20,000 jobs
- situated in Somerton adjacent to the company's multi-modal freight exchange (inland port), the Austrak Business Park accommodates a range of businesses and provides direct access to the inland port, facilities for road and rail, and Melbourne and Essendon Airports
- Freight Futures – the Victorian Government's 'Freight Futures' Strategy (2008) calls for 'the relocation of domestic interstate rail freight handling from South Dynon to a terminal site in the Donnybrook/ Beveridge area' (affecting Hume and Whittlesea); the new terminal will enable interstate domestic freight (which currently travels through the metropolitan area) to terminate at Donnybrook/Beveridge for distribution throughout Melbourne.

Business incubators

The region has three established business incubators that assist start-up businesses during early growth phases – Darebin Enterprise Centre, Brunswick Business Incubator and La Trobe Technology Enterprise Centre. A new facility is being developed in Northcote for the creative industries. These incubators create a point of difference for the region and offer opportunity for regional economic development.

Key developments

A number of key developments currently in planning or underway will improve amenity and offer opportunities for cluster businesses and service operators:

- University Hill in Bundoora, which incorporates two business parks, residential, retail and natural environment
- Greensborough Activity Centre, a major town centre revitalisation that will include a regional aquatic and leisure centre, a civic centre and government office, and a revitalised town square
- the Melbourne Wholesale Fruit and Vegetable Market, which will relocate to Epping in 2011
- the 'Coburg Initiative', a plan to redevelop a 12 ha site in Moreland with 1500 new dwellings, shops and offices
- the South Morang Development Plan, which will give the area a massive commercial and retail hub, including an expanded shopping and entertainment centre, the South Morang rail and bus terminal, and a large garden piazza
- the proposed Broadmeadows business centre
- Preston Civic Precinct Development and Australian Horizons Development at Northcote.

Areas designated as Central Activity Districts and Principal Activity Centres within the region will also offer increased development options.

Challenges and opportunities

While the region is facing some significant challenges in the short to medium term, these challenges also produce opportunities that could lead to change and growth.

Manufacturing

Manufacturing remains a strategic industry for the region, even though jobs in this sector continue to decline. It has suffered over recent years by many operators moving offshore. However, opportunities exist to build advanced manufacturing businesses and so increase manufacturing employment. Examples include the possibility of an aerospace cluster at the Melbourne Airport precinct, automotive 'green car' cluster activities, biotechnology associated with medical hub and tertiary research institutions, and increased food cluster activity associated with the relocated market development.

Retrain staff – integrate education and industry

The importance of lifelong learning applies to all residents of the region, but is especially important in areas of industrial restructuring, particularly as manufacturing businesses close. Retraining people will be a key to keeping residents employed and filling skill shortages for local industry. The further integration of education and industry will assist this process, and resources must be made available to ensure that it happens.

Employment policy for outer areas

Given the costs of climate change and transport issues, the requirement to provide local employment will be particularly high in the outer parts of the region where populations are growing rapidly.

Infrastructure

Currently, the north has significant infrastructure issues that include roads, public transport, telecommunications, waste and stormwater systems and the sustainability of domestic, commercial and industrial buildings. These are barriers to growth that need to be addressed as a priority. However, there is also infrastructure within the region that provides opportunity for linkages and increased activity, for example Melbourne Airport and the new market. These can be utilised more effectively by clustering associated industries around these sites.

Costs of climate change

Climate change will have an effect on all industries, particularly manufacturing, over the coming years. Traditional manufacturing processes are vulnerable to the costs of climate change. The need to convert the economy to a low carbon emissions future will require strong commitment to R&D and to innovation, the use of new technologies, and the further development of advanced manufacturing industries.

Diffusion of the knowledge economy

So far, diffusion of the knowledge economy away from the city core has been slow. The inner areas of the region are the gateway to the knowledge economy and are extremely important in enabling the outer areas to develop industries that are increasingly knowledge intensive. The development of business services to the advanced manufacturing industry will assist in integrating the inner and outer north.

Ensuring the efficiency of built form

Emissions trading and complementary policies will play a major role in shaping communities in terms of built form. Buildings will need to be planned well, with a goal of improved efficiency in energy savings as a priority.

Maximising the benefit of Activity Centres and Central Activity Districts

Activity Centres need excellent transport if they are to succeed, and the north is no different in this regard. Congestion of inner roads and extensions to clearways destroy amenity and undermine the role of Activity Centres.

Attracting knowledge intensive industries

While the north has succeeded in attracting some knowledge intensive industries, particularly in the inner suburbs, it is important to the development of the outer north that knowledge intensive industrial activity increases.

Economic strategies for the middle suburbs

While some manufacturing is suffering, there are still opportunities in advanced manufacturing and some niche areas; for example, the north has a thriving food sector that is innovative and successfully exporting. Initiatives such as the Plenty Food Cluster have proved that markets can benefit from clustering together and linking to the tertiary sector.

What needs to be done?

To maximise the future for the north, it is critical that the knowledge economy is used as a driver and spread as broadly as possible across the region. This means that smart businesses operate in the region, growing knowledge, skills and innovation. It also means an increased number of high skilled households, whose residents have a range of qualifications and skills, adding value to the region.

Education and industry must be further aligned to ensure a higher level of R&D, as well as training residents with the skills needed by local businesses. Retraining of unemployed residents is also a vital factor.

The built environment should include smart office buildings, housing developments, business parks and incubators. Both businesses and households should be positioned to take advantage of a carbon constrained economy and the opportunities presented by climate change.

Recommendations

1. Invest more in secondary education, career guidance and pathways
2. Vertically integrate education with industry to grow required knowledge and skills
3. Strengthen local knowledge economy by integrating tertiary institutions into the economy and encouraging development of activity clusters and business networks
4. Invest in transport infrastructure and public transport, road and rail infrastructure, removing barriers to efficiency
5. Grow the number of local business incubators, including a technology incubator
6. Provide high quality office space to accommodate future businesses
7. Continue to build on major investments in research
8. Retain qualified local residents to work in local knowledge-based industries
9. Develop regional business networks to encourage knowledge diffusion and R&D, and encourage medical precincts (and similar)
10. Strengthen manufacturing by creating a regional manufacturing strategy
11. Diffuse knowledge intensive activities in inner regions to outer regions, particularly specialised business services
12. Consolidate outer regions, bringing together community, business, amenity and retail
13. Drive retail development at a local level, including greater supply chain integration
14. Develop an efficient and equitable broadband service, particularly in the outer areas
15. Ensure new buildings achieve the highest possible environmental standards
16. Plan infrastructure development within the extended growth boundaries before commencing residential or commercial development
17. Develop an integrated jobs growth strategy for outer LGAs
18. Retain employment lands in the inner and middle LGAs
19. Create opportunities for development of creativity, the arts and entertainment to improve amenity and liveability
20. Create a culture of home-based entrepreneurship and working from home opportunities
21. Encourage clusters of related activity
22. Encourage creative industries, festivals and arts infrastructure across the region

Contents

Acronyms	xxvi
Additional reading and reference sources	xxvii
List of stakeholder interviews	xxviii
1 Introduction	1
1.1 Melbourne's North reports	1
1.2 The 2003 <i>Growing Melbourne's North</i> report	2
1.3 The 2003 <i>Growing Melbourne's North</i> report: progress on key goals	3
1.4 Prevailing economic and social conditions	4
2 Melbourne's North: Households measured and compared	6
2.1 Households compared	6
2.1.1 <i>National overview: SOR analysis</i>	6
2.2 Household performance by LGA	9
2.2.1 <i>The NIEIR unemployment rate</i>	9
2.2.2 <i>Banyule</i>	10
2.2.3 <i>Darebin</i>	10
2.2.4 <i>Hume</i>	10
2.2.5 <i>Moreland</i>	11
2.2.6 <i>Nillumbik</i>	11
2.2.7 <i>Whittlesea</i>	11
2.2.8 <i>Yarra</i>	12
3 Melbourne's North: People and community	13
3.1 The people that live here	13
3.2 Community capacity for a knowledge intensive future	16
3.2.1 <i>Building knowledge intensive communities</i>	16
3.2.2 <i>Investing in new markets and technologies</i>	18
3.3 The local economy, building communities of the future	19
3.3.1 <i>A stronger and more integrated local economy</i>	20
3.4 Creativity and the information society	21
3.5 Resident skills and occupational balance	22
3.6 Lifelong learning and educational achievement	24
3.6.1 <i>Post-secondary education providers</i>	24
3.6.2 <i>Highly qualified residents</i>	25
3.7 Household size	26
3.8 Ageing	27
3.9 Average weekly income: households	30
3.10 Average weekly income: individual resident	32

4	Benchmarking performance: a data envelop analysis	34
4.1	The results of the DEA analysis	41
5	The macroeconomic structure and interdependency of Melbourne's North	44
5.1	GDP formation	45
5.1.1	<i>Economic interdependency estimates – employment</i>	49
5.1.2	<i>Dormitory employment status versus LGA economic development</i>	49
6	Melbourne's North: Business, an overview	56
6.1	Businesses in Melbourne's North	56
6.1.1	<i>Size of businesses by sector</i>	56
6.1.2	<i>Small businesses (employing less than 10 persons)</i>	56
6.1.3	<i>Medium size businesses (employing 10 to 50 persons)</i>	57
6.1.4	<i>Large size businesses (employing more than 50 persons)</i>	57
6.1.5	<i>National trends in the distribution of businesses</i>	58
6.2	Businesses in Melbourne's North: relative employment proportions	59
7	Melbourne's North: Opportunities	63
7.1	Education	64
7.1.1	<i>The role of education in Melbourne's North</i>	65
7.1.2	<i>The TAFE sector in Melbourne's North</i>	67
7.2	Working together	69
7.3	Employment	69
7.4	Relocation of Melbourne Wholesale Fruit and Vegetable Market	70
7.5	Wholesale	72
7.6	Manufacturing	73
7.7	Transport and storage	73
7.8	Melbourne Airport	75
7.9	Biotechnology	76
7.10	Construction	77
7.11	Retail	78
7.12	Government services	81
7.13	Health	82
7.14	Business services	83
7.15	Incubators	83
8	Melbourne's North: Employment	85
8.1	Industry and local employment	85
8.1.1	<i>Local employment capacity</i>	87
8.1.2	<i>Employment generation ratio</i>	88
8.2	Journey to work	90
8.3	Opportunity cost of travel	97

8.4	Skills	98
	8.4.1 <i>High skills: industry and residence by SLA</i>	98
	8.4.2 <i>21st century skills</i>	99
8.5	Youth employment	100
	8.5.1 <i>Transition pathways to employment and tackling disadvantage</i>	100
	8.5.2 <i>Victorian Government training reforms described</i>	102
	8.5.3 <i>What does this all mean for the residents of Melbourne's North?</i>	103
	8.5.4 <i>Year 12 completers</i>	103
	8.5.5 <i>Early leavers</i>	103
8.6	Job readiness	105
	8.6.1 <i>Non-job ready</i>	105
8.7	Resident social security trends	107
	8.7.1 <i>Households and social security</i>	107
8.8	Power employment	108
9	Melbourne's North: The manufacturing industry	110
9.1	Manufacturing	110
	9.1.1 <i>The economic significance of an advanced manufacturing industry to Melbourne's North</i>	111
9.2	Manufacturing industries growing employment	111
	9.2.1 <i>Food processing</i>	111
	9.2.2 <i>Manufacturing – printing, publishing and recorded media</i>	112
	9.2.3 <i>Manufacturing industries at risk or in decline</i>	113
	9.2.4 <i>The automotive industry</i>	115
	9.2.5 <i>Automotive industry in Melbourne's North</i>	115
	9.2.6 <i>Background on automotive manufacturing</i>	115
	9.2.7 <i>Likely developments in technology</i>	118
	9.2.8 <i>Employment and skills</i>	118
	9.2.9 <i>Dealership and retail activity</i>	119
	9.2.10 <i>Green jobs in the advanced manufacturing industry</i>	121
	9.2.11 <i>Building on existing skills and know-how</i>	122
	9.2.12 <i>Advanced manufacturing opportunities</i>	124
	9.2.13 <i>The scope of research, manufacturing and business services in environmental technologies</i>	124
10	Melbourne's North: An integrated economy	126
10.1	Activity Centres and Transit Cities	126
	10.1.1 <i>Melbourne @5million, Central Activities Districts and employment corridors</i>	126
	10.1.2 <i>Activity Centres</i>	127
	10.1.3 <i>Transit Cities</i>	129
10.2	The integrated supply chain	130
	10.2.1 <i>The value of high-tech clusters as drivers of innovation and supply chain integration</i>	130

10.2.2	<i>Outcomes of high-tech cluster development</i>	130
10.2.3	<i>The role of local government in strengthening high technology clusters</i>	131
10.3	Telecommunications	131
10.3.1	<i>Variability of broadband connectivity</i>	131
10.3.2	<i>The National Broadband Network</i>	132
10.3.3	<i>The knowledge economy and the broadband network</i>	132
10.3.4	<i>Building competitive advantage</i>	133
10.3.5	<i>Difficulties with existing broadband services</i>	134
10.3.6	<i>Pair-gain technology</i>	135
10.4	Resilience to greenhouse costs	138
10.4.1	<i>The Northern Alliance for Greenhouse Action</i>	138
10.4.2	<i>NAGA region EREP sites</i>	139
10.4.3	<i>The cost of industrial emissions by LGA</i>	141
10.4.4	<i>Improving regional competitiveness: an important role for local government in Melbourne's North</i>	142
10.5	Infrastructure, access and the built environment	144
10.5.1	<i>Commercial accommodation in Melbourne's North</i>	144
10.5.2	<i>Infrastructure and opportunity</i>	149
10.5.3	<i>Building codes: building in competitive advantage</i>	151
11	The increasing demand on transport systems in Melbourne's North	153
11.1	Introduction	153
11.2	Victorian Government transport policy	155
11.2.1	<i>The RACV Outer Melbourne Connect Report</i>	156
11.3	Transport in Melbourne's North: options considered	157
11.3.1	<i>The transport conundrum</i>	157
11.3.2	<i>The business as usual scenario</i>	157
11.4	The greenhouse response	157
11.5	Transport problems in Melbourne's North	158
11.6	Radial trains	159
11.7	Trams	162
11.8	Radial bus	163
11.9	What can be done?	163
11.9.1	<i>Enhanced radial capacity</i>	163
11.9.2	<i>Radial freight</i>	164
11.9.3	<i>Local passenger traffic</i>	165
11.9.4	<i>Orbital passenger</i>	165
11.9.5	<i>Orbital freight</i>	167
11.9.6	<i>Freight hubs</i>	167
12	Melbourne's North: Diversity of LGAs	169
12.1	Strategic interventions	170

Appendices	187
Appendix 1: Local government indicators: households	188
Appendix 2: Local government indicators: industry	202
Appendix 3: Gross regional product by industry sector and LGA	219
A3.1 <i>GRP by industry and LGA</i>	220
A3.2 <i>GRP by LGA in time series</i>	222
Appendix 4: Employment distribution by travel zone: selected industry sectors	229
Appendix 5: Benchmarking performance: a data envelope analysis approach	233
A5.1 <i>Terminology clarification</i>	233
A5.2 <i>Selection of performance indicators</i>	236
A5.3 <i>The drivers of the performance indicators</i>	237
A5.4 <i>Driver efficiency improvement versus driver augmentation</i>	239
A5.5 <i>Proximate drivers versus secondary drivers</i>	239
A5.6 <i>DEA analysis: an overview</i>	242
A5.7 <i>The selection of the potential peer LGAs</i>	244
A5.8 <i>Potential peer ranks by performance indicators and drivers</i>	246
A5.9 <i>The strength of the linkages between performance indicators and drivers</i>	274
A5.10 <i>The results of the application of DEA analysis 1991–2006</i>	277
A5.11 <i>Driver focus for efficiency improvement</i>	280
A5.12 <i>The key drivers of economic development</i>	283
Appendix 6: The macroeconomic structure and interdependency of Melbourne's North	287
A6.1 <i>GDP formation</i>	287
A6.2 <i>The economic interdependency of Melbourne's North</i>	290
A6.3 <i>Melbourne's North economic interdependency estimates</i>	293
A6.4 <i>Dormitory employment status versus catchment economic development</i>	296
Appendix 7: LGA indicator explanations	302

List of tables

2.1	Macro indicators: unemployment, employment growth, real household disposable income	7
2.2	Debt and wealth in Australian regions	8
3.1	Resident population	14
3.2	Resident population: proportions of Victoria	14
3.3	2006 resident population by age	15
3.4	2006 resident population: proportion by age group	15
3.5	Foreign born resident population	16
3.6	Creativity in Melbourne's North: rank by LGA	22
3.7	2006 high skilled score	22
3.8	Skills intensity	23
3.9	Proportion of Bachelor or higher degree	36
3.10	Average number per household	36
3.11	Average number per households: proportions by size	27
3.12	Persons aged 55+ in the labour force by LGA of residence	29
3.13	Persons aged 55+ by LGA of residence	30
3.14	Persons aged 55+ in employment by LGA of residence: proportion	30
3.15	Average weekly income growth: households	31
3.16	Average weekly income relative to state average: households	31
3.17	Average income: individual resident	32
3.18	Average income relative to state average: individual resident	33
4.1	Key issues for economic policy development	35
4.2	Performance indicators and drivers: rank in potential peers 2006	37
4.3	Melbourne's North LGAs: performance indicators and drivers – rank for Melbourne catchment LGAs	39
4.4	Melbourne's North LGAs: total inefficiency and target performance indicators 1991–2006	41
4.5	Melbourne's North: unexploited driver estimate and priority ranking for efficiency improvement	42
5.1	Gross regional product (industry) formation Melbourne's North LGAs: average 2001–2006	48
5.2	Melbourne's North economic interdependency: beneficiary of resident employment	51
5.3	LGA implications of general Melbourne out of state export expansion with or without Melbourne's North participation	52
5.4	Out of state export expansion in Melbourne's North vis-à-vis Melbourne west/south-east	54

6.1	Melbourne's North business count 2006 (by ANZSIC Code)	57
6.2	Melbourne's North business count 2006 (by SLA)	58
6.3	Employment totals by ANZSIC: Melbourne's North	60
6.4	Employment totals by ANZSIC: Victoria	60
6.5	Relative employment proportions by ANZSIC: Melbourne's North versus Victoria everybody	61
6.6	High-tech by LGA	62
7.1	Education employment	70
7.2	Wholesale trade employment: basic material wholesaling	72
7.3	Wholesale trade employment: machinery and motor vehicle wholesaling	73
7.4	Wholesale trade employment: personal and household good wholesaling	73
7.5	Transport employment: road transport	74
7.6	Transport employment: rail transport	74
7.7	Transport employment: storage	74
7.8	Transport employment: services to transport	75
7.9	Transport employment: air to space transport	76
7.10	Construction employment: general construction	77
7.11	Construction employment: construction trade services	78
7.12	Retail employment by LGA: total number of employees	78
7.13	Retail employment by SLA: total number of employees	79
7.14	Retail employment by LGA: per cent growth in number of employees	79
7.15	Retail trade employment: food retailing	80
7.16	Retail trade employment: personal and household good retailing	80
7.17	Retail trade employment: motor vehicle retailing and services	80
7.18	Government and defence employment: government administration	81
7.19	Government and defence employment: defence	81
7.20	Health employment: health services	82
7.21	Health employment: community services	82
8.1	2006 source of labour	86
8.2	2006 source of labour: score	87
8.3	SLA: local employment capacity	88
8.4	SLA: employment generation ratio	90
8.5	Journey to work destinations	92
8.6	Opportunity cost of travel	98
8.7	2006 high skilled score: SLAs	99
8.8	21 st century skills	100
8.9	Non-job ready rate	106
8.10	Benefits as a per cent of disposable income	107

8.11	Benefits recipients per cent of population 15–64 years	108
8.12	Power employment occupations	109
9.1	Manufacturing employment: food, beverage and tobacco manufacturing	112
9.2	Manufacturing employment: printing, publishing and recorded media	112
9.3	Manufacturing employment: textile, clothing, footwear and leather manufacturing	113
9.4	Manufacturing: wood and paper product manufacturing	113
9.5	Manufacturing: petroleum, coal, chemical and associated product manufacturing	113
9.6	Manufacturing: metal product manufacturing	114
9.7	Manufacturing: machinery and equipment manufacturing	114
9.8	Manufacturing: other manufacturing	115
9.9	Automotive manufacturing and distribution: key automotive companies	116
10.1	Activity Centres in Melbourne's North	128
10.2	NAGA region EREP sites	140
10.3	Costs of climate change: CO ₂ emissions by industry and household	141
11.1	Average cars per household over time: LGAs	154
12.1	Opportunities by LGA: Banyule	171
12.2	Opportunities by LGA: Darebin	173
12.3	Opportunities by LGA: Hume	176
12.4	Opportunities by LGA: Moreland	178
12.5	Opportunities by LGA: Nillumbik	179
12.6	Opportunities by LGA: Whittlesea	181
12.7	Opportunities by LGA: Yarra	183
A2.1	One digit ANZSIC gross product (industry) at factor cost	203
A2.2	One digit ANZSIC employment (industry): number employed	207
A2.3	One digit ANZSIC productivity: gross product per employed person	211
A2.4	One digit ANZSIC gross product (industry) at factor cost: share of Melbourne's North total GRP	215
A5.1	Global knowledge occupations: ASCO unit groups	236
A5.2	Key issues for economic policy development	240
A5.3	The selected potential peer LGAs	245
A5.4	Performance indicators and drivers: rank in potential peers – 1991	248
A5.5	Performance indicators and drivers: rank in potential peers – 1996	254
A5.6	Performance indicators and drivers: rank in potential peers – 2001	260
A5.7	Performance indicators and drivers: rank in potential peers – 2006	266
A5.8	Melbourne's North LGAs: performance indicators and drivers – rank for Melbourne LGAs	272
A5.9	Average correlation between drivers and performance indicators: 1996–2006	275

A5.10 Efficient LGAs: 1991-2006	278
A5.11 Melbourne's North LGAs 2001: total inefficiency and target performance indicators 1991–2006	279
A5.12 Unexploited driver estimate and priority ranking for efficiency improvement	281
A5.13 Quantitative impact of key drivers of economic development	285
A5.14 Melbourne's North LGAs: resident share ratio in catchment: 2006	286
A6.1 Gross regional product (industry) formation Melbourne's North LGAs: average 2001–2006	289
A6.2 Melbourne's North economic interdependency: beneficiary of resident employment	295
A6.3 LGA implications of general Melbourne out of state export expansion with or without Melbourne's North participation	298
A6.4 Out of state export expansion in Melbourne's North vis-à-vis Melbourne west/south-east	300

Acronyms

ABS	Australian Bureau of Statistics
ANZIC	Australian and New Zealand Industry Classification
ASCO	Australian Classification of Occupations
CPRS	Carbon Reduction Pollution Scheme
DEA	Data Envelope Analysis
DSP	Disability Support Pension
ERP	Estimated Resident Population
ETS	Emissions Trading Scheme
GDP	Gross Domestic Product
ICT	Information and Communications Technology
LGA	Local Government Area
NACC	Northern Area Consultative Committee
NAGA	Northern Alliance for Greenhouse Action
NIEIR	National Institute of Economic and Industry Research
OECD	Organisation for Economic Co-operation and Development
SLA	Statistical Local Area
SOR	State of the Regions Report
VET	Vocational Education and Training
The region	In this report, the region (Melbourne's North) comprises the local government areas of Banyule, Darebin, Hume, Moreland, Nillumbik, Whittlesea and Yarra.

Additional reading and reference sources

Northern Exposure: an analysis of office and commercial accommodation issues in Melbourne's North; NORTH Link, NIETL, NACC.

Melbourne's North – the Market Leader, 2004, NORTH Link, NIETL, NIEIR.

Growing Melbourne's North – developing an integrated economy, 2003, NORTH Link, NIETL, NACC, NIEIR.

Greenhouse Challenge Support Programs, 2004–2008, NORTH Link, NIETL, RMIT University.

State of the Regions reports 2007–2008 and 2008–2009; ALGA, NIEIR.

Economic information and economic development reports are also available on the local government websites for the study region:

- Banyule: www.banyule.vic.gov.au
- Darebin: www.darebin.vic.gov.au
- Hume: www.hume.vic.gov.au
- Moreland: www.moreland.vic.gov.au
- Nillumbik: www.nillumbik.vic.gov.au
- Whittlesea: www.whittlesea.vic.gov.au
- Yarra: www.yarracity.vic.gov.au

List of stakeholder interviews

We would like to thank the following individuals and their organisations for their contributions to this report and their dedication to growing Melbourne's North.

John Andrews
RMIT University

Brian Beckor
Callpoint

Peter Beyer
Abigroup

Kevin Breen
City of Darebin

Mick Butera
NORTH Link

Dennis Cliché
Yarra Trams

Roger Collins
Moreland City Council

Tony Coppola
Northern Metropolitan Melbourne Area Consultative Sub-Committee

Kelly Court
Hume City Council

David Draper
Northern Melbourne Institute of TAFE

Jane Edwards
Chocolate Lily Hair & Beauty

Julie Eisenbise
RMIT University

Peter Elliott
Department of Community Development

David Ensor
La Trobe University

John Francis
City of Whittlesea

David Hall
MAB

Andrew Hanna
Macquarie Group

Raymond Harbridge
La Trobe University

Kate Harrington
Banyule City Council

Peter Harrison
Kangan Batman TAFE

Michael Hedt
Department of Innovation, Industry and Regional Development

Linc Horton
Melbourne Airport

Richard Johns
Australian Automotive Intelligence

Susan La Greca
City of Darebin

Roger Lasalle
Matrix Thinking

Phil Loader
City of Darebin

Duncan McLellan
Delfin Lend Lease

Grant Meyer
Hume City Council

Daniel Murphy
Moreland City Council

Greg O'Brien
La Trobe University

Fran O'Neil
NMIT

John Purdey
Northpoint Estate

Kate Rhodes
Banyule-Nillumbik LLEN

Vincent Ryan
Banyule City Council

Neville Slade
Shire of Nillumbik

Chanmali Treyambe
Connex

Bob Waite
Darebin Enterprise Centre

Mark Wilde
Architectus

Vivien Williamson
City of Yarra

1 Introduction

1.1 | Melbourne's North reports

A review of the history of the development of Melbourne's North suggests that development patterns have been about outward expansion, propelled by the desire for industrial land and housing rather than a coordinated plan to develop the regional economy along with adequate transport links and associated infrastructure and other amenities.

Two rules for regional economic development have emerged if city regions are to prosper:

1. regions within cities must define their own regional strategies
2. regions within cities will have to maximise their role in the knowledge economy.

This means that, to achieve maximum outcomes, Melbourne's North must share its resources and cooperate across local government boundaries, as the growth potential of sub-regions within Melbourne's North will be a key driver in providing employment for the region's households.

The purpose of this report is to provide a catalyst for regional cooperation, discussion, strategic thinking and formal planning and policy processes.

The 2003 *Growing Melbourne's North – developing an integrated economy* report assisted NORTH Link/NIETL, the Northern Area Consultative Committee (NACC) and many local stakeholders, including local councils, to implement a range of initiatives that directly responded to the report's strategic recommendations.

The 2009 *Melbourne's North – the new knowledge economy* report includes a detailed analysis of data gathered for this project and the findings from a series of face to face interviews with key stakeholders in the region. Stakeholders include representatives from local industry, the transport sector, education providers and the professions. These interviews were of great value in defining the current circumstances in Melbourne's North. A list of participants is provided in the prelims to this report.

The 2009 *Melbourne's North – the new knowledge economy* report recognises the importance of the knowledge economy as the key driver of economic growth and regional integration.

The region must continue to develop its knowledge economy for the following reasons.

1. An analysis of regional economies clearly shows that the most knowledge intensive regions – that is, what the region contains in terms of resident skills, high-tech and knowledge intensive businesses, services and educational opportunities – perform the best for their communities. This means greater resilience to change and economic downturns, greater stability and wealth of its households and the capacity to provide greater amenity. These types of regions also have greater capacity to attract businesses, investment and highly skilled residents, and in doing so, offer greater opportunities for young people in creative and knowledge based jobs.

2. A significant issue for Australia's policy makers is that the knowledge economy has struggled to gain a foothold in non-core metropolitan regions and the diffusion of the knowledge economy to the metropolitan edge and beyond has generally been poor. The situation has not been helped by the considerable problems relating to telecommunications sector strategies, particularly the development of equitable high speed internet services, the lack of which have constrained the growth of new industries and services.
3. Knowledge intensive economies should not just be seen as the domain of the elite inner city core. There are far greater opportunities in broadening the base of the knowledge economy through knowledge diffusion activities and greater economic integration across Melbourne's North. From an economic perspective, the process of innovation, development of intellectual property and upskilling of the workforce is valid across all sectors, from automotive manufacturing to medical research. The flow-on benefits of knowledge intensification will impact on the entire community.
4. As a result of the globalisation of industrial and financial systems, to compete successfully, regions need the strong foundations that an integrated knowledge economy can provide. Climate change, its problems and its costs means that the application of research and innovation are now even more important.
5. Knowledge intensive regional economies have far more capacity to export both goods and services and be an integral part of sophisticated global supply chains.
6. Knowledge intensive economies provide the capacity to re-invigorate built form by creating demand for both new commercial space and integrated communities as well older style shop tops.
7. The region is well placed to grow its knowledge economy because of the skills and diversity of its residents, the range of its businesses and institutions, and its growing amenity.

1.2 | **The 2003 *Growing Melbourne's North* report**

The strategies defined in the 2003 *Growing Melbourne's North* report still stand. These are:

- Melbourne's North should continue to promote its vision of an integrated economic region
- that, by acting cooperatively as a region, Melbourne's North can capitalise on a number of regional development opportunities
- community strengths exist in the region in the form of established networks and inter-regional cooperation
- fostering these networks and acting collaboratively can achieve regional economic growth greater than the sum of the individual parts
- the northern metropolitan region has the potential to achieve significant economic and social benefits for its community
- the history, infrastructure, knowledge intensity and amenity of the inner areas of Melbourne's North can be harnessed to provide genuine opportunities for households and businesses across all of the region

- the growth of industry and the development of transport infrastructure, such as the airport in the outer north, will continue to provide competitive advantage
- Melbourne's North, particularly its outer regions, requires a network of excellent transport linkages to utilise its relative strengths and to ensure that social and economic benefits can be shared across the region.

The recommendations were made within a context of valuing social outcomes and community strength as well as economic outcomes.

The 2003 *Growing Melbourne's North* report found that the region had the potential to achieve significant economic and social benefits for its community through:

- the identification of the region as a defined economic zone
- the development of an adequately resourced regional vision that places increased manufacturing employment as its central goal
- the cooperation and development of partnerships to leverage support at all levels of government – local, state and federal.

The 2003 report and its analysis identified a number of key goals. These were to be achieved by 2015:

1. a business services sector with a size comparable to the region's share of population
2. local employment in government and education comparable to the region's share of the population
3. a net exporter of education and training
4. a significant net exporter of personal services output
5. the shortfall in the regional share of retail employment to be reduced to zero
6. a clear dominance in the level of advanced manufacturing maintained.

The rationale behind these recommendations was to enhance the economic performance and overall competitive position of the region through cooperation and greater integration of its constituent parts. The period after the original report was completed was one of strong economic and employment growth followed by a sharp downturn in 2008, triggered by the impact of the financial meltdown in the United States and underpinned by unsustainable levels of household debt across many of Australia's regions.

1.3 | The 2003 *Growing Melbourne's North* report: progress on key goals

1. Since 1991, business services in Melbourne's North grew its share of gross regional product but growth slowed in the period 2001–2006, following a more rapid growth of share in 1996–2001. In the period 1996–2006, employment in business services in Victoria grew by almost 60 per cent to 299,000 jobs. Growth in business services jobs in Melbourne's North over the same period was 55 per cent to 31,083. Business services in the City of Hume occupy a lower share of Hume's gross regional product than is the case in other parts of Melbourne's North. Business services in the City of Yarra account for 17 per cent

of employment, while business services in the City of Hume account for 5 per cent of employment. Given that Hume is a key driver of the Melbourne economy, the goal of improving the level of business services is crucial. Activity Centres should be the focus for growth of business services across Melbourne's North.

2. Local employment in government in Melbourne's North, in terms of the number of jobs available, increased slightly in the period 1996–2001 against a significant decline in numbers in Victoria. Since Victoria's low in 2001, jobs in government have risen by 42 per cent to 88,967 statewide, still well below the 1991 figure of 101,512. The number of government jobs in the study region has risen by 34 per cent since 2001, to 9,079. A significant amount of this growth may be as a result of the relocation of defence forces to Melbourne's North. Melbourne's North has not kept pace with the growth in government jobs. Education in Melbourne's North, which is playing catch up to other Melbourne regions, saw jobs growth in education of 28 per cent in the period 1996–2006 to 24,920 jobs. Meanwhile, Victoria grew the number of jobs in education by 40 per cent to 183,767 jobs in 2006. Growth in government and education employment will need to continue if Melbourne's North is to achieve its goal of a comparable share of employment to the region's share of the population. Growth in research based in Melbourne's North tertiary institutions and relocation of a part of the Department of Justice to Broadmeadows are positive. More such initiatives are required.
3. As a net exporter of education and training services, the region's tertiary and TAFE providers are performing strongly. To build on this success, the region will need to ensure that its own residents have the capacity to compete in terms of access to tertiary education and pathways to knowledge economy employment.
4. The number of jobs in personal services in Melbourne's North have grown 24 per cent since 1996 to 11,448 jobs in 2006, compared to growth in Victoria in the same period of 32 per cent, indicating that Melbourne's North has not improved its overall capacity as a net exporter of personal services output.
5. In terms of the shortfall in the regional share of retail employment identified in the 2003 report, Melbourne's North has grown its share of retail employment, with Hume, Nillumbik, Whittlesea and Yarra all achieving higher growth rates in retail employment than the Melbourne average. Melbourne's North retail employment grew by 25 per cent in the period 2001–2006 compared to the Melbourne average of 20 per cent.
6. The goal to maintain dominance in the level of advanced manufacturing in Melbourne's North has not proved easy. Interestingly, after a period of decline, there is now a slight revival in training in advanced manufacturing. Manufacturing sector jobs in Melbourne's North continue to decline and exposure to loss of automotive industry jobs remains high. New opportunities may arise in areas of environmental protection and energy conservation and controls.

1.4 | Prevailing economic and social conditions

The 2009 *Melbourne's North – the new knowledge economy* report was written during a period of financial meltdown and its significant global impact. Another key and far more long-term influence is the recognition, by governments at all levels, that environmental issues relating to climate change will need to be addressed. The emission trading scheme (ETS) will be a key

component of the Australian Government's strategy to reduce greenhouse emissions. This report looks at the cost of an ETS and how this will impact on businesses and households across the region. In Australia, the ETS is called the Carbon Pollution Reduction Scheme (CPRS).

The report takes a longer-term strategic view so its recommendations may not be directly influenced by the current financial crisis, although it is understood that the current crisis will have a significant impact on economic performance in the coming months and may play a role in hastening the pace of structural change of local industry. Environmental factors are, however, considered throughout this report as it is likely that both the negative impacts of the direct costs of climate change on businesses and households across the region, as well as the business opportunities provided through innovation in goods and services because of climate change, will have an ongoing impact on the region's economic development.

A convergence of economic, environmental and social factors influence the strategic analysis in this report and, coming together as these factors now do, they provide a framework for shaping future regional economic development strategies.

These factors include:

- the impending costs of climate change and the further costs of greenhouse gas emissions abatement
- climate change and the management and costs of water supply
- the global financial crisis
- the record high household debt and its impact on household expenditures
- the lack of progress in developing a National Broadband Network
- the likelihood that, in Australia, the knowledge economy has failed to spread outside the existing knowledge intensive regions (broadly, the inner regions of the major cities)
- in terms of the migration flows, the tendency for young adult Australians to avoid the knowledge intensive regions and head north and west to resource and lifestyle regions or perhaps overseas to knowledge intensive regions in other countries, while young adults from overseas (including overseas returned Australians) are seeking their future in the knowledge intensive regions in Australia; these trends indicate increasing divergence between the cosmopolitan knowledge intensive core city regions and the relatively poorly-educated periphery
- funding strategies at the federal level for school education that may have had an adverse impact on or further disadvantaged regions with a lower representation of private schools
- the need to convert the economy to a low carbon emissions future, which will require a greater level of investment and a greater commitment to research, development and innovation
- the traditional manufacturing industries within metropolitan regions are vulnerable to the costs of climate change.

2 Melbourne's North: Households measured and compared

Findings

1. High levels of debt now constrain households' capacity to spend on goods and services.
2. Households in dispersed metro regions, because of current debt levels, have the lowest capacity to spend.
3. Households from knowledge intensive regions are likely to be the most resilient to economic downturn.
4. Households in knowledge intensive regions have a greater capacity to spend on goods and services, greatly assisting their local economies.
5. Since 2001, household debt service ratios and household debt to gross income ratios have deteriorated across all of parts of the region, including in the more established areas, as borrowing has fuelled consumer spending.
6. The region still has high levels of structural unemployment and a targeted effort should be made, where this is possible, to assist people into new types of employment.
7. The wealthiest households in the region have been established because of the skills and knowledge based employment capacity of their residents and businesses.
8. Productivity is the highest in the most skilled households.
9. In terms of economic development, the single most important act to improve industry employment is to increase the share of residents in Melbourne's North with tertiary and technical qualifications and skills sets.

2.1 | Households compared

2.1.1 National overview: SOR analysis

Over the period since the 2003 *Growing Melbourne's North* report, Australia's households have continued to accumulate debt at an unprecedented rate. The combination of financial deregulation and the substantial increase in property values has fuelled household borrowing.

As the land boom fades into memory and property prices fall, households are left with the stark reality that, on average, their debt levels have increased by 9.4 per annum nationally since 2001. Over the same period, the value of average household financial assets has increased by 6.7 per cent per annum (and house prices are now falling), demonstrating that household wealth accumulation has not kept pace with debt accumulation.

What this means to the region's economy more broadly is that, in the coming months, Australian households will have far less capacity to spend on goods and services as many households will:

- find it harder to access further borrowings
- consider a regime of debt reduction a priority over other expenditures.

The household wealth and debt profile for each local government area (LGA) within Melbourne's North is shown in the LGA tables in Appendix 1 of this report.

Levels of household debt within a given local area will have an impact on the providers of goods and services at the local level. It is expected that the retail sector will go through a difficult period in coming months because of households' reduced capacity to spend.

At a national level, the National Institute of Economic and Industry Research (NIEIR) has analysed the economic performance of Australia's households. In the annual *State of the Regions* (SOR) report (published by the Australian Local Government Association), NIEIR analyses Australia's regions and households by their dominant characteristics. The analysis allocates Australia's geographic regions into six different types of regions, shown in Table 2.1. It is evident from the analysis that the best performing households, in terms of employment and real household disposable income, are households from regions that are the most knowledge intensive. This means regions with businesses that are part of an integrated global supply chain, that have higher levels of research and innovation, access to high quality educational and business services, and highly skilled households.

Table 2.1 shows that households in the Knowledge Intensive zone are the most successful and that they are likely to be more resilient in harsher economic times. Melbourne's North, in terms of this SOR type analysis, can be described as a combination of Knowledge Intensive and Dispersed Metro.

Table 2.1 Macro indicators: unemployment, employment growth, real household disposable income (per cent)

Region types	NIEIR unemployment rate (%)			Employment growth (% p.a.)	Real household disposable income (% p.a.)
	2006	2007	2008	2006–2008	2006–2008
Knowledge Intensive	5.4	5.0	4.6	2.9	6.5
Lifestyle	11.6	10.9	10.0	3.4	5.4
Dispersed Metro	7.1	6.8	6.5	2.5	4.4
Independent Cities	9.3	8.9	8.2	3.0	3.7
Resource Based	9.0	8.5	9.0	2.4	-2.4
Rural	9.1	8.6	8.7	2.2	2.0
National	7.5	7.0	6.7	2.7	4.5

Source: SOR 2008–09.

An analysis of household debt and wealth across the SOR region types shows the national trends for households in Knowledge Intensive and Dispersed Metro regions to be as follows.

- The Dispersed Metro region still has the highest household liabilities in terms of dollars per household, although the annual rates of growth of debt accumulation are now lower than in the Knowledge Intensive region.
- Borrowing in the Dispersed Metro region was early to take off in the land boom, and now has limited capacity to absorb further debt.
- Households in the Knowledge Intensive region have accumulated debt at a faster rate than in other regions, reflecting high property values, the higher salaries of knowledge workers and a greater capacity to borrow.
- The average value of financial assets per household is the highest in the Knowledge Intensive region.
- When the SOR regions are compared, the annual growth in the value of household assets in the Lifestyle region (9.4 per cent) is not far below the growth in household liabilities (10.3 per cent). The gap is much greater in the Knowledge Intensive region, with the value of household assets increasing by an average of 7.4 per cent per annum, well below liabilities, which have been increasing by 13.1 per cent per annum.

Nationally, the household debt to gross income ratio continued to increase. Some of the largest increases occurred in previously low-debt regions, reflecting lenders' strategies to target these regions for more loans.

Although there has been some convergence, the distribution of household wealth continues to be unequal, with large differentials in household wealth across regions. What stands out is not only the general increase in household wealth, but that many regions have seen a doubling since 2001 in their debt service ratio and household debt to gross income ratio, placing increasing stress onto household finances.

Table 2.2 Debt and wealth in Australian regions

Zone	Household debt to income ratio		Wealth per household	
	2008	Percentage change 2001–2008	2008 (\$'000)	Percentage change 2001–2008
Knowledge Intensive	1.4	79.3	689.2	22.8
Lifestyle	1.7	53.7	353.2	26.4
Dispersed Metro	1.7	44.5	454.4	17.9
Independent Cities	1.5	43.3	397.6	24.9
Resource Based	1.3	32.7	435.3	19.5
Rural	1.4	29.7	429.7	30.5
National	1.5	50.9	501.2	22.0

Source: SOR 2008–09.

2.2 | Household performance by LGA

The tables in Appendix 1 provide an economic profile of household performance by LGA. The key performance indicators within these tables are for employment and productivity. These are household measures and are described in detail in Appendix 5. Where rankings are available, these are ranks out of 565 Australian LGAs. The tables are summarised in this section.

2.2.1 The NIEIR unemployment rate

The unemployment tables, as well as including headline rates, also include NIEIR unemployment measures, which reflect the underlying employment position more fully. The rationale for creating the NIEIR unemployment rate was that headline figures gave no indication of the 'hidden unemployed'; that is, the people who have dropped out of the labour market, or never entered it, due to the perceived futility of job search. The headline rate also makes no allowance for under-employment; that is, people who would prefer to work longer hours. The Australian Bureau of Statistics (ABS) has responded to the trend towards casual and part time work by asking part time workers if they want to work additional hours, and the resulting statistics have been presented as supplementary indicators, with little effect on interpretations of the headline rate. Other Commonwealth changes included the easing of eligibility conditions for the invalid pension, renamed Disability Support Payment (DSP). Disability no longer had a primarily medical definition, but took into account employability in relation to local labour market circumstances. This allowed the transfer of a large number of unemployed people (particularly middle-aged men) onto DSP. This pattern appears to be noticeable in such places as Broadmeadows. Also, Newstart payments for people aged 55 and over, who were not unemployable within the DSP definition but still faced poor employment prospects, were transferred to a new benefit called Mature Age Allowance. This differed from Newstart in that it was not activity tested.

Employment and unemployment will reflect the characteristics of a region and there are a number of inter-related conditions that impact on employment conditions. These include:

- job shortages, which are particularly severe for unskilled workers
- job shortages can be particularly severe in regions affected by industrial restructuring, one cause of structural unemployment leading to a mismatch between job vacancies and the skills and locations of unemployed workers
- for many workers, particularly unskilled residents of knowledge poor regions, job search became a pointless occupation and long-term unemployment, previously absent, can become pervasive; it is recognised that it is much more difficult for a long-term unemployed person to return to work than is the case for a worker who had been unemployed for only a few months
- except during recessions, job shortages for the unskilled residents of knowledge poor regions co-existed with shortages of skilled labour in knowledge intensive regions, often resulting in full-time workers working long hours
- at the same time, the proportion of part time and casual jobs has increased, and so has the number of workers working short hours
- married women's workforce participation has increased to the point where very few stay-at-home females are to be found among women of prime working age
- a general rise in the workforce participation rate.

Important considerations in relation to the LGA tables in Appendix 1 also include the rise in the value of the financial assets of households (shown to 2008) will have been impacted by the rapid decline in the value of financial assets, particularly shares. The impact of the financial crisis is also having a significant impact on construction activity. These generic trends will further reduce incomes and wealth (and therefore economic activity) beyond those issues discussed here. The wealthier parts of Melbourne's North are not immune from the fall in the value of assets and the associated impact on households' capacity to spend.

All the LGAs in Melbourne's North slipped in their national rankings in terms of household wealth, Nillumbik proving to be the most resilient LGA in holding its position nationally.

2.2.2 Banyule

While the headline unemployment rate for residents of Banyule fell to 3.2 per cent in 2008, the NIEIR structural unemployment rate still remained at 8 per cent, which, although it had fallen by 1.3 per cent since 2003, suggests concentrated pockets of disadvantage. The business productivity measure for Banyule in 2008 of \$52,461 per capita for the LGA's households compares with Yarra at \$59,315 and Whittlesea at \$45,347. The average for Melbourne Central was \$66,009 and for Melbourne's east was \$57,862.

Average household wealth in Banyule rose to \$609,000 in 2008, while the household debt to income ratio rose from 1 in 2001 to 1.41 in 2008. This change is particularly interesting given the relative stability of households in Banyule and probably reflects the national trend for borrowing to finance consumer goods other than houses. This means that even the relatively wealthy households in Banyule are likely to face some constraints on spending on retail and services, until at least some of the debts are repaid.

2.2.3 Darebin

Over the period 2003–2008, unemployment in Darebin fell 2.7 to 6.4 per cent. Structural unemployment remained high at 14.5 per cent in 2008. The business productivity measure per household showed a per capita contribution of \$48,572. Average household wealth in Darebin increased from \$314,000 in 2001 to \$357,000 in 2008. The household debt to gross income ratio rose from 1.01 in 2001 to 1.64 in 2008, with average levels of household debt more than doubling in the period to \$132,000. In Darebin, household debt has risen faster than household wealth.

2.2.4 Hume

The headline unemployment rate for Hume residents remained relatively high at 6.8 per cent in 2008. The structural unemployment rate was 16 per cent, reflecting the vulnerability of low skilled housing and restructuring of the manufacturing industry. It is interesting to reflect that Hume, a major employment node, has structural employment numbers that demonstrate that residents are being left behind, with little capacity to benefit from Hume's development. The average household business productivity figure of \$46,326 has increased since 2001, probably reflecting some dynamism in the types of new households being attracted, some with higher skills. Average household wealth in Hume in 2008 was \$271,000, while average household debt was \$169,000 with a debt to gross income ratio of 1.95, rising from 1.48 in 2001. In Hume, household disposable income, after debt service costs, has declined since 2001. Household expenditures on retail and services will be constrained until debt levels are reduced.

2.2.5 Moreland

Headline unemployment rates of residents were 4.3 per cent in 2008, falling from 7.1 per cent in 2003. Again, the structural unemployment rate, although it had fallen by 3.8 per cent since 2003, remained high at 14 per cent. This reflects a pattern of skilled households moving in and less skilled and longer-term residents being left behind. Average household business productivity rose quite strongly, approximately 5 per cent since 2003, and is now \$48,309 per capita, again reflecting the increase in skilled households.

Wealth per household increased to \$378,000, from \$329,000 in 2001, while average household debt levels doubled, resulting in a debt to gross income ratio of 1.65 per cent in 2008. Household disposable income has risen slightly but, given current circumstances, is likely to be used to consolidate household wealth rather than increasing consumer spending.

2.2.6 Nillumbik

Headline unemployment for the households in Nillumbik is low at 1.7 per cent in 2008. Structural unemployment is also very low when compared to other parts of Melbourne's North, at 3.9 per cent in 2008. The average household business productivity measure shows a per capita figure of \$53,604. These figures reflect the higher skills of residents and the likelihood that Nillumbik, with its lifestyle benefits, has been a locational choice for this group.

The household income to debt ratio has risen from 1.36 in 2001 to 1.58 in 2008 and average household liabilities for the period have increased by \$75,000 to \$217,000. While there has not been a significant rise in the household debt ratio, the average level of financial assets for households in Nillumbik is relatively high, so the decline in the value of shares is likely to constrain expenditures of households whose residents are closer to retirement age.

2.2.7 Whittlesea

The headline unemployment rate for Whittlesea residents fell from 6.7 per cent in 2003 to 5.1 per cent in 2008. For Whittlesea, the NIEIR unemployment rate is nearly 4 per cent higher than the headline unemployment rate, suggesting that a significant number of residents have been moved from unemployment benefits to other categories of benefit payments. This figure is interesting when it is compared to Yarra, where the headline unemployment rate and the NIER unemployment rate are similar. In Whittlesea, confirmed by the earlier finding, the structural unemployment rate remained high at 13.3 per cent. Household business productivity per capita was \$45,347, the lowest in Melbourne's North.

Average household wealth increased from \$406,000 in 2001 to \$451,000 in 2008, while average household liabilities rose to \$158,000. The household debt to income ratio rose from 1.29 in 2001 to 1.82 in 2008. These numbers indicate constraints on household expenditures until debt levels are reduced. Disposable household income in Whittlesea fell over the period.

2.2.8 Yarra

The headline resident unemployment rate fell to 4.4 per cent, a reduction of 2 per cent since 2003. Structural unemployment also declined by over 4 per cent in the period but remained high at 11.1 per cent. Structural unemployment in Yarra is likely to be concentrated in pockets of public housing, where residents have lost low skilled employment, as factories have relocated away from Yarra or closed completely. The low skilled group is, in effect, stranded in a high skilled area and successful area. Household business productivity per capita is the highest in the region at \$59,415, demonstrating the higher productivity of knowledge intensive regions.

Average household wealth in Yarra rose to \$596,000 in 2008, and levels of debt more than doubled between 2001 and 2008 but would have increased far less than the value of properties. The household debt to gross income ratio increased from .81 to 1.42. The average household disposable income rose by more than 15 per cent in the period, providing Yarra households with some capacity to spend on goods and services, even if some belt tightening is to occur.

3 Melbourne's North: People and community

Findings

1. Melbourne's North is changing, with more highly skilled people moving in.
2. Melbourne's North is younger and Hume and Whittlesea continue to grow rapidly.
3. Melbourne's North has a vibrant multicultural community.
4. The inner parts of Melbourne's North have a significant creative class and high levels of innovation.
5. Income levels vary and the highest levels of income are in the most knowledge intensive parts of Melbourne's North.
6. A growing number of people over the age of 55 are engaged in the workforce.
7. The occupational balance of jobs and resident skills is the greatest in the inner north and in Nillumbik.
8. The importance of encouraging lifelong learning applies for all residents of Melbourne's North but is particularly important in areas of industrial restructuring, particularly as manufacturing businesses close.
9. Green jobs may provide opportunities that match resident skills.

3.1 | The people that live here

'More highly skilled people are moving to the north, to suburbs like Ivanhoe and Alphington.'

Greg O'Brien, Emeritus Professor, La Trobe University

Melbourne's North can be described by its diversity. This includes the diversity of its resident population. The region embraces diversity in built form, from among the oldest to the newest suburbs, and a corresponding diversity in the culture, educational and ethnic background of its resident population.

This section introduces a comparison with Knowledge Intensive regions. The Knowledge Intensive region, for the purpose of this report, is defined as the 23 best performing LGAs within a metropolitan area in Australia in terms of patents per capita (the city core is excluded to avoid distortion). The average outcome for the 23 best performing regions is used to create the Knowledge Intensive benchmark.

The most rapid population growth in the region has been in Hume (population growth of 33,532 between the 1996 and 2006 census period) and Whittlesea (population growth of 23,581 between the 1996 and 2006 census period). These two growth areas have exceeded forecast expectations. The region's remaining outer LGA, Nillumbik, has grown more slowly, reflecting its geography and smaller industry base.

While growth in the inner parts of Melbourne's North has been more sedate, the trend towards increasing residential density and redevelopment of industrial areas to residential has resulted in an acceleration in population growth in Yarra, Moreland and Darebin. This report highlights the importance of retaining employment lands in the inner regions of Melbourne's North, now so attractive for residential development. Retaining employment lands is particularly important during a time of significant economic and industrial change, as this strategy allows for greater flexibility and capacity to embrace new and sometimes unforeseen opportunities. Closely integrated communities in terms of their residential and work choices should be the goal for all local governments in Melbourne's North.

Banyule's population has remained stable, reflecting its status as an established part of Melbourne's North.

Table 3.1 Resident population

Industry	1996	2001	2006	2011
Banyule (C)	117,910	118,696	119,163	123,297
Darebin (C)	127,396	127,855	133,644	142,925
Hume (C)	120,819	135,986	154,351	171,627
Moreland (C)	136,733	136,381	142,306	152,885
Nillumbik (S)	57,219	60,818	62,142	64,329
Whittlesea (C)	106,212	118,118	129,793	152,133
Yarra (C)	67,136	68,947	73,548	81,485
Northern Region	733,425	766,801	814,947	888,681
Melbourne	3,284,006	3,472,207	3,743,635	4,075,528
Victoria	4,560,090	4,804,727	5,126,540	5,517,453

Source: ABS Census/NIEIR.

Table 3.2 Resident population: proportions of Victoria (per cent)

Industry	1996	2001	2006	2011
Banyule (C)	2.6	2.5	2.3	2.2
Darebin (C)	2.8	2.7	2.6	2.6
Hume (C)	2.6	2.8	3.0	3.1
Moreland (C)	3.0	2.8	2.8	2.8
Nillumbik (S)	1.3	1.3	1.2	1.2
Whittlesea (C)	2.3	2.5	2.5	2.8
Yarra (C)	1.5	1.4	1.4	1.5
Northern Region	16.1	16.0	15.9	16.1
Melbourne	72.0	72.3	73.0	73.9
Victoria	100.0	100.0	100.0	100.0

Source: ABS Census/NIEIR.

	0–19	20–29	30–54	55+
Banyule (C)	29,042	15,562	42,405	32,154
Darebin (C)	28,838	21,470	50,600	32,736
Hume (C)	50,133	21,086	56,638	26,493
Moreland (C)	30,685	24,060	52,219	35,341
Nillumbik (S)	19,592	6,511	24,574	11,466
Whittlesea (C)	37,604	18,595	48,027	25,567
Yarra (C)	10,834	18,346	30,921	13,446
Northern Region	206,886	125,481	305,326	177,254
Melbourne	956,289	546,616	1,373,310	867,420
Victoria	1,336,499	687,863	1,844,514	1,257,664

Source: ABS Census 2006.

The region has a higher proportion of 20–54 year olds than the Melbourne average and closely mirrors the age profile for the Knowledge Intensive regions for this working age group. The study region also has a lower proportion of over 55 year olds than the other regions, as shown in Table 3.4.

	0–19	20–29	30–54	55+
Banyule (C)	24.4	13.1	35.6	27.0
Darebin (C)	21.6	16.1	37.9	24.5
Hume (C)	32.5	13.7	36.7	17.2
Moreland (C)	21.6	16.9	36.7	24.8
Nillumbik (S)	31.5	10.5	39.5	18.5
Whittlesea (C)	29.0	14.3	37.0	19.7
Yarra (C)	14.7	24.9	42.0	18.3
Northern Region	25.4	15.4	37.5	21.8
Knowledge Intensive	22.5	15.2	37.4	24.9
Melbourne	25.5	14.6	36.7	23.2
Victoria	26.1	13.4	36.0	24.5
Australia	26.7	13.2	35.8	24.4

Source: ABS Census 2006.

The region has a similar proportion of foreign born as the Melbourne average, with the highest levels of foreign born in 2006 living in Whittlesea (32.7 per cent), Moreland (32.3 per cent) and Darebin (32 per cent). Of interest is the attraction of Whittlesea and Hume to the foreign born population.

Table 3.5 Foreign born resident population (per cent)

LGA	1996	2001	2006
Banyule (C)	19.8	19.1	19.8
Darebin (C)	34.6	33.1	32.0
Hume (C)	29.3	28.8	29.3
Moreland (C)	35.6	33.2	32.3
Nillumbik (S)	14.6	14.1	14.1
Whittlesea (C)	35.2	33.5	32.7
Yarra (C)	33.2	28.7	27.7
Northern Region	29.9	28.4	28.1
Knowledge Intensive	30.0	29.2	30.2
Melbourne	29.2	28.3	28.9
Victoria	23.8	23.3	23.8
Australia	21.8	21.6	22.2

Source: ABS Census 2006.

3.2 | Community capacity for a knowledge intensive future

The capacity for developing a greater spread of knowledge intensive businesses and households across Melbourne's North should be considered against the following national trends.

- The lack of progress in developing a National Broadband Network.
- The likelihood that, in Australia, the knowledge economy has failed to spread outside the existing Knowledge Intensive regions focused in the metropolitan core of Australia's major cities.
- In terms of the migration flows, the tendency for young adult Australians to avoid the Knowledge Intensive regions and head north and west to Resource and Lifestyle regions or perhaps to Knowledge Intensive regions in other countries, while young adults from overseas are seeking their future in the Knowledge Intensive regions in Australia. These trends indicate increasing divergence between the cosmopolitan Knowledge Intensive core city regions and the relatively poorly-educated periphery.
- The need to convert the economy to a low carbon emissions future will require a greater commitment to research, development and innovation, the use of new technologies and the further development of advanced manufacturing industries.

3.2.1 Building knowledge intensive communities

ABS statistics show that research and development (R&D) expenditures by Australian businesses reached \$12 billion in 2006–2007, the major contributors being manufacturing (31 per cent), mining (21 per cent) and professional scientific and technical service industries (17 per cent). The strongest R&D expenditure growth was in New South Wales, probably reflecting the location of head offices. Business R&D expenditure in Australia as a proportion of Gross Domestic Product (GDP) was 1.15 per cent, well below the Organisation for Economic Co-operation and Development (OECD) average for the year of 1.56 per cent.

Melbourne's North has traditionally had a strong manufacturing base, and solid attributes in health and associated research both provide valuable foundations for future innovation.

The level of knowledge intensity and R&D activity within a regional economy are key drivers of business innovation. Innovation, in turn, enhances the capacity of a region to export goods and services. Regions in which innovation is encouraged create more highly skilled and better paid employment. The more knowledge intense the economy, the more the need for education and training, the more likely the development of high-tech industry clusters and greater connectivity to global and integrated supply chain activity.

In the United States, improvements to telecommunications infrastructure and technologies over the last 25 years were accompanied by an unexpected phenomenon – the unprecedented prosperity of several small regions within the United States, most notably Silicon Valley. These regions were engaged in the conversion of knowledge to both profit and employment. Regions like Silicon Valley confounded expectations in two ways. Firstly they were localised, whereas the expectation had been that the telecommunications revolution of which they were part would remove the benefits of locality. Secondly, where were the economies of scale? So many of the businesses involved seemed to be small start-ups and, even if some of them grew large, their industry was characterised by all sorts of temporary business relationships.

What remains startling is that little has changed over the last decade, in as much as it still appears to be a great deal easier (recent weeks aside), to establish global and knowledge intensive businesses in the global hotspots such as Silicon Valley.

It is relevant to this study to identify the ingredients required to establish global and knowledge intensive businesses. Broadly, these are as follows.

- There are local sources of new knowledge and ideas.
- Venture capital is available.
- The penalties of failure are not too severe, either in terms of financial penalties for the entrepreneur or in terms of lost knowledge.
- There is a realistic outlook that success will be rewarded – not necessarily with wealth alone, but also with social recognition.
- Local interpersonal networks assist in putting together the skills required to run an innovative business – practical as well as theoretical skills, managerial as well as production skills, marketing as well as product development skills.

So why is it still so difficult to establish new and global knowledge intensive businesses away from global hotspots such as Silicon Valley?

Business people in Melbourne's North are not lacking in ideas and entrepreneurship, and the demand for improved telecommunications services is manifest. For the purpose of developing a more integrated and knowledge intensive region, it is important to consider the barriers that constrain the process of turning ideas into products and services.

Apart from the business incubators and the assistance these provide, it is relatively difficult for knowledge intensive start up companies to access funding and affordable business services. Some larger international firms tend to have branch office mentalities when it comes to their operations in Australia; this means that an appropriate share of research and innovation and associated skills sets may not have been allocated to their Australian operations. Government policies should require firms to commit to greater levels of input from local research and innovation processes, particularly when these industries are being subsidised in some way. If subsidies or tax offsets are to be a feature of encouraging firms to locate or to stay in Melbourne's North, there should be a mechanism that provides some sort of share/licence in intellectual property rights.

Vertical integration of education/research and industry is critical to the knowledge intensification of regional firms, as is the provision of information and communication technology (ICT) infrastructure, including broadband.

Opportunities in the knowledge based economy include the supply of products and services that attract global markets via ICT or other forms of highly integrated supply chain activity. The negative impacts of barriers to the commercialisation of R&D come into sharper focus when climate change, the resulting shifts in products and services, and the opportunities for innovation are taken into the considerations.

Using Silicon Valley as an example, the profile of start up firms in Silicon Valley is likely to be that they have global reach and their market capitalisation tends, in good times, to be very high and fast growing. Companies have proved not to be immune to downturns in economic activity and, as a result, in the value of their stock. A quick review of the current share price of the major Silicon Valley ICT companies against their 12 month highs reveals a significant decline in share values, with many companies losing half of their value or more. These falls apply to hardware and software companies and companies whose business is online. It should be understood that, in the longer term, it is more likely that these knowledge intensive businesses will be far more resilient and more rapidly growing than businesses that require less innovation and research to drive their product and service development. There is a degree of safety in global reach, as the performance and the consequent demand from national and regional markets will differ.

3.2.2 Investing in new markets and technologies

Setting the global financial crisis aside, Silicon Valley financiers have tended to be less risk averse, or perhaps better understood the potential of some ICT and knowledge intensive business propositions. If a new wave of high-tech and knowledge intensive businesses are to be developed in Melbourne's North, it is critically important that the financial services sector, and the decisions makers within it, understand the opportunities and broader economic benefits of creating a highly developed knowledge intensive economy. Access to capital for high-tech start up firms has been difficult. Even though Australia's superannuation funds have continued to grow rapidly, their contribution to real capital investment remains muted. In Australia today there are some 6.5 million unclaimed superannuation accounts attracting in the order of \$100 million in fees. The Australian Government, in its considerations of how to deal with this issue, should consider setting up an innovation fund to assist industry access to capital for research and innovation. An improved funding model to support regional innovation is required.

3.3 | The local economy, building communities of the future

The policy initiative of continued economic integration becomes a far more important principle when regions are faced with the environmental, social and cost implications of climate change.

A key task for the region will be the development of communities that are more sustainable in terms of their environmental impact. From an economic point of view, sustainability benchmarks can be regarded as a response to a number of trends that need to be recognised in policy development.

- Emissions trading and its complementary policies will play a major role in shaping communities in terms of built form, density, public transport, and the introduction of new technologies to improve energy efficiency and waste management, to name a few. Initially, the more significant increases in costs for households are expected in the price of electricity (as it moves from coal to gas and renewable) and transport fuels (peak oil). However, the eventual ceiling price increases for electricity and heating may be less than for transport fuels, since the latter are difficult to source from renewables. In other words, price changes for the different forms of energy are expected to follow different paths.
- The near-certainty of an increase in the price of water is due basically to the increase in demand impacting against a resource flow that is given by nature, and that is likely to decline due to climate change. The ceiling price will be set by desalination and may be expected to increase as greenhouse emission penalties are imposed. This, incidentally, gives a price to potable water savings and will increase the incentive to develop grey water recycling and stormwater systems to provide water for sports grounds, parks and gardens, and other public amenities.
- A trend to dissatisfaction with motor vehicle transport has arisen for a number of reasons apart from emissions intensity. One is its poor safety record and another is its rising cost due to peak oil. A third problem, and one of particular importance to those living in parts of Melbourne's North in areas poorly serviced by public transport, is the car's propensity to congestion.
- A trend to dissatisfaction with high rates of waste generation, again in part, reflects the energy and emissions costs of dealing with waste, and also the rising costs of landfill as convenient sites are filled up. The response here will be to engage businesses to encourage more appropriate packaging of goods, to continue the engagement with residents in the recycling and waste sorting process and to adopt new technologies and processes in terms of waste management. Opportunities to improve food packaging processes and technologies will play an important role in the development of the food processing industry in the region.

Melbourne's North and its local governments face the issue that, after a century of favourable trends, it will take a long time for households to absorb the new realities imposed by climate change. The challenge for local governments in particular is to ensure both new building developments and renovations to existing building stocks occur in ways that anticipate future energy and water prices and the limitations of motor vehicle transport.

3.3.1 A stronger and more integrated local economy

The benefits of creating a more integrated local economy will become evident across the region, but particularly so in Hume, Whittlesea and Nillumbik. This is because many residents of these LGAs still need to access jobs in Melbourne's knowledge intensive core. Productivity would also be lifted in Moreland, Banyule and Darebin if these LGAs could improve the employment capture of their skilled residents.

Social, economic and environmental costs are associated with 'old model' sprawl. The alternative patterns of development have higher concentrations of infrastructure, more local jobs and services, reduced travel times and an improved quality of life. These are all features that must shape policy in relation to planning considerations. If communities are developed to high standards, with a goal of improved efficiency in energy savings across the different components of built form and on journeys to and from work, there will be savings to the community in the additional costs imposed by climate change. In turn, these savings will make local economies themselves more competitive and sustainable and, if the German experience applies (see section 9.2.11), be far more attractive places for families to live in.

The way in which communities are developed and how well they are located in relation to employment nodes will determine their sustainability from both economic and environmental perspectives. Urban nodes that create a focus for employment, services, living and social interaction are referred to as Activity Centres. In metropolitan areas, local government has an important role in conjunction with state and federal governments in ensuring that such centres are both knowledge hubs and true centres of community.

It is important that Activity Centres provide opportunities for a diversified lifestyle and cultural choices for residents. Activity Centres, if they are to be successful, should create:

- a reduction in the number of trips in a car that residents make to access employment, services and amenity by appropriate development and local employment integration
- the development of better public transport services
- improved non-motorised access by providing pathways and cycle paths that are safe and pleasant to use and independent of any major road infrastructure.

The environmental benefits (including greenhouse) of creating a stronger local economic system with higher capture of expenditures at the local level by reducing travel distances will be achieved by integrating future growth more intensively at the local level.

Use of new technologies and energy efficient buildings will lower household running costs, enabling direct annual savings in energy, water, transport and other household costs. The social benefits of amenity and closer communities should then flow on. Greenfield sites in Melbourne's North provide a significant opportunity to create sustainable communities.

3.4 | Creativity and the information society

Development of the knowledge economy requires creative people to drive ideas and innovation. Regions develop advantage based on their ability to mobilise talented and creative people and the resources and capabilities required to turn innovations into new business ideas and commercial products.

In his book *The Rise of the Creative Class*, Richard Florida postulates that economic growth is determined by where the holders of creative capital wish to live and work. Richard Florida and his colleagues in America theorise that a community's tolerance and acceptance of diversity is important to its success in attracting talented people. Florida's 'creative capital theory' identifies that creative people are essential to economic growth in a knowledge intensive economy.

The occupations that identify regions of high concentrations of human/creative capital are:

- computer and mathematical
- architecture and engineering
- life, physical and social science
- education, training and library
- arts, design, entertainment, sports and media
- management
- business and financial operations
- legal
- healthcare practitioners and technical and allied health
- high-end sales and sales management.

Typically, patterns of creativity are strongest in the central core of cities, with diffusion to the inner suburbs. Melbourne's North demonstrates its advantage over much of Melbourne. Patterns of creativity and diversity in Melbourne's North are changing with a growing creative class now living and working in the inner parts of the region. The capacity of Yarra, Moreland and Banyule to attract the creative class, as both residents and increasingly workers, is evident and the growing creative class in Darebin–Northcote is a welcome development.

Table 3.6 ranks the region's LGAs in order of their creative index scores. A major strength of the region continues to be its rich multicultural heritage and the capacity, through this diversity and amenity, to attract the creative class. The strategy to continue to strengthen the creativity of Moreland and Darebin to enhance the development of high-tech and creative industries, as well as online businesses, will remain an important goal in the economic development of the inner and middle parts of the region.

The lower scores of the outer parts of the region continue to reflect the less creative profile of the outer suburbs. The longer-term goal will be to improve the scores of Nillumbik, Hume and Whittlesea, as diversity and the knowledge intensive economy develop in these parts of Melbourne's North.

Table 3.6 Creativity in Melbourne's North: rank by LGA

LGA	Rank within the north	Score
Banyule (C)	3	173
Darebin (C)	4	171
Hume (C)	5	138
Moreland (C)	2	180
Nillumbik (S)	6	121
Whittlesea (C)	7	110
Yarra (C)	1	195
Northern Region		155
Knowledge Intensive		189
Melbourne		152

Source: NIEIR.

3.5 | Resident skills and occupational balance

Table 3.7 compares high skilled by place of residence with the high skilled jobs available locally in 2006. The score is a ratio of the industrial and residential score which, in turn, is a measure of the number of highly skilled jobs and residents within a given area.

Table 3.7 2006 high skilled score

LGA	Industrial	Residential	Score
Banyule (C)	1.11	1.14	103
Darebin (C)	0.99	1.07	108
Hume (C)	0.89	0.86	97
Moreland (C)	1.00	1.09	109
Nillumbik (S)	1.03	1.14	110
Whittlesea (C)	0.95	0.87	91
Yarra (C)	1.18	1.34	113
Northern Region	1.02	1.05	103
Knowledge Intensive	1.08	1.13	105
Melbourne	1.06	1.05	99
Victoria	1.04	1.03	99

Source: ABS Census 2006/NIEIR.

Skills intensity is determined by using the weighting of broad occupational groups as demonstrated in Table 3.8. The methodology gives higher weight to higher skilled employment and more senior positions.

Table 3.8 Skills intensity

Occupation group	Coefficient
Managers and administrators	1.6
Professionals	2.0
Associate professionals	1.2
Tradespersons and related workers	1.0
Advanced clerical and service workers	0.8
Intermediate clerical, sales and service workers	0.5
Intermediate production and transport workers	0.5
Elementary clerical, sales and service workers	0.3
Labourers and related workers	0.3

Source: ABS Census 2006/NIEIR.

Although there are many high skilled jobs in Hume, Table 3.7 shows that the LGA has a below average proportion of high skilled residents and suggests that there is still a comparatively high level of low skilled jobs available in local industry.

For Whittlesea, the scores suggest that the resident population has a below average proportion of high skilled residents and there is a higher proportion of high skilled jobs than can be filled by the resident population. In other words, the local residents are not keeping up with the high skill demand of local industry.

Where the resident score is higher than the industrial score, this indicates that some highly skilled residents are employed outside their local area in highly skilled and knowledge intensive jobs, probably in the City of Melbourne, as would be the case for Darebin, Moreland and Yarra. What is interesting about Nillumbik is the development of home office strategies where professionals, who may have commuted to Melbourne each day, are now choosing to work from home via the internet. This opportunity is available to the entire region.

Hume and Whittlesea, both rapidly growing municipalities, are attracting industrial development as well as residents with lower levels of skills. An important strategy for Hume and Whittlesea will be to continue to encourage lifelong learning and the upgrading of skills for its residents. It is inevitable that industry will continue to demand higher skills sets from its workforce, so what remains critically important is that residents' skills sets are in balance with the skills demand from industry.

A higher overall score probably reflects the likelihood of highly skilled workers wanting to locate to a local area where highly skilled jobs are available, or at least within a short commuting time. In the case of Nillumbik, the score could be demonstrating the importance of the internet in diffusing the knowledge economy and the region's capacity to attract highly skilled residents because of the lifestyle opportunities provided by local amenity.

3.6 | Lifelong learning and educational achievement

'Early intervention to assist the disengaged young is far cheaper than dealing with the problem of long-term unemployed.'

Tony Coppola, Executive Officer, NACC

Knowledge based regions are likely to have two complementary elements – knowledge infrastructure and knowledge enhancing linkages. The knowledge infrastructure of Melbourne's North includes its universities, TAFE institutes, schools, research centres, intermediary organisations and technology parks. Knowledge enhancing linkages are harder to define but they are essential to the development of a broader knowledge based economy. At the heart of this definition must be the strengths of inter-relationships between the component parts of the knowledge infrastructure, businesses and governments **within** the region.

One of the indicators of regional supply chain strength is the local commitment of residents to education and training and a commitment to lifelong learning. The LGAs with the highest qualified residents will also have the highest levels of income, residents in the most resilient types of employment and residents with the highest levels of disposable income, all major factors in developing the local economy.

One stakeholder stated that while *'there is a mismatch between the provision of private and public education in the north, and there has been a lack of state and local government investment in learning infrastructure, the Hume Global Knowledge Centre is an example of what can be done'*. The region had been traditionally behind in the provision of learning facilities. *'There is scope for better educational and skilling opportunities.'*

Trade Training Centres will develop across the region as Australian Government policy is implemented. Stakeholders made the point that these centres should develop policies to attract females to avoid a future imbalance of training and employment, particularly as young females, although the gap has closed, are more likely to be disengaged from education and employment than young males.

The flipside of building a knowledge intensive economy and greater productivity will be to ensure that the less fortunate and disengaged can find sustainable places in education and the workforce. Breaking the cycle of disadvantage will be a core component of this goal. Pockets of disadvantage such as Broadmeadows, Fawkner, West Heidelberg and some parts of Thomastown and Lalor should continue to be subject to special development plans and strategic interventions for their communities.

3.6.1 Post-secondary education providers

Post-secondary educational and training providers play a significant role, beyond the training of workers, in assisting industry across Melbourne's North to improve the capacity for innovation and in shaping future industries and new business developments.

La Trobe University is a key driver of the knowledge economy in Melbourne's North. The university is globally connected as well as having a network of campuses throughout Victoria. La Trobe's R&D Park is the largest wholly university owned and managed network of technology parks in Australia, focused on innovation, new product development and realisation, industry collaboration and the commercialisation of intellectual property. Further development of links with school education and industry through the vertical integration of activities will strengthen regional economic integration and supply chains.

RMIT University is well integrated to the needs of Melbourne's North through its health (including medical, sports science and nursing) and engineering focus (including aerospace and manufacturing). An example of integration with local industry is the relationship with Ford Motor Company of Australia, who traditionally have employed mechanical engineers graduating from the course. Large numbers of international students study at both universities. Typically, they leave the region after completing their studies.

Australian Catholic University has six campuses in Australia, with one situated in Yarra. It offers programs in areas such as arts, business, education, science, nursing and youth work, as well as religious education and theology.

Kangan Batman TAFE provides training for the supply chain, logistics and transport industries and Northern Melbourne Institute of TAFE (NMIT) is the largest provider of vocational training in the region, providing a wide range of programs that include courses designed specifically for businesses operating in the region. Both TAFE institutes provide a foundation and pathway to university for many young people living in Melbourne's North.

There was considerable concern that current TAFE reforms in Victoria would impact on the standard of education and create greater barriers for socio-economically disadvantaged families.

The role of educational institutions in the region's economy is described in more detail in Chapter 7.

3.6.2 Highly qualified residents

Table 3.9 shows that Yarra has the highest proportion of residents with a Bachelor degree or higher, while Hume and Whittlesea have the lowest proportions. Since 1996, all the region's LGAs have higher proportions of residents with tertiary qualifications. The increase in proportion of residents with a Bachelor degree or higher has been the greatest in Darebin and Moreland, while Banyule's share has grown steadily.

For 2006, Darebin and Moreland are above the Melbourne average. Yarra residents who reported having a Bachelor degree or higher were 73.1 per cent, 26 points more than the Melbourne average. The average for this indicator shows that Melbourne's North has a slightly higher outcome than the average for Melbourne.

Darebin, Moreland and Yarra all have higher proportions of residents with a Bachelor degree or higher than the average for the Knowledge Intensive regions.

Table 3.9 Proportion of Bachelor or higher degree (per cent)

LGA	1996	2001	2006
Banyule (C)	42.5	45.4	48.3
Darebin (C)	44.1	49.4	54.0
Hume (C)	22.7	25.3	27.3
Moreland (C)	42.5	48.5	52.0
Nillumbik (S)	40.0	42.1	43.7
Whittlesea (C)	24.0	27.0	29.5
Yarra (C)	67.3	69.7	73.1
Northern Region	42.4	45.2	48.4
Knowledge Intensive	45.9	48.8	51.6
Melbourne	41.8	44.3	47.4
Victoria	38.2	40.8	43.3
Australia	34.7	37.2	39.6

Source: ABS Census 2006.

3.7 | Household size

In the northern region there has been a slight decline in the average number of individuals living in a household, reflecting a similar trend to that of Melbourne and Victoria. The households in Hume, Nillumbik and Whittlesea continue to be larger in terms of the number of people per household, while Yarra has the lowest number of people per household.

More than 50 per cent of households in Melbourne's North have two people or less.

Table 3.10 Average number per household

LGA	1996	2001	2006
Banyule (C)	2.76	2.67	2.61
Darebin (C)	2.54	2.47	2.46
Hume (C)	3.29	3.24	3.13
Moreland (C)	2.58	2.50	2.47
Nillumbik (S)	3.27	3.21	3.14
Whittlesea (C)	3.32	3.23	3.09
Yarra (C)	2.21	2.15	2.16
Northern Region	2.80	2.75	2.70
Knowledge Intensive	2.46	2.45	2.45
Melbourne	2.74	2.69	2.65
Victoria	2.72	2.66	2.61

Source: ABS Census 2006.

Table 3.11 Average number per household: proportions by size (per cent)

LGA	One	Two	Three	Four	Five	Six or more
Banyule (C)	23.7	33.1	16.6	17.4	6.8	2.4
Darebin (C)	28.8	32.7	16.4	14.2	5.4	2.6
Hume (C)	15.4	26.7	18.6	21.9	11.1	6.3
Moreland (C)	28.1	33.5	16.3	13.8	5.4	2.8
Nillumbik (S)	12.4	26.6	18.4	27.3	11.7	3.6
Whittlesea (C)	13.8	27.7	19.6	23.9	10.2	4.7
Yarra (C)	32.4	38.9	15.2	9.5	2.9	1.1
Northern Region	22.8	31.4	17.3	17.7	7.4	3.4
Knowledge Intensive	27.0	35.2	15.7	14.4	5.5	2.1
Melbourne	23.8	32.1	16.6	17.2	7.3	3.0
Victoria	24.5	33.2	15.9	16.3	7.1	3.0

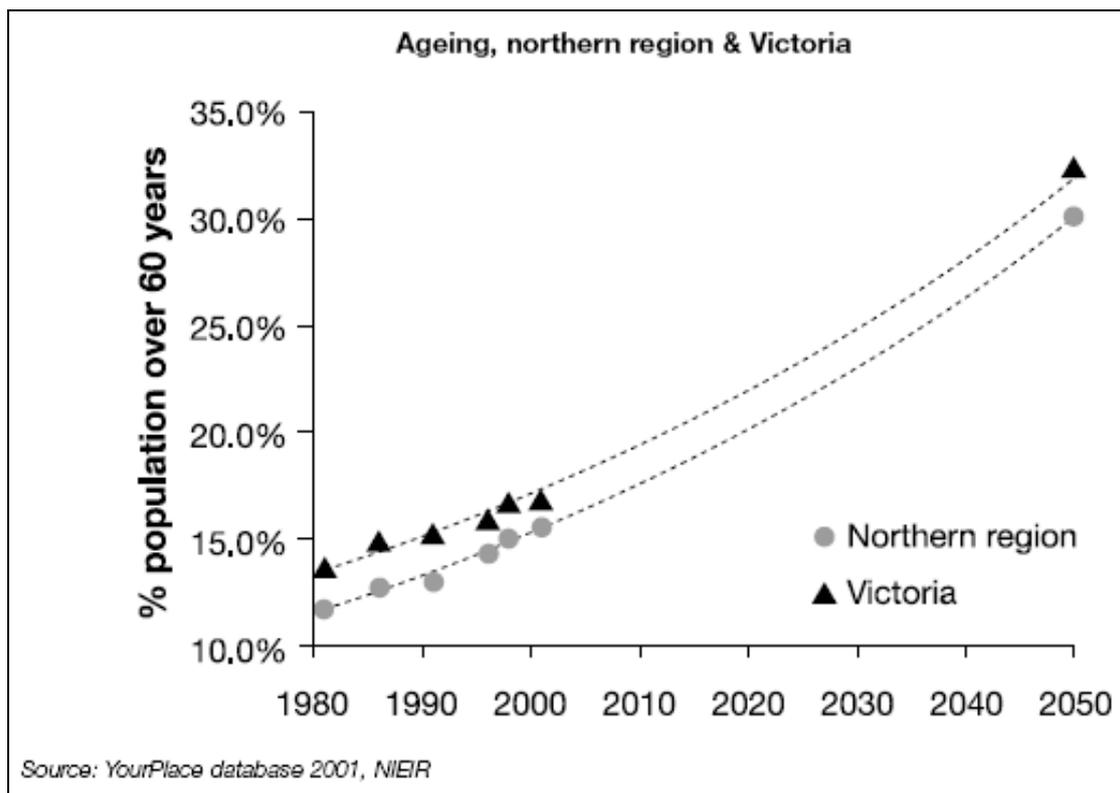
Source: ABS Census 2006.

