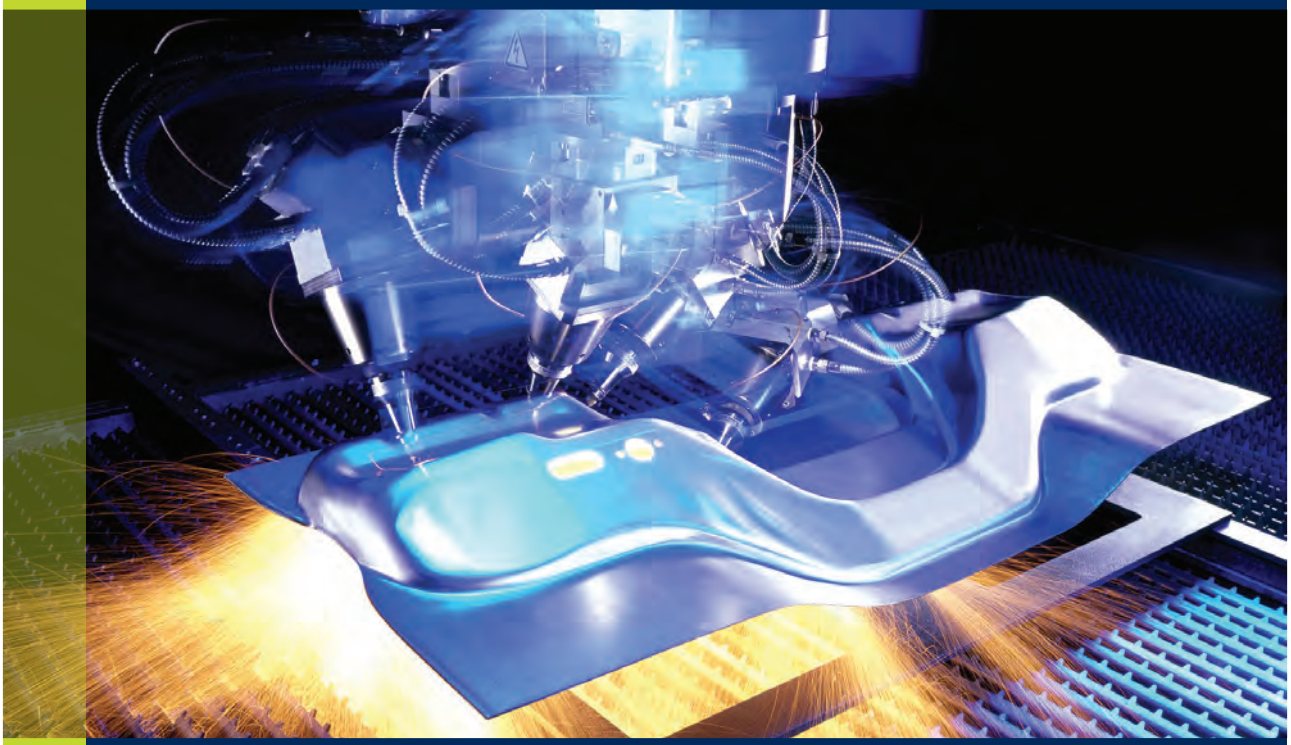


Manufacturing in Melbourne's North: Now and into the future.

A Northern Melbourne RDA report

Regional Development
Regional Development Australia and Regional Development Victoria
NORTHERN MELBOURNE

NORTHLink
Networking for Economic Development

Foreword

The manufacturing industry is critical to the future of Melbourne's North and so we need to ensure that it survives and grows.

Our region is a great place to live and work in. But it already faces some disadvantage and we know that our population is growing at a significant rate. So we need to secure our future in the best way that we can.

There are many reasons why manufacturing is important to Melbourne's North. It's the largest employing sector we have and it provides our workers with well-paid jobs. Many of our residents have skills that relate to manufacturing, and these skills can't be easily transferred to other sectors. Studies in other places have shown that any reduction in the number of manufacturing jobs often leads to workers being stranded in lower paid, less permanent positions. This leads to an impact that spreads adversely across the whole regional economy.

We've already taken a hit over recent years. Our manufacturing share of gross regional product has fallen from 26.5 per cent in 1998 to 16.3 per cent in 2011. And if it falls any more, there will be real problems for our supply chains and other businesses. Our regional economy will become unbalanced and it might not recover easily, if at all.

We commissioned this report because we want to identify actions that can be taken now to keep our share of gross regional product at between 15 and 16 per cent. To do that accurately, we needed to find out what the state of the industry is now and exactly how important it is to our region's future.

The three main manufacturing industry sectors in Melbourne's North are automotive, food processing and chemicals. But many small and medium sized enterprises across all sectors are struggling. We need to find ways to support all our manufacturing businesses – identify what they require and give them the impetus they need to survive and thrive.

This report makes a number of recommendations on how we can make strategic interventions that will help. Our brief to the consultants was to make recommendations that were practical, realistic and that would provide the biggest 'bang for the buck'. They've come up with a four-tiered holistic strategy that will help to achieve our aims and improve our region's competitive advantage.

At the heart of the recommendations is the need for high-level management training activities relating to knowledge, skills and technology diffusion for small and medium sized enterprise

owners and managers. A key advantage is that, as a region, we've already worked hard to create the networks through which these activities could be carried out.

Other recommendations include:

- improving links between industry and research organisations/universities
- creating opportunities for export growth
- facilitating interventions to assist retrenched workers into comparable jobs
- promoting the Cities of Hume and Whittlesea in particular as manufacturing centres of excellence
- supporting the establishment of business incubators.

Adopting these recommendations will give us the best chance of moving into the future with a strong local manufacturing industry that is efficient, productive and competitive.

It's a big job and we can't succeed on our own. We need governments at every level to work with us.

Doing nothing will leave the industry to wind down, which will have an adverse effect on local businesses, local residents and the local economy. Longer term, it will result in us losing our knowledge, skills and R&D.

Please take the time to read this comprehensive report and most importantly, its recommendations. Our task is to work together, starting immediately, and make the strategic interventions required to retain this vital part of our regional economy.

Bob McQuillen
Chair, NMRDA

Contents

List of tables

List of figures

Executive summary and recommendations

Manufacturing is very important to Melbourne's North in a number of ways. The industry provides well paid employment and many of its residents have skills that are related to manufacturing. The region's hard and soft infrastructure and new developments will support hi-tech manufacturing exports, including Melbourne Airport, freight and logistics developments, and relocation of the Melbourne Wholesale Fruit and Vegetable Market (as well as the food processing cluster opportunities this may generate).

Manufacturing can also help to maintain an overall balanced economic structure that allows long term sustainable growth in living standards. For a region, this suggests a manufacturing share in total product of around 15 to 16 per cent. Manufacturing share of gross regional product (GRP) in Melbourne's North has fallen from 26.5 per cent in 1998 to 16.3 per cent in 2011. This shows decline in the manufacturing sector and that other sectors have grown their share of GRP. The issue is that if share of manufacturing GRP declines further, there is likely to be problems for local supply chains and an imbalance in the macroeconomic structure of the local economy.

This study was informed by an extensive process of data analysis, a detailed face to face industry survey and a review of related industry reports, particularly the Victorian Government's *A more competitive manufacturing industry: New directions for industry policy and manufacturing*.

The three largest manufacturing industries in Melbourne's North in terms of employment and value adding are automotive, food product manufacturing and chemicals. These three industry sectors are strategically important to the region's economy.

The automotive sector (transport equipment manufacturing) remains a vital part of the region's manufacturing industry. It has created the benchmark for manufacturing standards, processes and skills development, a positive impact that has flowed through much of the local manufacturing industry, lifting standards and encouraging better practice throughout the production and customer cycle in a wide range of businesses.

Over the last 10 years or so there has been a strong trend towards globalisation of the world automotive industry and emergence of China and Thailand as major vehicle producers. For Australia, and in particular Melbourne's North, this globalisation has reinforced the already growing export emphasis (including design, engineering and other high level skills) but has increased the competition for local component makers with more sourcing of content offshore.

Melbourne's North is the perfect location for food product manufacturing because of infrastructure developments including freight hubs, a cluster of industry skills and the relocation of the Melbourne Wholesale Fruit and Vegetable Market to Epping. These factors add to hub or cluster-type opportunities by strengthening the local supply chain and expertise in all things food and beverage.

Chemical manufacturing is important because chemicals are used in a wide range of other manufacturing processes. Chemical based products are an essential input into most sectors of the Australian economy. It would not be possible to manufacture a large proportion of the finished products that are currently produced without the use of chemical products.

Because at least part of the industry is very heavily knowledge based, chemical manufacturing provides the opportunity for ongoing research, relationships between universities and cooperative research centres, the development of intellectual property, licensing and new product development.

E.1 Manufacturing employment, exports and GRP formation

Strategies to assist the manufacturing sector in Melbourne's North to maintain and build competitive advantage are vitally important because:

- the manufacturing sector is the highest contributor to the formation of GRP in the region; the gap between the manufacturing sector's contribution to GRP and that of other industry sectors is significant
- the manufacturing sector is the highest contributor to Melbourne's North exports; the gap between the manufacturing sector's contributions to exports and that of other industry sectors is significant and has typically grown in the last decade
- the manufacturing sector is the largest employment industry in Melbourne's North
- Melbourne's North residents still rely on the manufacturing industry as a major employer. It is critical that the region's resident workforce keeps up with the increasing skill requirements of a more complex and technology driven manufacturing sector; this means ongoing training and improved educational standards
- the sector has critical links to R&D activities and, given the right circumstances and policies, has the potential to significantly increase exports. Germany is an example of how R&D, highly skilled and hi-tech manufacturing can make manufacturing a major contributor to regional wealth. To lose manufacturing to competing nations will most likely mean that R&D activities and highly skilled jobs (and the training for these) will also head offshore
- manufacturing employment creates wealth for Melbourne's North. The goal will be to maintain manufacturing employment at reasonable levels and not to replace it with employment in industries with lower value adding capacity. This will maintain a balanced regional economy on which future growth can flourish
- competing nations are likely to have strategic industry plans in place and are working hard to gain competitive advantage.

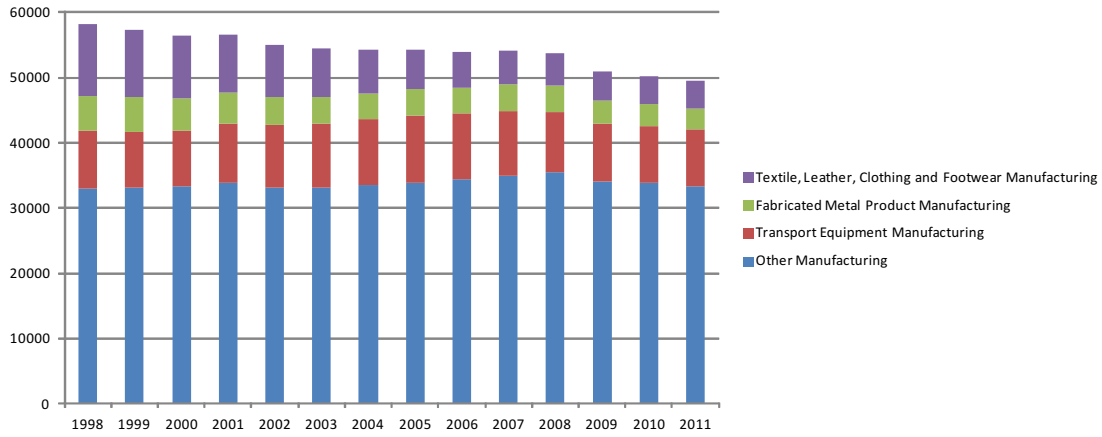
In the case of Melbourne's North the manufacturing industry's share of employment has declined, from 23.1 per cent of all job to work (JTW) employment in 1992 to 13.9 per cent in 2011. While other industries have grown employment, the manufacturing industry has been unable to do so and has shown a steady decline in employment numbers since 1996.

The City of Hume has continued to be extremely important as a creator of wealth for the region. A strategy to combine the manufacturing strengths of Hume and Whittlesea and market these areas as manufacturing centres of excellence for the future – places with spaces and skills – would help consolidate manufacturing supply chains and attract new businesses to Melbourne's North.

In terms of JTW employment, the transport equipment manufacturing industry (automotive and related) remains the largest manufacturing employer in Melbourne's North. It is closely followed by the food product manufacturing industry for the number employed. The chemical industry is the third largest employer of manufacturing workers in the region.

In terms of total employment, textiles clothing and footwear (TCF) has declined the most since 1998. Fabricated metal product manufacturing and transport equipment manufacturing have also had larger declines in employment. Given the large numbers of jobs lost in the TCF sector, the manufacturing industry has done well to maintain jobs at the level it has.

Figure E.1: Decline of manufacturing industry employment in Melbourne's North



E.2 Road blocks

The *Melbourne's North, the new knowledge economy* report identified four actions that would do most to enhance the region's productivity economy wide. These were:

1. improvement of transport links within the metropolitan north and with the CBD
2. a lifetime learning enhancement of existing resident skills to bring them into balance with what is required to better access catchment employment opportunities
3. encouraging local industry to exploit the region's catchment in terms of knowledge based resources to increase productivity and integrate more efficiently with its catchment supply chains
4. a connected region: implement an intensive region-wide rollout of the National Broadband Network.

These four key strategies and goals will assist the manufacturing sector in Melbourne's North to improve productivity and competitiveness.

In addition, in this report, roadblocks have been identified that directly impede productivity gains in the manufacturing sector in Melbourne's North. These include:

1. the extent and intensity of knowledge diffusion activities
2. the availability of high quality services and infrastructure to land development areas suitable for manufacturing, including gas, appropriate electrical supply and high speed broadband (the NBN)
3. the lack of application of management systems to improve productivity outcomes and ICT systems that will enhance sales and integrated supply chain outcomes
4. the less than best practice standards relating to links between the region's manufacturing firms and its research organisations and tertiary institutions
5. the capacity of managers in small to medium manufacturing enterprises (the majority of the manufacturing sector in Melbourne's North) to keep up-to-date with rapid market (including export opportunities) and technology changes
6. that training standards and access to training needs are declining, with some firms reporting that training for their specific needs no longer exists
7. that vocational and trade training activities are dumbing down as the TAFE sector comes under increasing pressure from funding cuts and an opening up of completion from the private sector where courses are reported to be more generic and less technical. These trends are counter intuitive for rapidly changing times requiring higher skills
8. that, for some manufacturing firms who supply finished products directly to the retail sector, the dominance of major retailers is severely restricting brand development and future export opportunities, particularly for food process manufacturers, hardware, and cosmetics and toiletries manufacturing.

E.3 Recommendations and roadmap

This roadmap links short term and long term goals for the manufacturing industry in Melbourne's North. The roadmap is by its nature a macro view. It is not about picking winners but instead suggests a strategic pathway to the future, with a view to building competitive advantage and productivity within the manufacturing sector in Melbourne's North.

This roadmap is intended to address the key issues facing manufacturing in the region.

The highway

Manufacturing can be a high value adding industry because people are engaged in making products. Replacing manufacturing jobs with jobs that have less value adding potential should not be the answer.

The goal must be to maintain and to hold manufacturing share of GRP in the region's economy at between 15 and 16 per cent.

The high street

The region's knowledge based infrastructure and networks should be leveraged to enhance knowledge diffusion activities.

Manufacturing's share of GRP can be held at 15 to 16 per cent by:

- moving production output up the value added chain
- focusing on high value added export markets
- intensifying R&D exports
- intensifying export expansion programs
- intensifying knowledge diffusion activities in tandem with high level management training
- CRITICAL FOR MELBOURNE'S NORTH: introducing policy levers that will maximise the opportunity for automotive manufacturing to remain viable in Melbourne's North; this will avoid significant long term job losses and significant declines in supply chain capacity and skills.

The way forward may be to support new automotive technologies and associated production for the global supply chain.

The carriage way

- A four tier approach to building knowledge, competitive advantage and productivity:

1. support high level management training in the manufacturing sector in Melbourne's North
2. support specialised and hi-tech skills development in the manufacturing workforce in Melbourne's North
3. support technology/knowledge based diffusion activities across the manufacturing sector in Melbourne's North, building on existing networks and organisations such as NORTH Link and Enterprise Connect
4. business systems implementation; support better management systems to enhance profitability outcomes for firms (including stock control, sales and accounting systems) and support improved ICT capacity to assist with improved supply chain integration and sales opportunities.

- Training: Goal: have the best trained and skilled managers possible in the Melbourne North manufacturing industry with strategic skills and in-depth knowledge of markets. Goal: provide local managers, particularly from medium sized manufacturing firms, with the opportunity to access world class manufacturing training (mostly short courses in strategic management in market development, product development and finance).