3.8 | Ageing

Ageing is seen as a significant issue in the developed economies, including Australia. Melbourne's North is, however, well placed in relative terms to other regions in Victoria. The attractiveness of the inner and middle north to younger knowledge based workers and their families, the relatively rapid growth of the outer north, and its attraction to migrant groups and younger families will all help to keep the region's exposure to ageing lower than the Victorian average.

Tables 3.12 to 3.14 demonstrate the increasing workforce participation of the over 55 years old group. The increase is due to a range of factors, including increasing workplace flexibility and casualisation of the workforce, and the ageing of the baby boomer population, who are choosing to stay at work rather than retire. It also reflects the skills shortages during the boom years and, hopefully, the changing perception towards older and more experienced workers. A new dimension has been added by the global financial crisis and its particular impact on those nearing retirement age, as it will be hard for these individuals to recover their financial position in the short term. It is likely that this group will try to, or perhaps need to, remain in employment as savings will not cover retirement costs.

It is important to recognise that a diverse community has greater capacity for creativity and that its acceptance of a diverse range of workers in terms of their age and cultural background is likely to translate into the workplace in very positive and productive ways.



The 2003 *Growing Melbourne's North* report suggested that the regional impact of ageing will be a function of housing and retirement income policy.

Two divergent outcomes were suggested:

1. significant increases in labour force participation by those over the age of 65 years, providing higher incomes and extended links to original communities of residence, and increased flexibility of employment and incomes policy to match expectations of service delivery, predominantly health but perhaps recreational, infrastructure and housing
2. property prices and poor taxation policy contributing to a significant movement of elderly residents to disparate parts of Australia, with each destination suffering terribly through the lack of provisioned services and infrastructure.

What the last report did not do was acknowledge the importance of the knowledge and skills of the older working population to a region's economic potential. By encouraging older residents to stay in situ, the region will benefit from the legacy of its existing skills base.

The preferred outcome for Melbourne's North, particularly given its capacity for innovation, creativity, its skills intensity and amenity, is that the region performs as the first scenario suggests and attempts to productively engage its ageing population.

Table 3.12 gives the number of 55 years old and above in the labour force by LGA of residence.

Table 3.12 Persons aged 55+ in the labour force by LGA of residence

LGA	1996	2001	2006
Banyule (C)	5,557	7,270	10,027
Darebin (C)	4,607	4,656	5,976
Hume (C)	3,441	4,818	7,412
Moreland (C)	5,126	4,908	6,138
Nillumbik (S)	2,169	3,431	5,427
Whittlesea (C)	2,965	4,236	6,539
Yarra (C)	2,139	2,799	4,040
Northern Region	25,974	32,079	45,623
Melbourne	142,631	181,421	256,134
Victoria	204,510	260,256	368,173

Source: ABS Census 2006.

Table 3.14 shows the growth of 55 years old and above employment by place of residence. The region's proportion of over 55 year olds in employment is significantly lower than that for Melbourne or Victoria. For 2006, the lowest participation rate in employment of the over 55 years old and above is for the residents of Moreland (16.5 per cent) and Darebin (17.2 per cent), well below the Melbourne average of 28.4 per cent. The highest participation rate, well above the Melbourne average, is for residents of Nillumbik, where 46.6 per cent of those in employment are over 55 years old.

Of concern is the loss of manufacturing jobs across Melbourne's North. This trend has a particularly severe impact on those of 45+ years old, and is even worse for the 55+ years old group. It will be very difficult, particularly in current economic circumstances, for these workers to find new employment. Retraining may be the only answer, particularly if the manufacturing sector fails to meet the challenges of climate change.

Table 3.13 Persons aged 55+ by LGA of residence

Industry	1996	2001	2006
Banyule (C)	25,698	28,338	32,154
Darebin (C)	31,535	31,015	32,736
Hume (C)	14,891	19,577	26,493
Moreland (C)	34,900	34,039	35,341
Nillumbik (S)	6,168	8,141	11,466
Whittlesea (C)	14,335	19,217	25,567
Yarra (C)	11,513	12,020	13,446
Northern Region	138,901	152,294	177,254
Melbourne	649,149	724,041	867,420
Victoria	930,176	1,043,038	1,257,664

Source: ABS Census.

Table 3.14 Persons aged 55+ in employment by LGA of residence: proportion (per cent)

Industry	1996	2001	2006
Banyule (C)	20.0	24.8	30.3
Darebin (C)	12.7	13.7	17.2
Hume (C)	20.0	22.9	26.8
Moreland (C)	12.9	13.2	16.5
Nillumbik (S)	33.5	41.0	46.6
Whittlesea (C)	18.2	20.5	24.6
Yarra (C)	16.3	21.4	28.8
Northern Region	16.7	19.8	24.7
Melbourne	19.9	23.8	28.4
Victoria	20.0	23.7	28.2
Australia	19.9	23.5	28.4

Source: ABS Census.

3.9 | Average weekly income: households

ABS data shows that, in 2006, the region's highest average household income was in Nillumbik, reflecting household size and the average level of resident income. The highest growth rates in household income since 1996 have occurred in Darebin and Moreland and are a result of the higher number of knowledge based workers moving to these LGAs. Both Darebin and Moreland remain slightly below the Melbourne average for household income but are catching up quickly.

Darebin and Moreland have the highest household weekly income growth.

Table 3.15 Average weekly income growth (per cent): households

LGA	2001 since 1996	2006
Banyule (C)	20.7	14.7
Darebin (C)	28.4	33.5
Hume (C)	20.0	18.5
Moreland (C)	28.4	31.1
Nillumbik (S)	19.8	-1.6
Whittlesea (C)	21.3	16.7
Yarra (C)	31.2	12.7
Northern Region	24.7	19.5
Knowledge Intensive	24.0	23.0
Melbourne	23.1	16.8
Victoria	24.0	23.0

Source: ABS Census.

Comparing the average weekly income in Melbourne's North, Nillumbik and Yarra households were higher than the average for the Knowledge Intensive regions. Nillumbik, Yarra and Banyule were all higher than the Melbourne and state average.

Table 3.16 Average weekly income relative to state average (per cent): households

LGA	1996	2001	2006
Banyule (C)	113.3	110.7	103.1
Darebin (C)	86.3	89.6	97.2
Hume (C)	104.6	101.5	97.7
Moreland (C)	88.0	91.5	97.3
Nillumbik (S)	141.0	136.6	109.1
Whittlesea (C)	104.3	102.3	97.0
Yarra (C)	109.7	116.5	106.6
Northern Region	102.1	103.0	100.0
Knowledge Intensive	114.1	112.1	104.9
Melbourne	107.4	106.9	101.4
Victoria	100.0	100.0	100.0

Source: ABS Census.

3.10 | Average weekly income: individual resident

For 2006, Yarra had the highest average income for individuals in Melbourne's North, followed by Nillumbik and Banyule; all three are above the Melbourne average for this indicator. The northern region average is below that of Melbourne and Victoria.

Table 3.17 Average income: individual resident

LGA	1996	2001	2006
Banyule (C)	424	528	664
Darebin (C)	337	442	562
Hume (C)	365	442	523
Moreland (C)	342	450	570
Nillumbik (S)	480	585	733
Whittlesea (C)	344	424	511
Yarra (C)	455	631	824
Northern Region	379	484	602
Knowledge Intensive	453	576	746
Melbourne	407	515	641
Victoria	389	493	612
Australia	394	491	627

Source: ABS Census.

Income data, when measured against the state average since 1996, shows that Banyule is stable, while Yarra, Moreland and Darebin have all improved their relative position. Hume's relative position has declined the most, followed by Whittlesea and Nillumbik, with individual income in the latter now improving again when measured against the state average. Since 1996, the income of residents in Yarra has been higher than for Knowledge Intensive regions. Knowledge intensity and educational qualifications are clearly playing a positive role in the distribution of income levels.

Table 3.18 Average income relative to state average (per cent): individual resident

LGA	1996	2001	2006
Banyule (C)	108.9	107.2	108.4
Darebin (C)	86.6	89.6	91.9
Hume (C)	93.9	89.6	85.4
Moreland (C)	87.9	91.3	93.2
Nillumbik (S)	123.3	118.7	119.6
Whittlesea (C)	88.4	86.1	83.5
Yarra (C)	116.8	128.1	134.6
Northern Region	97.5	98.2	98.4
Knowledge Intensive	116.4	116.9	121.8
Melbourne	104.6	104.5	104.6
Victoria	100.0	100.0	100.0

Source: ABS Census.

4 Benchmarking performance: a data envelope analysis

The statistical analysis in Chapter 2 provides information about the economic performance of Melbourne's North. However, this analysis alone does not provide enough information to allow regional stakeholders to develop the appropriate policies and actions for improving performance in Melbourne's North.

A data envelope analysis (DEA) has been undertaken and the methodology is described in Appendix 5.

The application of DEA techniques enable the measurement of:

- the degree of underperformance, if any, of the LGAs in Melbourne's North relative to their equivalent LGAs (or LGAs with best performance given their circumstances)
- the current under-utilisation of the drivers of economic performance in the LGAs in Melbourne's North.

The chapter then quantifies the impact of interventions that create drivers of growth to improve economic performance.

Using the DEA techniques, benchmarking Melbourne's North against 108 metropolitan (or proximate) LGAs was undertaken.

The performance indicators used were:

- household productivity (average income)
- employment ratio (employment to working age population ratio).

The analysis considered the resources currently available to Melbourne's North (within the LGA and within its catchment of 50 km), including:

- industry employment
- skills of residents
- skills required by industry
- industry productivity
- creative employment.

Table 4.1 shows the drivers of performance and the possible reasons for inefficiencies. The table also provides a set of actions and policy initiatives likely to be most effective in improving inefficiencies in the economic structure of Melbourne's North.

Table 4.1 Key issues for economic policy development			
Drivers	Key issues	Actions	Policies
Employment within 50 km of catchment	Inefficient/ineffective transport links. Poor household capacity for mobility. Examples include: <ul style="list-style-type: none"> ▪ sparse road, rail, tram and bus links within a catchment and especially to major employment nodes ▪ low car ownership due to low economic status ▪ mindset geographical orientation based on historical outcomes but now not where the employment is. 	Investment in transport infrastructure. Bus links to low socio-economic sub-regions.	Development of strategic employment nodes: <ul style="list-style-type: none"> ▪ attraction of investment and strategic foreign investment ▪ strengthening of R&D capacity and links with industry ▪ state government selection of regional employment nodes with necessary infrastructure support ▪ cluster development.
Local area industry employment	Imbalance between skills demanded by local industry and resident skills.	Attract industry with skill requirements in line with local residents and/or retain local workforce.	Land use planning to increase industry employment. Exploit complementary potential with industry developments in 50 km catchment.
Distance from CBD	Inferior transport links to CBD. Poor industry links and networks with CBD enterprises. Skills imbalance with CBD enterprises.	Investment in transport infrastructure. Encourage exporting by local enterprises. Improve local resident education and skill attainment to exploit CBD employment opportunities.	Attract exporting enterprises that will exploit CBD resources.
High skill employment within a catchment	Same for CBD issues for the LGA in relation to its catchment.	Solutions for CBD linkages.	Attract and create high skilled residents.
Intermediate skill employment within a 50 km catchment	Same as for high skill employment within a 50 km catchment.	Policy solution same as for high skill employment.	Attract and create intermediate skilled residents.
University qualified residents	Either transport links and/or skills imbalance within university qualification demand and supply.	Improve transport linkages and skills by extending lifelong learning opportunities and skills upgrading university courses.	Increase the concentration of university qualified residents by increasing the education attainment of existing residents and attract university qualified residents by immigration to the local area.

Table 4.1 Key issues for economic policy development (continued)

Drivers	Key issues	Actions	Policies
Technical skilled residents	Same as for university qualified residents.	Same as for university qualified residents.	Same as for university qualified residents.
Concentration of global knowledge residents within a catchment	Poor linkages between local enterprises and catchment enterprises.	Improve local enterprise connections and integration with catchment supply chains.	Attract export oriented (outside LGA) enterprises to LGA.
Industry productivity within a catchment	Strategic drivers of regional productivity form supply chains oriented outside the catchment or are highly capital intensive with low value added ratios accruing to catchment residents.	Improve knowledge intensity of catchment production and improve local access to supply chains of strategic (i.e. exporting) enterprises within catchment.	Attract exporting enterprises with good local catchment supply chain linkages and increase knowledge intensity of local production.
Catchment concentration of skills	Catchment industry making inefficient use of catchment skills.	Encourage catchment industry to upgrade skill base.	As per university and technical qualified residents.

Source: NIEIR.

Table 4.2 shows the results of the analysis in terms of the ranks of Melbourne's North LGAs when compared to the group of 108 LGAs chosen for benchmarking.

Potential peers	Performance indicators		Drivers				
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population
Banyule (C)	40	30	39	64	21	34	45
Darebin (C)	71	93	42	63	21	38	48
Hume (C)	84	102	38	24	34	41	37
Moreland (C)	75	89	37	101	14	36	42
Nillumbik (S)	33	8	72	107	49	64	80
Whittlesea (C)	92	97	63	95	38	51	70
Yarra (C)	23	51	15	4	2	14	13

Table 4.2 Performance indicators and drivers: rank in potential peers 2006 (continued)

Potential peers	Drivers						
	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Banyule (C)	35	66	37	43	34	35	42
Darebin (C)	34	97	38	39	38	82	46
Hume (C)	98	61	41	18	41	93	43
Moreland (C)	37	93	36	34	35	82	47
Nilumbik (S)	43	51	58	53	68	21	65
Whittlesea (C)	91	69	52	47	59	95	64
Yarra (C)	9	108	16	22	15	37	22

Source: NIEIR.

Table 4.3 shows the results of the analysis in terms of the ranks of the region's LGAs when compared with Melbourne catchment LGAs.

Table 4.3 Melbourne's North LGAs: performance indicators and drivers – rank for Melbourne catchment LGAs						
Performance indicators			Drivers			
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population
2006						
Banyule (C)	12	9	13	24	8	10
Darebin (C)	25	34	15	23	8	12
Hume (C)	31	37	12	9	12	14
Moreland (C)	27	32	11	35	5	11
Nillumbik (S)	8	1	28	38	20	26
Whittlesea (C)	34	35	25	33	15	20
Yarra (C)	5	19	2	1	1	2

Table 4.3 Melbourne's North LGAs: performance indicators and drivers – rank for Melbourne catchment LGAs (continued)

	Drivers					
	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment
2006						
Banyule (C)	14	12	22	11	16	10
Darebin (C)	16	11	35	12	14	12
Hume (C)	11	39	21	14	3	14
Moreland (C)	13	14	33	10	11	11
Nillumbik (S)	29	15	17	24	21	27
Whittlesea (C)	26	35	23	20	18	22
Yarra (C)	2	3	39	2	5	2

Source: NIEIR.

4.1 | The results of the DEA analysis

The conclusions from the DEA analysis are that:

- Melbourne's North is significantly inefficient
- the inefficiency, at the very least, has not improved over time
- the largest gains from efficiency improvements will come from household productivity gains, although the increase in the local employment ratio will be significant.

Given existing resources, the most efficient LGAs as measured by the DEA analysis are the City of Yarra and the Shire of Nillumbik. Given existing resources, the analysis shows that the remaining Melbourne's North LGAs are under performing.

Importantly, this means that economic development in Melbourne's North can be facilitated by:

- using existing resources more efficiently
- augmenting existing resources with new investments and interventions.

The important finding from the DEA analysis is that, if Melbourne's North LGAs were operating as effectively as equivalent LGAs, much can be done to improve the region's performance by using existing resources more effectively.

Table 4.4 shows that, given available resources, efficiency improvements in the drivers of economic performance (as shown in Table 4.1) could bring significant benefits to Melbourne's North.

Table 4.4 Melbourne's North LGAs: total inefficiency and target performance indicators 1991–2006 (per cent)

	Increase in output if inefficiency removed (household productivity)	Increased employment ratio
2006		
Banyule (C)	34.8	10.7
Darebin (C)	51.3	7.6
Hume (C)	11.0	11.1
Moreland (C)	29.8	4.6
Nillumbik (S)	0.0	-0.6
Whittlesea (C)	8.4	7.8
Yarra (C)	0.0	-0.5
Melbourne's North	21.7	6.7

Source: NIEIR.

For the region as a whole, the gains in household productivity from efficiency improvements would be of the order of 20 per cent, while the increase in employment would be around 7 per cent. The largest benefits would accrue to Banyule, Darebin and Moreland, while Hume and Whittlesea would improve their performance indicators by around 10 per cent.

Table 4.5 shows the opportunity for improvement of drivers by Melbourne's North LGAs by using existing resources.

Table 4.5 Melbourne's North: unexploited driver estimate and priority ranking for efficiency improvement

	Unexploited driver estimates (per cent)						
	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)
2006							
Ranking for efficiency improvement							
Industry employment in catchment per working age population	5	4	5	3	0	6	0
Local industry employment per working age population	9	10	7	9	0	8	0
Reciprocal of distance to CBD	1	2	1	1	0	1	0
High skilled industry employment in catchment per working age population	3	6	3	5	0	3	0
Intermediate skilled industry employment in catchment per working age population	10	3	6	7	0	5	0
Share of university qualified in working age population	7	8	8	10	0	7	0
Share of technical qualified in working age population	6	9	8	8	0	9	0
Industry global knowledge workers in working age population	2	1	2	4	0	2	0
Average industry productivity in catchment	8	7	10	2	0	9	0
Share of skilled residents in working age population in catchment	4	5	4	6	0	4	0

Source: NIEIR.

The focus of strategies and policies to improve the efficiency of Melbourne's North should be:

- improvement of physical (transport) and business links within the region (Activity Centre integration) and with the CBD
- a lifelong learning enhancement of existing resident skills to bring them into balance with what is required to better access catchment employment opportunities
- encouraging local industry to exploit the region's catchment, in terms of knowledge based resources, to increase productivity and integrate more efficiently with the region's catchment supply chains.

In terms of economic development (as at 2006), the single most important act to improve industry employment at high carbon emissions cost is to increase the share of residents in the catchment with tertiary and technical skills.

5 The macroeconomic structure and interdependency of Melbourne's North

This chapter describes gross regional product (industry) formation in Melbourne's North and the economic interdependency between LGAs in Melbourne's North and the rest of Melbourne.

Further detail regarding the assumptions and methodology used to describe the macroeconomic structure and interdependency of Melbourne's North is provided in Appendix 6 in this report.

Findings

1. Melbourne's North held its share of Victorian GDP despite its exposure to the decline of manufacturing describing an economy in transition.
2. The importance of Hume and Yarra in generating gross product for the region.
3. In terms of economic development, the single most important act to improve industry employment is to increase the share of residents in Melbourne's North with tertiary and technical qualifications and skills sets.
4. The more an LGA becomes a residential or 'dormitory' LGA, and the more the loss of employment lands, the greater the dependency on household expenditure income to drive the local economy.
5. In the case of Melbourne's North, almost 50 per cent of expenditures in the Shire of Nillumbik are driven by household consumption expenditures.
6. The City of Yarra, which has a high level of exports and high levels of current government expenditures within its boundaries, has the lowest proportion of household consumption expenditures (at 23 per cent) as a share of total GDP formation.
7. The remaining Melbourne's North LGAs are positioned between the Shire of Nillumbik and the City of Yarra in terms of their reliance on household consumption expenditures as a share of total GDP formation.
8. The growth of share in Melbourne's North GDP formation by the education sector between 2001 and 2006 is disappointing given the enormous economic benefit available to the region from improving the qualifications and skills of its residents.

These findings suggest that:

- a longer-term strategy, with a goal of creating a balanced economic structure that has greater current government expenditures and levels of business development in each LGA in Melbourne's North, will ensure greater resilience for both industry and residents
- an employment strategy for rural interface LGAs in Melbourne's North requires a state based macroeconomic vision

- to lift performance in the initial phase of these strategic interventions will require increased government community infrastructure, increased out of LGA exports and a reduction of LGA imports; in other words, the goal is to improve the balance of economic structures so that the structure of LGA GDP formation creates resilience and future opportunity
- that the qualification and skills base of the residents in the region must continue to improve and that these improvements must be applied to driving investment to Melbourne's North to increase exports and reduce imports.

5.1 | GDP formation

Results from the modelling show that, since 1991, Melbourne's North held its share of Victorian gross product but did not improve it. The trend is now towards growth. The region's share of Victorian gross product increased from 11.6 per cent in 1991 to 12.5 per cent in 1996. The region's share then declined, back to its 1991 levels in 2001, before recovering to its 1996 share in 2006.

Given the historical importance of manufacturing to Melbourne's North and the sector's decline and restructuring, the region has done extremely well to maintain its share of Victorian gross product. The figures indicate an economy in transition, and an economy that is creating new foundations on which to build its future prosperity.

The importance of Hume and Yarra in generating gross product for Melbourne's North and Victoria is evident from the data in Appendix 2¹. The success of Hume and Yarra in generating gross product demonstrates that both inner and outer parts of Melbourne's North can contribute strongly to economic growth and regional productivity. The City of Hume, because of its high share of out of state exports is a strategic driver of both the Victorian and Melbourne's North economies (Table 5.1).

As a strategic driver of economic growth in Melbourne, Melbourne's North is particularly important to Melbourne as a whole because of its share of Melbourne's out of state exports when compared to its share of Melbourne GDP. The region continues to punch above its weight in terms of driving exports.

The region is strategically important to Melbourne, as it generates 17.5 per cent of Melbourne's out of state exports. The export share is higher than the region's 2006 share of Victorian gross product, which was 12.3 per cent; 20 per cent of the region's out of state exports are for international markets.

¹ The tables in Appendix 2 show industry gross product and industry employment in Melbourne's North LGAs. Total labour productivity is also shown.

Figure 5.1 shows the share of industry growth of GDP in Melbourne’s North by industry sector. Highest contributions to GDP growth since 2001 were from transport, finance, health, construction, retail and wholesale trade and communications. The decline in manufacturing appears to have slowed but is likely to have accelerated again because of the global financial crisis. Business services growth, in terms of contribution to GDP formation, has also slowed markedly, but the sector is still growing. The growth in the educational sector will need to improve if it is to deliver the required outcomes for the development of the economy of Melbourne’s North.

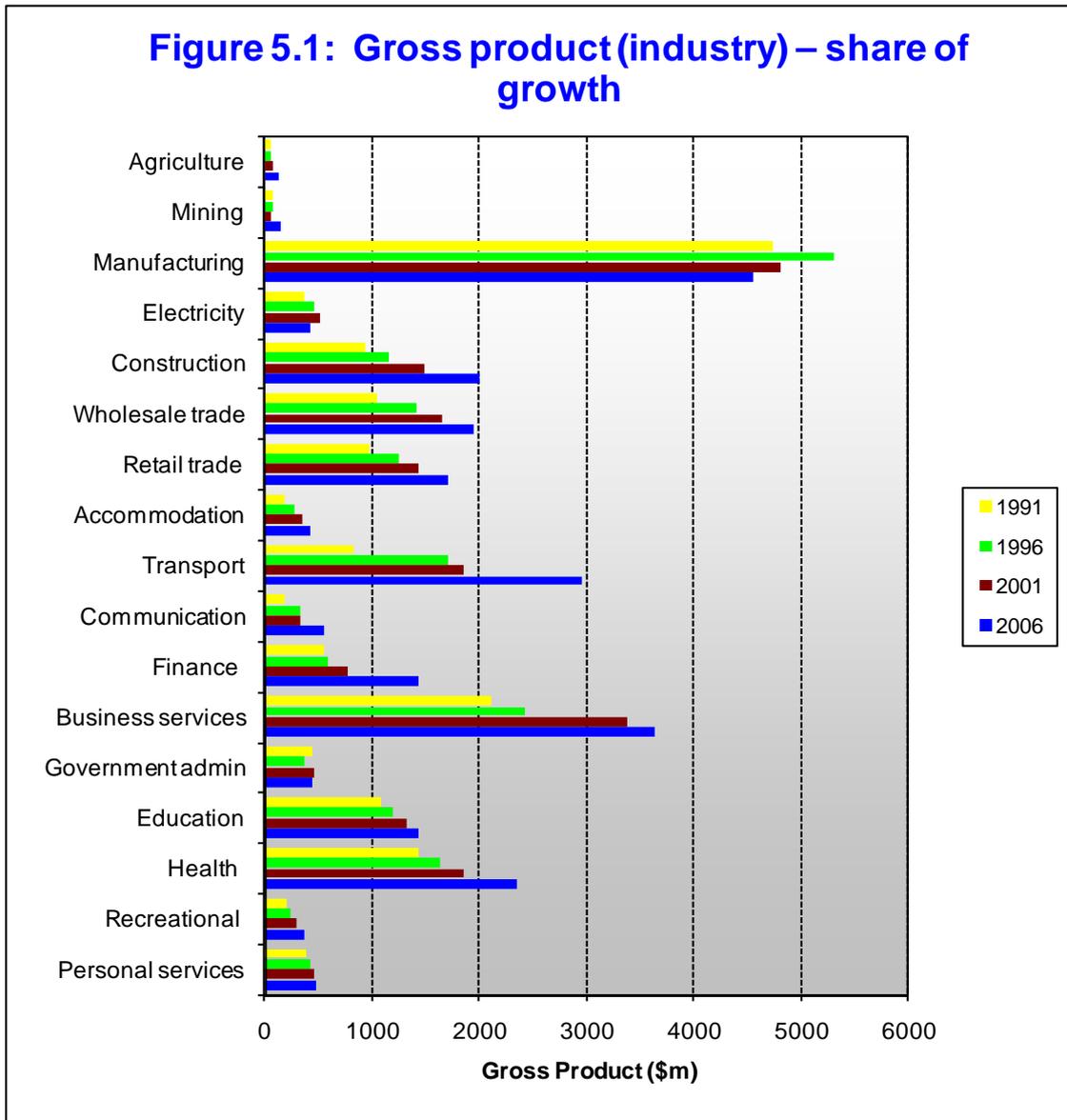


Figure 5.2 gives the share of Melbourne's North growth in GDP by LGA. The Cities of Hume and Yarra are the largest contributors to growth. The City of Hume has grown its share strongly since 2001.

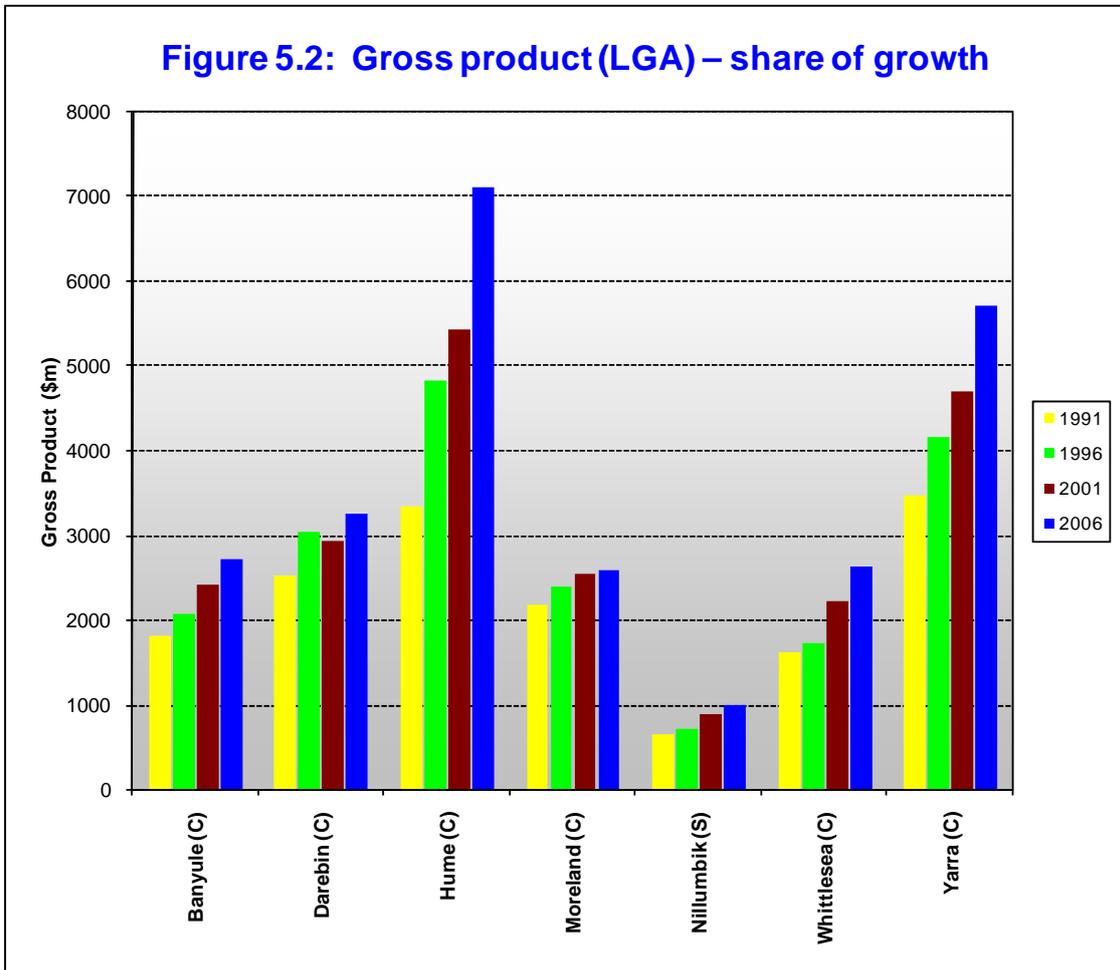


Table 5.1 Gross regional product (industry) formation Melbourne's North LGAs: average 2001–2006

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Total
Share of total LGA expenditure (per cent)								
Consumption expenditure	42	35	19	39	48	35	23	31
Government current expenditure	12	7	4	6	5	5	12	7
Investment – construction	8	9	5	8	14	10	7	8
Investment – equipment	12	13	11	12	14	13	13	12
Intra Victorian exports	14	17	20	15	11	18	17	17
Out of Victoria exports	12	20	41	21	9	20	27	25
Total	100	100	100	100	100	100	100	100
Intra Victorian imports (share of total expenditure)	20.0	19.8	21.0	20.3	21.2	21.4	16.1	19.8
Out of Victoria imports (share of total expenditure)	67.0	66.8	67.4	67.9	69.8	67.6	62.2	66.8
Gross regional product (industry) – share of total expenditure	39	41	35	37	30	34	57	40
Share of Melbourne's North total (per cent)								
Consumption expenditure	17	16	15	18	8	13	14	100
Government current expenditure	20	15	14	11	3	8	30	100
Investment – construction	14	16	16	15	10	14	15	100
Investment – equipment	12	15	22	14	6	12	19	100
Intra Victorian exports	10	15	29	12	3	12	18	100
Out of Victoria exports	6	12	40	12	2	9	20	100
Total	12	15	24	14	5	11	18	100

Source: NIEIR.

5.1.1 Economic interdependency estimates – employment

Economic modelling of Melbourne's North shows (Table 5.2) that the largest contribution to Victorian employment is generated by the City of Hume, which provides 4.5 per cent of total Victorian employment. The City of Yarra provides 3.7 per cent of Victorian employment. In total, Melbourne's North provides 19 per cent of total Victorian employment.

At 12 per cent, the largest contribution to total resident employment in Melbourne's North comes from Whittlesea, whereas Whittlesea's contribution to total Victorian employment is only half that of Hume. The reason is that Hume's economic linkages extend strongly outside Melbourne's North to the rest of Victoria, whereas Whittlesea's economic linkages are to a much greater extent confined to the region.

Moreland and Yarra's impact on Melbourne's North is also relatively small because, similar to Hume, these LGAs have strong linkages outside Melbourne's North. One reason for this is that the residents of these regions rely less on the region for direct or indirect employment.

5.1.2 Dormitory employment status versus LGA economic development

It is the case for Melbourne's North that performance indicators need to improve significantly before economic improvements can be achieved. The region does have the option of supplying employees to industry outside its boundaries if, for example, Melbourne's North was unwilling or unable to supply the appropriate infrastructure.

Land use planning moves to the centre of the debate in this case.

For land constrained LGAs, the constant issue in land use planning is the rationale for rezoning from industrial/commercial to residential, and especially industrial to residential. Land use planning strategies become particularly focused when there are industry closures and once industrial land becomes available for redevelopment.

The question is then whether or not existing land use zoning is maintained, and this may result in the vacant land remaining so for a number of years before new development occurs. The alternative is that the land could be rezoned to residential to achieve more rapid redevelopment and this is often the most likely outcome.

In the case of the outer LGAs with ample unutilised industrial land, the key determinant of the rate of development will be the size and amount of unutilised land in the vicinity of transport/distribution infrastructure. The land will need to be large enough to attract major investment and provide excess capacity to accommodate the expansion plans of a core cluster of support firms that would be created to support major industries. Competing demands may limit the size of the land provision, restricting participation to lower value added enterprises focused on meeting local and regional demands.

Economic modelling demonstrates the importance of out of state exports to regional economic development and employment.

Table 5.3 compares the outcomes of Melbourne's North participation or non-participation and shows a 10 per cent (across all industries and Melbourne LGAs) lift in out of state exports for all industry groups and all Melbourne LGAs. If Melbourne's North was able to participate in this growth of exports, Hume would gain an increase in resident employment of 2,650 and a 3,883 increase in industry employment. Total Melbourne employment increases by more than 65,000.

In the case where the LGAs in Melbourne's North were not able to increase out of state exports and these exports were now supplied by other parts of Melbourne, Hume's increase in resident employment falls to 1,342 and industry employment to 473.

For the region in total, if it participates in export expansion, then the resident employment gain is just under 14,000 and industry employment gain is 12,200. If Melbourne's North does not participate in export growth, then the resident employment gain is reduced to 8,725 and the industry employment gain falls to an increase of just under 2,000.

If the non-participation of the region in the export expansion was due to the unwillingness or inability to provide land and infrastructure because it had been diverted to residential use, then the employment outcomes will be worst. Under this scenario, the modelling shows that nearly 60 per cent of the new employment positions created in Melbourne's North (that is, 8,725 at a maximum) could go to new population entrants rather than the existing population.

If the provision of employment lands is not adequate, Melbourne's North would have the slowest rise in the employment to population ratio or the smallest decline in the unemployment rate of any Melbourne region.

Table 5.4 gives the results of modelling that assumes an increase in out of state exports from the region's LGAs only, compared with the alternative case of the same out of state export increase being restricted to western and south-east Melbourne LGAs.

In this case, the total residential employment of Melbourne's North increases by 18,400 and industry employment by 29,000. The alternative expansion in western and south-east Melbourne reduces the region's resident employment gain to half that achieved when it was the driver of exports, and the industry employment gain is reduced by 70 per cent.

The rule that comes from the analysis is that, for every 10 industry employment positions foregone or lost to Melbourne LGAs outside of Melbourne's North because of land use planning (that fails to maintain the attraction of industry investment in the region), residents of Melbourne's North will lose between four and five employment positions.

Table 5.2 Melbourne's North economic interdependency: beneficiary of resident employment (per cent of total)

Source of resident employment	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nilumbik (S)	Whittlesea (C)	Yarra (C)	Melbourne's North
Banyule (C)	-27.9	-10.2	-5.4	-3.3	-4.2	-6.6	-5.6	-9.1
Darebin (C)	-5.3	-24.9	-6.1	-6.1	-0.8	-6.1	-9.3	-9.0
Hume (C)	-2.2	-4.3	-41.4	-7.8	-0.5	-4.9	-3.0	-11.2
Moreland (C)	-2.4	-5.4	-11.0	-22.0	-0.5	-2.7	-6.3	-8.1
Nilumbik (S)	-14.5	-7.0	-5.8	-2.6	-24.3	-7.7	-4.4	-8.3
Whittlesea (C)	-7.7	-13.9	-12.0	-5.5	-1.6	-30.2	-5.1	-12.0
Yarra (C)	-2.1	-3.5	-2.7	-2.6	-0.5	-1.3	-24.4	-4.6
Total	-62.0	-69.1	-84.5	-50.0	-32.4	-59.5	-58.0	-62.2
Total (excluding own LGA)	-34.1	-44.3	-43.1	-27.9	-8.1	-29.3	-33.6	-33.5
Victoria	-2.4	-2.8	-4.5	-2.5	-0.9	-2.2	-3.7	-19.0

Source: NIEIR.

Table 5.3 LGA implications of general Melbourne out of state export expansion with or without Melbourne's North participation

	Resident employment (number)		Industry employment (number)		Resident employment (per cent)		Industry employment (per cent)	
	All LGA participation	Non-Melbourne North participation	All LGA participation	Non-Melbourne North participation	All LGA participation	Non-Melbourne North participation	All LGA participation	Non-Melbourne North participation
Banyule (C)	1,992	1,288	945	216	3.0	2.0	1.4	0.3
Bayside (C)	1,635	1,848	730	851	2.5	2.8	1.1	1.3
Boroondara (C)	2,841	2,934	1,557	1,821	4.3	4.5	2.4	2.8
Brimbank (C)	3,039	2,970	1,710	2,004	4.6	4.6	2.6	3.1
Cardinia (S)	877	1,017	488	563	1.3	1.6	0.7	0.9
Casey (C)	3,660	4,254	1,170	1,365	5.6	6.5	1.8	2.1
Darebin (C)	2,127	1,367	1,665	315	3.3	2.1	2.5	0.5
Frankston (C)	1,973	2,292	975	1,131	3.0	3.5	1.5	1.7
Glen Eira (C)	2,285	2,554	871	1,021	3.5	3.9	1.3	1.6
Greater Dandenong (C)	2,417	2,813	3,982	4,738	3.7	4.3	6.0	7.2
Hobsons Bay (C)	1,650	1,812	1,664	1,972	2.5	2.8	2.5	3.0
Hume (C)	2,650	1,342	3,883	473	4.1	2.1	5.9	0.7
Kingston (C)	2,815	3,254	4,140	4,928	4.3	5.0	6.3	7.5
Knox (C)	3,169	3,635	2,919	3,459	4.8	5.6	4.4	5.3
Manningham (C)	2,020	1,965	589	684	3.1	3.0	0.9	1.0
Maribyrnong (C)	1,081	1,130	1,575	1,859	1.7	1.7	2.4	2.8
Maroondah (C)	1,890	2,107	1,463	1,709	2.9	3.2	2.2	2.6
Melbourne (C)	1,081	1,154	13,869	16,497	1.7	1.8	21.0	25.2

Table 5.3 LGA implications of general Melbourne out of state export expansion with or without Melbourne's North participation (continued)

	Resident employment (number)		Industry employment (number)		Resident employment (per cent)		Industry employment (per cent)	
	All LGA participation	Non-Melbourne North participation	All LGA participation	Non-Melbourne North participation	All LGA participation	Non-Melbourne North participation	All LGA participation	Non-Melbourne North participation
Melton (S)	1,018	1,001	244	278	1.6	1.5	0.4	0.4
Monash (C)	3,185	3,622	4,255	5,075	4.9	5.6	6.5	7.8
Moonee Valley (C)	2,102	1,937	1,007	1,165	3.2	3.0	1.5	1.8
Moreland (C)	2,375	1,687	1,424	227	3.6	2.6	2.2	0.3
Mornington Peninsula (S)	1,769	2,053	1,105	1,293	2.7	3.2	1.7	2.0
Nilumbik (S)	1,111	703	308	88	1.7	1.1	0.5	0.1
Port Phillip (C)	1,994	2,179	3,302	3,905	3.1	3.3	5.0	6.0
Stonnington (C)	1,885	2,046	1,423	1,668	2.9	3.1	2.2	2.5
Whitehorse (C)	2,613	2,839	2,137	2,518	4.0	4.4	3.2	3.8
Whittlesea (C)	2,150	995	1,301	283	3.3	1.5	2.0	0.4
Wyndham (C)	1,742	1,920	1,255	1,470	2.7	3.0	1.9	2.2
Yarra (C)	1,584	1,343	2,671	345	2.4	2.1	4.0	0.5
Yarra Ranges (S)	2,651	3,015	1,343	1,554	4.1	4.6	2.0	2.4
Total Melbourne	65,385	65,078	65,971	65,477	100.0	100.0	100.0	100.0
Melbourne's North	13,989	8,725	12,196	1,947	21.4	13.4	18.5	3.0

Source: NIEIR.

Table 5.4 Out of state export expansion in Melbourne's North vis-à-vis Melbourne west/south-east

	Resident employment (number)		Industry employment (number)		Resident employment (per cent)		Industry employment (per cent)	
	Melbourne North expansion	Melbourne west/ south-east expansion	Melbourne North expansion	Melbourne west/ south-east expansion	Melbourne North expansion	Melbourne west/ south-east expansion	Melbourne North expansion	Melbourne west/ south-east expansion
Banyule (C)	2,512	1,310	2,089	672	7.7	4.0	6.2	2.0
Bayside (C)	327	850	90	516	1.0	2.6	0.3	1.5
Boroondara (C)	1,177	1,794	177	1,119	3.6	5.5	0.5	3.4
Brimbank (C)	1,638	1,174	189	162	5.0	3.6	0.6	0.5
Cardinia (S)	118	407	73	336	0.4	1.3	0.2	1.0
Casey (C)	479	1,200	142	821	1.5	3.7	0.4	2.5
Darebin (C)	2,708	1,419	3,844	1,212	8.3	4.4	11.3	3.6
Frankston (C)	260	799	130	678	0.8	2.5	0.4	2.0
Glen Eira (C)	522	1,228	95	624	1.6	3.8	0.3	1.9
Greater Dandenong (C)	310	537	288	271	1.0	1.7	0.9	0.8
Hobsons Bay (C)	448	580	137	124	1.4	1.8	0.4	0.4
Hume (C)	4,182	1,658	9,621	2,908	12.8	5.1	28.4	8.7
Kingston (C)	408	833	294	276	1.3	2.6	0.9	0.8
Knox (C)	520	1,000	240	227	1.6	3.1	0.7	0.7
Manningham (C)	1,106	1,243	78	417	3.4	3.8	0.2	1.3
Maribyrnong (C)	419	471	148	133	1.3	1.5	0.4	0.4
Maroondah (C)	443	1,014	171	1,045	1.4	3.1	0.5	3.1
Melbourne (C)	369	726	1,004	10,331	1.1	2.2	3.0	31.0

Table 5.4 Out of state export expansion in Melbourne's North vis-à-vis Melbourne west/south-east (continued)

	Resident employment (number)		Industry employment (number)		Resident employment (per cent)		Industry employment (per cent)	
	Melbourne North expansion	Melbourne west/ south-east expansion	Melbourne North expansion	Melbourne west/ south-east expansion	Melbourne North expansion	Melbourne west/ south-east expansion	Melbourne North expansion	Melbourne west/ south-east expansion
Melton (S)	536	388	43	36	1.6	1.2	0.1	0.1
Monash (C)	590	1,125	280	264	1.8	3.5	0.8	0.8
Moonee Valley (C)	1,390	1,065	144	121	4.3	3.3	0.4	0.4
Moreland (C)	2,674	1,528	3,392	1,049	8.2	4.7	10.0	3.1
Mornington Peninsula (S)	236	950	125	769	0.7	2.9	0.4	2.3
Nillumbik (S)	1,433	721	640	214	4.4	2.2	1.9	0.6
Port Phillip (C)	566	1,291	288	2,426	1.7	4.0	0.8	7.3
Stonnington (C)	564	1,179	155	1,028	1.7	3.6	0.5	3.1
Whitehorse (C)	776	1,468	206	1,554	2.4	4.5	0.6	4.7
Whittlesea (C)	3,587	1,435	2,919	931	11.0	4.4	8.6	2.8
Wyndham (C)	458	543	140	122	1.4	1.7	0.4	0.4
Yarra (C)	1,304	1,054	6,553	1,994	4.0	3.3	19.3	6.0
Yarra Ranges (S)	491	1,402	191	937	1.5	4.3	0.6	2.8
Total Melbourne	32,551	32,392	33,885	33,317	100.0	100.0	100.0	100.0
Melbourne's North	18,400	9,126	29,058	8,981	56.5	28.2	85.8	27.0

Source: NIEIR.

6 Melbourne's North: Business, an overview

Findings

1. Small business is critically important to the development of the region's economy.
2. As businesses grow and need to find better and bigger accommodation, this should be available locally; a business leaving is an opportunity lost.
3. In terms of numbers employed, it is now likely that the retail sector has become the region's largest employer.
4. The construction, transport and storage, finance and insurance, property and business services, government and defence, education, and health and community services sectors all grew their employment.
5. Manufacturing still remains a strategic industry for Melbourne's North.
6. Sectors performing above the state benchmark are transport and storage, wholesale trade, retail, education and personal services.
7. Total employment growth in health and community services in the region did not keep up with the growth in other parts of Melbourne.

'They do not know about each other – they would benefit from better connectivity.'

Greg O'Brien, Emeritus Professor, La Trobe University

6.1 | Businesses in Melbourne's North

Many businesses are registered each year, many businesses do not actively trade and many more do not employ staff. The business counts in this section only include those businesses that employ staff.

6.1.1 Size of businesses by sector

In terms of the overall numbers of businesses in Melbourne's North by sector, property and business services, construction, retail, manufacturing, wholesale trade, health and community services, transport and storage, and accommodation, cafes and restaurants are the most significant sectors.

6.1.2 Small businesses (employing less than 10 persons)

The greatest number of small businesses by sector, in descending order, are property and business services, construction, retail trade, manufacturing, wholesale trade, and health and community services.

6.1.3 Medium size businesses (employing 10 to 50 persons)

The greatest numbers of medium size businesses by sector, in descending order, are retail trade, manufacturing, property and business services, wholesale trade, construction and accommodation, cafes and restaurants.

6.1.4 Large size businesses (employing more than 50 persons)

The greatest numbers of large size businesses by sector, in descending order, are manufacturing, property and business services, retail trade, wholesale trade, and health and community services. The manufacturing sector still has the most large businesses in Melbourne's North and maintains its significance as a major employer.

Table 6.1 describes the size of businesses in the region by sector. The greatest numbers of large businesses in the region are in the manufacturing sector. Property and business services and retail trade are also significant large scale employers.

Table 6.1 Melbourne's North business count 2006 (by ANZSIC Code)

ANZSIC	Small business less than 10 persons	Medium business less than 10–50 persons	Large business more than 50 persons	Total business
Accommodation, cafes and restaurants	739	320	78	1,137
Agriculture, forestry and fishing	189	24	9	222
Communication services	295	29	12	336
Construction	4,301	532	63	4,896
Cultural and recreational services	507	108	24	639
Education	181	47	3	231
Electricity, gas and water supply	13	2	0	15
Finance and insurance	800	79	12	891
Health and community services	1,335	264	81	1,680
Manufacturing	2,069	952	213	3,234
Mining	10	2	0	12
Personal and other services	728	136	12	876
Property and business services	4,971	828	159	5,958
Retail trade	3,563	955	132	4,650
Transport and storage	1,275	120	54	1,449
Wholesale trade	1,534	506	120	2,160
Total	22,510	4,904	972	28,386
Victoria	161,438	37,315	6,996	205,749

Source: ABS Counts of Australian businesses.

Table 6.2 allocates business by size to the statistical local areas (SLAs) of Melbourne's North. The large businesses (employing more than 50 persons) are concentrated in Hume (C) – Broadmeadows, Yarra (C) – North, Yarra (C) – Richmond, Darebin (C) – Preston, Banyule (C) – Heidelberg, Whittlesea (C) – South-East and Moreland (C) – Brunswick. Each of these SLAs has more than 50 large businesses.

Table 6.2 Melbourne's North business count 2006 (by SLA)

SLAs northern region	Small business less than 10 persons	Medium business less than 10–50 persons	Large business more than 50 persons	Total business
Banyule (C) – Heidelberg	1,888	365	60	2,313
Banyule (C) – North	1,514	232	27	1,773
Darebin (C) – Northcote	1,277	292	36	1,605
Darebin (C) – Preston	1,788	426	96	2,310
Hume (C) – Broadmeadows	1,524	450	174	2,148
Hume (C) – Craigieburn	1,102	164	48	1,314
Hume (C) – Sunbury	765	126	15	906
Moreland (C) – Brunswick	1,260	348	51	1,659
Moreland (C) – Coburg	1,276	221	42	1,539
Moreland (C) – North	750	99	21	870
Nillumbik (S) – Balance	375	54	6	435
Nillumbik (S) – South	1,174	179	18	1,371
Nillumbik (S) – South-West	790	83	3	876
Whittlesea (C) – North	663	99	30	792
Whittlesea (C) – South-East	791	121	18	930
Whittlesea (C) – South-West	1,491	450	51	1,992
Yarra (C) – North	2,418	729	156	3,303
Yarra (C) – Richmond	1,664	466	120	2,250
Northern Region	22,510	4,904	972	28,386
Victoria	161,438	37,315	6,996	205,749

Source: ABS Counts of Australian businesses.

6.1.5 National trends in the distribution of businesses

The ABS report of June 2007 found that the distribution of the Australian business population by industry was similar to the distribution recorded in June 2006. Property and business services had the greatest number of businesses with 507,508 (or 25 per cent of the total), followed by construction (16 per cent), retail trade and agriculture, forestry and fishing (11 per cent each).

During 2006–2007, education (24 per cent) and communication services (23 per cent) had the highest entry rates, followed by the finance and insurance (21 per cent) and construction (20 per cent).

Over the same period, exit rates were highest for communication services (20 per cent), followed by education, electricity, gas and water supply, and personal and other services, each recording 18 per cent exit rates. The relatively high entry and exit rates associated with the education and communication services industries suggests these industries have undergone a significant amount of churn over 2006–2007. These industries also experienced relatively low survival rates from 2003–2007.

Electricity, gas and water supply (-4.3 per cent) and manufacturing (-0.2 per cent) experienced net decreases in the total number of businesses from the previous year (June 2006). The number of manufacturing businesses has decreased in every year since the ABS count of businesses data series commenced in 2003.

The survival rates at June 2007 for businesses operating since June 2003 were highest for health and community services (71 per cent) and agriculture, forestry and fishing (65 per cent). Over the period June 2003–2007, the survival rates attributed to these industries were consistently higher than those of other industries.

Survival rates were lowest for businesses operating in communication services (45 per cent) and education (49 per cent). As noted, for the period June 2003–2007, the survival rates attributed to these industries were consistently lower than in other industries.

The survival rates for business entries during 2003–2004 continued to be similar in terms of their industry breakdown to those for the stock of businesses at June 2003. The business entry survival rates were led by those businesses in health and community services (59 per cent) and the agriculture, forestry and fishing industries (58 per cent). Both had survival rates well above the national rate of 49 per cent.

6.2 | **Businesses in Melbourne's North: relative employment proportions**

Table 6.3 shows that, in 2006, the manufacturing sector is still the largest employer in terms of absolute numbers. What is concerning is that the manufacturing sector has shed more than 14,000 jobs since 2001. Given recent job losses in manufacturing in the region, it is likely that retail is now its largest employer. The construction sector performed well, adding more than 9,000 jobs since 2001, as did transport and storage, finance and insurance, property and business services, government and defence, education, and health and community services. The sectors in Melbourne's North that are performing above the state benchmark (Table 6.5) are shown in bold.

Table 6.4 shows the total number employed in Victoria by industry sector.

Table 6.3 Employment totals by ANZSIC: Melbourne's North

Industry	1991	1996	2001	2006
Agriculture	1,111	1,518	1,565	2,165
Mining	226	284	211	430
Manufacturing	75,671	73,322	67,413	53,191
Utilities	2,606	1,312	1,218	1,517
Construction	16,316	18,755	21,431	30,607
Wholesale trade	19,770	21,142	20,805	19,810
Retail trade	36,316	41,482	46,056	50,424
Accommodation, cafes and restaurants	6,566	8,630	11,707	11,837
Transport and storage	12,211	16,871	15,959	20,632
Communications	4,317	4,859	3,767	4,038
Finance and insurance	6,839	5,050	5,467	8,206
Property and business services	15,945	22,576	27,926	30,336
Government and defence	10,658	6,401	6,524	9,665
Education	19,525	20,266	22,276	25,122
Health and community services	30,763	31,977	41,571	45,579
Recreational	3,775	5,271	6,861	8,281
Personal services	9,220	10,527	10,336	10,304
Total	271,835	290,243	311,091	332,143

Source: ABS Census benchmarked to labour force.

Table 6.4 Employment totals by ANZSIC: Victoria

Industry	1991	1996	2001	2006
Agriculture	84,226	85,424	80,982	81,360
Mining	6,626	5,693	4,726	9,515
Manufacturing	350,896	351,796	353,616	317,539
Utilities	30,938	14,883	14,323	18,848
Construction	119,604	127,558	152,661	219,887
Wholesale trade	123,945	130,744	128,445	123,645
Retail trade	270,018	297,888	338,675	373,249
Accommodation, cafes and restaurants	70,256	82,234	102,167	105,828
Transport and storage	85,650	83,778	87,544	100,110
Communications	42,394	48,741	46,441	46,310
Finance and insurance	97,652	87,629	91,162	101,994
Property and business services	156,203	212,364	264,231	294,349
Government and defence	110,316	81,926	68,019	95,767
Education	144,594	149,397	164,877	184,452
Health and community services	179,522	199,563	225,520	293,906
Recreational	35,381	50,842	59,020	72,825
Personal services	63,078	75,041	77,293	75,862
Total	1,971,299	2,085,500	2,259,701	2,515,446

Source: ABS Census benchmarked to labour force.

Table 6.5 shows the region's relative employment proportions by sector when compared to Victoria. In Melbourne's North, the industries that improved their relative position, are above the state benchmark and are growing are transport and storage, wholesale trade, retail trade, education, and personal and other services. Manufacturing continued to decline but still plays a significant role in providing employment. The growth in employment in health and community services in Melbourne's North did not keep up with employment growth elsewhere in the state.

A number of other sectors, still below the state benchmark, improved their relative position including accommodation, cafes and restaurants, finance and insurance, government and defence, and property and business services. Sectors above the state benchmark in 2006 are shown in bold.

Table 6.5 Relative employment proportions by ANZSIC: Melbourne's North versus Victoria (per cent) everybody				
Industry	1991	1996	2001	2006
Agriculture	-90.4	-87.2	-86.0	-79.8
Mining	-75.3	-64.1	-67.5	-65.8
Manufacturing	56.4	49.8	38.5	26.9
Utilities	-38.9	-36.7	-38.2	-39.0
Construction	-1.1	5.6	2.0	5.4
Wholesale trade	15.7	16.2	17.7	21.3
Retail trade	-2.5	0.1	-1.2	2.3
Accommodation, cafes and restaurants	-32.2	-24.6	-16.8	-15.3
Transport and storage	3.4	44.7	32.4	56.1
Communications	-26.2	-28.4	-41.1	-34.0
Finance and insurance	-49.2	-58.6	-56.4	-39.1
Property and business services	-26.0	-23.6	-23.2	-21.9
Government and defence	-29.9	-43.9	-30.3	-23.6
Education	-2.1	-2.5	-1.9	3.1
Health and community services	24.3	15.1	33.9	17.4
Recreational	-22.6	-25.5	-15.6	-13.9
Personal services	6.0	0.8	-2.9	2.9

Source: ABS Census benchmarked to labour force.

'We need a knowledge economy centre of excellence, a clearing house for ideas.'

Jane Edwards, local business owner

Table 6.6 compares the high-tech capacity of LGAs in Melbourne's North. Yarra has the highest scores by far, followed by Banyule. This table demonstrates the poor rates of knowledge diffusion to the outer parts of Melbourne's North.

Table 6.6 High-tech by LGA		
LGA	High-tech per annum	High-tech per annum per 100,000 capita
Banyule (C)	5.20	4.38
Darebin (C)	3.69	2.85
Hume (C)	3.79	2.67
Moreland (C)	3.83	2.78
Nillumbik (S)	1.30	2.16
Whittlesea (C)	2.48	2.00
Yarra (C)	8.70	12.40
Metropolitan North		3.73
Knowledge Intensive		10.00
Melbourne		5.31

Source: IP Australia/NIEIR.

7 Melbourne's North: Opportunities

Findings

1. Education is a key driver of future economic growth; there are opportunities to improve the engagement between education and regional industry.
2. The relocation of the Melbourne Wholesale Fruit and Vegetable Market and the associated cluster of businesses, including logistics businesses, create a major opportunity for the future economic development of the region.
3. Melbourne Airport provides the region with a gateway to the world and enhances its integrated supply chain characteristics.
4. The Melbourne Airport business precinct provides the opportunity to develop a high-tech cluster, including aerospace and pharmaceuticals businesses.
5. The region's incubators provide an opportunity to grow a range of new businesses; opportunities will be lost when successful new businesses move out of the incubator, if they cannot be accommodated locally.
6. The region's greenfield sites provide the opportunity to develop high quality and sustainable communities and workplaces, built to the highest design and environmental standards.
7. Industry sector opportunities include biotech, the environmental protection industry and related manufacturing, growth of government services (particularly for Hume and Whittlesea), health and related specialist and allied services, aged services and associated research, business services and retail.
8. Competitive advantage could be built by encouraging the diffusion of the knowledge economy across the entire region.
9. To promote the benefits of Melbourne's North, its diversity and opportunity.

'To drive innovation, we should be providing companies with a five-year tax break for export sales.'

Roger La Salle, Director, Matrix Thinking

7.1 | Education

'There is scope to improve the proportion of young people going on to further study or training, both informal and formal, after leaving school.'

Dusseldorp Skills Forum

At the core of all opportunities for economic development in the region is the knowledge and skills of its residents. Industry is attracted to regions where skills are abundant and creativity flourishes. Education provides the regional foundation for economic growth and productivity.

Regional and vertical integration of schools, tertiary education, research and industry are important goals. Creating opportunity for the young people in the region means providing the opportunity for school students to link at least some of their learning activities with the specialisation of the region's tertiary institutions. These links will allow local students to benefit from the region's investment in post-school education in subjects such as aerospace, biotechnology and health sciences, construction and nursing, to name a few.

Stakeholder interviews repeatedly raised the issue of creativity and its application to innovation. The role of education providers is also to build the creative capacity of young people in the region, because building successful careers will most likely require very different and more adaptable skills sets to those of their parents.

Research and the development of locally owned intellectual property creates a sound economic base with greater protection from off-shoring and other supply chain risks, providing, of course, that the commercial development of new products is funded locally.

An example of integrated research activity in Melbourne's North is La Trobe University's R&D Park, with its focus on innovation, new product development and realisation, industry collaboration, and the commercialisation of intellectual property.

The R&D Park offers three stages of development:

- incubation
- maturation
- relocation.

How these R&D activities spill out into the local economy is critically important. Clustering and relocation demand created by R&D Park activities require appropriate commercial accommodation in the region to capture businesses that mature and leave the R&D Park or are attracted to the region because of its research capacity.

Two issues stand out:

1. stakeholders have expressed concern about the equity of school education in Melbourne's North when compared to other regions of Melbourne
2. education is a lifetime activity; given the decline and restructuring of the manufacturing industry in Melbourne's North, a greater retraining effort for older workers is critical.

7.1.1 The role of education in Melbourne's North

Universities

RMIT University and La Trobe University provide tertiary education in Melbourne's North from their campuses in Bundoora. The Australian Catholic University, situated in Yarra, also provides a range of programs.

Universities, as well as creating major out of region export business by providing education for international students, are increasingly recognising their important role in assisting with the regional integration of learning and research, to assist the local community towards better employment prospects and give industry improved access to highly skilled workers.

La Trobe University is an example of an educational institution developing knowledge intensive networks throughout the region. Health research, the integration of wet lab work with high powered computing, and the integration of lab work with downstream health activities are all important ways of improving regional opportunities. An example of the closer interaction of research with the providers of health services is the growing relationship between La Trobe University and the Northern Hospital. The opportunity for Melbourne's North, through the relationship of university and hospital, is that the Northern Hospital could become a far more significant teaching hospital.

The Monash–Parkville–Northern triangle also provides regional opportunities in terms of greater levels of integration of services and research. Major infrastructure such as the synchrotron or super computers can further amplify regional advantage. The regional advantage is about being able to pull together the experts to create and run complex software programs, hardware specialists and highly skilled scientists who want to use high powered super computing.

La Trobe University's links with regional schools will grow and this is a developing area. There is now widespread acceptance that the university should become a knowledge hub for Melbourne's North.

The Biosciences Research Centre at La Trobe University will be a world class facility for agricultural biosciences R&D and the catalyst for many regional and knowledge intensive research and business opportunities. The Centre will employ 450 staff, and 400 of these will be scientists. The Biosciences Research Centre is a joint venture between the Victorian Government's Department of Primary Industry and the university, with a total investment of \$230 million. The construction phase for the Biosciences Research Centre is beginning and it will be fully operational by 2012.

In May 2009, La Trobe University announced it had received funding of \$123.7 million from the Australian Government, part of which will go towards establishing a \$98 million La Trobe Institute for Molecular Sciences. The Biosciences Research Centre and the La Trobe Institute for Molecular Sciences will create a formidable cluster of scientific research in Melbourne's North.

'This project (La Trobe Institute for Molecular Sciences), along with the additional development of the \$230 million Biosciences Research Centre, will significantly increase La Trobe's leadership in science research.'

Professor Paul Johnson, La Trobe University Vice-Chancellor

The total commitment to investment in sciences at La Trobe University in the last two years now totals approximately \$350 million. In total, the La Trobe Institute for Molecular Sciences will create 220 additional research positions and address the critical shortage of bioscientists in Australia, with opportunities to extend the science outreach program to 2,500 secondary students in Melbourne's North and create over 800 additional construction jobs. Importantly, the critical mass provided by these developments will enable further opportunities in coming years.

The goal is also to create greater levels of interaction between schools and university, and do this in a more seamless way. Addressing disadvantage through the provision of scholarships is also important so that students from disadvantaged households can attend university, as are the programs that integrate students with local employment. The School of Educational Studies at La Trobe University runs a series of projects and experts in residence programs to enhance understanding of chemistry and science and technology with schools in Melbourne's North. La Trobe University's Heidelberg Schools Project is about creating a science and maths centre based at the former La Trobe Secondary College site adjoining the Bundoora campus. It involves seven schools in the Heidelberg area as well as contributions from NMIT in the development of a centre of excellence in Melbourne's North. Closer links are now also being established with TAFE institutes and La Trobe University, and NMIT has established an articulation agreement that creates a seamless pathway for NMIT students to access further education at La Trobe University.

RMIT University's dual system of tertiary education with a vocational education and training (VET) sector alongside higher education provides students in Melbourne's North with the potential for improved educational pathways in future years.

RMIT University can play a major role in widening the horizons of industry in Melbourne's North and an industry engagement team has now been established. This team will assist industry and business to connect with academic staff, students and professional services. Part of RMIT University's industry engagement strategy is to establish internal industry networks of educators and researchers in the five key industries identified for strategic partnerships.

These industries are:

- aerospace and aviation
- automotive
- built environment, construction and infrastructure
- health and community services
- media and communications.

RMIT University's Bundoora campus offers programs in health sciences, engineering, manufacturing and education. The courses offered at the Bundoora campus are related to industry in the region and so have a significant capacity to enhance regional business development. A range of programs are run at TAFE, undergraduate and postgraduate levels.

RMIT University runs osteopathy and chiropractic clinics in Melbourne's North. The osteopathy teaching clinic provides treatment for a wide range of musculoskeletal and other disorders and is a research facility investigating the clinical effectiveness of osteopathic care. Patients receive treatment, under supervision from registered osteopaths, by students in the later years of their five-year full-time degree training. The chiropractic teaching clinics offer chiropractic assessment, care and management for a range of health problems as well as health promotion

and rehabilitation from injury. RMIT University is a leader in chiropractic tertiary education. The program is offered as a five-year course, consisting of a three-year Bachelor of Applied Science in Complementary Medicine and a two-year Master of Clinical Chiropractic.

The university's overseas students and visiting delegates are great ambassadors for Australia's businesses and relationships are often enduring. The opportunity is there for businesses in Melbourne's North to tap into these international networks.

The regional economic significance of La Trobe University and RMIT University include the following contributions.

1. The large number of international students attending RMIT University and La Trobe University, contributing in excess of \$100 million in fees and in additional expenditures on food, accommodation, transport and other categories.
2. The value of the universities' knowledge diffusion activities in the region through engagement with local industry, growing the region's productivity and prosperity, and the development of increasing levels of engagement between schools and tertiary institutions. These engagement activities will be delivered through a range of projects that are closely allied with the 'opportunity' industries in Melbourne's North and with key infrastructure facilities such as the Melbourne Airport complex, the science cluster at Bundoora, the hospitals and the Melbourne Wholesale Fruit and Vegetable Market.
3. The capacity of both RMIT University and La Trobe University to develop international networks for the region's business community.

7.1.2 The TAFE sector in Melbourne's North

NMIT

NMIT currently delivers 640 different programs through its campuses in Melbourne's North, located in Greensborough, Heidelberg, Epping and Preston. The range of programs covers Certificate II to advanced diploma and higher education courses.

The Epping campus caters for primary industry programs, including meat processing, viticulture and wine making, aquaculture and equine studies. There are large farms, one based in Whittlesea, that provide students with a realistic experience of opportunities in primary industry. NMIT's strategy is to value add to primary production by assisting students to obtain the skills required to take their products beyond the farm gate. When the viticulture program is in full production, it will produce one million bottles of wine each year.

NMIT strategies can assist to make agricultural land more productive and also help hobby farmers to grow their businesses over time to create viable enterprises.

The Heidelberg campus runs programs for the traditional trades, construction, plumbing, carpentry, roofing etc. These courses are now in great demand, particularly with the increasing participation of schools in running VET and Victorian Certificate of Applied Learning (VCAL) programs. The mechanical manufacturing programs are holding their own after a decline about five years ago, which tends to suggest some innovation in regional manufacturing.

Hospitality and tourism programs were not proving to be popular and it was suggested that a weakness in Melbourne's North was a lack of well-known restaurants and high quality accommodation. *'Amenity does create employment.'*

The Greensborough campus runs programs for performing arts and professional writing as well as horticulture programs that include turf management and landscaping. It is possible that the Greensborough campus may be developed into an arts precinct, with potential to develop programs in technical and professional writing. Public transport is an issue for students attending the Greensborough campus.

The Epping, Greensborough and Preston campuses all run programs for migrant women, including learning English, which assist new migrants to engage more successfully with their communities.

NMIT takes students who may have had difficulties in the secondary schools system and employs a youth support group that offers one-on-one assistance. This has proved extremely valuable in providing students with a sense of pride and hope for the future.

NMIT is working closely with La Trobe University and runs nine degree programs that are not provided by La Trobe.

Kangan Batman TAFE

Kangan Batman TAFE is Victoria's major training provider for the automotive, aerospace, polymer and transport industries and is the state's largest provider of traineeship and apprenticeship training. Demand for courses in 2009 has been particularly high, with the highest number of students ever enrolled at the institute. *'We could be 100 per cent larger and still not meet demand.'*

Kangan Batman TAFE runs nationally accredited courses, from basic certificates to diplomas and graduate diplomas. Partnerships with universities provide a pathway from TAFE courses to degree and postgraduate studies.

One of the most important issues at this time is that Melbourne's North has the capacity to deliver training or retraining programs for people who have lost their jobs through industry decline and restructuring. This is particularly important for residents in Hume, as some major employers restructure or close their operations.

The training sector's role will be to re-engineer Melbourne's North to allow companies and their employees to benefit from new opportunities covered in this report. The Prime Minister used Kangan Batman TAFE Broadmeadows campus to launch the Green Car Plan. The TAFE sector is very well positioned to facilitate many of the changes required to create a more environmentally sustainable economy and all the things that go into creating green jobs. There is great potential here. Kangan Batman TAFE needs to invest in new areas of the green economy sector to assist workers who have lost jobs to retrain for new emerging industries. This restructuring is occurring more rapidly than envisaged and the task is now more urgent.

The TAFE training sector needs to react to, and help shape, demand so that people are trained in areas that meet future industry needs. One example is that no schools in the region appear to be reacting to the opportunities created by the relocation of the Wholesale Markets. They should be running courses on agricultural science and logistics, and this should stimulate demand for these programs at Kangan Batman TAFE.

New initiatives include the Centre of Fashion, which runs workshops on the latest developments in seamless garment manufacture. Funded by the International Fibre Centre in partnership with the Council of Textiles and Fashion Industries Australia, Kangan Batman TAFE will facilitate the delivery of two workshops featuring the latest technological advances in this new method of production.

7.2 | Working together

The region needs a more collaborative approach. There are very few clusters in the north and its historical development has meant that it is more difficult to get people and organisations to work together. There has been a tendency for the TAFE institutes to compete with each other, when collaboration would have been a better approach for the region. Contestability of training under Victorian Government reforms will tend to encourage a competition based approach.

Industry also needs to be more proactive and should be making demands from educators. This can be a two-sided issue. The training and education sectors need to work closely with industry to develop training programs, while industry needs to consider the training and education sectors in its planning and development, including encouraging work placements and using education providers' networks.

There is a great need for better vertical integration of education at all levels to provide improved pathways to employment. Many young people in the region find it hard to get into university, as schools are underperforming. All courses should work towards guaranteed articulations so that students have a clear pathway to further studies and advancement.

Melbourne's North needs consolidated training infrastructure in the form of Trade Training Centres. A clear statement of signature buildings that create centres of trade training excellence is required, rather than having funding diffused across numerous schools offering little improvement. The capacity to create these new facilities may be lacking in the north as people rush to fix the things that have just gone wrong rather than looking at the big picture. Ntech at Northland Secondary College is an example of what can be achieved. There, landmark infrastructure and industry partners combine to assist young people in building a career. Completion rates have risen and young people want to attend Ntech and stay.

Developing Trade Training Centres for Melbourne's North is a once in a lifetime opportunity to create major training infrastructure.

7.3 | Employment

Employment figures for Australian and New Zealand Industry Classification (ANZSIC) Level 1 Education Categories by LGA and year are shown in Table 7.1. The ongoing development of school and tertiary education in Melbourne's North is a critical component in meeting the goals of enabling greater knowledge intensification of industry and the higher skills of residents. In 2006, education employment proportions for the region moved to just above the state benchmark. Given the relatively low skills of some residents, significant new opportunities for industry, the potential for vertical integration of knowledge intensive firms with education providers, the further export potential of the industry itself and the comparative disadvantage of some schools, there is still a strong case for increased investment in, and development of, education at both school and tertiary level.

Table 7.1 Education employment

Industry	1991	1996	2001	2006
Banyule (C)	3,065	2,962	3,406	3,723
Darebin (C)	3,040	4,792	4,404	5,995
Hume (C)	3,181	3,261	4,084	4,395
Moreland (C)	2,971	3,014	2,875	3,135
Nillumbik (S)	1,434	1,870	1,998	1,711
Whittlesea (C)	4,031	2,463	3,441	3,477
Yarra (C)	1,803	1,902	2,068	2,686
Total	19,525	20,266	22,276	25,122

Source: ABS Census benchmarked to labour force.

Recommendations to enhance the economic capacity of the region in terms of education are:

- greater levels of investment in schools education in the region, including developing the diversity of schools; schools play an important role in the economic development of a region as, apart from teaching excellence, schools can determine where parents choose to live
- increase levels of integration between local schools, tertiary education providers and businesses, with a particular emphasis on careers guidance at secondary school level
- aim to capture at least some of the international students in employment in local industries; exporting talent may not be the best outcome for the region's future economic development
- educational infrastructure is a driver of locational advantage for businesses and households, so it is critical to actively promote the strengths of all tertiary providers.

7.4 | Relocation of Melbourne Wholesale Fruit and Vegetable Market

The Melbourne Wholesale Fruit and Vegetable Market will be relocated to Epping at the end of 2011. Construction at the Cooper Street site is due to commence in 2009 for completion during 2011. Moving from the original site in Footscray are the Melbourne Wholesale Fruit and Vegetable Market and the National Flower Centre.

The relocation of the Wholesale Market, which should be considered as a major infrastructure project in its own right with more than \$1 billion of planned investment in the redevelopment cycle over the next 10 years, will provide a major benefit and ongoing opportunities to the northern metropolitan region. The Wholesale Market currently has an annual turnover of more than \$1.6 billion.

The rationale for the relocation of the Wholesale Market is to create a modern facility with improved access and a contemporary and integrated trading environment, and greater opportunity for future development and growth in a related cluster of developments within the new food precinct. These developments could include businesses that are concerned with logistics and distribution of fresh produce, associated processing and packaging, various trading and export related activities, and education and training.

Case study: Rungis International Market, Paris

The Rungis International Market provides an interesting case study. The market site near Orly Airport has flourished since the relocation of the Les Halles Market in the early 1970s. The reasons for relocating Les Halles were broadly similar to those that have driven the relocation of the Melbourne Wholesale Fruit and Vegetable Market – more space for development, easier access, and planning and redevelopment priorities of the existing market sites, which over the long term were considered inappropriate because of the growing pressures of urban development.

The market is managed by Semmaris, which employs more than 200 staff who manage the market, its operations and facilities, including continual improvement of the market's buildings and business development activities such as marketing and communications initiatives and consultancy and engineering assignments.

The Rungis International Market has more than 450 wholesalers who employ over 7,000 staff. The wholesalers sell to the catering and retail sectors. In 2007, the number of wholesalers by sector were 211 in fruits and vegetables, 78 in ornamental flowers and plants, 65 in meat products, 36 in seafood and freshwater products, 36 in delicatessen products, 30 in dairy products, 108 horticultural producers, 66 fruit and vegetable producers and 41 accessory suppliers.

The Rungis International Market has attracted 96 transport companies and 179 miscellaneous services companies, 175 trading or import–export companies, 21 banks, insurance agencies or credit agencies, 21 restaurants and bars, 57 trade organisations, unions or associations and 8 administrative offices.

Issues that are particularly noteworthy and of significance to the relocation of the Melbourne Wholesale Fruit and Vegetable Market include the following.

1. Total turnover of Rungis International Market is in excess of 7 billion Euros, approximately 2 billion Euros of which is generated by service companies to the market located on the market precinct. This suggests that the opportunities for additional cluster activity, particularly given the room to grow at the relocated Melbourne Wholesale Fruit and Vegetable Market has the potential to add more than 30 per cent to the turnover of core wholesale activities, a significant opportunity for the local area.
2. In February 2007, Rungis launched its educational website following its Adolescent Health and Nutrition Conference.
3. Various international trade delegations and international agreements have been established, including the opening of the Rungis Market office in London and a cooperation agreement with the New Covent Garden Market. Rungis has also been active in China, Spain and many other countries.

4. Rungis Market states that, 'as with the French economy in general, business sectors at the Rungis Market are increasingly bound to the global economic situation reigning over its active business sectors'. In other words, globalisation, the information economy and the need to create closer links between international markets all impact on the Rungis Market's development strategies. The Rungis Market is now engaged in international consulting, providing advice on the location, definition, organisation, design and operation of wholesale markets in many countries, with a particular focus on China.
5. Logistics is now one of the Rungis Market's core business areas.
6. In January 2007, a new regulation governing goods transport in Paris was introduced. Broadly, the regulation stipulates two distinct traffic periods – daytime small delivery vehicles only, with part of the night reserved for delivery by larger vehicles. Importantly, zero emission vehicles can deliver produce at any time of the day or night.

7.5 | Wholesale

Opportunities for the wholesale sector are to develop synergies with the Wholesale Market and to integrate as knowledge intensive logistics firms with global supply chains. For some wholesale firms, there will also be opportunities for vertical integration of activities, including intellectual property and product development.

Employment figures for ANZSIC Level 2 Wholesale Trade Categories by LGA and year are shown. The opportunity to grow wholesale activity is through greater regional integration, particularly given the relocation of the Wholesale Market, and vertical integration of wholesale businesses (particularly in the inner north) to improve the capacity to develop and distribute products. Increasing the knowledge intensity and value add of wholesale operations will be an important goal towards improving economic outcomes for the region.

Table 7.2 Wholesale trade employment: basic material wholesaling

Industry	1991	1996	2001	2006
Banyule (C)	165	193	129	264
Darebin (C)	241	310	171	353
Hume (C)	249	316	333	1,059
Moreland (C)	237	182	141	266
Nillumbik (S)	63	82	64	146
Whittlesea (C)	215	248	230	616
Yarra (C)	222	264	191	678
Total	1,390	1,594	1,260	3,382

Source: ABS Census benchmarked to labour force.

Industry	1991	1996	2001	2006
Banyule (C)	571	795	747	509
Darebin (C)	1,488	989	638	722
Hume (C)	1,182	1,732	2,408	1,845
Moreland (C)	774	711	701	566
Nillumbik (S)	203	139	144	124
Whittlesea (C)	750	706	583	615
Yarra (C)	2,406	3,009	1,511	891
Total	7,375	8,081	6,732	5,273

Source: ABS Census benchmarked to labour force.

Industry	1991	1996	2001	2006
Banyule (C)	545	723	858	586
Darebin (C)	2,281	2,224	2,351	2,097
Hume (C)	895	1,283	1,779	1,709
Moreland (C)	2,030	1,685	2,211	1,655
Nillumbik (S)	190	318	251	138
Whittlesea (C)	840	891	1,288	1,328
Yarra (C)	4,223	4,342	4,075	3,643
Total	11,005	11,466	12,813	11,156

Source: ABS Census benchmarked to labour force.

7.6 | Manufacturing

Manufacturing has played a major role in the development of the northern economy. The manufacturing sector is described in detail in Chapter 9 of this report.

7.7 | Transport and storage

Employment figures for ANZSIC Level 2 Transport and Logistics Categories by LGA and year are shown. The major growth in road transport employment has occurred in Hume where 2,508 jobs were added between 2001 and 2006. Transport employment – storage is the highest in Hume at 494 positions. Employment in rail transport has also grown across all LGAs since 2001. Employment in transport services has declined in Melbourne's North and this trend requires further monitoring, as it is likely to be contrary to improved regional integration.

Table 7.5 Transport employment: road transport

Industry	1991	1996	2001	2006
Banyule (C)	266	316	330	371
Darebin (C)	1,315	1,259	975	961
Hume (C)	925	1,104	1,294	3,802
Moreland (C)	571	889	994	985
Nillumbik (S)	72	202	141	174
Whittlesea (C)	299	394	629	1,086
Yarra (C)	824	662	1,140	718
Total	4,273	4,827	5,502	8,097

Source: ABS Census benchmarked to labour force.

Table 7.6 Transport employment: rail transport

Industry	1991	1996	2001	2006
Banyule (C)	26	10	11	41
Darebin (C)	88	21	5	78
Hume (C)	20	7	22	76
Moreland (C)	52	17	10	91
Nillumbik (S)	8	6	9	33
Whittlesea (C)	39	48	25	78
Yarra (C)	61	35	38	118
Total	293	145	119	514

Source: ABS Census benchmarked to labour force.

Table 7.7 Transport employment: storage

Industry	1991	1996	2001	2006
Banyule (C)	0	19	37	32
Darebin (C)	60	30	50	108
Hume (C)	31	430	302	494
Moreland (C)	13	48	31	52
Nillumbik (S)	1	3	3	8
Whittlesea (C)	17	44	28	36
Yarra (C)	25	119	47	49
Total	147	693	499	780

Source: ABS Census benchmarked to labour force.

Industry	1991	1996	2001	2006
Banyule (C)	172	191	203	88
Darebin (C)	193	239	176	132
Hume (C)	2,700	4,060	4,149	2,708
Moreland (C)	271	264	200	151
Nillumbik (S)	49	81	63	64
Whittlesea (C)	105	82	119	79
Yarra (C)	342	592	464	565
Total	3,832	5,509	5,376	3,788

Source: ABS Census benchmarked to labour force.

7.8 | Melbourne Airport

Melbourne Airport and its precinct are major assets to the region and this major infrastructure should be a key driver of competitive advantage by:

- attracting new businesses
- creating export opportunities for both new and existing businesses
- enhancing global supply chain and local supply chain integration
- providing a cluster of high skilled employment with potential for knowledge diffusion to other parts of the region.

The opportunity for Hume is to oversee the development of an aerospace cluster of activity surrounding Melbourne Airport. There are also opportunities for vertical integration with TAFE institutes and universities in the region and the development of an engineering focused university of international standing.

Melbourne Airport's preliminary Major Development Plan for the Melbourne Airport Office Park, released in December 2008, supports the strategy of knowledge intensification of the region's economy as it includes a proposal to target R&D companies to the new site, such as pharmaceutical companies, and proposes a mix of office and warehousing and a potential for laboratory space. The proposed development is to be located within the approximate 34 ha of the airport entry.

The airport complex creates opportunities for distribution and logistics firms and access benefits in terms of cost and time to firms in the region.

As can be expected, air and space transport employment is concentrated in Hume, and jobs growth in this sector has reached nearly 3,000 since 2001.

Table 7.9 Transport employment: air and space transport

Industry	1991	1996	2001	2006
Banyule (C)	0	9	4	27
Darebin (C)	0	9	16	29
Hume (C)	3,516	5,562	4,275	7,243
Moreland (C)	22	64	4	19
Nillumbik (S)	0	0	0	5
Whittlesea (C)	0	0	15	16
Yarra (C)	83	9	26	69
Total	3,621	5,653	4,341	7,409

Source: ABS Census benchmarked to labour force.

7.9 | Biotechnology

Biotechnology is using the application of knowledge about living organisms and their components to make new products and develop new industrial processes. Biotechnology is an enabling technology with applications in a wide range of industry sectors. The applications most relevant to Melbourne's North are human health, agricultural production and food processing, and some aspects of environmental research and control.

One-third of Australia's biotechnology companies are located in Victoria, including CSL Limited. One of Victoria's greatest strengths in biotechnology capability is the co-location of research and education organisations, hospitals and industry in a number of precincts of research and education excellence. These precincts – Parkville, the Monash Health Research precinct, Richmond, the Alfred Medical Research and Education Precinct, Bundoora, the Austin Biomedical Alliance precinct and Werribee – provide a focal point for the sharing of resources and the exchange of ideas.

The Victorian Government has actively promoted the opportunities for biotechnology firms on the world stage. Developments like Melbourne University's Bio21 Institute in Parkville demonstrate the commitment to build the biotechnology sector in Melbourne with a strong focus on commercialisation.

Biotechnology development is driven by research and the highly skilled and specialised workers driving these developments. Biotechnology skills are an example of skills that are in demand globally.

Offering the right kind of first class research facilities that allow for globally competitive outcomes, and the opportunities to commercialise new technologies, helps drive the biotechnology cluster in Melbourne. This cluster of highly skilled people will, in turn, attract new high technology companies to Melbourne because of the city's growing strength in this sector. Biotechnology research and commercialisation is complex and needs investment to build manufacturing plants and R&D centres. Investment is required from major international biotechnology companies and also from the investment community in Victoria to support the start up phases of new companies in this sector.

Melbourne's North is well placed to benefit from the development of the biotechnology sector, particularly Moreland and Darebin, in terms of capturing some research and specialised business services relating to the sector. For the outer north, the capacity of Hume and Whittlesea to provide large industrial sites for the commercialisation of biotechnology applications in such areas as food processing and pharmaceuticals is significant.

7.10 | Construction

Employment figures for ANZSIC Level 2 Construction Categories by LGA and year are shown in this section. General construction employment has grown in all LGAs, with a significant increase in employment in Hume. Construction trade services have also grown across all LGAs except for Yarra. Construction activity in Moreland was stable.

Despite the economic downturn there will be opportunities in construction, including infrastructure developments and the retrofitting of commercial and domestic buildings to improve their environmental sustainability. One feature of the construction sector is that higher skills will be required to build higher tech and sustainable buildings. Ongoing training and upskilling of construction workers and trades will play an important role in improving the regional competitiveness of the construction industry.

There may be greater opportunities for the construction sector to integrate more closely with manufacturing firms supplying environmental products. The opportunity is one of developing specialised skills sets in the use of technology and materials.

Table 7.10 Construction employment: general construction

Industry	1991	1996	2001	2006
Banyule (C)	667	442	657	1,114
Darebin (C)	877	718	973	1,437
Hume (C)	811	520	1,010	2,892
Moreland (C)	396	330	705	1,069
Nillumbik (S)	324	367	545	1,052
Whittlesea (C)	486	472	853	2,052
Yarra (C)	657	659	1,025	2,157
Total	4,218	3,508	5,769	11,773

Source: ABS Census benchmarked to labour force.

Table 7.11 Construction employment: construction trade services

Industry	1991	1996	2001	2006
Banyule (C)	2,311	2,829	2,584	2,780
Darebin (C)	2,309	2,767	2,566	2,791
Hume (C)	1,752	2,264	2,402	4,012
Moreland (C)	1,605	2,350	2,343	2,348
Nillumbik (S)	1,082	1,452	1,505	1,866
Whittlesea (C)	1,317	1,728	2,357	3,235
Yarra (C)	1,721	1,856	1,906	1,803
Total	12,097	15,246	15,662	18,834

Source: ABS Census benchmarked to labour force.

7.11 | Retail

Tables 7.12 to 7.14 give retail industry employment by LGA and SLA. In the period 2001 to 2006, the growth in retail employment in Hume was the highest at 31.3 per cent, following on from rapid growth in the period 1996–2001. In Whittlesea, after a period of rapid employment growth (39.9 per cent) in the period 1996–2001, the growth rate of retail employment slowed to 21.6 per cent. In Nillumbik, the growth rate of retail employment also fell from 2001–2006 to 22.6 per cent, following growth in the previous period of 28 per cent.

Yarra, Moreland and Darebin each had higher growth rates of retail employment in 2001–2006 than in the previous period. For Banyule, the rate of growth in retail employment in the period 2001–2006 was slightly higher than in the period 1996–2001. The LGAs in the region with the greatest number of jobs in retail are Hume, Yarra and Darebin.

Hume, Nillumbik, Whittlesea and Yarra all had higher growth rates in retail employment than the Melbourne average.

Table 7.12 Retail employment by LGA: total number of employees

LGA	1991	1996	2001	2006
Banyule (C)	4,730	5,984	6,596	6,904
Darebin (C)	6,638	8,520	8,665	8,874
Hume (C)	5,753	6,504	8,131	10,248
Moreland (C)	6,358	6,321	6,025	6,140
Nillumbik (S)	2,038	1,948	2,369	2,509
Whittlesea (C)	3,814	4,212	5,806	6,457
Yarra (C)	6,986	7,993	8,464	9,292

Source: ABS Census benchmarked to labour force.

Table 7.13 Retail employment by SLA: total number of employees

SLA	1996	2001	2006
Yarra (C) – North	4,234	4,364	4,282
Yarra (C) – Richmond	3,759	4,101	5,010
Moreland (C) – Brunswick	2,764	2,657	2,580
Moreland (C) – Coburg	2,356	2,319	2,212
Moreland (C) – North	1,201	1,049	1,348
Banyule (C) – Heidelberg	2,627	2,966	3,167
Banyule (C) – North	3,358	3,629	3,737
Darebin (C) – Northcote	1,948	2,171	2,121
Darebin (C) – Preston	6,572	6,494	6,753
Hume (C) – Broadmeadows	4,238	4,605	5,537
Hume (C) – Craigieburn	967	1,730	2,689
Hume (C) – Sunbury	1,299	1,796	2,022
Nillumbik (S) – South	1,279	1,583	1,526
Nillumbik (S) – South-West	524	628	834
Nillumbik (S) – Balance	145	158	149
Whittlesea (C) – North	312	596	854
Whittlesea (C) – South-East	1,098	1,467	1,578
Whittlesea (C) – South-West	2,802	3,743	4,026

Source: ABS Census benchmarked to labour force.

Table 7.14 Retail employment by LGA: per cent growth in number of employees

LGA	2001 since 1996	2006
Banyule (C)	10.2	15.4
Darebin (C)	1.7	4.2
Hume (C)	25.0	57.6
Moreland (C)	-4.7	-2.9
Nillumbik (S)	21.6	28.8
Whittlesea (C)	37.8	53.3
Yarra (C)	5.9	16.2
Metropolitan North	13.92	24.65
Knowledge Intensive	22.7	30.2
Melbourne	18.6	20.4
Victoria	16.9	20.6

Source: ABS Census benchmarked to labour force.

Tables 7.15 to 7.17 show employment figures for ANZSIC Level 2 Retail Trade Categories by LGA and year. Employment in food retailing and personal and household good retailing has grown steadily since 1991. Employment in motor vehicle retail and servicing has declined since 1996, with strong employment growth in the industry occurring in Hume.

Table 7.15 Retail trade employment: food retailing

Industry	1991	1996	2001	2006
Banyule (C)	2,064	2,346	2,609	2,866
Darebin (C)	2,628	3,069	3,084	3,054
Hume (C)	2,601	2,705	3,237	4,005
Moreland (C)	2,366	2,331	2,197	2,646
Nillumbik (S)	895	837	1,040	1,351
Whittlesea (C)	1,597	1,797	2,471	2,982
Yarra (C)	1,976	2,276	2,218	2,210
Total	14,128	15,361	16,855	19,114

Source: ABS Census benchmarked to labour force.

Table 7.16 Retail trade employment: personal and household good retailing

Industry	1991	1996	2001	2006
Banyule (C)	1,767	2,440	2,825	2,951
Darebin (C)	2,600	3,646	4,062	4,574
Hume (C)	1,738	2,015	2,878	3,804
Moreland (C)	2,704	2,297	2,431	2,187
Nillumbik (S)	791	701	928	844
Whittlesea (C)	1,233	1,353	2,281	2,382
Yarra (C)	3,768	4,231	5,101	6,014
Total	14,601	16,683	20,505	22,755

Source: ABS Census benchmarked to labour force.

Table 7.17 Retail trade employment: motor vehicle retailing and services

Industry	1991	1996	2001	2006
Banyule (C)	899	1,199	1,162	1,088
Darebin (C)	1,409	1,804	1,520	1,246
Hume (C)	1,413	1,784	2,016	2,440
Moreland (C)	1,289	1,693	1,397	1,307
Nillumbik (S)	352	409	401	314
Whittlesea (C)	984	1,062	1,055	1,093
Yarra (C)	1,242	1,486	1,146	1,067
Total	7,588	9,438	8,696	8,555

Source: ABS Census benchmarked to labour force.

7.12 | Government services

Employment figures for ANZSIC Level 2 Government Services Categories by LGA and year are in Tables 7.18 and 7.19. Since 2001, the provision of employment in government administration in Melbourne's North has risen in line with the recommendations in the 2003 *Growing Melbourne's North* report, with 2,722 jobs added from 2001–2006. There has been a substantial growth in the number of personnel at the Simpson Army Barracks in Banyule since 2001.

Further relocation of government services to the region should be encouraged and should form part of the ongoing strategy to improve economic integration and regional competitiveness.

Table 7.18 Government and defence employment: government administration

Industry	1991	1996	2001	2006
Banyule (C)	1,546	855	852	1,256
Darebin (C)	1,812	1,234	1,006	1,651
Hume (C)	1,621	1,214	1,550	2,291
Moreland (C)	1,664	1,049	1,123	1,368
Nillumbik (S)	533	383	271	357
Whittlesea (C)	573	267	552	887
Yarra (C)	2,106	999	866	1,133
Total	9,854	6,002	6,221	8,943

Source: ABS Census benchmarked to labour force.

Table 7.19 Government and defence employment: defence

Industry	1991	1996	2001	2006
Banyule (C)	448	283	281	681
Darebin (C)	3	0	1	0
Hume (C)	306	101	17	33
Moreland (C)	19	1	0	0
Nillumbik (S)	8	0	0	0
Whittlesea (C)	3	0	3	8
Yarra (C)	17	14	2	0
Total	804	399	303	722

Source: ABS Census benchmarked to labour force.

7.13 | Health

Employment figures for ANZSIC Level 2 Health Categories by LGA and year are shown in Tables 7.20 and 7.21. Health is an important foundation for residents in the region and the sector is very important because of its knowledge intensive characteristics. While employment in health services in Banyule and Whittlesea has grown from 2001–2006, health services employment has either declined, or remained relatively stable, in the balance of Melbourne’s North. Overall, there has been a small growth in the total number employed.

The development of health clusters should encourage growth in specialist services. The strategy for the region will be to increase the depth of services available locally and the consolidation of the practice specialisation of major hospitals. Training and ongoing education is also an important part of the mix, as is the opportunity for increased integration with education providers in Melbourne’s North. Cancer research, medicine and the aged and rehabilitation are among the disciplines in which the region has built knowledge, skills and competitive advantage.

Employment in community services has grown in all LGAs in Melbourne’s North, adding 3,743 jobs across the region.

Table 7.20 Health employment: health services

Industry	1991	1996	2001	2006
Banyule (C)	7,610	6,866	9,572	10,570
Darebin (C)	4,550	4,363	3,315	3,287
Hume (C)	2,444	1,425	2,133	2,102
Moreland (C)	1,916	3,081	3,685	3,250
Nillumbik (S)	755	695	1,101	901
Whittlesea (C)	1,935	1,563	3,290	3,921
Yarra (C)	7,235	9,315	11,174	10,504
Total	26,445	27,309	34,269	34,533

Source: ABS Census benchmarked to labour force.

Table 7.21 Health employment: community services

Industry	1991	1996	2001	2006
Banyule (C)	596	692	1,181	1,779
Darebin (C)	603	1,150	1,566	2,071
Hume (C)	827	479	655	1,398
Moreland (C)	555	812	1,187	1,938
Nillumbik (S)	264	182	437	674
Whittlesea (C)	381	232	483	1,061
Yarra (C)	1,092	1,122	1,794	2,124
Total	4,318	4,668	7,303	11,046

Source: ABS Census benchmarked to labour force.

7.14 | Business services

Although Melbourne's North has improved its relative position slightly, the provision of business services is still well below the state benchmark. The development of business services, and increasingly specialist business services, is essential if the region is going to increase the knowledge intensity, export and innovation capacity of its business sector. The recommendation in the 2003 *Growing Melbourne's North* report that a benchmark for 2015 is to 'create a business services sector with a size comparable to the region's share of population' remains an important goal.

7.15 | Incubators

'The last decade has seen very little emphasis placed on the role of start-up and microenterprise businesses in national innovation.'

Bob Waite, CEO, Darebin Enterprise Centre

The region's enterprise or business incubators include the Brunswick Business Incubator, the La Trobe Technology Enterprise Centre and the Darebin Enterprise Centre. Although the acceptance of incubators tends to fluctuate as business fashions change, incubators have, and will continue to perform, a useful role in the region.

Darebin Enterprise Centre provides an example of the possibilities. The Centre provides businesses with the next step up from home based enterprises and 30 per cent of its occupants are start up businesses. The centre provides facilities and communications and some business services for the 45 businesses currently on site (there have been as many as 55 businesses). Typically, office based businesses turn over every 18 months. However, the frustration is that the lack of commercial office space in Darebin means that it is difficult to get businesses to stay in Darebin. For example, the nearby AMCOR site redevelopment is residential, with no plans for commercial space.

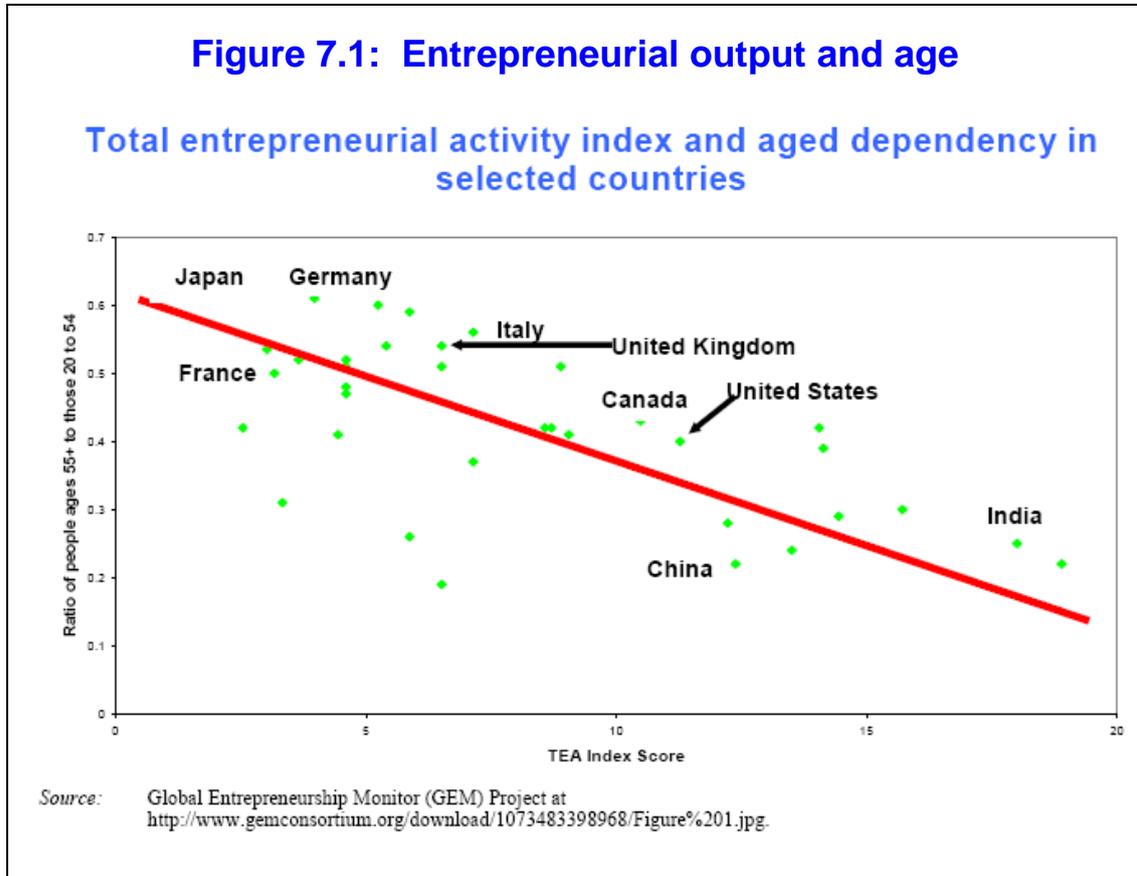
The old Northcote Police Station is now being developed as a creative industries incubator for new media, animation, photography and other computer based and arts businesses.

Incubators are important, as they provide opportunities for start-up businesses to grow and opportunities for young people to grow them. Incubators assist in the role of professionalising the start-up company.

'We need a technology incubator.'

Roger La Salle, Director, Matrix Thinking

Figure 7.1 shows the age distribution of entrepreneurial activity. The Global Enterprise Monitor Project has undertaken research into the dependency between entrepreneurial activity and age. The figure for the United States shows that people aged 55+ are 0.4 times as likely to undertake entrepreneurial activity as those aged 20 to 54. For the United Kingdom, this ratio is about 0.55.



8 Melbourne's North: Employment

Findings

1. The region should maintain the diversity of skills and employment.
2. The continued attraction of CBD employment to the high skilled residents of Yarra and Brunswick.
3. New developments in the region are likely to create new employment opportunities and reduce journey to work travel times.
4. New residential developments should be planned in conjunction with local employment opportunities and appropriate levels of infrastructure.
5. The opportunity cost of travel for some parts of the region remain high.
6. Economic integration would be improved by the diffusion of 21st century skills across the region.
7. Many young people in the region are doing well in work or education; the least engaged will require ongoing attention to decrease the likelihood of long-term structural unemployment and associated social security costs.
8. Retaining an appropriate level of employment lands in inner areas of Melbourne's North should be a Victorian Government policy objective.

8.1 | Industry and local employment

'There is a grave risk of not having diversity in employment; we are building a lot of sheds on a lot of land. Careers are narrowing and we are losing a lot of engineers.'

Peter Harrison, Kangan Batman TAFE

'Factories have benefited from low income (resident) labour.'

Roger La Salle, Director, Matrix Thinking

Columns one and two in Table 8.1 show the proportion of jobs in Melbourne's North (by industry sector) and if these jobs are filled by local residents or people living outside the region. The sectors that capture the most local employment are accommodation, cafes and restaurants, agriculture, retail trade, education, construction, personal and other services, government administration and defence, manufacturing, cultural and recreational services, health and community services, and property and businesses services.

Columns 3 and 4 give the proportion of workers (by sector) who live in the region, showing if they work in Melbourne's North or travel outside the region to employment. The highest capture of workers within the region is for the manufacturing sector, where 69 per cent of manufacturing workers living in Melbourne's North work within the region.

Conversely, residents working in the finance and insurance sector are most likely to travel outside the region to access employment. The growth of the finance and insurance sector in Yarra is beneficial to reducing travel times.

Table 8.1 2006 source of labour (per cent)

ANZSIC	MN jobs to person within MN	MN jobs to person from outside MN	MN workers to MN job	MN workers to job outside MN
(A) Agriculture, forestry and fishing	71	29	62	38
(B) Mining	51	49	30	70
(C) Manufacturing	63	37	69	31
(D) Electricity, gas and water supply	56	44	39	61
(E) Construction	67	33	61	39
(F) Wholesale trade	55	45	59	41
(G) Retail trade	70	30	63	37
(H) Accommodation, cafes and restaurants	73	27	55	45
(I) Transport and storage	56	44	58	42
(J) Communication services	53	47	41	59
(K) Finance and insurance	49	51	22	78
(L) Property and business services	61	39	39	61
(M) Government administration and defence	64	36	38	62
(N) Education	70	30	56	44
(O) Health and community services	62	38	59	41
(P) Cultural and recreational services	64	36	42	58
(Q) Personal and other services	66	34	49	51
Overall	64	36	54	46

Source: ABS Census benchmarked to labour force.

Table 8.2 2006 source of labour: score

ANZSIC	MN jobs to person within MN	MN jobs to person from outside MN	MN workers to MN job	MN workers to job outside MN
(A) Agriculture, forestry and fishing	112	79	115	82
(B) Mining	80	134	56	152
(C) Manufacturing	99	102	128	68
(D) Electricity, gas and water supply	88	122	73	132
(E) Construction	105	91	113	85
(F) Wholesale trade	87	123	109	89
(G) Retail trade	109	83	117	80
(H) Accommodation, cafes and restaurants	114	75	103	97
(I) Transport and storage	87	122	107	92
(J) Communication services	82	131	77	127
(K) Finance and insurance	76	142	41	169
(L) Property and business services	96	108	72	133
(M) Government administration and defence	101	99	70	135
(N) Education	110	83	103	96
(O) Health and community services	97	104	109	89
(P) Cultural and recreational services	101	98	77	127
(Q) Personal and other services	104	93	91	111
Overall	100	100	100	100

Source: ABS Census benchmarked to labour force.

8.1.1 Local employment capacity

This is a measure that gives a score to the source of labour supply by measuring the percentage of locals employed at the SLA and the percentage of local employment that is provided to locals. The table shows the dispersal of the workforce in Melbourne's North and if residents are more likely to travel outside the region to work.

Two effects are evident; firstly, the attraction of the skilled workforce from Yarra and Brunswick to CBD employment. In the case of Yarra, which has high levels of employment compared to its resident workforce, it is likely that there will be an increasing match between the skill demands of business and the skills of the local residents, stimulating the growth of a global village model and a knowledge intensive local economy more focused around the skills of its residents. Secondly, SLAs with lower levels of employment opportunity, such as Craigieburn, have had a far lower percentage of residents who work locally. This means that residents in areas that provide less local employment will travel for longer than average journey to work times. The proposed Craigieburn Town Centre development, creating 400 new residential as well as 50,000 sqm of mixed use commercial development, has the potential to provide the opportunity for residents in Hume to reduce their travel times as well as creating higher benchmarks of amenity and design standards.

The need to concentrate employment in Activity Centres to improve local employment provision is even more important when environmental and lifestyle issues (avoiding congestion and more time with family) are taken into account. It is essential that new suburban areas are developed in parallel to employment zones and that land planning in the inner parts of the region consider future employment opportunities. The priority is to ensure adequate amounts of commercial and niche industrial space rather than to build out employment opportunities by replacing them with residential space. Mixed development is far better for amenity, the environment and lifestyle choices and this kind of integrated planning will contribute to future growth and prosperity.

Table 8.3 SLA: local employment capacity

SLAs northern region	Value (%)	Score
Banyule (C) – Heidelberg	53.0	144
Banyule (C) – North	57.2	153
Darebin (C) – Northcote	39.2	105
Darebin (C) – Preston	45.2	121
Hume (C) – Broadmeadows	49.7	133
Hume (C) – Craigieburn	31.5	84
Hume (C) – Sunbury	89.8	241
Moreland (C) – Brunswick	32.2	86
Moreland (C) – Coburg	37.5	100
Moreland (C) – North	47.3	127
Nillumbik (S) – South	63.6	170
Nillumbik (S) – South-West	58.8	158
Nillumbik (S) – Balance	85.7	230
Whittlesea (C) – North	49.5	133
Whittlesea (C) – South-East	66.0	177
Whittlesea (C) – South-West	66.0	177
Yarra (C) – North	33.2	89
Yarra (C) – Richmond	30.6	82
Metropolitan North	47.3	127
Knowledge Intensive	31.0	84
Melbourne	38.2	101.4

Source: ABS Census 2006/NIEIR.

8.1.2 Employment generation ratio

This measure looks at the relative level of local employment capacity defined as the number of jobs in workplaces in the region compared to the number of people who live in the area. Strong local employment opportunities provide a significant advantage to residents through greater opportunity in employment choice and the proximity of employment.

Large differences in the local employment capacity of individual SLAs are evident. Regions with the strongest local employment are Hume–Broadmeadows, Moreland–Brunswick and the City of Yarra. The lowest values are in Nillumbik and Banyule–North because of their status as residential areas.

Given the costs of climate change and transport issues, the requirement to provide local employment will be particularly high in Whittlesea and Hume–Craigieburn, and typically those parts of the outer metropolitan north where populations are growing rapidly.

Other parts of Melbourne's North that may need to generate alternative employment to that existing now are those parts of the region where manufacturing employment is particularly high and has failed to innovate towards advanced manufacturing and integrated supply chains. The issue is highlighted by the Moreland–North score, which has lost employment and is likely to continue to attract infill residential developments.

The inner areas of Melbourne's North that have lost manufacturing employment will continue to benefit from the diffusion of the knowledge economy from the central core. Here the local employment opportunities are related to providing services to both the city core and to the region, as well as the development of knowledge economy businesses in such sectors as the media, design (including industrial design), internet based businesses, and high-tech niche manufacturing.

Other opportunities lie in building on the research and intellectual property development occurring in the inner city such as developing greater linkages with Melbourne University in biotech, medicine and engineering. These linkages will either translate to the development of specialist business services, important to the development of the outer north, or directly translate, given access to capital, to new knowledge intensive industrial activity.

The inner regions of Melbourne's North are the gateway of the knowledge economy and are extremely important in enabling the outer regions of the north to develop industries that are increasingly knowledge intensive. The development of business services for the advanced manufacturing industry will assist in integrating the inner and outer north. The new business and employment opportunities lie with companies that are not only integrated with the region but also to global supply chains (yet another gateway to future development opportunities).

The middle regions that have lost manufacturing employment may have difficulty in recreating employment because there are no obvious drivers of new employment. This reinforces the need for policy development to create a framework that encourages the further knowledge intensification of the inner and middle north. Issues include the development of appropriate land planning regimes, the development of greater amenity to attract the kinds of knowledge intensive business activity suited to the inner and middle suburbs, the appropriate level of infrastructure, including office space and telecommunications, and greater level of highly skilled and niche business services.

Nillumbik provides an interesting case in relation to the knowledge economy. Given appropriate standards of telecommunications infrastructure, not all business services or design companies need to be located in the inner parts of Melbourne's North. Nillumbik provides opportunities for knowledge workers to make a tree change. There is no reason why the provision of business services should be focused solely in the inner suburbs. Improved telecommunications pave the way for the geographic diffusion of knowledge intensive

businesses and provide an opportunity for older workers, who choose to relocate away from the inner and middle suburbs for lifestyle reasons, to continue to contribute their skills and play their part in the development of the region.

There has been a trend of improvement of retail within Melbourne's North, with retail developments in the outer parts of the region as well as a maturing of amenity and retail in many parts of the north. Retail employment will continue to play an important role in local area employment.

Table 8.4 SLA: employment generation ratio

SLAs northern region	Value (%)	Score
Banyule (C) – Heidelberg	40	214
Banyule (C) – North	20	54
Darebin (C) – Northcote	26	94
Darebin (C) – Preston	37	193
Hume (C) – Broadmeadows	55	414
Hume (C) – Craigieburn	49	336
Hume (C) – Sunbury	20	58
Moreland (C) – Brunswick	37	186
Moreland (C) – Coburg	29	116
Moreland (C) – North	11	18
Nillumbik (S) – South	25	90
Nillumbik (S) – South-West	16	34
Nillumbik (S) – Balance	17	40
Whittlesea (C) – North	33	148
Whittlesea (C) – South-East	27	99
Whittlesea (C) – South-West	27	99
Yarra (C) – North	80	500
Yarra (C) – Richmond	98	500
Metropolitan North	36	152
Melbourne	44	242

Source: ABS Census 2006/NIEIR.

8.2 | Journey to work

'Employment has improved, (there is) less trouble getting graduates to consider working in the north.'

Greg O'Brien, Emeritus Professor, La Trobe University

Table 8.5 gives the journey to work destinations. The highlighted boxes show that the greatest numbers of residents who work in the same LGA as they live in are in Hume and Whittlesea. The highest numbers of workers who live in Melbourne's North but travel to the Melbourne CBD to work are from Moreland, Yarra and Darebin.

The seven maps show the distribution of employment of residents of Melbourne's North. As well as the obvious trend of workers accessing employment in knowledge intensive regions surrounding the metropolitan core, there is a strong pattern of inner city workers choosing to work in the inner core rather than accessing employment in the outer north. This trend supports the finding that diffusion of the knowledge economy away from the city core has been slow. There is, however, another body of evidence that suggests that senior managers and some professionals working in firms in the outer parts of the region are living in the inner core and commuting out. It is noticeable from the Yarra map that the journey to work relationship of Yarra residents with Whittlesea is not strong.

The maps for Banyule, Darebin and Moreland show the importance of inner core employment for the residents of these three LGAs. The Hume map demonstrates a relatively high capture of workers locally, and lower levels of journey to work eastwards. The Whittlesea map show residents are travelling westwards to gain employment as well as to Darebin, Banyule and Melbourne's inner core. The Nillumbik map shows a strong relationship of resident employment with the inner core as well as a capture of workers locally.

Transport systems, including the Northern Ring Road and the Craigieburn Bypass, help to shape both industrial development and journey to work patterns. Changes of built form away from the traditional patterns of development such as University Hill and other more integrated employment and residential clusters will change journey to work patterns, as more knowledge workers in the outer north have the opportunity to live closer to where they work.

Table 8.5 Journey to work destinations

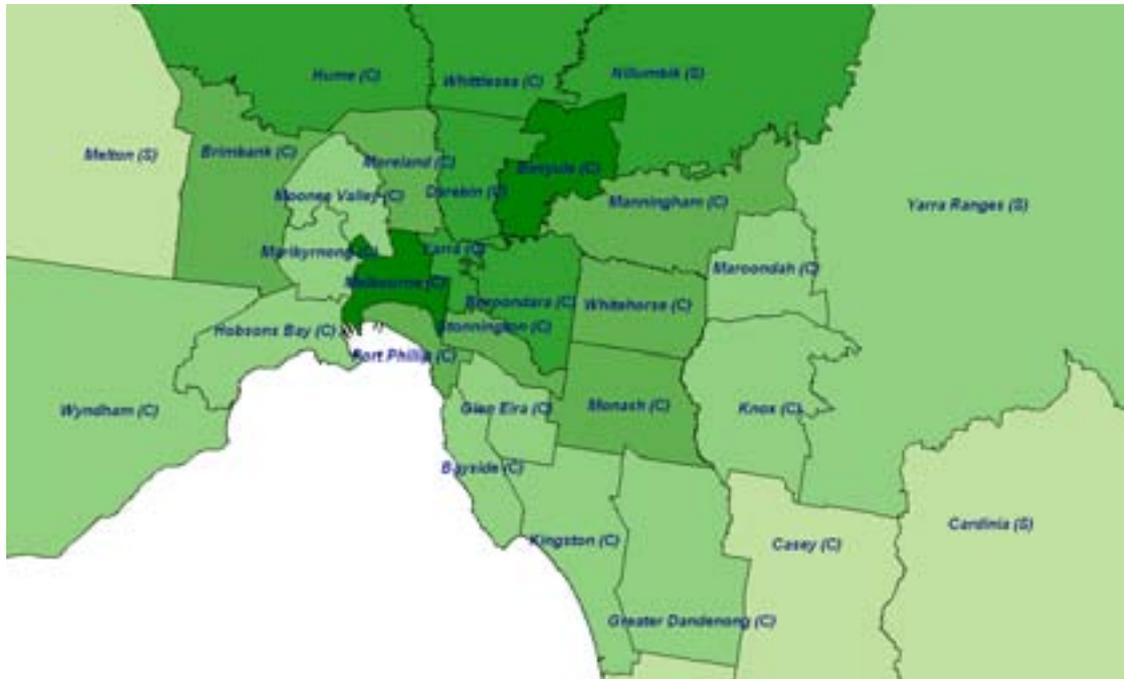
To LGA name	From Banyule (C)	From Darebin (C)	From Hume (C)	From Moreland (C)	From Nillumbik (S)	From Whittlesea (C)	From Yarra (C)
Banyule (C)	17,141	3,007	938	1,198	4,886	4,526	753
Darebin (C)	5,611	14,488	2,288	3,006	2,045	7,174	1,165
Hume (C)	2,657	2,932	27,149	5,683	1,708	6,869	549
Moreland (C)	1,423	2,766	4,035	12,907	542	2,235	697
Nillumbik (S)	2,259	302	119	136	8,943	1,078	69
Whittlesea (C)	3,759	3,168	2,929	1,335	2,711	17,670	255
Yarra (C)	3,022	5,314	1,344	3,774	1,266	2,167	10,051
Melbourne (C)	12,066	16,323	9,681	20,699	5,034	7,685	17,652
Port Phillip (C)	1,779	2,265	1,519	2,853	754	1,263	2,632
Moonee Valley (C)	695	1,059	4,019	3,274	289	973	428
Boroondara (C)	2,552	1,949	530	1,311	1,179	1,109	2,030
Brimbank (C)	741	1,039	4,124	1,961	392	1,269	352
Whitehorse (C)	1,778	1,116	306	710	1,289	738	875
Monash (C)	1,123	853	418	772	712	620	971
Maribyrnong (C)	393	727	1,406	1,471	189	512	463
Stonnington (C)	716	920	339	853	326	390	1,491
Manningham (C)	1,633	573	136	306	1,463	611	245
Hobsons Bay (C)	328	381	1,006	653	162	460	212
Wyndham (C)	300	324	1,102	585	172	514	168
Maroondah (C)	464	235	68	139	627	189	219

Table 8.5 Journey to work destinations (continued)

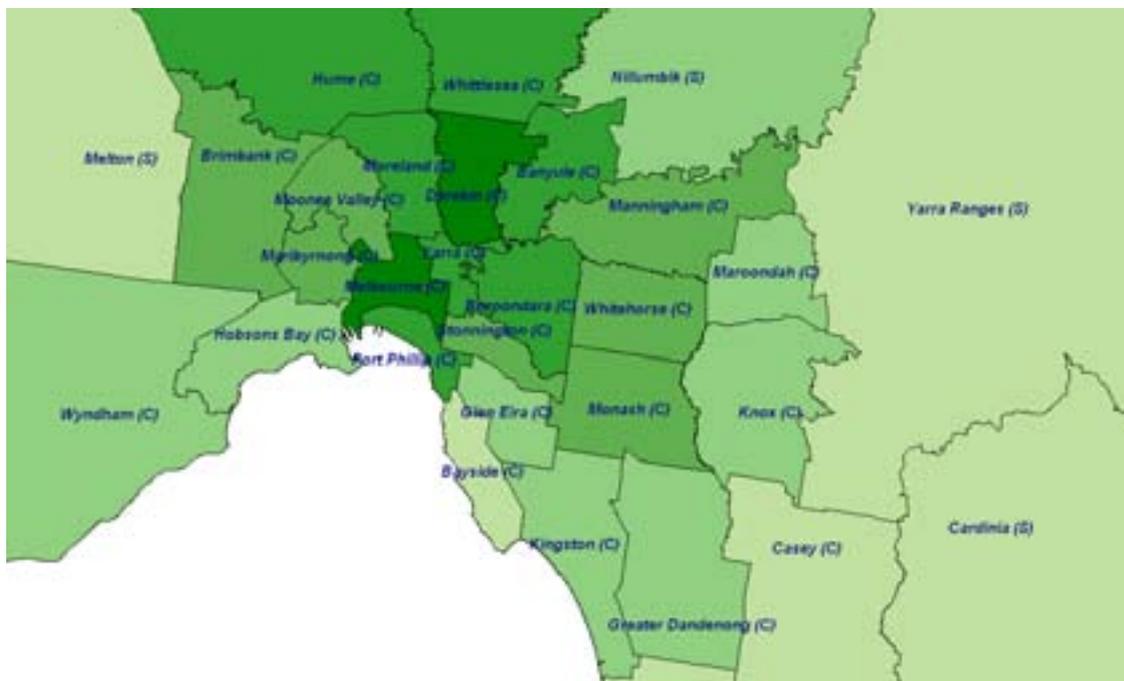
To LGA name	From Banyule (C)	From Darebin (C)	From Hume (C)	From Moreland (C)	From Nillumbik (S)	From Whittlesea (C)	From Yarra (C)
Kingston (C)	342	275	188	305	186	216	329
Knox (C)	412	251	87	208	387	182	273
Greater Dandenong (C)	283	254	198	221	234	229	325
Glen Eira (C)	216	230	98	268	90	101	352
Yarra Ranges (S)	160	86	41	69	256	68	91
Bayside (C)	118	113	83	161	39	40	186
Casey (C)	80	50	54	58	35	27	108
Frankston (C)	46	29	3	35	18	20	53
Mornington Peninsula (S)	11	34	17	34	18	13	63
Other LGA	575	570	1,887	797	363	635	545

Source: ABS Census 2006.

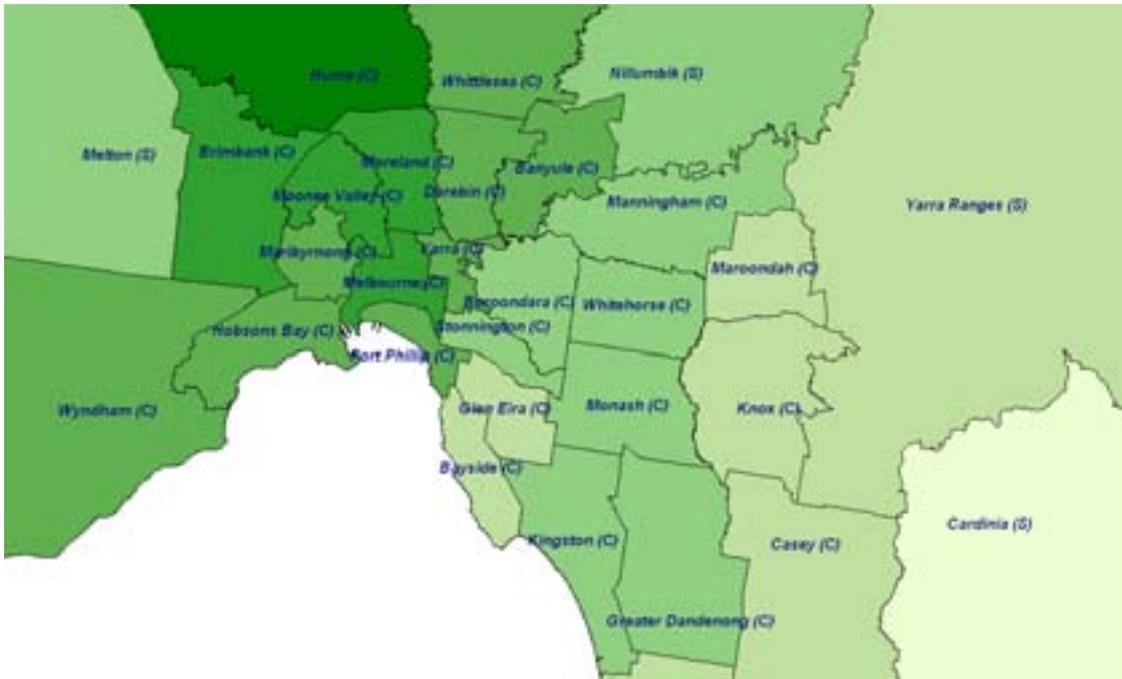
From Banyule (C)



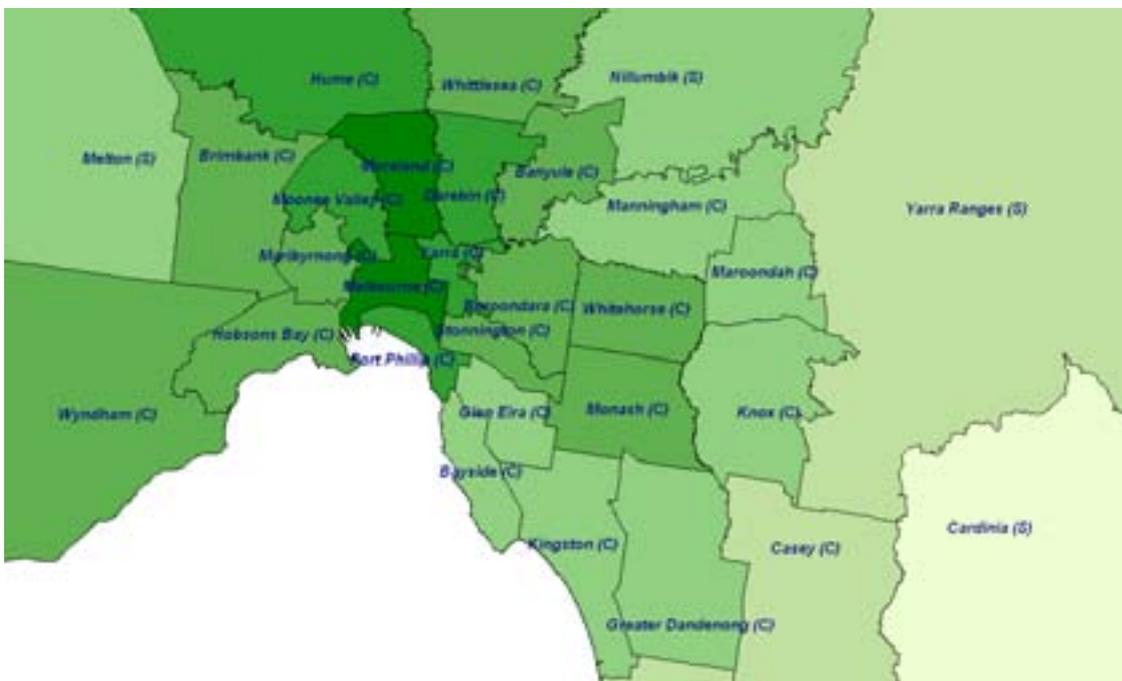
From Darebin (C)



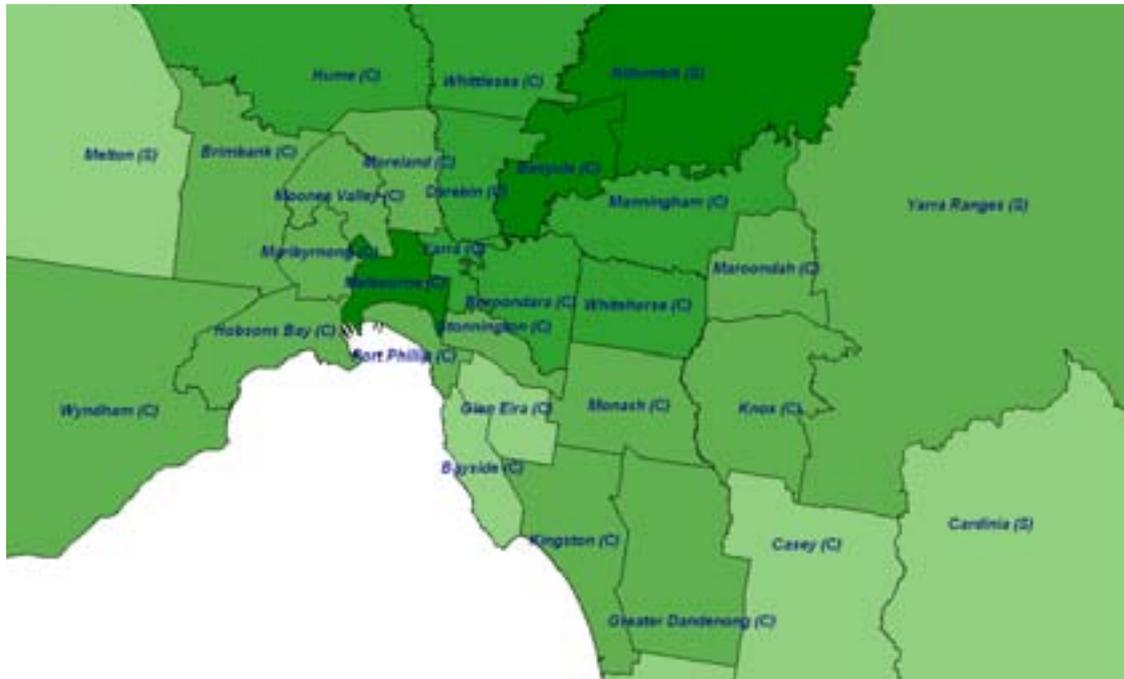
From Hume (C)



From Moreland (C)



From Nillumbik (S)



From Whittlesea (C)



From Yarra (C)



8.3 | Opportunity cost of travel

Table 8.6 provides an estimate of average journey to work travel times of residents from each SLA in Melbourne's North. While transport systems have evolved since the 2003 *Growing Melbourne's North* report, so has the city's congestion. Transport problems have worsened, with the likelihood of increased travel times for many residents living in the region.

Changes in employment patterns, extended retail hours and patterns of social activity have all contributed to the increase in the number of trips made by households. Moreland, Yarra and Darebin benefit from the proximity to high skilled employment and amenity in terms of access to entertainment, restaurants and other cultural assets. The difficulty will be for those parts of the region that have not been able to increase local employment supply, and as a result have not improved the travel times of their residents. It is likely that these regions will face the greatest falls in real income and the highest rates of unemployment.

In Table 8.6, the average two way travel times for each SLA are given and also expressed as a percentage of the average hours worked per week. The scores reflect the percentage of average weekly income that the travel time consumes.

Table 8.6 Opportunity cost of travel

SLA – Melbourne’s North	Travel minutes per day	Travel as a % of hours worked	Score
Banyule (C) – Heidelberg	46.03	10.95	115
Banyule (C) – North	65.06	15.49	73
Darebin (C) – Northcote	36.99	8.80	129
Darebin (C) – Preston	42.46	10.10	93
Hume (C) – Broadmeadows	48.43	11.53	73
Hume (C) – Craigieburn	65.20	15.52	69
Hume (C) – Sunbury	76.60	18.23	56
Moreland (C) – Brunswick	37.02	8.81	125
Moreland (C) – Coburg	40.12	9.55	110
Moreland (C) – North	50.77	12.01	75
Nillumbik (S) – South	70.18	16.71	89
Nillumbik (S) – South-West	72.57	17.28	76
Nillumbik (S) – Balance	88.33	21.03	42
Whittlesea (C) – North	90.41	21.53	24
Whittlesea (C) – South-East*	61.83	14.72	54
Whittlesea (C) – South-West*	61.83	14.72	54
Yarra (C) – North	32.17	7.65	146
Yarra (C) – Richmond	29.80	7.10	151
Knowledge Intensive			155
Melbourne – inner			168

Source: ABS Census 2006/NIEIR.

* Due to recent boundary changes, Whittlesea (C) South-East and Whittlesea (C) South-West cannot be distinguished.

8.4 | Skills

8.4.1 High skills: industry and residence by SLA

‘A lot of firms do not realise how much better they could do with higher skilled people; expectations are often low.’

Greg O’Brien, Emeritus Professor, La Trobe University

Table 8.7 compares 2006 high skilled by place of residence with the high skilled jobs available at the SLA level. The score is a ratio of the industrial and residential score which, in turn, measures the number of highly skilled jobs and residents within a given area. The table demonstrates the capacity for each SLA to supply the high skills demanded of local industry. This is not a total measure of employment but looks at high skilled employment demand from industry and the number of high skilled residents within a given SLA.

Skills deficits are the most severe in Whittlesea South-West and Broadmeadows.

Table 8.7 2006 high skilled score: SLAs

SLA	Industrial	Residential	Score
Yarra (C) – North	1.20	1.37	114
Yarra (C) – Richmond	1.15	1.28	111
Moreland (C) – Brunswick	0.99	1.24	126
Moreland (C) – Coburg	1.01	1.08	107
Moreland (C) – North	0.99	0.91	92
Banyule (C) – Heidelberg	1.17	1.19	101
Banyule (C) – North	0.96	1.08	113
Darebin (C) – Northcote	1.05	1.24	118
Darebin (C) – Preston	0.97	0.96	99
Hume (C) – Broadmeadows	0.90	0.79	87
Hume (C) – Craigieburn	0.85	0.86	101
Hume (C) – Sunbury	0.92	0.96	104
Nillumbik (S) – South	1.04	1.18	114
Nillumbik (S) – South-West	1.00	1.08	108
Nillumbik (S) – Balance	1.11	1.14	103
Whittlesea (C) – North	0.93	0.95	102
Whittlesea (C) – South-East	0.99	0.92	93
Whittlesea (C) – South-West	0.94	0.78	83

Source: ABS Census 2006/NIEIR.

8.4.2 21st century skills

‘There has been very little improvement in small engineering firms in Melbourne’s North.’

Greg O’Brien, Emeritus Professor, La Trobe University

Table 8.8 provides an analysis of the region’s capacity to connect to global knowledge and innovation flows. With a knowledge intensive economy, the flows of knowledge and learning within a region and globally are key components of improving innovation strength and regional competitiveness. The reasonable scores for the region suggest that it has the capacity to benefit from technology based innovation.

The 2003 *Growing Melbourne’s North* report described the rapid growth of global knowledge workers in the metropolitan cores of Melbourne and Sydney. The strategy for the inner north is to attract more businesses engaged in the global knowledge economy, away from the city core. Yarra has attracted publishing, design, media, businesses services and financial services businesses, to name a few, and similar growth opportunities exist for Darebin and Moreland in particular.

Melbourne’s North has achieved comparative advantage through its development of 21st century skills in local workplaces, particularly in Yarra, Darebin, Broadmeadows and Heidelberg. The average score for Melbourne is 112, with the region scoring an average of 107.

A strategy to improve regional economic integration would be to improve the 21st century skills score in those parts of the region currently lagging behind by adjusting local industry policy.

Table 8.8 21st century skills

SLAs northern region	Value (%)	Score
Banyule (C) – Heidelberg	5.30	132
Banyule (C) – North	3.32	92
Darebin (C) – Northcote	4.77	124
Darebin (C) – Preston	4.32	116
Hume (C) – Broadmeadows	4.21	114
Hume (C) – Craigieburn	2.67	71
Hume (C) – Sunbury	2.75	73
Moreland (C) – Brunswick	4.31	115
Moreland (C) – Coburg	4.11	112
Moreland (C) – North	1.98	50
Nillumbik (S) – South	4.47	119
Nillumbik (S) – South-West	3.23	89
Nillumbik (S) – Balance	3.16	87
Whittlesea (C) – North	2.63	70
Whittlesea (C) – South-West	2.91	79
Whittlesea (C) – South-East	2.91	79
Yarra (C) – North	7.95	155
Yarra (C) – Richmond	8.44	156
Metropolitan North	3.90	107
Melbourne	4.10	112

Note: The score for the workplace 21st century skills is a standardised value based on the average level of skills, with an average of 100 for Victoria as a whole.

Source: ABS Census 2006/NIEIR.

8.5 | Youth employment

8.5.1 Transition pathways to employment and tackling disadvantage

VCAL, VET and TAFE

Young people are the building blocks of the future economy. That is why education is so important to economic development, particularly in an increasingly knowledge intensive business environment. While some young people may not be suited to a professional career and academic excellence, other skills, such as in the trades, are important in building a balanced society and economy.

The transition between education and employment is the stage in development that is so critical to young peoples' lives. That is why improving partnerships and pathways between education providers, industry and the community to maximise the outcomes for young people is so important.

Pathways need signposts, and research in the region showed that practitioners believed there was one issue that needed more focus. This was the issue of getting the level and quality of careers advice during secondary education to a point where it truly becomes a cornerstone of the education process. This is a broader state issue that impacts on the region, where careers counselling is an under-resourced activity. It is worth noting that high level careers advice can also shape the range of subjects a secondary student chooses to take to maximise their own prospects in subsequent years of education and employment.

Not every student has academic potential. The success of VCAL and VET in providing alternative pathways and choices for young people, in terms of encouraging young people to take on trade based positions, has been noticeable over the period since 2001. Particularly in the outer parts of the region, taking on a trade career enhances the capacity for young people to gain local employment and to remain in their local area. There is also a longer-term pathway, as for this group there is the possibility to learn their trade, build their skills and eventually to start their own businesses.

Questions, however, must be asked. How many young people across Melbourne's North are disengaged? Are young people's pathways determined by social circumstances or location rather than ability? These questions are inherently complex to answer.

However, a number of things are plain and these include:

- the issues surrounding youth transition to employment are now better understood
- access to education can be difficult – the issues in some parts of the outer region might be that there are no secondary schools in the immediate area or that it is too hard to get to TAFE because of poor public transport arrangements; these are barriers for young people wishing to access education, particularly in the outer parts of Melbourne's North
- while the evidence shows that there are opportunities for young people to find employment in the trades, in retail and cafes, there are relatively few professional positions available to young people
- the standard of telecommunications services, in terms of quality and access to broadband services, also represents a barrier to establishing knowledge economy businesses and is a barrier to youth employment.

Progress in developing trade based opportunities has been positive. Melbourne's growth, as in-migration creates growth in services and construction, has the effect of increasing employment opportunities for the group of young people more suited to employment in the trades or related industries. It is also worth noting the importance of the construction industry, particularly as lower skilled manufacturing employment declines, as an employer of young people.

Current issues and trends

Research by the Dusseldorp Skills Forum and NIEIR points to the following general trends.

1. Of school leavers, 25 per cent attend TAFE and 30 per cent attend university.
2. The pattern of around 15 per cent of youth being not engaged in education or employment, although the figure has improved during the recent economic boom, still leaves a significant number of potentially disengaged youth.

3. Although teenage unemployment has fallen, part time work has increased. This means that many of the less skilled young are more vulnerable to casual and part time employment.
4. Overall, the proportion of young people not in employment or education has fallen. This may be partly as a result of economic boom conditions, and it is likely that the gap of disadvantage is widening.

A number of issues are worthy of consideration and discussions highlight a range of concerns.

- Breaking the cycle of disadvantage – there is potential for less academic schools to become the ‘dumping ground’ for disadvantaged youth, creating an unwillingness in these schools to open up more courses appropriate to the disadvantaged group as the ‘fear’ is more will come.
- Breaking the cycle of disadvantage – the higher a school’s academic performance and focus, the bigger the squeeze on the least advantaged.
- Breaking the cycle of disadvantage – lack of programs for the disadvantaged group at school and in a community setting confirm that disadvantage, once entrenched, has a significant long-term economic and social cost to the community; it is cheaper to help people early on. ‘*Engaged youth equals a more successful community.*’
- Breaking the cycle of disadvantage – disadvantaged youth are often further disadvantaged by the growing affluence of their communities, as this group finds it increasingly difficult to access programs. The issue in affluent areas is how schools are transitioning this group.
- Breaking the cycle of disadvantage – economic downturns have a major impact on disadvantaged youth, delaying any prospect of re-engagement.
- The Victorian State Government now requires greater accountability in relation to school performance. What happens to the disadvantaged under this scenario?
- It is probably the case that the best place for young people is at school, and disadvantaged youth are the least connected to schools. This group may only stay on if appropriate programs are offered.
- There is an issue of how policy changes at TAFE impact on the disadvantaged, if at all.
- The disadvantaged group may not have capacity to access TAFE programs and are not being catered for in school.

8.5.2 Victorian Government training reforms described

Securing Jobs for Your Future reforms are intended to deliver an extra \$316 million in extra funding for the Victorian training system over a four year period. The goal is to provide an extra 172,000 training places and increase levels of engagement with industry.

The Victorian Government state that the ‘goals are clear’. These are:

- more people undertaking training in areas where skills are needed and at higher levels where skills are needed
- a training system that engages more effectively with individuals and businesses and is easier to understand
- a skills system that is responsive to changing needs of individuals and businesses
- a culture of lifelong skills development.

The new system 'will be driven by demand'. Funding of \$139 million will be provided 'to subsidise training places available to all eligible Victorians at all levels of skills development, subject to eligibility requirements that encourage enrolments at a higher skill levels'.

An additional \$10 million will be provided in 'areas of critical skills shortages and significant labour market disadvantage'. This will provide students access to a 'limited' number of places where eligibility requirements cannot be met.

A major change in the training system will be the introduction of contestable funding, which means that the ability to provide government subsidised training will no longer be the domain of a limited number of providers.

A TAFE broadband fund has also been provided to enable a common technology platform and the delivery of e-based learning.

There are also plans to improve the business management and teaching capacity of Adult, Community and Further Education providers.

8.5.3 What does this all mean for the residents of Melbourne's North?

The issue will be the capacity for the more disadvantaged residents to access training. The outcome for the disadvantaged from the changes to the Victorian training system is unknown at this point, but concern is expressed by industry practitioners (because of pricing) about the outcomes for the most disadvantaged. The issue for disadvantaged residents will be the removal of concessions from July 2009.

8.5.4 Year 12 completers

The 2008 On Track survey data from the Australian Council for Educational Research highlights the following trends for Melbourne's North. Of those who complete year 12, 44.5 per cent attend university (similar to state average) and 18.3 per cent undertake Certificate IV or higher, four points higher than the state average. The Banyule Nillumbik Local Learning Education Network (LLEN) region reported more than 50 per cent of its year 12 completers were attending university, while 38 per cent of year 12 completers from the Hume Whittlesea LLEN region transitioned to university. Of this group, 11.3 per cent are working full time and 7.7 per cent part time, both below the state average. Compared to the state average of 3.8 per cent, 4.5 per cent are looking for work. The main occupations for year 12 completers who are not studying are sales assistants, store persons, food, hospitality and tourism, labourers, clerks and receptionists.

8.5.5 Early leavers

The main employment type for early school leavers in Melbourne's North is an apprenticeship, although this is well below the state average (33.2 per cent) at 24.9 per cent. Of this group, 22 per cent go on to work full time while 12.6 per cent are employed part time, and 17.2 per cent are looking for work, three points above the state average. Another 23.1 per cent are engaged in TAFE or other training. Main occupations of early leavers are sales assistants and store persons, food, hospitality and tourism, and labourers, factory workers and machine hands. A higher proportion of early leavers find employment in the construction industry than those who complete year 12.

The Australian Council for Educational Research 2004 longitudinal group study points to a relatively high dropout rate for apprentices – 12 per cent in non-metro and 20 per cent in metropolitan areas.

This data points to the following conclusions. Typically, the outcome for year 12 completers is more favourable than for early leavers. The educational outcomes differ across different parts of Melbourne's North and early leavers, because they tend to take up lower skilled work, are far more vulnerable, as they may not have the capacity to meet the increasing skill demands of employers and are more likely destined to part time or casual work patterns. Educational outcomes are still linked to family history and outcomes. Breaking this nexus should be a top priority for educational practitioners in Melbourne's North.

Case study: Swedish schools as an engine of social mobility, breaking the nexus of disadvantage

In the earlier part of the 20th century, like many other nations, Sweden had a system of early grading of primary school children. Selection to secondary schools was on ability. For those children who failed to make a successful transition, schooling was all but over with only one or two years of compulsory education remaining. In 1949, this meant that up to two-thirds of all children were not involved in ongoing learning. In 1950 the Swedish educational system was reformed to provide all children with nine years of compulsory education. The point of these changes was to try to address the serious issues of generational disadvantage of those children from unskilled or otherwise deprived households.

In 1950, Sweden decided on a reform designed to increase education for children from unskilled family backgrounds and to promote movement on up through the educational system. All children would have nine years of compulsory education in comprehensive schools and all children who successfully completed would qualify for secondary education. The reforms were introduced between 1950 and 1962.

UNICEF figures show that, when comparing children educated in both the old and new systems, children from unskilled or otherwise disadvantaged households who completed the compulsory nine year period were more likely to go on to higher levels of secondary and tertiary education. Earnings for this group were 6 per cent higher on average when compared to those who had been educated under the original system.

Further reforms took place in 1992 and these can be considered to be more radical than the earlier changes to Sweden's educational system. In today's system, parents are given an amount of money, roughly the equivalent of A\$12,000 per student, and this sum is used by parents to send their children to the school of their choice.

The reform made it possible for parents to send their children to any school of their choice – public or independent – without having to pay fees. Prior to the reforms, there were very few independent schools in Sweden where the law states that children have an equal right to education regardless of gender, ethnic or political background, and economic status of their families. A range of procedures are in place to ensure equity and equal conditions for independent/private and public schools throughout the country.

The system also allows parent groups and other providers to set up their own schools and this has led to the establishment of some 900 new schools in Sweden since the new policy was introduced.

As soon as new schools are accredited by the Swedish National Agency for Education, the schools receive government funding and are not allowed to charge student fees; they can, however, accept private donations.

The Swedish Teachers' Union supports the school choice policy because of the restrictions that prevent private schools from charging top-up fees or selecting students.

Sweden now has 91 per cent of 18 year olds in education compared to the United Kingdom, which has less than 60 per cent in education. Tertiary enrolments in Sweden are around 70 per cent. Although there are many pros and cons, the theory has it that Sweden's educational system now provides both equity for students and competition for providers.

8.6 | Job readiness

8.6.1 Non-job ready

The highest overall levels of structural unemployment in Melbourne's North are in Hume at 16 per cent, followed by Darebin 14.5 per cent, Moreland 14 per cent, Whittlesea 13.3 per cent, Yarra 11.1 per cent, Banyule 8 per cent and Nillumbik 3.9 per cent.

When high levels of unemployment are combined with high numbers of non-job ready individuals, households will face considerable unemployment stress and the region itself, at the local level, will find its capacity for economic growth constrained by the circumstances of its households. Typically, a region with high numbers of non-job ready will find it difficult to fund self-education and invest in new employment opportunities.

Table 8.9 details the level of dependency of residents of Melbourne's North to government supported income. Non-job ready rates tend to be hard to influence, as individuals find themselves caught in a cycle of disadvantage that begins with family circumstances and educational outcomes, which play such an important role in determining future transition pathways to employment.

The report *Skill shortages and future skill requirements for the labour force in Victoria*, prepared by RMIT University, Kangan Batman TAFE, Box Hill Institute and Chisholm Institute, October 2007, includes the following findings:

- the importance of having a set of key generic skills across all sectors
- the ability to further tune skills sets and acquire new skills throughout working life
- portability of skills within an industry and across sectors
- employability skills of the future are drawn from a generic skill list with variations based on specialisation, differentiation and the recognition of being part of a local yet globalised labour market.

Various studies will highlight the non-job readiness of individuals, beginning with basic skills such as communication to customers and to work colleagues, negotiation skills and basic ICT skills. In times of economic boom, the non-job ready may find employment but, typically, being non-job ready means that as employer skill demands increase, the likelihood of finding meaningful and sustainable employment is bleak.

The parts of the region that have high levels of non-job readiness are influenced by the location of public housing, which tends to concentrate unemployment, intergenerational dependency or the cycle of disadvantage, and concentrations of low skilled workers. The land boom and the increasing cost of housing will tend to displace the low skilled in the longer term. Moving low skilled people is, however, not the long-term solution and historically, in terms of internal migration patterns, at least some of Melbourne's North has proved attractive to the low skilled because of the availability of affordable housing.

Comparing different parts of Melbourne's North, Nillumbik has a low non-job ready rate, at 4 per cent, while Broadmeadows has a high rate of 19 per cent. The region continues to have a higher non-job ready rate at 11.7 per cent compared to the Melbourne average of around 9 per cent.

Table 8.9 Non-job ready rate

SLA northern region	Value (%)	Score
Banyule (C) – Heidelberg	8.9	115
Banyule (C) – North	7.2	127
Darebin (C) – Northcote	14.3	77
Darebin (C) – Preston	17.0	57
Hume (C) – Broadmeadows	19.8	37
Hume (C) – Craigieburn	8.5	118
Hume (C) – Sunbury	7.1	128
Moreland (C) – Brunswick	16.5	61
Moreland (C) – Coburg	13.8	80
Moreland (C) – North	14.7	74
Nillumbik (S) – South	3.7	152
Nillumbik (S) – South-West	4.5	147
Nillumbik (S) – Balance	4.1	150
Whittlesea (C) – North	6.3	133
Whittlesea (C) – South-East	13.3	83
Whittlesea (C) – South-West		
Yarra (C) – North	15.0	71
Yarra (C) – Richmond	12.6	88
Metropolitan North	11.9	93.2
Melbourne	9.6	107.6

Note: The non-job ready score is directly based on the percentage of non-job ready. The score is equal to 179 minus 714 times the non-job ready value (expressed as a decimal). This provides an average score of 100 for Victoria as a whole.

Source: ABS Census 2006/NIEIR.

8.7 | Resident social security trends

8.7.1 Households and social security

Social security payments continue to provide the major source of income for many households and, indeed, some regions. From 2006 to 2008, the buoyancy of employment reduced the need for social security payments, and incomes from this source were also reduced by the Australian Government policy of tightening eligibility conditions. Social security payments per capita are lowest in Knowledge Intensive regions and highest in Lifestyle regions. The decline in social security payments was most rapid in the Knowledge Intensive regions.

	2000	2003	2006	2007	2008	Annual growth (%)		
						2000–2003	2003–2006	2006–2008
Knowledge Intensive	11.4	11.8	11.1	10.6	9.9	0.9	–2.0	–5.4
Lifestyle	24.2	24.2	24.2	24.0	23.4	0.1	0.0	–1.6
Dispersed Metro	14.7	15.5	15.5	15.0	14.6	1.8	0.0	–3.0
Independent Cities	17.6	18.5	18.0	17.8	17.9	1.7	–1.0	–0.2
Resource Based	14.9	16.6	15.7	16.1	18.5	3.9	–1.9	8.7
Rural	17.5	18.1	17.8	18.4	19.6	1.1	–0.6	4.9
National	14.9	15.5	15.2	14.9	14.7	1.5	–0.8	–1.7

Source: ATO Taxation Statistics/NIEIR.

Melbourne's North has followed similar patterns to national trends in the decline of the numbers of social security recipients. Unemployment hotspots in the region continue to be Hume (C) – Broadmeadows, where the percentage of those on unemployment benefits fell from 8.9 per cent in 2003 to 7.9 per cent in 2006, while those on disability support pensions rose from 9.8 per cent in 2003 to 10.6 per cent in 2006, offsetting any decline in unemployment benefits. In 2006, Darebin (C) – Preston, Moreland (C) – North and Yarra (C) – North all had levels of unemployment benefits above 4.6 per cent but all had declined since 2003. These parts of the region are likely to be the most vulnerable in an economic downturn because of the numbers of relatively low skilled workers and casualisation of employment.

The region's average rate of unemployment benefits in 2006 was 3.7 per cent, higher than the Melbourne average of just 3 per cent. Student youth allowance rates also fell as a result of eligibility criteria and the improved economic circumstances of some parents during buoyant economic conditions. The only place student youth allowance rates actually rose between 2003 and 2006 was Hume (C) Broadmeadows. In each of the four benefit categories shown in Table 8.11, rates in Melbourne's North were higher than the Melbourne average.

Table 8.11 Benefits recipients per cent of population 15–64 years

SLA	Unemployment Benefits		Student Youth Allowance		Disability Support Pension		Parenting Payment Single	
	2003	2008	2003	2008	2003	2008	2003	2008
Banyule (C) – Heidelberg	3.5	2.7	2.5	2.2	4.8	5.0	2.9	2.2
Banyule (C) – North	2.8	2.2	2.6	2.3	4.0	4.1	2.5	2.0
Darebin (C) – Northcote	6.0	3.7	2.9	2.6	6.3	5.7	2.0	1.5
Darebin (C) – Preston	6.7	4.9	3.3	2.7	8.4	7.8	3.8	2.7
Hume (C) – Broadmeadows	8.9	7.9	4.4	4.6	9.8	10.6	5.3	4.4
Hume (C) – Craigieburn	4.2	2.8	2.6	2.3	4.1	4.0	3.6	2.6
Hume (C) – Sunbury	2.9	2.4	2.1	1.8	3.3	3.5	3.2	2.7
Moreland (C) – Brunswick	7.0	3.9	4.2	3.4	6.4	5.6	1.8	1.2
Moreland (C) – Coburg	5.8	3.8	3.0	2.6	7.1	6.6	2.7	2.0
Moreland (C) – North	6.1	4.6	3.0	2.7	7.9	7.6	3.8	2.9
Nillumbik (S) – South	1.7	1.2	1.9	1.4	1.7	1.8	1.6	1.3
Nillumbik (S) – South-West	1.7	1.2	1.9	1.5	2.2	2.2	2.1	1.3
Nillumbik (S) – Balance	3.1	2.1	1.8	1.5	2.9	3.5	2.3	2.4
Whittlesea (C) – North	4.6	2.9	3.0	2.7	6.8	6.6	3.4	2.7
Whittlesea (C) – South-East	4.6	2.9	3.0	2.7	6.8	6.6	3.4	2.7
Whittlesea (C) – South-West	4.6	2.9	3.0	2.7	6.8	6.6	3.4	2.7
Yarra (C) – North	7.3	4.6	3.8	3.2	5.5	5.4	2.4	1.8
Metropolitan North	5.2	3.7	3.1	2.7	6.1	5.9	3.1	2.4
Melbourne	4.2	3.0	2.6	2.1	4.6	4.5	2.9	2.2

Source: ATO Taxation Statistics/NIEIR.

8.8 | Power employment

Power employment is employment that can be characterised as well paid, full time, probably increasingly knowledge based and in good supply. Power employment is important because it provides an offset to worrying trends in employment such as the casualisation of the workforce, particularly for the lowest skilled, and the equitable distribution of employment.

Table 8.12 Power employment occupations

Project and program administrators	Real estate associate professionals
Hotel, motel and club managers	Customer service managers
Transport company managers	Ambulance officers and paramedics
Safety inspectors	General mechanical engineering tradespersons
Metal fitters and machinists, toolmakers	Aircraft maintenance engineers
Structural steel and welding tradespersons	Electricians
Refrigeration and air-conditioning mechanics	Electrical distribution tradespersons
Communications tradespersons	Carpentry and joinery tradespersons
Fibrous plasterers, bricklayers and floor finishers	Concreters
Plumbers	Printing machinists and small offset printers
Fire fighters	Chemical, petroleum and gas plant operators
Insurance investigators, loss adjusters and agents	Transport and despatching clerks
Sales representatives	Motor vehicle and related products salespersons
Prison officers	Intermediate plant operators
Mobile construction plant operators	Crane, hoist and lift operators
Engineering production systems workers	Intermediate stationary plant operators
Truck drivers	Train drivers and assistants
Structural steel construction workers	

Source: NIEIR.

Power employment in the region will rise with the development of its knowledge intensity, because knowledge based and globally connected jobs have a greater capacity to provide well paid and secure employment.

9 Melbourne's North: The manufacturing industry

Findings

1. Resident skills sets in Melbourne's North provide an opportunity to develop advanced manufacturing and environmental sector businesses.
2. There are opportunities for further growth of food processing and integration of business development with the Melbourne Wholesale Fruit and Vegetable Market when this relocates.
3. The likelihood of further restructuring of the automotive industry will require an innovative approach by suppliers to adapt to changing opportunities, particularly opportunities created by the Green Car Fund.
4. There is the possibility of growth of green jobs in advanced manufacturing.
5. There are a range of advanced manufacturing opportunities, which are described in this chapter.

9.1 | Manufacturing

The debate about the value of a sustained manufacturing industry in Australia has continued over the last 25 years, as manufacturing has declined and basic manufactures have moved offshore. It is, however, important to recognise that manufacturing, particularly advanced manufacturing, has a strategic role in the region's economy. Manufacturing matters because of its contribution as a driver of economic development, as the industry needs high rates of technological change and innovation to ensure ongoing competitiveness.

The Victorian Government's November 2008 manufacturing statement includes a transition fund of \$50 million to allow manufacturers to restructure their existing operations and move into new markets as well as setting local content targets for the State Government's purchase of trains. The complete manufacturing package of \$245 million over a four-year period includes some 'repackaging' of existing projects.

Current Victorian Government policy encourages manufacturing through its stated goals of driving innovation and growth in the sector by:

- accelerated innovation
- growing exports
- championing manufacturing to increase the recruitment and retention of talent and lift community and financial sector support
- creating high-performance workplaces
- building skills by strengthening commitment and infrastructure for education, training and skills
- attracting investment in research, development and other forms of innovation
- creating environmentally sustainable manufacturing and pursuing environmentally sustainable practices to build goodwill, boost competitiveness and open up new markets.

9.1.1 The economic significance of an advanced manufacturing industry to Melbourne's North

For many manufacturing firms, the additional cost per worker as the cost of carbon is priced into the economy will create further pressure on manufacturing companies to increase productivity and intellectual property development, integrate supply chains and achieve higher levels of advanced manufacturing and value adding. Carbon pricing is likely to reduce the sustainability of firms that do not adapt to the new cost structures.

Leading edge industries, such as the motor vehicle industry and the food processing industry, play a key role in the economy by generally being the first industries to adopt new technologies into an economy. Because of the relatively small scale of the manufacturing industry in Australia, many of these new technologies may be imported as they form part of new manufacturing equipment or production lines, designed and manufactured elsewhere.

What is important about the manufacturing industry in Australia and in the region, however, is that to employ these new technologies efficiently, new and more advanced skills are required. In a region with an advanced manufacturing industry, there is likely to be an ongoing upskilling of the working population.

As manufacturing becomes more advanced, supply chains also become increasingly integrated, both at the local level, with the outsourcing of sp

ecialist tasks to local suppliers, and at the national and international level. Automotive manufacturing is an example.

Advanced manufacturing businesses also drive the diffusion of technological change into the wider manufacturing sector and the general economy. These businesses, as the automotive industry has done in the northern metropolitan region, create the benchmarks, skills and expertise, which then (via labour churn and knowledge diffusion) enable other industries to adopt leading edge technologies.

Higher levels of advanced manufacturing require a more skilled and larger service industry, so the benefits of manufacturing flow out into the broader economy.

9.2 | Manufacturing industries growing employment

9.2.1 Food processing

After a period of decline, employment in food, beverage and tobacco manufacturing in the region has increased since 2001. Table 9.1 shows growth in the food manufacturing/processing industry has been particularly strong in Whittlesea, adding 644 jobs since 2001. Food processing activities have the capacity to further integrate supply chain activity between Hume and Whittlesea. Yarra has seen a significant decline in the industry as manufacturing firms have relocated away from Melbourne's inner core.

The opportunity to develop the food processing industry is likely to increase because of the relocation of the Wholesale Market to Whittlesea. The LGA is well placed to grow the industry further and develop closer integration with Hume and its manufacturing and distribution services, as well as the inner north for specialist business services.

Table 9.1 Manufacturing employment: food, beverage and tobacco manufacturing

Industry	1991	1996	2001	2006
Banyule (C)	354	356	168	309
Darebin (C)	736	820	568	652
Hume (C)	1,745	1,947	1,673	1,461
Moreland (C)	915	845	833	1,008
Nillumbik (S)	131	135	41	46
Whittlesea (C)	474	700	701	1,345
Yarra (C)	2,367	1,767	1,350	1,224
Total	6,723	6,570	5,335	6,044

Source: ABS Census/NIEIR.

9.2.2 Manufacturing – printing, publishing and recorded media

New technologies provide opportunities for vertical integration and niche manufacturing in the industry. Smaller high-tech manufacturing firms are well suited to inner and middle north locations. There are likely to be increasing opportunities for the development of media related businesses as the industry, particularly news and related advertising, undergoes restructuring. The opportunity is for the development of new entrepreneurial firms in the inner and middle parts of the region and the consolidation of larger scale manufacturing operations in Whittlesea and Hume. Employment has grown most strongly in this industry group in Hume. Recorded media is also important, as firms providing recorded media will be able to take advantage of technological change and the move to recorded media in educational settings. This industry group has a good spread of businesses across the region; only employment in Yarra in this sector has declined as manufacturing firms move out.

Table 9.2 Manufacturing employment: printing, publishing and recorded media

Industry	1991	1996	2001	2006
Banyule (C)	236	359	388	613
Darebin (C)	674	940	779	875
Hume (C)	455	518	594	1,448
Moreland (C)	737	467	432	550
Nillumbik (S)	101	44	61	112
Whittlesea (C)	189	205	231	350
Yarra (C)	1,553	1,378	1,468	1,299
Total	3,945	3,911	3,953	5,247

Source: ABS Census/NIEIR.

9.2.3 Manufacturing industries at risk or in decline

Table 9.3 Manufacturing employment: textile, clothing, footwear and leather manufacturing				
Industry	1991	1996	2001	2006
Banyule (C)	292	368	348	290
Darebin (C)	2,879	2,671	1,625	845
Hume (C)	1,470	1,199	1,171	987
Moreland (C)	5,124	3,777	2,170	1,033
Nillumbik (S)	85	58	70	54
Whittlesea (C)	1,405	1,478	1,224	617
Yarra (C)	5,063	4,845	2,575	1,298
Total	16,318	14,396	9,184	5,125

Source: ABS Census/NIEIR.

Table 9.4 Manufacturing employment: wood and paper product manufacturing				
Industry	1991	1996	2001	2006
Banyule (C)	534	404	444	236
Darebin (C)	1,184	1,256	941	802
Hume (C)	965	1,046	1,327	1,534
Moreland (C)	572	374	493	266
Nillumbik (S)	45	34	47	51
Whittlesea (C)	432	648	749	421
Yarra (C)	656	525	427	333
Total	4,388	4,287	4,427	3,643

Source: ABS Census/NIEIR.

Table 9.5 Manufacturing employment: petroleum, coal, chemical and associated product manufacturing				
Industry	1991	1996	2001	2006
Banyule (C)	385	468	557	212
Darebin (C)	1,410	1,743	1,658	913
Hume (C)	1,189	4,023	3,617	2,574
Moreland (C)	391	642	506	862
Nillumbik (S)	135	13	75	50
Whittlesea (C)	1,973	1,626	1,750	810
Yarra (C)	769	588	488	281
Total	6,253	9,104	8,651	5,703

Source: ABS Census/NIEIR.

Table 9.6 Manufacturing employment: metal product manufacturing

Industry	1991	1996	2001	2006
Banyule (C)	925	1,327	832	853
Darebin (C)	1,407	1,420	1,046	920
Hume (C)	1,354	1,736	1,979	2,260
Moreland (C)	1,876	1,043	841	797
Nillumbik (S)	176	155	196	61
Whittlesea (C)	879	1,744	1,191	1,475
Yarra (C)	1,354	900	396	294
Total	7,970	8,325	6,481	6,659

Source: ABS Census/NIEIR.

Table 9.7 Manufacturing employment: machinery and equipment manufacturing

Industry	1991	1996	2001	2006
Banyule (C)	2,099	1,720	1,704	1,006
Darebin (C)	4,087	2,929	1,879	1,254
Hume (C)	10,869	10,085	13,105	8,993
Moreland (C)	3,113	2,818	2,387	780
Nillumbik (S)	398	203	339	143
Whittlesea (C)	1,675	1,774	2,282	1,667
Yarra (C)	2,120	1,382	1,155	763
Total	24,361	20,912	22,852	14,606

Source: ABS Census/NIEIR.

Table 9.8 Manufacturing employment: other manufacturing

Industry	1991	1996	2001	2006
Banyule (C)	342	380	402	294
Darebin (C)	1,005	864	876	1,076
Hume (C)	547	711	1,068	1,141
Moreland (C)	618	643	652	524
Nillumbik (S)	136	75	166	203
Whittlesea (C)	717	1,163	1,282	886
Yarra (C)	526	659	672	503
Total	3,891	4,497	5,119	4,626

Source: ABS Census/NIEIR.

9.2.4 The automotive industry

In its 2001–2011 automotive industry strategic plan, the Victorian Government identified the main challenges to the industry as:

- confronting global rationalisation and increased global competition
- the need to continue to take advantage of technological change to increase efficiency and customer service
- environmental issues, particularly relating to greenhouse gas emissions impacting on ability to export.

These three challenges will need to be met by increasing knowledge intensity within the industry, covering such things as design innovation in material and energy efficiency and an improved understanding of customers' needs and export opportunities, against longer-term scenarios.

The analysis of the automotive sector has been prepared for NIEIR by Richard Johns, Australian Automotive Intelligence.

9.2.5 Automotive industry in Melbourne's North

The region contains a relatively large slice of Australia's light vehicle manufacturing industry, with:

- Ford Motor Company of Australia, the maker of the Ford Falcon and Territory, which is scheduled to add assembly of the Focus small car in 2011
- a solid and representative slice of automotive components manufacturers, including the 16 listed in Table 9.9.

In addition, three vehicle importers are also based in the region – Scania with its heavy buses and trucks, Honda with its cars and SUVs plus the motorcycle and power equipment operation on a separate site, and Porsche Cars Australia on the northern edge of the CBD.

Furthermore, Caterpillar Australia is based at Tullamarine, with its major Australian activities of earthmoving and mining equipment and parts, including some manufacturing, at a large site in Moreland. The Cat Logistics operation distributes parts and accessories for a number of car makers from two other sites in Tullamarine (in Hume).

9.2.6 Background on automotive manufacturing

The automotive manufacturing industry in Australia has been under some stress in recent years, principally because of:

- a strong Australian dollar making imported cars and light trucks cheaper than before while damaging the profitability of Australian automotive exports
- the major rise in oil and thus fuel prices, making the large Australian cars less popular with buyers.

A further and more recent negative has been the precarious financial positions of the three United States car corporations – Chrysler, Ford and General Motors – two of which are the parent companies of Ford and GM Holden.

The withdrawal of just one of the three current car companies from Australia would jeopardise the survival of all three, because the removal of any of the companies from local production would lead to the exit of a number of component companies with impact on the remaining car companies.