- Knowledge diffusion activities: Assist manufacturing firms with export, hi-tech and new product development potential. Goal: use regional and government networks, skills and resources to open up new markets internationally.
- Strengthen links to research organisations and universities in Melbourne's North; this needs to become a real planning focus, with significant effort being put into creating and measuring results. Goal: create growth in hi-tech manufactures based on local research and intellectual property.
- Address barriers to potential growth industries in the manufacturing sector in Melbourne's North, particularly the barrier created by dominance of the retail sector. Goal: find a way around barriers to create the opportunity for export growth.
- Employment: from the lessons learnt from major manufacturing closures of the past, create individual pathways for retrenched manufacturing workers to new forms of manufacturing related employment. Goal: no loss of skills and avoidance of avoid long term structural unemployment and low paid casual re-employment. Strategy may seem difficult but will be a lot easier and cheaper than the alternative outcome created by not putting this policy in place.
- Promote the Cities of Hume and Whittlesea in particular as manufacturing centres of excellence and ensure that the appropriate hard and soft infrastructure required by manufacturing firms is available in industrial developments. This means among other things gas supply, electrical supply suitable for manufacturing operations, broadband and specialised industry training. Goal: ensure there is planning for a manufacturing future and not just a warehousing and distribution future, and create the capacity to retain and attract manufacturing firms in and to the region.
- Support the establishment of new business incubators. Both state and federal governments should have a role in this.

E.4 Best bang for the buck

Modelling indicates that the most productive actions that could be taken by the Northern Melbourne RDA, given the resources and scope available to the organisation, are those that enhance and support knowledge and skills and technology diffusion activities within the manufacturing industry in Melbourne's North.

The advantage the region has is that it has already worked hard to create the networks through which these activities could be carried out.

E.5 The significance of manufacturing for future regional prosperity

As Australia's resource boom fades at some point in the future and the value of the Australian dollar declines, the important thing will be to replace this currently flourishing sector with economic activity in other higher value adding sectors. Maintaining a manufacturing base therefore remains strategically important, particularly as recent events have shown that the services sector is highly vulnerable to offshoring.

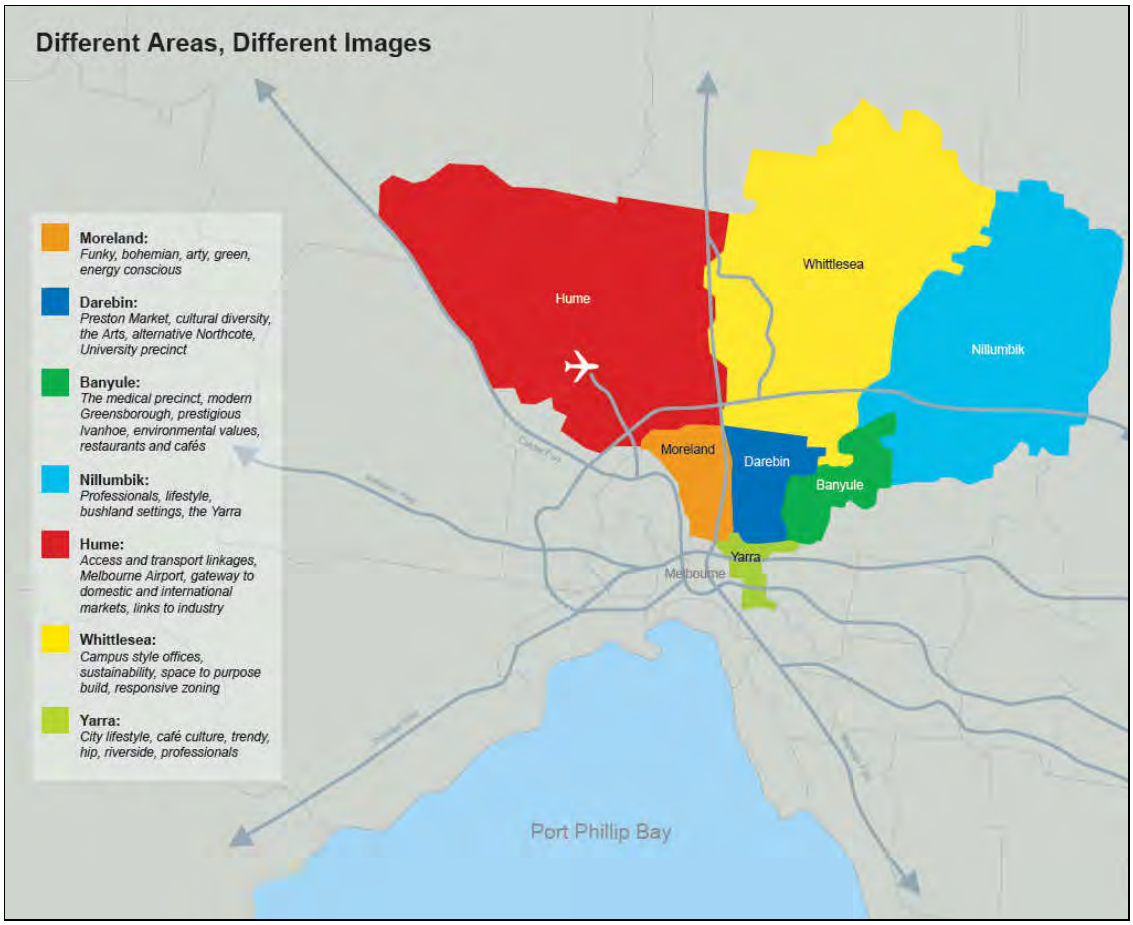
With the demand for food products and issues of food security and safety across the region, future export opportunities are likely to be significant. The demands for a greener economy will also create significant opportunities across many parts of the manufacturing sector including construction materials and technologies, scientific and electronic measuring systems, chemical manufacturing technologies with a move to bio-based production and a whole range of hi-tech manufactures. Automotive manufacturing will require a complete reworking of past technologies, as cars become increasingly fuel efficient and technology adapts away from the total reliance on petroleum. Germany has shown the way in many of these things.

Melbourne's North wants to be part of this exciting future.

Introduction and rationale

The Northern Melbourne RDA region covers seven Local Government Areas (LGAs): Banyule, Darebin, Hume, Moreland, Nillumbik, Whittlesea 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.



Northern Melbourne is likely to grow significantly in the next 20 years. Features and strategic issues include the following.

Increasing dynamism of the region through residential growth, improving skills of residents, business development, diversity and amenity.

1. During a future phase of new developments, the opportunity to redefine the region as a carbon efficient economy and society. This can occur through improved energy efficiency of buildings and communities, distance and transport to employment, and ongoing development of the knowledge economy including maximising the benefit of the National Broadband Network (NBN) to the region.

2. The future skills of its residents – a region of education and skills development with policies to assist lower skilled workers in employment towards a carbon efficient economy.

3. A gateway to Melbourne with major assets in the region (including tertiary institutions, health developments, businesses, the rapidly developing Melbourne Airport, transport infrastructure and the newly locating Wholesale Markets) and how these things can be better connected to create significant future growth.

4. A region with the policies to continually improve amenity while maintaining some degree of housing affordability.

Focus of efficiency improvement in Melbourne's North

1. Improvement of transport links within the metropolitan north and with the CBD.

2. A lifetime learning enhancement of existing resident skills to bring them into balance with what is required to better access catchment employment opportunities.

3. Encouraging local industry to exploit the region's catchment in terms of knowledge based resources to increase productivity and integrate more efficiently with regional catchment supply chains.

4. A connected region: implement an intensive region-wide rollout of the NBN.

These four key strategies and goals will assist the manufacturing sector in Melbourne's North to improve productivity and competitiveness.

Manufacturing is very important to Northern Melbourne in a number of ways. The industry provides well paid employment and many residents have skills that are related to manufacturing. The region's hard and soft infrastructure and new developments will support hi-tech manufacturing exports – these include Melbourne Airport, freight and logistics development (including freight hubs) and the relocation of the Wholesale Markets (and the food processing cluster opportunities this may generate).

The largest employing industry (that is, journey to work [JTW] or industry employment, which means workers from all over metropolitan Melbourne) in Melbourne's North remains manufacturing. In terms of usual resident (UR) employment, manufacturing is no longer the leading employer with health care and social assistance now the leading employment industry. The region's manufacturing industry includes a historically significant automotive manufacturing sector that has been buffeted by the global financial crisis (GFC), changing customer demands and the competitive nature of manufacturing in China, Thailand and other regions of South East Asia in particular.

There are, however, opportunities for the growth of some sectors within manufacturing such as food processing and a range of hi-tech/intellectual property (IP) lead manufacturing niches. The new manufacturing opportunities will also be export opportunities, so their development is strategically important to both the region and Victoria as a whole.

In terms of economic output and employment, the region appears to be experiencing a 'W' effect with further declines in the automotive sector impacting gains made since the GFC. The last and

upward stroke in the letter W to some extent relies on how well manufacturing within the region is understood. The more that is known, the easier it is to create strategies that will assist the industry to refocus its output to areas of opportunity and growth.

A key result from maintaining strong manufacturing activity in Melbourne's North will be increase in the region's wealth and that of its residents, because of the exports and value adding generated for the region by its manufacturing sector. The strategic goal will be to not replace 'higher productivity and export type' manufacturing employment with employment industries that do not perform so well in these areas. That is, to maintain and improve the balance, structure and economic health of Melbourne's North.

The manufacturing industry in Melbourne's North is an integrated part of the national, state and regional supply chain that captures research, IP development and design at the front end, and logistics and markets in the final stages of the supply chain. Manufacturing remains a strategically important industry for Melbourne's North and automotive manufacturing has been particularly important as a driver of performance and manufacturing expertise and standards, influencing the productivity of the sector more broadly.

The purpose of this report is to:

- analyse and synthesise recent data/reports that profile the manufacturing industry in Melbourne's North
- review the recommendations from these reports and identify gaps in relation to the future direction of manufacturing, particularly the Victorian Government's *A more competitive manufacturing industry: New directions for industry policy and manufacturing*
- summarise emerging issues and current directions (regionally, nationally and internationally) of manufacturing; industry sectors, trends and future skills requirements
- outline the potential future direction of manufacturing and recommendations for a practical roadmap so that industry in Melbourne's North can take advantage of future trends
- via the meta analysis, explore changes in the profile of manufacturing at the regional level in the following areas:

  (a) key sector demand

  (b) emerging and declining sectors

  (c) impact of technology on infrastructure and employment

  (d) immediate and long term threats to sustainable growth

- identify gaps, particularly in relation to trends that may predict the future direction of manufacturing.

1. Melbourne's North: Manufacturing in context

Manufacturing has high strategic value in its own right, which means that it is a driver of regional growth. This chapter shows the significance of the manufacturing sector to the economy of Melbourne's North.

Manufacturing has a strategic role in the economy. It matters because its contribution as a driver of economic development is either unique or is duplicated by few other industries. Manufacturing can also help to maintain an overall balanced economic structure that allows long term sustainable growth in living standards. For a region, this suggests a manufacturing share in total product of around 15 to 16 per cent.

Manufacturing share of GRP in Melbourne's North has fallen from 26.5 per cent in 1998 to 16.3 per cent in 2011. This shows that manufacturing has declined and that other sectors have grown their share of GRP. The issue here is that if manufacturing GRP declines further, there will be problems for local supply chains and an imbalance in the macroeconomic structure of the region's economy.

The macroeconomic costs of a poorly performing manufacturing sector should not be underestimated, as this increases vulnerability to structural imbalances in the economy and future economic shocks.

1.1 GRP formation and exports

FACT 1: The manufacturing sector is the highest contributor to the formation of GRP in Melbourne's North. The gap between the manufacturing sector's contributions to GRP and that of other industry sectors remains significant.

Figure 1.1: Melbourne's North: GRP ($m)

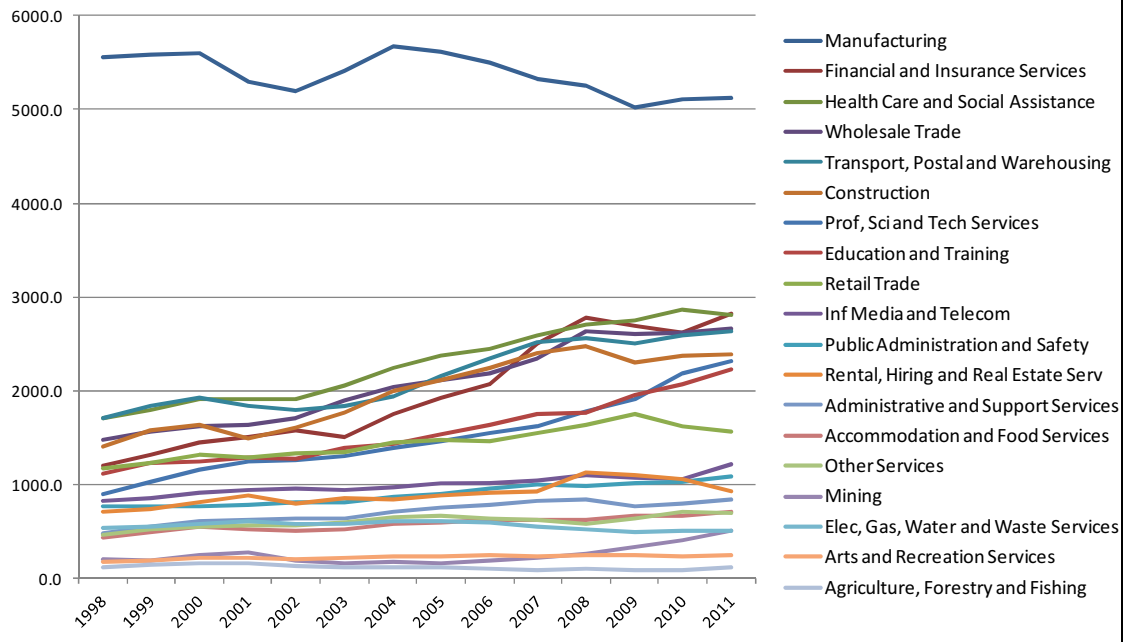


Table 1.1 Melbourne's North: GRP ($m)														
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Manufacturing	5557.4	5591.7	5601.0	5294.2	5187.7	5406.4	5677.8	5608.1	5498.1	5328.4	5257.9	5020.6	5112.1	5119.2
Financial and Insurance Services	1201.9	1320.2	1448.9	1507.9	1574.3	1508.8	1749.5	1931.3	2066.4	2499.5	2777.6	2697.9	2620.8	2826.6
Health Care and Social Assistance	1702.7	1801.8	1918.2	1915.2	1908.6	2058.1	2237.7	2369.4	2443.1	2585.3	2709.6	2751.9	2870.3	2809.6
Wholesale Trade	1473.3	1564.2	1629.0	1631.5	1705.2	1900.7	2041.0	2110.4	2183.8	2344.4	2630.1	2600.0	2618.7	2663.5
Transport, Postal and Warehousing	1706.6	1836.9	1926.7	1839.1	1799.8	1837.2	1948.3	2162.7	2347.4	2517.9	2565.4	2505.9	2596.0	2635.7
Construction	1412.2	1574.4	1634.0	1497.9	1615.2	1768.3	2002.4	2120.0	2250.1	2409.7	2473.8	2308.9	2368.7	2396.0
Prof, Sci and Tech Services	893.3	1029.2	1153.9	1247.0	1256.1	1307.5	1389.1	1459.3	1554.4	1628.9	1780.2	1911.8	2191.9	2316.6
Education and Training	1118.6	1229.2	1250.5	1283.4	1276.7	1389.0	1429.3	1533.3	1640.4	1748.2	1765.2	1959.6	2065.0	2229.1
Retail Trade	1179.5	1236.0	1324.6	1293.4	1332.6	1352.4	1447.1	1476.7	1470.2	1544.7	1638.1	1751.1	1625.4	1571.8
Inf Media and Telecom	821.1	850.2	907.6	940.5	957.3	937.2	967.5	1011.9	1018.6	1041.0	1099.0	1076.4	1059.1	1225.2
Public Administration and Safety	769.9	770.2	765.9	783.3	818.6	808.1	867.0	899.1	954.8	999.9	982.1	1016.9	1026.6	1089.5
Rental, Hiring and Real Estate Serv	712.6	734.4	808.5	881.5	792.5	858.8	839.5	891.5	920.1	922.3	1134.4	1107.0	1063.9	934.3
Administrative and Support Services	483.6	546.9	611.3	622.6	641.0	644.6	708.1	753.6	791.2	825.3	843.7	771.7	795.1	847.3
Accommodation and Food Services	438.6	489.1	549.8	529.2	515.7	524.1	580.3	598.9	618.7	618.3	619.3	665.7	668.6	707.7
Other Services	472.6	518.6	550.8	564.1	564.5	599.0	647.9	674.9	646.8	626.6	587.2	634.5	708.2	700.6
Mining	200.3	190.0	244.0	272.7	192.8	161.5	175.4	163.8	194.6	223.4	270.1	336.2	406.0	510.1
Elec, Gas, Water and Waste Services	540.4	559.5	585.1	608.4	585.8	587.9	604.2	617.4	590.7	550.5	527.5	489.4	506.5	508.7
Arts and Recreation Services	173.9	190.3	214.2	220.7	210.6	219.5	237.9	241.5	244.6	233.8	251.4	244.5	238.9	248.2
Agriculture, Forestry and Fishing	125.2	146.6	163.1	167.5	134.0	125.6	125.9	116.5	109.6	91.6	110.6	92.0	92.0	112.6
Total	20983.7	22179.4	23287.1	23100.1	23069	23994.7	25675.9	26740.3	27543.6	28739.7	30023.2	29942	30633.8	31452.3

FACT 2: The manufacturing sector is the highest contributor to exports in Melbourne's North. The gap between the manufacturing sector's contributions to exports and that of other industry sectors remains significant and has typically grown in the last decade.