Table 9.9 Automotive manufacturing and distribution: key automotive companies

Company	Address	Council	Employment
Ford Motor Company of Australia	1765 Sydney Road Campbellfield 3061	Hume	3500 (a)
Ford Performance Vehicles Pty Ltd	35 Glenbarry Road Campbellfield 3061	Hume	
Major automotive component and specialised service companies			
A. N. Cooke Manufacturing Co Pty Ltd (Staetite Fasteners)	53–55 Sheehan Road West Heidelberg 3081	Banyule	50*
Autocaps (AUST) Pty Ltd	4–10 Hillwin Street Reservoir 3073	Darebin	62*
Autoliv Australia	1521 Hume Highway Campbellfield 3061	Hume	270*
Bostik Australia	51–71 High Street Thomastown 3074	Whittlesea	332*
CMI Industrial Pty Ltd	76–106 National Blvd Campbellfield 3061	Hume	
CVP Australia Pty Ltd	8 Adrian Road Campbellfield 3061	Hume	
Continental	2 Scholar Drive Bundoora 3083	Whittlesea	300
Diver Consolidated Industries	96–108 Newlands Road Reservoir 3073	Darebin	200#
Dolphin Product Pty Ltd	600 Waterdale Road Heidelberg West 3081	Banyule	
Futuris Automotive Group	1733 Sydney Road Campbellfield 3061	Hume	
Kennon (part of the Nylex Group)	32–46 Chifley Drive Preston 3072	Darebin	
National Springs & Wire Products	15–19 Glenbarry Road Campbellfield 3061	Hume	
Plexicor	235 Barry Road Campbellfield 3061	Hume	200
SWS Australia	23 Scanlon Drive Epping 3076	Whittlesea	75
Trident Plastics	104–118 Link Drive Campbellfield 3061	Hume	
Tyco Electronics, Automotive Division	421 Victoria Road Brunswick 3056	Moreland	
Venture Asia Pacific	1741 Sydney Road Campbellfield 3061	Hume	600#

Table 9.9 Automotive manufacturing and distribution: key automotive companies (continued)

Company	Address	Council	Employment
Automotive importers and distributors			
Scania Australia	212–216 Northbourne Road Campbellfield 3061	Hume	270
Honda Australia	95 Sharps Road Tullamarine 3043	Moreland	350 (combined)
Honda MPE	1954–1956 Hume Hwy Campbellfield 3061	Hume	
Porsche Cars Australia	109–111 Victoria Parade Collingwood 3066	Yarra	120
Cat Logistics – Automotive Division of Caterpillar Australia	Link and Anandale Roads Tullamarine 3043	Hume	60 (combined)

Notes re employment data:

Where possible estimates of employment have been included in the above table, the following notes refer to this data:

* FAPM Directory 2008.

Australian Automotive Intelligence estimate based on company annual reports and other data sources.

(a) nationwide employment, with about 67 per cent in Campbellfield.

(b) some companies such as CMI Industrial and Futuris Automotive Group operate over several sites and data is not readily available for the plants specified.

There must inherently be some uncertainty about the future of the Australian automotive industry and, from an Australian perspective, Ford is generally seen as in the weakest position. However, the conclusion of a rescue package in the United States for GM and Chrysler, the better cash position of Ford than its competitors and what can only be described as a relatively generous new policy package for the Australian industry increases the chance of the Australian industry surviving the current problems.

Significant further recent developments are the dramatic fall in the value of the AUD, especially against the Yen, and the fall in the price of oil. The currency change will slow the trend to offshore sourcing of components and more arguably reverse some decisions already made, while making imported cars less competitive in price against locally made models. The lower oil price will help the local large cars to gradually regain some popularity among local buyers, especially in the used car market where purchases of near new cars by private buyers underpin the buying of new cars by fleets.

Employment in the Australian automotive industry has been declining:

- on a long-term trend but more recently with the fall in production since 2004
- with cost pressures forcing efficiency improvements
- a number of component manufacturers closing in Australia as significant sourcing shifts offshore.

9.2.7 Likely developments in technology

It is difficult to predict how much will change in terms of the manufacturing technology for cars and their parts over the foreseeable future in Australia. It is clear that demands for lower fuel consumption and emissions will cause significant and progressive change in the design and manufacture of vehicle sub-assemblies and perhaps of the body structure but, at least initially, such assemblies may be imported.

The two key thrusts will be:

- developments in power-train to improve energy efficiency and reduce emissions, including the use of alternative fuels and electric drive-trains
- reductions in weight of body and components.

These types of development will make certain components, their materials and/or manufacturing technology obsolete and so threaten the survival of some suppliers. Conversely, the changes will provide opportunities for growth or adaptation by some suppliers and emergence of new suppliers.

In its automotive industry policy announced in late 2008, the Australian Government committed up to \$1.3 billion to its Green Car Fund. This fund will assist companies in the development of lower emission vehicles and component companies in development of new technology and reduced weight components.

9.2.8 Employment and skills

While car production has fallen and some component production has been lost, the automotive manufacturing industry remains a major employer. About 50,000 people are employed directly in the manufacture of light vehicles and their components nationally and many more are indirectly employed by the industry in raw materials, logistics and other services.

In the region, Ford is the biggest single employer, currently with about 3,500 employees at Campbellfield and in excess of 2,000 at the 16 component makers identified in Table 9.9.

Ford operations include a wide range of engineering and design activities, partly for the local vehicles and partly under contract to Ford affiliates throughout the world. Management, marketing, and export and import administration are also centred at Campbellfield.

Ford has the reputation of being a high quality and sought after employer of engineering and business graduates as well as of skilled trades and technicians.

While Ford has reduced employment markedly in recent years, the additional assembly of the small Ford Focus to production in 2011 will lift production line employment and this may be bolstered by higher Falcon and Territory volumes if oil prices are contained and the Australian currency remains relatively weak.

The component companies are also significant employers of people with engineering and manufacturing management skills as well as technicians.

Other companies support the industry with specialised services – such as Campbellfield based CVP Australia – while still others provide tooling, manufacturing engineering and other services.

The thrust for the industry to improve its competitiveness and export performance will result in further consolidation in the component industry and scaling up of remaining manufacturers.

This will inevitably lead to more capital intensive operations and the need for greater emphasis on professional engineers and manufacturing managers as well as business related professionals and increased reliance on skilled technicians – in effect, consolidation and rationalisation is likely to increase the need for more highly skilled and professional employment and reduce the opportunities for the low and unskilled.

Changing technology in vehicles will provide opportunities for universities, engineers, scientists and technicians to participate in development of new products, components and assemblies from lightweight materials and new manufacturing technology.

Importers such as Honda and Scania are also significant employers. Much of this employment is of graduates and high level technicians who are generally well paid by manufacturing industry standards.

Overall, there is likely to be a significant number employed by the automotive industry into the foreseeable future. Experience shows cyclical ups and downs around a gradual long-term decline and this pattern is likely to continue, with attrition likely to be more severe among the lower paid and unskilled.

9.2.9 Dealership and retail activity

Melbourne's North

There are a number of clusters of car dealerships in Melbourne's North. The key clusters appear to be:

- Bundoora – on and in the vicinity of Grimshaw Street
- Coburg and Campbellfield – Hume Highway
- Heidelberg – on and near Bell Street and Banksia Street.

The dealerships in the North tend to represent the mass brands such as Holden, Ford, Toyota, Nissan, Mazda and Hyundai, while European and luxury marques, such as Mercedes-Benz, Volkswagen, BMW, Audi, Peugeot and Alfa Romeo, are largely absent.

In addition to these there is a developing cluster at Essendon Fields (Essendon Airport) – just outside the seven LGAs included in the study – where AutoCentro includes dealerships for five car companies.

Background on car dealerships

Car dealerships and associated service facilities have tended to be widespread. Like many businesses, they have increasingly clustered where regulations and layout have allowed this to happen. The Essendon Fields development is different in that the cluster was planned and developed as a 'campus' of automotive dealerships and includes a pre-delivery and storage building for all dealerships.

Some of the trends in dealerships are as follows:

- established vehicle manufacturers are aiming for fewer dealerships, with smaller ones disappearing or becoming agencies for larger dealers; this is especially so in rural areas, but dealership closures have also occurred in metro areas
- the number of dealerships in inner suburban areas has diminished, typically replaced by more expansive but fewer dealerships in middle to outer suburbs; it can be expected that this trend will continue and new dealerships and/or coordinated developments will occur in expanding outer areas
- acquisition of additional franchises has been common with the entry, re-entry and expansion of makers leading to major brand franchisees acquiring additional franchises, and usually locating them in adjoining or proximate sites and with common service facilities for all the marques – this tends to reinforce the clustering
- large dealer conglomerates have been emerging, such as the Perth based AHG, AP Eagers (Brisbane), Suttons Group (Sydney), Adtrans (Adelaide), Commercial Motor Vehicles (Adelaide) and Inchcape Automotive Retail (Sydney); to varying degrees these companies are represented across Australia and have sales revenue ranging from \$0.5 billion to \$2.3 billion
- Victorian based companies Bayford, Preston Motors, Barloworld, Stilwell Motor Group, Penfolds and Patterson Cheney all have five or more dealerships in Melbourne and a degree of co-location
- the conglomerates tend to develop more formal and centralised management structures that are not directly involved in the day to day running of the dealerships
- conglomerates also have common service and logistics facilities for the marques they sell in a locale; this not only provides economies through reduced duplication of facilities and staffing, but also justifies the complex equipment that is increasingly demanded by technical advances.

Likely developments

The implications of these developments for a specific area are:

- there will be fewer stand-alone dealerships – dealerships outside a cluster will diminish in number
- further concentration will occur in some clusters, but other clusters will decline
- new developments will tend to occur in or near rapidly developing areas where there is space for what is typically a property hungry activity; some developments are already underway in Whittlesea
- authorities could possibly nurture the development of integrated centres, such as Essendon Fields, through zoning and more proactive means.

Employment and skills

From an employment perspective, the changing profile of dealerships will impact on career structures and skills required:

- in the technical area, the complexity of car technology and servicing is resulting in demands for added skills for traditional automotive mechanics and electricians, as well as skill upgrading for other operators

- the structure of dealer conglomerates means they offer career advancement from a specific dealership to other dealerships and into corporate management, with specialist and centralised roles in corporate management that could not be supported in an individual dealership
- within dealerships, the demand for sales, marketing and management skills is increasing and a greater degree of professionalism sought; this can be expected to result in dealerships increasingly seeking diploma and graduate staff.

Other automotive industry activities

The changing technology of the car and commercial pressures are likely to accelerate some of the existing trends in the industry. These factors include longer periods between service for vehicles, the need for expensive diagnostic equipment and the wider range of skills required by mechanics and technicians.

Outside the authorised dealership networks, the impact will partly differ from those within the dealership networks:

- standalone small workshops will continue to decline
- well-financed service chains and franchises may expand their range of activities and grow, as an alternative to the dealership service operations
- the future of specialised chains and franchises such as brakes and tyres is more open to question, although some could find their way into integrated clusters (such as a tyre outlet servicing all dealerships within a 'campus'); customers increasingly expect 'one stop shop' services rather than dealing with each requirement individually
- smash repair services are increasingly concentrating into fewer and larger operations because of the cost of technology and the pressure from insurance companies for greater efficiencies, higher quality and lower costs.

The implications of these trends will generally be fewer such businesses, except in areas of growing population, and probably lower overall employment. However:

- there will still be a need for an increase in the skill levels of both qualified technicians and other operatives
- so far as these businesses are corporatised, and many such as tyres and servicing are already company stores or franchised, professional marketing and management skills will be more in demand and longer-term career opportunities will present themselves.

9.2.10 Green jobs in the advanced manufacturing industry

The manufacturing industry in the region will now have to deal with the impact of climate change costs by improving efficiency and innovation. The advanced manufacturing sector will also have opportunities to develop new products for the environmental protection market, including such things as renewable energy equipment production, advanced building insulation and ventilation products, and measuring and control devices and systems. The flow-on opportunities for the service industries and trades will be significant.

The October 2008 Australian Conservation Foundation and Australian Council of Trade Unions joint report *Green Gold Rush*, October 2008, quotes from OECD, *Environmental Innovations and Global Markets*, 2008.

'For environmental technologies to penetrate and succeed in global markets, it is important that they succeed domestically. Thus, well designed environmental policies that spur innovation, and government measures that contribute to creating and consolidating domestic markets for environmental technologies, constitute a success in global markets.'

The report estimates that the global green products and services market will double from the current figure of \$US1.4 trillion per annum to \$US2.7 trillion by 2020. The report selects six green market segments as representing major opportunities for Australian business: renewable energy, energy efficiency, sustainable water systems, biomaterials, green buildings, and water and water recycling. The report estimates that, if the domestic market is supported by appropriate legislation, an additional 500,000 jobs could be created by 2030 (using their business as usual baseline).

9.2.11 Building on existing skills and know-how

With its richness in manufacturing skills, educational capacity and know-how, the region, given the appropriate support and policy framework, is in a position to be pre-eminent in the manufacture of environmental protection products.

Growth in this sector will rely on the existing skills of the inner parts of Melbourne's North in terms of design and research activities, while the new manufacturing areas in the outer parts of the study region are well-placed to manufacture these products.

Many opportunities will only be available to innovative companies if government policy mechanisms and the regulatory environment encourage the growth of the environmental protection industry and related services. While there have been some significant disappointments in Australia, with manufacturers of both wind and solar renewable energy products heading offshore, it would be a very poor outcome if no lessons were learnt from these departures.

Case study: The German regulatory framework

Developments in Germany may be a pointer to the opportunities available. The following actions have been the drivers of innovation.

The German Federal Government adopted new energy conservation regulations in April 2007, superseding the 2002 Energy Conservation Ordinance. The new energy conservation regulations make the EC Energy Performance of Buildings Directive into national law. The regulations require energy certificates for existing buildings. One aspect of the new regulations is to encourage investment and a return on investment in energy saving measures over the shorter term. This policy benefits the householder by cutting energy costs as well as achieving the goal of reduced emissions. The German Federal Government, through introducing energy certificates, believes it will stimulate investment in the construction sector and related environmental technologies and create more jobs and more highly skilled jobs in the process. The certificate will also be an important competitive instrument on the property market as energy efficiency will become a key marketing tool and an important decision-making criterion for those buying a house.

The New Energies Heating Law (from 1 January 2009) mandates the installation of renewable energy technologies for the heating of all new houses. The requirement is that households meet 14 per cent of their total energy consumption from renewable energy sources. Existing houses will also be retrofitted so that they achieve a minimum of 10 per cent of their heating and water heating from renewable sources. These new laws will stimulate an associated effort in further insulating houses and mean that the German Government will be providing some 350 million Euros per annum to households towards the cost of installing the mandated renewable energy systems.

To date, 24 German cities have established low emissions zones to mitigate air pollution by fine particles. The purpose of the low emissions zones is to stop cars and trucks with high emissions of fine particulate matter entering the zones. Additional zones will be added in 2009 and 2010. This policy places pressure on firms and individuals with substandard vehicles to upgrade their vehicles to more efficient forms.

The management of waste in Germany has also been a feature of the nation's environmental protection strategies. From mid-2005, untreated waste in Germany could no longer be placed in landfills. New policies stated that waste should be pre-treated by mechanical or biological methods, or by incineration. Once treated, waste can be placed in landfills. German policy means that ecological disasters such as leaching of toxic materials or gases harmful to the atmosphere are avoided. The tight controls on waste management, including increasing levels of recycling, have made a significant contribution to climate protection.

Germany has been very proactive in developing policies in relation to adapting to or mitigating the impacts of climate change. It is appropriate to acknowledge Germany's leadership role. Germany has a culture of innovation and of high design and engineering standards. The German Federal Government was also quick to understand the significance of climate change at the national and international level.

What is interesting is that, in creating a first mover advantage in terms of climate change innovation, Germany has also had significant success in developing an export market in environmental products and services. The greatest growth in German exports over the last three years has been in the area of renewable energy manufactures and technology, rising by almost 25 per cent per annum. Demand internationally for German measurement and control systems and other environmental protection systems means that Germany is the world leader in this sector, ahead of both the United States and Japan. Exports from Germany of environmental protection products are now around 60 billion Euros.

The chairman of Germany's Federal Environment Agency stated that *'the encouraging development in exports of environmental protection products has more than just a positive effect on international environmental protection efforts; it is beneficial to the national economy and creates jobs in Germany. This success would not be possible without demanding and progressive environmental policy'*.

Two key questions in relation to advanced manufacturing should be asked. The answers to these questions will be particularly important to the future outcomes for Melbourne's North.

1. How long will Australia (and, by implication, Melbourne's North) be competitive in attracting foreign students if its technological base is seen to be in relative decline?
2. How long will Australia (and, by implication, Melbourne's North) be competitive in health innovation if it fails to develop and maintain a reasonably sophisticated and diverse biotechnology supply chain integrated into the health service sector?

In terms of its macroeconomic impact, manufacturing assists in maintaining a balanced economic structure which, in turn, creates long-term sustainable growth in living standards. In Australia, this suggests a manufacturing share in total product of around 15 to 16 per cent; this should also be the benchmark for the region.

It is likely, and in keeping with the overarching strategy in this report, that the manufacturing sector will only be sustainable in the region by increasing its levels of innovation and knowledge intensity. Initiatives will include the development of new products, improved product design and improved sales and marketing capacity, creating an increasingly integrated supply chain and greater export capacity.

9.2.12 Advanced manufacturing opportunities

Advanced manufacturing industries with significant potential for the region include:

- aerospace cluster associated with existing infrastructure in the Melbourne Airport precinct
- automotive
- biotechnology associated with medical hub and tertiary institutions
- scientific and analytical products
- electronics and process control to assist development in the automotive, biotechnology, environmental, advanced material and aerospace industries
- environmental technologies and protection industry
- food processing with potential for greater integration with the development and relocation of the Melbourne Wholesale Fruit and Vegetable Market
- ICT industry manufacturing and services.

9.2.13 The scope of research, manufacturing and business services in environmental technologies

In his 2008 report, *Energy Technology for Climate Change: Accelerating the Technology Response* (Australian Academy of Technological Sciences and Engineering), Dr John Burgess describes the report's key finding as:

'That a commitment is needed by government and industry to invest around \$6 billion by 2020 on RD&D on new power generation technologies. Increased deployment expenditure is required after that. Further, no single new technology for stationary energy production will be capable of achieving the projected reductions for CO₂. A new Energy Research Council should be established and should fund necessary RD&D proposals.'

The report goes on to describe the possible scope of technology development, manufactures and other investment required by 2050 and in doing so describes the scope and potential of this burgeoning industry sector to research and manufacturing organisations in Melbourne's North.

The report goes on to say that, to begin to meet CO₂ reduction targets, around \$250 billion in new technology investment will be required in Australia by 2050. Scenarios include wind generation at 50 times the current level and solar photovoltaic (PV) application six times higher than a 2 kW panel on five million roofs in Australia. The report then states '*without accelerated development and commercialisation of new power generation technologies, there is a high likelihood that projected political targets for the reduction of GHG will not be met*'.

If the German example can be followed, then there will be opportunities to export these new technologies. The ownership of intellectual property will be a key to building value in this industry sector.

10 Melbourne's North: An integrated economy

Findings

1. Further development of Activity Centres and Transit Cities will enhance regional economic integration.
2. Improved transport systems are essential.
3. Supply chain characteristics will improve with better local integration of community and employment and increased cluster development, particularly of high-tech businesses.
4. Melbourne Airport is an important driver of global supply chain integration for businesses in Melbourne's North.
5. Equitable distribution of broadband is essential and broadband speeds should be nationally competitive.
6. The costs of climate change must be understood by the region's business community.
7. The cost of climate change varies considerably across Melbourne's North, depending on industrial structure.
8. There are many development activities, either at planning stage or in construction, that will assist regional economic integration by bringing community and businesses together in improved environments.

10.1 | Activity Centres and Transit Cities

10.1.1 Melbourne@5million, Central Activities Districts and employment corridors

The Victorian Government's December 2008 amendments to Melbourne 2030 included the designation of six new Central Activities Districts, with Broadmeadows selected for Melbourne's North. These new amendments will mean that these centres will be developed to provide knowledge intensive CBD type employment, a depth of retail and services, significant residential opportunities and higher levels of community integration, including a range of transport options. As part of these amendments, employment corridors and growth areas (Investigation Areas) have also been defined. The Hume and Whittlesea growth areas focus on areas to the north of Epping and the north of Hume. The purpose of these changes is to further concentrate and integrate regional economic activity.

The 2009–10 state budget allocates \$80.3 million towards the development of the Broadmeadows Central Activity District, continuing the large scale re-engineering of the Broadmeadows commercial and shopping area.

10.1.2 Activity Centres

'Connections between Activity Centres need to be strong. There is no facilitation of this process.'

Michael Hedt, DIIRD

Activity Centres are not a new concept and their importance is emphasised in Melbourne 2030. Activity Centres increase in economic significance as the knowledge economy grows stronger, manufacturing declines and cities become more constrained because of population growth. The opportunity to develop improved sustainability, environmental and social outcomes by developing Activity Centres should be encouraged as increasing pressure is placed on Melbourne's transport systems by rapid population growth.

Within Melbourne's 2030 planning scheme, the Melbourne CBD is defined as the dominant retail, commercial, cultural, administrative and civic centre. Supporting this, there are six new Central Activities Districts and more than 100 Principal, Major and Specialised Activity Centres. These Activity Centres are distributed across metropolitan Melbourne and vary in scale and complexity, with some Activity Centres providing specialist roles.

In addition, more than 900 small-scale Neighbourhood Activity Centres provide access to local convenience needs and transport services.

It is interesting to compare the development of Melbourne and Sydney. Sydney, with its more consistent centre development policies, has generally been more successful in creating dense centres of activity. Melbourne, on the other hand, has been more susceptible to changes in fashions and trends impacting on development strategies. Consistency has been an important part of the policy framework and, in this regard at least, has delivered Sydney some competitive advantage. This is now proving particularly important given Sydney's current transport and congestion problems.

The historical patterns of development in Melbourne's North mean that Activity Centres are more densely clustered in the inner parts of the region. They are less well defined than Activity Centres in the outer north because of the existing mix of activity in the inner parts of the city. The historical pattern of development has led to a legacy of inequitable distribution of Activity and Neighbourhood Centres, particularly in outer growth areas with their associated lack of transport services. Competition from existing out of centre developments, such as clusters of businesses that are difficult to access other than by car, also play a role in diluting policy.

The issue for Activity Centre development in the outer parts of the region is to ensure that any development provides a balanced high density residential mix. Current lifestyle choices are likely to work against this strategy for Activity Centre development in outer growth areas. This is because people choosing to live in high density residential developments prefer to do so closer to the city's core. These attitudes may change over time as high amenity mixed developments are created in the outer parts of the region.

Table 10.1 Activity Centres in Melbourne's North

Principal Activity Centres	Major Activity Centres	Specialised Activity Centres
Greensborough – Banyule	Heidelberg – Banyule	Austin Biomedical Alliance – Heidelberg – Banyule
Northland – Darebin Preston High Street – Darebin	Ivanhoe – Banyule	La Trobe University and Technology Park – Bundoora – Darebin
Broadmeadows – Hume Since December 2008 designated as a Central Activities District	Northcote – Darebin	Janefield Technology Precinct – Bundoora – Whittlesea
Coburg – Moreland Epping – Whittlesea	Reservoir – Darebin	Melbourne Airport – Hume RMIT Technology Park – Whittlesea
	Gladstone Park – Hume	
	Roxburgh Park – Hume	
	Craigieburn – Hume	
	Craigieburn Town Centre – Hume	
	Sunbury – Hume	
	Brunswick – Moreland	
	Glenroy – Moreland	
	Diamond Creek – Nillumbik	
	Eltham – Nillumbik	
	South Morang – Whittlesea	
	Fitzroy – Brunswick Street – Yarra	
	Fitzroy – Smith Street – Yarra	
	Richmond – Swan Street – Yarra	
	Richmond – Bridge Road – Yarra	
	Richmond – Victoria Street – Yarra	

Source: Melbourne 2030.

The discussions with councils and other stakeholders provide an understanding of what makes Activity Centres work. The comments include:

- Activity Centres, effectively linked with transport and communication options, are a mechanism for further integration of the region's economy
- Activity Centres must be connected to effective public transport systems and integrated with Neighbourhood Centres and the like
- policies that ensure that developments occur in Activity Centres and not outside them
- high standards of amenity, including design 'an aesthetic sense of place within Activity Centres'
- access to business and personal services
- access to high standards of ICT, including high speed broadband
- Activity Centres should be less reliant on cars and offer opportunities to use alternative forms of transport, including cycling and walking.

Developers stated that the delivery of projects can be difficult, citing red tape and compliance rather than outcome driven attitudes. Developers also stated that infrastructure was increasingly an issue and that it was better to concentrate activity. *'Cost structure is an important issue as it can be very hard to deliver a meaningful outcome. Price point and affordability issues mean that it may not be possible to build appropriate products in outer suburbs. Can't have one model fits all policy.'*

10.1.3 Transit Cities

There are two designated Transit Cities in Melbourne's North – Broadmeadows and Epping. The development outcomes for the region's two Transit Cities as stated by the Victorian Government are to:

- improve the use of public transport and the integration of public transport services
- develop high density housing near transport centres
- provide a range of housing options, including affordable housing
- provide opportunities for private investment and business innovation
- build communities that offer fair access for all to services and employment opportunities
- improve the overall quality of the Transit Cities and encourage sustainable development.

Epping

Epping is undergoing rapid development, which includes expansion of the Epping Plaza Shopping Centre, expansion of the Northern Hospital, the Craigieburn Bypass, relocation of the Wholesale Market and associated developments, and the Aurora residential project in Epping North. NMIT also creates many trips.

Broadmeadows

The Transit Cities program in Broadmeadows is linked to the schools regeneration program and the Neighbourhood Renewal program. A master plan for Broadmeadows was developed by council in 2004. Broadmeadows, a significant hub of activity, includes the Broadmeadows Shopping Centre, the Civic Centre and Hume Global Learning Centre, Kangan Batman TAFE, a new school, a health centre and various sporting/leisure facilities. Recent development has included the five-star energy rated Hume City Council Offices, the new Civic Plaza, improvements to Broadmeadows Main Street and expansion of the Broadmeadows Shopping Centre.

The 2008–2009 Victorian Government budget allocated \$8.4 million for design work to integrate Broadmeadows Station with the local precincts. A further main street upgrade is planned, as are the encouragement of further private sector development and an investigation of land use options.

10.2 | The integrated supply chain

10.2.1 The value of high-tech clusters as drivers of innovation and supply chain integration

Clusters drive innovation because they encourage information sharing among the firms within the cluster. Highly integrated supply chains within the cluster consolidate the knowledge base between firms in relation to changing customer needs, more sophisticated marketing and selling operations, and technology and knowledge diffusion.

The development of high-tech clusters continues to be an important mechanism in defending and improving industry output. The development of high-tech innovation clusters is likely to have a positive impact, as these developments enhance future prospects by:

- improving planning towards more knowledge intensive focus and high value added businesses
- strengthening the region's competitiveness, including such factors as innovation, regulation, market access, logistics and reputation
- intensifying R&D and growing the number of patents
- moving basic manufactures to a more knowledge intensive culture to embrace innovation, including new products and processes, services and engineering solutions
- strengthening the opportunity to retain as much of the manufacturing supply chain as possible to avoid hollowing out the customer base of remaining firms
- growing exports of higher value production, associated technologies and engineering solutions that include innovation in product delivery
- achieving global competitiveness through scale and consolidation
- improving branding and marketing channels, both local and international
- harnessing available knowledge, skills and manpower to attract global opportunity, particularly in areas of R&D
- leveraging off high local demand to build a world scale export industry
- enhancing prospects for future growth and profitability by encouraging government and industry to work together to develop the strategies needed to create and sustain global competitiveness.

10.2.2 Outcomes of high-tech cluster development

The purpose of pursuing policies that support the development of high-tech clusters and the knowledge intensification of the region are:

- to increase real wages, allowing firms to employ higher skilled workers and attract higher skilled workers to the region
- to increase real profits, enabling increased investment and capacity
- to fund R&D, marketing expansions and training programs to increase exports
- to accelerate growth in domestic demand, increasing the incentive and opportunities for import replacement and exports, and increasing productivity growth rates from economies of scale and from increases in cluster density.

The goal must be to lift productivity (relative to other regions), as this creates the mechanism whereby higher productivity growth rates can be sustained, relative to the past growth rates and relative to leading metropolitan regions around the nation.

10.2.3 The role of local government in strengthening high technology clusters

An important contribution by local governments towards lifting regional productivity is to improve the relative competitiveness of the region by strengthening:

- transport and communication links
- community infrastructure
- recognition of culture and diversity
- amenity in terms of design and overall attractiveness.

A region that has clusters of high technology businesses integrated with high standards of amenity and liveability is in a far stronger position to capture highly mobile knowledge intensive households.

10.3 | Telecommunications

The lack of an equitable telecommunications service remains a barrier to the development of the knowledge economy in Australia. Surprisingly, this is not only an issue for regional and remote Australia but still remains a concern in Melbourne's North, particularly (but not only) in outer and rapidly developing parts of the region.

The Regional Telecommunications Independent Review Committee Report 2008, *Framework for the Future*, was tabled in the Federal Parliament on 15 October 2008. An extract from the report states:

'The importance of regional Australia and its industries to our overall national wellbeing underscores the importance of adequate telecommunications services to regional, rural and remote parts of Australia. Increasingly telecommunications services are not only an end in themselves for achievement of equity, but also critical enablers in equitable availability of other services. We therefore support a policy and regulatory environment that promotes competition, innovation and investment in telecommunications for regional areas, supported by effective measures to protect consumers. The ultimate aim of any such approach is to establish fairness and equity for all Australians.'

10.3.1 Variability of broadband connectivity

There are a number of ways in which customers connect to the internet. The growing number of wireless connections is an example. The Whittlesea example discussed in this section relates to the most frequently used (and cornerstone) of Australia's broadband system, the existing copper wire telephone network.

It is critically important to economic development, both in the region and outside it, that businesses and households have equitable and high standards of connection to broadband services. Business and households must be able to compete in an increasingly globalised economy. What has become evident from research is that access to telecommunications services and quality of service can be an issue in certain locations across the region. Problems with the provision of telecommunications services are not only an issue for regional and rural Australia.

In contrast to the supply side issues, consumer demand for broadband services in Australia has been strong, as both businesses and households embrace the need for telecommunications services to enhance competitiveness, for education and other essential services, and for entertainment, video and voice services.

10.3.2 The National Broadband Network

The National Broadband Network will be the largest single nation building infrastructure project in Australian history, with a projected investment of \$43 billion over eight years. The Australian Government announced that it would build a new super-fast National Broadband Network in April 2009, creating a new company in which the Australian Government would be the largest shareholder.

The government's objectives are to:

- connect homes, schools and workplaces with optical fibre (fibre to the premises or FTTP), providing broadband services to Australians in urban and regional towns with speeds of 100 megabits per second – 100 times faster than those currently used by most people, extending to towns with a population of around 1,000 or more people
- use next generation wireless and satellite technologies that will be able to deliver 12 megabits per second or more to people living in more remote parts of rural Australia
- provide fibre optic transmission links connecting cities, major regional centres and rural towns
- be Australia's first national wholesale-only, open access broadband network
- be built and operated on a commercial basis by a company established at arm's length from government and involve private sector investment
- be expected to be rolled-out simultaneously in metropolitan, regional and rural areas.

10.3.3 The knowledge economy and the broadband network

Until the National Broadband Network is completed, the growth in knowledge economy firms and government online services will continue to be constrained, holding back the competitive position of firms, and, in government services, delaying cost savings that could have been achieved by online service delivery.

Poor standards of internet connectivity also constrain innovation, for example, opportunities to develop smart network grids that have a major role to play in managing levels of greenhouse emissions for both households and industry are compromised, as are developments in e-medicine and e-education and an array of business opportunities.

The telecommunications sector and telecommunications in general are extremely important to aiding the development of a low carbon economy. They are important because telecommunications facilitate communications, and because advanced telecommunication technologies are providing many opportunities to change behaviour away from unnecessary use of energy.

10.3.4 Building competitive advantage

Case study: The City of Brisbane

In December 2008, the City of Brisbane announced that it had committed \$500,000 for a business plan to establish an ultra high speed broadband network in Brisbane. The proposal suggests that the network would deliver speeds of between 100 megabits to one gigabit per second. The council said that it believed the network roll out could begin in 2009. The council's initial estimates of the benefits of the network include an additional 15,000 jobs to be added over the next five years plus an addition of \$5 billion to the region's economy.

"It's really about the roads and tunnels of the future," said the council's spokesperson.

Why is the Brisbane development of importance to Melbourne's North? By improving the City of Brisbane's broadband network, the council is creating a far more integrated economy – not only because of improved connections and speed, but by reshaping the future business landscape of the city.

If the network goes ahead it will give the City of Brisbane (with spin-off benefits to south-east Queensland) huge competitive advantage over other regions who are waiting for and relying on the National Broadband Network, with initially far slower speeds than the Brisbane proposal.

What an ultra-fast network could do for a region (particularly within a national framework of unsatisfactory telecommunications infrastructure) is to attract a range of high-tech businesses, from large and established global companies to entrepreneurial high-tech start ups. The network could also create significant competitive advantage for existing businesses that would also suddenly have a whole new range of global opportunities opened up to them. In turn, these developments will increase skills demand and the level of skills required by regional businesses. This process of knowledge intensification will mean increased business revenues, higher salaries and more resilient households, which in turn will create improved conditions for local service and retail businesses.

The recommendation for Melbourne's North is to at least monitor the developments in Brisbane as well as progress towards a National Broadband Network. There could be significant economic advantage in creating a similar plan for Melbourne's North if the National Broadband Plan continues to falter.

10.3.5 Difficulties with existing broadband services

This analysis is provided by Callpoint Pty Ltd (www.callpoint.com.au). As xDSL utilises the existing copper-pair telephone network, it potentially extends broadband internet quite widely.

In reality, this is not always the case because:

- the exchanges need to have DSL interfacing equipment installed – some 40 per cent of exchanges are still to be equipped, especially in rural areas
- the maximum distance from the exchange to the user is typically 5–6 km (length of cable run, not the distance to the exchange)
- in many areas, Telstra has installed pair-gain technology that enables two telephone services to be delivered over the one cable; as this technology blocks the broadband DSL signal, it must be removed or bypassed before these services can be enabled.

There are many different types of DSL services but the one most commonly offered to households and small business is ADSL – asymmetric digital subscriber line.

Telstra is the monopoly owner of the copper based Customer Access Network but has been required to offer other companies access to this network. The regulatory environment enables other carriers to rent Telstra's copper lines for the delivery of their own xDSL services (what is known as Unconditioned Local Loop), as well as be able to resell Telstra's ADSL broadband services under a broadband providers' own branding.

The actual speeds that can be achieved may be well below the maximums depending on many factors, particularly the distance from the exchange as well as the number of copper pairs that are carrying ADSL services. The potential maximum speeds attainable via an ADSL connection are significantly less than for the fastest broadband cable connection. These maximum speeds are rarely achieved, and typical ADSL connections may be perceived as slow compared to broadband cable connections.

Other xDSL services offered in Australia are targeted at larger users, such as businesses and other organisations. These include SDSL (symmetrical DSL), which provides users with equal upload and download speeds, HDSL (high-bit rate DSL) and VDSL (very high data rate DSL).

The following map is of the LGA of Whittlesea in Melbourne's North. The map and associated commentary has been provided by Callpoint, a geospatial services firm for broadband.

The Callpoint map shows coverage rings relating to xDSL broadband coverage only and so the map does not account for any other broadband access technologies that may be available.

When studying the Whittlesea map, the following should be noted.

1. The coverage rings themselves are representative proxies for xDSL coverage. While copper does obviously not run in radial fashion from Telstra exchanges, the rings are easy to understand, and they do not require other datasets (such as Telstra copper cable duct feeder routes, or Shortest Street Centreline methods) to create a proxy of local connectivity. In any event, xDSL deliverability is determined by transmission loss, which is a function of actual distance and copper cable gauge (among other factors).

2. The three different rings relate to:

- inner or green: Symmetric High Speed DSL (SHDSL) at 1.7 km, most likely used by businesses
- middle or brown: Asymmetric Digital Subscriber Line (ADSL), at 4 km, the most commonly available type on the market
- outer or red: Reach Extended ADSL 2, at 6 km.

3. The maps do not include any Large Pair Gain System (LPGS) information. LPGS are a major 'broadband blocker'. The reason why the maps do not include LPGS regions is due to restrictions regarding access to certain Telstra Geographical Information System datasets.

4. Further analysis, e.g. the number of premises that are within and outside each of the coloured rings, can be performed using spatial analysis methods.

5. In summary:

- the rings are a useful means of depicting xDSL coverage across a region, even though they are not necessarily accurate, do not account for LPGS and do not consider alternate broadband technologies
- the most accurate means for determining specific broadband availability at a site is for the customer to request a full service qualification from their intended supplier.

10.3.6 Pair-gain technology

As mentioned previously, in many areas Telstra has installed pair-gain technology that enables two telephone services to be delivered over the one cable. As this technology blocks the broadband DSL signal, it must be removed or bypassed before these services can be enabled.

In its response to a then Department of Communications, Information Technology and the Arts discussion paper in January 2006, Callpoint described the background to the issue of LPGS as follows.

In the 1990s, Telstra introduced LPGS as a way of increasing the number of copper connections to high growth areas. This was done at a time when demand for public switched telephone network services were also growing because of, for example, fax machines being installed by business and residential customers. As such, these systems were seen as astute, both from a technical and commercial perspective.

Later, customers that were served by LPGS noticed that they could not obtain ADSL services. Telstra has made enormous strides by upgrading its Customer Access Network. However, there were many premises that are still unable to obtain ADSL due to these systems.

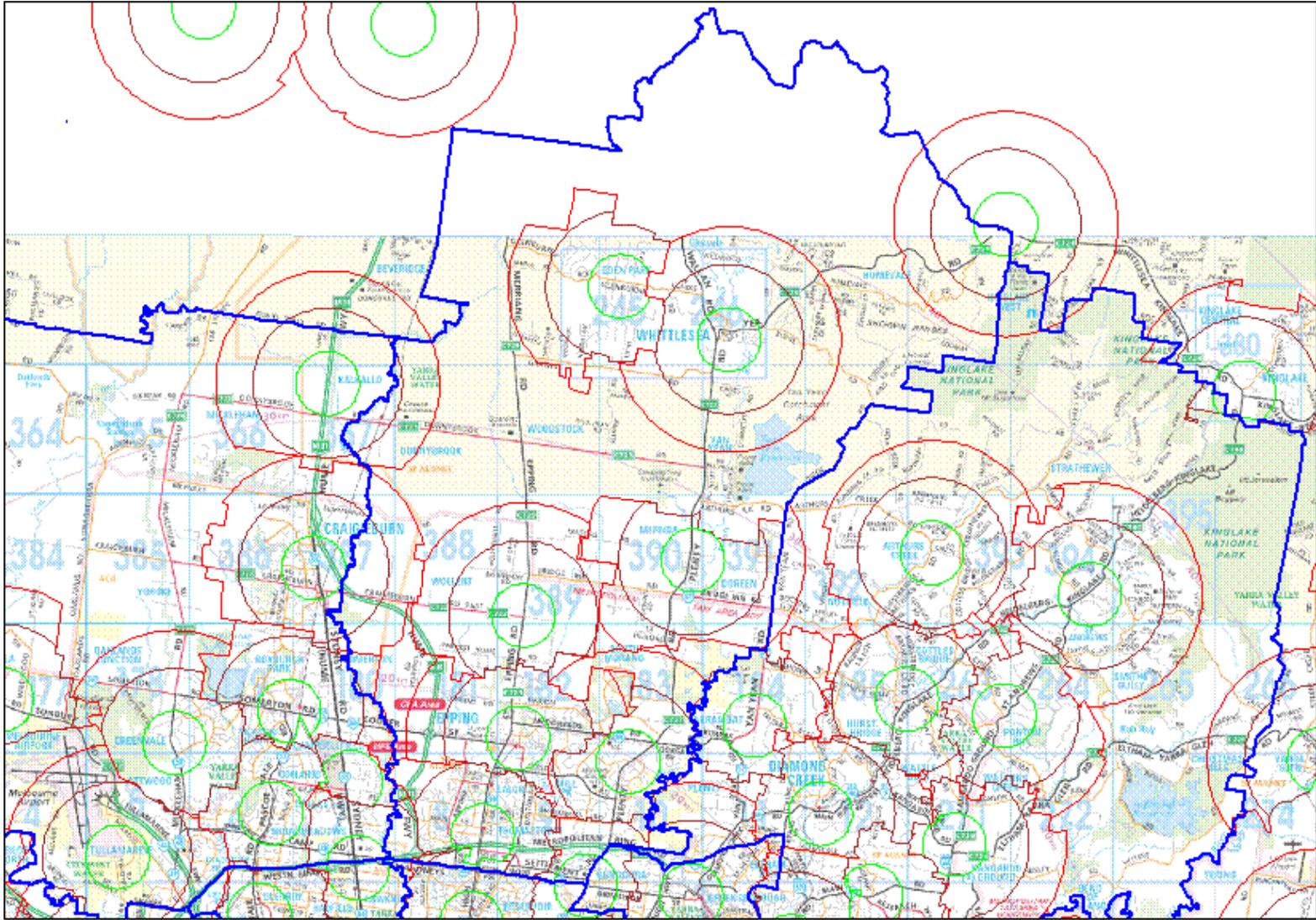
In January 2003, the then Broadband Advisory Group in its report, *Australia's Broadband Connectivity*, outlined a number of the elements necessary to encourage efficient market entry, including 'the need to reduce information asymmetries facing new entrants'.

In August 2004, the Senate final report, *Competition in Broadband Services*, recommended that 'the Australian Communications Authority be provided with all of Telstra's current geospatial datasets, and that the Australian Communication Authority makes available these datasets on request, in a useable format, to other carriers and ISPs'.

In December 2004, Telstra Wholesale commercialised its geospatial datasets and LPGS polygons became included within ExchangeInfo Plus. However, sale restrictions still apply. The majority of Exchange Service Areas have no LPGS. Some have only a few. Others have significant LPGS penetration. It is the areas of significant LPGS coverage that are of concern because these have the potential to create further equity and access issues for certain regions, some of which are in metropolitan areas.

The information in this section might, for example, suggest two issues for Whittlesea:

- the extent of broadband coverage in the outer areas of Whittlesea
- the possibility of LPGS across those parts of Whittlesea, including the inner parts, that currently might appear to have broadband coverage.



10.4 | Resilience to greenhouse costs

10.4.1 *The Northern Alliance for Greenhouse Action*

The Victorian Greenhouse Alliances were formed as part of the Victorian Greenhouse Strategy 2002, with the aim of implementing climate change action, building capacity of local government and community, and improving integration and targeting of government services and programs. There are currently six alliances in Victoria, which comprise 50 of Victoria's 79 municipalities and also include State Government departments, Catchment Management Authorities, educational institutions, businesses and community groups.

The Northern Alliance for Greenhouse Action (NAGA) was formed in 2002. It consists of nine northern metropolitan Melbourne LGAs and the Moreland Energy Foundation Limited. The LGAs are Banyule, Darebin, Hume, Manningham, Melbourne, Moreland, Nillumbik, Whittlesea and Yarra.

NAGA states that the NAGA region 2005–2006 carbon footprint and projections to 2020 reflect a typical urban and mixed-use profile. The footprint is dominated by stationary energy emissions, of which the largest contributors are the industrial and commercial sectors. Transport is the next largest contributor to the regional profile, with non-freight road transport being the most significant element. Projections to 2020 reflect regional household and population growth profiles. Total growth in emissions to 2020 is estimated to be approximately 18.8 per cent on 2005–2006 emissions.

Emissions from the industrial sector comprised 28 per cent of overall emissions and 38 per cent of all stationary energy emissions for the period 2005–2006, representing the largest source of emissions in the NAGA region.

Hume and Whittlesea account for the largest proportions of manufacturing-related emissions. Emissions are also related to distinct industry types, with non-ferrous and other metal processing (including aluminium, zinc and copper extrusion, drawing, rolling and other manufacturing) accounting for a significant proportion of emissions.

Potential reductions in carbon emissions from the industrial sector may be achieved through optimising resource use – not just in terms of energy and water, but also through waste products and reuse through a program of regional industrial symbiosis.

Proposed actions

Proposed actions are:

- identify industrial ecology opportunities
- identify alternate energy generation opportunities
- identify reuse of waste opportunities.

Commercial sector

The commercial sector within NAGA represents 26.2 per cent of total emissions and 35 per cent of the total stationary energy profile. A predicted 28 per cent growth in population will drive the emissions in this sector, resulting in an increase in emissions of 24.8 per cent by 2020.

Wholesale and retail trade represents the largest contributor to emissions in every LGA. When City of Melbourne commercial sector emissions are removed, 44 per cent of emissions from the commercial sector of the remaining NAGA member councils are from this sector. This profile ranges from strip-style shopping in the metropolitan areas to large developments in the outer NAGA region.

10.4.2 NAGA region EREP sites

From 1 January 2008, all commercial and industrial sites in Victoria that use more than 100 TJ of energy and/or 120 ML of water in a financial year need to prepare a plan that identifies actions to reduce energy, water use and waste generation.

Businesses that tripped the thresholds in the 2006–07 financial year were required to register with the Environmental Protection Agency by 31 March 2008, prepare a plan by December 2008, and implement actions with a three year or better payback period.

All sites participating in the Environment and Resource Efficiency Plan (EREP) program across Victoria use a total of approximately 700 PJ of energy and 300 gigalitres of water a year. This is the equivalent to around 45 per cent of Victoria's annual energy use, and the annual water consumption of around 1.5 million average Victorian households.

Table 10.2 NAGA region EREP sites²

Municipality	Industry	Company name	Suburb	Exceeded energy use threshold	Exceeded water use threshold
Banyule	Health	Austin Hospital	Heidelberg	✓	✓
	Higher education	La Trobe University	Bundoora	✓	✓
Darebin	Packaging	Huhtamaki (HAPL)	Preston	✓	✓
	Packaging	Visy Industries	Reservoir	✓	✓
Hume	Construction	Austral Bricks	Craigieburn	✓	
	Food and beverage	Cadbury Schweppes	Tullamarine	✓	✓
	Construction	Cemex	Oaklands Junction		✓
	Pharmaceutical	CSL	Broadmeadows	✓	✓
	Automotive	Ford Motor Co	Campbellfield	✓	✓
	Textiles	Leading Synthetics	Campbellfield	✓	
	Food and beverage	Nestle	Campbellfield	✓	
	Manufacturing	Venture Industries	Campbellfield	✓	
	Packaging	Visy Industries	Campbellfield	✓	✓
Automotive	Wingfoot & Goodyear Tyre	Somerton	✓	✓	
Moreland	Health	Cryovac Aust	Fawkner	✓	
	Food and beverage	Visy Food	Coburg North	✓	✓
Nillumbik					
Whittlesea	Construction	Boral Bricks	Thomastown	✓	
	Food and beverage	Turi Enterprises	Thomastown		✓
Yarra	Packaging	Amcor Packaging	Alphington	✓	✓
	Food and beverage	Fosters Group	Abbotsford	✓	✓
	Health	St Vincent's Hospital	Fitzroy		✓
	Hospital	Varnsdorf	Fitzroy	✓	

Voluntary sites: Hume: Australia Pacific Airports – Melbourne Airport. Qantas Airways – Melbourne Airport. NB: Melbourne Airport not included in TZNE.
Nillumbik: Melbourne Water – Christmas Hills.

Source: NAGA.

² EPA Victoria (2006) EREP registered sites (EPA) accessed from <http://www.epa.vic.gov.au/bus/erep/docs/EREP-registered-sites-12Aug08.pdf>.

10.4.3 The cost of industrial emissions by LGA

To calculate the cost of CO₂, NIEIR's methodology is as follows. The basic data is taken from National Economics' *The CO₂ content of Australian production and financial demand – 2004–05*, for the National Emissions Trading Taskforce, 2007. This report provides the direct and indirect CO₂ content of production by 102 industries.

The estimates are then broken down into state CO₂ content per \$million of production by using the CO₂ content of the different types of energy supply published by the Australian Greenhouse Office, with the adjustment that the National Electricity Market (NEM) will tend to reduce the differentials in electricity CO₂ content between the states in the NEM.

The next step is to convert the CO₂ per \$million of production in CO₂ per person employed for the 102 industries. This is then broken down into the regional level by the share of employment by industry and region.

The emissions allocated are energy emissions, industrial process emissions and fugitive emissions. In Australia, the regions with the highest CO₂ emissions are:

- the resource rich regions
- the industrial regions of the metropolitan areas and regional cities.

The estimates for Melbourne's North follow the national pattern, with the annual cost per person employed the lowest in Yarra at \$1,849 and the highest in Hume and Whittlesea, the two LGAs within the study region most sensitive to climate change.

The other data gives average direct household emissions excluding transport fuels. This is added to the industrial economies per household to give an indication of overall regional vulnerability to carbon prices. Both Hume and Whittlesea are above the Melbourne and Victorian average cost per person employed.

Table 10.3 Costs of climate change: CO₂ emissions by industry and household				
LGA	CO₂ emissions per household	Average industry CO₂ emissions per employed person direct and indirect domestic emissions	Average cost per employed person \$50 tonne of CO₂	Total direct household and direct and indirect industry emissions per household
Banyule (C)	65.9	41.5	2,075.5	75.6
Darebin (C)	81.8	60.8	3,039.2	90.7
Hume (C)	158.6	103.3	5,166.5	167.5
Moreland (C)	73.2	58	2,901	82
Nillumbik (S)	71.7	34	1,697.7	81.4
Whittlesea (C)	142.7	90.5	4,524.4	152.3
Yarra (C)	58.2	37	1,848.8	66.5
Melbourne	84.9	58.5	2,925.5	93.7
Victoria	81.2	60.3	3,013.8	90.1

Source: NIEIR.

What these figures suggest is that the position for LGAs that rely on emissions-intensive industries for employment will be more difficult than those with a greater depth of knowledge intensive industries. Although there has already been a reshaping of the manufacturing industry in Melbourne's North, with closure or shift away of manufacturing businesses, the costs of climate change will inevitably create further pressure on some segments of the manufacturing industry. Local governments should understand that employment in the most vulnerable of these companies cannot be maintained indefinitely.

These figures again contribute to the case for building more advanced and knowledge intensive industries and firms that create products and services that contribute to the mitigation (or adaptation) of climate change.

On a positive note, the need for emissions abatement provides the region with an opportunity to invest in growth industries. Internationally, there will be a surge in emissions-abatement technologies and, for the region's manufacturing and services industries, it is not too late to enter the market at an early stage – but this will involve sophisticated industry policy and the vertical integration of tertiary education, research and industry.

The manufacturing industry

The immediate problems for the most carbon intense manufacturing businesses in Melbourne's North may be:

- the likely outcome that these businesses have a lack of low-cost emissions abatement options, particularly retrofit options
- emissions abatement requirements, whether enforced by emissions pricing or otherwise, will lead to industry closures without generation of alternative jobs, adding to unemployment and weakening exports from the region
- points 1 and 2 are countered by the understandable tendency to want to conserve the capital and skills invested in each remaining manufacturing industry.

The emissions abatement possibilities in manufacturing most broadly revolve around investing for energy efficiency and industry modernisation. These actions are worthwhile in their own right and the need to abate emissions increases the urgency.

Among governments, the primary responsibility for encouraging emissions abatement in manufacturing industry lies with the Australian Government and state governments. It is, however, important that local governments' strategic and development planning takes into account the economic consequences of climate change by adjusting industry policies and planning regimes. To ignore these issues now is to create competitive disadvantage in the future.

10.4.4 Improving regional competitiveness: an important role for local government in Melbourne's North

Complementary measures in the energy supply industries

In Victoria, electricity supply (because it is coal generated) is particularly costly in terms of the costs of climate change, affecting long-term competitiveness.

Local government has a considerable contribution to make in this area, including the following, in at least helping to mitigate some of these costs, both economic and social:

- local advocacy, to ensure that standards of local power supply are not sacrificed
- advocacy on behalf of areas where employment is likely to be reduced as a result of emissions abatement, and participation in generating alternative employment
- supplementary measures will be required, in particular to ensure that finance is available for necessary investment in new generating equipment, new bulk transmission lines to cater for a different geographical pattern of electricity generation and possibly new equipment for system management; local negotiation to mediate conflicts that may arise in such an investment program will be crucial in determining appropriate local outcomes
- participation in local investment in decarbonised electricity.

Households

NIEIR has conducted studies for the Brotherhood of St Laurence, which proposes that part of the revenue from emissions trading should be spent on a national energy efficiency program to assist low-income households. The Brotherhood proposes that this scheme should target low-income households, partly in compensation for their exposure to rising energy prices and partly in recognition that such households cannot afford to invest in energy efficiency.

The Brotherhood proposal is that the scheme should be implemented through the private sector (as retrofit contractors) and the community sector (as managers).

However, local government would be in a position to add value in several ways:

- by assisting with the information aspects of the program
- by coordinating the geography of investment in home retrofits to reduce costs; a program that rolls across the geography of a municipality is likely to cost less than one that retrofits houses at random
- by extending the scheme to cover all households neighbourhood by neighbourhood, with high-income households and landlords expected to contribute their own costs
- subject to state legislation, by providing financial incentives to efficiency improvement, for example, by increasing the rate levied on dwelling and small business property owners who have received but refused a fair offer of energy efficiency retrofit.

A program of this kind would have the macroeconomic advantage of employing construction workers (who are likely to become unemployed as the housing boom subsides) and of using mainly domestic materials (so avoiding balance of payments effects).

Literature

Studies conducted in the region include the following.

- *Greenhouse gas abatement programs in Melbourne's North 2007*, produced by NORTH Link / NIETL and RMIT University.
- Summary of the School of Aerospace, Mechanical and Manufacturing Engineering supervision of undergraduate student programs with selected firms in Melbourne's North on the technical and financial evaluation of the implementation of identified emissions reduction measures. The 2007 student assessment identified a potential emissions reduction of 27,000 tonnes per year plus energy savings of \$1 million per year for a total capital investment of \$4 million. Similar programs had been run in 2004, 2005 and 2006.

10.5 | Infrastructure, access and the built environment

10.5.1 Commercial accommodation in Melbourne's North

Patterns of development, like patterns of behaviour, tend to follow historical precedents. In the case of Melbourne's North, the history of development has created a shortage of high quality office accommodation. Historically, the relatively poor supply of office accommodation has created an impression among senior executives and developers that the region is less attractive for these kinds of developments.

There are advantages in not having a legacy of poorly designed and, from the environmental perspective, poorly performing office buildings. The 2007 *Northern Exposure – an analysis of office and commercial accommodation issues in Melbourne's North* report makes the point that Melbourne's North is a haven for sustainable office developments. From the economic point of view, a relatively clean slate creates the opportunity to 'build in' competitive advantage, creating office buildings that are more sustainable and, in the long term, far cheaper to run. The opportunity to create integrated developments, particularly in Hume and Whittlesea, will also provide additional benefits for the sustainability of local communities.

Some stakeholders made the point that the key to the economic development of the region was to get the balance between residential development and the provision of employment lands right. Clearly, a shift to white collar employment means a requirement for the better provision and integration of office accommodation. Changing the 'all industrial' mindset is important.

Master planning of larger greenfield sites creates an opportunity to provide amenity and high quality integration of commercial and residential developments. The issues relating to redevelopment of inner areas can be very different because of the scale of sites.

Development in Melbourne's North

The following are examples of developments in Melbourne's North and form an impressive portfolio of activity. The examples are not a comprehensive list of all development activities because of the scope of this report. However, they do describe a vibrant and changing region.

Developments in excess of \$1 billion, currently commenced or planned, include:

- Merrifield at Mickelham – \$8 billion
- the Coburg Initiative – \$1 billion
- University Hill, Bundoora – \$1.1 billion
- Melbourne Airport Business and Office Parks – \$1.1 billion.

Developments in excess of \$200 million, commenced or planned, include:

- Melbourne Wholesale Markets, Epping – \$300 million state government plus same from private sector
- Preston Civic Precinct Master Plan – \$200 million
- Cooper Street, Epping – \$300 million
- Hume Central Precinct Master Plan – \$200 million
- Greensborough Shopping Centre Precinct – \$220 million

- High Street Northcote (Australian Horizons) – \$250 million
- Biosciences Research Centre, La Trobe University, Bundoora – \$250 million.

There are a number of shopping centre developments and upgrades occurring in the region that will create considerable improvements to local amenity and retail capacity. The Craigieburn Town Centre is such an example. This project, on a greenfield site, will add a new shopping centre and bulk retail development with approximately 50,000 sqm of retail and commercial space and approximately 400 new residential lots. The end value of the mixed use town centre is estimated at approximately \$400 million. Planning for the Centre has commenced, with development anticipated to start in the next few years. *‘Craigieburn should be seen as Melbourne’s gateway to the north.’*

New Australian Government and local government funding of \$14.5 million has been provided to build the Craigieburn Library and Learning Centre, a new information hub and lifelong learning centre in Hume.

In Banyule, Greensborough will undergo a major town centre revitalisation that will create the footprint for the ongoing development of the Greensborough Activity Centre. The development will include a Regional Aquatic and Leisure Centre, a civic centre and government office, and a revitalised town square. Investment will be in excess of \$50 million.

In South Morang in Whittlesea, the McDonalds Road precinct will undergo major development, including expansion of the Westfield Plenty Valley shopping centre.

Major residential developments are occurring in Epping North with the development of a new suburb, Aurora, on a 660 ha site. Investment in the Aurora development is \$1.8 billion, with plans to make the new community a model for sustainable development. The proposed Lockerbie development adjacent to the Hume Highway at Kalkallo to the north of Craigieburn, with an investment of \$4.5 billion, is another major residential development planned for the region.

Changes to the economic structure of the region, the decline of the manufacturing industry and the growth of the knowledge economy create very different needs and opportunities. These changes are now being recognised through a range of new developments.

In Whittlesea, MAB’s University Hill Development, which incorporates two business parks, and residential, retail and natural environment provides an indication that changing perceptions about Melbourne’s North are not impossible and that major companies are prepared to relocate operations if the provision of services and amenity are high. Business Park South (20 ha) at University Hill has attracted businesses such as Siemens VDO (investment of \$40 million on high-tech manufacturing facility and three-storey office building), the national head office of Hard Yakka, VicRoads and Doncaster BMW. Business Park North (3 ha) is being developed as a dedicated office precinct.

The University Hills site was purchased by MAB Corporation in 2003 with the goal of creating a greenfield community. The master plan for the project contains nine precincts that create a highly integrated community.

When complete, the University Hill development will incorporate 1,200 apartments and townhouses with the capacity to accommodate up to 3,000 residents. Around 12,000 jobs have been created and it is estimated that the site will eventually provide employment for 30,000 workers. The development also includes a 'town centre', providing easy access to shops, cafes and restaurants. From a development point of view, the designation of University Hill as a special use zone provided greater flexibility in planning and construction.

Importantly, MAB states that the first office building at University Hill is fully leased and a second 4,000 sqm office building is to be constructed, comprising some 36 office suites. Demand is coming from local businesses that are currently located above retail businesses in outdated buildings along busy shopping strips. The new offices provide local businesses with the opportunity to upgrade to a contemporary business environment.

In May 2007, the Florey Apartments on the University Hill development were released and sold out in three days. A number of further releases have occurred since that time.

The integrated development in Epping of a town centre of industrial parks, medical services and residential provides an insight into possibilities for the region and includes:

- the Epping Medical and Specialist Centre located adjacent to the Northern Hospital, with possible development of a private hospital
- Northpoint Enterprise Park, adjacent to the Hume Freeway and adjacent to the new Wholesale Market site
- Epping Business Park located within Northpoint Enterprise Park, providing contemporary and well-designed two-storey office warehouse and factory accommodation
- the Aurora development in the Epping North residential precinct, which is projected to have a population of 40,000 by 2030.

Stakeholders believed the extension of Edgars Road to O'Herns Road would boost economic development at the local level and reduce travel times, and stated that a rail extension to Aurora should be completed quickly. Given the growth of the Epping region, stakeholders believed (and this is an issue for other parts of Melbourne's North) that more high quality hotel accommodation was required so business people could access appropriate types of accommodation. It is likely that not having high quality accommodation locally has the potential to deter major firms from relocating.

Stakeholders stated that *'image is everything; decision makers still do not want to live here, but the north is a great place to do business'*.

The 2009–10 state budget allocates \$80.3 million towards the development of the Broadmeadows Central Activity District in Hume, continuing the large scale re-engineering of the Broadmeadows commercial and shopping area. Of this funding, \$17.4 million is allocated to the development of the Broadmeadows Government Services Building, co-locating the departments of Human Services, Justice, Education and Early Childhood Development together with Centrelink.

In Hume, the Amaroo Business Park at Craigieburn is adjacent to the Hume Freeway and the Melbourne–Sydney rail corridor. Amaroo provides contemporary warehouse space within a master planned and landscaped environment. *'The benefit of locating to the north is northern access as well as proximity to the airport.'* At the airport itself there are significant plans for further development, both in terms of airport operating infrastructure and for commercial

developments adjoining the airport. Direct airport related development includes the expansions of T2, the international terminal, adding a total of 25,000 sqm of new space that will be completed over the next five years at a combined total cost of over \$330 million.

The preliminary major development plan for Melbourne Airport Office Park was released in December 2008. The plan states 'the proposed development is located on two distinct parcels of land of approximately 5.4 ha on Melrose Drive and its form will be a multi-building office park, comprising a mix of approximately 21,000 sqm of multi-storey office buildings and 8,100 sqm of high-tech office warehouse space with amenities that support the development. The high-tech component is proposed to target R&D companies, such as pharmaceuticals, with a mix of office and warehousing and a potential for laboratory space. The proposed development is to be located within the approximate 34 ha of the Airport Entry'.

Stakeholder comments suggest that greater local amenity is required in the airport precinct and should be developed in line with commercial developments. It appears from the Melbourne Airport Office Park development plan that these issues have been taken on board. The project cost is approximately \$69 million and will generate 430 construction jobs, and when complete the site will provide employment for 760 people. Transport issues again come to the fore with a large and increasing number of employees travelling to the precinct by car.

The Merrifield development in Hume, an \$8 billion development by MAB and Gibson Property Corporation, will become Victoria's largest fully master-planned and integrated business and employment hub, situated 30 kms from the CBD. Located on the corner of Donnybrook Road and the Hume Highway in Mickleham in the City of Hume, the development is more than 1.5 times the size of the Melbourne CBD. With over 400 ha of purpose built space to accommodate a broad range of business operators, the project is poised to become the state's new heartland of business activity. Planning for Merrifield has been underway since approximately 2005. In 2005, the Urban Growth Boundary was extended to incorporate about 400 ha of Merrifield and was designated for future employment. In March 2008 this land was then zoned into a comprehensive development zone, creating a parcel of land that really has no comparison in Melbourne. The vision for Merrifield is to transform over 1,000 ha into a sustainable, mixed-use business and lifestyle community. Merrifield is being planned to create jobs close to where people live and has the capacity for upwards of 30,000 jobs within the employment precinct, which will be supported by providing 10,000 dwellings to house up to 30,000 people. It meets goals of creating developments, or communities, that are essentially 24 hour cities where people can work, live and play. The aspiration is that people will choose to live and set up small businesses in the development, rather than commuting every day. With the support of government, commitments are now in place for the delivery of trunk infrastructure to the Merrifield project to enable businesses to be operational by early-mid 2010, with residential development to potentially follow in the next few years.

Stakeholders stressed the need for high quality provision of services, utilities, telecommunications and transport to all development zones. *'The State Government needs to be on the same page as developers.'* An example of a problem is communicating with telecommunications firms, as pathways are complex and it is difficult to understand where to go for assistance. Shortages of power can also be an issue, and again resolution of these problems is complex.

In Darebin, office development plans include the \$250 million Australian Horizon development and Bell City \$120 million revamp, which includes office space, conference facilities and accommodation.

In Moreland, a master plan to redevelop a 12 ha site at the intersection of Bell Street and Sydney Road, with a proposed investment of \$1 billion, will provide 1,500 new dwellings, shops and offices with plans to develop the airspace above Coburg Station within this development. Importantly, the development incorporates 65,000 sqm of commercial and retail space and some 300 dwellings will be reserved as affordable housing.

As new developments start to break down past perceptions about Melbourne's North, it will become increasingly important to showcase how well these new and integrated developments perform. Strategies to create a new image that redefines Melbourne's North are obviously important, but as the momentum of change increases, the capacity to sell Melbourne's North will strengthen.

General design standards of built form

Outside major master plan developments, questions must be asked about the sustainability of smaller or individual developments. Design may sometimes be an issue and often new buildings demonstrate little recognition of the impacts of climate change, particularly increases in temperature and water supply. Little consideration is taken in regard to climate characteristics such as wind direction and orientation of buildings.

In an attempt to reduce costs, sustainability features of buildings are often set aside, suggesting the urgent need for strict building regulations. *'Renewable energy systems are very much tack on rather than properly integrated into building design.'* Often and during the design process, renewables are dismissed out of hand – again, regulations are required. There is greater scope for co-generation of energy. Melbourne's North cannot afford unsustainable buildings, as they will constrain the region's competitiveness for years to come.

Barriers to business relocating to Melbourne's North

'We need to find an incentive for high-tech industry to locate in the region – a stick and carrot to change behaviour.'

Roger La Salle, Director, Matrix Thinking

Stakeholders described some of the barriers to attracting businesses to locate in region. These include:

- the legacy of perception
- competition with other developments, such as Docklands, located closer to CBD
- decision makers do not live in Melbourne's North
- provision of services, including broadband capacity
- the perception about the mix of skills and employment lands
- some issues with the built environment, including the historical shortfall in office accommodation that helped shape perception of the region as being industrial
- standard of amenity, which includes substandard environments, streetscapes and urban design standards in parts of the inner north, and the perceived lack of amenity in the outer north and areas such as those surrounding Melbourne Airport (businesses see amenity as an important feature for enabling the firm's capacity to attract highly skilled staff)
- transport issues, particularly to the urban/rural interface regions.

10.5.2 Infrastructure and opportunity

A consistent finding in the world literature is the relationship between the development of infrastructure and economic growth. Infrastructure provision is a mechanism for enabling a region to gain competitive advantage.

Infrastructure includes airports, rail and other transport systems, roads, electricity, gas, telecommunications and water (waste and stormwater). In the social and cultural sense, the term 'infrastructure' also embraces hospitals, universities, schools, libraries, sporting stadiums, shopping centres and cultural centres, including galleries and museums, to name a few.

As regions compete more aggressively for new businesses and investment, those regions that are well organised and efficient in terms of their infrastructure profile will gain competitive advantage by:

- reducing the cost of operating in the domestic market
- reducing the region's greenhouse costs
- unlocking new markets
- catalysing innovation
- expanding the effective labour market
- expanding opportunities for individuals
- enhancing broad social outcomes
- improving family cohesion by providing effective transport systems that reduce journey to work times
- increasing the attractiveness of a region through amenity and lifestyle characteristics.

Infrastructure planning is critical to the success of new communities. The days of creating dormitory-style housing developments at the city fringe are over. The increased complexity and scale of the Melbourne metropolitan area, the costs of climate change, increased use of telecommunications technology and transport issues all point towards more fully integrated local communities. Infrastructure planning is at the core of the development of these communities.

Infrastructure provision is also critical to the competitive position of Melbourne's North as an integrated economic region. Infrastructure improvements or innovations in the region are required for its transport systems, telecommunications infrastructure, waste and stormwater systems (to ensure that water is not wasted but recycled), and in the development of environmental and economic sustainability of its domestic, commercial and industrial buildings. In times of economic downturn, infrastructure projects provide an important mechanism for maintaining regional economic activity.

Major infrastructure such as the Melbourne Airport and the relocating Wholesale Market have the capacity to create significant regional advantage and specialised cluster development. Melbourne Airport is Melbourne's window to the global economy. As well as creating a large amount of employment, the airport is a catalyst of innovation that connects regional businesses to the global economy.

The location of Melbourne Airport in Melbourne's North offers an opportunity to promote the region as a global centre of business excellence.

The high-tech nature of airports attracts highly skilled workers, adding to the knowledge intensification of the region and bringing skills that have the potential to diffuse into local industry. The Wholesale Market also has the potential to create a cluster of related business activity and brings with it a new dimension of opportunity to Epping and the north.

Major road projects such as the Northern Ring Road, CityLink upgrades and the way these roads integrate into Melbourne's road network will reshape Melbourne's North. The completion of the Ring Road is now high on the list of the region's infrastructure requirements.

The knowledge based infrastructure of Melbourne's North, its tertiary institutions, research facilities, schools and knowledge intensive industries are vital to the further development and economic integration of the region. The case here is for greater vertical integration of schools, TAFE institutes, universities and high technology businesses so that a greater proportion of the young trained in the region have the opportunity to use their skills and creativity to build the local economy.

Hospitals and other health related services are also critical to the development needs of Melbourne's North. Hospitals include Northern Health's Northern Hospital in Epping, St Vincent's in Fitzroy and the Austin Health cluster in Heidelberg. The Austin Hospital is now housed in one of two new hospital towers and shares its site with the Mercy Hospital for Women. Austin Health also comprises the Heidelberg Repatriation Hospital and the Royal Talbot Rehabilitation Centre.

The ongoing development of health infrastructure will become even more important as the original growth boundaries of Melbourne are moved outwards to the north of Craigieburn, in line with Victorian Government boundary adjustments in 2008 and 2009.

The kinds of medical clusters being formed in the region also create the opportunity for greater knowledge intensification of the economy. This process occurs through increased integration with universities and the development of medical education, more and higher levels of research at the local level, more highly skilled households, the attraction of more specialist medical services and the opportunity for the growth of medical conferencing and medical information businesses.

Austin Health demonstrates the possibilities as it currently:

- supports more trainee cancer researchers than any other Australian medical centre
- has the largest number of students studying health professions on a single site outside a university
- has the largest veteran clientele of any Victorian public hospital
- has the largest translational cancer research program in Australia.

It is clear from this short summary that infrastructure can impact on the economy in a range of different ways, but all add to the capacity of a region to compete.

10.5.3 Building codes: building in competitive advantage

Buildings account for about 40 per cent of all energy use in OECD countries. Given the carbon footprint of Victoria's electricity sector because of its current reliance on coal fired generation, it is critically important for future competitiveness to reduce energy consumption by implementing strict building codes that meet the expectations of future residents and businesses.

The most advanced building codes include all aspects of a building's energy use, including lighting, installed equipment and appliances as well as renewable energy options.

Creating a more knowledge intensive, high-tech and sustainable built environment will be a foundation stone in the search for global competitiveness. Creating a built form that is energy smart and uses new materials, technologies, renewable energy and integrated water and waste systems will provide new opportunities for regional businesses. Events in Germany are currently the model for world best practice.

Recommendations by the International Energy Agency to the G8 summits 2006–2008 included the following policy measures for buildings:

- building codes for new buildings to embody energy efficiency
- passive energy houses and zero energy buildings
- policy packages to promote energy efficiency in existing buildings
- building certification schemes
- energy efficiency improvements in glazed areas.

The International Energy Agency Information Paper *Energy Efficiency Requirements in Building Codes, Energy Efficiency Policies for New Buildings*, March 2008, makes some key points that are worth noting.

1. The energy efficiency of new buildings determines energy consumption over a long period. Improvements to energy efficiency are relatively easy at the planning stage and far harder after construction is complete.
2. Energy efficiency requirements in building codes serve as efficiency targets, with buyers and renters now taking a much harder look at a building's energy consumption profile, spurring demand for energy efficient buildings.
3. Because the energy consumption of buildings is so high, at around 40 per cent of total energy use, countries can significantly reduce energy costs, and cut greenhouse emissions and the need for imported energy. Energy efficiency is seen as the best way to establish energy security.
4. Energy efficiency is not just the choice of the individual owner. The energy efficiency of new buildings will last a lifetime and lost opportunities at the construction phase will require remediation and significant additional costs at a later date.
5. New buildings are unlikely to be renovated in early use, so the benchmark should be set for renovations that would normally aim to bring older buildings up to the present standard.

6. If incorporated into the early design stage, energy efficiency measures are far cheaper. An example might be increasing the thickness of insulation layers at a marginal additional cost.

Case study: Passive energy houses

The International Energy Agency Information Paper, *Energy Efficiency Requirements in Building Codes, Energy Efficiency Policies for New Buildings* describes a passive house as a building in which 'a comfortable indoor climate' can be achieved without a traditional cooling and heating system. Passive houses use far less energy, calculated for most countries as 70–90 per cent less energy than a house with traditional heating and cooling systems. The first passive house was built in Darmstadt in Germany in 1990. Standards and conditions for passive house construction are set by the Passive House Institute in Darmstadt.

Passive houses must be highly insulated and designed without thermal bridges (parts of the construction that allow heat and energy to escape). They include triple glazing with specially treated glass, elimination of drafts to make the building airtight, highly efficient mechanical ventilation, and innovative heating solutions such as heat exchange systems. While passive houses are a European and cool climate innovation, it is possible to adapt and extend the principles and ideas used in the European passive house to design and construction across the northern metropolitan region.

The International Energy Agency information paper reports that, in parts of southern Germany and Austria, passive houses are now in sufficient supply to be available on the market and, in Upper Austria, passive houses have a 7 per cent share of the market for one-family houses. In Upper Austria, with its relatively mild climate, there is a strong shift to low energy houses, which are forecast to dominate the built domestic housing market. This shift has been driven by a strong policy to promote the construction of passive houses that include subsidies (only obtainable by the owner), certification schemes and a range of actions by energy agencies. Passive building construction innovation is now migrating across to public buildings, schools and offices.

What is also worthy of note is that supply firms benefit from the opportunity to develop new products to meet the demand for passive houses. These products will also have rapidly growing opportunities for export. The building trades in Austria and Germany also benefit from an increasing range of skills and knowledge, which create a value add and more opportunity to develop new skills and careers in this industry sector.

Passive houses can be different to our understanding of the definition of a zero energy building in that they are designed in detail and in their total form to be passive in the use of energy. Zero energy buildings could be traditional buildings that have undergone a retrofit of their water heating systems and electricity generation to renewable sources of energy.

Among its recommendations, the International Energy Agency information paper states that 'best practice and demonstration buildings such as passive houses and zero energy buildings should be encouraged and supported to help these buildings penetrate the market. National targets should be set to ensure that these buildings represent the market for new buildings in 2020'.

11 The increasing demand on transport systems in Melbourne's North

Findings

1. Congested transport systems destroy regional economic integration strategies.
2. Congestion of the inner north's roads and extensions to clearways destroys amenity and undermines the role of Activity Centres.
3. Residents from all parts of the region continue to access knowledge intensive jobs in Melbourne's core.
4. The outer regions of Melbourne's North need to be better served by public transport and transport infrastructure in ways that do not destroy the amenity of the middle and inner parts of the north.
5. Major residential and commercial developments in the region should have access to rail.
6. Activity Centres need excellent transport if they are to succeed.
7. East-west connections across the region will become increasingly important to enhance social and economic integration.

11.1 | Introduction

Congestion and transport issues in Melbourne's North have the potential to slow future economic development and integration, as well as reduce the quality of life for both workers and residents. The transport issue is so important to the successful development of the region that this study examines the issues in detail and highlights issues that require further investigation but are not in the scope of this study.

Transport issues are exacerbated by a series of social and economic changes that include:

- 1,200 or so people move to Melbourne each week, with many moving to the city's outer suburbs
- businesses are also relocating to LGAs such as Hume and Whittlesea because of land availability and the growing workforce
- residents of the outer and middle suburbs still need to access jobs in the knowledge intensive core – over-crowding of public transport, traffic congestion of trams on inner routes and east-west access are all issues
- public transport is increasingly important in terms of providing at least the potential for commuters to avoid serious road congestion
- Melbourne's economy is being constrained by incomplete or not connected transport systems, both road and public transport
- given the extension to Melbourne 2030 boundaries, particularly to the north, transport systems need to be planned prior to developments occurring rather than lagging behind other development; an integrated development plan with multimodal transport systems should be a given.

This summary points to the growing importance of building strong and integrated communities away from the city core.

Significant developments within the region that will increase the need for passenger and goods transport include:

- Melbourne Airport Activity Centre
- development of the Broadmeadows Central Activity District
- relocation of the Melbourne Wholesale Fruit and Vegetable Market
- Craigieburn Town Centre
- Plenty Valley Town Centre.

Hume and Whittlesea are expanding, with the townships of Epping North, Mernda and Doreen growing rapidly. While Nillumbik has slower growth, there are access issues because of geography and limited public transport options.

The population of Whittlesea is forecast to grow – from the current 133,000 to either 192,000 or 240,000 (depending on the source) by 2030. And around 23,000 jobs are planned at the Cooper Street employment area, including some 6,000 jobs at the relocated Wholesale Market.

The population of Hume is forecast to grow from the current population of 157,000 to 186,000 by 2030. Despite rail upgrades, line electrification to Craigieburn and a new station at Roxburgh Park, Hume is becoming more congested.

Table 11.1 Average cars per household over time: LGAs

LGA	1996	2001	2006
Banyule (C)	1.63	1.63	1.70
Darebin (C)	1.26	1.33	1.37
Hume (C)	1.71	1.72	1.82
Moreland (C)	1.29	1.34	1.36
Nillumbik (S)	2.02	2.01	2.18
Whittlesea (C)	1.77	1.79	1.87
Yarra (C)	1.07	1.14	1.14
Northern Region	1.49	1.53	1.60
Melbourne	1.54	1.57	1.64
Victoria	1.56	1.59	1.67
Australia	1.48	1.51	1.63

Source: ABS Census.

11.2 | Victorian Government transport policy

Yarra Trams believes that it is unlikely that there will be any extensions to tram lines, although there has been some discussion about light rail along freeway corridors. *'We will keep what we have and make it work better.'* While Melbourne has the longest tram network in the world, its tram infrastructure is run down and needs substantial investment. Yarra Trams has identified economic and transport hubs and is trying to get better continuity. *'Public transport needs proper planning and integration with urban design.'*

The first step in improvement is to replace rolling stock. Yarra Trams aims to provide 100 new trams on the network over the next three years. A state of the art depot and workshop will be developed at Preston, with an investment of \$200 million, as part of the Victorian Government's transport package.

Connex reported a 38 per cent growth in patronage on Melbourne's suburban train network over the last three years.

The following initiatives were announced in the Victorian Government's December 2008 transport plan.

- **New trains, new tracks** – Up to 70 new six-car trains costing over \$2.6 billion (including stabling and maintenance) and more than 100 km of new rail tracks to shift Melbourne's suburban rail system to a modern metro system.
- **More trams and buses** – A \$1.5 billion investment in up to 50 new large low-floor trams to boost the tram fleet and up to 270 new low-floor buses to expand bus services and replace older buses, including the continuation of the hybrid bus trial.
- **Regional Rail Link** – The biggest expansion to the rail network since the Melbourne City Loop – a new 40 km twin-track rail link from West Werribee to Southern Cross Station via Tarneit and Sunshine, and new platforms at Southern Cross Station, will separate regional and metropolitan train services. Rapid access to the city for Geelong, Ballarat and Bendigo trains will be created, as well as extra capacity on the Werribee, Watergardens and Craigieburn lines. This complex project will provide capacity for more than 9,000 extra passengers every hour and cost in excess of \$4 billion.
- **Melbourne Metro** – A new rail tunnel between west and east that will increase the capacity of Melbourne's rail network by around 12,000 passengers every hour and reduce congestion. Stage 1 of the tunnel from Dynon to St Kilda Road (Domain) will cost in excess of \$4.5 billion, with Stage 2 to Caulfield to be delivered after completing Stage 1.
- **Multi-billion dollar upgrade to major regional transport infrastructure** – In partnership with the Australian Government, the state will deliver upgrades to strategic road and rail freight links. The state will also contribute \$1.2 billion to AusLink 2 projects, with the next priority being duplication of the Western Highway between Ballarat and Stawell – a key part of the national transport network.
- **An alternative to the West Gate Bridge** – A new tunnel from Geelong Road / Sunshine Road to Dynon Road / Footscray Road in the Port of Melbourne precinct, which will relieve Melbourne's dependence and reduce traffic congestion on the West Gate Bridge at a cost of more than \$2.5 billion.

- **Shaping Victoria** – Making jobs and services more accessible to more Victorians by investing in transport and attracting jobs and services to six new Central Activities Districts in Melbourne at a cost of \$60 million. A blueprint supporting future growth in regional Victoria will be completed by the end of 2009.
- **Truck Action Plan** – A two-stage plan to remove thousands of trucks from residential areas in Melbourne’s inner west and improve freight access to the Port of Melbourne, including a new link from the West Gate Freeway into the port and upgrades to other key routes in the inner west. Stage 1 will cost \$380 million.
- **Completing the ‘missing link’ in Melbourne’s Ring Road** – A connection between the Metropolitan Ring Road in Greensborough and the Eastern Freeway in Bulleen will close the ‘missing link’ between Melbourne’s north and east at a cost of more than \$6 billion. This road will include tunnelling to preserve environmental and heritage values.
- **Rail extensions to provide more transport choice in growth areas** – Rail extensions from Epping to South Morang and electrification of the Sydenham line to Sunbury to meet growing demand in the growth areas of the north and west. New train stations will be built at Lynbrook and Cardinia Road in the south-east. In the longer term, the Cranbourne Line will be extended to Cranbourne East, with a new station to be built. New train stations will also be built at Williams Landing and Caroline Springs in the west. Melton services will be increased in the short term and electrified in the medium to longer term. The combined cost of these projects is \$2.7 billion.

11.2.1 The RACV Outer Melbourne Connect Report

The Royal Automotive Club of Victoria (RACV), in its *Outer Melbourne Connect Report* (October 2008), recommended the following transport initiatives for Melbourne’s North.

1. Additional investment in roads across the outer north, including:
 - Hume – six road projects \$336 million
 - Whittlesea – nine road projects \$300 million
 - Nilumbik – five road projects \$86 million.

2. Other transport initiatives include:
 - Epping North rail extension
 - Epping rail line duplication from Keon Park to Epping
 - Mernda Rail extension, including completion of South Morang railway station
 - Metropolitan Ring Road extension from Greensborough to Eastlink
 - E14 Arterial connecting Western Ring Road and Mt Ridley Road
 - E6 Arterial connecting Metropolitan Ring Road and Bridge Inn Road
 - Orbital SmartBus services (RACV recommended) Chelsea, Nunawading, Doncaster, Broadmeadows and Werribee
 - Orbital SmartBus Frankston, Dandenong, Ringwood, Epping and Melbourne Airport.

Plans for an outer Metropolitan Ring Road, which will run in an arc from Avalon Airport to the Hume Highway, are also being considered.

11.3 | Transport in Melbourne's North: options considered

11.3.1 *The transport conundrum*

Typically, modes of travel are influenced by road speeds – suburban rail patronage is only what it is because the roads are congested, and de-congesting the roads would empty the trains and require further additions to road capacity.

Theoretically speaking, it is not possible to separate the costs of an aspect of transport from transport costs as a whole, and it is not possible to separate transport costs from the costs/benefits of urban design as a whole.

11.3.2 *The business as usual scenario*

The scenario described assumes little attention is paid to greenhouse emissions from transport and attempts to describe current circumstances.

Freight

If the freight transport needs of Melbourne's North are met by trucks and other road transport, trucks will get bigger and heavier, and will reach the region from interstate, mainly via the Hume and Western Highways (the latter via the Ring Road and whatever further-out rings are built).

As the volume of airfreight increases, so will the volume of road freight into and out of Tullamarine, mainly by medium-weight trucks and vans.

Passenger

Existing trends show that private cars continue to carry most loads. Residual public transport will be provided: social service minimum bus services in the outer suburbs (this means a bus every hour or perhaps half hour during business hours from suburbs to a point in the car park of the local shopping mall), and park and ride trains from the outer suburbs to the CBD, with more intensive public transport services in the inner suburbs. Improved provision for cyclists is occurring in the inner suburbs, but conflicts of interest between pedestrians and motorists will always be settled in favour of the motorists.

Air continues to dominate long distance travel. There will probably be a need to provide high-capacity reserved-track connections to Tullamarine.

11.4 | The greenhouse response

Planning is the key to achieving emissions reductions through the reduction of goods and passenger kilometres by ensuring that local choices which reduce transport distance are available.

Reducing emissions per tonne per kilometre travelled can be facilitated by:

- increasing the payload/tare ratio (not easy in freight but there are many opportunities for passenger transport, including lighter personal vehicles and a switch to public transport, assuming this operates at reasonable capacity utilisation)

- switching to rail
- switching from petroleum power to renewable, for which there is little prospect until the electricity industry is decarbonised – once it is, there is potential for light road vehicles to be electric-powered (battery, possibly hydrogen) and rail can easily be electrified; heavy road vehicles are more difficult, though trolley buses are a proven technology and the principle could be extended to trucks, including capacity for short forays away from the wires.

Freight transport

'High-tech = less mass = lower transport costs.'

Roger La Salle, Director, Matrix Thinking

To maintain long-term competitiveness of manufacturing and distribution of goods in Melbourne's North more generally means reducing the greenhouse emissions from transport of goods. A revival of rail for long-distance general freight, whether in containers or not and for high density local flows, for example into Melbourne Port, could provide significant long-term benefits.

Under this scenario, the location of rail terminals becomes important. There might even be a revival in 1920s style rail-served industrial estates, but this depends on growth of manufacturing businesses with significant long-distance transport needs.

Passenger transport

Reducing distances is important. Greater emphasis on local employment, local facilities, pedestrian planning (walk to school, walk to shops, etc), reducing distances and improving conditions for pedestrians increases the potential role of local public transport. Local public transport is best seen as an extension of walking – commonly, more time is spent walking and waiting than in-vehicle. Shorter distances increase the potential destinations for which walking and public transport are potentially competitive. This confirms the importance of Activity Centres.

Emissions abatement would require non-transport investments (the high priority for decarbonising electricity and improving telecommunications), with transport investment concentrating more on public transport and rail. This implies an increased emphasis on road management priority for low-emission vehicles and imposed costs on high-emission transport.

Increases in cycling involve extension of the present cycle-path and cycle-lane approach, possibly at the expense of powered-vehicle capacity.

11.5 | Transport problems in Melbourne's North

Under a business as usual scenario, there is an insoluble problem – how to transport a vastly increased outer suburban population by car to workplaces in the CBD and inner suburbs (some of which, particularly Yarra, are in the study area). The problem is worsened by the conversion of Moreland and Darebin from areas with substantial local (manufacturing) employment to short-distance commuter suburbs.

The problem has several aspects:

- accommodating hordes of parked cars in the CBD and inner suburbs without destroying amenity and (more importantly) pedestrian connectivity
- accommodating traffic to and from car parks in the CBD and inner suburbs, which is difficult to do without destroying amenity and pedestrian / public transport connectivity
- accommodating traffic through Banyule, Darebin and Moreland; the two radial freeways run along the boundaries of the region and are far from the direct radial route choices of residents in the new development areas.

These problems are similar to those of the western suburbs, with the difference that the port fills the territory between the western suburbs and the CBD and greatly restricts the number of routes (both road and rail) between these suburbs and the CBD – hence the additional problem, pointed out by Eddington, of east–west traffic seeking ‘rat runs’ through the northern part of Yarra and through Moreland. An important fact about both Moreland and Darebin is that their street patterns resist rat-running both east–west and north–south, which means that the typical suburban street is quiet and attractive for gentrification.

The clearway debate illustrates a basic problem. There are very few radial roads from Greensborough–Epping–Craigieburn to the CBD, and those that exist are one-chain wide, with strip shopping centres and mostly with tramlines. VicRoads wishes to increase road capacity by declaring clearways, but the locals resist. The main problems are that clearways reduce pedestrian amenity and safety (particularly for pedestrians with little children) and that local traders want parking spots right outside their doors. In short, clearways are guaranteed to destroy the strip shopping centres – a result possibly welcomed by the developers of shopping malls but not by local residents. In any case, the increase in capacity offered by clearways is nothing compared to the increase in potential demand from the growing outer-suburban population.

Are there any other ways to increase radial road capacity? The answer is probably no, short of tunnelling or reviving the Merri Creek freeway proposal and bulldozing a lot more of Yarra to provide connecting road space. It is axiomatic that road capacity between the Ring Road and the CBD will not increase, and may decrease as measures are put in place to protect amenity in Moreland and Darebin.

11.6 | Radial trains

The public transport alternatives are worth examining, since capacity per track lane is much higher than for private cars on roads, especially when those cars are driver-only, as is common for commuter traffic.

Theoretical crush capacities for heavy rail trains have been calculated at around 60,000 passengers per hour, but the practical limit under Melbourne conditions appears to be around 25,000 passengers per hour. This limit can be increased by using express-only tracks. It is reduced when a combination of express and all-stations services uses the one track. Theoretical crush capacity for tram services is somewhat less, given at around 20,000 passengers per hour, but practical capacity is less again, especially if crush conditions are to be avoided. Practical capacity for busways is probably a bit less than trams, assuming that the typical bus is smaller than the typical tram.

Both train speeds and minimum service intervals depend in part on rolling stock. Metro style rolling stock has wide doors and correspondingly shorter dwell times at stations, at the expense of seating capacity. Many passengers are expected to stand. It is accordingly regarded as suitable for high-frequency relatively short-distance services, say 20 minutes in the train at most. Much traffic on the north suburbs radial lines is of this kind, but some is not. Hurstbridge in particular requires a more comfortable service, and the time to Craigieburn is also getting beyond the metro range. Ideally, this type of demand can be serviced by 'commuter trains' with lots of seats and relatively slow loading, which pick up at a limited number of park and ride stations in the outer suburbs and then run express to the CBD. This type of operation is well developed in some North American cities, where service is often peak period peak direction only, perhaps with a backup bus service off peak. Around Melbourne, V/Line provides this type of service, plus rail off-peak service. The problem is to find tracks for additional peak-hour express runs. A possibility would be an extra pair of tracks – Broadmeadows–Southern Cross – for this type of service.

Possible future investments

Possible future investments include the following.

- Lay rail tracks in the centre reservation of the Eastern Freeway and provide park and ride. There is already a bus service doing this – a rail service would increase capacity somewhat and improve ride quality (one can read if seated on a rail vehicle, less easily if seated on a bus). A light rail line could connect via Nicholson Street into Bourke Street, where there is some spare capacity but the street is already used by two routes – the Eastern Freeway line would be limited to (say) 20 trams per hour. This line would be of limited interest to the region since it is throughout on the wrong bank of the Yarra. Among the region's residents, the most likely to use it would be those of eastern Nillumbik, that is, the semi-rural populations of Kangaroo Ground.
- Convert two lanes of the Tullamarine Freeway to rail. This is currently impractical, since it involves reducing road space, but could be a possibility if greenhouse gas emissions abatement policy starts to bite. The result would be an express run from Tullamarine to the CBD. There would be problems in providing terminal facilities in the CBD. Perhaps the main role of this possibility would be as a terminal leg of interstate fast rail.
- More down to earth, there are currently four radial rail lines that run through the region and can be considered.
 1. The **Craigieburn line** feeds into North Melbourne and carries Seymour services as well as strictly suburban and occasional broad-gauge goods trains, though these may cease if there is further gauge standardisation for freight. Even so, it is running at less than capacity north of North Melbourne. Current policy is to provide an all-stations service only. Journey time from Broadmeadows to the CBD is 30 minutes, which even with the addition of a connecting bus ride of, say, 20 minutes, places it within commuter range. There are limited park-ride sites but electrification could be extended north again to sites where substantial car parks could be provided. There are substantial opportunities for feeder buses to serve Broadmeadows, which is cited as a major node development.
 2. The **Upfield line** feeds into North Melbourne with suburban services only. Currently there are three trains an hour, so there is substantial excess capacity north of North Melbourne even if the full Melbourne maximum of 17 trains per hour cannot be approached because of the numerous level crossings, as this would disrupt east–west road traffic too much. The time from Upfield to the CBD is 31 minutes and therefore within commuting range. The line

does not serve any proposed major urban centres (though it parallels the strip shopping centre in Sydney Road). However, there may be room for large car parks at Upfield (if Ford reduces its site utilisation) or at Campbellfield where the line crosses the Ring Road.

Both the Craigieburn and Upfield lines run through North Melbourne, where they join the Sydenham and Werribee lines in making demands on a single track of the Loop or on the single non-Loop track from North Melbourne direct to Flinders Street. There are also capacity limitations between North Melbourne and Southern Cross due to the need to divert country trains across various tracks into the terminal. The announced independent V/Line track from Sunshine to Southern Cross promises to deal with some of these problems. The Eddington proposal for diversion of the Sydenham (and potentially Melton) line into a tunnel via Parkville and under Swanston Street would release more capacity, in addition to being fearfully expensive. It might be possible to divert the Upfield line into this tunnel. A further possibility for Upfield would be to connect northwards to Craigieburn, which would, however, involve an expensive flyover at Roxburgh Park to get over the standard gauge line and would also ignore the proposed Broadmeadows hub.

Alternatively, V/Line services might be diverted via the Upfield line (which would retain its present long-interval suburban service), releasing capacity on the line via Broadmeadows for more intensive suburban service. This would have the attraction of providing the Broadmeadows hub with an intensive service, and possibly making way for a CBD to Tullamarine Airport service via Broadmeadows.

3. The **Epping line**, with its proposed extensions northwards to North Epping and North East to South Morang is a purely suburban line, which joins the Hurstbridge line at a flat junction at Clifton Hill. The current peak-hour service is six trains, all of which stop at all stations, giving a current time Epping to the CBD of 37 minutes. There are numerous level crossings and an increase in service frequency would probably only be politically feasible if overpasses were provided, at least at Bell Street. Opportunities for park and ride development on the existing line are limited but there should be room at South Morang.
4. The **Hurstbridge line** serves southern Darebin and runs right through Banyule into Nillumbik (Eltham, Diamond Creek, Hurstbridge). This is a purely suburban line, which joins the Epping line at a flat junction at Clifton Hill. The current peak-hour service is seven trains, two of which are expresses Heidelberg to Clifton Hill with a further express running Clifton Hill to Jolimont. There are some level crossings, but they are not as significant as on the Upfield or Epping lines. Current journey time Eltham to the CBD is around 40 minutes by one of the peak-period expresses.

The Epping and Hurstbridge lines join at Clifton Hill and run round the Loop. The current peak hour service of 13 trains is short of the Melbourne practical maximum of 17, perhaps due to the mixture of express and stopping services and also perhaps due to the limitations of arrangements at Clifton Hill. The current project at Clifton Hill should improve matters somewhat but does not include a flyover, so there will still be cross-movements that limit capacity.

It was originally thought that the Eastern Freeway line would be a heavy rail line joining the existing line at Victoria Park but there is not enough spare capacity for this, so the proposal is for light rail.

If tunnelling is allowable, the Epping line might be a candidate for diversion into a tunnel from Rushall under Fitzroy to Swanston Street. It could be run as a metro line, with wide-door low-seating trains and short station dwell times.

11.7 | Trams

Given problems in expanding rail capacity, what about the tram lines? All tramlines in the region are radial and are reviewed below.

1. **West Coburg** serves an established residential area, stopping well short of the new suburbs. It runs on reserved track through Royal Park but the layout does not make for fast running.
2. **North Coburg** runs straight down Sydney Road from a point not far south of the Ring Road. It serves a strip shopping centre that both generates passenger traffic and slows tram speeds – a major site of clearway conflict. On Royal Parade the line has semi-reserved track but right-turning motorists cause major delays, especially outbound in the evening. The tram line runs into Elizabeth Street and there would be scope to increase service frequency, but there is little room for additional car parks near the northern end of the line. The line runs parallel to the Upfield line, and works very well as a local service in the strip shopping area plus a reasonably fast service from Brunswick to the CBD.
3. **East Coburg** in Moreland runs on a one-chain street, but in Yarra runs on virtual reserved track without the right-turn motorist delays noticeable on Royal Parade. The line stops short of the new suburbs. Like North Coburg, it provides a reasonably fast service from East Brunswick and North Carlton to the CBD.
4. **East Brunswick** in Moreland runs on a one-chain street, but in Yarra runs on virtual reserved track without motorist delays other than traffic lights. This line provides fast and reliable service for the people of North Carlton and East Brunswick, but is of no potential interest to the new outer suburban populations.
5. **West Preston** is like North Coburg in that the line starts a few kilometres south of the Ring Road. It runs for several kilometres on one-chain roads, then on reserved track along St Georges Road (no strip shops here) then along Brunswick Street through Fitzroy. In Brunswick Street it provides a valuable local service, but is inevitably slow.
6. **Bundoora** is the only tram line to penetrate north of the Ring Road. The line runs on reserved track from Bundoora to East Preston, then on one-chain streets to Clifton Hill, then briefly on reserved track again before turning into Smith Street and Gertrude Street, both of which are one-chain streets. High Street Northcote, Smith Street and Gertrude Street are all shopping strips where the tram provides a needed local service, but the result is a peak-period running time from Bundoora to the CBD of approximately an hour. This could be reduced, with a relatively small capital investment in additional tracks, by running the service along Plenty Road as at present, then St Georges Road, then Alexandra Parade (300 metres of new track), then Nicholson Street. However, this would disrupt the more local tram services currently provided and would still be subject to traffic light delays. A suggestion is that the West Preston service should be diverted via High Street, and Bundoora and West Preston services could then interchange with each other and the Epping line at Dundas Street (which would require shifting Thornbury station a few

hundred metres north). This would leave Brunswick Street for a terminating local service. As it stands, the Bundoora line is important in that it serves La Trobe University and RMIT University, a potential hub of knowledge based activities. The tram line is important in that it connects this hub to medium and high density residential areas.

Conclusion

These tram services provide radial and local service to the inner and middle suburbs of the region, but are not in a position to make much contribution to the demand for radial travel from the new outer suburbs. Indeed, the quality of tram services on these routes is threatened as motorists from the new outer suburbs force their way onto the one-chain streets used by all the services at some stage or other. Rather than attempting to force more traffic onto these streets (as by clearways), the obvious strategy is to manage the traffic away from the streets concerned so that the trams can provide quality local service and the strip shopping centres can be maintained.

An important role of the tram system is local transport in the inner suburbs, particularly now that the knowledge economy is decentralising into Yarra. Because the Melbourne rail and tram systems were developed in competition, interchange between them is poor. There should be opportunities for improved interchange (at Clifton Hill perhaps). Where rail–tram interchange cannot be improved, there may be opportunities for bus services like the new 401 from North Melbourne to Parkville.

11.8 | Radial bus

Finally, what about radial bus services? There are only two. The 250/1 jogs from central Darebin through North Fitzroy to the CBD. The 350 connects the CBD with La Trobe University via the Eastern Freeway and various local streets in central Darebin. Apart from these, there are no more radial roads that do not already have a tram service. The main opportunity for additional bus services would be to make greater use of the express bus lane on the Tullamarine Freeway. This could be done without the furore that would accompany conversion of this lane to rail transport, and would be the logical way to provide CBD services to any new suburbs that may be developed along Mickleham Road.

11.9 | What can be done?

11.9.1 Enhanced radial capacity

The possibilities are as follows.

- The present four train lines provide good basic coverage for radial travel. They suffer from the inherent defect of radial travel – as the distance from the city increases, the distance between lines increases. In Yarra, Banyule, Darebin and Moreland, many residents can walk to their station but this is not the case in Whittlesea and Hume, so there is a need for feeder buses and/or park and ride.

- Broadmeadows, Upfield, Epping and Greensborough are more or less at the limit of tolerable travel time for stopping all stations service. An express service could be provided by adding two tracks that need not have platforms, although providing platforms adds to operational flexibility (cf Richmond–Caulfield). The existing Upfield railway reserve is too narrow for additional tracks. The Epping reserve might take them north of Rushall, though there are too many level crossings and there would be a need for a tunnel from Rushall to create capacity southwards. The existing Hurstbridge line probably does not have room, and there would be problems south of Clifton Hill. That leaves the Craigieburn line via Broadmeadows as the most likely candidate for additional tracks, provided the problems that these tracks would encounter on reaching North Melbourne can be solved.
- The role of the tram and bus system is likely to remain that of providing quality local service. That role can be enhanced if there is better provision for tram/bus/train interchange.

11.9.2 Radial freight

The need for radial freight transport arises from three main sources.

1. supplies to the CBD itself
2. port traffic
3. cross-town traffic where the most direct route runs through the inner suburbs.

Congestion provides a strong incentive to schedule the first of these off-peak, and there is probably no further need for policy attention since road capacity exists at these times. The second is a major geographical problem for Melbourne. It has often been suggested that the port should be transferred elsewhere – either down Port Philip Bay or to Westernport, but for these purposes it is assumed that the port stays where it is. Since the port is to the west of the CBD, it is logical that its main connections should be westwards, and this is indeed the case, currently and in terms of state planning for future investment. This means that the truck route from Melbourne's North to the port is going to be via the Tullamarine Freeway or the Ring Road, or a combination of the two.

Despite the existence of the Tullamarine–CityLink connection, the value of inner city land is such that augmentation of capacity across the inner city is very expensive (cf. the Eddington road tunnel). The obvious investment is the heralded Ring Road to Eastern Freeway connection, coupled with measures to stop trucks developing rat runs through Moreland, Darebin and Banyule. The main benefits of this investment are expected to be expediting truck movements from the outer east and south-eastern suburbs, and Gippsland, to the Hume and Western freeways. The benefit to the northern suburbs is subsidiary, but an improved truck connection to Dandenong etc could allow integration of production between the two areas. This road is expected to be very expensive, since long sections will have to be underground for environmental reasons.

Since the main benefits are to freight, consideration should be given to two options.

1. Build it as a freight-only road, with just one tunnel in each direction. This would reduce costs without sacrificing any of the benefits to freight traffic.
2. In the emissions-abatement context, add in provision for a single-track freight rail connection from Somerton to a terminal south of Dandenong.

Currently, the Eastern Freeway pours traffic into Yarra. Eddington suggested that the freeway should be extended by tunnel to Braybrook, but Yarra residents opposed the proposal. As a result of his terms of reference, Eddington did not investigate whether an Eastern–Ring connection would be an alternative, and if so for what traffics. But it would certainly meet some of the demands, particularly trucks from Dandenong to the Hume and the west. Eddington demonstrated that east–west traffic is responsible for considerable rat running through Yarra and Moreland, and it might be possible to achieve inner suburban support for a revised east–west tunnel if this traffic was blocked as part of the deal. However, it is more likely that the whole question will subside as the country turns its attention to emissions abatement. (There are various ways to block rat runs, ranging from physical barriers and traffic calming to pricing techniques.)

11.9.3 Local passenger traffic

Under a business as usual scenario, the low-key inner suburban conflict between motorists and cyclists, pedestrians and public transport will continue. Pressure will grow from increased motor traffic, much of it originating outside the inner suburbs, but at the same time residents are becoming less willing to accept the costs imposed by motor traffic and, with gentrification, are more able to promote policies that limit motoring. A stalemate is likely which, under emissions abatement, could develop into stronger anti-motoring measures.

With regard to local public transport, radial services are for the most part adequate, at least during business hours. Cross-town bus services are less so, particularly out of business hours, and their infrequency discourages the L-shaped journeys that are necessary if people are to make diagonal trips. There is scope for frequency improvement, at least for selected major routes.

In the outer suburbs under business as usual, the car will retain its pre-eminent role. In this context, one may wonder if the proposed Broadmeadows business centre will get off the ground. The site was perhaps chosen because it is close to the Ring Road, but this means that it is expected to be largely car-served. The fact is that Australia has yet to develop a major business centre served entirely by car, as the resulting car parks and access roads destroy connectivity. A business hub worth the name is unlikely to develop without being a public transport hub, and there is little sign of Broadmeadows achieving this status. Under a business as usual scenario, outer suburban local public transport is likely to be the social service minimum that currently translates as a half-hourly or hourly frequency, suitable for travel to neighbourhood centres but not to any major hub. However, under emissions abatement, this could change.

11.9.4 Orbital passenger

For cross-town passenger transport in the inner suburbs, see previous text. At inner suburban scale, this type of passenger transport is essentially cross-town.

In the outer suburbs, cross-town passenger transport is likely to be almost entirely by private cars. There is room to build multi-lane orbital roads. The RACV advocates fast bus services along these roads, but this advocacy is part of its general advocacy of road investment – its argument is that orbital bus services using freeways (or at least high-capacity arterials) are adequate provision for orbital public transport.

This is very much a business as usual proposition and, under this scenario, such services indeed extend the social service minimum. However, uncomfortable facts should be remembered. Orbital buses, however smart, are only useful for fairly long distances because stops have to be far apart both to take advantage of freeway speeds and because freeway verge areas are blighted and unattractive to urban development. So on a pure orbital service, the only stops are likely to be where the service crosses a radial route and/or passes near a shopping mall or other hub.

The long distances, even covered at speed, mean that bus services are not highly competitive with cars even if they go as fast as cars when on the freeway. Total journey durations are likely to be too long. On top of this, existing orbital SmartBus services are slowed down by the necessity to leave the orbital road to visit bus stations, which tend to involve various right and left turns and stops at traffic lights. It would be possible to improve the orbital bus services considerably by providing convenient interchange with all radial routes crossed and providing reserved tracks in and out of interchanges and other stops, such as shopping malls, that lie off the highway.

The cost of these reserved tracks should not be underestimated, since all entry and egress from the orbital freeway will involve flyovers. The cheaper alternative where an orbital freeway encounters a radial line is to provide an interchange platform in the middle of the freeway directly connected to the radial line, which will be either above or below. So an orbital service on the Ring Road would not go into Broadmeadows, but would interchange directly with a rail station directly above the Ring Road, more or less at Jacana. This suggests that shopping malls should similarly be built not beside the main roads but above them. On top of all this is the issue of frequency; orbital bus services are fairly useless for L-shaped journeys unless they run at least every 10 minutes or less.

Where space is available, there is much to be said for running reserved track orbital public transport routes in their own reserves separate from the freeways, and running directly through Activity Centres, which motorists reach by side roads off the main roads. An example that makes use of main road reservations in the absence of dedicated reservations would be an orbital reserved track public transport route through Broadmeadows, which would steer clear of the Ring Road but would have its own two tracks (whether rail or busway) from the airport via Johnstone Street, leading directly to an interchange above or below Broadmeadows railway station, and on via Camp Road with an interchange with the Upfield line (above or below) and on via Mahoneys Road (still on reserved track, taken from the car lanes if necessary) to a similar interchange at Keon Park, and on preferably to La Trobe University and beyond. Further out it should not be too late to make orbital public transport reservations (for example, Werribee–Melton–Sunbury–Craigieburn–Diamond Creek–Lilydale) that lie between the orbital freeway reservations and on the line of the proposed major urban centres. (NB: This is official Netherlands town planning policy.)

From a motor traffic point of view, the Yarra Valley constitutes an important barrier to free orbital movement. Undoubtedly expanding capacity across the Yarra will increase interaction between the northern and eastern suburbs but, apart from freight, what are the benefits? These should be evaluated separately from freight benefits if big money is to be spent on road connections (even if tolled) available to all traffic.

These policies will become more important under emissions abatement.

11.9.5 Orbital freight

This is about trucks, and conventional road planning may be expected under business as usual (though refer to previous text concerning the case for a truck-only connection between the Ring Road and the Eastern Freeway).

If emissions abatement policies are implemented, it will be necessary to re-integrate rail traffic. The obvious sites for major intermodal terminals are at Somerton or perhaps a bit further out. It may not be too late to consider a rail spur to the Wholesale Market site – under emissions abatement policies, it is likely that one or two long trains of produce will arrive from Queensland daily, in lieu of hundreds of trucks. A rail freight line to Dandenong is likely to cross the region, but will not serve the region.

In any re-integration of rail freight, the potential should be considered for rail transport to the port.

11.9.6 Freight hubs

The Victorian Government's 'Freight Futures' Strategy (2008) calls for 'the relocation of domestic interstate rail freight handling from South Dynon to an alternate terminal site in the Donnybrook/Beveridge area, to the north Melbourne metropolitan area. The new terminal will enable interstate domestic freight (which currently travels through the metropolitan area to Dynon) to terminate at Donnybrook/Beveridge for distribution throughout Melbourne. In accordance with the governance arrangements, the authority assigned responsibility for the development of the Melbourne Freight Terminal Network (MFTN) will plan and facilitate this initiative. This will include identifying and acquiring a suitable site, establishing appropriate zonings around the site, managing investment in base infrastructure at the site, negotiating commercial arrangements for the transfer of current operations from South Dynon, and establishing new management arrangements for an open access terminal at the Donnybrook/Beveridge site. In the longer term, the Donnybrook/Beveridge terminal will form a key element of the stage 2 MFTN servicing the Port of Melbourne and other metropolitan freight distribution tasks'.

In consultation with the State Government, Hume, Whittlesea and Mitchell Councils are in discussions concerning undertaking a Logistics City Scoping and Land Use Planning Project to further refine and plan for a new northern Melbourne facility. It is anticipated that this work would consider issues of location and scale.

Austrak Business Park Somerton

Developed by Austrak and situated in Somerton adjacent to the company's multi-modal freight exchange (inland port), between the Hume Highway and the National Rail Network, this park accommodates a range of businesses. It provides direct access to the inland port, facilities for road and rail, and Melbourne and Essendon Airports, and is located less than 20 km from the CBD. The Somerton Intermodal Terminal is strategically placed to improve efficiency in transporting goods along the Hume corridor where freight task, when expressed as tonnes per kilometres, dominates the total freight transported in Victoria each year. The site is positioned within close proximity to many of the major food retailers in regional Victoria, furnishing opportunities for maximum weight capability of import and export containers by rail mode into and from the Port of Melbourne and other Australian ports. The Somerton Intermodal Terminal will facilitate the consolidation of product between various (business) sectors utilising existing

and proposed road, rail and sea freight networks. Opportunities for competitive transport rates may be negotiated in collaboration with individual members of the Austrak Business Park Somerton on a 'total supply and distribution chain' contract encompassing all modes of transport. P&O Intermodal are the operators of the terminal.

The facility incorporates:

- six 750m purpose designed efficient rail sidings
- hardstand and container loading capability
- secure storage facility for 10,000+ containers
- B-triple capable weighbridges and high-tech security gatehouse facility.

12 Melbourne's North: Diversity of LGAs

The following analysis provides a snapshot of some of the issues and opportunities in each LGA in Melbourne's North. The list is not intended to be comprehensive but does provide an indication of the diversity of regional issues and the types of opportunity within the region.

The City of Yarra, the innermost LGA in Melbourne's North, has undergone a major transition to its economy, culture and amenity over the last 20 years. Successfully redefining its economic activity, the City of Yarra's 8,700 businesses have become a significant contributor to the region's economy. The City of Yarra is a creative hub, with highly qualified residents, knowledge based businesses and diversity of household wealth and culture.

The creative industries that have developed in Richmond include design and production, fashion, new media and interior design. The City of Yarra is rapidly becoming a hub for Melbourne's commercial galleries; interior design and fashion are also important drivers of tourism, attracting large numbers of visitors to Yarra and surrounds. There are a number of arts precincts across Yarra, and nationally recognised commercial galleries include Australian Galleries, Alcaston Gallery, Niagara Galleries and Charles Nodrum Gallery.

The City of Yarra has an important history in the development of Melbourne and its housing stock, history, shopping precincts and restaurants make the city a vibrant place to live in or visit. Yarra has a high proportion of renters in both private and public housing.

Environmental awareness among Yarra residents is high and there is a strong desire to protect the local environment and historical landscape. Traffic congestion, particularly from through traffic, is currently a major issue.

The City of Moreland and the City of Darebin are also undergoing significant change. A decline in industrial activity and demand for housing means that opportunities exist to continue to develop new working environments and improve amenity. Proximity to Melbourne's CBD and Melbourne Airport will create significant opportunities to develop new businesses, including business services, creative industries and green environmental protection industries that could facilitate the development of new advanced manufacturing businesses. Moreland and Darebin are well positioned to benefit from developments in Hume and Whittlesea, which contain 50 per cent of Melbourne's development land, providing transport issues are resolved. An important strategic goal for Darebin and Moreland will be to increase the level of service exports that have strengthened the performance of the City of Yarra in recent years.

The City of Banyule includes high quality residential areas with relatively low levels of population growth. Banyule has led the way in the development of commercial floor space in its Activity Centres, which also provide quality shopping precincts. The health cluster is a strong feature of the growth in service exports. The residents of Banyule are highly qualified and many commute to Melbourne's CBD for employment. Transport is a critical issue, particularly east-west travel.

The Shire of Nillumbik is an interface LGA. Its residents are highly qualified and lifestyle opportunities are a key attraction – Nillumbik has been nominated as the third most liveable LGA in Australia. Its environment is valued highly by its residents and there are opportunities to create greater levels of sustainability in both the workplace and in local households. A longer-term strategy to increase local employment in Activity Centres will consolidate

communities even more and the internet could facilitate opportunities for professionals to work from home rather than travel to the Melbourne CBD for employment. Transport and access are again issues for this LGA.

In Melbourne's North, population growth has been most rapid in Hume and Whittlesea, with both LGAs exceeding forecast expectations. The City of Hume is an important employment destination for Melbourne residents, providing 4.5 per cent of Victoria's total employment. The largest contribution to total resident employment in Melbourne's North comes from Whittlesea. The City of Hume's economic links extend outside Melbourne's North to the rest of Victoria, where Whittlesea's economic linkages are, to a much greater extent, confined to Melbourne's North. Both LGAs are attracting larger industries, and industry clusters are developing in sectors such as food processing, logistics, transport and warehousing. Major investments are occurring in Hume and Whittlesea, including at Melbourne Airport, the relocation of the Wholesale Market and the Broadmeadows Central Activity District developments.

12.1 | Strategic interventions

Following are new knowledge based public sector investments that could assist the future economic development of Melbourne's North.

1. Assistance for new businesses

- Establish business incubators that encourage entrepreneurship and new employment opportunities in areas of technology and environment, food production and processing, and education
- Develop integrated small scale business parks, particularly on old industrial sites, as the next step up for businesses moving out of incubator facilities.

2. Growing the arts and information sectors

- Create arts centre developments, including for the visual and performing arts, such as the \$14.5 million Craigieburn Library and Learning Centre to encourage lifelong learning practices
- Create redevelopment projects such as an arts style precinct (based on the Danks Street model in Sydney) to drive the growth of amenity and lifestyle improvements; this could include an industrial design business incubator, artists' studios and commercial galleries
- Establish art spaces and studios for artists, integrated in small scale business parks.

3. Opportunities from the green economy

- Develop an environmental products manufacturing and business services research centre of excellence and funding for a green industries business park
- Establish a centre of excellence for the development of energy efficient and sustainable buildings, which could showcase new materials and technologies, be a resource centre for education and trades, and be a resource for all Victorians.

4. Assistance for home based businesses

- Develop incubators that specialises in taking home based businesses to the next step
- Offer home based business resource centres in existing public facilities such as libraries.

5. Harnessing industry links with TAFE and university

- Strengthen the role of LLENs and industry groups to actively encourage engagement between industry and education.

6. Accelerating Activity Centre development

- Ensure that Activity Centres are the places in which knowledge economy infrastructure is developed, including location of incubators, centres of excellence, arts spaces, office accommodation for LLENs and other business services or networking organisations.

7. Accelerating the establishment of Trade Training Centres

Ensure that Melbourne's North receives an appropriate share of funding for Trade Training Centres. The Commonwealth will contribute \$2.5 billion over 10 years nationally for capital investment in Trade Training Centres in schools across all sectors. It is vitally important that Melbourne's North receives an appropriate share of funding from future funding rounds, particularly given the region's strength in manufacturing type activities. The capacity for schools to organise submissions that have the potential to create Trade Training Centres of excellence remains critical. The role of local organisations, with the assistance of local government practitioners, will be to assist schools in shaping strong and viable proposals.

Table 12.1 Opportunities by LGA: Banyule

Key issues/features

1. Mature community, relatively low population growth, declining household size
2. Professional class is strong but house prices are high in some areas and this can be a barrier to younger professionals moving in
3. Residents tend to stay where they are, there is a low migration out of the LGA
4. No greenfield sites
5. Demand for office space, particularly from medical precinct in and around Heidelberg
6. Public transport is constrained; State Government involvement in transport is crucial – this is particularly the case for east–west travel
7. Ageing community
8. Consolidation of health services and development of a knowledge intensive health cluster
9. Biotech cluster adjoining La Trobe University
10. Health sector is a large employer
11. Some manufacturing but with little room to grow. Heidelberg West industrial estate is the largest in terms of land use
12. Growth in government services now attracting cluster
13. Amenity is benefiting from the general growth and is maturing
14. Melbourne 2030 starting to have impact – particularly the Greensborough Principal Activity Centre, Heidelberg Specialised and Major Activity Centre and Ivanhoe Major Activity Centre

Table 12.1 Opportunities by LGA: Banyule (continued)

Key issues/features

15. Greensborough will see significant residential development and growth in retail with \$300 million development including retail, commercial and residential
16. Council supportive of higher density and residential and commercial integration of Activity Centres; issue is that cost of construction of high density apartment buildings is the same as it is in Southbank – and people want to live in Southbank. Opportunities do now exist with current Activity Centre planning and local enhancements
17. There are further opportunities for retail and commercial activities
18. Complexity of the economic and social structure of the Melbourne's North economy is replicating that of Melbourne's west
19. Relatively poor access to road and transport network
20. Extended clearways in Ivanhoe are proposed by State Government; this goes against the philosophy of Activity Centres
21. Need investment in improving key roads such as Waterdale Road towards Heidelberg Industrial Estate and La Trobe cluster
22. Three grammar schools, large number of students from overseas who live in Ivanhoe or Alphington
23. Within Banyule, education participation rates for young people have risen, council's community programs and LLEN have assisted in the process
24. Well served by the region's post-school education and training providers, although access to education via public transport can be difficult for some students living in Banyule
25. Pockets of long-term unemployment in West Heidelberg and Watsonia
26. Simpson Army Barracks located on Commonwealth land in the centre of Banyule
27. Increasing employment opportunities

Key opportunities

1. Further development of public transport is critical. To maximise the benefit of Activity Centres, these must be served by effective public transport, so continued State Government funding is essential. Key issue is to shorten travel times on public transport and improve cross travel
2. More commercial activity and support services, so that fewer residents need to access employment outside Banyule. *'Banyule has led growth of commercial floor space in the northern economy, including the Heidelberg office precinct.'*
3. Focus on planning for Activity Centres tapping into development opportunities and planning for growth, particularly recognising the demand for office space. Opportunities for growth in these centres should be noted
4. Growth of Activity Centres will be driven by amenity, access to services and quality of what is there
5. Development of integrated transport systems and interchanges
6. The continued growth of health services and growth in specialised health services operating from medical suites in close proximity to existing health clusters
7. Growth of other niche businesses such as the Chocolatier and some opportunities for those specialised manufacturing businesses not requiring large amounts of space
8. Increased number of medical specialisations and associated clusters
9. Training of nurses, doctors and specialists – ongoing medical education
10. Medical conferencing and information services

Table 12.1 Opportunities by LGA: Banyule (continued)**Key opportunities**

11. Develop pathways for school students towards accessing careers in growing health sector to meet local employment demand
12. Development of secondary education facilities and greater focus on tertiary education
13. Further maturing of retail
14. Additional development of serviced apartment buildings, hotels etc to cater for increasing demand from local organisations and businesses
15. Opportunity for community and commercial development through State Government and Australian Government investment, including at Heidelberg West
16. Greensborough project received \$5 million funding from the Australian Government (Regional and Local Community Infrastructure Program), providing an opportunity to further develop activity in the mixed use centre. Civic components include a regional aquatic and leisure centre, a community collaborative workplace, a landscaped town square and other civic infrastructure
17. Gallery feasibility study is being undertaken; Activity Centre development and the concept of mixed use creates further opportunities for cultural/entertainment activities

SLA	Strengths	Weaknesses
Banyule (C) – Heidelberg	High skilled residents 21 st century skills Health sector cluster and skills Access to quality retail strips	Public transport East–west travel
Banyule (C) – North	High skilled resident 21 st century skills Amenity	Opportunity cost of travel Public transport East–west travel

Table 12.2 Opportunities by LGA: Darebin**Key issues/features**

1. Textiles, clothing and footwear manufacturing firms have closed or relocated. The emphasis is now on high-tech manufacturing and research and technology
2. Transport, logistics and warehousing is growing; smaller distribution companies are taking advantage of location
3. Distribution and logistics firms far more integrated into global supply chains; they employ white collar workers, just-in-time management. Companies like Waive Star are an example, with 40–50 staff and only two work in the store
4. Good access to CBD, gentrification continues, amenity improving
5. More professionals now living in Darebin
6. Pockets of affordable housing
7. Professionals tend to work in the CBD, same issues as Moreland; a poor outcome for economic integration of the region would be if Darebin and Moreland ended up as dormitory LGAs
8. Darebin has the highest population of Indigenous people in Melbourne's North
9. Continuing decline in the availability of affordable housing that is eroding diversity, some people being pushed out by higher costs

Table 12.2 Opportunities by LGA: Darebin (continued)

Key issues/features

10. Stopped losing jobs and the process of restructuring appears to be in balance
11. Northcote High Street is about creative shop tops; game based, computer based, design type companies are developing along with improved amenity, attracting larger numbers of people to the precinct to shop and eat
12. Office development plans include the \$250 million Australian Horizon development and Bell City \$120 million revamp, which includes office space, conference facilities and accommodation
13. Retail strips are improving, there are few vacant shops
14. Darebin is well served and has good diversity of retail, cafes and restaurants. Retail ranges from Northland Shopping Centre to boutique style shops in High Street Northcote
15. Well located to airport, distribution firms get first drop off and last pick up of the day because of proximity to airport
16. A region of productive diversity, there are significant success stories in terms of ethnic diversity
17. Darebin has suffered from lack of investment in secondary education. There are no private schools in immediate region
18. Children of professional families attend school in Yarra or Stonnington; Australian Government funding policies in relation to school education have not helped this trend
19. The automotive industry is a concern for the region

Key opportunities

1. Office development in Darebin, particularly where transport links are strong. Consider the possibilities for cluster development related to La Trobe research activities and incubator firms as they grow
2. Office development in Northcote and Preston
3. Build on opportunities that relate to changing demographic profile; encourage new residents to establish businesses or work locally
4. Changing demographic profile may create the opportunity to develop a business services hub for Melbourne's North focused around Activity Centres
5. New use of industrial areas with much greater vertical integration of products and services
6. Niche manufacturing vertically integrated with product and business development, more short run niche manufacturing
7. Advanced manufacturing, high value and driven by locational advantage to airport and CBD
8. Mixed use industrial office type developments with higher levels of amenity
9. Australian Horizon development, and Bell City development that includes office space, conference facilities and accommodation will provide cluster opportunities
10. Build on diversity such as developing ethnic food processing and distribution companies and work with the Indigenous community to develop new business opportunities
11. Continue to improve opportunities in primary and secondary education
12. Where there are pockets of high disadvantage and structural unemployment, actively develop strategies to assist integration such as the Neighbourhood Renewal program in East Reservoir

Table 12.2 Opportunities by LGA: Darebin (continued)

Key opportunities

13. Use educational institutions and business networks in Melbourne's North to develop programs to ensure that workers from the manufacturing industry now unemployed are re-skilled and provided with new pathways to employment. This will require a collaborative approach. Service industry type jobs associated by major local developments may provide a pathway
14. Continue to grow La Trobe University R&D capacity. The Biosciences Research Centre and the newly announced Institute for Molecular Sciences are engines of growth and provide cluster opportunities
15. Continue to develop Plenty Road knowledge precinct
16. Continue to develop business incubators; build on the success of the Darebin Enterprise Centre and use the Northcote Police Station arts incubator as a driver of arts and creative development. Consider a technology based incubator to align with ICT and regional research activities, and green industry and environmental technologies
17. Develop an ICT sector building on opportunities provided by proximity, research capacity and regional business development
18. Encourage continued growth of arts sector as a gateway to Melbourne's North. Northcote is already attracting an arts community. Continue to develop studio spaces and creative workshops, and promote Darebin as a place for artists to live and work. Use the opportunity of redundant industrial land to develop creative spaces, artists' studios and the like
19. Link Darebin with Melbourne's national and international design push, a design / interior design / industrial design and architecture cluster. New media businesses could include video production, computer based lighting design, etc. Link some of these developments with advanced manufacturing
20. The Activity Centres of Northcote and Preston provide significant opportunities for growth; both centres have redundant industrial land and provide opportunities for larger scale and denser development
21. Use the opportunity of redundant industrial land and residents' support for a more environmentally sustainable economy to create a green job precinct / green industry office and industrial park. Link these with green incubator businesses. Council may wish to undertake a review of opportunities
22. Pressure to rezone industrial areas for use by bulky goods retailers; opportunity in longer term is probably for more commercial space plus retention of some industrial land
23. In terms of economic integration, whole of city approach is no longer possible. Regions will need to be self-sustainable; Melbourne's North needs to be promoted in its own right, there is a strong story to be told
24. Significant benefit to the North from better links between EastLink and inner Melbourne
25. Build on advantage in terms of proximity to airport
26. Given the significant changes occurring to businesses and households in the City of Darebin, networks and working together at the local level will help to identify and facilitate new opportunities

SLA	Strengths	Weaknesses
Darebin (C) – Northcote	<ul style="list-style-type: none"> Locational advantage Amenity improving Creativity High skilled residents Growing knowledge economy Public transport 	Office accommodation
Darebin (C) – Preston	<ul style="list-style-type: none"> Locational advantage High skilled residents growing Public transport Access to airport 	<ul style="list-style-type: none"> Education at school level Structural unemployment

Table 12.3 Opportunities by LGA: Hume

Key issues/features

1. Growth area including Greenvale, Craigieburn and Roxburgh Park
2. Strategic transport corridor – Melbourne Airport, Hume Freeway and Somerton Intermodal Freight Terminal
3. Significant industrial and employment region
4. 59 per cent of residents are in the labour force, of which 60.6 per cent are employed full time, two points lower than for Melbourne
5. Most common employment of residents is in manufacturing at 17.5 per cent and declining, and most growth in employment is construction
6. Individual median incomes of residents are below the Melbourne average
7. Median age of residents 32.6 years old, the fourth youngest municipality in Melbourne
8. Among the fastest growing municipalities in Melbourne
9. Land supply available
10. Number of qualified residents growing
11. The largest number of large employers in Melbourne's North
12. The need for an employment strategy that engages the interface councils of Melbourne's North because it is difficult to compete with fashionable locations such as Docklands and Melbourne CBD to attract international businesses to set up headquarters in interface regions. These businesses are required to create a greater balance of employment, including employment of a greater proportion of white collar workers
13. Journey to work times are seen as an issue, particularly in the outer parts of the LGA; requires a greater balance between industrial and residential employment in growth areas and better integration of commercial and industrial. Lack of public transport options for the 15,000 people working at the airport complex means most employees travelling to work by car. Employment in Hume creates lengthy journey to work patterns
14. Development of intermodal freight hubs that reduce congestion and the region's carbon footprint will be an essential component of any growth strategy
15. Substantial recent job losses in the manufacturing and telecommunications industry; many workers are 45+ years old and extensive retraining effort is required
16. Skills in demand include aero-engineering, health services, transport and logistics, and trades
17. The LGA needs 'pioneers', perhaps government departments or international firms, to relocate to Hume to seed further clustering and create new opportunities
18. Manufacturing is both a strength and a weakness; consolidation of manufacturing operations is possible when firms relocate to Hume because of the availability of larger sites
19. Requires greater level of amenity at interface
20. Quality of business accommodation, some catch up occurring
21. Some companies at urban edge may find themselves boxed in because of land planning issues; companies now looking for larger pieces of land to meet future needs

Key opportunities

1. Build on opportunity provided by the Central Activities District of Broadmeadows and State Government focus on its development
2. Melbourne Airport is a major asset to Melbourne's North and to Hume, and a gateway to the world. Major expansion of the facility is planned, including a \$330 million upgrade of the International Terminal and a new office complex (Melbourne Airport / Investa) built as a campus style development on an 11 ha site on Melrose Drive. What is also critically important is that the airport attracts knowledge intensive and high-tech businesses to the airport cluster

Table 12.3 Opportunities by LGA: Hume (continued)

Key opportunities

3. CSL Bioplasma, located in Broadmeadows and employing 500 highly qualified staff, represents a knowledge intensity business that should be an example for the region
4. Manufacturing moving to high skills intensity, residents' skills match industry requirements
5. Develop clusters of freight intensive (with high freight requirement / logistics businesses to improve efficiency, particularly if an existing cluster is starting to grow
6. Future growth opportunities – IT, engineering, disaster recovery centre, aviation cluster – some constrained by current telecommunications infrastructure. Meeting the needs of growing ethnic communities – specialised food production
7. Engineering focused university in Hume
8. Development of transport hubs
9. Greater opportunities for knowledge diffusion to cluster support businesses that supply major local companies
10. Shape investment around new knowledge intensive businesses
11. Encourage more people to work from home
12. Development of affordable and sustainable housing
13. Craigieburn Town Centre Development, a new regional centre and gateway to Melbourne's North

SLA	Strengths	Weaknesses
Hume (C) – Broadmeadows	<ul style="list-style-type: none"> Manufacturing High-tech capacity Employment generation Hume Global Learning Centre and Ideas Lab Broadmeadows Community Neighbourhood Renewal Project 	<ul style="list-style-type: none"> Business services Non-job ready residents Income of residents Qualifications of residents Low skills of residents Journey to work
Hume (C) – Craigieburn	<ul style="list-style-type: none"> Manufacturing Employment generation Business expansion and retention program 	<ul style="list-style-type: none"> Business services Qualifications of residents Low skills of residents
Hume (C) – Sunbury	<ul style="list-style-type: none"> Local employment Retail capacity 	<ul style="list-style-type: none"> Journey to work High-tech capacity Qualifications of residents

Table 12.4 Opportunities by LGA: Moreland

Key issues/features

1. A relatively low proportion of Moreland residents work in the Moreland LGA
2. Reduction of people employed in industry in Moreland of 10 per cent since 1996
3. Many small businesses, relatively few major businesses
4. Loss of large businesses such as Kodak and Caroma
5. Loss of industrial land in line with continued urban restructuring
6. Total stock of industrial land in Moreland in 2007 was 272 ha, compared to Hume of 2,304 ha
7. Steady increase in residential property values that are above the Melbourne average price. Residential property values are the highest in Brunswick
8. While the manufacturing industry is the largest employer, the industry has shed 31 per cent of its workforce since 2001. The second largest employer, retail, has shed 25 per cent of its workforce in the same period
9. Food, beverage and tobacco manufacturing, which has seen moderate growth, is the largest employer in the manufacturing sector; textiles, clothing and footwear is the second highest but probably at risk of further decline
10. There is no evident driver of employment growth, and risk is employment lands continue to diminish or end up as warehousing space with little employment
11. Skills deficit in Moreland's North persists
12. Moreland Activity Centre team finalisation and implementation of the Brunswick and Glenroy structure plans
13. The Coburg Initiative and the redevelopment of central Coburg
14. Economic development and planning seen as critically important at this stage of transition

Key opportunities

1. Improve streetscapes and design/amenity features of public places to provide an alternative location for knowledge intensive businesses to locate away from the city core
2. Opportunity to renew bespoke manufacturing; the electrical transformer company in Brunswick is an example
3. Concentrate on knowledge intensive manufacturing with unique intellectual property; biotechnology products and specialised environmental protection products are examples. Brunswick would benefit from larger scale companies in this cluster
4. Business services integrated with manufacturing sector specialisation to serve the industry in Melbourne's North, advanced food processing is an example
5. Design hub, industrial design, graphic design and architectural services
6. Internet and other recorded media
7. Publishing
8. Arts precinct – Danks Street model
9. Knowledge intensive business parks; meet accommodation demand from incubator firms leaving nest
10. Property services and financial services
11. Develop a greater range of serviced offices
12. Increase knowledge intensification of small businesses
13. Currently there is a mismatch between resident skills and local employment base; opportunity for more professionals to establish local businesses

Table 12.4 Opportunities by LGA: Moreland (continued)**Key opportunities**

14. Melbourne needs strong middle radius administrative hubs. Coburg has positive attributes and 3,000 new apartments have now been built, as Melbourne has not been as successful at creating alternative metropolitan hubs as Sydney
15. Improve amenity of Sydney Road to improve capacity to attract new knowledge intensive businesses as well as improving amenity for residents
16. Resolution of traffic congestion in Moreland in regard to the number of level crossings (22) between Bell Street and Brunswick Road. This investment will resolve the growing issues of traffic congestion and enable more efficient flow of train services as population to the north continues to increase
17. Solar Cities Program and retrofitting buildings and water systems

SLA	Strengths	Weaknesses
Moreland (C) – Brunswick	Journey to work Creativity High skilled residents Income of residents	Local employment Non-job ready Lack of employment driver
Moreland (C) – Coburg	Journey to work Creativity Cluster/hub potential	Business services
Moreland (C) – North	Potential to reposition	Low skills of residents Skills sustainability Labour utilisation

Table 12.5 Opportunities by LGA: Nillumbik**Key issues/features**

1. Relatively slow growing
2. The green wedge shire
3. Relatively static population that is ageing but is likely to attract older lifestyles
4. Relatively few residents (about one-fifth) work in the shire
5. Access is relatively poor
6. Council relies mostly on residential rate based revenue
7. Relatively poorer levels of infrastructure provision
8. 90 per cent of the shire is rural
9. Two major Activity Centres – Eltham and Diamond Creek; Activity Centres are more like country towns
10. Historical lack of office accommodation constraining local businesses
11. Structure plans being implemented to improve infrastructure, traffic flows, parking and public transport
12. Plans are about making centres work more effectively and this includes rezoning
13. Shire is ageing; ageing lifestyle may sell their land but remain in the shire
14. Well-educated population and young people tend to go to university

Table 12.5 Opportunities by LGA: Nillumbik (continued)

Key issues/features

15. Lifestyle is important; Nillumbik was nominated the third most liveable shire in Australia
16. Environment is important; areas outside of growth boundaries are strictly managed
17. The quality of at least some rural land is poor
18. Strong local community
19. Council uses 100 per cent green power on all its buildings
20. Sustainable street lighting project that received more than \$500,000 of funding from the State Government
21. Relatively high per capita water use because of land use patterns
22. Priority is protecting the environment and thinking about sustainability issues
23. High level of car use and relatively low level of access to public transport
24. Plan to move bus interchange at Eltham (buses to surrounding towns) to integrate with trains to encourage greater use of public transport
25. Need for more commuter parking
26. Redevelopment at Eltham including the Eltham Circulatory Road, landscaping and new office space
27. Although there have been significant retail developments, there is still some retail leakage to Northland
28. Supply of guest accommodation in Nillumbik is relatively low

Key opportunities

1. Well-educated population combined with lifestyle opportunities means that provision of high speed broadband in the shire is extremely important in enabling future economic growth
2. Create more commercial and office space to accommodate growth of home based businesses. New offices in Eltham likely to be suites
3. Attract businesses that have a low carbon footprint
4. Attract entrepreneurial and knowledge intensive small businesses and continue to encourage home business network
5. Continue to increase retail capacity and its depth; this is a longer-term goal given current economic circumstances
6. Grow the level of commercial activity to broaden rate base by developing Activity Centres so they become integrated communities, places to live, work and enjoy
7. Protect the environment and the amenity enjoyed by residents of the shire and use this amenity to drive an internet based knowledge economy
8. Improve public transport links and further develop cycle paths
9. Improve bus services
10. Improve major roads that are now all too narrow for existing level of traffic
11. In terms of building design, ensure the highest standards of sustainability
12. Local markets developing, providing increasing opportunities for local trade
13. Food and wine developments associated with tourism

Table 12.5 Opportunities by LGA: Nillumbik (continued)

SLA	Strengths	Weaknesses
Nillumbik (S) – South	High skilled residents Labour utilisation	High-tech capacity
Nillumbik (S) – South-West	Labour utilisation	High-tech capacity
Nillumbik (S) – Balance	High skilled residents	Opportunity cost of travel Retail capacity High-tech capacity

Table 12.6 Opportunities by LGA: Whittlesea**Key issues/features**

1. Manufacturing industry undergoing period of change, automotive under stress and declining while food processing is growing. Food is a strategic sector
2. Attracting large manufacturing businesses to greenfield sites
3. Health sector is growth area, private hospital development in Cooper Street close to Northern Hospital. Cluster enhances the capacity of the Northern Hospital to attract clinicians
4. Develop clusters of freight intensive (with high freight requirement / logistics businesses) to improve efficiency, particularly if an existing cluster is starting to grow. New opportunities to cluster freight intensive businesses include Wholesale Market and the Donnybrook Intermodal Terminal
5. Aged accommodation and services is growing
6. Northpoint Enterprise Park is growing
7. Need more corporate office activity to create balanced economic development. MAB development is a good example, now scoping second office building
8. Momentum regarding relocation of Wholesale Market beginning to build
9. Relocation of market will trigger growth of services and logistics businesses; Whittlesea has fewer logistics companies than Hume
10. Similar to Hume so integration with Hume stronger than the inner metropolitan north, although La Trobe University is helping to facilitate better relationship with Darebin
11. Medical and agricultural research at La Trobe University can be linked to business development
12. Businesses in Heidelberg that need to expand may move to Whittlesea or Hume – better that they stay in Melbourne's North
13. Many businesses that relocate to Whittlesea come from Melbourne's North, unusual to see businesses relocating from the east
14. Residential, industrial and commercial development means that the construction industry is doing well. This includes factory based businesses, cabinet makers, etc
15. Residential/industrial/commercial activity tends to rotate, so construction industry moves between them
16. Demographic trend towards white collar residents
17. The longer-term resident workforce has typically been employed in traditional manufacturing operations and are semi-skilled rather than highly skilled; traditional residents are falling behind
18. As automotive declines, some opportunity for older workers to be retained as bus drivers
19. Some businesses have skills shortages while others are downsizing

Table 12.6 Opportunities by LGA: Whittlesea (continued)

Key issues/features

20. Big issue is identifying skills shortages – a missed opportunity is cross-sector employment transfer; skills shortages in one sector may be balanced by similar skills in another sector being redundant due to downsizing
21. 85 per cent of employers employ less than 10 staff
22. Skills shortages across the board; transport and logistics stands out, food sector has difficulty attracting skilled staff
23. Westfield and Epping Plaza planned well before the transit city strategy
24. No brownfield development, only greenfield
25. Some retail developments may not be sustainable
26. Public transport is an issue, could be a lot better; need transport networks to integrate more fully, rail is particularly important but major improvements unlikely before 2020
27. For residents, particularly new migrants, east–west alignment is important; there are now more buses connecting east–west. East–west will become more integrated
28. Congestion north–south, station car park full by 7am
29. Need more local jobs and trying to attract more companies
30. For local young people life can be very localised, local TAFE, local employment. This is cultural and economic
31. Infrastructure requirements include improved rail services, tram line extension up Plenty Road and broadband improvements
32. Northpoint Enterprise Park has no broadband access and places like Thomastown also have problems
33. More people are starting small businesses; there are more entrepreneurs who must have access to technology

Key opportunities

1. Residential growth brings far greater range of opportunities for local economic development
2. Land availability provides the opportunity to develop integrated communities and high-tech communities
3. Whittlesea's greenfield sites provide opportunity for new kind of built environment
4. Lifelong learning strategies are particularly important for long-term residents
5. Greater integration with global supply chains – design companies getting interesting work overseas because time differences mesh well with tight schedules
6. Invest in council strategy to locate new industries that fits with changing demographic to improve skills balance
7. Develop service industries such as call centres
8. Develop strategies to try and assist suppliers to the automotive industry to survive period of change in the industry; automotive industry supply chain is highly sensitive to global supply chain dynamics
9. Investigate strategies to develop city edge high density agricultural activities based on world best practice and new methods to create local food supply and reduce food miles
10. Food processing has higher levels of natural protection but also provides Whittlesea with increasing export opportunities (Asia and Middle East are key markets); high quality fresh foods, no cans; niche ethnic/health markets
11. More innovation in food manufacturing, better packaging to extend product life and environmental characteristics

Table 12.6 Opportunities by LGA: Whittlesea (continued)**Key opportunities**

12. Land provides greenhouse offset opportunities; the rural community pays high rates, not viable for farming and needs new approach
13. Integrate educational and business activities – closer links, improve understanding of sectors and industry requirements. Goal is greater levels of research and innovation and improved skills and integration of local industry with global networks, including those established by the region's tertiary education providers
14. Development of the Southern Whittlesea Trade Training Centre, cluster schools include Epping Secondary College (SC), Lalor SC, Lalor North SC, Mill Park SC, The Lakes – South Morang, Peter Lalor SC, St Monica's College and Thomastown SC

SLA	Strengths	Weaknesses
Whittlesea (C) – North	Greenfield sites	Public transport
Whittlesea (C) – South-West		Public transport
Whittlesea (C) – South-East		Public transport

Table 12.7 Opportunities by LGA: Yarra**Key issues/features**

1. Recognised as a hub for creative industries
2. Arts precincts
3. Amenity and businesses drive cultural tourism
4. Arts and design create high value retail
5. Development of residential following decline of industrial activity, good industrial buildings recycled, others demolished – some mixed use
6. Relocation or closure of manufacturing companies has created under-utilised industrial land
7. Old shop style buildings ideal for small knowledge intensive / creative businesses, including artists and musicians, IT, specialist retail and marketing
8. Area of design and production management skills
9. Remaining manufacturing still declining, now dominated by food and beverage, print and recorded media, still some textiles, clothing and footwear
10. AMCOR is relocating to Sydney and CUB might relocate
11. Finance and property services starting to dominate
12. Growing strength of business services
13. Land value in Richmond is very high
14. New head offices moving in / alternative to CBD location. Existing large knowledge intensive businesses in health, telecommunications, financial services, media and IT create opportunities for service firms to cluster
15. Need to retain business services such as IT and also service businesses that are more trades based like car servicing and building trades
16. Southern part of Yarra is an IT precinct
17. Success of industrial restructuring adds up to future increased demand for new office space
18. Wholesale activities reflect inner metropolitan demand for personal and household goods

Table 12.7 Opportunities by LGA: Yarra (continued)

Key issues/features

19. Skills shortages in Yarra include retail and hospitality
20. Yarra businesses predominantly small, with 1–4 staff
21. Export capacity is improving
22. Supply chain integration is improving with greater development of intellectual property, sitting somewhere towards the middle of the supply chain
23. Incubators making a contribution to the development of intellectual capital
24. Education – Yarra is transitioning away from industrial; need is for small business related training
25. Relationships stronger with CBD than Hume and Whittlesea
26. Yarra is liked by residents and workers because of proximity to CBD
27. Activity Centre but no Transit City; issue for Yarra is what is defined as an Activity Centre
28. While access is good, congestion is a huge issue; Yarra is on the way to the city. Congestion is caused by poor public transport in the eastern suburbs
29. Tram users find longer travel times in peak hours particularly difficult
30. Economic activity constrained by congestion
31. Yarra is concerned about possible tunnel entries following the Eddington report creating even more congestion
32. Local infrastructure – everything is old and a period of renewal is required
33. More small parks required to improve amenity for residents
34. New development in Yarra and Melbourne's North more generally adds pressure
35. Issues with public transport and congestion
36. Social and skills gaps getting wider as Yarra continues to gentrify
37. Many professional jobs in Yarra are filled by people who live in the eastern suburbs
38. Almost starting to get London problem; affordability issues for nurses, teachers etc growing, so many essential workers now living further away
39. Long-term parking issues for essential workers who can no longer afford to live locally
40. Typically, workers travelling further to access jobs in Yarra
41. Conversely, local jobs for the people who live in public housing in Yarra are declining rapidly; these jobs have now shifted to outer regions
42. More than one in 10 Yarra residents live in public housing and there is also a high level of residents who live in other rental property
43. Diversity is strong and creates a diverse and engaging community
44. Amenity and culture are important to residents
45. Residents tend to be both locally and globally connected to issues such as the environment and climate change
46. History in Yarra is important and a great plus for amenity

Table 12.7 Opportunities by LGA: Yarra (continued)

Key opportunities

1. Consider the 'gateway' benefits of Yarra in terms of its capacity to connect the outer north to the CBD – this strategy could create a two-way benefit by strengthening opportunities for Yarra's business services in leveraging IP and creating more business as well as assisting firms in the north to integrate more fully into the north's economy
2. Use the growing capacity of business services in Yarra to strengthen economic development and integration in Melbourne's North; business services should face both inwards and outwards
3. Harness community culture and local business to deliver strong environmental outcomes such as the reduction of greenhouse gases
4. Create a centre of excellence for green-star buildings
5. Use knowledge based economy to stimulate the growth of 'green jobs'
6. Opportunity to build commercial office space to attract firms that would otherwise locate in the CBD
7. Give life to under-utilised land in Yarra for mixed use; this is council strategy
8. In terms of built form, create greater range of new integrated office/residential development on under-utilised land and continue to encourage the use of older style businesses by smaller service and creative industry businesses
9. Create more affordable housing for essential workers in mixed developments, not as ghettos
10. Encourage small businesses to improve their skills base, particularly in management and export business development – more small business training opportunities
11. Identify major knowledge intensive firms and encourage sector clusters to develop – health, IT, telecommunications, financial services and media
12. Continue to encourage development in businesses that use the internet as their delivery channel – a strong cluster of these businesses, the strong IT and new media activity in Yarra, provides a real opportunity to improve the productivity and export potential of Yarra. This trend will also strengthen the 'gateway' opportunities to the outer north. Business types could be medical communications, e-medicine, e-learning, internet service providers, application service providers and a range of other online businesses including video and entertainment, social networks, news media and online advertising
13. Over one-third of residents of Yarra work in the CBD; opportunity to harness more of these skilled residents in local employment to build knowledge intensity of businesses in Yarra
14. Large numbers of residents travel to work in Yarra from Boroondara and Darebin
15. Health is an important employer and provides an opportunity for future growth and greater regional integration
16. At least some remaining manufacturing is likely to move out of Yarra, possibly the largest companies in this sector; a key objective should be to recapture them in Melbourne's North
17. Exports from Yarra have continued to grow in line with knowledge intensification, with the finance and insurance sector trebling its out of region exports since 2001 while manufacturing exports fell sharply since 2001. Communication services and health and community services also are also strong contributors to Yarra's exports and as such are positioned to benefit Melbourne's North. The opportunity is to grow these two sectors further

Table 12.7 Opportunities by LGA: Yarra (continued)

SLA	Strengths	Weaknesses
Yarra (C) – North	21 st century workplace skills Business services capacity Creativity Amenity Retail Visitor destination	Non-job ready state Traffic congestion
Yarra (C) – Richmond	21 st century workplace skills Business services capacity Creativity Amenity Retail Health sector Visitor destination	Non-job ready state Traffic congestion

Appendices

- Appendix 1: Local government indicators: households
- Appendix 2: Local government indicators: industry
- Appendix 3: Gross regional product by industry sector and LGA
- Appendix 4: Employment distribution by travel zone: selected industry sectors
- Appendix 5: Benchmarking performance: a data envelope analysis approach
- Appendix 6: The macroeconomic structure and interdependency of Melbourne's North
- Appendix 7: LGA indicator explanations

Appendix 1 | Local government indicators: households

Banyule (C)

LABOUR FORCE

	Number ('000s)						Percentage Change					%p.a. growth	
	2003	2004	2005	2006	2007	2008	2003 to 2004	2004 to 2005	2005 to 2006	2006 to 2007	2007 to 2008	2003 -2006	2006 -2008
Population	118	118	118	119	120	121	-0.6%	0.5%	0.7%	0.9%	0.9%	0.2%	0.9%
Households	41	41	42	42	42	42	0.2%	0.3%	0.3%	0.2%	0.3%	0.3%	0.3%
NIEIR Workforce	63	64	65	66	67	69	1.6%	2.5%	1.2%	1.5%	2.6%	1.8%	2.1%
NIEIR Employment	59	60	62	62	64	65	1.5%	2.7%	1.6%	1.9%	2.5%	1.9%	2.2%
NIEIR Unemployment	3.8	4.0	3.9	3.8	3.6	3.7	3.9%	-1.6%	-4.6%	-4.8%	4.8%	-0.8%	-0.1%

UNEMPLOYMENT

	Percentage						Percentage Point Change					Average % Point Change pa	
	2003	2004	2005	2006	2007	2008	2003 to 2004	2004 to 2005	2005 to 2006	2006 to 2007	2007 to 2008	2003 -2006	2006 -2008
NIEIR Unemployment	6.1%	6.3%	6.0%	5.7%	5.3%	5.4%	0.1	-0.2	-0.3	-0.4	0.1	-0.2	-0.1
Headline Unemployment	3.9%	4.0%	3.9%	3.5%	3.1%	3.2%	0.1	-0.1	-0.5	-0.4	0.1	-0.1	-0.1
NIEIR Structural U/E	9.3%	9.1%	8.8%	8.5%	8.4%	8.0%	-0.2	-0.3	-0.3	-0.1	-0.3	-0.3	-0.2

INCOME FLOWS & PRODUCTIVITY

	Level 2005/06 \$m						Per Capita \$						%p.a. Growth of Level	
	2003	2004	2005	2006	2007	2008	2003	2004	2005	2006	2007	2008	2003 -2006	2006 -2008
Wages/Salaries	2,438	2,566	2,712	2,844	2,941	3,047	20,577	21,778	22,913	23,869	24,465	25,121	5.3%	3.5%
Taxes Paid	711	751	802	834	867	894	6,000	6,370	6,777	7,001	7,210	7,368	5.5%	3.5%
Benefits	407	446	452	432	424	412	3,437	3,782	3,816	3,627	3,529	3,395	2.0%	-2.4%
Business Income	402	426	434	440	437	439	3,390	3,614	3,663	3,691	3,637	3,623	3.1%	0.0%
Interest Paid	245	301	347	385	445	554	2,070	2,554	2,928	3,232	3,705	4,568	16.2%	19.9%
Property Income	568	631	719	771	848	1,008	4,792	5,356	6,078	6,466	7,059	8,308	10.7%	14.4%
Disposable Income	3,097	3,255	3,438	3,547	3,742	3,861	26,138	27,628	29,044	29,765	31,131	31,833	4.6%	4.3%
Business Value Added	2,840	2,992	3,146	3,284	3,378	3,486	23,967	25,391	26,576	27,559	28,102	28,743	5.0%	3.0%
Business Productivity							47,225	49,040	50,222	51,626	52,092	52,461	3.0%	0.8%

- Note: (1) All years stated above are fiscal years ending.
(2) Figures for wages/salaries include superannuation supplements.
(3) Figures for disposable income (less depreciation expense) include imputed income from ownership of dwellings.
(4) Figures for business productivity are per employee.

RESIDENTIAL AND NON-RESIDENTIAL BUILDING CONSTRUCTION

	1999 -2002	2003 -2006	2007	2008	2009	Percentage Change: 2007-09 to 2003-06
Value \$m2005/06 per annum						
Residential	105	117	125	128	112	4%
Non Residential	69	112	60	68	51	-47%
Total	173	229	185	196	163	-21%
Value per capita \$2005/06						
Residential	882	983	1,039	1,056	917	2%
Non Residential	578	950	501	558	416	-48%
Total	1,460	1,934	1,541	1,614	1,333	-23%

POPULATION MOVEMENT 2001 TO 2006

Age in 2006	Not Yet Born	Same Address	Local Move	Other Australia	Overseas	Not Stated
0 to 19	6,997	13,984	3,457	2,595	722	1,057
20 to 29		8,225	3,113	4,576	1,197	1,015
30 to 54		23,820	6,559	6,963	1,645	1,758
55+		25,382	2,192	1,725	188	1,994

Note: This data has been benchmarked to the Estimated Residential Population.

Banyule (C)

HOUSEHOLD WEALTH & DEBT

Indicator	2001	2008	2001 Rank	2008 Rank	2001 %Rank 1	2008 %Rank 1
Wealth per Household (\$000 2004/05 prices)	478	609	142	152	6%	8%
Value of Property and Unincorporated Business	381	455	55	63	28%	25%
Value of Financial Assets	183	310	209	192	2%	4%
Value of Household Liabilities	85	156	332	466	42%	47%
Disposable Income after Debt Service Costs	67	77	225	150	1%	16%
Household Debt Service Ratio	13%	21%	254	308	52%	48%
Household Debt to Gross Income Ratio	1.00	1.41	254	308	51%	48%

SOCIAL SECURITY

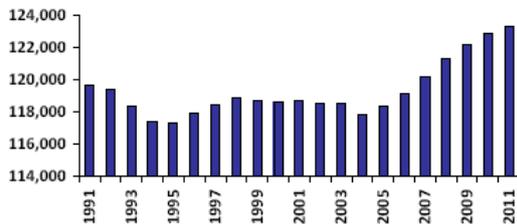
	% Pop	Australian Average
Disability Support (aged 16-20)	0.10%	0.09%
Disability Support (aged 21-24)	0.11%	0.10%
Disability Support (aged 25+)	2.69%	3.40%
Parenting Payment - Single (aged 16-20)	0.00%	0.00%
Parenting Payment - Single (aged 21-24)	0.05%	0.05%
Parenting Payment - Single (aged 25+)	0.11%	0.11%
Unemployed Long Term	1.16%	1.30%
Unemployed Short Term	0.84%	1.27%
Youth Allowance - Non Student	0.55%	0.79%
Youth Allowance Student	0.18%	0.21%

Cash Benefits Share of Disposable Income	Share	Rank
2003	13.1%	169
2004	13.7%	163
2005	13.1%	162
2006	12.2%	158
2007	11.3%	132
2008	10.7%	107

BABY BOUNCE

	Per cent	Rank
2002	1.13%	421
2003	1.14%	394
2004	1.18%	350
2005	1.20%	331
2006	1.25%	311
2007	1.29%	275
Bounce 2005-06	0.05%	217
Actual Change 2005-06 (Number)	69	53
Bounce 2006-07	0.04%	201
Actual Change 2006-07 (Number)	66	52

Population Profile



POPULATION

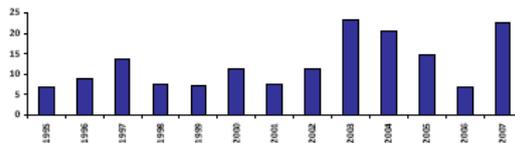
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Population	120	119	118	117	117	118	118	119	119	119	119	119	118	118	118	119	120	121	122	123	123

PATENT APPLICATIONS

	No	Aust Avg	Rank
Average p.a. (1994-2007)	15.14	14.95	56
Average p.a. per capita	12.77	14.87	126
Hi Tech p.a. (1994-2007)	5.20	4.14	39
Hi Tech p.a. per capita	4.38	4.18	66
Info. Tech p.a. (1994-2007)	1.25	1.21	59
Info. Tech p.a. per capita	1.05	1.15	88
Average per capita (1994-2001)	9.36	11.38	171
Average per capita (2001-2007)	16.47	18.81	107
2001-07 avg./1994-01 avg.	1.76	1.65	154

Note: Per capita = 100,000 people

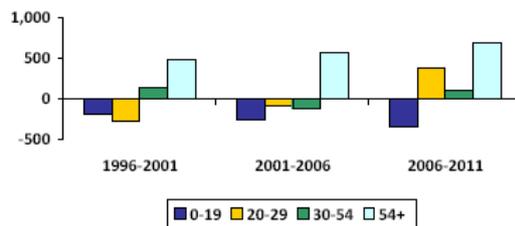
Patent Applications per 100,000 residents



POPULATION CHANGE

	1996	2001	2006	2011
Share of Population				
Age 0-19	26.3%	25.3%	24.2%	22.0%
Age 20-29	15.5%	14.3%	13.8%	14.9%
Age 30-54	35.9%	36.2%	35.6%	34.8%
Age 55+	22.3%	24.2%	26.4%	28.3%
Population Change (average between years)				
Age 0-19		-189	-251	-344
Age 20-29		-270	-92	376
Age 30-54		134	-121	103
Age 55+		482	557	692
Average Annual Growth		0.1%	0.1%	0.7%

Population Change by Age Group



Darebin (C)

LABOUR FORCE

	Number ('000s)						Percentage Change					%p.a. growth	
	2003	2004	2005	2006	2007	2008	2003 to 2004	2004 to 2005	2005 to 2006	2006 to 2007	2007 to 2008	2003 -2006	2006 -2008
	Population	129	130	131	134	135	137	0.8%	1.2%	1.7%	1.1%	1.4%	1.2%
Households	48	48	48	49	49	49	0.6%	0.7%	0.7%	0.4%	0.5%	0.7%	0.4%
NIEIR Workforce	63	64	65	66	68	70	1.7%	2.3%	0.9%	3.3%	2.8%	1.6%	3.0%
NIEIR Employment	56	56	58	59	63	65	1.3%	3.0%	2.1%	5.5%	3.2%	2.1%	4.4%
NIEIR Unemployment	7.1	7.5	7.2	6.6	5.5	5.4	5.1%	-3.2%	-9.0%	-16.9%	-1.7%	-2.5%	-9.6%

UNEMPLOYMENT

	Percentage						Percentage Point Change					Average % Point Change pa	
	2003	2004	2005	2006	2007	2008	2003 to 2004	2004 to 2005	2005 to 2006	2006 to 2007	2007 to 2008	2003 2006	2006 2008
	NIEIR Unemployment	11.3%	11.7%	11.1%	10.0%	8.0%	7.7%	0.4	-0.6	-1.1	-1.9	-0.4	-0.4
Headline Unemployment	9.1%	9.6%	9.2%	7.9%	6.6%	6.4%	0.5	-0.4	-1.3	-1.3	-0.2	-0.4	-0.7
NIEIR Structural U/E	18.8%	18.3%	17.3%	16.6%	15.5%	14.5%	-0.5	-0.9	-0.8	-1.1	-1.0	-0.7	-1.0

INCOME FLOWS & PRODUCTIVITY

	Level 2005/06 \$m						Per Capita \$						%p.a. Growth of Level	
	2003	2004	2005	2006	2007	2008	2003	2004	2005	2006	2007	2008	2003 -2006	2006 -2008
	Wages/Salaries	2,100	2,213	2,344	2,478	2,673	2,811	16,290	17,035	17,831	18,541	19,780	20,513	5.7%
Taxes Paid	552	582	623	653	722	751	4,286	4,480	4,741	4,884	5,346	5,482	5.7%	7.3%
Benefits	580	625	632	595	573	546	4,501	4,814	4,805	4,450	4,241	3,987	0.8%	-4.2%
Business Income	333	367	368	382	396	384	2,585	2,827	2,798	2,859	2,928	2,805	4.7%	0.3%
Interest Paid	227	284	334	378	446	558	1,761	2,187	2,537	2,829	3,299	4,073	18.5%	21.5%
Property Income	350	385	409	429	473	572	2,719	2,966	3,113	3,208	3,498	4,174	6.9%	15.5%
Disposable Income	2,694	2,826	2,905	2,959	3,161	3,206	20,899	21,753	22,100	22,140	23,393	23,400	3.2%	4.1%
Business Value Added	2,433	2,580	2,712	2,860	3,068	3,195	18,876	19,862	20,629	21,400	22,708	23,318	5.5%	5.7%
Business Productivity							42,818	44,859	45,813	47,340	48,141	48,572	3.4%	1.3%

Note: (1) All years stated above are fiscal years ending.
(2) Figures for wages/salaries include superannuation supplements.
(3) Figures for disposable income (less depreciation expense) include imputed income from ownership of dwellings.
(4) Figures for business productivity are per employee.

RESIDENTIAL AND NON-RESIDENTIAL BUILDING CONSTRUCTION

	1999	2003	2007	2008	2009	Percentage Change: 2007-09 to 2003-06
	-2002	-2006				
Value \$m2005/06 per annum						
Residential	95	129	123	127	110	-7%
Non Residential	78	75	79	97	80	14%
Total	173	204	201	224	190	1%
Value per capita \$2005/06						
Residential	747	983	907	929	790	-11%
Non Residential	611	571	582	707	574	9%
Total	1,358	1,554	1,488	1,636	1,364	-4%

POPULATION MOVEMENT 2001 TO 2006

Age in 2006	Not Yet Born	Same Address	Local Move	Other Australia	Overseas	Not Stated
0 to 19	8,435	12,028	3,436	1,918	1,031	1,629
20 to 29		7,417	3,719	5,972	4,899	2,732
30 to 54		25,589	9,154	7,240	2,628	3,575
55+		25,321	2,405	1,406	264	2,848

Note: This data has been benchmarked to the Estimated Residential Population.