Figure 1.2: Melbourne's North: Exports ($m)

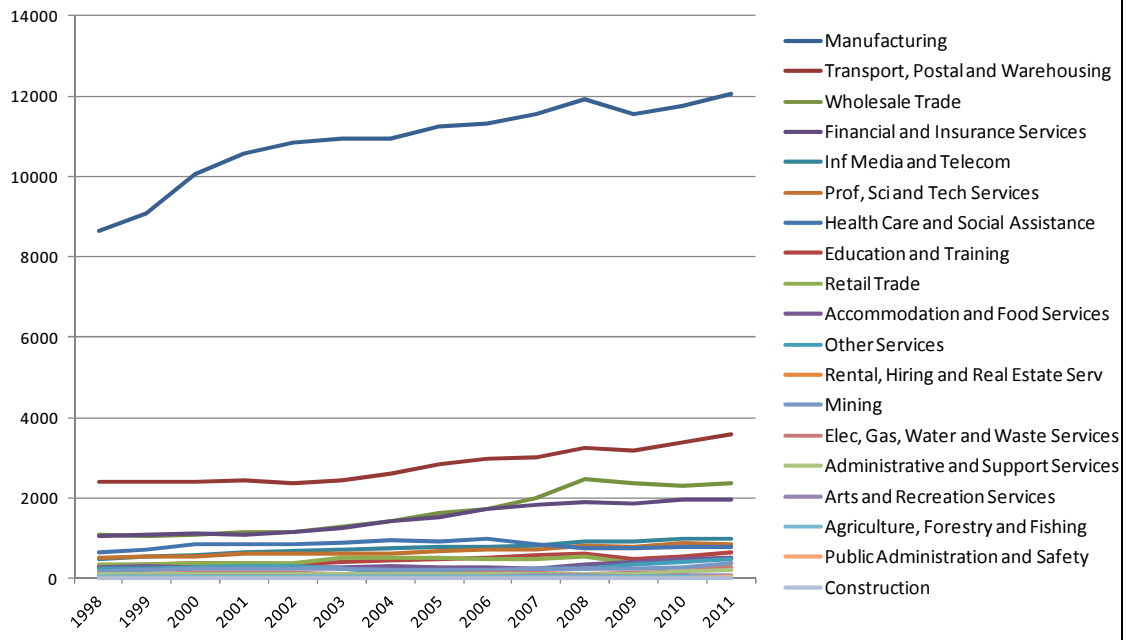


Table 1.2 Melbourne's North: Exports ($m)														
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Manufacturing	8639.8	9080.4	10079.3	10573.1	10836.8	10927.0	10934.5	11248.8	11315.7	11556.3	11923.0	11530.8	11760.6	12066.6
Transport, Postal and Warehousing	2407.6	2398.9	2397.3	2420.7	2368.8	2435.9	2623.0	2831.5	2965.3	3013.2	3231.9	3170.7	3391.5	3578.1
Wholesale Trade	1093.1	1057.6	1072.3	1161.7	1152.6	1297.7	1422.2	1641.8	1720.4	1995.9	2461.7	2363.1	2295.9	2369.9
Financial and Insurance Services	1049.2	1092.3	1123.5	1100.8	1168.2	1244.9	1418.6	1519.2	1718.4	1837.1	1902.4	1854.4	1949.7	1973.4
Inf Media and Telecom	496.2	539.5	594.7	649.7	684.2	718.2	746.0	772.4	786.9	825.2	915.0	923.5	989.2	993.1
Prof, Sci and Tech Services	514.5	554.0	553.6	616.4	621.1	609.5	627.5	681.8	701.4	732.0	821.3	798.6	883.0	843.6
Health Care and Social Assistance	640.3	713.5	858.9	865.2	852.8	874.7	938.0	925.8	988.1	849.9	761.9	747.1	779.4	770.1
Education and Training	327.8	340.6	379.2	368.5	357.0	409.7	455.4	490.8	514.4	570.0	603.2	477.5	535.6	643.9
Retail Trade	343.0	345.4	367.1	390.1	378.3	501.4	515.3	513.6	465.9	487.7	538.6	380.7	438.3	507.0
Accommodation and Food Services	278.0	306.1	287.1	291.4	271.1	288.4	295.6	282.2	263.5	260.4	356.4	410.3	465.2	500.1
Other Services	229.9	245.2	270.4	304.6	302.1	243.2	140.3	154.7	177.4	238.3	232.4	338.7	427.2	481.7
Rental, Hiring and Real Estate Serv	39.1	45.0	52.3	56.6	56.3	57.6	52.4	44.7	37.0	39.3	96.7	122.5	150.1	385.9
Mining	183.6	221.3	252.7	260.3	240.6	232.4	222.5	221.6	220.3	244.1	248.1	259.5	271.4	376.2
Elec, Gas, Water and Waste Services	105.2	109.0	127.8	130.3	126.7	115.9	109.3	111.0	130.2	131.6	120.5	140.4	184.2	293.2
Administrative and Support Services	95.1	106.7	114.7	104.6	101.5	102.0	102.7	110.3	95.0	97.1	96.7	120.5	179.9	194.1
Arts and Recreation Services	47.8	44.5	47.8	41.9	35.7	37.6	45.2	56.1	55.7	67.6	67.4	48.9	60.9	66.7
Agriculture, Forestry and Fishing	48.9	50.7	50.7	51.1	49.8	37.5	42.2	45.8	43.1	39.1	41.7	40.4	37.9	43.1
Public Administration and Safety	22.5	23.3	22.1	20.1	20.4	20.3	23.6	20.5	20.6	21.0	21.4	22.4	22.5	29.3
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**16561.6**	**17274**	**18651.5**	**19407.1**	**19624**	**20153.9**	**20714.3**	**21672.6**	**22219.3**	**23005.8**	**24440.3**	**23750**	**24822.5**	**26116**

1.2 Manufacturing and employment

The GFC has created challenges for regions around the globe. For Melbourne's North and particularly the rapidly developing local government area (LGA) of Hume, there has been a significant decline in manufacturing employment in industries such as automotive, where some of the restructuring that has resulted in loss of employment is influenced by global trends.

Retraining therefore becomes a regional issue. One of the features of the region's employment in manufacturing is the comparatively low level of formal qualifications of residents working in the industry. This does not necessarily mean low skills, as there appears to be a considerable and probably high level of tacit skills (on-the-job learning) within this part of the working population. The comparatively low level of qualifications does, however, mean that for many retrenched workers living in Melbourne's North, and particularly in the City of Hume, finding equivalent employment will prove difficult.

Major closures or downsizing in automotive manufacturing in Melbourne's North, while new jobs are being created in other parts of the manufacturing sector, is likely to mean stranding of the lowest skilled workers in casual work or long term structural unemployment. In terms of numbers, this may be particularly the case for manufacturing workers in Hume and Whittlesea.

A worthwhile intervention would be to ensure that retrenched manufacturing workers are given the capacity, through special training and other initiatives, to find pathways to employment in other parts of the manufacturing sector.

FACT 3: The manufacturing sector is the largest employment industry in Melbourne's North.

Figure 1.3: Melbourne's North: JTW employment

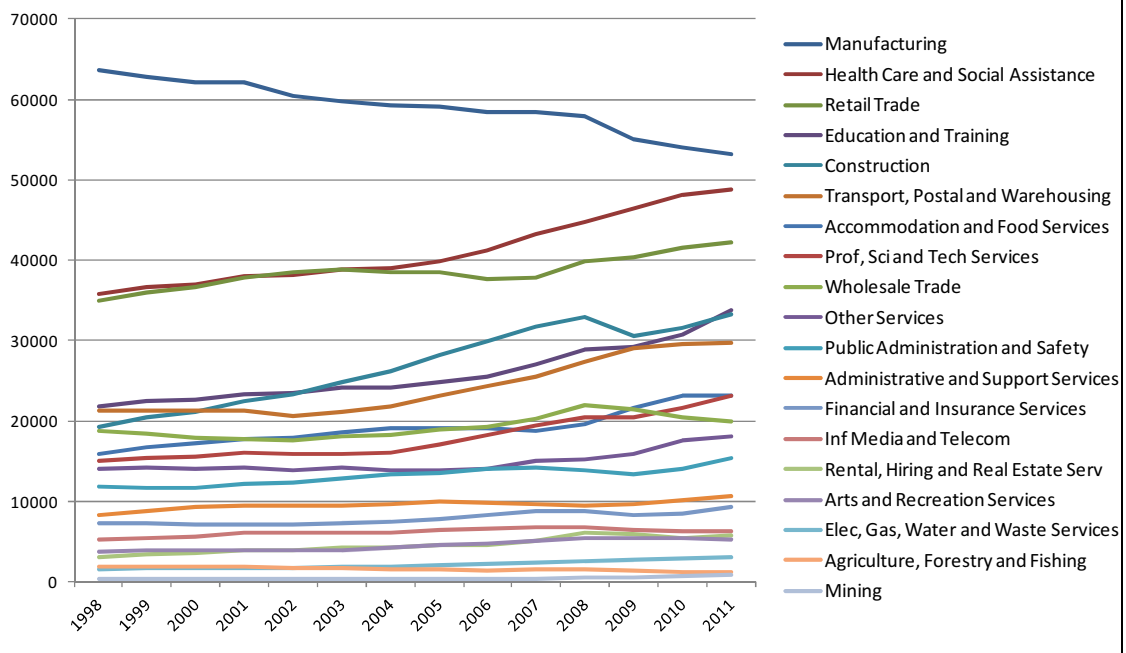


Table 1.3 Melbourne's North: JTW employment														
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Manufacturing	63565	62862	62059	62089	60370	59782	59279	59122	58343	58430	57959	55096	54065	53160
Health Care and Social Assistance	35836	36616	36978	37996	38219	38854	39090	39905	41252	43251	44684	46394	48037	48791
Retail Trade	35007	35899	36568	37860	38437	38838	38480	38482	37605	37871	39927	40320	41542	42188
Education and Training	21799	22555	22614	23372	23530	24095	24157	24806	25559	27095	28864	29172	30763	33707
Construction	19328	20440	21179	22519	23265	24909	26253	28210	29952	31788	32993	30545	31539	33302
Transport, Postal and Warehousing	21286	21281	21287	21292	20704	21055	21745	23162	24362	25488	27419	29061	29495	29657
Accommodation and Food Services	15939	16752	17292	17759	18002	18575	19039	19185	19021	18783	19612	21709	23190	23236
Prof, Sci and Tech Services	15016	15332	15490	16029	15954	15898	15986	17161	18249	19480	20473	20421	21566	23147
Wholesale Trade	18746	18503	17919	17796	17577	18016	18290	18880	19310	20228	22021	21473	20457	19942
Other Services	13992	14219	13981	14206	13957	14197	13874	13936	14023	15006	15197	15921	17503	18172
Public Administration and Safety	11796	11692	11744	12107	12393	12935	13338	13608	14120	14231	13846	13416	14127	15446
Administrative and Support Services	8260	8896	9395	9465	9476	9516	9647	9970	9753	9576	9485	9680	10097	10601
Financial and Insurance Services	7326	7323	7156	7204	7130	7234	7547	7841	8300	8836	8830	8242	8404	9324
Inf Media and Telecom	5305	5411	5671	6099	6196	6148	6188	6376	6568	6714	6792	6396	6325	6310
Rental, Hiring and Real Estate Serv	3153	3403	3557	3916	3970	4195	4327	4559	4678	5087	6110	5861	5388	5700
Arts and Recreation Services	3749	3946	3935	3988	3918	4000	4249	4535	4786	5031	5421	5510	5481	5228
Elec, Gas, Water and Waste Services	1604	1648	1702	1733	1748	1819	1917	2085	2248	2382	2490	2783	2961	3046
Agriculture, Forestry and Fishing	1895	1920	1876	1871	1756	1694	1565	1524	1474	1538	1554	1404	1275	1210
Mining	296	313	327	316	309	312	331	365	380	427	471	565	708	800
Total	**303898**	**309011**	**310730**	**317617**	**316911**	**322072**	**325302**	**333712**	**339983**	**351242**	**364148**	**363969**	**372923**	**382967**

FACT 4: Melbourne's North residents still rely on the manufacturing industry as a major employer. It is critical for the region to ensure that its resident workforce keeps up with the increasing skill requirements of a more complex and technology driven manufacturing sector. This means ongoing training and improved educational standards.