Darebin (C)

HOUSEHOLD WEALTH & DEBT

Indicator	2001	2008	2001 Rank	2008 Rank	2001 %Rank 1	2008 %Rank 1
Wealth per Household (\$000 2004/05 prices)	314	357	245	299	4%	5%
Value of Property and Unincorporated Business	323	388	79	96	24%	21%
Value of Financial Assets	56	102	505	493	1%	1%
Value of Household Liabilities	65	132	132	383	32%	40%
Disposable Income after Debt Service Costs	50	52	449	429	1%	11%
Household Debt Service Ratio	14%	25%	262	447	52%	55%
Household Debt to Gross Income Ratio	1.01	1.64	262	447	52%	55%

SOCIAL SECURITY

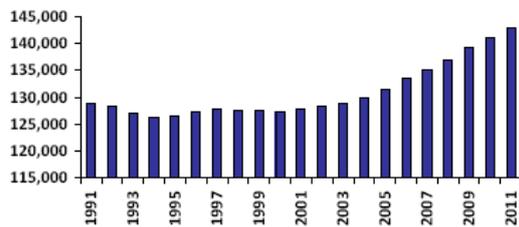
	% Pop	Australian Average
Disability Support (aged 16-20)	0.08%	0.09%
Disability Support (aged 21-24)	0.10%	0.10%
Disability Support (aged 25+)	4.33%	3.40%
Parenting Payment - Single (aged 16-20)	0.00%	0.00%
Parenting Payment - Single (aged 21-24)	0.05%	0.05%
Parenting Payment - Single (aged 25+)	0.11%	0.11%
Unemployed Long Term	1.28%	1.30%
Unemployed Short Term	1.68%	1.27%
Youth Allowance - Non Student	0.93%	0.79%
Youth Allowance Student	0.23%	0.21%

Cash Benefits Share of Disposable Income	Share	Rank
2003	21.5%	430
2004	22.1%	405
2005	21.7%	409
2006	20.1%	389
2007	18.1%	296
2008	17.0%	239

BABY BOUNCE

	Per cent	Rank
2002	1.31%	247
2003	1.32%	224
2004	1.35%	200
2005	1.37%	194
2006	1.43%	189
2007	1.50%	134
Bounce 2005-06	0.06%	184
Actual Change 2005-06 (Number)	106	27
Bounce 2006-07	0.08%	164
Actual Change 2006-07 (Number)	125	21

Population Profile



POPULATION

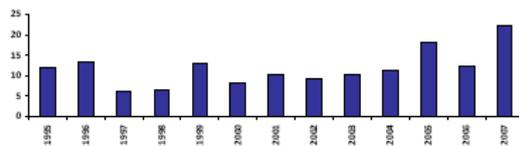
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Population	129	128	127	126	127	127	128	127	128	127	128	128	129	130	131	134	135	137	139	141	143

PATENT APPLICATIONS

	No	Aust Avg	Rank
Average p.a. (1994-2007)	16.38	14.95	48
Average p.a. per capita	12.62	14.87	129
Hi Tech p.a. (1994-2007)	3.69	4.14	56
Hi Tech p.a. per capita	2.85	4.18	106
Info. Tech p.a. (1994-2007)	1.61	1.21	48
Info. Tech p.a. per capita	1.23	1.15	71
Average per capita (1994-2001)	9.88	11.38	156
Average per capita (2001-2007)	15.28	18.81	123
2001-07 avg./1994-01 avg.	1.55	1.65	190

Note: Per capita = 100,000 people

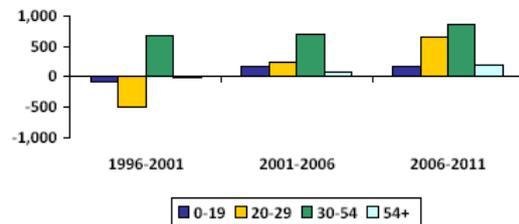
Patent Applications per 100,000 residents



POPULATION CHANGE

	1996	2001	2006	2011
Share of Population				
Age 0-19	22.1%	21.7%	21.3%	20.5%
Age 20-29	18.6%	16.7%	16.8%	17.9%
Age 30-54	34.3%	36.8%	37.8%	38.3%
Age 55+	25.1%	24.9%	24.1%	23.2%
Population Change (average between years)				
Age 0-19		-85	159	172
Age 20-29		-487	229	640
Age 30-54		680	689	851
Age 55+		-16	81	193
Average Annual Growth		0.1%	0.9%	1.4%

Population Change by Age Group



Hume (C)

LABOUR FORCE

	Number ('000s)						Percentage Change					%p.a. growth	
	2003	2004	2005	2006	2007	2008	2003 to 2004	2004 to 2005	2005 to 2006	2006 to 2007	2007 to 2008	2003 -2006	2006 -2008
	Population	143	147	151	154	158	161	2.4%	2.5%	2.5%	2.3%	2.3%	2.5%
Households	41	43	44	45	45	46	2.7%	2.4%	1.9%	1.4%	1.5%	2.4%	1.5%
NIEIR Workforce	68	70	72	74	75	77	2.6%	3.8%	2.2%	1.6%	1.9%	2.9%	1.8%
NIEIR Employment	61	63	65	66	68	69	3.0%	3.0%	1.7%	3.3%	1.8%	2.5%	2.6%
NIEIR Unemployment	7.2	7.2	7.9	8.5	7.5	7.7	-0.2%	10.4%	6.5%	-11.5%	3.0%	5.5%	-4.6%

UNEMPLOYMENT

	Percentage						Percentage Point Change					Average % Point Change pa	
	2003	2004	2005	2006	2007	2008	2003 to 2004	2004 to 2005	2005 to 2006	2006 to 2007	2007 to 2008	2003 -2006	2006 -2008
	NIEIR Unemployment	10.6%	10.3%	11.0%	11.4%	9.9%	10.0%	-0.3	0.7	0.5	-1.5	0.1	0.3
Headline Unemployment	7.1%	6.7%	7.9%	8.4%	6.8%	6.8%	-0.5	1.3	0.5	-1.6	-0.1	0.4	-0.8
NIEIR Structural U/E	17.1%	17.6%	17.0%	16.6%	16.3%	16.0%	0.5	-0.6	-0.4	-0.3	-0.3	-0.2	-0.3

INCOME FLOWS & PRODUCTIVITY

	Level 2005/06 \$m						Per Capita \$						%p.a. Growth of Level	
	2003	2004	2005	2006	2007	2008	2003	2004	2005	2006	2007	2008	2003 -2006	2006 -2008
	Wages/Salaries	2,316	2,482	2,614	2,711	2,848	2,940	16,139	16,892	17,363	17,561	18,047	18,215	5.4%
Taxes Paid	598	632	669	680	730	746	4,167	4,298	4,446	4,404	4,627	4,623	4.4%	4.8%
Benefits	549	625	661	656	666	668	3,826	4,252	4,390	4,249	4,220	4,136	6.1%	0.9%
Business Income	279	293	305	307	307	305	1,943	1,993	2,026	1,987	1,945	1,886	3.2%	-0.4%
Interest Paid	306	373	426	470	540	678	2,133	2,537	2,831	3,047	3,421	4,201	15.4%	20.1%
Property Income	260	301	314	342	393	497	1,815	2,046	2,084	2,217	2,492	3,077	9.5%	20.5%
Disposable Income	2,693	2,886	2,991	3,051	3,220	3,236	18,767	19,636	19,866	19,764	20,403	20,048	4.2%	3.0%
Business Value Added	2,595	2,775	2,919	3,017	3,155	3,245	18,082	18,885	19,389	19,548	19,992	20,102	5.2%	3.7%
Business Productivity							41,938	43,595	44,563	45,292	45,878	46,326	2.6%	1.1%

- Note: (1) All years stated above are fiscal years ending.
(2) Figures for wages/salaries include superannuation supplements.
(3) Figures for disposable income (less depreciation expense) include imputed income from ownership of dwellings.
(4) Figures for business productivity are per employee.

RESIDENTIAL AND NON-RESIDENTIAL BUILDING CONSTRUCTION

	1999	2003	2007	2008	2009	Percentage Change: 2007-09 to 2003-06
	-2002	-2006				
Value \$m2005/06 per annum						
Residential	247	313	250	259	216	-23%
Non Residential	191	237	330	371	308	42%
Total	437	551	579	631	524	5%
Value per capita \$2005/06						
Residential	1,836	2,110	1,583	1,607	1,308	-29%
Non Residential	1,426	1,592	2,088	2,300	1,868	31%
Total	3,262	3,702	3,670	3,907	3,176	-3%

POPULATION MOVEMENT 2001 TO 2006

Age in 2006	Not Yet Born	Same Address	Local Move	Other Australia	Overseas	Not Stated
0 to 19	11,587	21,505	7,067	5,202	1,568	2,767
20 to 29		10,624	5,029	5,269	1,642	1,712
30 to 54		31,057	8,825	8,938	2,251	3,306
55+		19,631	1,850	2,218	359	1,945

Note: This data has been benchmarked to the Estimated Residential Population.

Hume (C)

HOUSEHOLD WEALTH & DEBT

Indicator	2001	2008	2001 Rank	2008 Rank	2001 %Rank 1	2008 %Rank 1
Wealth per Household (\$000 2004/05 prices)	237	271	360	409	3%	3%
Value of Property and Unincorporated Business	297	343	103	134	22%	19%
Value of Financial Assets	52	97	518	495	1%	1%
Value of Household Liabilities	112	169	489	491	56%	51%
Disposable Income after Debt Service Costs	55	53	378	404	1%	11%
Household Debt Service Ratio	20%	29%	524	527	76%	66%
Household Debt to Gross Income Ratio	1.48	1.95	524	527	76%	66%

SOCIAL SECURITY

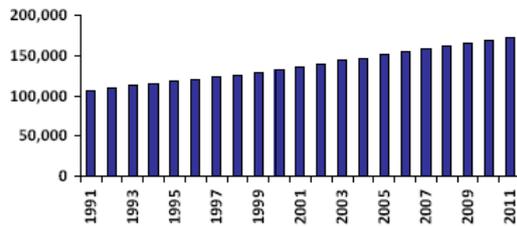
	% Pop	Australian Average
Disability Support (aged 16-20)	0.12%	0.09%
Disability Support (aged 21-24)	0.12%	0.10%
Disability Support (aged 25+)	3.96%	3.40%
Parenting Payment - Single (aged 16-20)	0.00%	0.00%
Parenting Payment - Single (aged 21-24)	0.05%	0.05%
Parenting Payment - Single (aged 25+)	0.18%	0.11%
Unemployed Long Term	1.93%	1.30%
Unemployed Short Term	1.63%	1.27%
Youth Allowance - Non Student	1.02%	0.79%
Youth Allowance Student	0.40%	0.21%

Cash Benefits Share of Disposable Income	Share	Rank
2003	20.4%	396
2004	21.7%	393
2005	22.1%	417
2006	21.5%	419
2007	20.7%	381
2008	20.6%	337

BABY BOUNCE

	Per cent	Rank
2002	1.48%	143
2003	1.44%	144
2004	1.46%	144
2005	1.45%	154
2006	1.47%	165
2007	1.58%	101
Bounce 2005-06	0.02%	351
Actual Change 2005-06 (Number)	86	40
Bounce 2006-07	0.12%	124
Actual Change 2006-07 (Number)	239	1

Population Profile



POPULATION

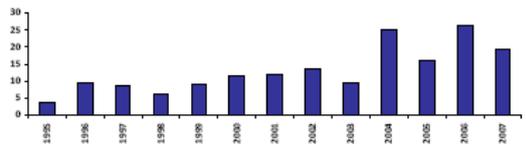
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Population	107	110	113	116	118	121	123	125	128	132	136	140	143	147	151	154	158	161	165	168	172

PATENT APPLICATIONS

	No	Aust Avg	Rank
Average p.a. (1994-2007)	19.32	14.95	38
Average p.a. per capita	13.73	14.87	113
Hi Tech p.a. (1994-2007)	3.79	4.14	54
Hi Tech p.a. per capita	2.67	4.18	116
Info. Tech p.a. (1994-2007)	0.86	1.21	76
Info. Tech p.a. per capita	0.61	1.15	148
Average per capita (1994-2001)	9.31	11.38	173
Average per capita (2001-2007)	18.77	18.81	89
2001-07 avg./1994-01 avg.	2.02	1.65	121

Note: Per capita = 100,000 people

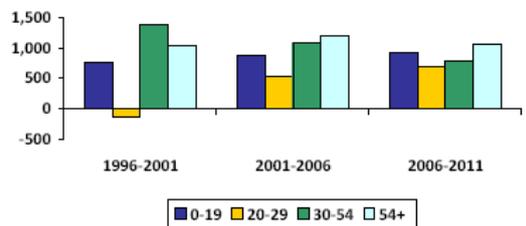
Patent Applications per 100,000 residents



POPULATION CHANGE

	1996	2001	2006	2011
Share of Population				
Age 0-19	34.4%	33.3%	32.2%	31.6%
Age 20-29	16.7%	14.4%	14.3%	14.9%
Age 30-54	36.6%	37.6%	36.6%	35.2%
Age 55+	12.4%	14.8%	16.8%	18.2%
Population Change (average between years)				
Age 0-19		753	880	923
Age 20-29		-122	522	691
Age 30-54		1,378	1,087	786
Age 55+		1,025	1,184	1,055
Average Annual Growth		2.4%	2.6%	2.1%

Population Change by Age Group



Moreland (C)

LABOUR FORCE

	Number ('000s)						Percentage Change					%p.a. growth	
	2003	2004	2005	2006	2007	2008	2003	2004	2005	2006	2007	2003	2006
							to 2004	to 2005	to 2006	to 2007	to 2008	-2006	-2008
Population	138	139	140	142	144	147	0.8%	1.0%	1.4%	1.2%	1.8%	1.1%	1.5%
Households	51	52	52	52	53	53	0.9%	0.8%	0.7%	0.7%	1.1%	0.8%	0.9%
NIEIR Workforce	65	65	66	67	68	70	0.0%	2.6%	1.5%	0.9%	2.7%	1.4%	1.8%
NIEIR Employment	59	59	61	62	64	66	0.7%	2.5%	1.7%	3.6%	3.3%	1.6%	3.4%
NIEIR Unemployment	5.9	5.5	5.7	5.7	4.1	3.8	-6.9%	3.3%	-0.4%	-27.7%	-6.7%	-1.4%	-17.9%

UNEMPLOYMENT

	Percentage						Percentage Point Change					Average % Point Change pa	
	2003	2004	2005	2006	2007	2008	2003	2004	2005	2006	2007	2003	2006
							to 2004	to 2005	to 2006	to 2007	to 2008	-2006	-2008
NIEIR Unemployment	9.2%	8.6%	8.6%	8.5%	6.1%	5.5%	-0.6	0.1	-0.2	-2.4	-0.6	-0.2	-1.5
Headline Unemployment	7.1%	6.3%	6.7%	6.5%	4.8%	4.3%	-0.8	0.5	-0.2	-1.7	-0.4	-0.2	-1.1
NIEIR Structural U/E	17.8%	17.8%	16.7%	15.7%	15.0%	14.0%	0.0	-1.1	-1.0	-0.8	-0.9	-0.7	-0.8

INCOME FLOWS & PRODUCTIVITY

	Level 2005/06 \$m						Per Capita \$						%p.a. Growth of Level	
	2003	2004	2005	2006	2007	2008	2003	2004	2005	2006	2007	2008	2003	2006
							2003	2004	2005	2006	2007	2008	-2006	-2008
Wages/Salaries	2,246	2,359	2,487	2,601	2,754	2,899	16,298	16,974	17,719	18,276	19,120	19,769	5.0%	5.6%
Taxes Paid	568	599	635	661	713	744	4,123	4,313	4,528	4,644	4,948	5,075	5.2%	6.1%
Benefits	622	667	672	670	683	687	4,515	4,801	4,788	4,705	4,739	4,687	2.5%	1.3%
Business Income	296	330	333	343	349	346	2,147	2,374	2,371	2,407	2,421	2,362	5.0%	0.6%
Interest Paid	246	307	360	408	480	602	1,784	2,211	2,568	2,867	3,336	4,107	18.4%	21.5%
Property Income	359	381	414	449	513	644	2,602	2,739	2,947	3,155	3,560	4,394	7.8%	19.8%
Disposable Income	2,796	2,903	2,991	3,069	3,284	3,405	20,284	20,893	21,313	21,567	22,800	23,221	3.2%	5.3%
Business Value Added	2,542	2,688	2,820	2,943	3,103	3,245	18,446	19,348	20,091	20,683	21,542	22,131	5.0%	5.0%
Business Productivity							42,455	44,606	45,652	46,867	47,706	48,309	3.4%	1.5%

- Note: (1) All years stated above are fiscal years ending.
 (2) Figures for wages/salaries include superannuation supplements.
 (3) Figures for disposable income (less depreciation expense) include imputed income from ownership of dwellings.
 (4) Figures for business productivity are per employee.

RESIDENTIAL AND NON-RESIDENTIAL BUILDING CONSTRUCTION

	1999 -2002	2003 -2006	2007	2008	2009	Percentage Change: 2007-09 to 2003-06
Value \$m2005/06 per annum						
Residential	101	128	123	153	142	9%
Non Residential	42	45	76	79	59	57%
Total	143	174	199	232	201	21%
Value per capita \$2005/06						
Residential	738	917	856	1,044	953	4%
Non Residential	310	324	527	537	394	50%
Total	1,048	1,241	1,383	1,582	1,347	16%

POPULATION MOVEMENT 2001 TO 2006

Age in 2006	Not Yet Born	Same Address	Local Move	Other Australia	Overseas	Not Stated
0 to 19	8,799	13,307	3,838	1,868	1,066	1,551
20 to 29		8,241	4,650	7,155	5,026	2,826
30 to 54		26,675	9,383	7,179	3,091	3,181
55+		27,654	2,393	1,298	248	2,877

Note: This data has been benchmarked to the Estimated Residential Population.

Moreland (C)

HOUSEHOLD WEALTH & DEBT

Indicator	2001	2008	2001 Rank	2008 Rank	2001 %Rank 1	2008 %Rank 1
Wealth per Household (\$000 2004/05 prices)	329	378	222	285	4%	5%
Value of Property and Unincorporated Business	340	394	69	92	25%	22%
Value of Financial Assets	56	117	507	471	1%	2%
Value of Household Liabilities	67	133	144	386	33%	40%
Disposable Income after Debt Service Costs	49	52	464	441	1%	11%
Household Debt Service Ratio	14%	25%	285	463	53%	56%
Household Debt to Gross Income Ratio	1.04	1.65	284	463	53%	56%

SOCIAL SECURITY

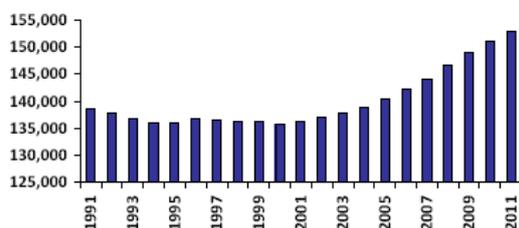
	% Pop	Australian Average
Disability Support (aged 16-20)	0.08%	0.09%
Disability Support (aged 21-24)	0.08%	0.10%
Disability Support (aged 25+)	3.93%	3.40%
Parenting Payment - Single (aged 16-20)	0.00%	0.00%
Parenting Payment - Single (aged 21-24)	0.04%	0.05%
Parenting Payment - Single (aged 25+)	0.10%	0.11%
Unemployed Long Term	1.10%	1.30%
Unemployed Short Term	1.44%	1.27%
Youth Allowance - Non Student	0.89%	0.79%
Youth Allowance Student	0.20%	0.21%

Cash Benefits Share of Disposable Income	Share	Rank
2003	22.3%	440
2004	23.0%	427
2005	22.5%	431
2006	21.8%	431
2007	20.8%	384
2008	20.2%	327

BABY BOUNCE

	Per cent	Rank
2002	1.33%	237
2003	1.33%	207
2004	1.36%	194
2005	1.38%	190
2006	1.43%	186
2007	1.49%	147
Bounce 2005-06	0.05%	196
Actual Change 2005-06 (Number)	105	30
Bounce 2006-07	0.06%	182
Actual Change 2006-07 (Number)	106	24

Population Profile



POPULATION

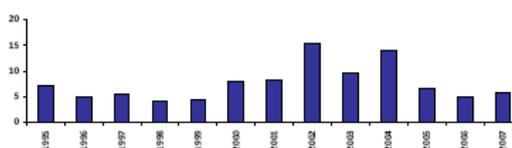
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Population	138	138	137	136	136	137	137	136	136	136	137	138	139	140	142	144	147	149	151	153	

PATENT APPLICATIONS

	No	Aust Avg	Rank
Average p.a. (1994-2007)	10.38	14.95	81
Average p.a. per capita	7.53	14.87	263
Hi Tech p.a. (1994-2007)	3.83	4.14	53
Hi Tech p.a. per capita	2.78	4.18	108
Info. Tech p.a. (1994-2007)	1.83	1.21	41
Info. Tech p.a. per capita	1.33	1.15	66
Average per capita (1994-2001)	7.17	11.38	249
Average per capita (2001-2007)	9.07	18.81	255
2001-07 avg./1994-01 avg.	1.27	1.65	285

Note: Per capita = 100,000 people

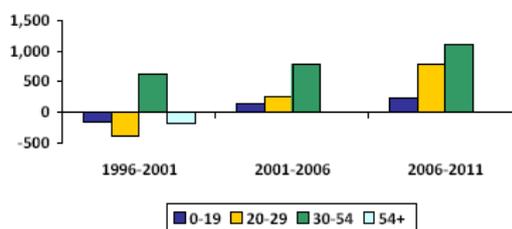
Patent Applications per 100,000 residents



POPULATION CHANGE

	1996	2001	2006	2011
Share of Population				
Age 0-19	22.3%	21.8%	21.4%	20.6%
Age 20-29	18.9%	17.6%	17.8%	19.0%
Age 30-54	32.9%	35.3%	36.6%	37.7%
Age 55+	25.9%	25.3%	24.2%	22.6%
Population Change (average between years)				
Age 0-19		-151	135	227
Age 20-29		-384	263	771
Age 30-54		636	794	1,107
Age 55+		-170	-8	10
Average Annual Growth		-0.1%	0.9%	1.4%

Population Change by Age Group



Nillumbik (S)

LABOUR FORCE

	Number ('000s)						Percentage Change					%p.a. growth	
	2003	2004	2005	2006	2007	2008	2003	2004	2005	2006	2007	2003	2006
							to 2004	to 2005	to 2006	to 2007	to 2008	-2006	-2008
Population	61	61	62	62	62	63	0.3%	0.9%	0.8%	0.5%	0.7%	0.7%	0.6%
Households	18	18	18	18	18	18	0.3%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
NIEIR Workforce	34	34	35	36	36	39	1.8%	2.9%	0.7%	2.1%	7.0%	1.8%	4.5%
NIEIR Employment	33	33	34	35	35	38	1.2%	2.9%	1.5%	2.1%	6.8%	1.9%	4.4%
NIEIR Unemployment	1.1	1.2	1.3	1.0	1.0	1.2	17.4%	1.8%	-20.2%	3.0%	12.6%	-1.6%	7.7%

UNEMPLOYMENT

	Percentage						Percentage Point Change					Average % Point Change pa	
	2003	2004	2005	2006	2007	2008	2003	2004	2005	2006	2007	2003	2006
							to 2004	to 2005	to 2006	to 2007	to 2008	-2006	-2008
NIEIR Unemployment	3.1%	3.6%	3.6%	2.8%	2.9%	3.0%	0.5	0.0	-0.7	0.0	0.1	-0.1	0.1
Headline Unemployment	2.0%	2.2%	2.1%	1.8%	1.6%	1.7%	0.2	-0.1	-0.3	-0.2	0.1	-0.1	-0.1
NIEIR Structural U/E	4.5%	4.8%	4.4%	3.6%	4.0%	3.9%	0.3	-0.4	-0.8	0.4	-0.1	-0.3	0.1

INCOME FLOWS & PRODUCTIVITY

	Level 2005/06 \$m						Per Capita \$						%p.a. Growth of Level	
	2003	2004	2005	2006	2007	2008	2003	2004	2005	2006	2007	2008	2003	2006
							2003	2004	2005	2006	2007	2008	-2006	-2008
Wages/Salaries	1,383	1,457	1,531	1,596	1,649	1,777	22,699	23,839	24,847	25,682	26,406	28,266	4.9%	5.5%
Taxes Paid	420	445	467	477	502	545	6,893	7,289	7,572	7,673	8,043	8,662	4.3%	6.9%
Benefits	156	174	176	166	160	154	2,556	2,852	2,862	2,669	2,563	2,443	2.1%	-3.8%
Business Income	237	252	254	254	250	269	3,889	4,124	4,116	4,090	4,003	4,274	2.4%	2.8%
Interest Paid	169	201	225	243	274	339	2,769	3,292	3,654	3,916	4,380	5,388	13.0%	18.0%
Property Income	318	377	381	395	430	527	5,216	6,177	6,177	6,351	6,894	8,383	7.5%	15.6%
Disposable Income	1,635	1,752	1,794	1,837	1,921	2,069	26,849	28,677	29,100	29,557	30,754	32,911	3.9%	6.1%
Business Value Added	1,619	1,709	1,785	1,850	1,899	2,046	26,588	27,963	28,964	29,771	30,409	32,540	4.5%	5.2%
Business Productivity							48,794	50,892	51,697	52,841	53,183	53,604	2.7%	0.7%

Note: (1) All years stated above are fiscal years ending.
 (2) Figures for wages/salaries include superannuation supplements.
 (3) Figures for disposable income (less depreciation expense) include imputed income from ownership of dwellings.
 (4) Figures for business productivity are per employee.

RESIDENTIAL AND NON-RESIDENTIAL BUILDING CONSTRUCTION

	1999	2003	2007	2008	2009	Percentage Change:
	-2002	-2006				2007-09 to 2003-06
Value \$m2005/06 per annum						
Residential	77	62	63	60	52	-6%
Non Residential	14	17	15	15	10	-22%
Total	91	79	78	75	62	-9%
Value per capita \$2005/06						
Residential	1,275	1,009	1,007	961	823	-8%
Non Residential	237	273	236	233	155	-24%
Total	1,513	1,282	1,243	1,194	978	-11%

POPULATION MOVEMENT 2001 TO 2006

Age in 2006	Not Yet Born	Same Address	Local Move	Other Australia	Overseas	Not Stated
0 to 19	3,971	10,401	1,723	2,293	344	560
20 to 29		4,849	713	1,550	163	288
30 to 54		15,238	2,400	4,701	662	922
55+		9,286	531	901	94	550

Note: This data has been benchmarked to the Estimated Residential Population.

Nillumbik (S)

HOUSEHOLD WEALTH & DEBT

Indicator	2001	2008	2001 Rank	2008 Rank	2001 %Rank 1	2008 %Rank 1
Wealth per Household (\$000 2004/05 prices)	523	656	129	139	7%	8%
Value of Property and Unincorporated Business	486	569	36	36	36%	31%
Value of Financial Assets	180	304	215	203	2%	4%
Value of Household Liabilities	142	217	548	545	70%	66%
Disposable Income after Debt Service Costs	76	92	171	83	2%	19%
Household Debt Service Ratio	18%	24%	486	410	70%	53%
Household Debt to Gross Income Ratio	1.36	1.58	486	410	70%	53%

SOCIAL SECURITY

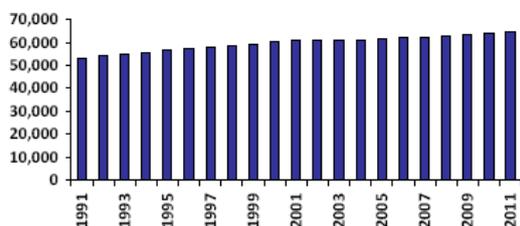
	% Pop	Australian Average
Disability Support (aged 16-20)	0.10%	0.09%
Disability Support (aged 21-24)	0.11%	0.10%
Disability Support (aged 25+)	1.25%	3.40%
Parenting Payment - Single (aged 16-20)	0.00%	0.00%
Parenting Payment - Single (aged 21-24)	0.05%	0.05%
Parenting Payment - Single (aged 25+)	0.08%	0.11%
Unemployed Long Term	0.84%	1.30%
Unemployed Short Term	0.42%	1.27%
Youth Allowance - Non Student	0.35%	0.79%
Youth Allowance Student	0.09%	0.21%

Cash Benefits Share of Disposable Income	Share	Rank
2003	9.5%	98
2004	9.9%	96
2005	9.8%	102
2006	9.0%	98
2007	8.3%	84
2008	7.4%	59

BABY BOUNCE

	Per cent	Rank
2002	1.32%	239
2003	1.27%	266
2004	1.24%	295
2005	1.19%	335
2006	1.17%	383
2007	1.14%	391
Bounce 2005-06	-0.02%	461
Actual Change 2005-06 (Number)	-7	560
Bounce 2006-07	-0.03%	306
Actual Change 2006-07 (Number)	-15	457

Population Profile



POPULATION

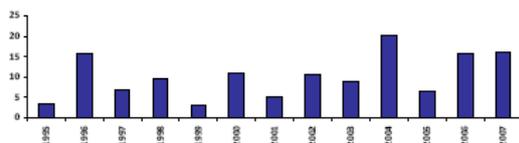
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Population	53	54	55	56	56	57	58	59	59	60	61	61	61	61	62	62	62	63	63	64	64

PATENT APPLICATIONS

	No	Aust Avg	Rank
Average p.a. (1994-2007)	6.41	14.95	111
Average p.a. per capita	10.65	14.87	177
Hi Tech p.a. (1994-2007)	1.30	4.14	120
Hi Tech p.a. per capita	2.16	4.18	132
Info. Tech p.a. (1994-2007)	0.22	1.21	140
Info. Tech p.a. per capita	0.35	1.15	185
Average per capita (1994-2001)	8.21	11.38	213
Average per capita (2001-2007)	13.46	18.81	146
2001-07 avg./1994-01 avg.	1.64	1.65	173

Note: Per capita = 100,000 people

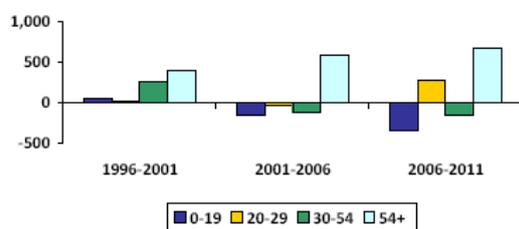
Patent Applications per 100,000 residents



POPULATION CHANGE

	1996	2001	2006	2011
Share of Population				
Age 0-19	34.6%	33.0%	31.0%	27.4%
Age 20-29	12.5%	11.8%	11.3%	12.9%
Age 30-54	41.7%	41.3%	39.4%	36.8%
Age 55+	11.2%	13.9%	18.3%	22.9%
Population Change (average between years)				
Age 0-19		56	-153	-337
Age 20-29		10	-39	265
Age 30-54		254	-130	-158
Age 55+		401	587	669
Average Annual Growth		1.2%	0.4%	0.7%

Population Change by Age Group



Whittlesea (C)

LABOUR FORCE

	Number ('000s)						Percentage Change					%p.a. growth	
	2003	2004	2005	2006	2007	2008	2003 to 2004	2004 to 2005	2005 to 2006	2006 to 2007	2007 to 2008	2003 -2006	2006 -2008
	Population	123	125	128	130	133	138	1.5%	2.1%	1.8%	2.8%	3.3%	1.8%
Households	36	37	38	38	39	40	2.0%	1.6%	1.7%	2.3%	2.9%	1.8%	2.6%
NIEIR Workforce	61	62	64	65	67	69	1.4%	2.7%	2.3%	2.3%	2.8%	2.1%	2.6%
NIEIR Employment	55	55	57	59	61	63	0.8%	3.4%	3.1%	3.4%	3.1%	2.4%	3.2%
NIEIR Unemployment	6.6	7.0	6.8	6.5	6.0	6.0	6.6%	-2.9%	-4.7%	-7.7%	0.3%	-0.5%	-3.8%

UNEMPLOYMENT

	Percentage						Percentage Point Change					Average % Point Change pa	
	2003	2004	2005	2006	2007	2008	2003 to 2004	2004 to 2005	2005 to 2006	2006 to 2007	2007 to 2008	2003 2006	2006 2008
	NIEIR Unemployment	10.7%	11.3%	10.6%	9.9%	9.0%	8.7%	0.5	-0.6	-0.7	-1.0	-0.2	-0.3
Headline Unemployment	6.7%	7.1%	7.0%	6.1%	5.2%	5.1%	0.4	-0.1	-0.8	-0.9	-0.1	-0.2	-0.5
NIEIR Structural U/E	15.0%	15.4%	14.8%	14.2%	13.8%	13.3%	0.4	-0.6	-0.6	-0.4	-0.5	-0.3	-0.5

INCOME FLOWS & PRODUCTIVITY

	Level 2005/06 \$m						Per Capita \$						%p.a. Growth of Level	
	2003	2004	2005	2006	2007	2008	2003	2004	2005	2006	2007	2008	2003 -2006	2006 -2008
	Wages/Salaries	1,988	2,100	2,219	2,345	2,472	2,591	16,157	16,818	17,400	18,067	18,523	18,792	5.7%
Taxes Paid	509	537	576	599	618	645	4,139	4,299	4,521	4,612	4,633	4,678	5.5%	3.8%
Benefits	463	525	549	530	525	516	3,767	4,206	4,306	4,082	3,937	3,742	4.6%	-1.3%
Business Income	287	295	303	297	286	288	2,336	2,360	2,380	2,285	2,141	2,092	1.1%	-1.4%
Interest Paid	247	302	345	381	438	553	2,009	2,415	2,708	2,939	3,285	4,008	15.5%	20.4%
Property Income	279	288	341	405	453	436	2,268	2,307	2,674	3,120	3,397	3,160	13.2%	3.7%
Disposable Income	2,414	2,504	2,641	2,760	2,930	2,833	19,618	20,056	20,715	21,261	21,954	20,551	4.6%	1.3%
Business Value Added	2,275	2,395	2,522	2,642	2,758	2,879	18,493	19,178	19,780	20,353	20,664	20,884	5.1%	4.4%
Business Productivity							40,579	42,480	43,230	44,152	44,835	45,347	2.9%	1.3%

- Note: (1) All years stated above are fiscal years ending.
(2) Figures for wages/salaries include superannuation supplements.
(3) Figures for disposable income (less depreciation expense) include imputed income from ownership of dwellings.
(4) Figures for business productivity are per employee.

RESIDENTIAL AND NON-RESIDENTIAL BUILDING CONSTRUCTION

	1999	2003	2007	2008	2009	Percentage Change: 2007-09 to 2003-06
	-2002	-2006				
Value \$m2005/06 per annum						
Residential	197	238	319	416	328	49%
Non Residential	75	85	197	213	159	122%
Total	272	323	516	629	487	68%
Value per capita \$2005/06						
Residential	1,684	1,885	2,388	3,016	2,301	36%
Non Residential	646	673	1,478	1,543	1,112	105%
Total	2,329	2,557	3,866	4,560	3,412	54%

POPULATION MOVEMENT 2001 TO 2006

Age in 2006	Not Yet Born	Same Address	Local Move	Other Australia	Overseas	Not Stated
0 to 19	9,019	16,944	4,707	3,832	1,002	1,679
20 to 29		10,538	3,582	4,646	1,467	1,254
30 to 54		27,990	6,990	7,285	1,553	2,196
55+		20,045	1,459	1,898	227	1,480

Note: This data has been benchmarked to the Estimated Residential Population.

Whittlesea (C)

HOUSEHOLD WEALTH & DEBT

Indicator	2001	2008	2001 Rank	2008 Rank	2001 %Rank 1	2008 %Rank 1
Wealth per Household (\$000 2004/05 prices)	406	451	170	223	5%	6%
Value of Property and Unincorporated Business	346	383	65	100	26%	21%
Value of Financial Assets	164	227	239	297	2%	3%
Value of Household Liabilities	103	158	454	473	51%	48%
Disposable Income after Debt Service Costs	59	55	317	383	1%	11%
Household Debt Service Ratio	17%	27%	462	505	67%	62%
Household Debt to Gross Income Ratio	1.29	1.82	462	505	67%	62%

SOCIAL SECURITY

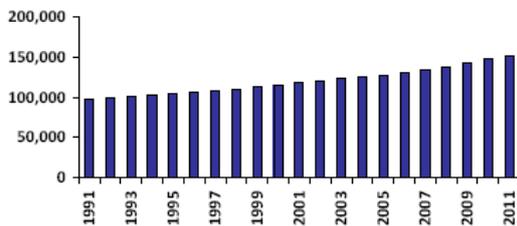
	% Pop	Australian Average
Disability Support (aged 16-20)	0.08%	0.09%
Disability Support (aged 21-24)	0.08%	0.10%
Disability Support (aged 25+)	4.11%	3.40%
Parenting Payment - Single (aged 16-20)	0.00%	0.00%
Parenting Payment - Single (aged 21-24)	0.04%	0.05%
Parenting Payment - Single (aged 25+)	0.11%	0.11%
Unemployed Long Term	1.58%	1.30%
Unemployed Short Term	0.99%	1.27%
Youth Allowance - Non Student	0.69%	0.79%
Youth Allowance Student	0.21%	0.21%

Cash Benefits Share of Disposable Income	Share	Rank
2003	19.2%	371
2004	21.0%	382
2005	20.8%	386
2006	19.2%	356
2007	17.9%	290
2008	18.2%	275

BABY BOUNCE

	Per cent	Rank
2002	1.40%	180
2003	1.38%	179
2004	1.40%	171
2005	1.39%	180
2006	1.43%	184
2007	1.41%	194
Bounce 2005-06	0.04%	262
Actual Change 2005-06 (Number)	84	42
Bounce 2006-07	-0.03%	300
Actual Change 2006-07 (Number)	18	121

Population Profile



POPULATION

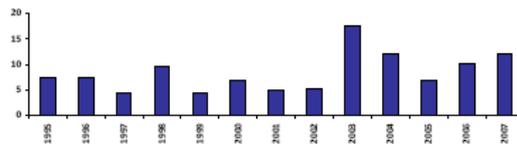
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Population	97	100	101	103	104	106	108	110	113	115	118	120	123	125	128	130	133	138	143	147	152

PATENT APPLICATIONS

	No	Aust Avg	Rank
Average p.a. (1994-2007)	10.26	14.95	82
Average p.a. per capita	8.63	14.87	237
Hi Tech p.a. (1994-2007)	2.48	4.14	79
Hi Tech p.a. per capita	2.00	4.18	147
Info. Tech p.a. (1994-2007)	0.69	1.21	88
Info. Tech p.a. per capita	0.56	1.15	153
Average per capita (1994-2001)	6.32	11.38	290
Average per capita (2001-2007)	10.76	18.81	211
2001-07 avg./1994-01 avg.	1.70	1.65	161

Note: Per capita = 100,000 people

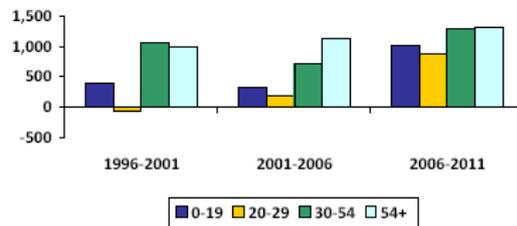
Patent Applications per 100,000 residents



POPULATION CHANGE

	1996	2001	2006	2011
Share of Population				
Age 0-19	31.6%	30.1%	28.6%	27.8%
Age 20-29	17.9%	15.8%	15.1%	15.7%
Age 30-54	36.8%	37.5%	36.9%	35.7%
Age 55+	13.7%	16.5%	19.3%	20.8%
Population Change (average between years)				
Age 0-19		405	320	1,011
Age 20-29		-69	179	865
Age 30-54		1,050	714	1,282
Age 55+		996	1,122	1,309
Average Annual Growth		2.1%	1.9%	3.2%

Population Change by Age Group



Yarra (C)

LABOUR FORCE

	Number ('000s)						Percentage Change					%p.a. growth	
	2003	2004	2005	2006	2007	2008	2003	2004	2005	2006	2007	2003	2006
							to 2004	to 2005	to 2006	to 2007	to 2008		
Population	71	71	72	74	75	76	1.1%	1.2%	1.8%	1.8%	1.9%	1.4%	1.9%
Households	28	28	29	29	29	30	1.4%	1.3%	0.9%	0.8%	0.9%	1.2%	0.9%
NIEIR Workforce	41	42	43	44	45	48	2.1%	3.3%	1.8%	2.4%	6.1%	2.4%	4.3%
NIEIR Employment	38	39	40	42	43	46	2.3%	3.2%	3.0%	2.8%	7.2%	2.8%	5.0%
NIEIR Unemployment	2.9	2.9	3.0	2.6	2.5	2.2	0.4%	4.5%	-14.3%	-4.1%	-11.5%	-3.5%	-7.9%

UNEMPLOYMENT

	Percentage						Percentage Point Change					Average % Point Change pa	
	2003	2004	2005	2006	2007	2008	2003	2004	2005	2006	2007	2003	2006
							to 2004	to 2005	to 2006	to 2007	to 2008		
NIEIR Unemployment	7.1%	6.9%	7.0%	5.9%	5.5%	4.6%	-0.1	0.1	-1.1	-0.4	-0.9	-0.4	-0.6
Headline Unemployment	6.4%	6.5%	6.6%	5.4%	5.1%	4.4%	0.1	0.1	-1.2	-0.4	-0.7	-0.3	-0.5
NIEIR Structural U/E	15.3%	14.8%	13.9%	12.9%	12.0%	11.1%	-0.4	-0.9	-0.9	-0.9	-0.9	-0.8	-0.9

INCOME FLOWS & PRODUCTIVITY

	Level 2005/06 \$m						Per Capita \$						%p.a. Growth of Level	
	2003	2004	2005	2006	2007	2008	2003	2004	2005	2006	2007	2008	2003	2006
							2003	2004	2005	2006	2007	2008		
Wages/Salaries	1,695	1,794	1,909	2,015	2,102	2,279	24,001	25,133	26,424	27,400	28,069	29,855	5.9%	6.3%
Taxes Paid	583	630	683	712	739	806	8,259	8,829	9,456	9,681	9,868	10,554	6.9%	6.4%
Benefits	261	277	280	279	284	286	3,694	3,886	3,880	3,793	3,796	3,751	2.3%	1.3%
Business Income	384	423	441	455	456	486	5,444	5,922	6,097	6,186	6,087	6,363	5.8%	3.3%
Interest Paid	150	191	229	265	318	408	2,120	2,678	3,168	3,600	4,253	5,349	20.9%	24.2%
Property Income	405	428	484	538	598	673	5,730	5,992	6,694	7,312	7,983	8,821	10.0%	11.9%
Disposable Income	2,213	2,300	2,422	2,543	2,711	2,851	31,334	32,234	33,523	34,577	36,196	37,357	4.8%	5.9%
Business Value Added	2,079	2,216	2,350	2,470	2,558	2,764	29,446	31,056	32,521	33,586	34,156	36,217	5.9%	5.8%
Business Productivity							53,437	55,711	57,299	58,516	58,932	59,415	3.1%	0.8%

- Note: (1) All years stated above are fiscal years ending.
(2) Figures for wages/salaries include superannuation supplements.
(3) Figures for disposable income (less depreciation expense) include imputed income from ownership of dwellings.
(4) Figures for business productivity are per employee.

RESIDENTIAL AND NON-RESIDENTIAL BUILDING CONSTRUCTION

	1999 -2002	2003 -2006	2007	2008	2009	Percentage Change: 2007-09 to 2003-06
Value \$m2005/06 per annum						
Residential	85	94	82	82	63	-20%
Non Residential	131	114	126	164	133	24%
Total	216	209	208	246	196	4%
Value per capita \$2005/06						
Residential	1,231	1,313	1,094	1,079	801	-25%
Non Residential	1,902	1,585	1,686	2,143	1,706	16%
Total	3,133	2,898	2,780	3,221	2,507	-2%

POPULATION MOVEMENT 2001 TO 2006

Age in 2006	Not Yet Born	Same Address	Local Move	Other Australia	Overseas	Not Stated
0 to 19	3,578	3,710	1,314	687	452	882
20 to 29		2,851	3,456	8,066	3,770	2,976
30 to 54		10,614	7,504	4,988	2,575	3,023
55+		8,991	1,520	949	178	1,463

Note: This data has been benchmarked to the Estimated Residential Population.

Yarra (C)

HOUSEHOLD WEALTH & DEBT

Indicator	2001	2008	2001 Rank	2008 Rank	2001 %Rank 1	2008 %Rank 1
Wealth per Household (\$000 2004/05 prices)	484	596	140	153	6%	8%
Value of Property and Unincorporated Business	353	411	64	84	26%	23%
Value of Financial Assets	198	343	192	176	3%	4%
Value of Household Liabilities	68	158	167	472	33%	48%
Disposable Income after Debt Service Costs	67	78	221	142	1%	16%
Household Debt Service Ratio	11%	21%	138	316	42%	48%
Household Debt to Gross Income Ratio	0.81	1.42	138	316	42%	48%

SOCIAL SECURITY

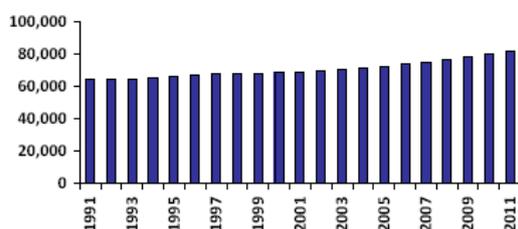
	% Pop	Australian Average
Disability Support (aged 16-20)	0.09%	0.09%
Disability Support (aged 21-24)	0.09%	0.10%
Disability Support (aged 25+)	3.50%	3.40%
Parenting Payment - Single (aged 16-20)	0.00%	0.00%
Parenting Payment - Single (aged 21-24)	0.04%	0.05%
Parenting Payment - Single (aged 25+)	0.08%	0.11%
Unemployed Long Term	1.19%	1.30%
Unemployed Short Term	1.88%	1.27%
Youth Allowance - Non Student	1.10%	0.79%
Youth Allowance Student	0.16%	0.21%

Cash Benefits Share of Disposable Income	Share	Rank
2003	11.8%	139
2004	12.1%	132
2005	11.6%	132
2006	11.0%	131
2007	10.5%	115
2008	10.0%	98

BABY BOUNCE

	Per cent	Rank
2002	1.15%	403
2003	1.14%	390
2004	1.16%	378
2005	1.17%	361
2006	1.22%	338
2007	1.33%	245
Bounce 2005-06	0.05%	207
Actual Change 2005-06 (Number)	53	73
Bounce 2006-07	0.11%	130
Actual Change 2006-07 (Number)	100	26

Population Profile



POPULATION

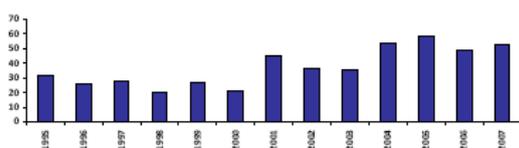
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Population	64	64	65	66	66	67	68	68	68	68	69	70	71	71	72	74	75	76	78	80	81

PATENT APPLICATIONS

	No	Aust Avg	Rank
Average p.a. (1994-2007)	26.75	14.95	24
Average p.a. per capita	38.14	14.87	18
Hi Tech p.a. (1994-2007)	8.70	4.14	18
Hi Tech p.a. per capita	12.40	4.18	18
Info. Tech p.a. (1994-2007)	2.03	1.21	39
Info. Tech p.a. per capita	2.88	1.15	35
Average per capita (1994-2001)	29.39	11.38	20
Average per capita (2001-2007)	47.89	18.81	19
2001-07 avg./1994-01 avg.	1.63	1.65	174

Note: Per capita = 100,000 people

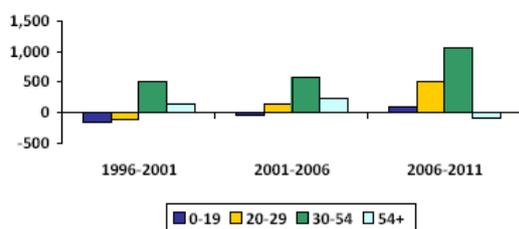
Patent Applications per 100,000 residents



POPULATION CHANGE

	1996	2001	2006	2011
Share of Population				
Age 0-19	17.4%	15.7%	14.4%	13.6%
Age 20-29	27.9%	26.3%	25.7%	26.3%
Age 30-54	38.1%	40.7%	42.1%	44.5%
Age 55+	16.7%	17.3%	17.8%	15.6%
Population Change (average between years)				
Age 0-19		-164	-41	86
Age 20-29		-117	152	516
Age 30-54		500	569	1,065
Age 55+		143	241	-80
Average Annual Growth		0.5%	1.3%	2.1%

Population Change by Age Group



Appendix 2 | Local government indicators: industry

Appendix 2 provides data on industry in Melbourne's North by LGA for 1996, 2001 and 2006 by:

1. one digit ANZSIC gross product (industry) at factor cost (\$2006m)
2. one digit ANZSIC employment (industry) – number employed
3. one digit ANZSIC productivity (industry) – gross product per employed person (2006 \$'000)
4. one digit ANZSIC gross product (industry) at factor cost (\$2006m) – share of Melbourne's North total GRP (per cent).

Table A2.1 One digit ANZSIC gross product (industry) at factor cost (\$2006m)

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Total Melbourne's North	Total Victoria
1991									
Agriculture	3	1	5	1	5	33	2	49	4,316
Mining	2	23	16	4	6	7	7	75	10,069
Manufacturing	234	796	1,395	784	75	523	920	4,727	26,370
Electricity	17	55	38	26	11	87	133	367	5,091
Construction	160	156	167	115	85	110	146	939	7,464
Wholesale trade	72	197	129	156	27	97	376	1,055	7,023
Retail trade	121	181	155	172	53	95	190	968	7,480
Accommodation	19	24	29	19	10	19	64	184	1,980
Transport	21	77	578	43	7	28	67	820	5,662
Communication	23	47	23	32	6	9	51	190	2,071
Finance	91	94	57	68	30	28	184	551	10,290
Business services	312	341	283	339	160	200	469	2,104	16,911
Government admin	119	55	100	57	12	17	76	435	6,593
Education	157	167	159	139	78	243	135	1,078	8,692
Health	402	230	117	102	43	91	446	1,431	9,017
Recreational	17	27	20	19	12	13	97	204	2,010
Personal services	47	48	58	89	15	23	108	387	2,748
Total gross regional product	1,816	2,517	3,330	2,163	636	1,623	3,471	15,566	133,785

Table A2.1 One digit ANZSIC gross product (industry) at factor cost (\$2006m) (continued)

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Total Melbourne's North	Total Victoria
1996									
Agriculture	0	1	4	1	9	46	1	63	4,780
Mining	0	56	5	2	0	8	1	72	8,089
Manufacturing	290	850	1,880	675	44	601	957	5,297	28,196
Electricity	30	15	90	9	11	118	194	467	5,572
Construction	173	186	184	159	134	138	178	1,151	8,306
Wholesale trade	119	225	233	164	39	119	519	1,418	9,169
Retail trade	172	261	206	188	54	120	243	1,245	9,092
Accommodation	34	40	41	28	9	17	101	270	2,540
Transport	28	88	1,362	72	18	49	85	1,701	7,073
Communication	46	56	48	24	4	9	138	325	3,766
Finance	102	122	51	91	23	38	155	582	12,878
Business services	341	366	300	442	184	207	590	2,430	20,629
Government admin	99	56	85	50	10	12	52	364	6,050
Education	150	349	169	171	91	112	146	1,188	9,140
Health	401	269	87	189	40	80	571	1,638	10,730
Recreational	24	37	22	20	14	16	104	237	2,377
Personal services	47	63	59	95	22	29	113	429	3,106
Total gross regional product	2,057	3,038	4,827	2,380	707	1,719	4,148	18,874	151,494

Table A2.1 One digit ANZSIC gross product (industry) at factor cost (\$2006m) (continued)

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Total Melbourne's North	Total Victoria
2001									
Agriculture	1	2	9	1	19	49	1	82	6,632
Mining	1	25	5	3	4	11	7	56	11,970
Manufacturing	312	682	1,773	644	60	630	716	4,816	29,382
Electricity	22	17	115	14	11	125	202	507	6,237
Construction	202	241	239	217	146	207	227	1,479	10,701
Wholesale trade	139	217	358	214	40	148	529	1,645	10,663
Retail trade	202	267	269	196	69	167	270	1,439	10,694
Accommodation	41	43	67	32	16	24	123	345	3,077
Transport	35	76	1,474	73	17	66	108	1,849	8,499
Communication	20	68	73	12	6	13	133	326	5,117
Finance	111	105	65	69	35	40	350	775	15,879
Business services	460	494	418	526	236	302	933	3,368	27,825
Government admin	124	55	112	68	10	27	55	451	5,873
Education	184	310	215	158	103	183	162	1,313	10,183
Health	464	212	121	210	63	155	629	1,853	12,134
Recreational	28	42	33	29	17	24	124	298	2,968
Personal services	58	73	79	72	26	41	112	460	3,593
Total gross regional product	2,402	2,930	5,423	2,539	878	2,211	4,681	21,062	181,426

Table A2.1 One digit ANZSIC gross product (industry) at factor cost (\$2006m) (continued)

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Total Melbourne's North	Total Victoria
2006									
Agriculture	1	8	14	1	29	75	1	130	6,755
Mining	0	22	10	65	7	42	3	148	6,076
Manufacturing	325	628	1,883	481	44	573	614	4,548	29,852
Electricity	7	16	64	8	13	149	172	430	5,983
Construction	264	284	388	258	199	309	295	1,997	14,568
Wholesale trade	142	267	500	231	46	231	519	1,937	13,412
Retail trade	217	302	317	250	84	199	335	1,704	12,778
Accommodation	45	57	72	39	23	30	154	420	3,735
Transport	32	92	2,541	88	19	82	93	2,946	10,551
Communication	20	95	115	12	7	13	283	547	6,865
Finance	145	132	93	94	43	56	862	1,426	19,015
Business services	460	547	457	491	266	335	1,076	3,632	32,254
Government admin	87	57	135	68	7	34	55	443	5,939
Education	203	377	241	169	91	189	168	1,439	11,194
Health	657	235	152	236	68	231	769	2,348	14,996
Recreational	36	50	32	30	21	29	176	375	3,603
Personal services	64	73	72	67	28	47	125	476	3,995
Total gross regional product	2,706	3,244	7,088	2,586	997	2,625	5,700	24,947	201,571

Table A2.2 One digit ANZSIC employment (industry): number employed

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Total Melbourne's North	Total Victoria
1991									
Agriculture	119	35	150	36	135	512	36	1,022	77,502
Mining	9	63	50	7	6	63	11	208	6,097
Manufacturing	4,216	12,734	17,124	12,772	1,219	7,850	13,715	69,630	322,882
Electricity	104	353	238	159	70	655	820	2,398	28,468
Construction	2,701	2,926	2,458	1,779	1,291	1,690	2,167	15,013	110,055
Wholesale trade	1,223	3,390	2,200	2,785	443	1,735	6,416	18,192	114,050
Retail trade	4,313	6,155	5,327	5,948	1,894	3,469	6,310	33,417	248,261
Accommodation	631	829	995	628	341	766	1,852	6,042	64,651
Transport	470	1,660	6,198	893	150	592	1,273	11,236	78,812
Communication	488	982	487	682	136	205	992	3,972	39,009
Finance	1,026	1,155	714	801	339	373	1,884	6,293	89,856
Business services	2,072	2,187	1,913	1,658	867	1,004	4,970	14,671	143,733
Government admin	2,319	1,455	2,039	1,377	444	461	1,713	9,807	101,512
Education	2,571	2,784	2,765	2,317	1,240	4,360	1,928	17,966	133,050
Health	7,825	4,760	2,780	2,193	876	2,087	7,786	28,307	165,190
Recreational	359	463	341	318	230	248	1,515	3,474	32,560
Personal services	1,102	1,250	1,183	2,054	337	505	2,052	8,484	58,042
Total gross regional product	31,548	43,182	46,964	36,408	10,018	26,574	55,440	250,134	1,813,930

Table A2.2 One digit ANZSIC employment (industry): number employed (continued)

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Total Melbourne's North	Total Victoria
1996									
Agriculture	95	77	190	91	325	287	74	1,140	73,910
Mining	6	106	59	3	1	68	10	252	4,778
Manufacturing	4,430	11,955	18,521	9,764	733	8,355	11,134	64,892	309,207
Electricity	70	39	210	21	29	332	466	1,166	13,033
Construction	2,804	3,136	2,508	2,255	1,714	2,032	2,220	16,668	112,674
Wholesale trade	1,606	3,039	3,008	2,265	499	1,648	6,724	18,789	115,603
Retail trade	5,413	7,733	6,085	5,459	1,598	3,794	6,783	36,866	263,319
Accommodation	1,029	1,200	1,258	803	271	497	2,611	7,670	72,603
Transport	467	1,448	9,802	1,091	291	708	1,186	14,994	73,961
Communication	641	920	653	350	77	155	1,522	4,318	43,085
Finance	816	954	408	696	185	319	1,110	4,488	77,562
Business services	2,618	2,826	1,980	3,316	1,176	1,214	6,933	20,064	187,779
Government admin	1,347	974	1,205	836	300	209	818	5,689	71,621
Education	2,402	5,027	2,619	2,624	1,447	1,877	2,015	18,011	131,879
Health	7,063	4,996	1,828	3,510	811	1,543	8,668	28,420	176,327
Recreational	531	689	434	429	372	383	1,846	4,684	44,677
Personal services	1,241	1,566	1,128	1,923	484	666	2,238	9,246	65,176
Total gross regional product	32,579	46,687	51,895	35,435	10,313	24,089	56,359	257,356	1,837,196

Table A2.2 One digit ANZSIC employment (industry): number employed (continued)

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Total Melbourne's North	Total Victoria
2001									
Agriculture	67	104	269	61	283	560	85	1,430	73,996
Mining	6	78	24	10	6	48	19	193	4,318
Manufacturing	4,177	8,985	21,315	8,371	941	8,967	8,625	61,379	322,292
Electricity	46	43	254	31	25	307	408	1,113	13,087
Construction	2,839	3,208	3,211	2,699	1,945	3,001	2,679	19,582	139,491
Wholesale trade	1,611	2,711	4,106	2,610	447	1,872	5,654	19,010	117,364
Retail trade	6,058	7,882	7,808	5,512	2,046	5,309	7,468	42,083	309,458
Accommodation	1,313	1,380	2,248	1,031	493	807	3,424	10,697	93,353
Transport	541	1,179	8,952	1,147	251	1,030	1,483	14,582	79,992
Communication	302	740	922	160	86	210	1,024	3,442	42,435
Finance	747	787	490	507	223	332	1,909	4,995	83,298
Business services	3,461	3,194	3,252	2,922	1,492	1,647	9,550	25,517	241,436
Government admin	1,423	850	1,338	933	228	465	724	5,961	62,151
Education	2,902	4,687	3,387	2,486	1,632	3,024	2,236	20,354	150,653
Health	8,167	3,889	2,305	3,746	1,181	3,101	9,595	31,985	206,065
Recreational	598	907	607	693	472	593	2,398	6,269	53,928
Personal services	1,414	1,646	1,378	1,442	590	923	2,051	9,444	70,625
Total gross regional product	35,671	42,270	61,864	34,360	12,342	32,194	59,334	278,036	2,063,941

Table A2.2 One digit ANZSIC employment (industry): number employed (continued)

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Total Melbourne's North	Total Victoria
2006									
Agriculture	62	154	394	73	375	775	50	1,883	77,267
Mining	5	296	59	36	11	145	41	592	8,600
Manufacturing	4,209	7,741	20,821	6,454	745	8,424	6,574	54,967	317,700
Electricity	23	56	278	28	54	615	566	1,621	20,967
Construction	4,230	4,460	6,193	3,963	3,114	5,080	3,902	30,942	222,467
Wholesale trade	1,432	3,040	5,149	2,524	465	2,722	4,869	20,201	129,767
Retail trade	6,231	8,723	8,895	6,745	2,463	5,839	8,909	47,806	356,500
Accommodation	1,358	1,624	2,423	1,127	631	892	3,823	11,877	101,000
Transport	616	1,565	15,863	1,509	307	1,425	1,618	22,903	111,300
Communication	353	1,012	1,446	174	120	225	1,830	5,161	55,967
Finance	895	846	670	634	271	435	4,072	7,824	100,267
Business services	3,842	3,853	4,181	3,141	1,775	2,032	12,260	31,083	299,267
Government admin	1,633	1,592	2,319	1,353	335	898	948	9,079	88,967
Education	3,689	6,067	4,256	3,081	1,653	3,449	2,726	24,920	183,767
Health	12,195	5,002	3,262	4,857	1,534	4,771	12,369	43,991	279,200
Recreational	818	1,268	685	897	691	825	3,445	8,627	72,833
Personal services	1,636	1,972	1,558	1,646	776	1,224	2,636	11,448	86,167
Total gross regional product	43,226	49,272	78,451	38,241	15,320	39,776	70,637	334,924	2,512,000

Table A2.3 One digit ANZSIC productivity: gross product per employed person (2006 \$'000)

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Total Melbourne's North	Total Victoria
1991									
Agriculture	22	17	35	27	39	64	43	48	56
Mining	230	372	328	529	930	111	629	362	1,651
Manufacturing	55	63	81	61	62	67	67	68	82
Electricity	167	155	161	162	154	134	162	153	179
Construction	59	53	68	65	66	65	67	63	68
Wholesale trade	59	58	59	56	61	56	59	58	62
Retail trade	28	29	29	29	28	27	30	29	30
Accommodation	29	29	29	31	30	25	34	30	31
Transport	44	46	93	48	46	47	53	73	72
Communication	46	48	46	47	47	43	52	48	53
Finance	88	81	80	85	89	74	97	88	115
Business services	150	156	148	204	185	199	94	143	118
Government admin	51	38	49	41	28	37	44	44	65
Education	61	60	57	60	63	56	70	60	65
Health	51	48	42	46	49	44	57	51	55
Recreational	47	58	60	60	51	52	64	59	62
Personal services	43	38	49	43	44	45	53	46	47
Total gross regional product	58	58	71	59	64	61	63	62	74

Table A2.3 One digit ANZSIC productivity: gross product per employed person (2006 \$'000) (continued)

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Total Melbourne's North	Total Victoria
1996									
Agriculture	4	16	23	8	27	160	19	55	65
Mining	55	529	79	591	0	121	56	285	1693
Manufacturing	65	71	101	69	60	72	86	82	91
Electricity	432	375	428	447	378	355	417	400	428
Construction	62	59	73	70	78	68	80	69	74
Wholesale trade	74	74	77	73	79	72	77	75	79
Retail trade	32	34	34	34	34	32	36	34	35
Accommodation	33	34	32	34	34	34	39	35	35
Transport	60	61	139	66	62	69	72	113	96
Communication	72	61	74	68	48	57	91	75	87
Finance	125	128	126	130	126	118	139	130	166
Business services	130	129	152	133	157	170	85	121	110
Government admin	74	57	70	60	35	57	64	64	84
Education	62	69	65	65	63	60	72	66	69
Health	57	54	48	54	49	52	66	58	61
Recreational	44	53	51	48	37	41	57	51	53
Personal services	38	40	53	50	46	44	51	46	48
Total gross regional product	63	65	93	67	69	71	74	73	82

Table A2.3 One digit ANZSIC productivity: gross product per employed person (2006 \$'000) (continued)

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Total Melbourne's North	Total Victoria
2001									
Agriculture	20	23	33	9	67	87	11	57	90
Mining	137	320	210	333	548	219	378	289	2,772
Manufacturing	75	76	83	77	64	70	83	78	91
Electricity	470	409	455	449	446	407	496	455	477
Construction	71	75	74	81	75	69	85	76	77
Wholesale trade	86	80	87	82	90	79	94	87	91
Retail trade	33	34	34	36	34	31	36	34	35
Accommodation	31	31	30	31	32	29	36	32	33
Transport	65	64	165	64	69	64	72	127	106
Communication	66	92	79	77	67	63	130	95	121
Finance	148	134	133	136	157	120	183	155	191
Business services	133	155	128	180	158	183	98	132	115
Government admin	87	65	83	73	45	59	76	76	94
Education	63	66	63	63	63	60	72	65	68
Health	57	54	52	56	53	50	66	58	59
Recreational	47	47	55	42	36	41	52	48	55
Personal services	41	44	57	50	43	44	55	49	51
Total gross regional product	67	69	88	74	71	69	79	76	88

Table A2.3 One digit ANZSIC productivity: gross product per employed person (2006 \$'000) (continued)

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Total Melbourne's North	Total Victoria
2006									
Agriculture	16	52	36	13	79	97	13	69	87
Mining	34	74	168	1,823	611	288	75	250	707
Manufacturing	77	81	90	75	59	68	93	83	94
Electricity	299	291	230	281	238	242	305	265	285
Construction	62	64	63	65	64	61	76	65	65
Wholesale trade	99	88	97	91	99	85	107	96	103
Retail trade	35	35	36	37	34	34	38	36	36
Accommodation	33	35	30	34	37	34	40	35	37
Transport	52	59	160	58	63	57	57	129	95
Communication	58	94	80	71	60	59	155	106	123
Finance	162	157	139	148	160	130	212	182	190
Business services	120	142	109	156	150	165	88	117	108
Government admin	53	36	58	50	22	38	58	49	67
Education	55	62	57	55	55	55	62	58	61
Health	54	47	47	48	44	48	62	53	54
Recreational	44	40	47	33	31	36	51	43	49
Personal services	39	37	46	41	36	38	48	42	46
Total gross regional product	63	66	90	68	65	66	81	74	80

Table A2.4 One digit ANZSIC gross productivity (industry) at factor cost (\$2006m): share of Melbourne's North total GRP (per cent)

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nilumbik (S)	Whittlesea (C)	Yarra (C)
1991							
Agriculture	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Mining	0.0	0.2	0.1	0.0	0.0	0.0	0.0
Manufacturing	1.5	5.1	9.0	5.0	0.5	3.4	5.9
Electricity	0.1	0.4	0.2	0.2	0.1	0.6	0.9
Construction	1.0	1.0	1.1	0.7	0.5	0.7	0.9
Wholesale trade	0.5	1.3	0.8	1.0	0.2	0.6	2.4
Retail trade	0.8	1.2	1.0	1.1	0.3	0.6	1.2
Accommodation	0.1	0.2	0.2	0.1	0.1	0.1	0.4
Transport	0.1	0.5	3.7	0.3	0.0	0.2	0.4
Communication	0.1	0.3	0.1	0.2	0.0	0.1	0.3
Finance	0.6	0.6	0.4	0.4	0.2	0.2	1.2
Business services	2.0	2.2	1.8	2.2	1.0	1.3	3.0
Government admin	0.8	0.4	0.6	0.4	0.1	0.1	0.5
Education	1.0	1.1	1.0	0.9	0.5	1.6	0.9
Health	2.6	1.5	0.8	0.7	0.3	0.6	2.9
Recreational	0.1	0.2	0.1	0.1	0.1	0.1	0.6
Personal services	0.3	0.3	0.4	0.6	0.1	0.1	0.7
Total gross regional product	11.7	16.2	21.4	13.9	4.1	10.4	22.3

Table A2.4 One digit ANZSIC gross productivity (industry) at factor cost (\$2006m): share of Melbourne's North total GRP (per cent) (continued)

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nilumbik (S)	Whittlesea (C)	Yarra (C)
1996							
Agriculture	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Mining	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Manufacturing	1.5	4.5	10.0	3.6	0.2	3.2	5.1
Electricity	0.2	0.1	0.5	0.0	0.1	0.6	1.0
Construction	0.9	1.0	1.0	0.8	0.7	0.7	0.9
Wholesale trade	0.6	1.2	1.2	0.9	0.2	0.6	2.7
Retail trade	0.9	1.4	1.1	1.0	0.3	0.6	1.3
Accommodation	0.2	0.2	0.2	0.1	0.0	0.1	0.5
Transport	0.1	0.5	7.2	0.4	0.1	0.3	0.4
Communication	0.2	0.3	0.3	0.1	0.0	0.0	0.7
Finance	0.5	0.6	0.3	0.5	0.1	0.2	0.8
Business services	1.8	1.9	1.6	2.3	1.0	1.1	3.1
Government admin	0.5	0.3	0.4	0.3	0.1	0.1	0.3
Education	0.8	1.8	0.9	0.9	0.5	0.6	0.8
Health	2.1	1.4	0.5	1.0	0.2	0.4	3.0
Recreational	0.1	0.2	0.1	0.1	0.1	0.1	0.6
Personal services	0.2	0.3	0.3	0.1	0.1	0.2	0.6
Total gross regional product	10.9	16.1	25.6	12.6	3.7	9.1	22.0

Table A2.4 One digit ANZSIC gross productivity (industry) at factor cost (\$2006m): share of Melbourne's North total GRP (per cent) (continued)

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nilumbik (S)	Whittlesea (C)	Yarra (C)
2001							
Agriculture	0.0	0.0	0.0	0.0	0.1	0.2	0.0
Mining	0.0	0.1	0.0	0.0	0.0	0.1	0.0
Manufacturing	1.5	3.2	8.4	3.1	0.3	3.0	3.4
Electricity	0.1	0.1	0.5	0.1	0.1	0.6	1.0
Construction	1.0	1.1	1.1	1.0	0.7	1.0	1.1
Wholesale trade	0.7	1.0	1.7	1.0	0.2	0.7	2.5
Retail trade	1.0	1.3	1.3	0.9	0.3	0.8	1.3
Accommodation	0.2	0.2	0.3	0.2	0.1	0.1	0.6
Transport	0.2	0.4	7.0	0.3	0.1	0.3	0.5
Communication	0.1	0.3	0.3	0.1	0.0	0.1	0.6
Finance	0.5	0.5	0.3	0.3	0.2	0.2	1.7
Business services	2.2	2.3	2.0	2.5	1.1	1.4	4.4
Government admin	0.6	0.3	0.5	0.3	0.0	0.1	0.3
Education	0.9	1.5	1.0	0.7	0.5	0.9	0.8
Health	2.2	1.0	0.6	1.0	0.3	0.7	3.0
Recreational	0.1	0.2	0.2	0.1	0.1	0.1	0.6
Personal services	0.3	0.3	0.4	0.3	0.1	0.2	0.5
Total gross regional product	11.4	13.9	25.7	12.1	4.2	10.5	22.2

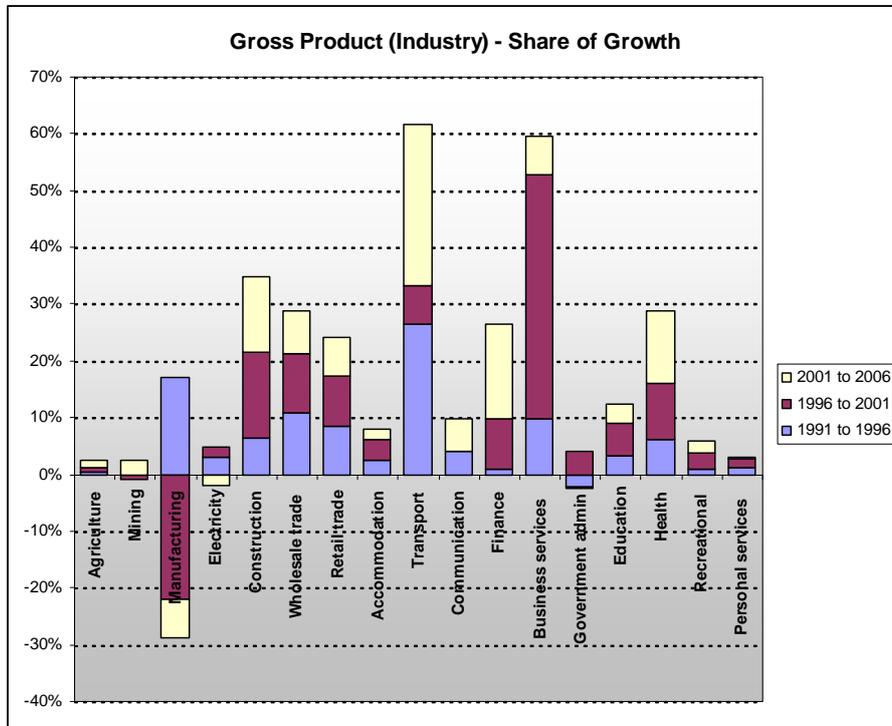
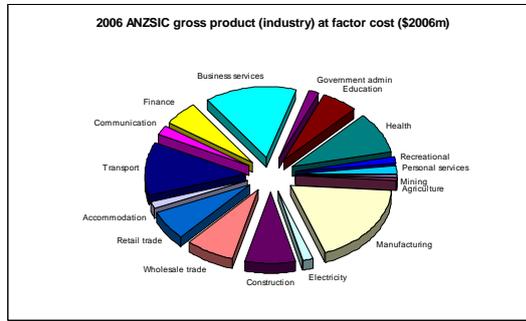
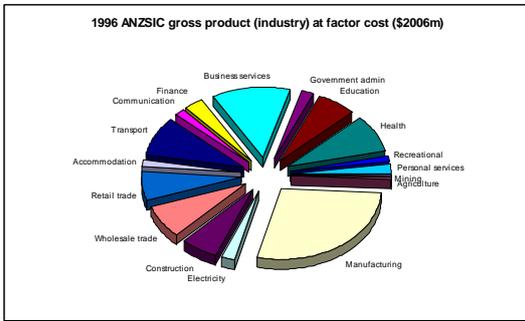
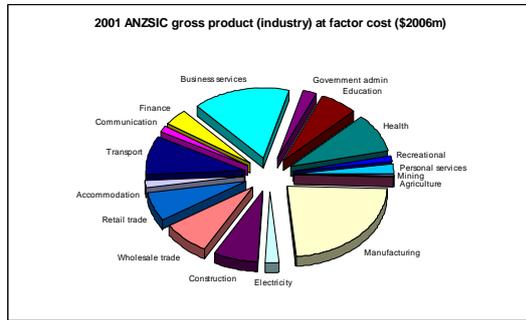
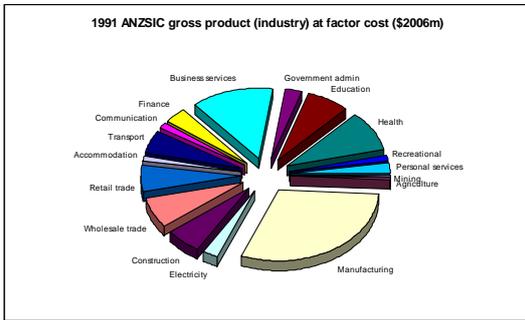
Table A2.4 One digit ANZSIC gross productivity (industry) at factor cost (\$2006m): share of Melbourne's North total GRP (per cent) (continued)

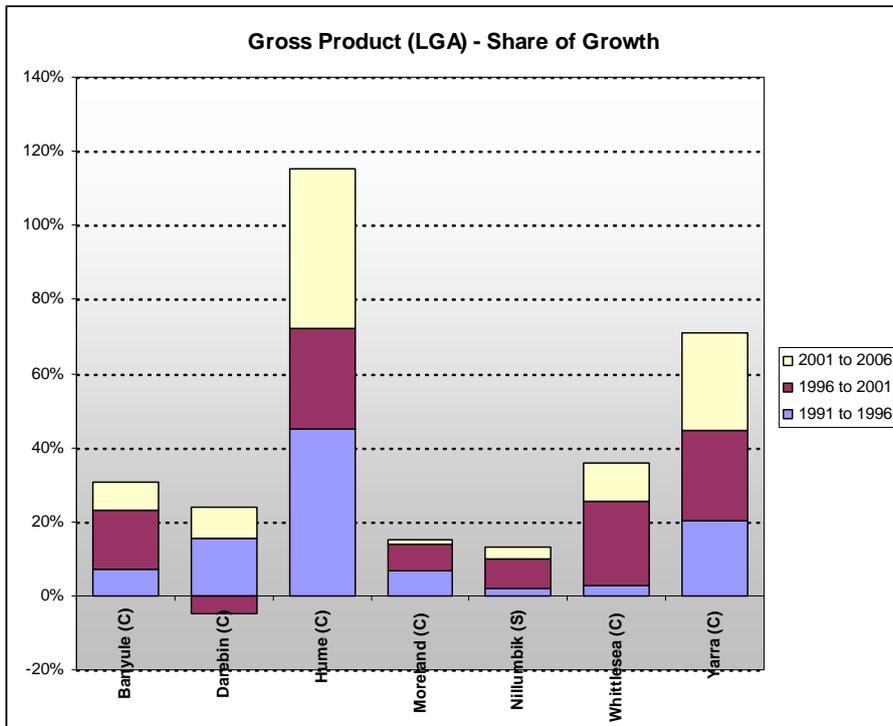
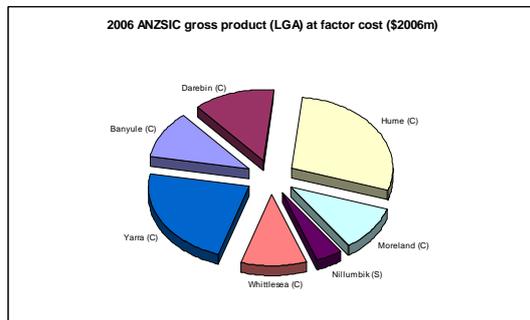
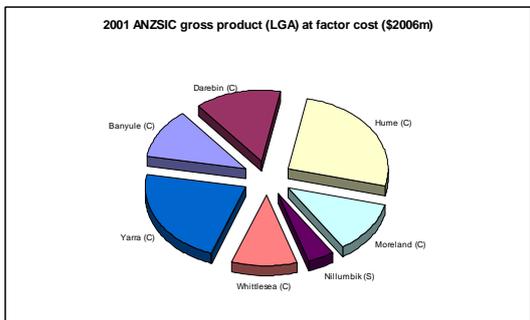
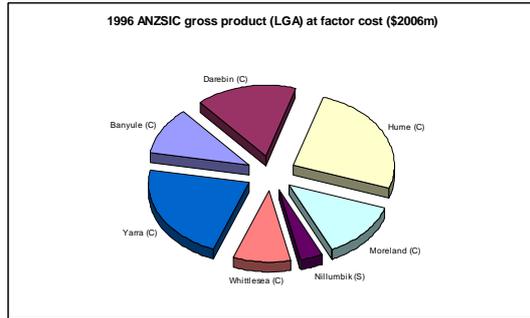
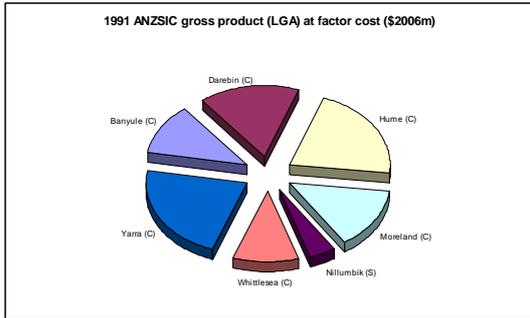
	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nilfumbik (S)	Whittlesea (C)	Yarra (C)
2006							
Agriculture	0.0	0.0	0.1	0.0	0.1	0.3	0.0
Mining	0.0	0.1	0.0	0.3	0.0	0.2	0.0
Manufacturing	1.3	2.5	7.5	1.9	0.2	2.3	2.5
Electricity	0.0	0.1	0.3	0.0	0.1	0.6	0.7
Construction	1.1	1.1	1.6	1.0	0.8	1.2	1.2
Wholesale trade	0.6	1.1	2.0	0.9	0.2	0.9	2.1
Retail trade	0.9	1.2	1.3	1.0	0.3	0.8	1.3
Accommodation	0.2	0.2	0.3	0.2	0.1	0.1	0.6
Transport	0.1	0.4	10.2	0.4	0.1	0.3	0.4
Communication	0.1	0.4	0.5	0.0	0.0	0.1	1.1
Finance	0.6	0.5	0.4	0.4	0.2	0.2	3.5
Business services	1.8	2.2	1.8	2.0	1.1	1.3	4.3
Government admin	0.3	0.2	0.5	0.3	0.0	0.1	0.2
Education	0.8	1.5	1.0	0.7	0.4	0.8	0.7
Health	2.6	0.9	0.6	0.9	0.3	0.9	3.1
Recreational	0.1	0.2	0.1	0.1	0.1	0.1	0.7
Personal services	0.3	0.3	0.3	0.3	0.1	0.2	0.5
Total gross regional product	10.8	13.0	28.4	10.4	4.0	10.5	22.8

Appendix 3 | Gross regional product by industry sector and LGA

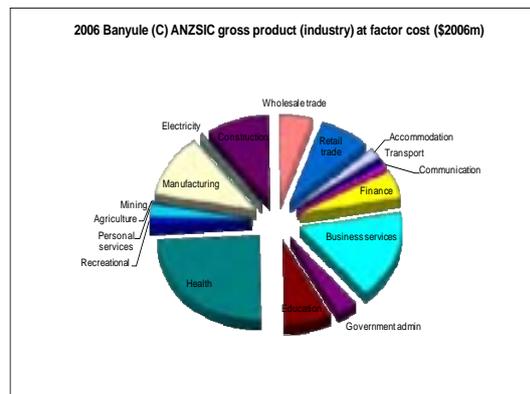
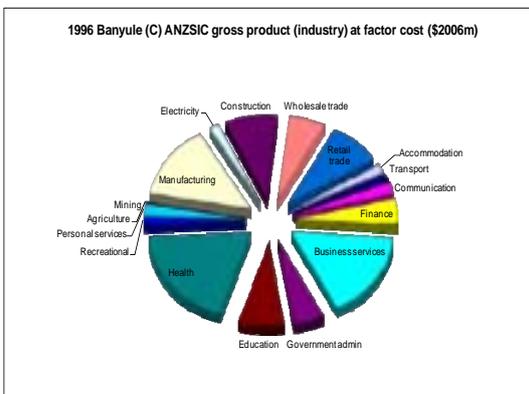
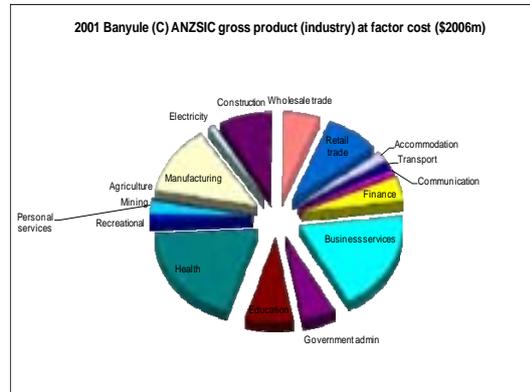
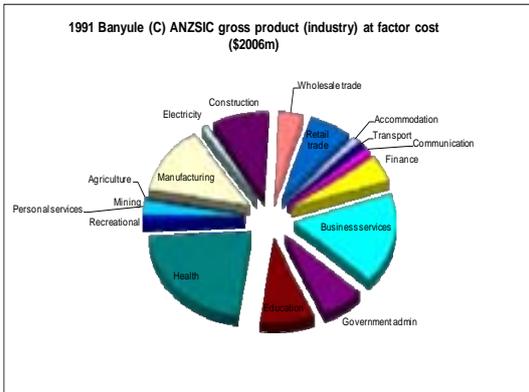
Appendix 3 contains a graphical analysis of Gross Regional Product (GRP) by industry sector and LGA for Melbourne's North for the years 1991, 1996, 2001 and 2006. Shares of internal GRP growth or decline are also shown by industry sector and LGA.