Figure 1.4: Melbourne's North: Usual resident employment

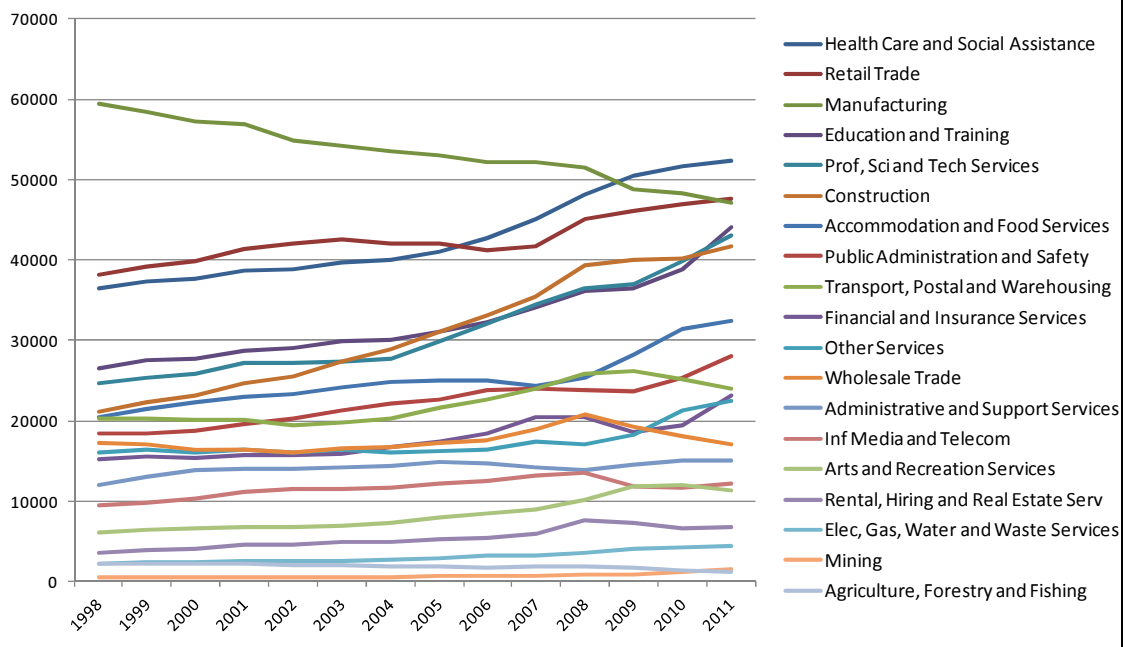


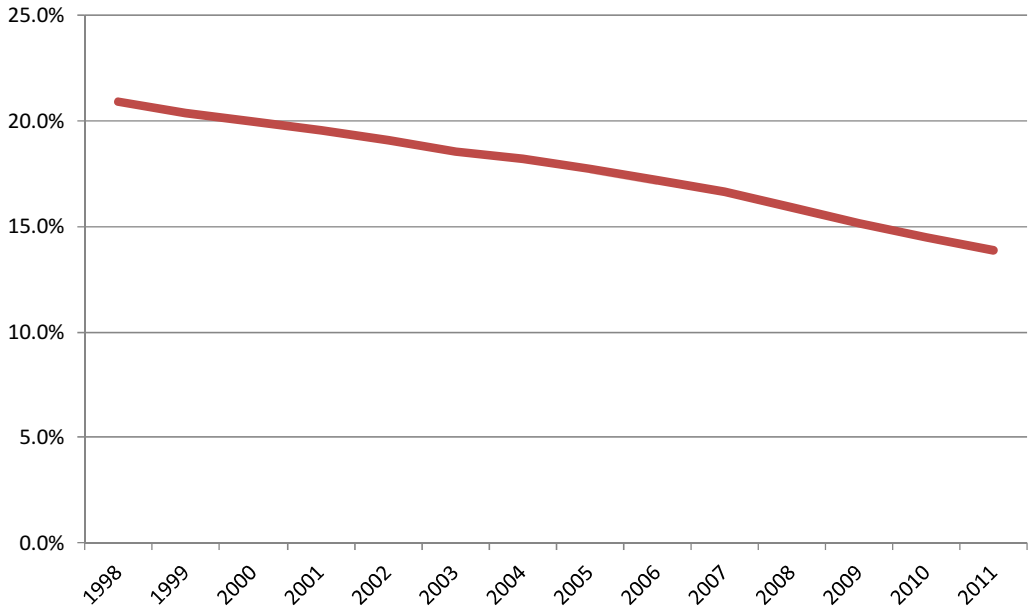
Table 1.4 Melbourne's North: Usual resident employment														
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Health Care and Social Assistance	36446	37265	37646	38673	38925	39697	40101	41071	42671	45057	48118	50484	51731	52405
Retail Trade	38103	39139	39928	41409	42057	42491	42120	42106	41214	41641	45092	46152	46938	47667
Manufacturing	59342	58376	57295	56962	54917	54155	53476	53063	52108	52146	51481	48879	48290	47174
Education and Training	26553	27558	27742	28771	29046	29895	30151	31139	32335	34184	36211	36436	38890	44023
Prof, Sci and Tech Services	24621	25404	25925	27120	27260	27353	27708	29912	32125	34470	36542	37013	39898	43000
Construction	21076	22350	23198	24709	25524	27380	28921	31117	33123	35446	39286	40080	40258	41753
Accommodation and Food Services	20440	21549	22313	22997	23372	24179	24850	25067	24944	24373	25362	28158	31352	32421
Public Administration and Safety	18358	18411	18726	19570	20218	21263	22079	22676	23766	24014	23825	23648	25415	28021
Transport, Postal and Warehousing	20231	20212	20160	20112	19435	19705	20298	21551	22657	24073	25814	26211	25232	24080
Financial and Insurance Services	15285	15482	15344	15663	15647	15940	16709	17387	18510	20391	20524	18518	19438	23157
Other Services	16036	16335	16088	16368	16091	16398	16078	16179	16340	17414	17097	18331	21257	22551
Wholesale Trade	17239	17006	16464	16355	16112	16503	16755	17263	17658	18902	20851	19298	18079	17163
Administrative and Support Services	12006	13018	13829	14018	14081	14179	14413	14909	14634	14195	13879	14485	15018	15032
Inf Media and Telecom	9459	9754	10345	11253	11540	11531	11685	12104	12592	13267	13455	11886	11598	12121
Arts and Recreation Services	6118	6530	6603	6774	6723	6892	7360	7909	8446	8942	10234	11813	12094	11287
Rental, Hiring and Real Estate Serv	3611	3920	4115	4558	4630	4865	4996	5247	5377	5894	7570	7365	6601	6721
Elec, Gas, Water and Waste Services	2237	2329	2437	2522	2549	2631	2749	2971	3196	3317	3583	4121	4308	4443
Mining	520	561	594	576	561	562	596	657	678	746	814	960	1268	1573
Agriculture, Forestry and Fishing	2206	2263	2225	2227	2093	2016	1866	1813	1756	1854	1935	1727	1461	1258
Total	**349887**	**357462**	**360977**	**370637**	**370781**	**377635**	**382911**	**394141**	**404130**	**420326**	**441673**	**445565**	**459126**	**475850**

In the case of Melbourne's North, the manufacturing industry's share of employment has continued to decline, from 23.1 per cent of all JTW employment in 1992 to 13.9 in 2011. While other industries have grown employment, the manufacturing industry has been unable to do so and has shown a steady decline in employment numbers since 1996.

Table 1.5 Manufacturing share of all JTW employment in Melbourne's North

Year	Manufacturing	All JTW	Share
1992	64060	277789	23.1%
1993	62537	274791	22.8%
1994	62407	277494	22.5%
1995	64122	288331	22.2%
1996	65694	296835	22.1%
1997	64719	300383	21.5%
1998	63565	303897	20.9%
1999	62862	309011	20.3%
2000	62059	310730	20.0%
2001	62089	317616	19.5%
2002	60370	316911	19.0%
2003	59782	322071	18.6%
2004	59279	325303	18.2%
2005	59122	333710	17.7%
2006	58343	339983	17.2%
2007	58430	351242	16.6%
2008	57959	364146	15.9%
2009	55096	363971	15.1%
2010	54065	372924	14.5%
2011	53160	382968	13.9%

Figure 1.5: Melbourne's North: Manufacturing share of JTW employment



FACT 5: Manufacturing employment creates wealth for Melbourne's North. The goal will be to maintain manufacturing employment at reasonable levels and not to replace it with employment in industries that have lower value adding capacity. This will maintain a balanced regional economy on which future growth can flourish.

Figure 1.6: Melbourne's North: Significance of manufacturing (employment and GRP) – 2001

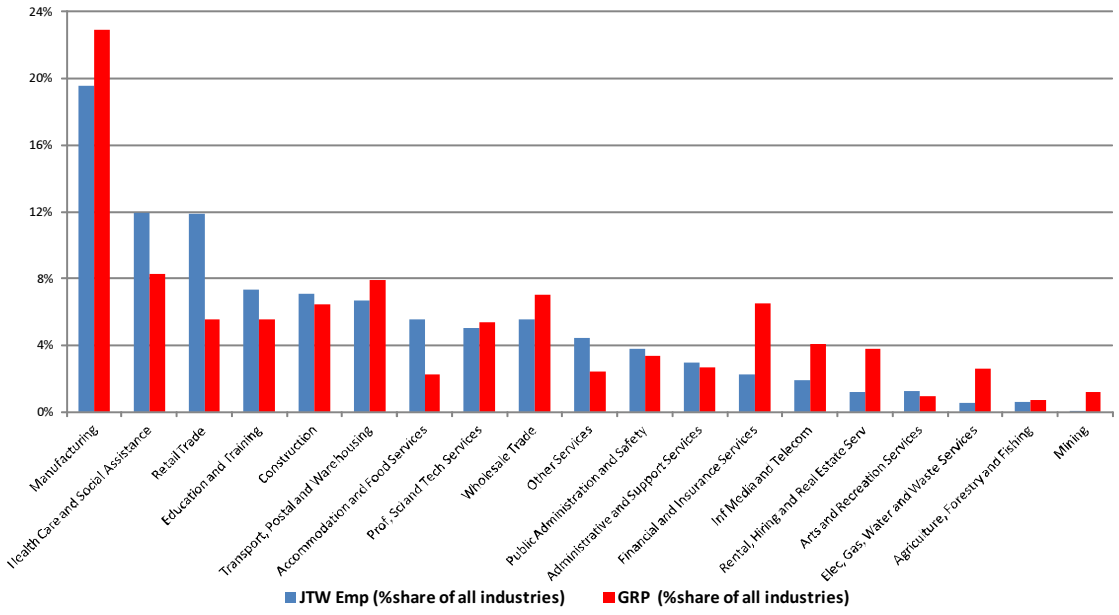
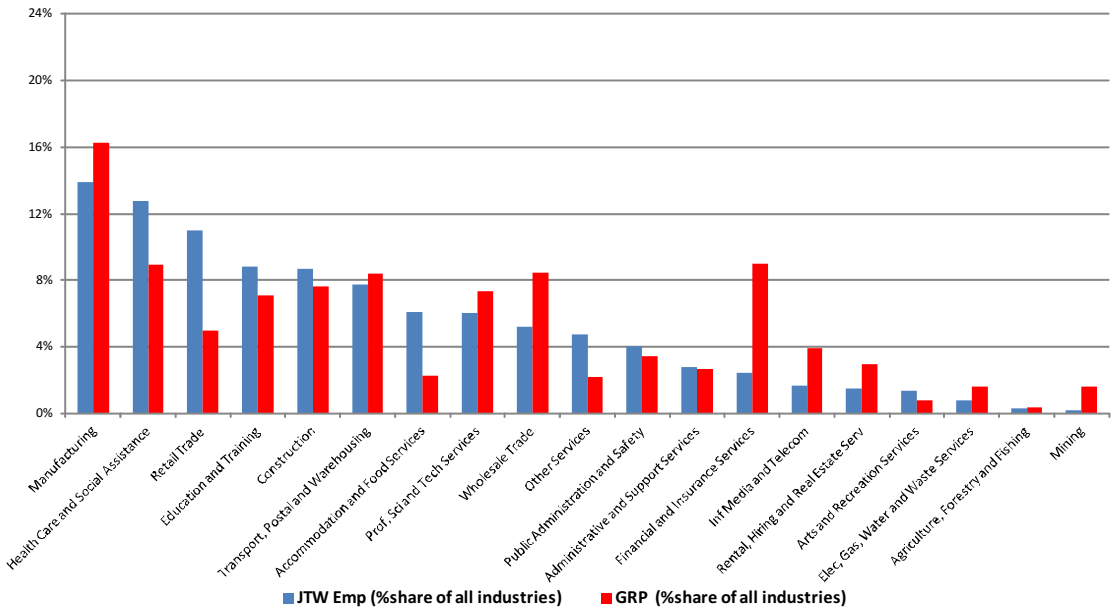


Figure 1.7: Melbourne's North: Significance of manufacturing (employment and GRP) – 2011



The region's share of manufacturing employment and GRP at the Melbourne, Victorian and national levels has declined, in part due to its heavy reliance on automotive manufacturing.

Figure 1.8: Melbourne's North: Share of manufacturing employment – 2001 and 2011

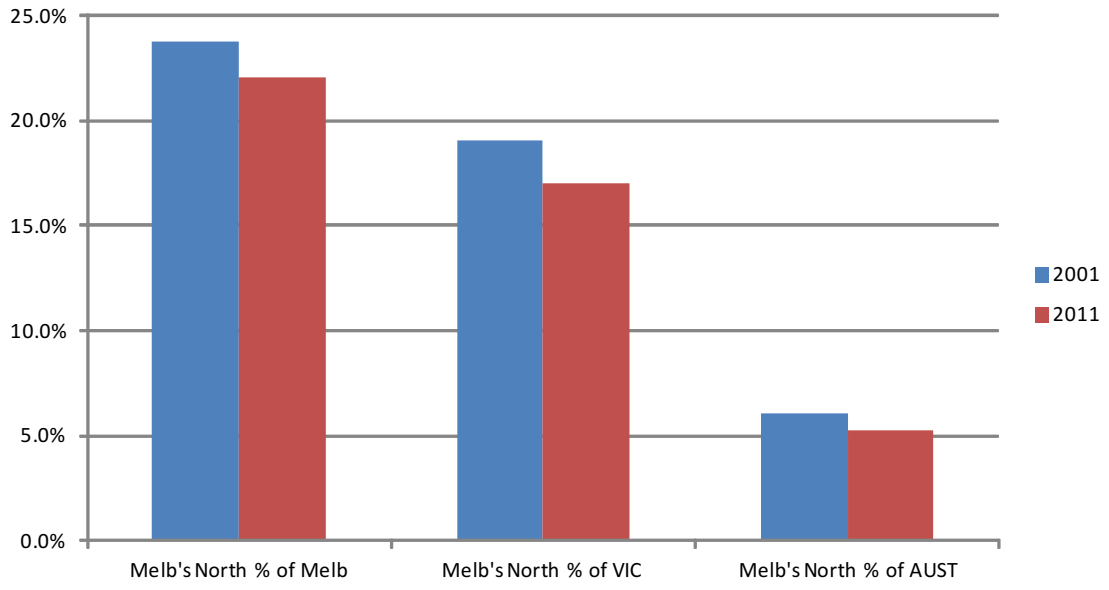
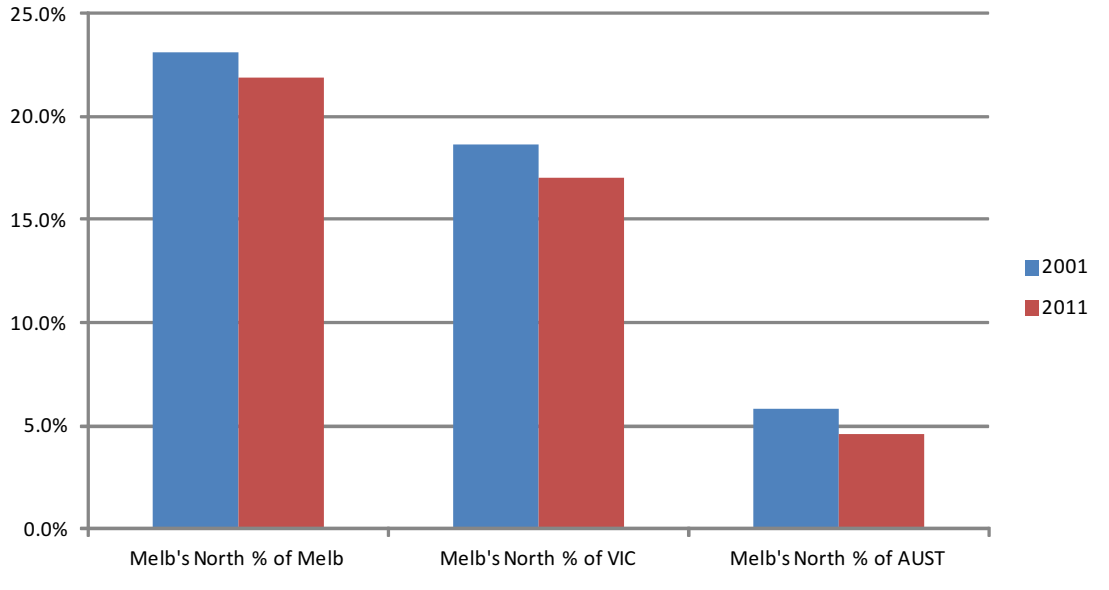


Figure 1.9: Melbourne's North: Share of manufacturing GRP – 2001 and 2011



The following charts compare manufacturing employment and manufacturing GRP by Victorian RDA. Despite declines in employment for the manufacturing sector generally, it is worth noting the recent upturn in Southern Melbourne. After a significant decline, it is increasing employment and GRP at a difficult time. It may be that Southern Melbourne has been the most successful in

developing hi-tech manufacturing and export markets, a pointer for the strategic direction of manufacturing businesses in Melbourne's North.

Figure 1.10: JTW manufacturing employment by Victorian RDA

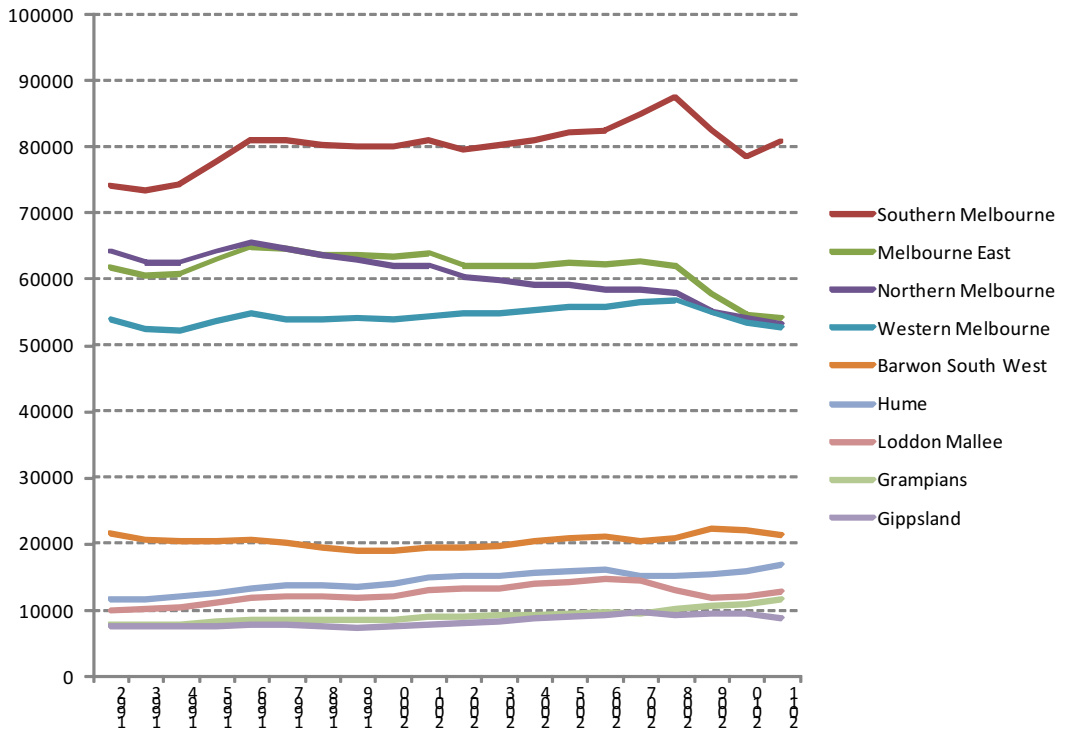
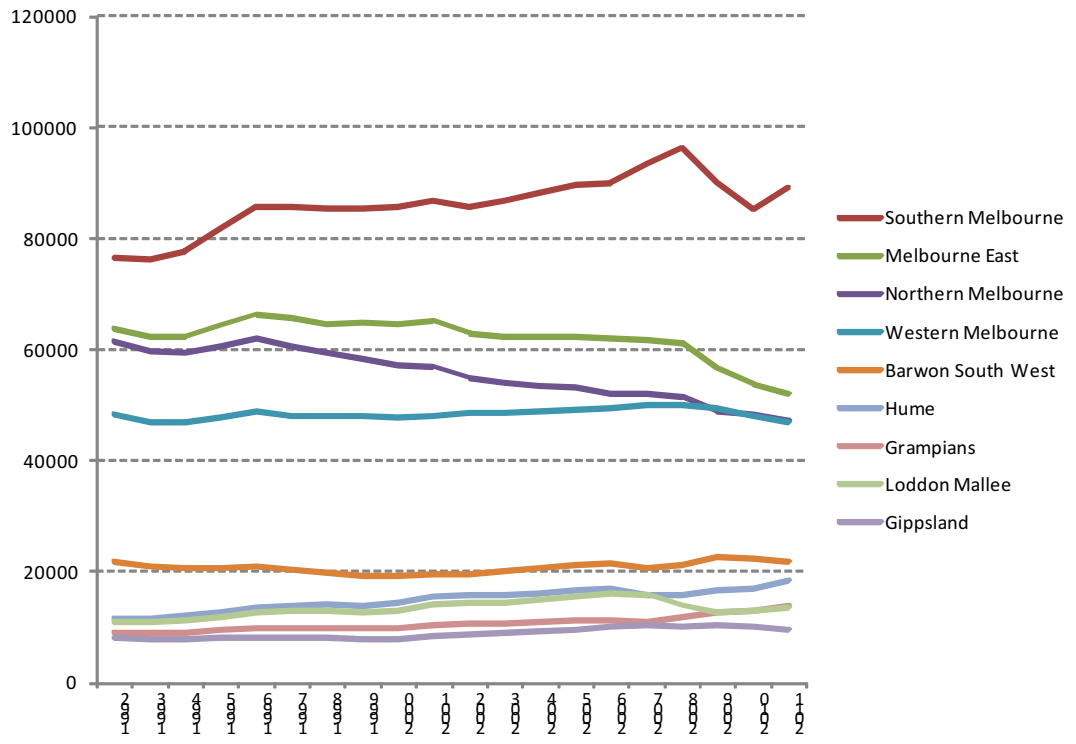
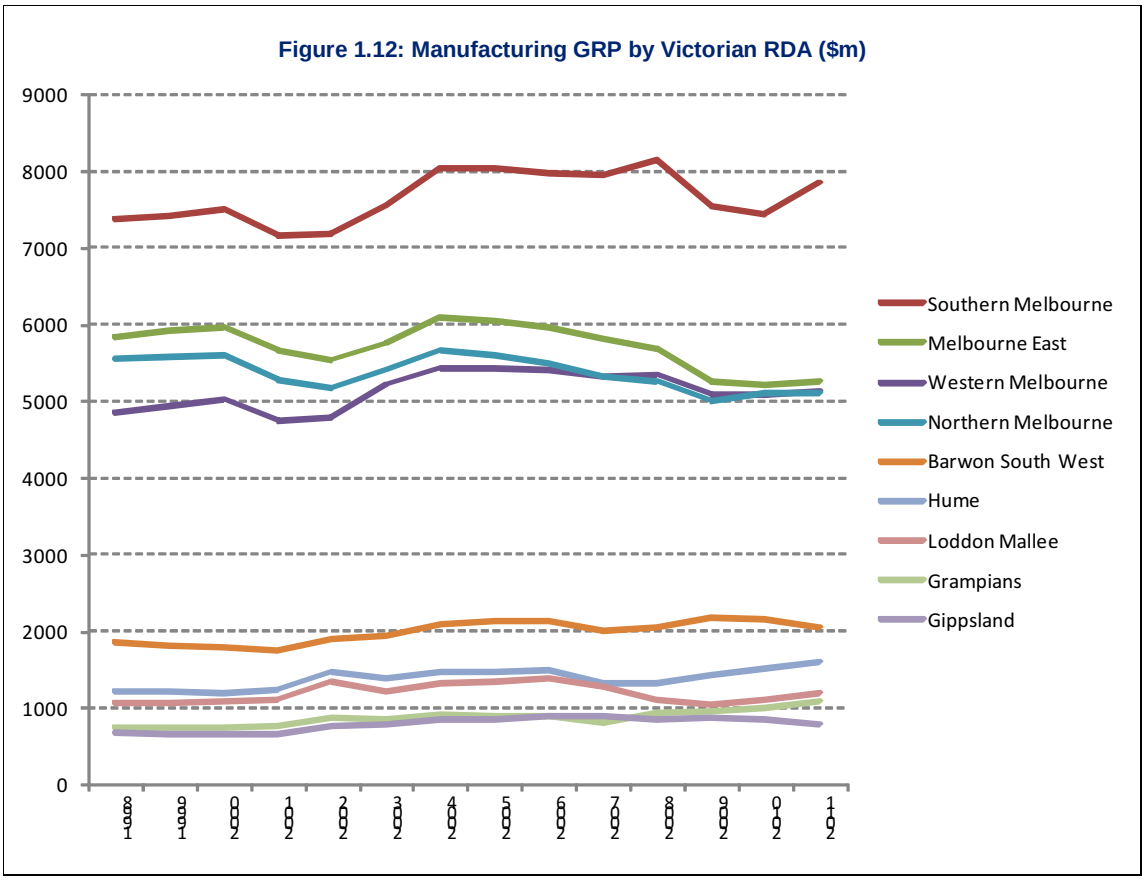


Figure 1.11: Resident manufacturing employment by Victorian RDA





This chart demonstrates the significance of manufacturing employment to the economies of Victoria and New South Wales. Despite its exposure to automotive manufacturing sector employment, Victoria now has the highest number of people employed in manufacturing. Manufacturing employment in Queensland is growing.

Figure 1.13: JTW manufacturing employment by state

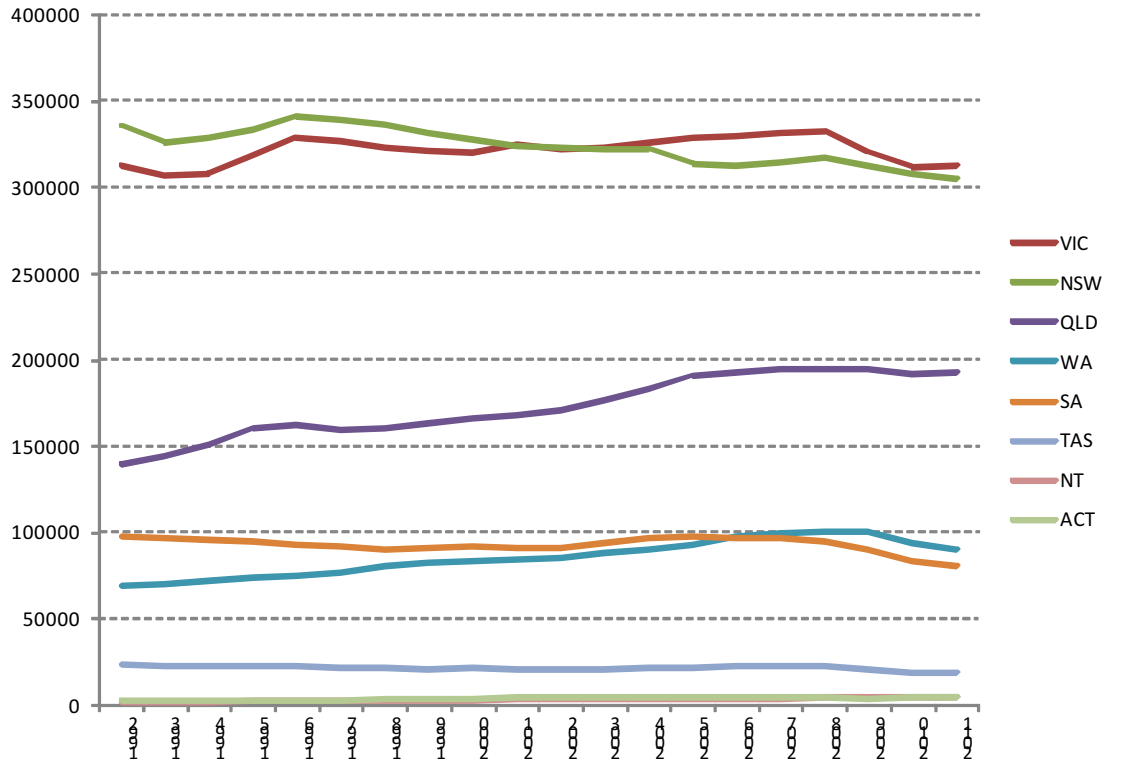
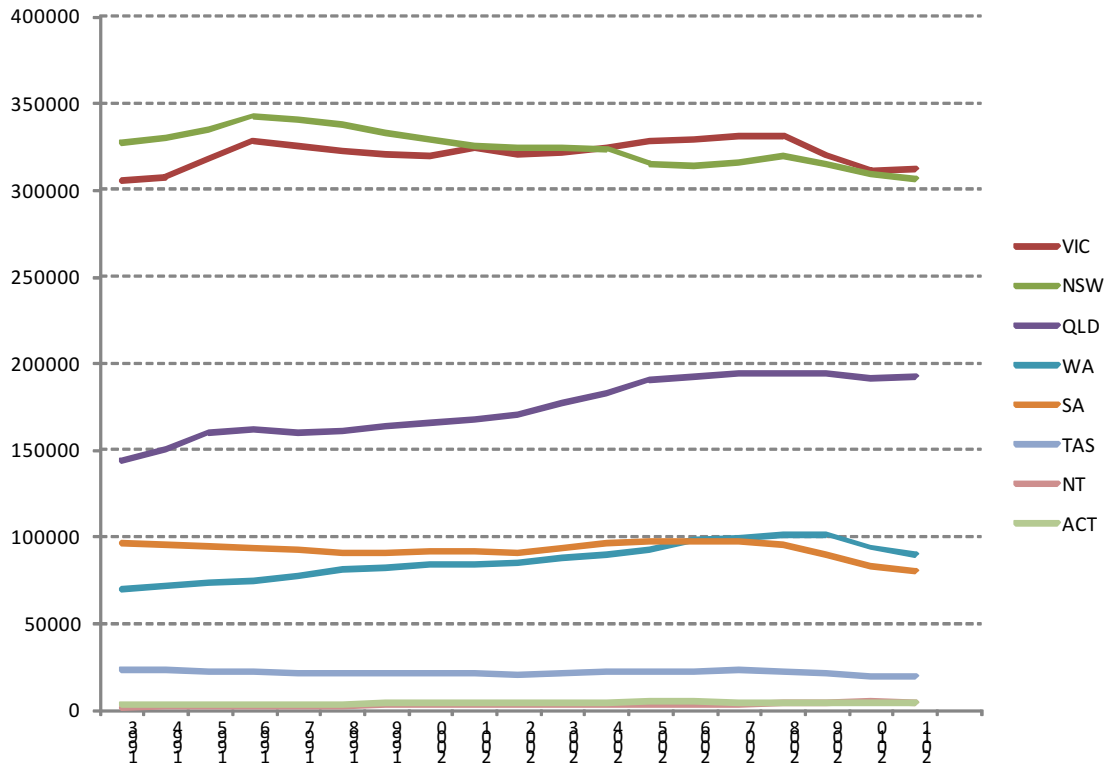
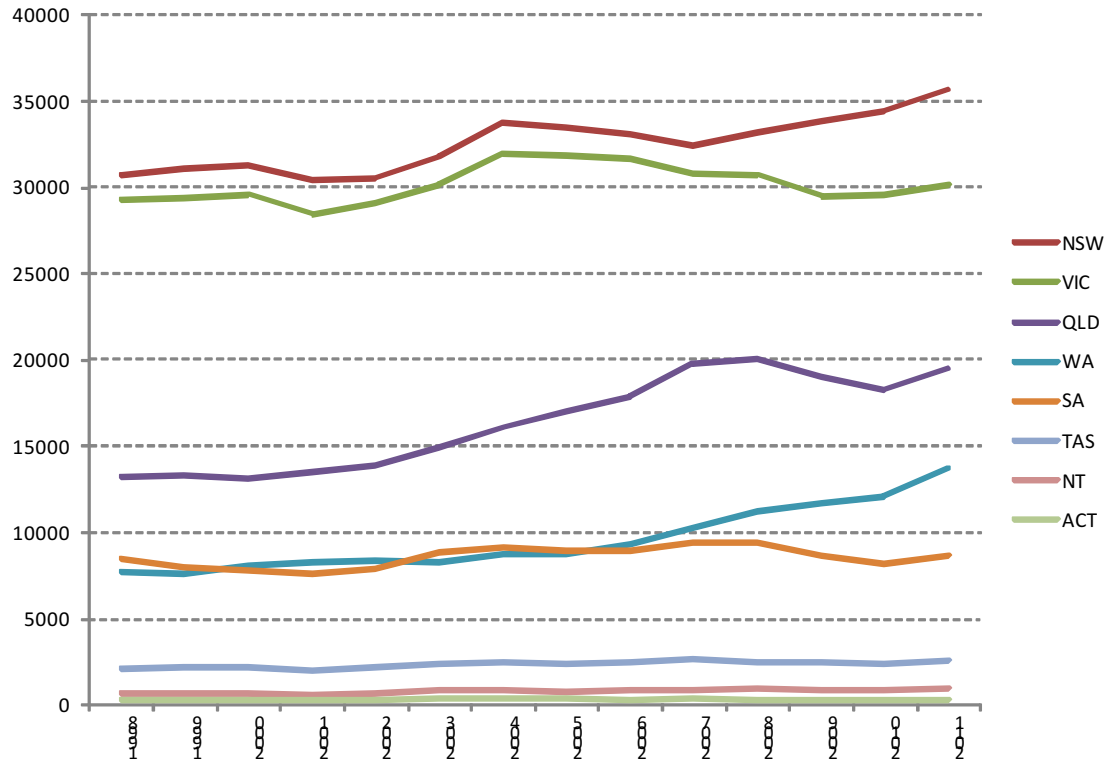


Figure 1.14: Resident manufacturing employment by state



Manufacturing sector GRP in New South Wales appears to be growing at a slightly higher rate than that of Victoria, suggesting higher productivity rates for the industry there. Without detailed investigations it is hard to draw conclusions as to why this is the case, but it could be the impact of automotive industry manufacturing on Victorian manufacturing as a whole.

Figure 1.15: Manufacturing GRP by state



The following diagrams compare the share of GDP by industry in Melbourne's North for 2001 and 2011. The significance of the manufacturing sector on the formation of the region's GRP remains evident.