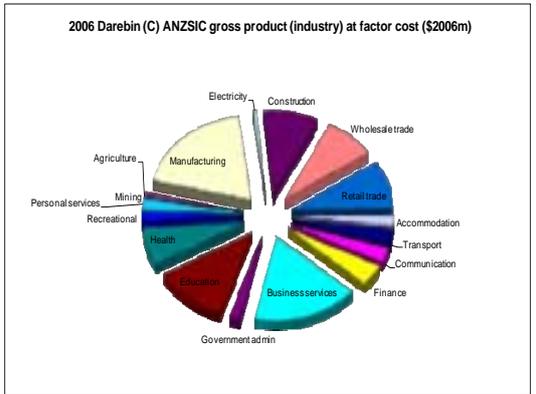
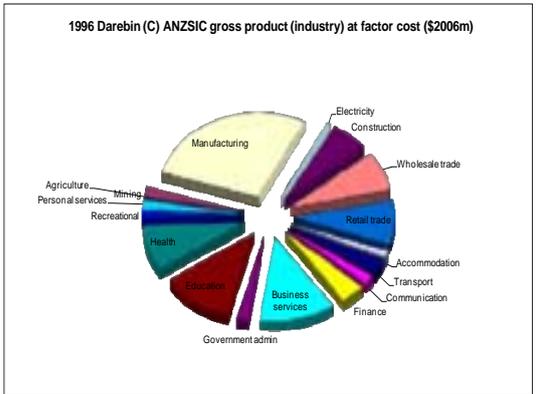
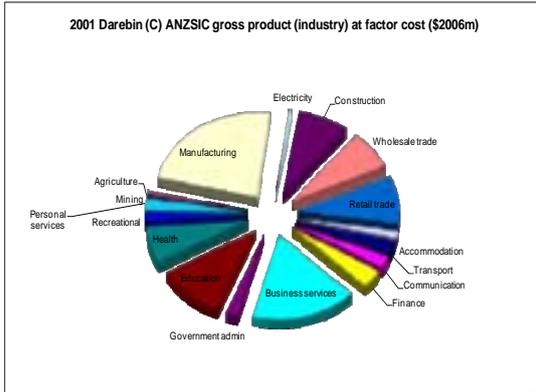
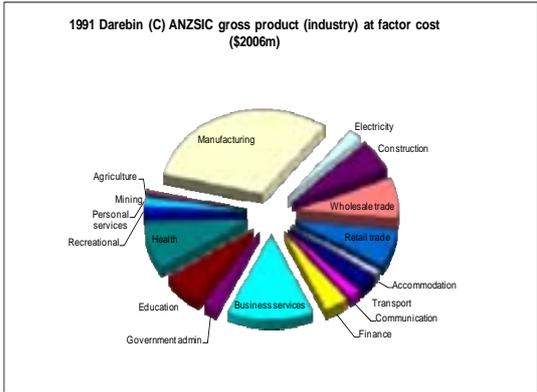
A3.1 GRP by industry and LGA

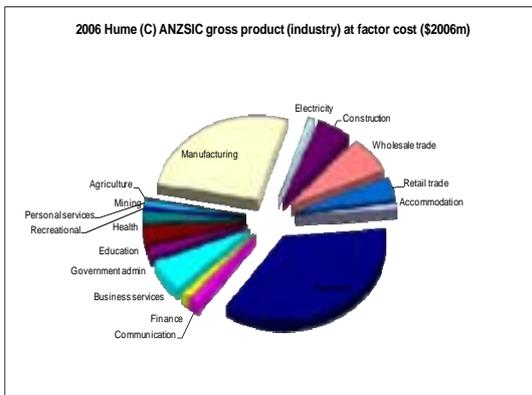
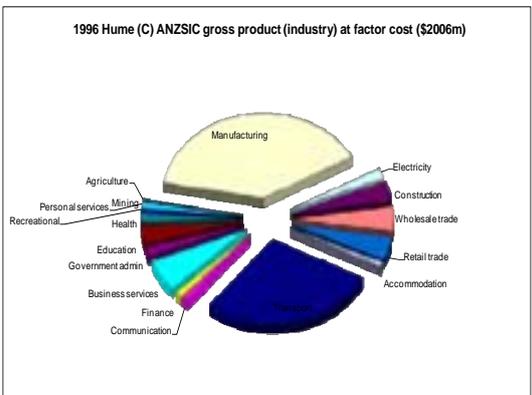
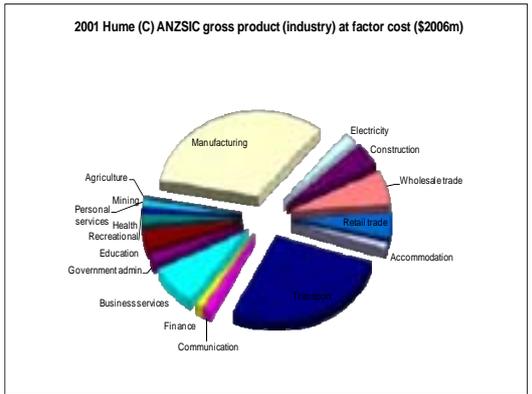
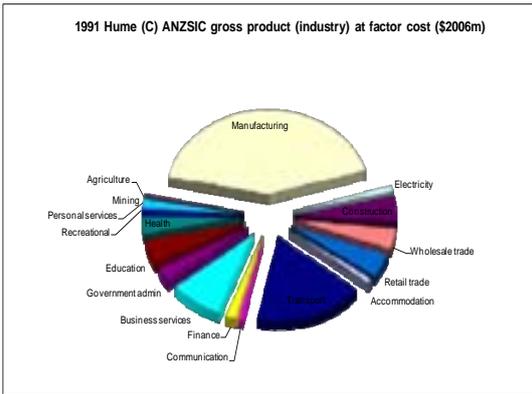


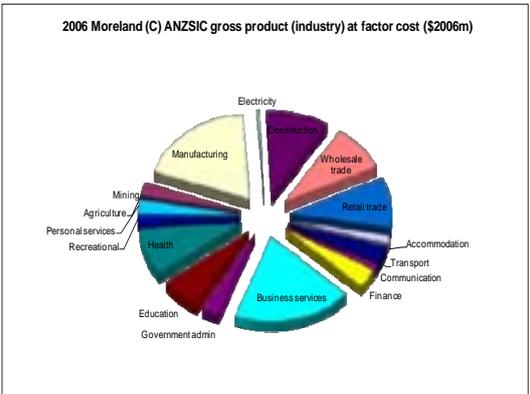
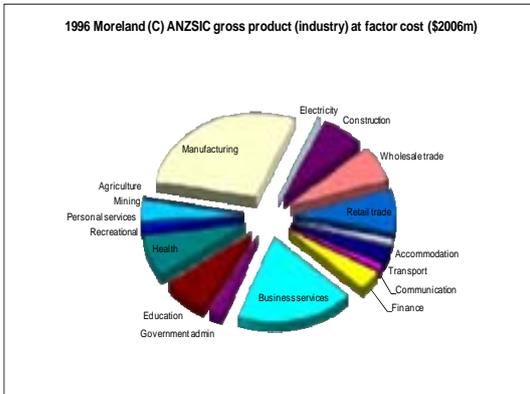
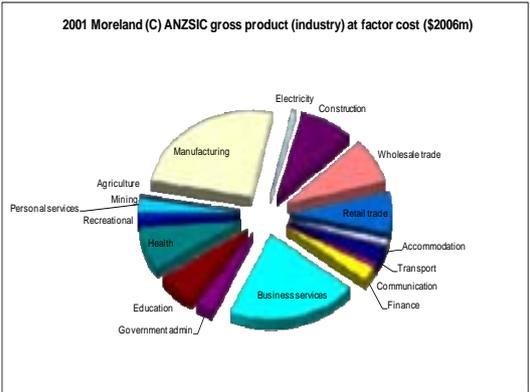
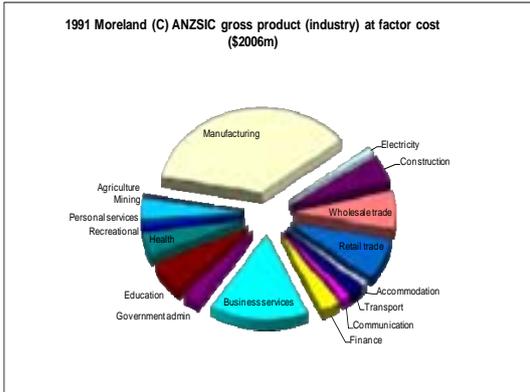


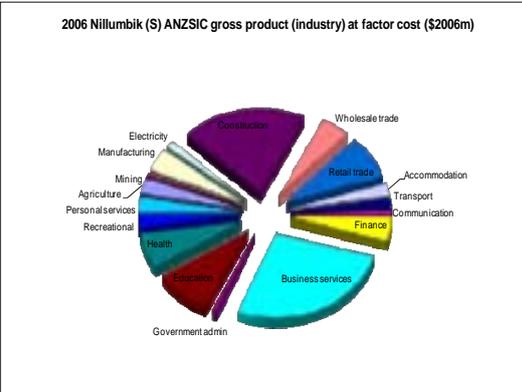
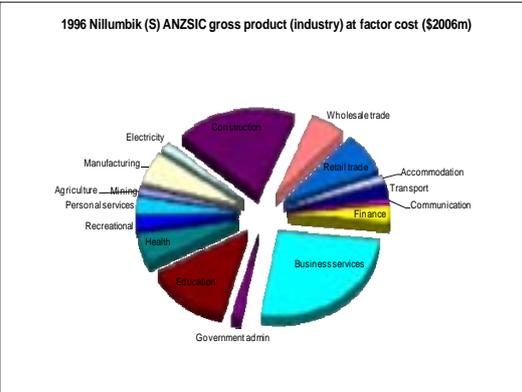
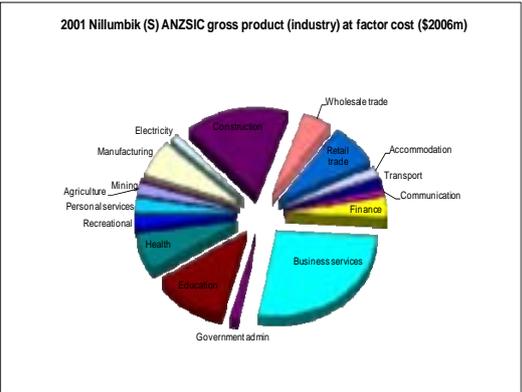
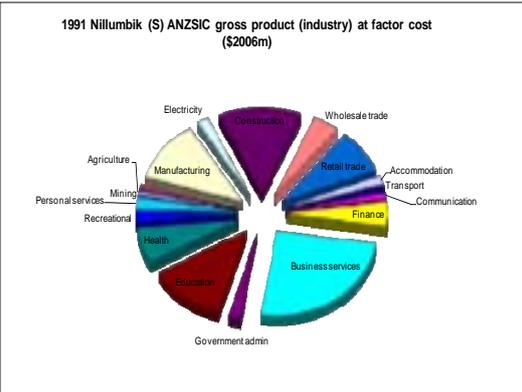
A3.1 GRP by LGA in time series

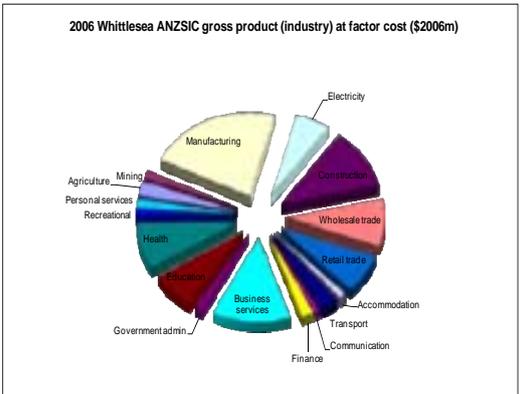
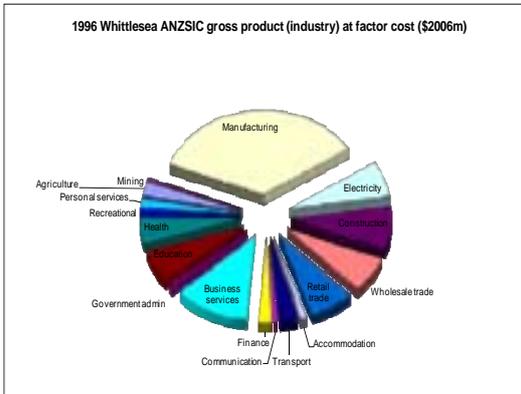
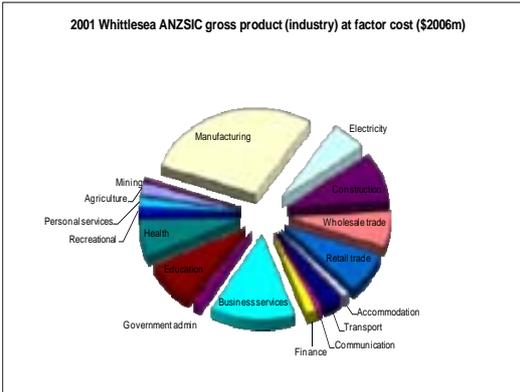
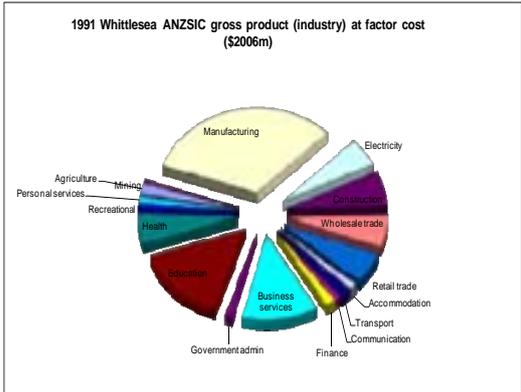




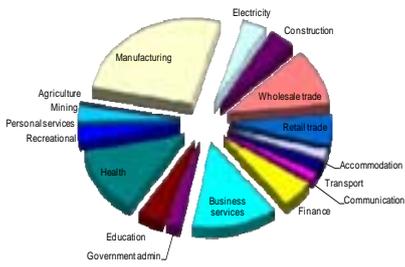




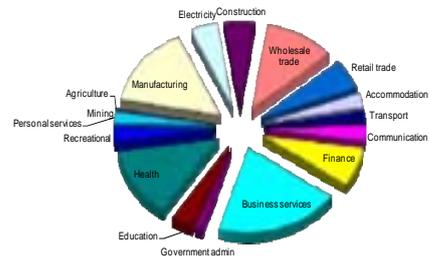




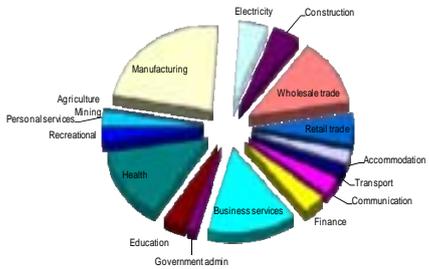
1991 Yarra (C) ANZSIC gross product (industry) at factor cost (\$2006m)



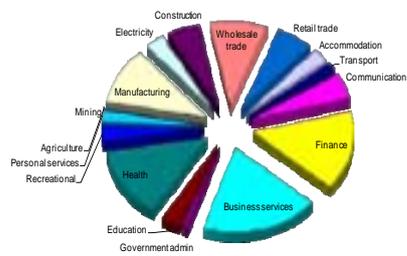
2001 Yarra (C) ANZSIC gross product (industry) at factor cost (\$2006m)



1996 Yarra (C) ANZSIC gross product (industry) at factor cost (\$2006m)

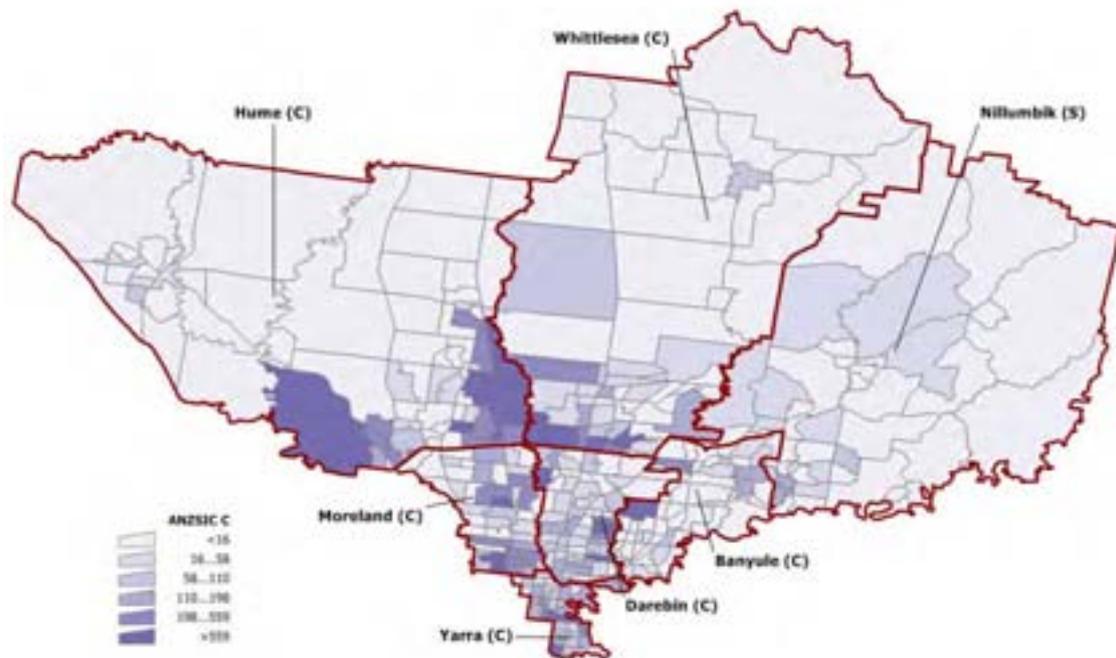


2006 Yarra (C) ANZSIC gross product (industry) at factor cost (\$2006m)

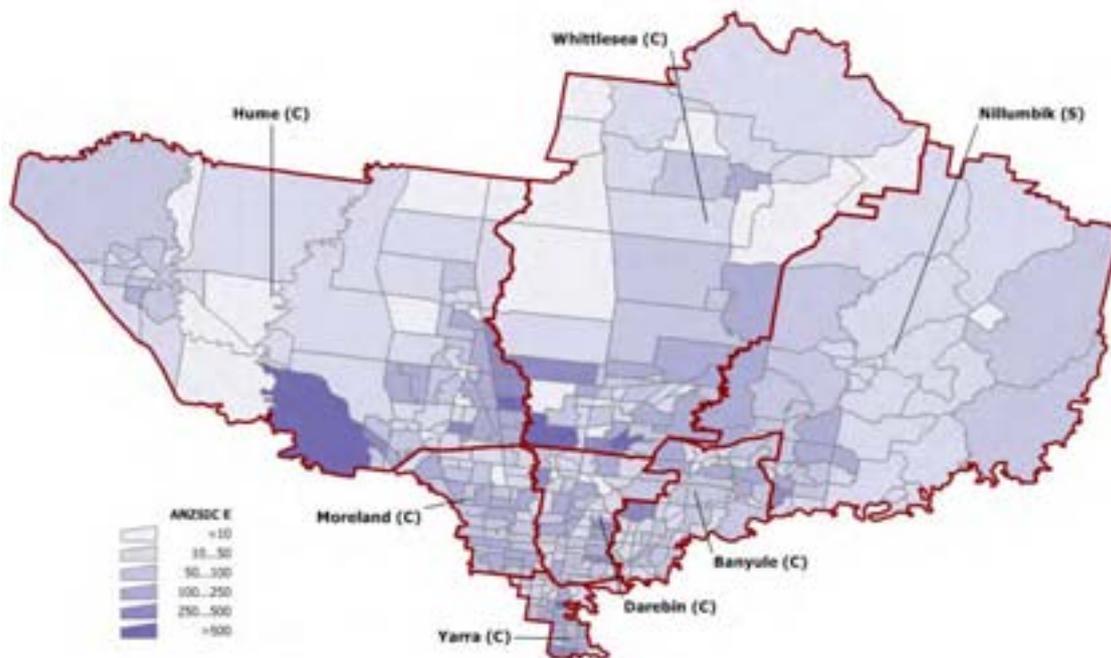


Appendix 4 | Employment distribution by travel zone: selected industry sectors

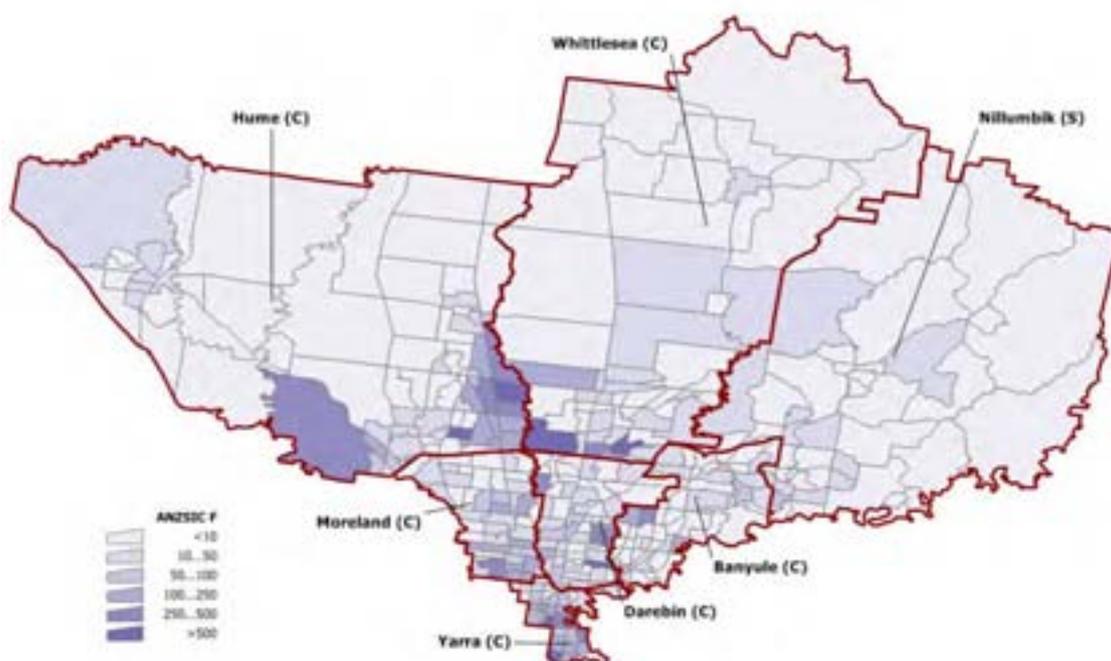
Map A4.1: Manufacturing



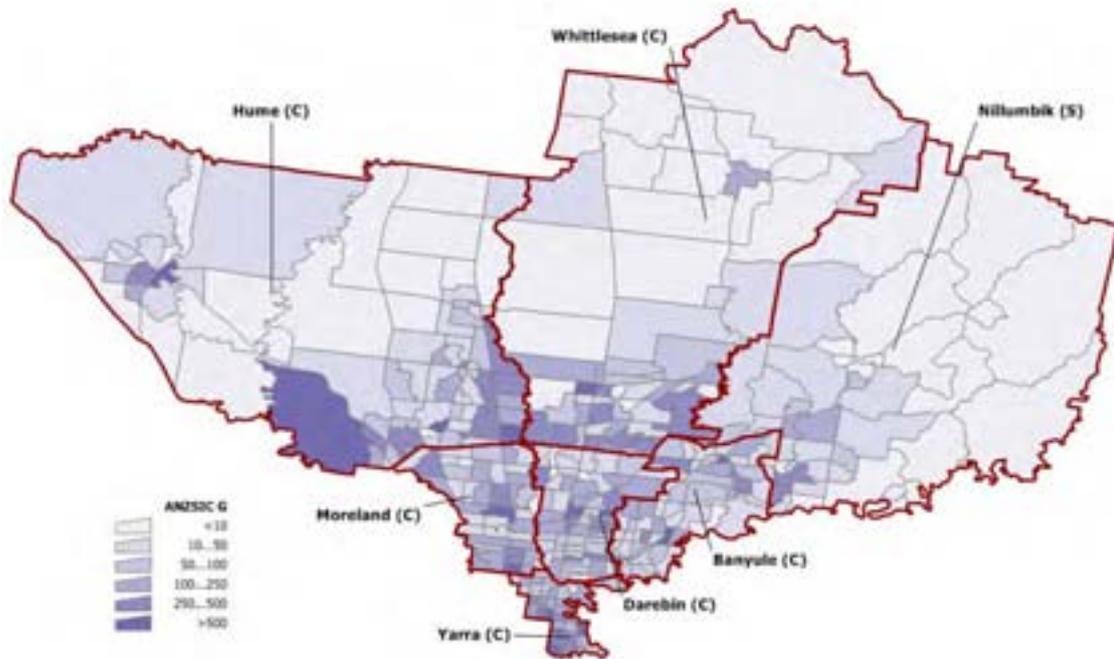
Map A4.2: Construction



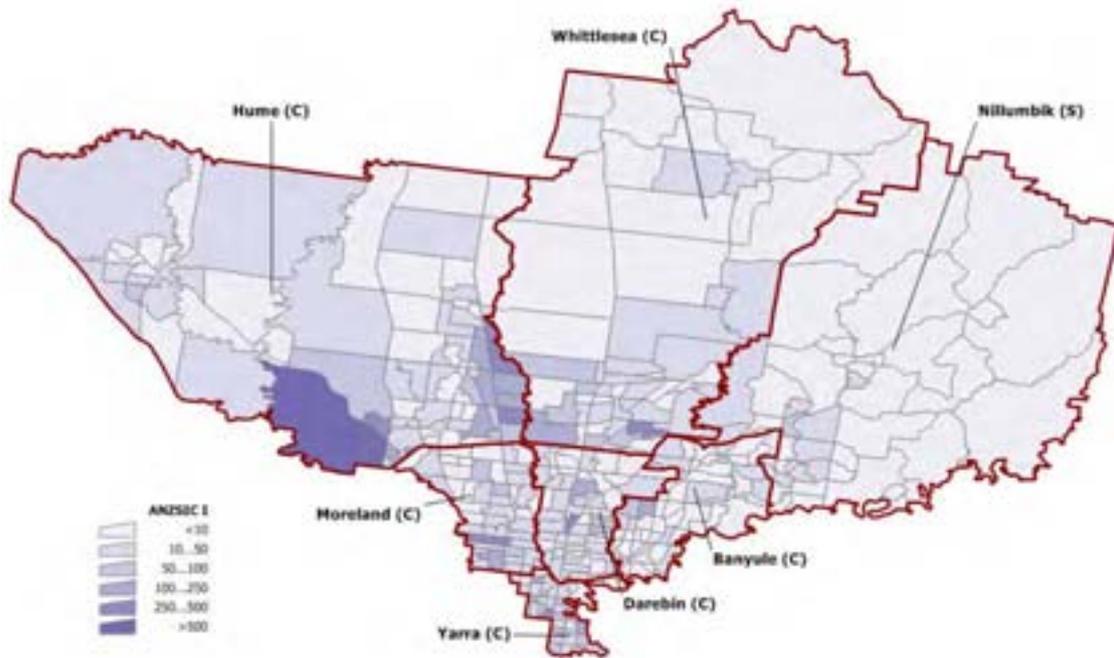
Map A4.3: Wholesale trade



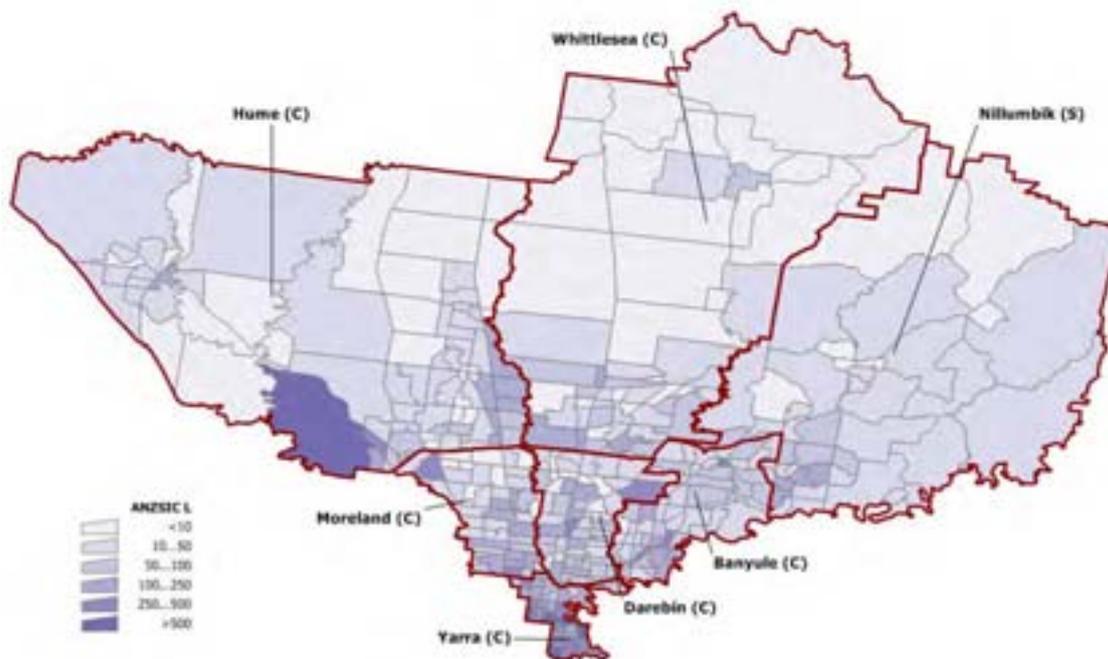
Map A4.4: Retail trade



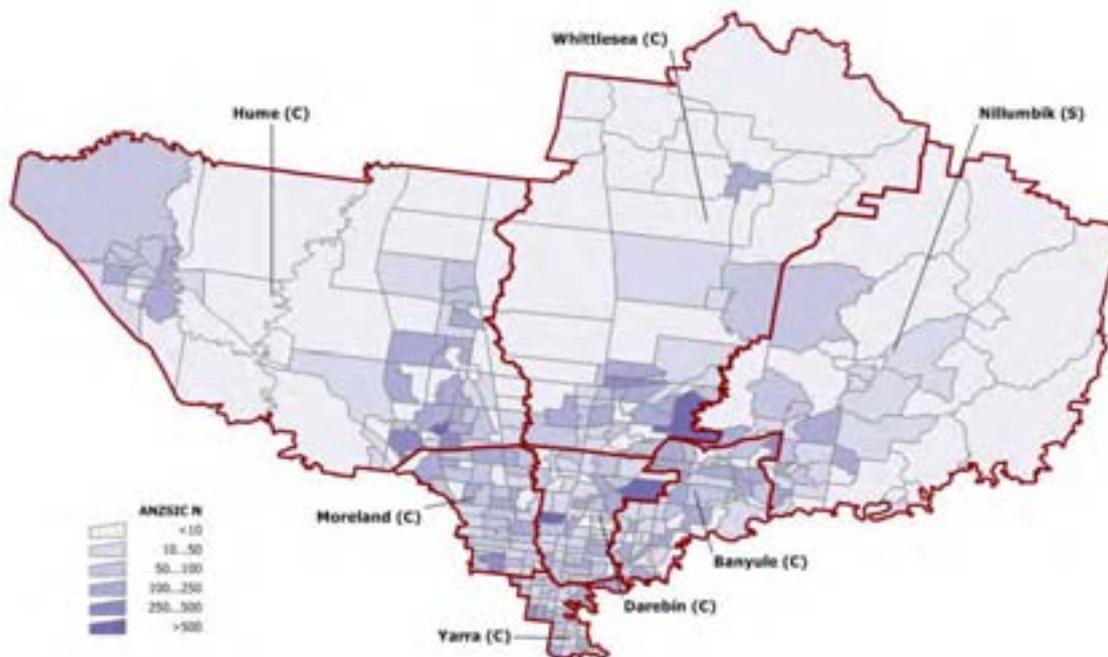
Map A4.5: Transport and storage



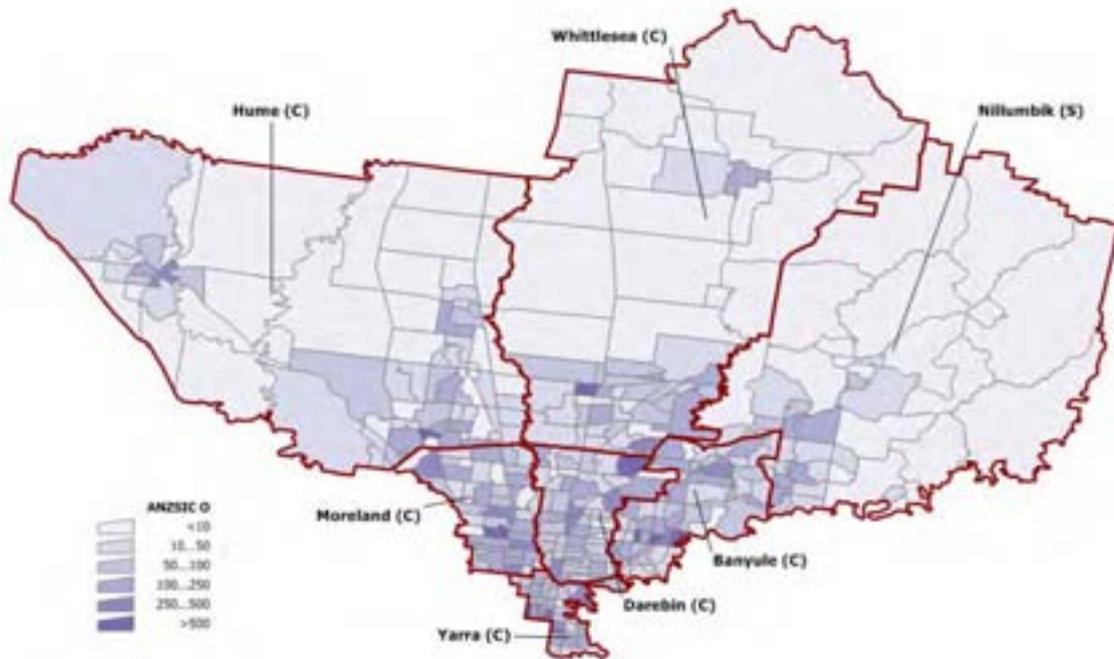
Map A4.6: Property and business services



Map A4.7: Education



Map A4.8: Health and community services



Appendix 5 | Benchmarking performance: a data envelope analysis approach

Appendix 5 gives a detailed description of the data envelope analysis (DEA) for this study. Statistical analysis of the type given in Chapters 2 and 3 in the main report allows for the performance of the region to be placed in context. However, it does not offer clear guidelines for determining the appropriate policies, actions and stakeholder activity for improving performance. This analysis requires the application of DEA techniques.

Appendix 5 develops the framework (see Chapter 4 in main report for summary of findings) that allows the application of DEA techniques which, in turn, allows the determination of:

- the degree of underperformance, if any, of Melbourne's North LGAs relative to their appropriate peers (or LGAs with best performance given their circumstances)
- the current under-utilisation of the drivers of economic performance in Melbourne's North LGAs.

The analysis concludes with the effects of increasing the input of growth drivers to improve economic performance.

A5.1 Terminology clarification

It would be useful to clarify the meaning of terminology that will be used.

Local area:	Local area refers to local government area (LGA) in general, or to a specific LGA.
Region:	Region refers to a group of LGAs that either jurisdictionally or economically form an integrated area. Melbourne's North is a region, at least from the perspective of quasi-jurisdictional.
Catchment:	For the purposes of this study a catchment, from the perspective of a given LGA, is formed by a 50 km radius around the LGA with the strength of any activity within the catchment (e.g. employment, industry output, etc) impacting on the LGA declining as the distance from the LGA increases. The weights to capture this decay effect are given in Figure A5.1.
Resident employment:	The number of residents employed within an LGA, catchment, region, etc.
Industry employment:	The number of employment positions offered by employers within an LGA, catchment, region, etc.
Resident employment ratio:	Resident employment divided by working age population (those aged 15 to 64) for an LGA, catchment or region.
Industry employment ratio:	Industry employment divided by working age population for an LGA catchment or region.
Household productivity:	Total income from work (wages, salaries, unincorporated enterprise income) divided by the number of employed receiving that income for an LGA, catchment, region.

Industry productivity:	Total value added (gross product) generated by industry for an LGA, catchment or region divided by the number of employed in industry employment.
Performance indicators:	Indicators used by LGA, catchment or regional stakeholders to evaluate the performance of the LGA, catchment or region, or the consequences of policy changes.
High skilled industry employment:	Industry employment in Australian Bureau of Statistics' ASCO 1-digit categories one to three.
Intermediate skilled industry employment:	Industry employment in Australian Bureau of Statistics' ASCO 1-digit categories of four to six.
University qualified residents:	Residents with a Bachelor degree or higher.
Technically qualified residents:	Residents with TAFE Certificate III to Advanced Diploma.
Skilled residents:	The total of university and technically qualified residents.
Global knowledge industry employment:	Industry employment in ASCO 4-digit occupations deemed global knowledge occupations, which are occupations monitoring, applying or acting on knowledge flows from outside the region. The 4-digit ASCO occupations deemed global knowledge occupations are given in Table A5.1.

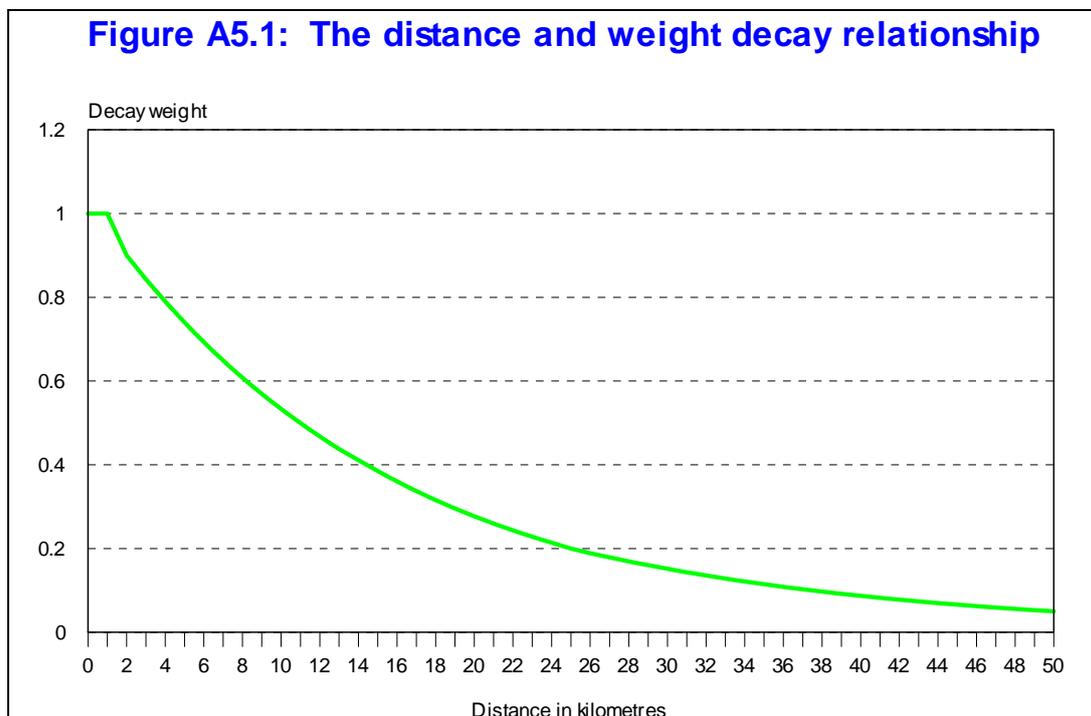


Table A5.1 Global knowledge occupations: ASCO unit groups

Importers, exporters & wholesalers	Computing professionals
Resource managers nfd*	Miscellaneous business & inform. professionals nfd
Finance managers	Human resource professionals
Information technology managers	Librarians
Sales & marketing managers	Mathematicians, stat'ns & actuaries
Policy & planning managers	Business & organisation analysts
Media products & artistic directors	Property professionals
Professionals nfd	Other business & information professionals
Science, building & engineering professionals nfd	Legal professionals
Natural & physical science professionals nfd	Economists
Chemists	Designers & illustrators
Geologists & geophysicists	Journalists & related professionals
Life scientists	Authors & related professionals
Medical scientists	Film, TV, radio & stage directors
Other natural & physical science professionals	Media presenters
Building & engineering professionals nfd	Scientists, engin. & related assoc. professionals nfd
Electrical & electronics engineers	Medical & science tech offs nfd
Business & information professionals nfd	Medical technical officers
Accountants, auditors & corporate treasurers nfd	Science technical officers
Accountants	Financial dealers & brokers
Auditors	Financial investment advisers
Corporate treasurers	Project & program administrators
Sales, marketing & advertising professionals nfd	Computing support technicians
Marketing & advertising professionals	Library technicians
Technical sales representatives	

*nfd = not fully defined.

A5.2 Selection of performance indicators

The selection of performance indicators will depend on the interests and stakeholder status of the evaluator. Business stakeholders would focus on the ability of an LGA, catchment or region to supply suitably qualified candidates for employment, the quality of transport infrastructure, etc. Community focused stakeholders would focus on the size of the commodity market of interest, for example, the number of unemployed for welfare services, school age population for educators, the number of people retired for health professionals, etc, and the resources needed to effectively service the market.

For many residents and their electoral representatives the indicators of relevance, from the economic perspectives, are the ability to obtain employment and the income associated with that employment. So performance indicators that will be used to benchmark Melbourne's North LGAs will be:

- the resident employment ratio
- household productivity.

The household productivity is the business productivity indicator from the household perspective discussed in Chapter 2 of the main report.

A5.3 The drivers of the performance indicators

Performance benchmarking and economic development requirements need a framework that nominates the determinants of selected performance indicators. Unless the determinants are nominated and their impact quantified, in terms of the efficiency they are used by in an LGA, or their role quantified in improving the outcomes of the performance indicators if the resources available for each determinant are increased, then the analysis cannot extend much beyond what has been achieved in Chapters 2 and 3.

Determinants are also variously called (in studies) inputs, resources, factors and drivers. In this study they will be designated the (perhaps more descriptive) drivers of performance.

The drivers of performance can be divided into two types:

- proximate or direct
- secondary.

The nominated proximate drivers of the performance indicators for an LGA, etc for this study are:

- industry employment within 50 km (decayed) catchment per capita of working age population (local) catchment
- LGA industry employment per capita of working age employment
- reciprocal of distance from CBD
- high skilled industry employment within 50 km (decayed) catchment per capita of working age population
- intermediate skilled industry employment within 50 km (decayed) catchment per capita of catchment working age population
- university trained local residents per capita of working age population
- global knowledge industry employment within 50 km catchment (decayed) per capita of working age population
- catchment industry productivity (decayed) catchment
- skilled residents (university and technical) within a 50 km (decayed) catchment per capita of working age population.

Most of the proximate drivers are self-explanatory. For a given LGA, the more employment in a labour market catchment, the greater would be the expectation that the local employment ratio would be higher. That is, higher than other LGAs with less industry employment within a labour market catchment. Similarly, the higher the LGA industry employment ratio, the higher would be expected to be the LGA resident employment ratio.

The closer to a CBD, the higher would expect to be both the resident employment ratio and resident productivity. This is because the closer an LGA is to a CBD the better, *prima facie*, access the residents have to employment in each state's major employment node and because the CBD has the highest paying employment positions. That is, enterprises with the highest productivity in the state, at least for entertainment, community services and business services industries.

The higher the high skilled employment available within a labour market catchment, the higher would, at the very least, be household productivity. However, if there was also a strong positive link between the resident employment ratio and the high skilled employment available within a 50 km catchment, this would suggest that the availability of high skilled employment had the effect of extending the effective labour market catchment. That is, for a low skilled employment position, employers would tend to look locally for candidates. However, for high skilled employment, employers are forced to extend the recruitment scope over a considerably wider catchment. This is because high skilled employment often requires specialty skills and expertise that can have limited availability, even within a metropolitan region let alone a local area.

The same comment applies to the intermediate skill employment availability driver as to the high skilled employment availability driver, though with a little less intensity in terms of the strength of the linkages.

The higher the share of LGA working age residents who have university qualifications, the higher would be, at the very least, the resident business productivity and probably the higher the employment ratio if, for no other reason than that employers would, in general, favour a higher educated candidate over a lower educated candidate.

The same comments apply to intermediate skilled residents.

Non-resource based exporting of goods and services out of the state requires relatively high concentrations of global knowledge workers. Exporting, particularly exporting out of the country, is associated with high levels of labour productivity. So high concentrations of global knowledge workers in the LGA catchment would be expected to complement industry labour productivity as a driver of resident business productivity.

That is, the higher the number of global knowledge workers in a given 50 km catchment, the more likely, relative to industry productivity, that residents in the catchment will capture more of the benefits of productivity. The greater the knowledge intensity of industry, the less the capital intensity and the greater the distribution of the value added to workers. The less the knowledge intensity, the greater the capital intensity and the greater the share of value added that will accrue to equity holders residing outside the catchment.

The role of the industry labour productivity variable is self-explanatory. The higher the level of labour productivity, the more likely will be the higher the level of average earnings per employed person and so the higher household productivity.

Finally, the skilled resident workforce within a 50 km (decay) catchment could be expected to have a negative impact on the local output indicators. However, as will be seen below, statistically it has an unambiguous positive impact. That is, the expected negative impact, in the sense that the greater the concentration of resident skills for a given LGA catchment, then the less likely local residents would secure high paying employment, is not validated.

The positive statistical relationship suggests a cluster effect. The greater the concentrations of skills in a catchment, the more likely industry within the catchment will be of the type to employ the skills available within the catchment. That is, the diversity of skills influence the type of industry located in the catchment area, so the more likely, overall, residents will be employed.

Therefore the density of skills in a catchment will be considered a possible driver of the performance indicators.

A5.4 Driver efficiency improvement versus driver augmentation

In this Appendix, a clear distinction is made between driver efficiency improvement and driver augmentation. Driver efficiency improvement occurs when, because of changes stemming from policy, investment or stakeholder action, the performance indicators improve without any increase in the input of the drivers. On the other hand, economic development occurs when drivers are augmented (that is, increased) with subsequent increases in the value of the performance indicators.

In Table A5.2, for the 10 proximate drivers nominated for this study, possible reasons for driver inefficiencies are listed along with corrective remedies. Policies for economic development (that is, driver augmentation) are also listed for comparison. It is clear from the table why segmenting the policy issue into driver efficiency and augmentation is important. This is because, unless the reasons for any driver inefficiencies are corrected before driver augmentation policies are introduced, the augmentation policies are unlikely to be effective. That is, they will tend to increase existing inefficiencies. In other words, efficiency comes first.

A5.5 Proximate drivers versus secondary drivers

Following on from Table A5.2, secondary drivers influence the efficiency of proximate drivers. In this context, examples of secondary drivers would include:

- travel times within a catchment
- university and technical qualifications by skill type
- age segmentation and experience of workforce
- English speaking skills
- ethnic diversity and length of time in Australia
- travel times to CBD
- segmentation of industry structures, etc.

It is possible, of course, to enhance the analysis to incorporate secondary drivers. However, it is an extensive data task and in any case is outside the scope of this study. The methodology of this study is segmented between a macro statistical approach complemented by stakeholder assessment of the potential for improvement, which would include, in part, assessment of the secondary drivers.

Table A5.2 Key issues for economic policy development

Drivers	Key issues	Actions	Policies
Employment within 50 km of catchment	<p>Inefficient/ineffective transport links. Poor household capacity for mobility. Examples include:</p> <ul style="list-style-type: none"> ▪ sparse road, rail, tram and bus links within a catchment and especially to major employment nodes ▪ low car ownership due to low economic status ▪ mindset geographical orientation based on historical outcomes but now not where the employment is. 	Investment in transport infrastructure. Bus links to low socio-economic sub-regions.	<p>Development of strategic employment nodes:</p> <ul style="list-style-type: none"> ▪ attraction of investment and strategic foreign investment ▪ strengthening of R&D capacity and links with industry ▪ State Government selection of regional employment nodes with necessary infrastructure support ▪ cluster development.
Local area industry employment	Imbalance between skills demanded by local industry and resident skills.	Attract industry with skill requirements in line with local residents and/or retain local workforce.	Land use planning to increase industry employment. Exploit complementary potential with industry developments in 50 km catchment.
Distance from CBD	Inferior transport links to CBD. Poor industry links and networks with CBD enterprises. Skills imbalance with CBD enterprises.	Investment in transport infrastructure. Encourage exporting by local enterprises. Improve local resident education and skill attainment to exploit CBD employment opportunities.	Attract exporting enterprises that will exploit CBD resources.
High skill employment within a catchment	Same for CBD issues for the LGA in relation to its catchment.	Solutions for CBD linkages.	Attract and create high skill residents.
Intermediate skill employment within a 50 km catchment	Same as for high skill employment within a 50 km catchment.	Policy solution same as for high skill employment.	Attract and create intermediate skilled residents.
University qualified residents	Either transport links and/or skills imbalance within university qualification demand and supply.	Improve transport linkages and skills by extending lifetime learning opportunities and skills upgrading university courses.	Increase the concentration of university qualified residents by increasing the education attainment of existing residents and attract university qualified residents by immigration to the local area.

Table A5.2 Key issues for economic policy development (continued)

Drivers	Key issues	Actions	Policies
Technical skilled residents	Same as for university qualified residents.	Same as for university qualified residents.	Same as for university qualified residents.
Concentration of global knowledge residents within a catchment	Poor linkages between local enterprises and catchment enterprises.	Improve local enterprise connections and integration with catchment supply chains.	Attract export oriented (outside LGA) enterprises to LGA.
Industry productivity within a catchment	Strategic drivers of regional productivity form supply chains oriented outside the catchment or are highly capital intensive with low value added ratios accruing to catchment residents.	Improve knowledge intensity of catchment production and improve local access to supply chains of strategic (i.e. exporting) enterprises within catchment.	Attract exporting enterprises with good local catchment supply chain linkages and increase knowledge intensity of local production.
Catchment concentration of skills	Catchment industry making inefficient use of catchment skills.	Encourage catchment industry to upgrade skill base.	As per university and technical qualified residents.

A5.6 DEA analysis: an overview

DEA analysis is a performance measurement technique used for evaluating the relative efficiency of decision making units (DMU) which, in the case of this study, is LGAs.

The mathematics of DEA can be explained in terms of the inputs (drivers) and outputs (performance indicators) adopted for this study.

The efficiency of LGA i can be expressed as:

$$\sum_i = \frac{\sum_{j=1}^2 p_{ij} w_j}{\sum_{j=1}^{10} d_{ij} v_j} \quad (\text{A5.1})$$

where p_{ij} represents either the household productivity or the local area resident employment ratio. That is, the two performance indicators adopted for this study. Correspondingly, the d_{ij} represents the 10 drivers adopted for this study. The core problem of a DEA analysis is to estimate the weights w_j, v_j so as to enable the efficiency indices, equation (A5.1), to be calculated.

This is done in the following manner. A separate linear programming problem is solved for each LGA where the objective function is the maximisation of:

$$\sum_{j=1}^2 p_{ij} w_j \quad (\text{A5.2})$$

subject to a number of constraints. One set of constraints is that the LGA under investigation cannot select weights that would cause the efficiency of any LGA (including the LGA under investigation) to be greater than 100 per cent. That is, equation (A5.2) is maximised subject to the constraint that:

$$\sum_{j=1}^2 p_{m,j} w_j \leq \sum_{j=1}^{10} d_{m,j} v_j \quad (\text{A5.3})$$

$m = 1, \dots, n$

where n is the number of LGAs that, as will be seen below, for this study are set at 108.

Also, it is required that the sum of weighted inputs for each LGA equal 1, or:

$$\sum_{j=1}^{10} v_{m,j} = 1 \quad (\text{A5.4})$$

$m = 1, \dots, n$

It is also required that:

$$v_{m,j} \geq 0, \quad w_{m,j} \geq 0$$

Efficient LGAs have an efficiency score of 100 per cent.

It should be noted that in specifying the inputs or drivers in the case of this study, more is better. This is why one of the drivers, the reciprocal of the distance from the CBD, is expressed as it is. This is the case the 'more' or closer an LGA is to a CBD, the better its performance indicators would be. The closer the LGA, the greater the reciprocal will be.

If an LGA is found to be inefficient, then DEA can be used to estimate the improvement in the performance indicators, if it was operating at maximum efficiency with driver inputs left unchanged.

This will be done with one output (the unemployment rate) and two drivers, namely:

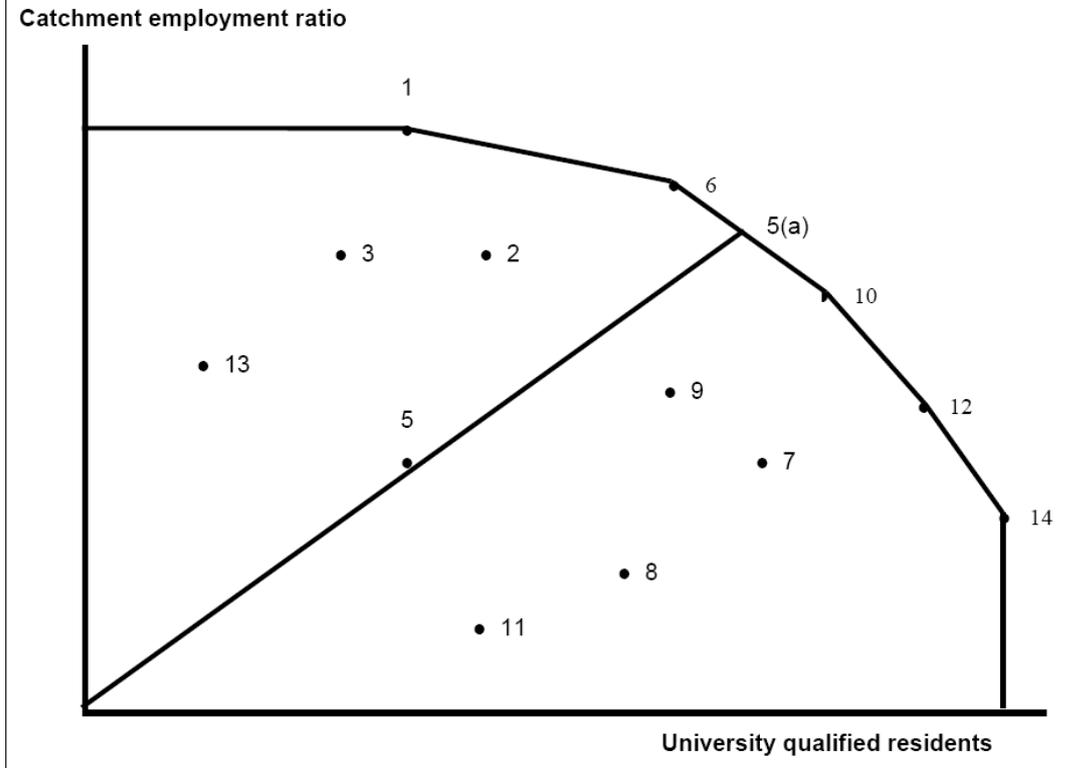
- catchment industry employment
- university qualified residents.

This allows the process to be demonstrated graphically as in Figure A5.2. For 14 LGAs, each LGA is evaluated in turn using the methodology outlined above and it is found that, in terms of the resident employment ratio, LGA 1, 6, 10, 12 and 14 are efficient with the LGA defining the efficiency frontier of the figure and the other LGAs are found to be inefficient. LGA 5 was found particularly inefficient, with an efficiency score of less than 50. This is because point 5 is closer to the origin than the efficiency frontier. The efficiency frontier is described by the actual driver values of the efficiency LGAs. DEA analysis can then be used to measure the improvement in the employment ratio if it used its drivers as efficient as a weighted combination of LGAs 6 and 10, which are the LGAs most like LGA 5 in terms of driver structure, but are also efficient. LGAs 6 and 10 are called the peers of LGA 5.

By improving its efficiency, in terms of a weighted average combination of driver efficiency exhibited by LGAs 6 and 10, an LGA can move to point 5(a) in the frontier without changing its driver inputs.

The analysis outlined above is for an 'output oriented' approach to benchmarking. The dual of this is the 'input oriented' approach, which takes performance indicators as fixed and calculates the reduction in driver inputs necessary to achieve maximum efficiency. Both approaches are adopted here, with the input oriented approach used to estimate the degree to which individual drivers are not being exploited for an inefficient LGA.

Figure A5.2: DEA – 14 LGAs, one performance indicator and two driver example



A5.7 The selection of the potential peer LGAs

From Table A5.3, the LGA selection was based on LGAs in and around Sydney, Melbourne and Brisbane, giving 108 in all. The LGAs of Sydney and Melbourne City are excluded because their inclusion would dominate peer selection with very few other LGAs selected as efficient peers. The Brisbane LGA is included because of its size. In any case, the CBD influence is captured by the distance from CBD driver.

Table A5.3 The selected potential peer LGAs

LGAs in and around Sydney	LGAs in and around Melbourne	LGAs in and around Brisbane
Ashfield (A)	Ballarat (C)	Beaudesert (S)
Auburn (A)	Banyule (C)	Boonah (S)
Bankstown (C)	Bass Coast (S)	Brisbane (C)
Bathurst (C)	Baw Baw (S)	Caboolture (S)
Baulkham Hills (A)	Bayside (C)	Caloundra (C)
Blacktown (C)	Boroondara (C)	Gold Coast (C)
Blue Mountains (C)	Brimbank (C)	Ipswich (C)
Botany Bay (C)	Cardinia (S)	Logan (C)
Burwood (A)	Casey (C)	Maroochy (S)
Camden (A)	Colac-Otway (S)	Noosa (S)
Campbelltown (C) NSW	Darebin (C)	Pine Rivers (S)
Canterbury (C)	Frankston (C)	Redcliffe (C)
Cessnock (C)	Glen Eira (C)	Redland (S)
Concord (A)	Greater Bendigo (C)	Toowoomba (C)
Drummoyne (A)	Greater Dandenong (C)	
Fairfield (C)	Greater Geelong (C)	
Gosford (C)	Hobsons Bay (C)	
Goulburn (C)	Hume (C)	
Hawkesbury (C)	Kingston (C)	
Holroyd (C)	Knox (C)	
Hornsby (A)	Macedon Ranges (S)	
Hunter's Hill (A)	Manningham (C)	
Hurstville (C)	Maribyrnong (C)	
Kiama (A)	Maroondah (C)	
Kogarah (A)	Melton (S)	
Ku-ring-gai (A)	Monash (C)	
Lake Macquarie (C)	Moonee Valley (C)	
Lane Cove (A)	Moreland (C)	
Leichhardt (A)	Mornington Peninsula (S)	
Liverpool (C)	Mount Alexander (S)	
Maitland (C)	Nillumbik (S)	
Manly (A)	Port Phillip (C)	
Marrickville (A)	Stonnington (C)	
Mosman (A)	Surf Coast (S)	
Newcastle (C)	Whitehorse (C)	
North Sydney (A)	Whittlesea (C)	
Parramatta (C)	Wyndham (C)	
Penrith (C)	Yarra (C)	
Pittwater (A)	Yarra Ranges (S)	

Table A5.3 The selected potential peer LGAs (continued)

LGAs in and around Sydney	LGAs in and around Melbourne	LGAs in and around Brisbane
Queanbeyan (C)		
Randwick (C)		
Rockdale (C)		
Ryde (C)		
Shellharbour (C)		
Singleton (A)		
Strathfield (A)		
Sutherland Shire (A)		
Warringah (A)		
Waverley (A)		
Willoughby (C)		
Wingecarribee (A)		
Wollondilly (A)		
Wollongong (C)		
Woollahra (A)		
Wyong (A)		

A5.8 Potential peer ranks by performance indicators and drivers

Before the formal modelling is attempted, it is useful to examine the ranking of LGAs within their potential peer group and the trends in the rankings for both performance indicators and drivers. This information is given in Table A5.4 to Table A5.7.

In terms of the performance indicators for household productivity, the top ranked 2006 LGA within Melbourne's North is Yarra, with an overall ranking of 23 among the 108 group of potential peers. In terms of the employment ratio, the top ranked LGA within Melbourne's North for 2006 is Nillumbik, with a ranking of 8. Since 1991, Nillumbik has managed to stay in the top 13 in terms of the local employment performance indicator. Darebin has stayed relatively constant over the period, ranked in the 70s or 80s for the household productivity indicator and in the 90s for the employment performance indicator.

Hume's rank for household productivity fell sharply between 1991 and 1996, with the rank falling from 45 to 84. Since then the rank has been around this level. For Hume, the employment rank has steadily fallen from 80 in 1991 to 102 in 2006. Moreland's ranking for the two performance indicators has stayed relatively constant between 1991 and 2006, with values in the 70s or 80s.

Banyule's employment ratio rankings have also remained relatively stable over the period, being close to 30. However, the household productivity ranking has oscillated between 25 and 50. The trend in Whittlesea's rankings has been downwards. The household productivity ranking has gone from 49 to 92 over the period, while in 2006 the employment ratio ranking was at its lowest rank at 97.

The only local area that can be definitely said to have improved its rankings is Yarra, with rankings for both performance indicators being 71 in 1991 to a ranking of 23 for the household productivity indicator in 2006 and 51 for the employment ratio.

The conclusion is that over the past one and a half decades, Melbourne's North started with low rankings and, if anything, the rankings on average have declined.

For a local area to be doing as well as could be expected, one would expect that the average rank of the performance indicators could be roughly similar to the rank of the drivers. For Banyule, for example, this is the case, with the average rank of the two indicator groups being in the range of 35 to 41 for 2001 and 2006.

For Darebin, this is not the case. The average rank of the drivers is approximately one half the rank of the performance indicators. This suggests that inefficiencies, whatever the cause, are limiting Darebin's performance. The same conclusion applies to Hume and Moreland.

The only drivers where Moreland has ranking values significantly above the average is the local industry employment ratio and the share of technical qualified residents. The only driver which, in relative terms, stands out as an impediment to Hume's performance is the skills of the local residents.

Whittlesea is also an LGA where the average of the performance indicator rankings is well above the average of the driver rankings, with technical skills and local employment provision the only drivers that are significantly ranked lower than the average for Whittlesea.

For Nillumbik, the average of the performance indicator rankings is well below the average of the driver rankings, while for Yarra the average rankings for two indicator groups are similar, especially if the technical skills indicator is ignored.

Table A5.7 shows the ranking of the Melbourne's North LGAs in terms of the 39 selected LGAs in and around Melbourne. It tells a similar story. The poor performing Melbourne's North LGAs are generally in the first or second quintile (the poorest performers are in the first quintile), while in terms of drivers the poor performing metropolitan north LGAs can, more often than not, be ranked in the fourth quintile.

Table A5.4 Performance indicators and drivers: rank in potential peers – 1991

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Ashfield (A)	66	55	25	64	14	27	23	19	94	22	22	22	61	33
Auburn (A)	69	106	46	4	43	52	38	54	70	49	37	46	88	44
Bankstown (C)	31	85	52	25	41	58	43	84	34	51	36	50	58	47
Bathurst (C)	94	70	56	26	107	47	79	43	17	75	87	64	82	60
Baulkham Hills (A)	16	11	62	66	55	60	55	31	46	54	38	55	14	52
Blacktown (C)	76	86	78	72	64	80	72	82	62	71	49	76	81	71
Blue Mountains (C)	60	28	107	101	86	104	105	33	15	102	78	106	44	84
Botany Bay (C)	84	87	10	1	11	12	8	63	75	12	13	12	86	22
Burwood (A)	62	69	29	24	27	32	25	25	80	30	29	29	66	33
Camden (A)	53	23	97	48	75	98	93	62	19	93	84	97	38	77
Campbelltown (C) NSW	37	74	95	100	70	95	87	94	48	83	70	91	56	83
Canterbury (C)	68	100	31	102	21	31	26	52	85	29	24	30	84	43
Cessnock (C)	57	93	101	65	103	103	102	107	32	104	85	104	75	91
Concord (A)	51	27	27	10	26	28	24	39	29	26	28	24	39	26
Drummoyne (A)	33	19	6	90	4	9	6	26	81	9	9	8	26	25
Fairfield (C)	61	107	71	84	56	76	61	100	78	67	44	70	84	71
Gosford (C)	55	60	96	55	78	97	92	74	10	96	81	96	58	78
Goulburn (C)	72	49	45	21	106	50	74	91	8	85	86	61	61	63
Hawkesbury (C)	58	20	87	50	73	90	84	70	5	78	75	85	39	70

Table A5.4 Performance indicators and drivers: rank in potential peers – 1991 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Holroyd (C)	28	72	54	36	45	59	49	76	39	55	41	53	50	51
Hornsby (A)	7	9	53	62	53	42	50	18	52	39	32	45	8	45
Hunter's Hill (A)	10	67	7	59	9	7	7	10	86	8	16	9	39	22
Hurstville (C)	54	29	44	53	38	46	36	45	21	43	31	43	42	40
Kiama (A)	79	44	105	86	94	106	100	40	3	97	54	103	62	79
Kogarah (A)	15	21	33	73	30	36	29	35	35	33	23	33	18	36
Ku-ring-gai (A)	2	31	48	89	45	35	45	3	98	28	25	38	17	45
Lake Macquarie (C)	65	78	99	83	96	101	96	81	7	99	48	101	72	81
Lane Cove (A)	6	2	8	12	14	6	9	7	95	6	12	7	4	18
Leichhardt (A)	27	17	15	34	4	16	14	9	102	14	17	14	22	24
Liverpool (C)	80	94	68	30	58	70	58	103	36	66	47	66	87	60
Maitland (C)	46	62	88	87	104	96	89	85	22	87	82	94	54	83
Manly (A)	11	5	13	60	30	8	12	15	79	7	8	10	8	24
Marrickville (A)	38	83	18	49	11	20	18	22	105	20	20	18	61	30
Mosman (A)	1	3	4	58	9	2	5	4	104	2	5	3	2	20
Newcastle (C)	70	76	12	11	100	37	13	53	27	47	67	20	73	39
North Sydney (A)	3	1	2	2	14	1	3	2	103	1	7	1	2	14
Parramatta (C)	52	61	50	9	45	51	42	41	55	48	40	49	57	43
Penrith (C)	34	48	92	63	72	94	86	93	44	84	77	90	41	80

Table A5.4 Performance indicators and drivers: rank in potential peers – 1991 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Pittwater (A)	9	7	22	27	63	18	21	32	18	18	18	19	8	26
Queanbeyan (C)	40	14	20	13	108	45	16	65	45	50	108	31	27	50
Randwick (C)	30	38	11	74	14	10	11	17	58	10	14	11	34	23
Rockdale (C)	26	58	32	82	27	34	27	48	59	31	21	32	42	39
Ryde (C)	12	18	21	15	27	22	22	21	71	19	27	21	15	27
Shellharbour (C)	95	97	100	105	88	102	97	108	20	92	56	102	96	87
Singleton (A)	20	12	47	14	105	73	67	96	14	79	2	71	16	57
Strathfield (A)	23	65	37	7	30	41	31	16	88	37	33	35	44	36
Sutherland Shire (A)	18	10	72	88	56	67	60	44	6	61	26	65	14	55
Warringah (A)	17	4	19	79	34	17	20	36	26	13	11	17	11	27
Waverley (A)	22	15	5	92	3	4	4	13	73	4	6	4	19	21
Willoughby (C)	5	8	9	3	25	5	10	11	97	5	10	6	7	18
Wingecarribee (A)	59	50	83	41	91	86	83	47	13	89	65	84	55	68
Wollondilly (A)	35	46	104	81	84	105	103	79	11	98	3	105	41	77
Wollongong (C)	44	89	79	32	79	89	76	55	23	76	39	82	67	63
Woolahra (A)	4	6	3	38	4	3	2	1	106	3	4	2	5	17
Wyong (A)	81	102	98	68	85	100	95	105	9	103	42	100	92	81
Ballarat (C)	107	101	76	31	92	72	78	58	66	80	106	77	104	74
Banyule (C)	25	30	41	70	21	33	47	28	63	36	63	39	28	44
Bass Coast (S)	103	105	89	54	98	69	98	86	31	105	100	87	104	82
Baw Baw (S)	93	35	91	51	90	71	101	67	43	95	101	89	64	80

Table A5.4 Performance indicators and drivers: rank in potential peers – 1991 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Bayside (C)	8	34	35	97	34	29	37	14	91	34	58	34	21	46
Boroondara (C)	21	24	30	43	14	26	35	6	100	27	61	28	23	37
Brimbank (C)	47	104	39	78	33	39	44	97	93	35	43	40	76	54
Cardinia (S)	42	36	94	98	74	91	91	73	41	88	83	92	39	83
Casey (C)	48	52	74	76	68	75	71	92	56	72	76	73	50	73
Colac-Otway (S)	92	66	51	20	101	19	85	88	84	91	97	52	79	69
Darebin (C)	77	99	42	52	21	40	48	37	96	38	60	41	88	48
Frankston (C)	63	57	70	61	69	64	68	80	38	68	79	67	60	66
Glen Eira (C)	75	40	23	95	21	21	28	20	89	21	55	23	58	40
Greater Bendigo (C)	108	88	81	37	102	79	82	72	57	82	104	80	98	78
Greater Dandenong (C)	86	98	60	18	61	61	56	89	69	63	73	59	92	61
Greater Geelong (C)	87	82	82	39	77	88	81	61	49	81	15	83	85	66
Hobsons Bay (C)	36	81	24	45	34	25	30	66	64	24	30	26	59	37
Hume (C)	45	80	34	23	34	38	40	104	82	40	50	37	63	48
Kingston (C)	39	59	43	17	43	44	46	51	65	46	62	44	49	46
Knox (C)	83	26	67	46	51	62	63	64	54	62	72	63	55	60
Macedon Ranges (S)	64	45	103	75	83	92	104	50	53	100	95	98	55	85
Manningham (C)	19	47	66	106	38	56	66	23	77	56	66	62	33	62
Maribyrnong (C)	88	108	17	19	4	15	19	49	87	17	46	16	98	29

Table A5.4 Performance indicators and drivers: rank in potential peers – 1991 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Maroondah (C)	67	25	73	47	49	63	70	46	40	64	74	68	46	59
Melton (S)	50	64	55	107	67	48	59	106	72	45	45	51	57	66
Monash (C)	29	63	59	22	45	57	57	27	83	59	69	54	46	53
Moonee Valley (C)	32	53	26	93	11	24	32	34	74	25	52	27	43	40
Moreland (C)	73	95	36	80	14	30	41	38	92	32	57	36	84	46
Mornington Peninsula (S)	89	77	102	69	80	99	99	59	24	101	34	99	83	77
Mount Alexander (S)	102	90	85	44	95	83	94	71	61	94	98	88	96	81
Nilumbik (S)	13	13	77	104	49	68	75	30	50	65	68	75	13	66
Port Phillip (C)	56	43	14	6	4	11	15	12	99	11	51	13	50	24
Stonnington (C)	14	22	28	16	14	23	33	5	101	23	59	25	18	33
Surf Coast (S)	85	56	86	77	89	87	88	42	33	86	19	86	71	69
Whitehorse (C)	24	33	65	42	41	55	62	24	76	58	71	56	29	55
Whittlesea (C)	49	79	63	71	38	54	65	99	90	53	64	58	64	66
Wyndham (C)	43	32	49	85	58	43	53	78	67	41	35	48	38	56
Yarra (C)	71	71	16	5	2	14	17	8	107	15	53	15	71	25
Yarra Ranges (S)	78	42	84	103	65	82	80	60	42	73	80	79	60	75
Beaulesert (S)	91	37	108	108	76	108	108	87	37	106	1	108	64	85
Boonah (S)	104	96	93	35	82	77	107	101	108	108	107	95	100	91
Brisbane (C)	41	39	1	8	1	13	1	29	68	16	89	5	40	23
Caboolture (S)	106	91	106	99	71	107	106	102	25	90	88	107	99	90

Table A5.4 Performance indicators and drivers: rank in potential peers – 1991 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediated skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Caloundra (C)	105	103	90	57	86	93	90	83	12	74	102	93	104	78
Gold Coast (C)	98	54	75	33	81	84	64	68	2	70	94	78	76	65
Ipswich (C)	100	41	61	56	65	81	54	95	16	77	92	69	71	67
Logan (C)	74	68	58	91	51	66	52	98	47	57	96	60	71	68
Maroochy (S)	96	75	69	28	92	78	69	69	4	60	103	72	86	64
Noosa (S)	97	73	80	40	99	85	77	56	1	69	99	81	85	69
Pine Rivers (S)	90	16	57	94	58	65	51	75	51	52	91	57	53	65
Redcliffe (C)	101	92	40	67	62	53	39	90	28	44	93	47	97	56
Redland (S)	82	51	38	96	53	49	34	77	30	42	90	42	67	55
Toowoomba (C)	99	84	64	29	97	74	73	57	60	107	105	74	92	74

Table A5.5 Performance indicators and drivers: rank in potential peers – 1996

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Ashfield (A)	35	61	23	82	14	23	22	20	92	19	21	22	48	34
Auburn (A)	72	107	47	4	43	48	39	47	85	37	34	45	90	43
Bankstown (C)	55	86	53	27	41	51	44	77	27	42	33	47	71	44
Bathurst (C)	53	49	50	25	107	58	58	45	13	79	80	59	51	57
Baulkham Hills (A)	16	8	61	64	55	54	57	29	26	43	38	54	12	48
Blacktown (C)	78	77	74	70	64	76	74	70	65	57	48	73	78	67
Blue Mountains (C)	33	32	106	98	86	101	104	34	21	97	86	105	33	84
Botany Bay (C)	63	74	12	1	11	11	12	54	71	14	8	10	69	20
Burwood (A)	38	83	30	20	27	31	24	24	83	23	25	29	61	32
Camden (A)	83	12	99	75	75	99	96	75	17	92	83	97	48	81
Campbelltown (C) NSW	64	75	93	93	70	94	89	92	41	77	68	92	70	81
Canterbury (C)	71	103	31	103	21	33	25	49	86	22	20	30	87	42
Cessnock (C)	25	100	102	86	103	105	102	108	20	103	71	103	63	90
Concord (A)	50	27	24	14	26	25	23	23	39	20	23	24	39	24
Drummoyne (A)	18	10	7	91	4	9	7	31	80	11	9	9	14	26
Fairfield (C)	66	106	69	79	56	70	62	97	81	54	42	68	86	68
Gosford (C)	49	55	92	49	78	93	90	73	9	89	89	91	52	75
Goulburn (C)	51	40	48	24	106	61	65	88	14	84	87	63	46	64
Hawkesbury (C)	32	16	87	48	73	88	84	76	4	74	76	86	24	70

Table A5.5 Performance indicators and drivers: rank in potential peers – 1996 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Holroyd (C)	43	70	55	32	45	53	48	67	40	44	36	49	57	47
Hornsby (A)	15	9	52	59	53	40	50	18	54	29	31	44	12	43
Hunter's Hill (A)	4	30	8	67	9	8	8	9	78	10	12	8	17	22
Hurstville (C)	29	45	46	52	38	45	38	41	29	32	26	41	37	39
Kiama (A)	42	39	101	92	94	102	100	42	5	93	58	100	41	79
Kogarah (A)	26	38	34	56	30	35	29	32	36	25	22	33	32	33
Ku-ring-gai (A)	3	25	45	74	45	30	45	1	96	21	28	36	14	42
Lake Macquarie (C)	40	79	96	72	96	103	92	79	7	94	63	99	60	80
Lane Cove (A)	6	2	6	11	14	6	9	7	95	8	14	6	4	18
Leichhardt (A)	14	14	15	39	4	14	14	13	103	15	13	12	14	24
Liverpool (C)	70	89	68	42	58	69	60	80	45	55	43	67	80	59
Maitland (C)	47	68	86	60	104	90	81	95	24	83	82	87	58	79
Manly (A)	10	6	9	57	30	7	11	14	72	9	7	7	8	22
Marrickville (A)	45	82	19	54	11	17	18	22	102	18	17	19	64	30
Mosman (A)	1	7	2	55	9	2	3	4	107	4	5	2	4	19
Newcastle (C)	44	81	10	9	100	29	5	51	25	53	59	18	63	36
North Sydney (A)	5	1	1	2	14	1	1	3	105	3	6	1	3	14
Parramatta (C)	30	69	49	8	45	47	43	37	61	36	37	46	50	41
Penrith (C)	52	41	90	62	72	91	88	90	31	78	81	90	47	77

Table A5.5 Performance indicators and drivers: rank in potential peers – 1996 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Pittwater (A)	13	4	28	63	63	20	26	36	11	16	18	21	9	30
Queanbeyan (C)	65	26	22	17	108	41	15	62	57	33	108	27	46	49
Randwick (C)	23	52	13	83	14	10	13	17	73	13	10	11	38	26
Rockdale (C)	37	65	33	87	27	34	27	48	59	24	19	32	51	39
Ryde (C)	21	20	20	16	27	18	21	21	66	17	24	20	21	25
Shellharbour (C)	57	95	100	106	88	104	97	107	15	90	44	102	76	85
Singleton (A)	7	17	41	15	105	71	34	93	10	81	1	55	12	51
Strathfield (A)	24	78	37	7	30	38	31	15	90	27	27	35	51	34
Sutherland Shire (A)	20	5	71	84	56	66	64	46	2	50	30	66	13	54
Warringah (A)	19	3	18	46	34	13	16	40	18	12	16	13	11	23
Waverley (A)	17	28	4	89	3	4	4	12	84	6	4	4	23	21
Willoughby (C)	8	18	5	3	25	5	10	10	98	7	15	5	13	18
Wingecarribee (A)	62	60	85	43	91	84	83	53	12	88	77	85	61	70
Wollondilly (A)	41	44	104	88	84	106	103	87	16	102	11	106	43	81
Wollongong (C)	28	91	76	29	79	82	75	56	23	75	2	81	60	58
Wollahra (A)	2	15	3	47	4	3	2	2	106	5	3	3	9	18
Wyong (A)	79	94	98	69	85	100	95	106	8	96	69	98	87	82
Ballarat (C)	96	88	72	28	92	74	76	55	60	85	97	75	92	71
Banyule (C)	39	29	42	65	21	37	46	30	67	47	61	38	34	45
Bass Coast (S)	103	97	88	53	98	79	101	91	34	107	93	89	100	83
Baw Baw (S)	58	54	83	36	90	64	99	74	51	98	96	82	56	77

Table A5.5 Performance indicators and drivers: rank in potential peers – 1996 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Bayside (C)	12	19	32	68	34	32	36	16	91	45	52	34	16	44
Boroondara (C)	11	24	29	35	14	24	35	5	101	39	62	28	18	37
Brimbank (C)	89	104	44	102	33	42	49	83	88	49	41	43	97	57
Cardinia (S)	68	33	94	85	74	92	91	84	44	86	84	94	51	83
Casey (C)	87	36	77	105	68	78	79	100	53	73	75	77	62	79
Colac-Otway (S)	93	51	38	22	101	28	87	89	68	99	79	52	72	66
Darebin (C)	76	99	43	40	21	39	47	38	99	48	55	39	88	47
Frankston (C)	73	58	70	71	69	67	71	86	30	70	74	70	66	68
Glen Eira (C)	48	31	21	80	21	21	28	19	87	34	53	23	40	39
Greater Bendigo (C)	90	90	81	38	102	81	85	64	49	91	102	83	90	78
Greater Dandenong (C)	80	102	56	19	61	59	56	81	70	66	66	60	91	59
Greater Geelong (C)	75	85	82	34	77	86	69	65	48	1	51	79	80	59
Hobsons Bay (C)	60	80	27	44	34	27	32	60	77	41	29	31	70	40
Hume (C)	84	87	36	26	34	43	40	101	69	51	32	40	86	47
Kingston (C)	56	53	39	13	43	44	41	57	55	52	56	42	55	44
Knox (C)	74	23	60	31	51	57	63	66	47	63	72	61	49	57
Macedon Ranges (S)	59	56	105	90	83	98	105	59	52	105	85	104	58	89
Manningham (C)	31	47	62	107	38	52	67	26	79	60	65	58	39	61
Maribyrnong (C)	67	108	17	12	4	16	20	44	94	30	40	17	88	29

Table A5.5 Performance indicators and drivers: rank in potential peers – 1996 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Maroondah (C)	61	21	66	41	49	60	66	52	35	65	73	65	41	57
Melton (S)	88	67	64	108	67	56	72	105	62	59	39	64	78	70
Monash (C)	46	57	54	18	45	49	53	27	75	56	67	50	52	49
Moonee Valley (C)	54	59	26	73	11	26	30	35	89	38	46	26	57	40
Moreland (C)	77	98	35	78	14	36	42	39	97	46	49	37	88	47
Mornington Peninsula (S)	81	72	97	58	80	97	93	63	22	101	45	96	77	75
Mount Alexander (S)	94	101	91	51	95	87	98	61	33	100	90	93	98	80
Nilumbik (S)	34	11	75	104	49	68	77	33	43	68	64	72	23	65
Port Phillip (C)	22	43	14	6	4	12	17	11	100	26	47	14	33	25
Stonnington (C)	9	22	25	23	14	22	33	6	104	35	57	25	16	34
Surf Coast (S)	91	73	89	94	89	89	86	43	37	2	54	88	82	67
Whitehorse (C)	36	34	57	37	41	50	59	25	74	58	70	53	35	52
Whittlesea (C)	86	84	63	96	38	55	68	98	82	61	60	62	85	68
Wyndham (C)	82	48	51	61	58	46	54	82	63	40	35	48	65	54
Yarra (C)	27	66	16	5	2	15	19	8	108	28	50	16	47	27
Yarra Ranges (S)	69	42	80	99	65	75	80	68	32	72	78	76	56	73
Beaulesert (S)	95	50	108	100	76	107	108	99	38	106	101	107	73	95
Boonah (S)	98	105	103	76	82	95	106	94	93	108	107	101	102	97
Brisbane (C)	85	35	11	10	1	19	6	28	76	31	88	15	60	29
Caboolture (S)	102	92	107	97	71	108	107	104	50	104	103	108	97	96

Table A5.5 Performance indicators and drivers: rank in potential peers – 1996 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Caloundra (C)	107	96	95	66	86	96	94	85	19	95	104	95	102	84
Gold Coast (C)	105	62	79	33	81	85	73	69	3	80	100	80	84	68
Ipswich (C)	100	46	65	50	65	73	55	103	46	71	94	69	73	69
Logan (C)	99	64	67	81	51	72	61	102	58	67	99	71	82	73
Maroochy (S)	106	76	78	30	92	80	78	72	6	82	105	78	91	70
Noosa (S)	108	63	84	45	99	83	82	58	1	87	98	84	86	72
Pine Rivers (S)	92	13	73	101	58	77	70	71	56	69	92	74	53	74
Redcliffe (C)	104	93	59	77	62	65	51	96	42	64	95	57	99	67
Redland (S)	97	37	58	95	53	63	52	78	28	62	91	56	67	64
Toowoomba (C)	101	71	40	21	97	62	37	50	64	76	106	51	86	60