Figure 1.16: Melbourne's North: Share of GRP – 2001

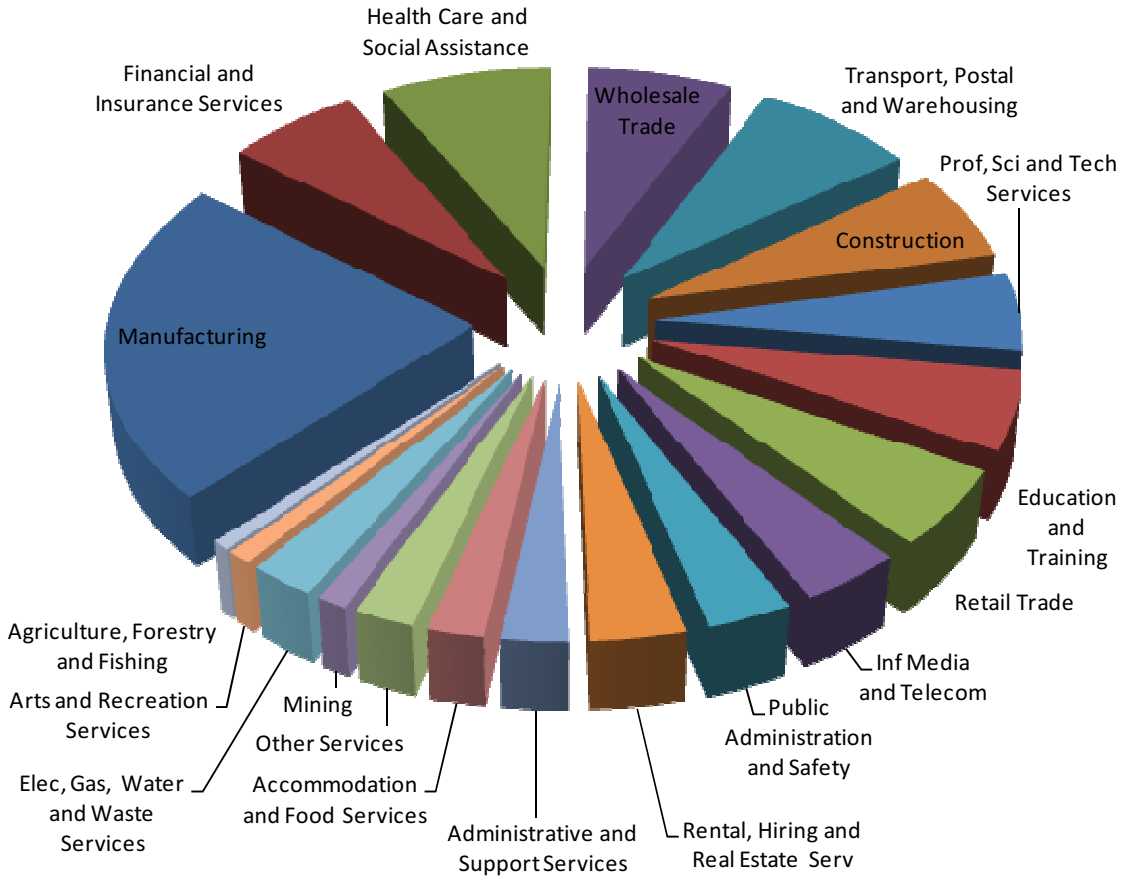
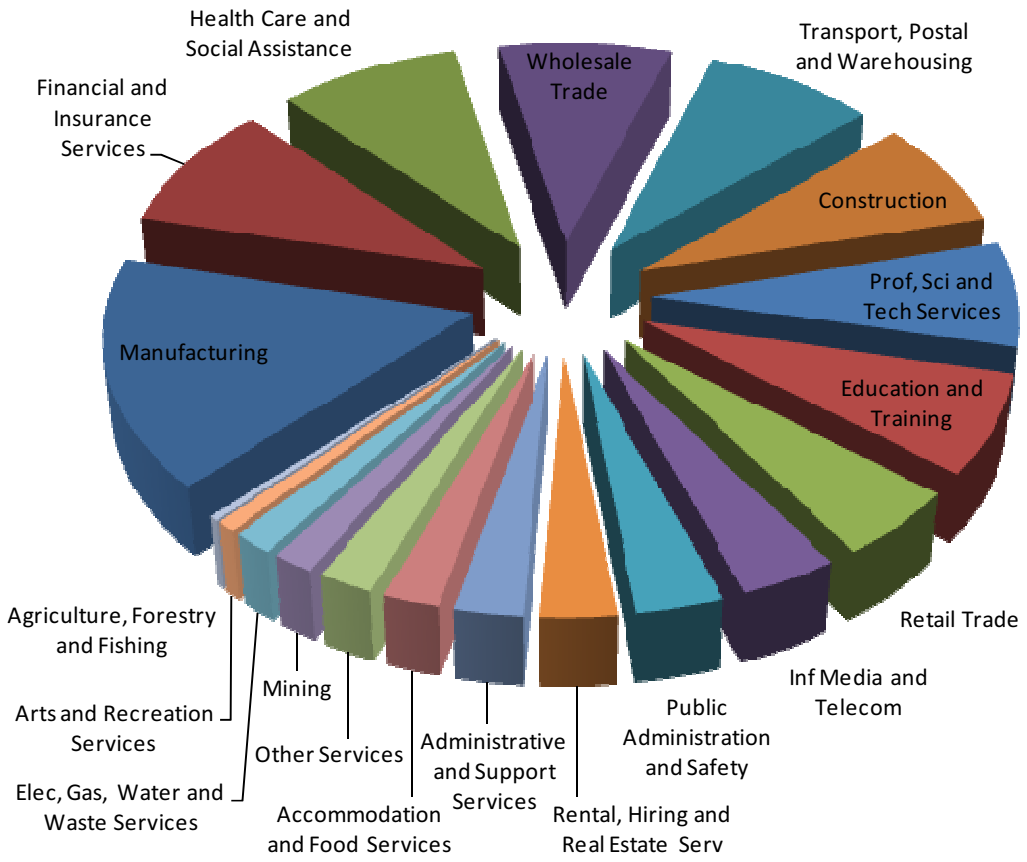


Figure 1.17: Melbourne's North: Share of GRP – 2011



2. Manufacturing and Melbourne's North LGAs

The GFC has had its impact on the structure of the region's manufacturing industry. For Melbourne's North (and particularly the rapidly developing LGAs of Hume and Whittlesea) declines in manufacturing employment, particularly in the automotive sector, have had an adverse impact.

2.1 Manufacturing employment in Melbourne's North LGAs

Some job losses have occurred as part of a realignment of global strategies by global companies. These may have brought forward some inevitable changes, the causes of which (in at least some cases) are difficulties in faraway lands. The far cheaper manufacturing opportunities in other parts of the region, and in South East Asia and China in particular, have shaped global manufacturing strategies in the automotive and chemical industries specifically.

It has therefore been difficult for local policymakers to influence trends that are driven by circumstances beyond their sphere of influence. The capacity to compete for new employment may also be an issue for some residents of Hume, because of the low level of skills in at least some of the resident population.

If there are major automotive manufacturing closures or downsizing of operations in the region, while new jobs are being created in other parts of the manufacturing sector (food processing for example), stranding of the lowest skilled workers in casual work or long term structural unemployment remains an issue for both Hume and Whittlesea.

The automotive industry is analysed in greater detail in Chapter 4 of this report.

The City of Hume is home to the largest manufacturing industry in Melbourne's North and Hume is an important contributor to Victoria's GRP and export performance.

Over the last decade there has been a significant decline in the number of residents of Moreland and Darebin, and to a lesser extent Banyule, who work in the manufacturing industry. These changes are as much about the changing resident population and land values as they are about decline in the manufacturing industry in these LGAs, although in Darebin and Moreland in particular employment in the manufacturing industry has declined as businesses have closed or relocated to greenfield sites in other parts of Melbourne.

Figure 2.1: JTW manufacturing employment by Melbourne's North LGAs

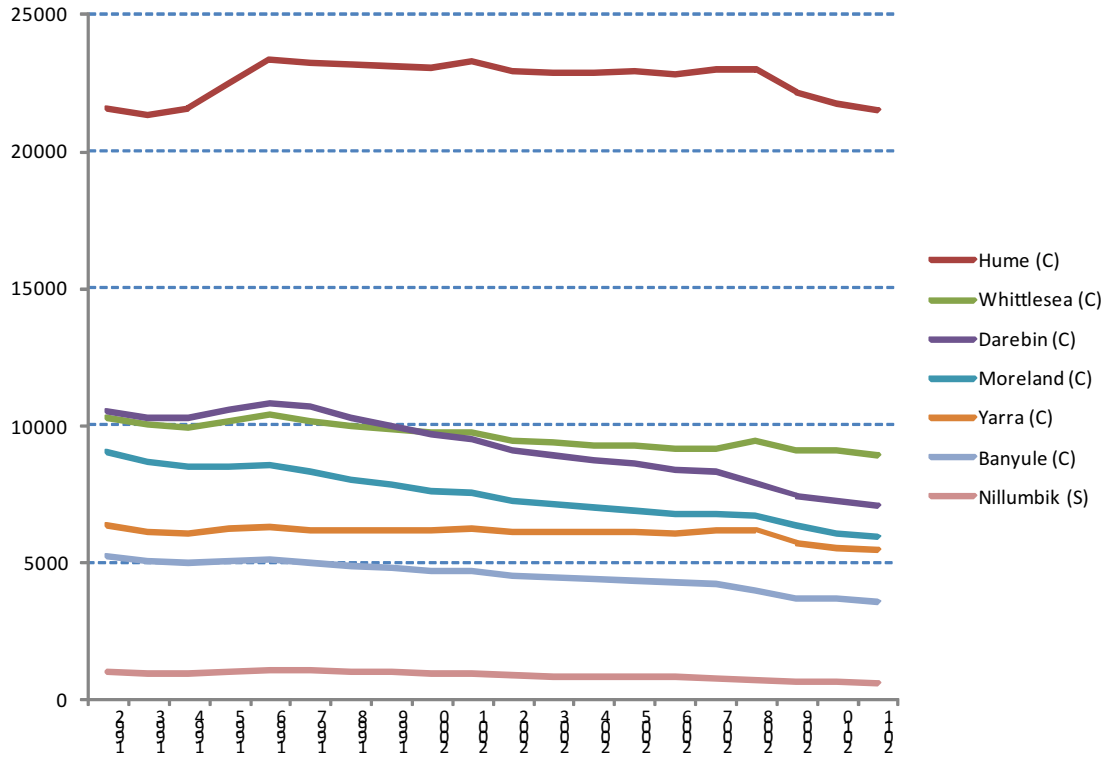


Figure 2.2: Resident manufacturing employment by Melbourne's North LGAs

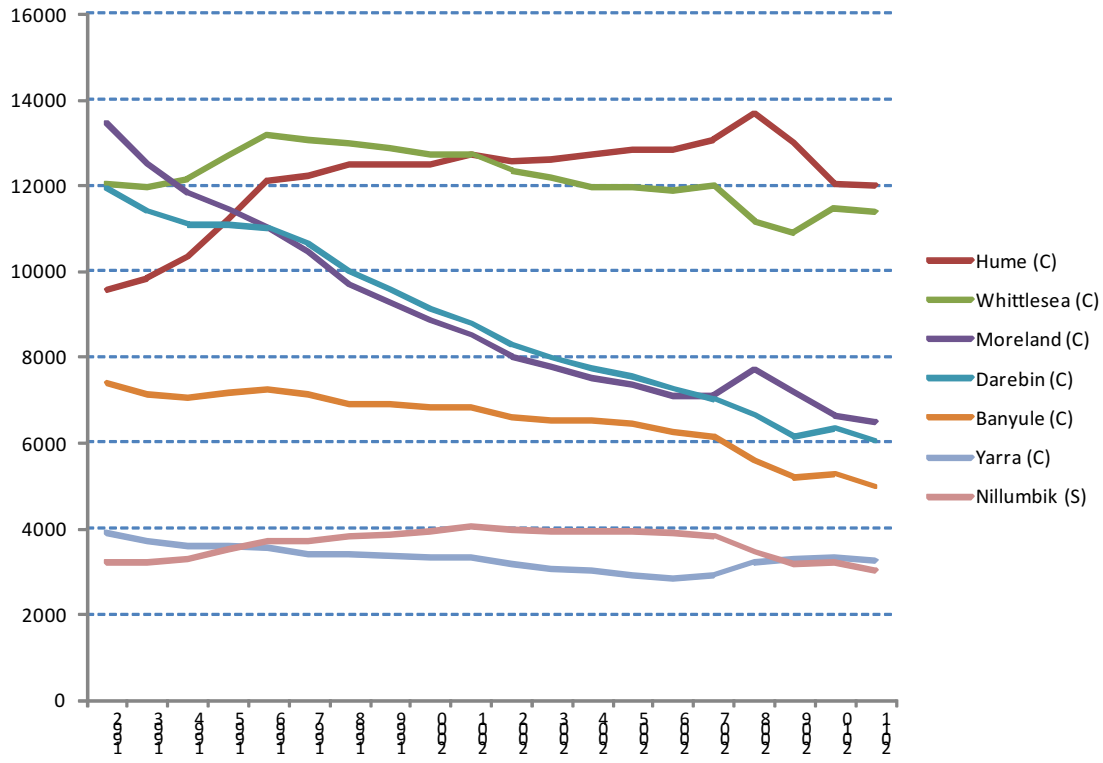
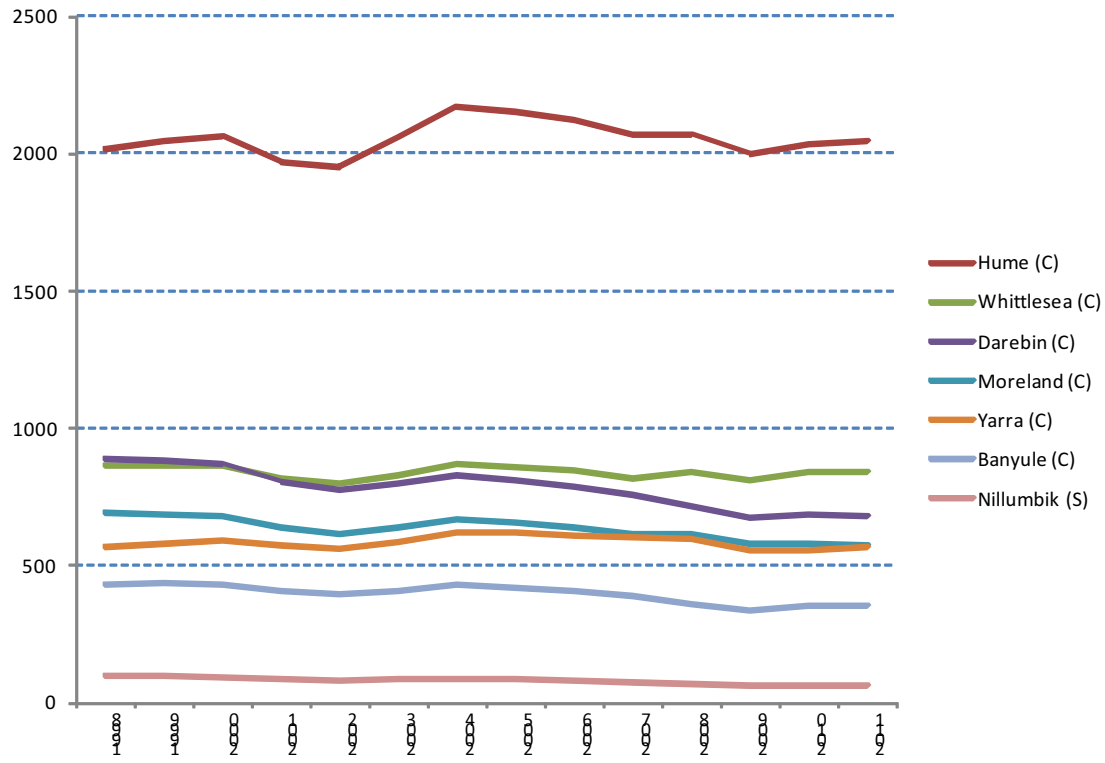


Figure 2.3: Manufacturing GRP by Melbourne's North LGAs ($m)



The following diagrams show the share of manufacturing industry GRP in Melbourne's North by LGA for 2001 and 2011. The City of Hume continued to be extremely important as a creator of wealth for the region. A strategy to combine the manufacturing strengths of Hume and Whittlesea to market these LGAs as manufacturing centres of excellence for the future – places with spaces and skills – would help consolidate manufacturing supply chains and attract new businesses to Melbourne's North.