Table A5.6 Performance indicators and drivers: rank in potential peers – 2001

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Ashfield (A)	28	55	27	89	14	23	25	19	92	20	17	23	42	35
Auburn (A)	77	108	49	6	43	50	44	44	85	46	46	49	93	46
Bankstown (C)	60	96	55	29	41	52	51	73	46	49	45	51	78	49
Bathurst (C)	66	68	60	20	107	68	65	53	19	81	103	69	67	65
Baulkham Hills (A)	19	7	61	52	55	54	60	30	49	51	47	56	13	52
Blacktown (C)	52	76	75	70	64	72	72	69	63	64	57	73	64	68
Blue Mountains (C)	38	34	106	98	86	104	104	33	28	101	94	105	36	86
Botany Bay (C)	48	71	11	1	11	13	10	54	60	12	13	11	60	20
Burwood (A)	29	83	34	22	27	31	33	24	83	29	27	31	56	34
Camden (A)	31	6	98	77	75	102	96	80	23	91	87	99	19	83
Campbelltown (C) NSW	63	79	94	88	70	94	90	89	44	77	71	93	71	81
Canterbury (C)	75	105	35	103	21	30	32	52	82	28	19	30	90	43
Cessnock (C)	58	106	97	74	103	105	99	108	13	103	70	101	82	87
Concord (A)	21	26	30	26	26	25	28	22	66	23	25	26	24	30
Drummoyne (A)	12	10	8	99	4	9	6	29	86	9	9	9	11	27
Fairfield (C)	80	107	71	80	56	67	67	100	87	60	53	70	94	71
Gosford (C)	49	60	92	47	78	92	88	71	8	88	89	92	55	75
Goulburn (C)	68	77	65	19	106	77	70	76	1	93	107	77	73	69
Hawkesbury (C)	39	20	87	44	73	86	83	77	5	72	72	85	30	68

Table A5.6 Performance indicators and drivers: rank in potential peers – 2001 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Holroyd (C)	59	80	56	42	45	55	52	62	59	52	51	54	70	53
Hornsby (A)	16	12	52	76	53	40	55	20	67	37	28	42	14	47
Hunter's Hill (A)	4	54	7	69	9	8	7	12	81	8	12	8	29	22
Hurstville (C)	32	64	46	65	38	43	43	42	54	41	29	43	48	44
Kiama (A)	42	52	101	95	94	98	100	46	7	98	82	100	47	82
Kogarah (A)	27	48	39	54	30	35	37	34	56	32	20	34	38	37
Ku-ring-gai (A)	3	33	43	72	45	29	47	3	98	26	21	36	18	42
Lake Macquarie (C)	62	88	99	81	96	103	95	82	14	95	74	98	75	84
Lane Cove (A)	6	8	6	9	14	6	9	8	95	6	8	6	7	17
Leichhardt (A)	10	9	15	43	4	15	16	10	100	13	14	15	10	25
Liverpool (C)	54	87	73	55	58	69	68	79	52	61	54	71	71	64
Maitland (C)	55	78	86	63	104	89	82	96	24	83	90	86	67	80
Manly (A)	9	16	9	64	30	7	8	14	76	7	6	7	13	23
Marrickville (A)	33	61	20	61	11	18	20	21	101	19	16	18	47	31
Mosman (A)	1	15	2	53	9	2	3	4	107	2	3	2	8	19
Newcastle (C)	53	90	18	11	100	42	12	47	35	65	86	29	72	45
North Sydney (A)	5	1	1	2	14	1	2	2	106	1	4	1	3	13
Parramatta (C)	36	81	50	7	45	49	45	37	65	44	50	47	59	44
Penrith (C)	57	43	91	67	72	93	85	93	31	76	83	90	50	78
Pittwater (A)	17	3	28	60	63	17	29	35	15	17	15	21	10	30
Queanbeyan (C)	40	30	103	62	108	97	102	63	62	94	104	102	35	90
Randwick (C)	23	63	12	83	14	10	13	16	79	11	10	10	43	26

Table A5.6 Performance indicators and drivers: rank in potential peers – 2001 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Rockdale (C)	44	74	37	96	27	32	34	45	61	30	18	32	59	41
Ryde (C)	22	31	22	13	27	19	23	23	71	18	23	20	27	26
Shellharbour (C)	61	93	102	104	88	101	101	107	18	90	78	103	77	89
Singleton (A)	18	49	26	12	105	78	17	102	17	85	1	58	34	50
Strathfield (A)	26	85	42	8	30	37	39	17	96	35	34	38	56	38
Sutherland Shire (A)	24	4	69	84	56	61	66	48	6	56	41	64	14	55
Warringah (A)	20	5	17	45	34	11	19	41	29	10	11	13	13	23
Waverley (A)	14	25	4	87	3	4	4	13	89	4	5	4	20	22
Willoughby (C)	7	28	5	3	25	5	11	9	102	5	7	5	18	18
Wingecarribee (A)	41	62	83	36	91	81	81	55	16	87	91	81	52	70
Wollondilly (A)	35	37	107	102	84	107	107	92	12	104	63	108	36	89
Wollongong (C)	43	92	79	30	79	85	78	61	27	74	62	84	68	66
Woollahra (A)	2	29	3	46	4	3	1	1	105	3	2	3	16	17
Wyong (A)	78	94	100	78	85	99	97	106	9	96	81	97	86	85
Ballarat (C)	96	70	53	25	92	65	49	58	58	73	95	62	83	63
Banyule (C)	50	27	38	66	21	33	40	31	64	34	44	35	39	41
Bass Coast (S)	95	103	90	50	98	84	98	83	3	105	88	89	99	79
Baw Baw (S)	73	44	82	38	90	71	94	75	38	100	105	79	59	77
Bayside (C)	13	14	29	59	34	28	30	15	90	31	40	28	14	38
Boroondara (C)	11	21	25	35	14	22	31	5	104	25	43	25	16	33
Brimbank (C)	89	101	40	97	33	38	42	81	80	38	33	41	95	52

Table A5.6 Performance indicators and drivers: rank in potential peers – 2001 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Cardinia (S)	71	18	89	82	74	91	89	88	26	80	80	91	45	79
Casey (C)	81	42	76	105	68	75	77	94	42	68	67	75	62	75
Colac-Otway (S)	92	45	47	23	101	46	86	90	55	92	100	63	69	70
Darebin (C)	84	89	41	51	21	36	41	38	97	36	42	39	87	44
Frankston (C)	85	47	62	68	69	60	64	87	21	59	65	61	66	62
Glen Eira (C)	30	19	19	86	21	20	22	18	88	21	37	19	25	35
Greater Bendigo (C)	100	73	70	28	102	73	75	66	45	75	101	74	87	71
Greater Dandenong (C)	98	104	48	14	61	57	48	85	69	57	59	52	101	55
Greater Geelong (C)	83	69	78	31	77	83	79	67	43	79	66	82	76	69
Hobsons Bay (C)	51	66	24	41	34	27	27	50	72	27	22	27	59	35
Hume (C)	86	91	32	24	34	39	35	99	68	40	31	37	89	44
Kingston (C)	65	35	36	15	43	41	36	51	50	42	48	40	50	40
Knox (C)	67	17	54	32	51	53	56	65	39	54	60	53	42	52
Macedon Ranges (S)	46	46	104	90	83	100	103	59	36	102	93	104	46	87
Manningham (C)	34	41	57	106	38	48	62	27	78	48	52	50	38	57
Maribyrnong (C)	79	102	14	17	4	16	18	40	93	16	24	16	91	26
Maroondah (C)	69	11	59	37	49	56	61	49	30	55	61	57	40	51
Melton (S)	87	58	68	108	67	59	71	98	51	53	38	65	73	68

Table A5.6 Performance indicators and drivers: rank in potential peers – 2001 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Monash (C)	56	56	45	16	45	45	46	26	73	45	58	44	56	44
Moonee Valley (C)	47	51	23	71	11	24	24	32	84	24	32	24	49	35
Moreland (C)	82	84	33	92	14	34	38	36	94	33	36	33	83	44
Mornington Peninsula (S)	64	59	95	58	80	96	92	64	11	99	75	95	62	77
Mount Alexander (S)	97	98	85	33	95	82	93	60	41	89	98	87	98	76
Nillumbik (S)	37	2	72	107	49	62	74	39	47	58	55	67	20	63
Port Phillip (C)	15	24	10	4	4	12	14	11	99	14	26	12	20	21
Stonnington (C)	8	22	21	21	14	21	26	6	103	22	39	22	15	30
Surf Coast (S)	72	53	88	75	89	88	87	43	32	84	68	88	63	74
Whitehorse (C)	45	32	51	27	41	47	54	25	75	47	56	48	39	47
Whittlesea (C)	93	82	58	85	38	51	63	95	74	50	49	55	88	62
Wyndham (C)	74	50	44	49	58	44	50	84	48	43	35	46	62	50
Yarra (C)	25	38	13	5	2	14	15	7	108	15	30	14	32	22
Yarra Ranges (S)	76	23	74	91	65	66	76	68	22	63	64	72	50	66
Beaulesert (S)	94	57	108	100	76	106	108	101	37	107	96	106	76	95
Boonah (S)	88	39	96	56	82	90	105	97	91	108	108	96	64	93
Brisbane (C)	70	36	16	10	1	26	5	28	77	39	69	17	53	29
Caboolture (S)	103	97	105	94	71	108	106	105	34	106	102	107	100	94
Caloundra (C)	107	99	93	57	86	95	91	86	20	97	97	94	103	82
Gold Coast (C)	99	75	81	39	81	87	73	72	4	78	85	80	87	68

Table A5.6 Performance indicators and drivers: rank in potential peers – 2001 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Ipswich (C)	101	72	66	48	65	74	57	103	40	70	73	68	87	66
Logan (C)	105	67	67	79	51	70	59	104	57	67	84	66	86	70
Maroochy (S)	106	86	80	34	92	79	80	70	10	82	99	78	96	70
Noosa (S)	108	100	84	40	99	80	84	56	2	86	92	83	104	71
Pine Rivers (S)	91	13	77	101	58	76	69	74	53	69	77	76	52	73
Redcliffe (C)	104	95	63	73	62	64	53	91	33	66	79	59	100	64
Redland (S)	90	40	64	93	53	63	58	78	25	62	76	60	65	63
Toowoomba (C)	102	65	31	18	97	58	21	57	70	71	106	45	84	57

Table A5.7 Performance indicators and drivers: rank in potential peers – 2006

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Ashfield (A)	29	61	23	97	14	22	24	16	94	18	23	22	45	35
Auburn (A)	85	108	54	7	43	48	52	40	88	45	52	48	97	48
Bankstown (C)	76	103	59	36	41	49	57	73	55	47	49	52	90	52
Bathurst (C)	77	58	68	27	107	75	64	62	19	81	104	74	68	68
Baulkham Hills (A)	22	6	65	54	55	53	66	31	52	49	55	60	14	54
Blacktown (C)	62	88	75	68	64	70	81	64	59	66	67	75	75	69
Blue Mountains (C)	41	26	107	100	86	104	107	38	28	103	106	104	34	88
Botany Bay (C)	48	77	2	1	11	5	3	47	65	5	14	4	63	16
Burwood (A)	35	96	35	20	27	31	36	20	89	29	36	33	66	36
Camden (A)	38	9	97	55	75	101	98	85	22	89	97	100	24	82
Campbelltown (C) NSW	79	86	92	87	70	91	90	88	34	71	83	91	83	80
Canterbury (C)	81	104	34	105	21	29	34	49	81	26	29	31	93	44
Cessnock (C)	68	101	98	75	103	103	99	108	12	104	82	102	85	89
Concord (A)	20	10	29	44	26	25	28	23	71	22	32	27	15	33
Drummoyne (A)	14	29	12	52	4	11	12	27	86	11	11	10	22	24
Fairfield (C)	93	107	70	86	56	67	74	99	76	62	63	69	100	72
Gosford (C)	53	52	90	43	78	90	86	67	6	85	102	88	53	74
Goulburn (C)	87	55	56	19	106	73	47	87	1	98	108	67	71	66
Hawkesbury (C)	50	13	86	46	73	87	85	82	4	73	87	85	32	71

Table A5.7 Performance indicators and drivers: rank in potential peers – 2006 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Holroyd (C)	73	95	60	40	45	52	58	54	63	50	57	54	84	53
Hornsby (A)	17	11	58	76	53	43	63	21	68	40	37	45	14	50
Hunter's Hill (A)	2	48	14	56	9	10	15	10	83	10	12	11	25	23
Hurstville (C)	44	62	43	77	38	39	44	42	64	35	40	39	53	46
Kiama (A)	45	36	102	91	94	97	100	46	9	95	93	98	41	83
Kogarah (A)	30	50	33	62	30	28	31	30	60	24	30	29	40	36
Ku-ring-gai (A)	4	14	45	67	45	33	56	2	91	32	21	37	9	43
Lake Macquarie (C)	67	82	99	78	96	102	96	81	13	93	90	99	75	85
Lane Cove (A)	6	7	10	18	14	8	16	7	98	8	8	8	7	20
Leichhardt (A)	11	39	16	5	4	13	17	11	103	12	15	14	25	21
Liverpool (C)	72	100	73	66	58	68	78	79	48	63	65	71	86	67
Maitland (C)	58	68	81	50	104	86	73	96	27	82	96	84	63	78
Manly (A)	10	23	13	74	30	9	14	15	84	9	4	9	17	26
Marrickville (A)	28	53	19	69	11	16	20	24	99	15	20	18	41	31
Mosman (A)	1	17	7	73	9	4	10	5	101	4	3	5	9	22
Newcastle (C)	51	84	9	12	100	35	1	48	46	60	94	19	68	42
North Sydney (A)	5	5	1	2	14	1	8	3	105	1	2	1	5	14
Parramatta (C)	59	94	50	8	45	47	51	33	70	43	56	47	77	45
Penrith (C)	63	42	93	57	72	92	89	97	30	77	95	93	53	80
Pittwater (A)	16	3	30	49	63	19	33	39	24	19	10	21	10	31

Table A5.7 Performance indicators and drivers: rank in potential peers – 2006 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Queanbeyan (C)	32	12	106	85	108	105	105	56	57	100	107	105	22	93
Randwick (C)	18	66	6	82	14	6	6	17	82	6	13	6	42	24
Rockdale (C)	60	81	31	89	27	26	26	44	67	21	27	26	71	38
Ryde (C)	24	47	26	9	27	21	30	22	73	20	28	24	36	28
Shellharbour (C)	69	91	101	102	88	99	101	107	15	91	92	101	80	90
Singleton (A)	21	40	18	13	105	77	4	104	11	88	1	57	31	48
Strathfield (A)	27	98	40	14	30	37	43	14	95	33	41	36	63	38
Sutherland Shire (A)	26	2	69	81	56	58	69	52	7	53	48	62	14	56
Warringah (A)	19	1	20	41	34	15	21	41	35	13	9	16	10	25
Waverley (A)	12	72	3	83	3	3	5	13	92	3	7	3	42	22
Willoughby (C)	7	31	8	3	25	7	18	8	100	7	5	7	19	19
Wingecarribee (A)	39	45	76	30	91	79	71	58	16	87	84	76	42	67
Wollondilly (A)	42	18	104	96	84	106	104	94	5	99	46	106	30	84
Wollongong (C)	47	92	77	29	79	81	75	61	31	75	77	78	70	66
Woollahra (A)	3	43	4	59	4	2	7	1	107	2	6	2	23	19
Wyong (A)	89	83	96	70	85	100	97	105	3	94	98	96	86	84
Ballarat (C)	96	67	52	21	92	66	41	57	50	74	101	63	82	62
Banyule (C)	40	30	39	64	21	34	45	35	66	37	43	34	35	42
Bass Coast (S)	95	90	91	47	98	85	94	84	17	105	75	90	93	79
Baw Baw (S)	52	35	89	45	90	82	92	78	33	102	85	86	44	78

Table A5.7 Performance indicators and drivers: rank in potential peers – 2006 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Bayside (C)	13	19	32	72	34	32	32	19	87	34	33	32	16	41
Boroondara (C)	9	25	27	35	14	24	29	4	106	27	38	25	17	33
Brimbank (C)	90	105	41	92	33	40	49	77	80	39	25	42	98	52
Cardinia (S)	61	28	94	93	74	94	95	93	29	83	81	94	45	83
Casey (C)	78	69	82	106	68	76	84	92	43	69	69	79	74	77
Colac-Otway (S)	91	24	46	23	101	61	83	95	37	97	88	66	58	70
Darebin (C)	71	93	42	63	21	38	48	34	97	38	39	38	82	46
Frankston (C)	83	59	66	71	69	63	68	89	20	65	68	64	71	64
Glen Eira (C)	25	38	21	98	21	20	22	18	90	23	26	20	32	36
Greater Bendigo (C)	98	60	67	28	102	72	61	69	39	78	103	72	79	69
Greater Dandenong (C)	100	106	49	11	61	59	50	76	72	56	58	55	103	55
Greater Geelong (C)	74	71	79	31	77	83	76	68	41	80	62	83	73	68
Hobsons Bay (C)	43	80	24	39	34	30	27	51	75	31	16	30	62	36
Hume (C)	84	102	38	24	34	41	37	98	61	41	18	41	93	43
Kingston (C)	54	41	36	16	43	42	35	50	56	42	44	40	48	40
Knox (C)	66	21	55	34	51	50	55	65	45	54	60	53	44	52
Macedon Ranges (S)	37	33	103	84	83	98	103	60	44	101	100	103	35	88
Manningham (C)	31	44	61	104	38	46	62	29	77	48	50	50	38	57
Maribyrnong (C)	70	99	17	25	4	17	19	32	96	17	19	17	85	26

Table A5.7 Performance indicators and drivers: rank in potential peers – 2006 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Maroondah (C)	64	15	62	37	49	54	59	55	36	55	61	58	40	53
Melton (S)	80	78	84	108	67	74	88	86	53	61	42	82	79	75
Monash (C)	49	74	44	15	45	44	46	25	78	44	54	44	62	44
Moonee Valley (C)	34	57	25	79	11	27	25	36	85	28	24	28	46	37
Moreland (C)	75	89	37	101	14	36	42	37	93	36	34	35	82	47
Mornington Peninsula (S)	55	54	95	61	80	96	91	66	14	96	78	95	55	77
Mount Alexander (S)	99	87	85	42	95	88	93	53	42	92	99	92	93	78
Nilumbik (S)	33	8	72	107	49	64	80	43	51	58	53	68	21	65
Port Phillip (C)	15	49	11	6	4	12	11	12	102	14	17	13	32	20
Stonnington (C)	8	37	22	22	14	23	23	6	104	25	35	23	23	30
Surf Coast (S)	46	34	88	80	89	89	87	45	49	86	59	87	40	76
Whitehorse (C)	36	32	48	26	41	45	54	26	79	46	51	46	34	46
Whittlesea (C)	92	97	63	95	38	51	70	91	69	52	47	59	95	64
Wyndham (C)	57	63	57	58	58	55	65	75	54	51	31	61	60	57
Yarra (C)	23	51	15	4	2	14	13	9	108	16	22	15	37	22
Yarra Ranges (S)	65	27	74	94	65	65	79	74	26	67	66	70	46	68
Beaulesert (S)	94	46	108	103	76	108	108	103	32	107	80	108	70	93
Boonah (S)	88	20	100	51	82	95	102	101	62	108	45	97	54	84
Brisbane (C)	56	22	5	10	1	18	2	28	74	30	64	12	39	24
Caboolture (S)	103	79	105	90	71	107	106	106	23	106	91	107	91	91
Caloundra (C)	101	75	87	48	86	93	82	83	18	90	70	89	88	75

Table A5.7 Performance indicators and drivers: rank in potential peers – 2006 (continued)

Potential peers	Performance indicators		Drivers											
	Household productivity	Local resident employment ratio	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment	Average rank of performance indicators	Average rank of drivers
Gold Coast (C)	97	70	80	33	81	84	60	71	8	76	76	80	84	65
Ipswich (C)	104	65	64	53	65	69	53	102	38	70	74	65	85	65
Logan (C)	106	73	51	60	51	62	38	100	40	64	79	56	90	60
Maroochy (S)	102	56	78	32	92	78	72	70	10	79	86	77	79	67
Noosa (S)	108	85	83	38	99	80	77	59	2	84	89	81	97	69
Pine Rivers (S)	82	4	71	99	58	71	67	72	47	68	71	73	43	70
Redcliffe (C)	107	76	53	65	62	57	40	90	25	59	73	51	92	58
Redland (S)	86	16	47	88	53	56	39	80	21	57	72	49	51	56
Toowoomba (C)	105	64	28	17	97	60	9	63	58	72	105	43	85	55

Table A5.8 Melbourne's North LGAs: performance indicators and drivers – rank for Melbourne LGAs

Performance indicators			Drivers									
Household productivity	Local resident employment ratio		Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment
1991												
Banyule (C)	7	6	13	24	8	12	14	10	16	12	20	12
Darebin (C)	26	35	14	20	8	15	15	13	35	13	17	14
Hume (C)	14	28	9	9	12	13	10	38	26	14	9	11
Moreland (C)	24	33	11	30	5	11	11	14	33	9	14	10
Nilumbik (S)	2	1	29	37	20	27	27	11	10	25	23	28
Whittlesea (C)	17	27	21	25	15	19	22	37	31	18	21	21
Yarra (C)	23	25	2	1	1	2	2	3	39	2	12	2
1996												
Banyule (C)	9	7	14	24	8	12	13	10	20	14	20	11
Darebin (C)	24	35	15	17	8	13	14	13	35	15	16	12
Hume (C)	29	30	11	9	12	15	10	38	22	17	2	13
Moreland (C)	25	34	10	28	5	11	12	14	34	13	10	10
Nilumbik (S)	7	1	28	36	20	28	28	11	8	27	22	27
Whittlesea (C)	30	28	23	33	15	21	23	36	28	23	19	23
Yarra (C)	5	23	2	1	1	2	2	3	39	4	11	2

Table A5.8 Melbourne's North LGAs: performance indicators and drivers – rank for Melbourne LGAs (continued)

Performance indicators			Drivers									
Household productivity	Local resident employment ratio		Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment
2001												
Banyule (C)	12	11	13	25	8	10	13	10	21	11	16	11
Darebin (C)	28	33	15	22	8	12	14	13	35	12	14	13
Hume (C)	30	34	10	9	12	14	10	39	22	14	5	12
Moreland (C)	26	32	11	34	5	11	12	12	34	10	9	10
Nilumbik (S)	8	1	29	38	20	27	27	14	15	25	20	28
Whittlesea (C)	34	31	24	30	15	21	24	37	26	20	18	22
Yarra (C)	5	14	2	2	1	2	2	3	39	2	4	2
2006												
Banyule (C)	12	9	13	24	8	10	14	12	22	11	16	10
Darebin (C)	25	34	15	23	8	12	16	11	35	12	14	12
Hume (C)	31	37	12	9	12	14	11	39	21	14	3	14
Moreland (C)	27	32	11	35	5	11	13	14	33	10	11	11
Nilumbik (S)	8	1	28	38	20	26	29	15	17	24	21	27
Whittlesea (C)	34	35	25	33	15	20	26	35	23	20	18	22
Yarra (C)	5	19	2	1	1	2	2	3	39	2	5	2

Note: The lowest rank is 39.

A5.9 The strength of the linkages between performance indicators and drivers

One way of depicting the strength of the relationship between performance indicators and drivers is by graphing a performance indicator against a driver. A more efficient way of presenting this is simply calculating the correlation coefficients between the performance indicators and the drivers. If the correlation coefficient between any two variables is 0.6 or above, then the plot between the factors will resemble a straight line. A correlation coefficient of 1.0 implies a 45 degree straight line.

Table A5.9 presents the average correlation coefficients between the drivers and performance indicators for the years 1996, 2001 and 2006. Most drivers have a strong correlation coefficient with resident productivity. The bigger the labour market employment catchment, high skilled industry employment occupations available, share of university qualified residents, industry global knowledge worker employment, industry productivity and the extent of skilled residents in the catchment, the higher the level of resident business productivity. The share of university qualified residents has the highest correlation coefficient, with resident business productivity at 0.80.

The correlation coefficients of the drivers with the local resident employment ratio are generally around 40 to 50 per cent of the corresponding resident business productivity ratio.

Of equal interest are some of the correlation coefficients between the drivers. The share of skilled residents in the working age population in the catchment has a near 1 correlation with the size of the catchment total industry employment. The share of skilled residents in the catchment also has a near 1 correlation with the availability of high and intermediate skilled employment positions available in the catchment. Industry productivity also has a high correlation coefficient with share of skilled residents in the catchment working age population and the employment of global knowledge worker occupations.

Table A5.9 Average correlation between drivers and performance indicators: 1996–2006

Potential peers	Performance indicators		Drivers									
	Household productivity	Employment working age population	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment
Household productivity	1.00	0.51	0.54	0.17	0.20	0.62	0.51	0.80	-0.52	0.59	0.60	0.60
Local resident employment ratio	0.51	1.00	0.20	-0.02	0.12	0.26	0.18	0.42	-0.03	0.22	0.19	0.24
Industry employment in catchment per working age population	0.54	0.20	1.00	0.46	0.44	0.97	0.98	0.69	-0.67	0.80	0.65	0.99
Local industry employment per working age population	0.17	-0.02	0.46	1.00	0.23	0.41	0.46	0.31	-0.30	0.29	0.20	0.43
Reciprocal of distance to CBD	0.20	0.12	0.44	0.23	1.00	0.43	0.45	0.37	-0.39	0.37	0.22	0.45
High skilled industry employment in catchment per working age population	0.62	0.26	0.97	0.41	0.43	1.00	0.92	0.77	-0.74	0.85	0.68	0.99
Intermediate skilled industry employment in catchment per working age population	0.51	0.18	0.98	0.46	0.45	0.92	1.00	0.64	-0.61	0.79	0.64	0.96

Table A5.9 Average correlation between drivers and performance indicators: 1996–2006 (continued)

Potential peers	Performance indicators		Drivers									
	Household productivity	Employment working age population	Industry employment in catchment per working age population	Local industry employment per working age population	Reciprocal of distance to CBD	High skilled industry employment in catchment per working age population	Intermediate skilled industry employment in catchment per working age population	Share of university qualified in working age population	Share of technical qualified in working age population	Industry global knowledge workers in working age population	Average industry productivity in catchment	Share of skilled residents in working age population in catchment
Share of university qualified in working age population	0.80	0.42	0.69	0.31	0.37	0.77	0.64	1.00	-0.75	0.71	0.54	0.74
Share of technical qualified in working age population	-0.52	-0.03	-0.67	-0.30	-0.39	-0.74	-0.61	-0.75	1.00	-0.67	-0.51	-0.71
Industry global knowledge workers in working age population	0.59	0.22	0.80	0.29	0.37	0.85	0.79	0.71	-0.67	1.00	0.71	0.85
Average industry productivity in catchment	0.60	0.19	0.65	0.20	0.22	0.68	0.64	0.54	-0.51	0.71	1.00	0.68
Share of skilled residents in working age population in catchment	0.60	0.24	0.99	0.43	0.45	0.99	0.96	0.74	-0.71	0.85	0.68	1.00

A5.10 The results of the application of DEA analysis 1991–2006

The program to apply the DEA analysis is the DEAP software. See T.J. Coelli *A Guide to DEAP Version 2.1: A Data Envelopment Analysis (Computer) Program*, University of New England. The DEA analysis was applied for the years 1991, 1996, 2001 and 2006, with the focus being on the 2001 and 2006 years.

Table A5.10 shows the efficient LGAs for the four years. Not surprising for the latter years, given the relationship between the performance indicator ranking and their average input ranking, Nillumbik and Yarra are judged 100 per cent efficient LGAs. While the usual suspects of high performance LGAs are listed, Mosman, North Sydney, Boroondara, etc are also listed as 100 per cent efficient. A number of poorly performing LGAs are also listed as 100 per cent efficient. Included in this category would be Melton and Boonah.

This may be considered surprising, but on reflection it is not. The efficiency frontier across all 108 LGAs is described by a wide range of driver structures, including low levels of driver input. So Melton is included because, although its driver rankings are low, it is relatively efficient in that the performance indicator outcomes are consistent with the driver input values.

Table A5.11 gives the inefficiency index and the percentage increase in the household productivity and employment ratio that would be expected if the five inefficient LGAs of Melbourne's North were operating at 100 per cent efficiency. The conclusions are clear cut, namely:

- Melbourne's North is significantly inefficient
- the inefficiency, at the very least, has not improved over time
- the largest gains from efficiency improvements will come from household productivity gains, although the increase in the local employment ratio would be significant.

For Melbourne's North as a whole, the gains in household productivity from efficiency improvement would be of the order of 20 per cent, while the increase in employment would be at least 7 per cent. The largest benefits would accrue to Banyule, Darebin and Moreland, with an average improvement in the performance indicators of approximately 20 per cent. Hume and Whittlesea improve their performance indicators by around 10 per cent.

Table A5.10 Efficient LGAs: 1991–2006

1991	1996	2001	2006
Bathurst (C)	Bathurst (C)	Blue Mountains (C)	Blue Mountains (C)
Blue Mountains (C)	Blue Mountains (C)	Camden (A)	Camden (A)
Camden (A)	Camden (A)	Cessnock (C)	Cessnock (C)
Campbelltown (C) NSW	Cessnock (C)	Drummoyne (A)	Goulburn (C)
Cessnock (C)	Ku-ring-gai (A)	Fairfield (C)	Ku-ring-gai (A)
Ku-ring-gai (A)	Lane Cove (A)	Ku-ring-gai (A)	Lane Cove (A)
Maitland (C)	Leichhardt (A)	Leichhardt (A)	Maitland (C)
Mosman (A)	Mosman (A)	Mosman (A)	Mosman (A)
North Sydney (A)	North Sydney (A)	North Sydney (A)	North Sydney (A)
Penrith (C)	Queanbeyan (C)	Queanbeyan (C)	Queanbeyan (C)
Queanbeyan (C)	Shellharbour (C)	Shellharbour (C)	Shellharbour (C)
Shellharbour (C)	Singleton (A)	Singleton (A)	Singleton (A)
Singleton (A)	Wollondilly (A)	Wollondilly (A)	Wollondilly (A)
Wollondilly (A)	Baw Baw (S)	Wyong (A)	Woollahra (A)
Baw Baw (S)	Bayside (C)	Casey (C)	Wyong (A)
Cardinia (S)	Boroondara (C)	Macedon Ranges (S)	Boroondara (C)
Macedon Ranges (S)	Cardinia (S)	Manningham (C)	Colac-Otway (S)
Manningham (C)	Casey (C)	Melton (S)	Glen Eira (C)
Melton (S)	Colac-Otway (S)	Nillumbik (S)	Manningham (C)
Nillumbik (S)	Macedon Ranges (S)	Yarra (C)	Melton (S)
Whittlesea (C)	Manningham (C)	Beautesert (S)	Nillumbik (S)
Beautesert (S)	Melton (S)	Boonah (S)	Yarra (C)
Boonah (S)	Nillumbik (S)	Caboolture (S)	Beautesert (S)
Caboolture (S)	Stonnington (C)	Pine Rivers (S)	Boonah (S)
Ipswich (C)	Wyndham (C)		Pine Rivers (S)
Logan (C)	Yarra (C)		
	Beautesert (S)		
	Boonah (S)		
	Caboolture (S)		
	Ipswich (C)		
	Pine Rivers (S)		

Table A5.11 Melbourne's North LGAs 2001: total inefficiency and target performance indicators 1991–2006 (per cent)

	Inefficiency (per cent)	Increase in output if inefficiency removed (household productivity)	Inefficiency (employment ratio)
1991			
Banyule (C)	6.7	20.7	0.3
Darebin (C)	20.2	32.8	0.6
Hume (C)	2.5	0.0	0.5
Moreland (C)	17	47.7	-0.3
Nillumbik (S)	0	0.0	-0.1
Whittlesea (C)	0	0.0	0.3
Yarra (C)	3.7	12.0	0.1
Melbourne's North	8.0	17.6	0.2
1996			
Banyule (C)	9.8	20.8	10.4
Darebin (C)	12.1	13.7	14.6
Hume (C)	3.8	3.9	3.3
Moreland (C)	11.6	13.2	13.4
Nillumbik (S)	0	0.0	-0.7
Whittlesea (C)	1.7	1.8	1.7
Yarra (C)	0	0.0	0.6
Melbourne's North	6.3	8.4	7.0
2001			
Banyule (C)	14.1	36.8	17.2
Darebin (C)	15.4	55.4	18.0
Hume (C)	10.5	11.8	12.5
Moreland (C)	10.1	39.6	11.8
Nillumbik (S)	0	0.0	0.3
Whittlesea (C)	8.2	8.9	8.5
Yarra (C)	0	0.0	0.0
Melbourne's North	9.5	24.5	11.1
2006			
Banyule (C)	9.3	34.8	10.7
Darebin (C)	7.3	51.3	7.6
Hume (C)	9.9	11.0	11.1
Moreland (C)	4.8	29.8	4.6
Nillumbik (S)	0	0.0	-0.6
Whittlesea (C)	7.7	8.4	7.8
Yarra (C)	0	0.0	-0.5
Melbourne's North	6.4	21.7	6.7

The appropriate DEA analysis peers (LGAs they should benchmark themselves against) for the Melbourne's North LGAs are:

Melbourne's North LGA	Peer
Banyule	Mosman, Yarra
Darebin	Mosman, Yarra
Hume	Camden, Mosman
Moreland	Mosman, Glen Eira
Nillumbik	Nillumbik
Whittlesea	Mosman, Camden
Yarra	Yarra

A5.11 Driver focus for efficiency improvement

Table A5.12 gives the results from an input oriented DEA analysis. It shows the reduction in driver inputs that could be expected, performance indicators unchanged, in the movement to 100 per cent efficiency. The results are also clear cut. CBD integration, or rather the lack of, and the exploitation of the existing global knowledge employment resources in the Melbourne's North catchment would be the main priority. Further, in global terms, the resident skills are not a priority except that they are not accessing the region's skilled employment opportunities.

So the policy focus to improve Melbourne's North performance should be:

- improvement of transport links within Melbourne's North and with the CBD
- a lifetime learning enhancement of existing resident skills to bring them into balance of what is required to better access catchment employment opportunities
- encouraging local industry to exploit Melbourne's North catchment in terms of knowledge based resources to increase productivity and integrate more efficiently with Melbourne's North catchment supply chains.

Table A5.12 Unexploited driver estimate and priority ranking for efficiency improvement

	Unexploited driver estimates (per cent)						
	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)
2001							
Industry employment in catchment per working age population	-14.2	-24.7	-33.1	-15.5	0.0	-28.2	0.0
Local industry employment per working age population	-14.2	-15.5	-21.2	-10.3	0.0	-8.2	0.0
Reciprocal of distance to CBD	-36.7	-45.6	-85.0	-20.0	0.0	-66.0	0.0
High skilled industry employment in catchment per working age population	-14.8	-21.9	-45.9	-10.0	0.0	-28.9	0.0
Intermediate skilled industry employment in catchment per working age population	-18.7	-31.3	-36.7	-17.0	0.0	-34.3	0.0
Share of university qualified in working age population	-14.4	-15.3	-10.0	-10.0	0.0	-8.6	0.0
Share of technical qualified in working age population	-13.9	-15.7	-10.6	-10.0	0.0	-8.1	0.0
Industry global knowledge workers in working age population	-23.8	-33.8	-80.8	-12.1	0.0	-55.5	0.0
Average industry productivity in catchment	-16.3	-32.5	-27.5	-18.8	0.0	-33.8	0.0
Share of skilled residents in working age population in catchment	-15.4	-24.2	-39.8	-11.6	0.0	-30.6	0.0

Table A5.12 Unexploited driver estimate and priority ranking for efficiency improvement (continued)

	Unexploited driver estimates (per cent)						
	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)
Ranking for efficiency improvement							
Industry employment in catchment per working age population	9	5	6	4	0	7	0
Local industry employment per working age population	8	9	8	7	0	9	0
Reciprocal of distance to CBD	1	1	1	1	0	1	0
High skilled industry employment in catchment per working age population	6	7	3	8	0	6	0
Intermediate skilled industry employment in catchment per working age population	3	4	5	3	0	3	0
Share of university qualified in working age population	7	10	10	10	0	8	0
Share of technical qualified in working age population	10	8	9	8	0	10	0
Industry global knowledge workers in working age population	2	2	2	5	0	2	0
Average industry productivity in catchment	4	3	7	2	0	4	0
Share of skilled residents in working age population in catchment	5	6	4	6	0	5	0

Table A5.12 Unexploited driver estimate and priority ranking for efficiency improvement (continued)

	Unexploited driver estimates (per cent)						
	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)
2006							
Industry employment in catchment per working age population	-12.2	-18.0	-28.4	-15.1	0.0	-28.5	0.0
Local industry employment per working age population	-9.3	-7.2	-16.8	-4.8	0.0	-7.7	0.0
Reciprocal of distance to CBD	-34.4	-23.3	-76.7	-36.0	0.0	-64.0	0.0
High skilled industry employment in catchment per working age population	-16.3	-15.3	-44.9	-14.6	0.0	-35.6	0.0
Intermediate skilled industry employment in catchment per working age population	-9.2	-21.2	-27.3	-12.8	0.0	-28.7	0.0
Share of university qualified in working age population	-9.5	-7.5	-10.0	-4.7	0.0	-7.8	0.0
Share of technical qualified in working age population	-9.5	-7.3	-10.0	-5.0	0.0	-7.5	0.0
Industry global knowledge workers in working age population	-22.9	-24.7	-75.6	-14.7	0.0	-57.1	0.0
Average industry productivity in catchment	-9.4	-10.6	-10.00	-19.4	0.0	-7.5	0.0
Share of skilled residents in working age population in catchment	-13.7	-17.6	-37.6	-13.9	0.0	-32.8	0.0

Table A5.12 Unexploited driver estimate and priority ranking for efficiency improvement (continued)

	Unexploited driver estimates (per cent)						
	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)
Ranking for efficiency improvement							
Industry employment in catchment per working age population	5	4	5	3	0	8	0
Local industry employment per working age population	9	10	7	9	0	8	0
Reciprocal of distance to CBD	1	2	1	1	0	1	0
High skilled industry employment in catchment per working age population	3	6	3	5	0	3	0
Intermediate skilled industry employment in catchment per working age population	10	3	6	7	0	5	0
Share of university qualified in working age population	7	8	8	10	0	7	0
Share of technical qualified in working age population	6	9	8	8	0	9	0
Industry global knowledge workers in working age population	2	1	2	4	0	2	0
Average industry productivity in catchment	8	7	10	2	0	9	0
Share of skilled residents in working age population in catchment	4	5	4	6	0	4	0

A5.12 The key drivers of economic development

The focus for economic development should be on expanding the envelope of the efficiency frontier. The results in Table A5.13 come from running log linear regressions across the 2006 database, with the two performance indicators as alternative dependent variables and all 10 drivers included.

The results are strikingly clear cut. Although attracting new investment into Melbourne's North catchment to create new employment is essential, the best complementary strategy to lift growth will be to upgrade the skills of all residents in the catchment. This is because, as Table A5.13 shows, the share of skilled residents per capita of working age population in an LGA's catchment is the most powerful driver of growth for both performance indicators.

However, as Figure A5.13 shows, the benefits of increasing resident skills decline as the skill ratio moves above 70 per cent.

Table A5.13 Quantitative impact of key drivers of economic development

	Household productivity		Local employment ratio	
	Elasticity	T statistics	Elasticity	T statistic
Industry employment in catchment per working age population	0.83	1.18	0.65	1.31
Local industry employment per working age population	Weak		Weak	
Reciprocal of distance to CBD	Weak: If the resident skills are there CBD integration will be easier		0.02	1.52
High skilled industry employment in catchment per working age population	Weak: If the skilled residents are there the skilled employment will come		Weak: If the skilled residents are there the skilled employment will come	
Intermediate skilled industry employment in catchment per working age population	Weak: If the skilled residents are there the skilled employment will come		Weak: If the skilled residents are there the skilled employment will come	
Share of university qualified in working age population	0.27	5.67	0.18	5.49
Share of technical qualified in working age population	0.06	0.58	0.42	5.58
Industry global knowledge workers in working age population	If the resident skills are there the global knowledge employment will be created		Correlated with share of skilled residents	
Average industry productivity in catchment	Weak: If the resident skills are there the industry productivity will be there		Weak: If the resident skills are there the industry productivity will be there	
Share of skilled residents in working age population in catchment	25.23	6.88	6.30	2.44

Figure 3.3: Household productivity versus skilled residents per capita in catchment

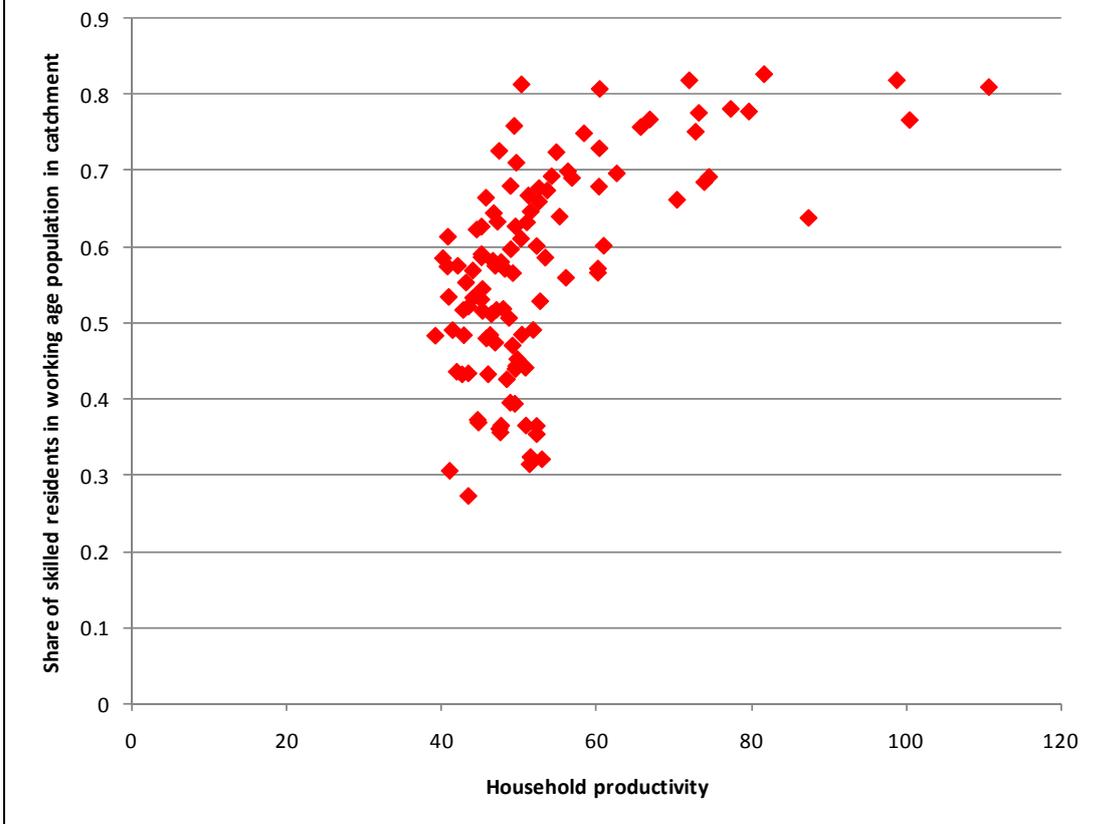


Table A5.14 shows the 2006 resident skill catchment ratios for Melbourne's North LGAs. The inference is that the largest gains from expansion in resident skills (as distinct from increasing the quality of resident skills, which is the focus of efficiency improvement policies) would be Whittlesea. The other LGAs could expect a significant improvement in household productivity. Because Nillumbik always has a high household productivity rank, the benefits could be expected to be relatively modest compared to the average gains.

Table A5.14 Melbourne's North LGAs: resident share ratio in catchment 2006

	Per cent
Banyule	65
Darebin	63
Hume	63
Moreland	64
Nillumbik	53
Whittlesea	57
Yarra	75

Appendix 6 | The macroeconomic structure and interdependency of Melbourne's North

Appendix 6 describes gross regional product (industry) formation in Melbourne's North and the economic interdependency between Melbourne's North LGAs and the rest of Melbourne. Appendix 6 includes the methodology used to obtain the study outputs. The findings are summarised in Chapter 5 of the main report.

A6.1 GDP formation

Table A6.1 shows the structure of demand and GDP formation. The so called 'dormitory' LGAs with a relatively small industry base tend to have household consumption expenditure as a relatively high proportion of total expenditure. The extreme example of this structure in Table A6.1 is Nillumbik, with household consumption expenditure nearly 50 per cent of total LGA expenditures. The gross regional product (industry) share of total expenditure is a low 30 per cent.

At the other extreme are LGAs with relatively high levels of current government expenditures, high out of LGA exports and relatively low total import to expenditure ratios. These LGAs also tend to have a high gross regional product (industry) to total expenditure ratios. The extreme example of this is Yarra. Consumption expenditure only constitutes 23 per cent of total expenditure, current government expenditures is approximately double the share of the other LGAs in the region with the exception of Banyule, and out of LGA exports are 45 per cent of total expenditure. Nillumbik's total out of LGA export share by contrast is less than 20 per cent. As a result, the gross regional product (industry) share of total expenditure is high at 57 per cent.

It can be seen why Yarra is a peer LGA that a number of other LGAs in Melbourne's North should use as a benchmark and target for the evaluation of their economic structures.

The other LGAs in the region fall between these two polar extremes. Banyule has Yarra's advantages in terms of government current expenditure support focused on health expenditures, but is held back by an out of LGA export ratio that is only a little better than Nillumbik's.

Hume has a high out of LGA export ratio, but this is offset by low consumption expenditure contributions to economic activity caused by low household productivity and low household other income sources. It is also held back by low current government expenditure support.

The other LGAs have export ratios in the vicinity of 37 per cent, low current government expenditure contributions, consumption shares around 35 to 39 per cent of total expenditures and import ratios at around 88 per cent of expenditures.

The analysis of Table A6.1 is a reality check on the results of Chapter 4 in that the initial step to lift the performance indicators will have to come from a combination of:

- increased government community infrastructure
- increased out of LGA exports
- reduced out of LGA imports

with the qualification that the increased demand is allocated outside Melbourne's North. Clearly, increasing the quality and quantity of skills for the region is a necessary condition for improvement in the performance indicators. However, for performance indicator improvement to be realised, the improved skill base must be applied to attract investment and production enhancement directed at import replacement or exports out of the region.

Table A6.1 Gross regional product (industry) formation Melbourne's North LGAs: average 2001–2006

	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Total
Share of LGA total expenditure (per cent)								
Consumption expenditure	42	35	19	39	48	35	23	31
Government current expenditure	12	7	4	6	5	5	12	7
Investment – construction	8	9	5	8	14	10	7	8
Investment – equipment	12	13	11	12	14	13	13	12
Intra Victorian exports	14	17	20	15	11	18	17	17
Out of Victoria exports	12	20	41	21	9	20	27	25
Total	100	100	100	100	100	100	100	100
Intra Victorian imports (share of total expenditure)	20.0	19.8	21.0	20.3	21.2	21.4	16.1	19.8
Out of Victorian imports (share of total expenditure)	67.0	66.8	67.4	67.9	69.8	67.6	62.2	66.8
Gross regional product (industry) – share of total expenditure	39	41	35	37	30	34	57	40
Share of Melbourne's North total (per cent)								
Consumption expenditure	17	16	15	18	8	13	14	100
Government current expenditure	20	15	14	11	3	8	30	100
Investment – construction	14	16	16	15	10	14	15	100
Investment – equipment	12	15	22	14	6	12	19	100
Intra Victorian exports	10	15	29	12	3	12	18	100
Out of Victoria exports	6	12	40	12	2	9	20	100
Total	12	15	24	14	5	11	18	100

A6.2 The economic interdependency of Melbourne's North

An input-output, inter-regional trade flow model of Victorian LGAs is applied to estimate the contribution to Melbourne's North and to Victoria as a whole of economic activity in each of the region's LGAs.

The model requirements to carry out the analysis are considerably less sophisticated than what would be required for policy impact analysis or forecasting. This is because a more accounting approach is required built on the principle of proportionality. By proportionality means that if it is established in LGA i that economic drivers in LGA j explain k per cent of its activity, then the other LGAs in Victoria (including i) will explain $1 - k$ per cent of x 's economic activity.

The principal of proportionality is embedded in the model structure by the solution of:

- linear equations
- unitary elasticity parameters for behavioural equations.

For industry i in LGA j the central identity is given by:

$$x_{i,j} = \sum_{k=1}^n y_{i,k,j} + \sum_{l=1}^m r_{i,l,j} + cd_{i,j} + gexp_{i,j} + exo_{i,j} + fdo_{i,j} \quad (\text{A6.1})$$

Where:

$x_{i,j}$ = output of industry i in LGA j ;

$y_{i,k,j}$ = sales of output of industry i in LGA j to industry k located in LGA j .
The $y_{i,k,j}$ represent the intra industry trade flows within the LGA j boundary;

$r_{i,l,j}$ = exports from industry i in LGA j to LGA l ;

$cd_{i,j}$ = sales of industry i in LGA j to final consumers in LGA j ;

$exo_{i,j}$ = exports out of state (interstate and overseas) from industry i in LGA j ;

$gexp_{i,j}$ = government current expenditure in industry i in LGA j ;

$fdo_{i,j}$ = other elements of final demand for industry i in LGA j ; and

n denotes the number of industries and m the number of LGAs.

The supply industry corresponding to (A6.1) is given by:

$$x_{i,j} = \sum_{k=1}^n y_{i,k,j}^m + \sum_{l=1}^m r_{i,l,j} + c_{i,j} + \text{gexp}_{i,j} + \text{exo}_{i,j} + \text{fdo}_{i,j}^m - m_{i,j} \quad (\text{A6.2})$$

Where:

$y_{i,k,j}^m$ = sales of industry i products in LGA j to industry k located in LGA j .
The $y_{i,k,j}^m$ represent the intra industry trade flows within the LGA j boundary, including all imports whether from other LGAs in Victoria, interstate or overseas

$c_{i,j}$ = total consumption expenditure in industry i productions by consumers in LGA j

$m_{i,j}$ = total imports of industry i products into LGA j from other LGAs in Victoria, interstate or overseas suppliers

$\text{fdo}_{i,j}^m$ = other final demand expenditures (e.g. investment) for industry i products in LGA j .

Household income is defined as:

$$\text{hdi}_j = (w_j + \text{bi}_j + \text{cb}_j + \text{pi}_j - \text{ic}_j) * \text{tr}_j \quad (\text{A6.3})$$

Where:

hdi_j = household disposable income in LGA j

w_j = total wages and salary income accruing to households in LGA j

cb_j = total cash benefits for households in LGA j

pi_j = total property income for households in LGA j

ic_j = interest costs for households in LGA j

tr_j = average household tax rate for households in LGA j .

The principle of proportionality suggests the following. Total consumption expenditure:

$${}^o c_j = {}^o hdi_j \quad (\text{A6.4})$$

$${}^o c_{i,j} = \alpha_i \cdot {}^o c_j \quad (\text{A6.5})$$

$${}^o ts_{i,j} = x_{i,j} + m_{i,j} \quad (\text{A6.6})$$

$${}^o m_{i,j,r} = {}^o m_{i,j,o} = {}^o m_{i,j} \quad (\text{A6.7})$$

$${}^o m_{i,j} = {}^o ts_{i,j} \quad (\text{A6.8})$$

$${}^o cd_{i,j} = {}^o c_{i,j} \quad (\text{A6.9})$$

$${}^o e_{i,j} = x_{i,j} \quad (\text{A6.10})$$

$${}^n y_{i,k,j} = a_{i,k,j} \cdot x_{k,j} \quad (\text{A6.11})$$

$$y_{i,k,j} = a_{i,k,j} \cdot x_{k,j} \quad (\text{A6.12})$$

$$f_{i,l,j} = r_{i,l,j} / m_{i,l} \quad (\text{A6.13})$$

Where:

- o denotes percentage rate of change
- α_i = elasticity of industry i product with respect to total consumption expenditure
- ${}^o ts_{i,j}$ = total supply of industry i product in LGA j
- ${}^o m_{i,j,r}$ = imports of industry i products by industry in LGA j from other LGAs in Victoria
- ${}^o m_{i,j,o}$ = imports of industry i products by industry in LGA j from other sources outside Victoria
- ${}^o e_{i,j}$ = employment by industry i in LGA j
- ${}^n a_{i,k,j}$ = the intra LGA technological input-output coefficient
- $a_{i,k,j}$ = the intra LGA input-output coefficient with the direct allocation of imports.

$$\sum_j^r = \sum_{l=1}^n \sum_{i=1}^n jtw_{i,l,j} e_{i,l} \quad (\text{A6.14})$$

Where:

\sum_j^r = total number of residents employed in LGA j

$jtw_{i,l,j}$ = proportion of residents in LGA j employed in industry i in LGA l .

$$TW_j = \sum_{l=1}^n \sum_{i=1}^n aw_{i,l} \cdot jtw_{i,l,j} \cdot e_{i,l} \quad (\text{A6.15})$$

Where:

$aw_{i,l}$ = average earnings of employment in industry i in LGA l .

And finally:

$$grp_j = \sum_{l=1}^n va_{i,j} \cdot x_{i,j} \quad (\text{A6.16})$$

Where:

grp_j = gross regional product in LGA j

$va_{i,j}$ = value added ratio for industry i in LGA j .

Business income for residents in LGA j is determined from an industry similar to (A6.14). There are 79 LGAs in Victoria, including an unincorporated zone.

A6.3 Melbourne's North economic interdependency estimates

Table A6.2 profiles the economic interdependency estimates from the perspective of resident employment. The results in the table are obtained by setting all internal demand components at zero, intra-Victorian imports at zero and industry employment at zero for an individual LGA, and then assessing the impact on the Victorian economy.

Taking Banyule as an example, if economic activity was eliminated in Banyule the resident employment would fall by 28 per cent, 10 per cent in Darebin, 7 per cent in Whittlesea and so on. For Melbourne's North as a whole, Banyule contributes 9 per cent to total employment and 2.4 per cent for Victoria as a whole.

The largest contribution to Victorian employment comes from Hume, explaining 4.5 per cent of Victorian total employment.

However, the largest contribution to Melbourne's North total resident employment comes from Whittlesea, with a 12 per cent contribution, whereas Whittlesea's contribution to total Victorian employment is only half that of Hume. The reason is that Hume's economic linkages extend strongly outside Melbourne's North to the rest of Victoria, whereas Whittlesea's economic linkages are, to a much greater extent, confined to Melbourne's North.

Moreland's and Yarra's impact on Melbourne's North is also relatively small because, similar to Hume, these LGAs have strong linkages outside Melbourne's North. One reason for this is that the residents of these regions rely less on Melbourne's North for direct or indirect employment.

Table A6.2 Melbourne's North economic interdependency: beneficiary of resident employment (per cent of total)

Source of resident employment	Banyule (C)	Darebin (C)	Hume (C)	Moreland (C)	Nillumbik (S)	Whittlesea (C)	Yarra (C)	Melbourne's North
Banyule (C)	-27.9	-10.2	-5.4	-3.3	-4.2	-6.6	-5.6	-9.1
Darebin (C)	-5.3	-24.9	-6.1	-6.1	-0.8	-6.1	-9.3	-9.0
Hume (C)	-2.2	-4.3	-41.4	-7.8	-0.5	-4.9	-6.3	-11.2
Moreland (C)	-2.4	-5.4	-11.0	-22.0	-0.5	-2.7	-6.3	-8.1
Nillumbik (S)	-14.5	-7.0	-5.8	-2.6	-24.3	-7.7	-4.4	-8.3
Whittlesea (C)	-7.7	-13.9	-12.0	-5.5	-1.6	-30.2	-5.1	-12.0
Yarra (C)	-2.1	-3.5	-2.7	-2.6	-0.5	-1.3	-24.4	-4.6
Total	-62.0	-69.1	-84.5	-50.0	-32.4	-59.5	-58.0	-62.2
Total (excluding own LGA)	-34.1	-44.3	-43.1	-27.9	-8.1	-29.3	-33.6	-33.5
Victoria	-2.4	-2.8	-4.5	-2.5	-0.9	-2.2	-3.7	-19.0

A6.4 Dormitory employment status versus catchment economic development

The point was made earlier in this chapter that, for performance indicators to improve significantly, at least from Melbourne's North perspective, net trade enhancement has to be realised. Of course Melbourne's North does have the option of largely supplying employees to industry outside the region if, for example, Melbourne's North was unwilling or unable to supply the appropriate infrastructure. Land use planning moves to the centre of the debate in this case.

For land constrained LGAs, the perennial issue in land use planning is rezoning from industrial/commercial to residential, and especially industrial to residential. The issue becomes particularly focused when there are capacity closures and the land becomes available for redevelopment. The question then becomes one of whether or not existing land use zoning is maintained, which may result in a number of years of vacant land before new development occurs, or if the land should be rezoned to residential to achieve a shorter time period for redevelopment, which will be the most likely outcome.

Even for more fringe LGAs with unutilised industrial land, the key determinant of its rate of development will be the scale of unutilised land in the vicinity of transport/distribution infrastructure, which has to be of a strategic size. That is, large enough to attract major investment with the confidence that there will be enough excess capacity to accommodate the expansion plans of the core cluster of firms that would be created in support industries. Competing demands may limit the size of the land provision, thereby restricting participation to lower value added enterprises focused on meeting local and regional demands.

Table A6.3 gives the results of the model described above, where there is a 10 per cent across the board (i.e. across all industries and Melbourne LGAs) in out of state exports. In this case, Hume would gain an increase in resident employment of 2,650 and a 3,883 increase in industry employment. Total Melbourne employment increases by 65,000.

The second model run shows non-metropolitan north participation in the out of state export expansion. That is, it represents the case where Melbourne's North LGAs do not increase out of state exports, compared to model run one, and the exports that Melbourne's North does not now provide are supplied by non-metropolitan north's LGAs on a pro-rata basis. In this case, from Table A6.3, Hume's increase in resident employment falls to 1,342 and industry employment to 473.

For Melbourne's North as a whole, if it participates in export expansion, then the resident employment gain is just under 14,000 and industry employment gain is 12,200. If Melbourne's North does not participate then the resident employment gain is reduced to 8,725 and the industry employment gain falls to an increase of just under 2,000.

If the non-participation of Melbourne's North in the export expansion was due to the unwillingness or inability to provide land and infrastructure because it had been diverted to residential use, then the outcomes will not end with the results in Table A6.3.

Assume that every Melbourne's North JTW employment loss from Table A6.3 represents a 75 square metre land conversion (from industrial/commercial to residential) per employment position lost. Alternatively, the opportunity cost is residential zoning where industrial zoning would have occurred. As the JTW employment loss for Melbourne's North is 12,196 minus 1,947 or 10,249, this amounts to 77,000 square metres of land use. Next assume (to keep it simple but not implausible) that every 75 square metres (based on build area of land only) attracts one additional population to the area with 50 per cent of the additional population being of working age. This would mean that there were 5,125 additional people that could potentially be seeking employment. So nearly 60 per cent of the new employment positions created in the region (that is, 8,725 at a maximum) could go to new population entrants rather than the existing population. In any case, across Melbourne, Melbourne's North would have the slowest rise in the employment to population ratio, or the smallest decline in the unemployment rate.

Table A6.4 examines the case of an increase in out of state exports from Melbourne's North LGAs only, compared with the alternative case of the same out of state export increase being restricted to western and south-east Melbourne LGAs. In this case, Melbourne's North total residential employment gains by 18,400 and industry employment by 29,000. The alternative expansion in western and south-east Melbourne reduces Melbourne's North resident employment gain to half that achieved when the region was the driver of exports, while the industry employment gain is reduced by 70 per cent. The rule that comes from the analysis, therefore, is for every 10 industry employment positions foregone or lost to Melbourne LGAs outside Melbourne's North (because of land use planning that does not at least maintain the attraction of industry investment in Melbourne's North), the north's residents will lose between four and five employment positions.

Table A6.3 LGA implications of general Melbourne out of state export expansion with or without Melbourne's North participation

	Resident employment (number)		Industry employment (number)		Resident employment (per cent)		Industry employment (per cent)	
	All LGA participation	Non-Melbourne's North participation	All LGA participation	Non-Melbourne's North participation	All LGA participation	Non-Melbourne's North participation	All LGA participation	Non-Melbourne's North participation
Banyule (C)	1,992	1,288	945	216	3.0	2.0	1.4	0.3
Bayside (C)	1,635	1,848	730	851	2.5	2.8	1.1	1.3
Boroondara (C)	2,841	2,934	1,557	1,821	4.3	4.5	2.4	2.8
Brimbank (C)	3,039	2,970	1,710	2,004	4.6	4.6	2.6	3.1
Cardinia (S)	877	1,017	488	563	1.3	1.6	0.7	0.9
Casey (C)	3,660	4,254	1,170	1,365	5.6	6.5	1.8	2.1
Darebin (C)	2,127	1,367	1,665	315	3.3	2.1	2.5	0.5
Frankston (C)	1,973	2,292	975	1,131	3.0	3.5	1.5	1.7
Glen Eira (C)	2,285	2,554	871	1,021	3.5	3.9	1.3	1.6
Greater Dandenong (C)	2,417	2,813	3,982	4,738	3.7	4.3	6.0	7.2
Hobsons Bay (C)	1,650	1,812	1,664	1,972	2.5	2.8	2.5	3.0
Hume (C)	2,650	1,342	3,883	473	4.1	2.1	5.9	0.7
Kingston (C)	2,815	3,254	4,140	4,928	4.3	5.0	6.3	7.5
Knox (C)	3,169	3,635	2,919	3,459	4.8	5.6	4.4	5.3
Manningham (C)	2,020	1,965	589	684	3.1	3.0	0.9	1.0
Maribyrnong (C)	1,081	1,130	1,575	1,859	1.7	1.7	2.4	2.8
Maroondah (C)	1,890	2,107	1,463	1,709	2.9	3.2	2.2	2.6
Melbourne (C)	1,081	1,154	13,869	16,497	1.7	1.8	21.0	25.2
Melton (S)	1,018	1,001	244	278	1.6	1.5	0.4	0.4

Table A6.3 LGA implications of general Melbourne out of state export expansion with or without Melbourne's North participation (continued)

	Resident employment (number)		Industry employment (number)		Resident employment (per cent)		Industry employment (per cent)	
	All LGA participation	Non-Melbourne's North participation	All LGA participation	Non-Melbourne's North participation	All LGA participation	Non-Melbourne's North participation	All LGA participation	Non-Melbourne's North participation
Monash (C)	3,185	3,622	4,255	5,075	4.9	5.6	6.5	7.8
Moonee Valley (C)	2,102	1,937	1,007	1,165	3.2	3.0	1.5	1.8
Moreland (C)	2,375	1,687	1,424	227	3.6	2.6	2.2	0.3
Mornington Peninsula (S)	1,769	2,053	1,105	1,293	2.7	3.2	1.7	2.0
Nillumbik (S)	1,111	703	308	88	1.7	1.1	0.5	0.1
Port Phillip (C)	1,994	2,179	3,302	3,905	3.1	3.3	5.0	6.0
Stonnington (C)	1,885	2,046	1,423	1,668	2.9	3.1	2.2	2.5
Whitehorse (C)	2,613	2,839	2,137	2,518	4.0	4.4	3.2	3.8
Whittlesea (C)	2,150	995	1,301	283	3.3	1.5	2.0	0.4
Wyndham (C)	1,742	1,920	1,255	1,470	2.7	3.0	1.9	2.2
Yarra (C)	1,584	1,343	2,671	345	2.4	2.1	4.0	0.5
Yarra Ranges (S)	2,651	3,015	1,343	1,554	4.1	4.6	2.0	2.4
Total Melbourne	65,385	65,078	65,971	65,477	100.0	100.0	100.0	100.0
Melbourne's North	13,989	8,725	12,196	1,947	21.4	13.4	18.5	3.0

Table A6.4 Out of state export expansion in Melbourne's North vis-à-vis Melbourne west/south-east

	Resident employment (number)		Industry employment (number)		Resident employment (per cent)		Industry employment (per cent)	
	Melbourne North expansion	Melbourne west/ south-east expansion	Melbourne North expansion	Melbourne west/ south-east expansion	Melbourne North expansion	Melbourne west/ south-east expansion	Melbourne North expansion	Melbourne west/ south-east expansion
Banyule (C)	2,512	1,310	2,089	672	7.7	4.0	6.2	2.0
Bayside (C)	327	850	90	516	1.0	2.6	0.3	1.5
Boroondara (C)	1,177	1,794	177	1,119	3.6	5.5	0.5	3.4
Brimbank (C)	1,638	1,174	189	162	5.0	3.6	0.6	0.5
Cardinia (S)	118	407	73	336	0.4	1.3	0.2	1.0
Casey (C)	479	1,200	142	821	1.5	3.7	0.4	2.5
Darebin (C)	2,708	1,419	3,844	1,212	8.3	4.4	11.3	3.6
Frankston (C)	260	799	130	678	0.8	2.5	0.4	2.0
Glen Eira (C)	522	1,228	95	624	1.6	3.8	0.3	1.9
Greater Dandenong (C)	310	537	288	271	1.0	1.7	0.9	0.8
Hobsons Bay (C)	448	580	137	124	1.4	1.8	0.4	0.4
Hume (C)	4,182	1,658	9,621	2,908	12.8	5.1	28.4	8.7
Kingston (C)	408	833	294	276	1.3	2.6	0.9	0.8
Knox (C)	520	1,000	240	227	1.6	3.1	0.7	0.7
Manningham (C)	1,106	1,243	78	417	3.4	3.8	0.2	1.3
Maribyrnong (C)	419	471	148	133	1.3	1.5	0.4	0.4
Maroondah (C)	443	1,014	171	1,045	1.4	3.1	0.5	3.1
Melbourne (C)	369	726	1,004	10,331	1.1	2.2	3.0	31.0
Melton (S)	536	388	43	36	1.6	1.2	0.1	0.1

Table A6.4 Out of state export expansion in Melbourne's North vis-à-vis Melbourne west/south-east (continued)

	Resident employment (number)		Industry employment (number)		Resident employment (per cent)		Industry employment (per cent)	
	Melbourne North expansion	Melbourne west/ south-east expansion	Melbourne North expansion	Melbourne west/ south-east expansion	Melbourne North expansion	Melbourne west/ south-east expansion	Melbourne North expansion	Melbourne west/ south-east expansion
Monash (C)	590	1,125	280	264	1.8	3.5	0.8	0.8
Moonee Valley (C)	1,390	1,065	144	121	4.3	3.3	0.4	0.4
Moreland (C)	2,674	1,528	3,392	1,049	8.2	4.7	10.0	3.1
Mornington Peninsula (S)	236	950	125	769	0.7	2.9	0.4	2.3
Nillumbik (S)	1,433	721	640	214	4.4	2.2	1.9	0.6
Port Phillip (C)	566	1,291	288	2,426	1.7	4.0	0.8	7.3
Stonnington (C)	564	1,179	155	1,028	1.7	3.6	0.5	3.1
Whitehorse (C)	776	1,468	206	1,554	2.4	4.5	0.6	4.7
Whittlesea (C)	3,587	1,435	2,919	931	11.0	4.4	8.6	2.8
Wyndham (C)	458	543	140	122	1.4	1.7	0.4	0.4
Yarra (C)	1,304	1,054	6,553	1,994	4.0	3.3	19.3	6.0
Yarra Ranges (S)	491	1,402	191	937	1.5	4.3	0.6	2.8
Total Melbourne	32,551	32,392	33,885	33,317	100.0	100.0	100.0	100.0
Melbourne's North	18,400	9,126	29,058	8,981	56.5	28.2	85.8	27.0

Appendix 7 | LGA indicator explanations

LGA indicators

Population

Residential population by region for 2003 to 2007 is taken from the Australian Bureau of Statistics' (ABS) *Estimated resident population* (ERP) series. The 2008 population was derived from the household growth for 2007–2008 and constrained to 2008 state population growth. The 2008 household total was derived by increasing the 2007 household total by the number of dwelling approvals.

Workforce

Before 2005, the workforce is based on NIEIR's unemployment level plus employment based on the tax statistics. This is driven forward using a measure of the labour force adjusted for the movement of people from the workforce to Disability Support Pensions (DSP). The labour force estimates are produced by the Department of Education, Employment and Workplace Relations (DEEWR). The information is contained in the *Small Area Labour Markets* publication that is produced quarterly. The labour force is defined as the yearly average level for 2003 to 2008. The average DEEWR figure is added to the excess movement to DSPs. Excess movement is defined as any growth in excess of the rate of growth in the general population. It therefore assumes that there is a natural level of people (expressed as a per cent of the population) who need to access the DSP. The DSP data is ascertained from Centrelink. The rationale for adding in people who move from unemployment benefits to disability support is to measure the real labour force. If a person is receiving unemployment benefits, they are counted as part of the labour force. However, when people move from unemployment benefits to the DSP, they are excluded. This impacts on the unemployment rate, which is defined as the number of unemployed divided by the labour force.

Employment

Before 2005, this is based on the tax statistics adjusted to NIEIR definitions. This NIEIR measure of employment is the adjusted labour force as defined above, minus the estimated NIEIR unemployment level. This means that some unemployed people will be working a small number of hours. The NIEIR employment estimates exclude those employees who are on benefits while working a small number of hours.

NIEIR unemployment rate

This is an NIEIR measure derived from Centrelink data. It includes all people receiving Newstart allowance, Mature Age Allowance, excess growth in DSP (that is, at a level greater than population growth), youth allowance as a non-student and an estimate of students on youth allowance who are, for example, unemployed and undertaking compulsory training. This latter measure is based on demographic trends and microsimulation. This measure was discussed at length in *State of the Regions* (SOR) report 2005–06, Chapters 10 and 11.

Headline unemployment

This is the unemployment rate produced by DEEWR. The information is contained in the *Small Area Labour Markets* publication. It contains estimates of employment, labour force participation, unemployment and the unemployment rate by statistical local areas (SLAs). NIEIR does additional adjustments to the data to smooth the series. So it is now designated the headline unemployment rate to denote that it is not exactly equal to the DEEWR series.

NIEIR structural unemployment

This is a measure of the level of long-term unemployed as a percentage of the population aged 21 to 65 years old. It includes all those classified as long-term unemployed, those receiving disability support pensions, 50 per cent of people from a non-English speaking background receiving Newstart allowance, 50 per cent of people receiving single parents' benefits and all people receiving the Mature Age Allowance. This measure excludes people on Newstart allowance short-term and anyone receiving youth allowance. It therefore assumes that none of the youth are structurally unemployed.

Disposable funds and productivity

Source: Australian Tax Office Taxation Statistics, National Accounts Data

In past SOR reports, NIEIR used a net flow of funds concept. This has been changed to accord directly with the net household disposable income and business value added. All state totals are reconciled to the household accounts in the ABS 'State Accounts'.

The household disposable income indicator for each LGA is household disposable income from wages and salaries (including supplements, e.g. superannuation contributions) plus benefits and business income (adjusted to gross operating surplus basis consistent with the State Accounts) and interest and dividends received (including superannuation accrued earnings) and rent income less direct taxes, interest paid and depreciation expenses. The ABS 'other income' is treated as a balancing item. All data are in real dollars, which for this year are in 2005–06 prices.

To 2006, all data are derived from the postcode tax statistics. The data is estimated for 2006–07 and 2007–08 using the following methods.

Wages/salaries

The following dot points outline the calculation of the non-farm components of wages and salaries income.

- Recent growth in income from taxation records provides the trend in income per person that can be expected in each region. This measure is required due to the very large differences in wage growth at the regional level.
- Growth in employment at the local area level is combined with growth in income per employee and the base levels of income from taxation statistics to produce updates of income at the regional level.

- State and national account control totals are then used to balance wages and income growth.
- As with all information collected from taxation statistics, the data is converted from postcode definitions to ABS regions using the 2001 Postcode to SLA concordance provided by the ABS.

Again, farm income is estimated using rainfall data as a proxy for the impact of the drought on regional incomes. The change in rainfall from long-term average is used as a basis for allocating farm income on a regional basis. Farm income cannot be derived from declared taxable income from primary production due to problems of declaration and the transfer of losses between tax years. Instead, the NIEIR estimate is based on the most recent measure of gross agricultural output converted to a realised income measure consistent with national accounts. In this process, differences between the relative income generating capacity of various agricultural activities are accounted for. By varying the incomes derived by the estimate of the impact of drought, a reasonably accurate distribution of incomes for 2008 is obtained.

Taxes paid

This total income tax paid is the net tax paid after deductions and rebates. It includes the Medicare levy as well as the additional Medicare levy for high-income taxpayers. The 2003 to 2006 figure is based on reported taxation statistics. The 2007 and 2008 figures have been adjusted by state control totals, using estimates of income created earlier.

Benefits

This figure is an estimate of the total amount of benefits received at the local level. The amount includes all benefits and allowances received from Centrelink and an indicative assessment of the contribution of Community Development Employment Program income in remote areas. Figures for all years are based on recipient data. This measure does not include the income derived from Department of Veterans' Affairs benefits.

Business income

The business income for a region is effectively based on the value of the businesses that operate in the region and the relative performance of the economy as a whole. Unfortunately, the net business income as reported in taxation statistics does not adequately capture the total impact of business income. NIEIR utilises small area microsimulation of the value of unincorporated businesses based on realised cash flows. Using state control totals and the estimated value of business assets, the destination of business income can be adequately measured. The changes in business income reflect both the evolution of business values through time as well as the macro-economic trends captured in economy wide reported values of business income.

Interest paid

The amount of interest paid by the household sector is a function of the stock of debt, the nature of the debt and interest rates applied. In order to keep abreast of the impacts of the rising level of household debt in the late 1990s, NIEIR developed a Household Debt Model that estimates the impact of debt at the local level. One of the measures derived from such modelling is the amount of interest that is paid by the household sector on debt. The debts incurred in running unincorporated businesses are not included, but are used in the net business income estimates presented in the table. The debt included covers housing, personal finance and credit card debt. These model estimates are balanced to state and national control totals automatically. The relatively large increase in the amount of interest paid across the period 2003 to 2008 reflects the continued strong growth in household debt throughout the same period.

Net property income

Net property income is derived from taxation statistics, and balanced to state control totals. This small measure cannot be updated at the local levels and so NIEIR relies on state trends to derive the 2007 and 2008 estimates.

Business value added

Business value added is wages and salaries plus business income. Productivity is business value added divided by employment. Business value added excludes the gross surplus of companies, since this is difficult to allocate to any small geographic area. For LGAs that are relatively isolated, business value added represents the LGA's capture of gross regional product. For LGAs in major metropolitan areas, this is not necessarily the case because it is based on the household sector. However, for SOR aggregated LGAs, the measure is a good indicator of the SOR region's capture of gross product.

Household disposable income

The household disposable income estimates are benchmarked to the ABS net (that is, after depreciation) household disposable income estimates in ABS State Accounts.

This means an estimate for superannuation supplements is added to wages. Also required (other than what has been outlined above) are estimates for:

- imputed owner occupier rental income
- depreciation.

Imputed owner occupier rental income is based on the value of owner occupied property in an LGA. Depreciation state totals are allocated to LGAs on the basis of a weighted average of the replacement value of the dwelling stock by LGA and the market value of the dwelling stock.

Financial assets, liabilities and wealth

All wealth estimates are benchmarked back to the ABS Australian National Accounts – Financial Accounts and National ABS estimates for dwelling stock and value of unincorporated business assets.

National financial assets are divided into two types – direct income generating financial assets and financial assets on which an imputed income is added to household income, namely superannuation assets for working households. Direct financial assets are allocated to LGAs on the basis of the taxation statistics' interest received data.

Imputed financial assets are allocated to LGAs using microsimulation modelling based on the ABS Household Income Survey (HES) unit and data for 2003–04 and earlier HES years.

The same procedure is adopted for allocating household total liabilities. For the benchmark years, e.g. 2006, a key Census variable in the microsimulation modelling is household mortgage debt service costs.

The value of unincorporated business assets is derived from the SOR LGA business income estimates, which in turn are based on the taxation statistics and ABS State Income Accounts.

The value of housing is based on property values outlined below and Census benchmarks for average rent paid by renters. The rental property is allocated back to the LGA of the owners based on rental income estimates, which in turn is derived from tax statistics.

The wealth indicator in the tables is equal to value of dwellings owned by residents of an LGA plus holdings of financial assets less stock of household liabilities.

The household debt service ratio equals interest paid on debt plus 0.07 of the outstanding stock of liabilities.

Household income less loan repayments equals household disposable income less 0.07 times the stock of outstanding financial liabilities.

The household income measure used for the debt to income ratio is household disposable income plus depreciation plus interest paid.

Baby bounce

Source: ABS

The estimates of effective fertility are calculated using the individual year estimated resident population (ERP) at the SLA level. These amounts are aggregated to the SOR region, with the effective fertility equalling the share of total population represented by those aged less than one year. It is 'effective' in the sense that the actual birthplace is not collected, rather the place at which the infant lives at June 30th in their first year.

Social security

Source: Centrelink

Summarised from postcode level values provided by Centrelink and divided by population.

Population and migration

Source: ABS Estimated Regional Population

The presentation of ageing, population and migration information is primarily based on the ABS report census migration rates, ABS ERP series by age 2003 to 2007, and NIEIR population and migration modelling program called PopInfo.

The calculation of migration patterns relies heavily on the trends established in the ABS *ERP by Age* series. Based on reported changes in population and age distribution at the LGA level and recent migration patterns, population movements are modelled to produce the population outcomes estimated in the 2007 ERP series. The extent to which such a series has incorrectly modelled the actual 2007 estimated resident population by age will create errors in the modelled net flows of migration. The other balancing items crucial to this modelling on an intercensal basis are the state control totals of net migration from both overseas and interstate.

Population movement – where they were in 2001

With reference to the SOR region as the current place of residence, the table illustrates where the current population was located in 2001 as a proportion. The data is obtained from the 2006 Census by usual residence.

The table is disaggregated into four different age cohorts. The categories include 0–19, 20–29, 30–54 and 55+. The total category refers to all age groups.

The location in 2001 has been split into six groups; they are:

1. not yet born – includes the proportion of the population who are less than 5 years of age
2. same address – the proportion of the population who lived at the same address in 2001
3. local move (same LGA) – the proportion of the population that have either not moved out of the municipality or have moved locally; for the metropolitan region, a local move is considered to be 10 km or less and 50 km or less for a regional area
4. other Australia – the proportion of the population who in 2001 did not live at the same address, did not move within the same LGA, nor moved locally, but is known to have come from another Australian address
5. overseas – the proportion of the population who were living overseas in 2001
6. not stated – includes those people who did not write down where they lived in 2001.

Population sustainability

This suite of measures was fully described in Chapter 8 of the 2006–07 SOR report. The individual measures are as follows.

- Percentage of years since 1995 in which the population has grown, from the *ABS Estimated Regional Populations*. This can be termed consistency of population growth.
- Share of population under 55 in 2001, from the Census.
- Aged migration: estimated in-migration of persons aged 55 and over, 2001–06, as a percentage of population.
- Population growth rate, 55+: estimated rate of growth of population 55 and over.
- Demographic stress: a US government measure based on the total levels of out-migration and the growth rate of the 15 to 55 year age group.
- Dominant locations: the share of population of the largest urban locality within the region.
- Family/youth migration: net migration of 0–14 year olds 2001–06, from the Census.
- Fertility bounce 1997–06, see baby bounce previously.

- Fertility, babies as a percentage of the population 2006, see baby bounce previously.
- Sustainability score: a compound of the previous measures.
- Working elderly: share of persons aged 55 and over who are employed, from the 2001 Census.

Residential and non-residential building and construction

Source: ABS publication 8731.0 – Building Approvals Australia

Building approvals data is converted to constant price values. Forecasts are derived using NIEIR construction models.

Innovation start-ups

Source: Dunn & Bradstreet

Innovation start-up estimates are defined as the total number of high-tech companies in 2008 that were not present in 2001. The rank of each region was based on the gross number of high-tech start-ups per capita. Average employment figures for both 2001 and 2008 were obtained by taking only hi-tech businesses that reported at least an employee. New start-up employment is calculated as the gross number of high-tech start-ups multiplied by the average number of employees for 2006. This was then taken as a percentage of the workforce.

Businesses by industry type

Source: Dunn & Bradstreet

All businesses by industry type are from the Dunn & Bradstreet database, listings used as at 30 June 2006, 2007 and 2008. Businesses where an industry type could not be established have not been included.

Patent applications

Patent applications per 100,000 people

This indicator measures the number of patent applications from businesses and individuals over a 10-year period. It is an average from 1994 to 2007, expressed as the number of patents per 100,000 residents. Expressing the measure in these terms allows for regional comparisons.

The patent data is provided by the Australian patent office (IP Australia). The number of applications was chosen over patents granted, due to the long delays associated with the granting of patents. In some cases this can be up to five years.

This measure acts as a proxy for scientific innovation, knowledge endowment and entrepreneurial dynamism. Regions with a high value for this indicator will generally prosper, as innovation leads to greater value added and wealth creation.

High-tech and IT applications per 100,000 people

The patent application data is grouped into 31 different classifications. The following classifications were identified as 'high-tech':

- electrical devices and engineering
- information technology
- optics
- instrumentation
- medical engineering
- polymers
- pharmaceuticals
- biotechnology
- environmental processes
- nuclear engineering
- space technology, weapons.