Figure 2.4: Share of manufacturing GRP by Melbourne's North LGAs – 2001

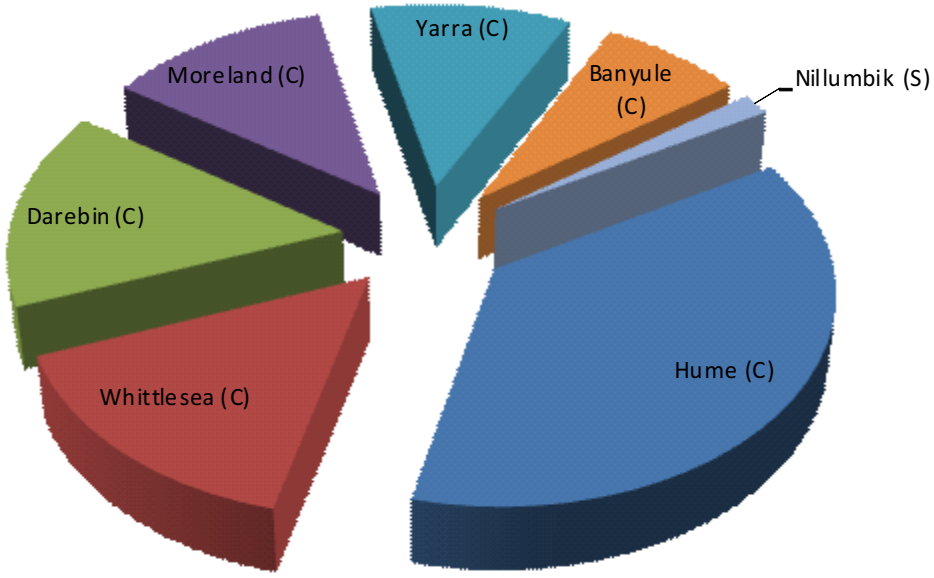
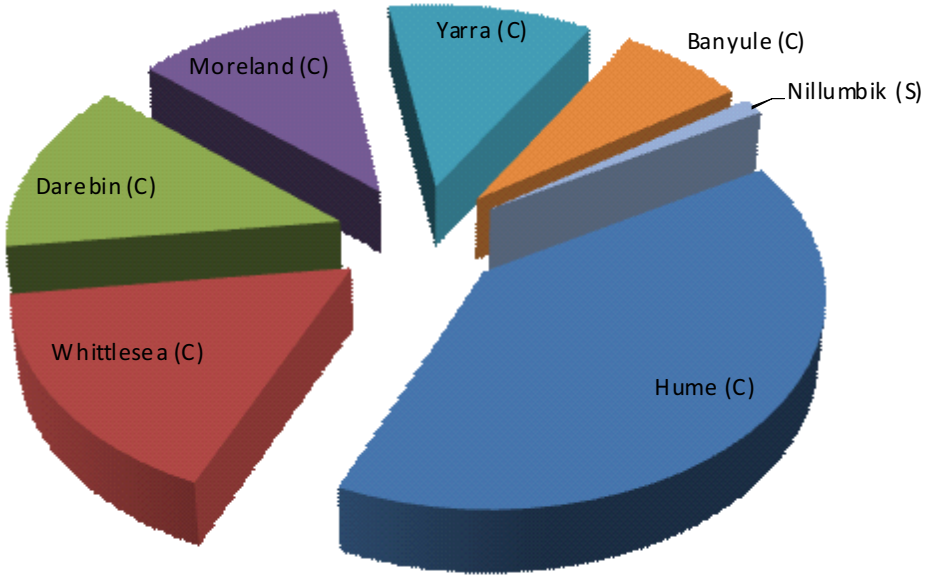


Figure 2.5: Share of manufacturing GRP by Melbourne's North LGAs – 2011



The following figures show the decline in share of manufacturing employment and GRP in the City of Hume.

Figure 2.6: JTW employment for Hume (C) – 2001

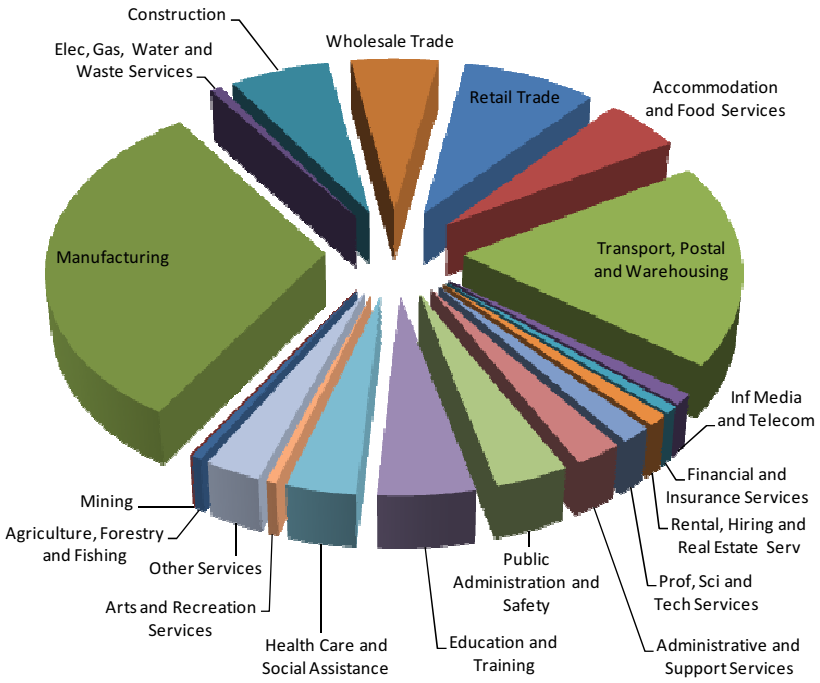


Figure 2.7: JTW employment for Hume (C) – 2011

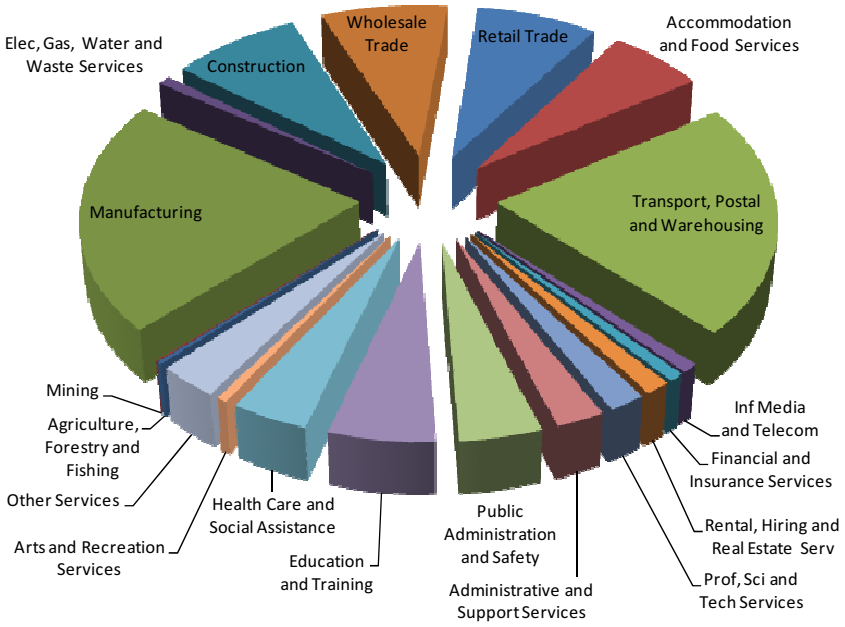


Figure 2.8: Value added for Hume (C) – 2001

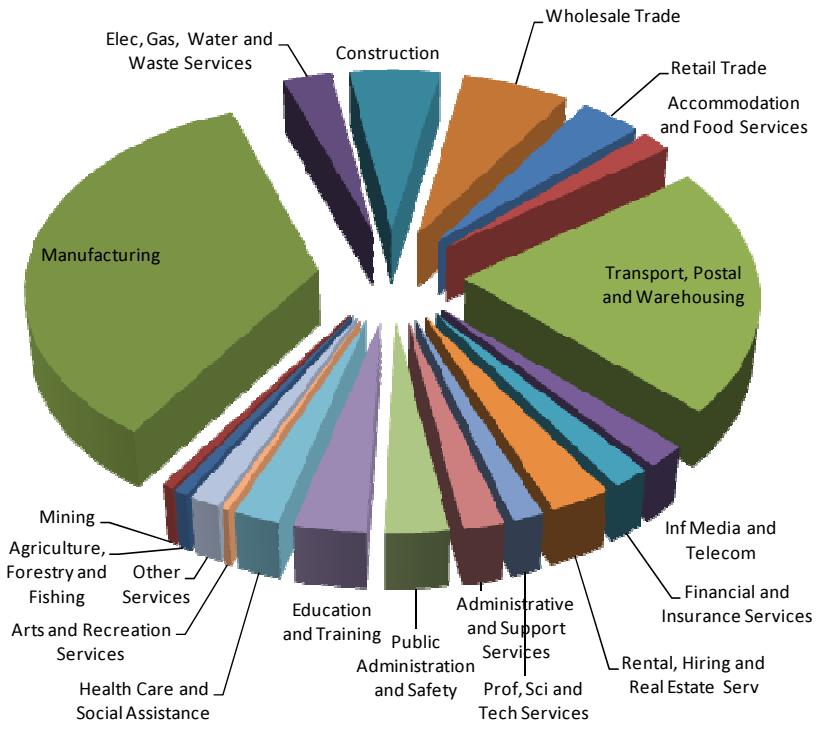
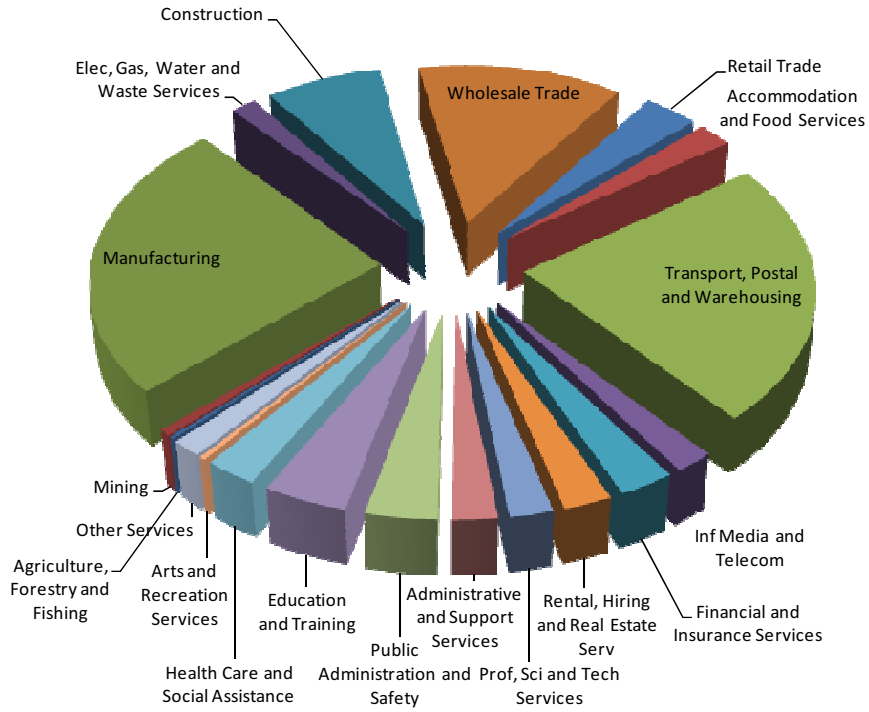


Figure 2.9: Value added for Hume (C) – 2011



3. Melbourne's North: Manufacturing described

3.1 Current state of manufacturing in the region

In terms of JTW employment, the transport equipment manufacturing industry (automotive and related) remains the largest employer in the manufacturing industry in Melbourne's North. It is closely followed by the food product manufacturing industry in terms of the number employed. The chemical industry is the third largest employer of manufacturing workers in the region.

In terms of total employment, textiles, clothing and footwear (TCF) has declined the most since 1998. Given the large numbers of jobs lost in the TCF sector, the manufacturing industry has done well to maintain jobs at the level it has.

What continues to be a concern is that the decline in employment in the manufacturing sector is more or less occurring across all parts of the industry. The exception is primary metal and metal product manufacturing, which has shown steady if relatively small employment growth in the last decade. This employment growth looks as if it is coming from industry consolidation to the region and the recycling industry, as the metals sector faces stiff competition from imports.

For resident employment there have been notable declines in automotive manufacturing employment and TCF. There is also a worrying decline in food product manufacturing employment.

Figure 3.1: Melbourne's North LGAs: JTW employment by industry

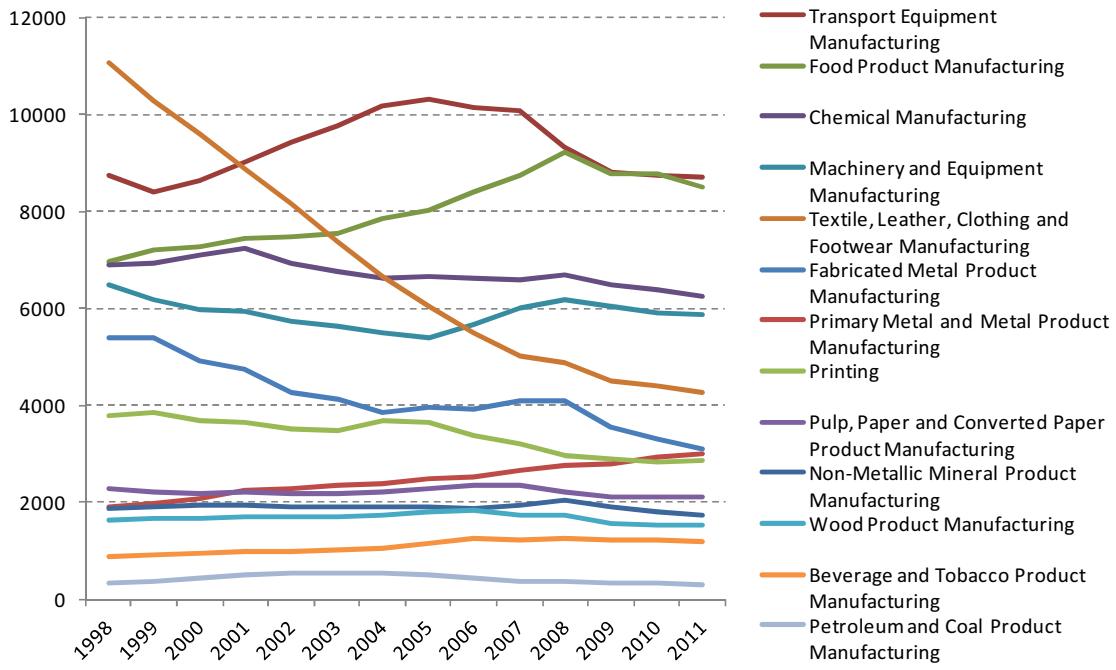
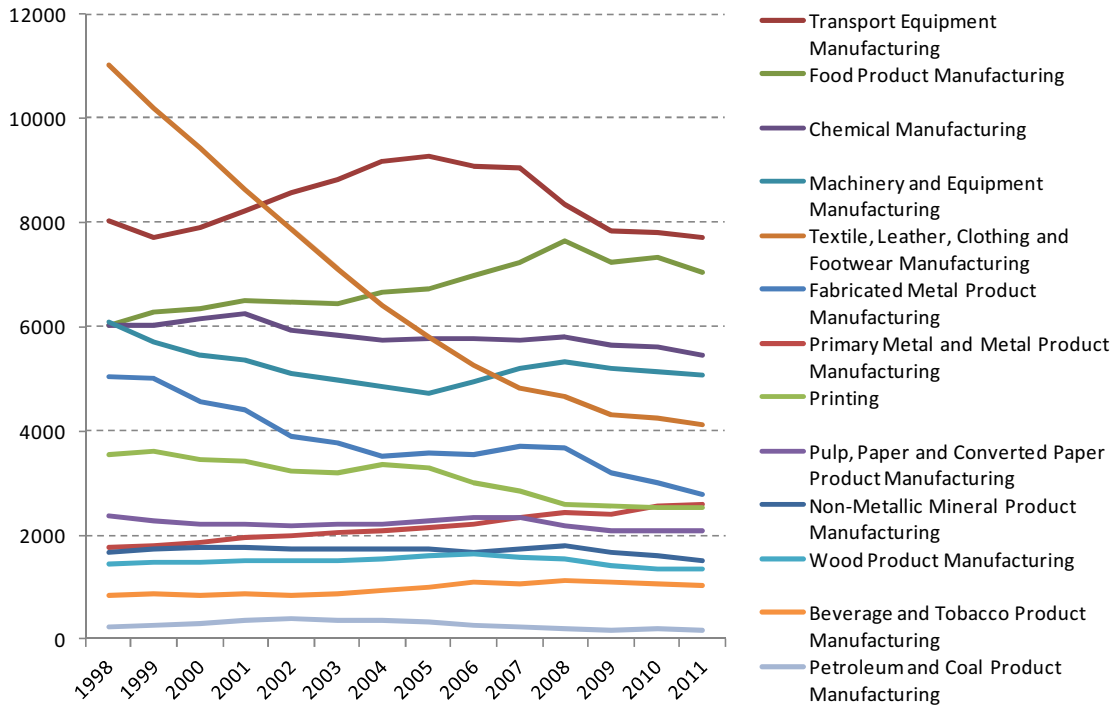


Figure 3.2: Melbourne's North LGAs: UR employment by industry



Note: Journey to work (JTW) figures relate to workers from all over Melbourne.
Usual Residents (UR) figures relate to workers who live in Melbourne's North.

Table 3.1 Melbourne's North LGAs: JTW employment by industry														
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Transport Equipment Manufacturing	8735	8407	8648	9005	9443	9766	10170	10336	10158	10092	9325	8822	8750	8696
Food Product Manufacturing	6957	7212	7288	7462	7491	7540	7867	8042	8405	8748	9240	8765	8787	8514
Chemical Manufacturing	6886	6927	7101	7249	6922	6766	6640	6671	6637	6576	6681	6488	6400	6267
Machinery and Equipment Manufacturing	6493	6173	5964	5937	5734	5627	5498	5398	5680	6022	6193	6047	5892	5886
Textile, Leather, Clothing and Footwear Manufacturing	11081	10295	9615	8880	8154	7384	6650	6038	5491	5032	4881	4492	4386	4271
Fabricated Metal Product Manufacturing	5385	5387	4931	4759	4253	4125	3860	3946	3920	4087	4086	3546	3308	3100
Primary Metal and Metal Product Manufacturing	1921	1964	2084	2235	2286	2351	2397	2473	2519	2669	2777	2784	2930	2986
Printing	3794	3871	3700	3660	3500	3493	3681	3653	3375	3212	2960	2888	2828	2853
Pulp, Paper and Converted Paper Product Manufacturing	2298	2229	2180	2202	2175	2194	2200	2293	2339	2337	2213	2098	2103	2102
Non-Metallic Mineral Product Manufacturing	1861	1899	1933	1929	1905	1921	1921	1922	1872	1950	2036	1915	1812	1737
Wood Product Manufacturing	1616	1663	1665	1714	1703	1700	1737	1810	1832	1744	1741	1579	1528	1518
Beverage and Tobacco Product Manufacturing	891	930	951	987	985	1012	1066	1138	1248	1229	1268	1231	1212	1190
Petroleum and Coal Product Manufacturing	335	375	435	521	544	539	551	505	450	380	363	317	328	312
Total	**58253**	**57332**	**56495**	**56540**	**55095**	**54418**	**54238**	**54225**	**53926**	**54078**	**53764**	**50972**	**50264**	**49432**

Table 3.2 Melbourne's North LGAs: UR employment by industry														
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Transport Equipment Manufacturing	8029	7708	7912	8223	8562	8819	9157	9268	9081	9029	8337	7850	7800	7724
Food Product Manufacturing	6039	6270	6340	6492	6462	6437	6656	6729	6968	7238	7641	7230	7325	7035
Chemical Manufacturing	6022	6029	6148	6252	5941	5824	5734	5774	5765	5735	5806	5642	5612	5463
Machinery and Equipment Manufacturing	6082	5715	5456	5363	5116	4990	4846	4721	4930	5205	5317	5211	5130	5082
Textile, Leather, Clothing and Footwear Manufacturing	11024	10173	9437	8640	7857	7103	6394	5790	5256	4819	4668	4304	4254	4129
Fabricated Metal Product Manufacturing	5027	5013	4570	4389	3894	3766	3519	3587	3555	3709	3684	3185	2992	2786
Primary Metal and Metal Product Manufacturing	1775	1784	1863	1969	1990	2047	2091	2157	2200	2340	2422	2411	2552	2584
Printing	3548	3615	3452	3410	3240	3200	3342	3282	3004	2842	2605	2556	2532	2532
Pulp, Paper and Converted Paper Product Manufacturing	2353	2271	2209	2223	2183	2196	2199	2285	2326	2326	2189	2073	2090	2076
Non-Metallic Mineral Product Manufacturing	1678	1721	1756	1757	1727	1733	1726	1717	1665	1734	1801	1682	1599	1520
Wood Product Manufacturing	1437	1485	1485	1522	1505	1502	1541	1607	1631	1560	1552	1402	1363	1342
Beverage and Tobacco Product Manufacturing	841	858	855	864	850	875	925	988	1089	1077	1113	1085	1075	1042
Petroleum and Coal Product Manufacturing	224	258	307	375	390	378	377	332	282	230	216	187	196	185
Total	**54079**	**52900**	**51790**	**51479**	**49717**	**48870**	**48507**	**48237**	**47752**	**47844**	**47351**	**44818**	**44520**	**43500**

Value added by manufacturing industry in Melbourne's North is highest in transport equipment manufacturing, food manufacturing and chemical manufacturing in that order. Machinery and equipment manufacturing also plays an important role in the region's manufacturing. Value adding in the automotive sector has been the most volatile.

Figure 3.3: Melbourne's North LGAs: Value added by industry

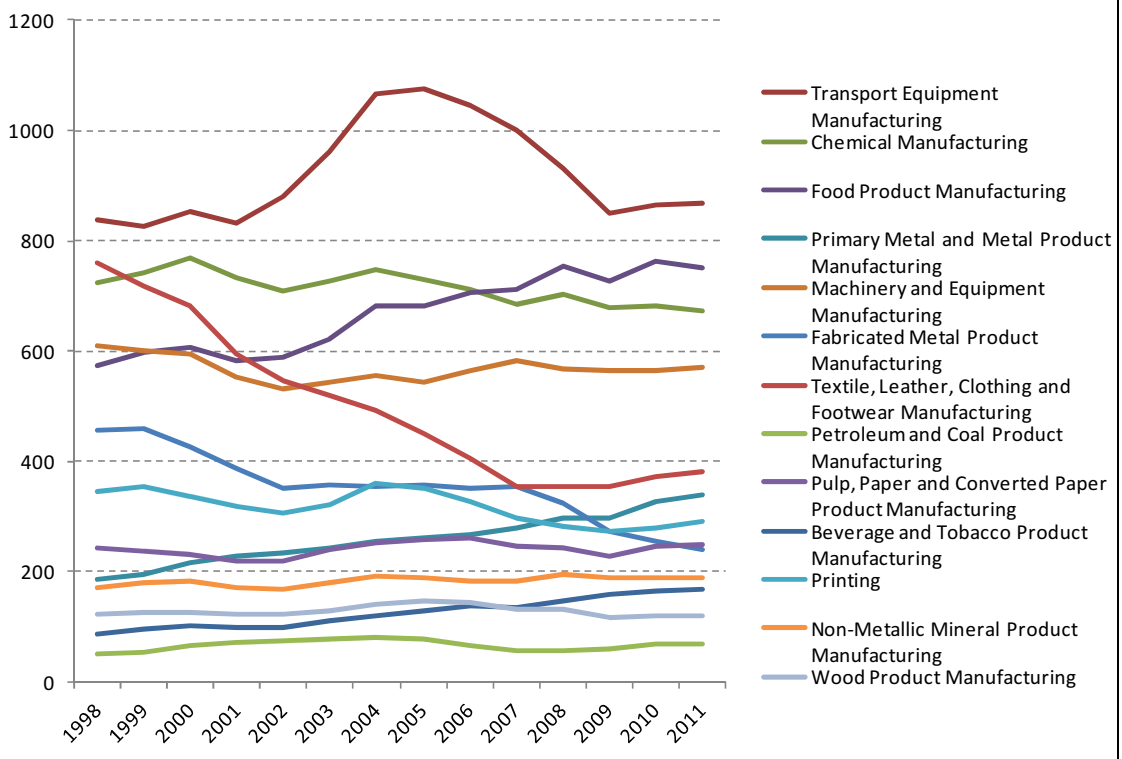


Table 3.3 Melbourne's North LGAs: Value added by industry ($m)														
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Transport Equipment Manufacturing	839	827	854	833	879	960	1067	1076	1044	1000	931	849	864	869
Chemical Manufacturing	724	743	768	733	708	726	747	729	711	684	703	678	681	672
Food Product Manufacturing	572	598	607	583	587	622	682	681	706	710	753	727	762	750
Primary Metal and Metal Product Manufacturing	186	195	216	227	233	243	254	260	267	279	298	297	327	339
Machinery and Equipment Manufacturing	609	602	594	553	531	544	554	542	566	581	568	565	564	572
Fabricated Metal Product Manufacturing	456	459	426	387	351	356	353	356	353	353	324	273	256	240
Textile, Leather, Clothing and Footwear Manufacturing	761	716	681	596	547	519	493	450	404	355	354	356	373	381
Petroleum and Coal Product Manufacturing	50	54	65	73	75	77	82	78	67	56	58	59	68	68
Pulp, Paper and Converted Paper Product Manufacturing	243	236	232	219	220	239	252	259	261	247	242	228	246	250
Beverage and Tobacco Product Manufacturing	88	95	101	98	98	110	121	129	138	135	145	158	164	168
Printing	346	355	337	317	305	321	359	352	326	296	282	273	280	292
Non-Metallic Mineral Product Manufacturing	171	180	182	170	168	179	193	190	183	183	194	190	189	190
Wood Product Manufacturing	122	127	127	123	124	130	142	147	145	133	133	118	119	119
Total	**5167**	**5187**	**5190**	**4912**	**4826**	**5026**	**5299**	**5249**	**5171**	**5012**	**4985**	**4771**	**4893**	**4910**

The region's out of LGA exports are led by the automotive industry, followed by chemical manufacturing and food product manufacturing. Primary metal and metal product manufacturing and machinery manufacturing have also grown exports. In the case of primary metal and metal product manufacturing, this growth may be the result of industry consolidation to the region, which means that long term prospects may prove difficult.

Figure 3.4: Melbourne's North LGAs: Exports by industry

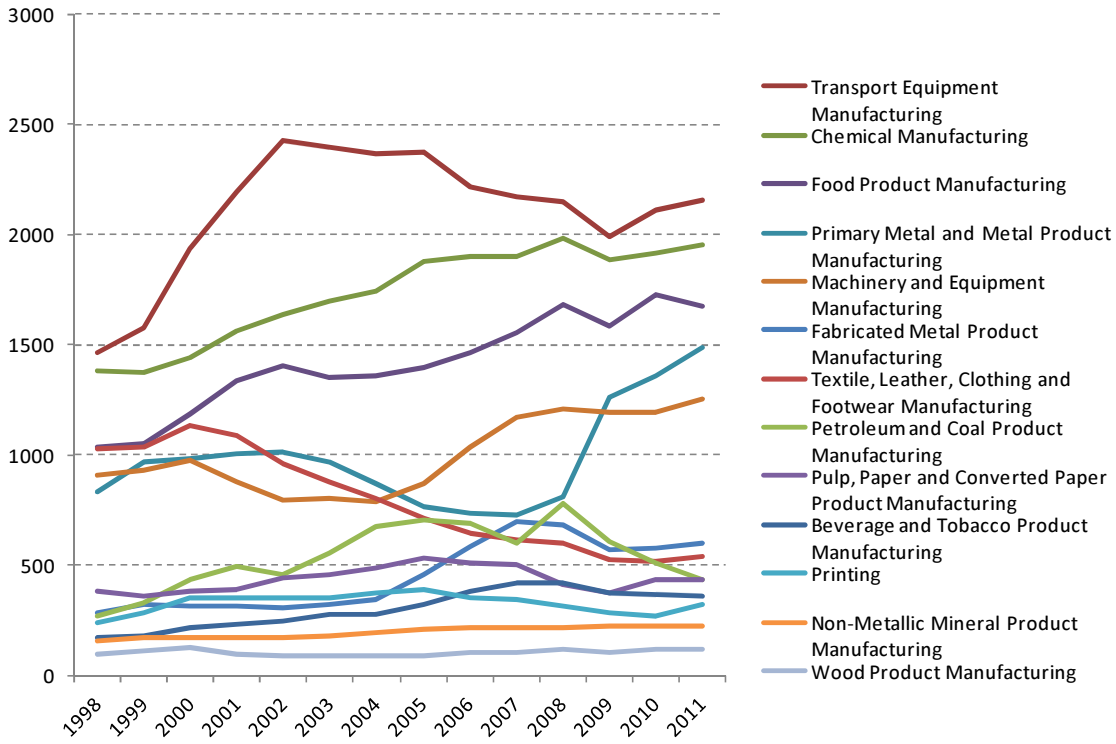


Table 3.4 Melbourne's North LGAs: Exports by industry ($m)														
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Transport Equipment Manufacturing	1464	1575	1938	2192	2429	2395	2366	2373	2213	2170	2148	1989	2108	2158
Chemical Manufacturing	1386	1372	1441	1561	1636	1696	1740	1880	1903	1900	1986	1886	1918	1955
Food Product Manufacturing	1036	1053	1189	1339	1406	1351	1359	1397	1463	1553	1682	1587	1726	1678
Primary Metal and Metal Product Manufacturing	833	967	986	1010	1015	965	873	769	736	727	814	1263	1360	1489
Machinery and Equipment Manufacturing	906	929	974	878	799	804	787	868	1036	1169	1206	1195	1191	1257
Fabricated Metal Product Manufacturing	289	320	313	316	307	324	348	458	586	701	687	573	578	599
Textile, Leather, Clothing and Footwear Manufacturing	1028	1034	1132	1087	964	877	801	713	642	614	600	525	517	543
Petroleum and Coal Product Manufacturing	268	328	434	492	461	557	677	707	692	603	781	606	508	438
Pulp, Paper and Converted Paper Product Manufacturing	384	360	383	394	442	460	491	532	512	503	412	379	435	433
Beverage and Tobacco Product Manufacturing	173	182	218	235	249	277	282	326	385	421	424	375	365	357
Printing	241	285	354	353	355	353	377	387	351	349	315	283	269	320
Non-Metallic Mineral Product Manufacturing	157	170	172	172	171	182	197	210	218	222	218	224	226	225
Wood Product Manufacturing	99	111	130	99	88	89	89	94	102	102	120	108	121	120
Total	**8264**	**8686**	**9664**	**10128**	**10322**	**10330**	**10387**	**10714**	**10839**	**11034**	**11393**	**10993**	**11322**	**11572**

From Table 3.4 it may be that the growth in primary metal and metal product manufacturing is exaggerated due to the increase in the price of metals.

Table 3.5 gives an estimation of the increase of value added by hours worked.

Table 3.5 Increase in value added for hours worked, Melbourne's North manufacturing sector 1997-98 to 2010-11 (per cent)

	Melbourne's North Inner	Melbourne's North Outer
Food	10	8
Drink	45	42
Textiles, clothing and footwear (TCF)	35	42
Wood products	6	4
Pulp and paper	15	13
Printing	10	8
Petroleum and coal products	42	41
Chemicals	7	3
Non-metallic minerals	23	21
Primary metals	11	10
Fabricated metals	-9	-10
Transport equipment	1	0
Machinery equipment	5	4
Furniture	-19	-20

These preliminary figures show that some parts of the manufacturing sector in Melbourne's North have struggled to improve productivity. The following points should be noted.

- Some firms may have had more capacity to increase prices and this was dependent on which part of the manufacturing sector they were in.
- Data suggests that statewide trends are a strong influence on productivity.
- In the case of the furniture manufacturing industry, data is likely to indicate that the industry is having difficulties in maintaining prices because of high levels of competition or market related difficulties – figures may indicate future decline.
- Conversely, TCF manufacturing has seen a higher level of productivity increase, a typical result for an industry in steep decline where the less productive parts of the industry have already closed or moved offshore, leaving only the most highly productive businesses or parts of businesses.
- In the case of fabricated metals, this is very much a state and national trend (and this is despite the resources boom).

The story of Melbourne's manufacturing industry is that much of it is composed of relatively small businesses; that is, those employing between one and 19 staff. This is also the case for Melbourne's North.

For smaller companies the issues include the capacity to develop export markets, keep up with market intelligence, develop hi-tech skills and keep pace with industry training and investment requirements in an increasingly complex technological and market landscape.

Southern Melbourne has the most companies in each category and probably has the strongest supply chain dynamism of any Melbourne RDA.

Figure 3.5: Number of manufacturing businesses in Melbourne's RDA – June 2007 to June 2009

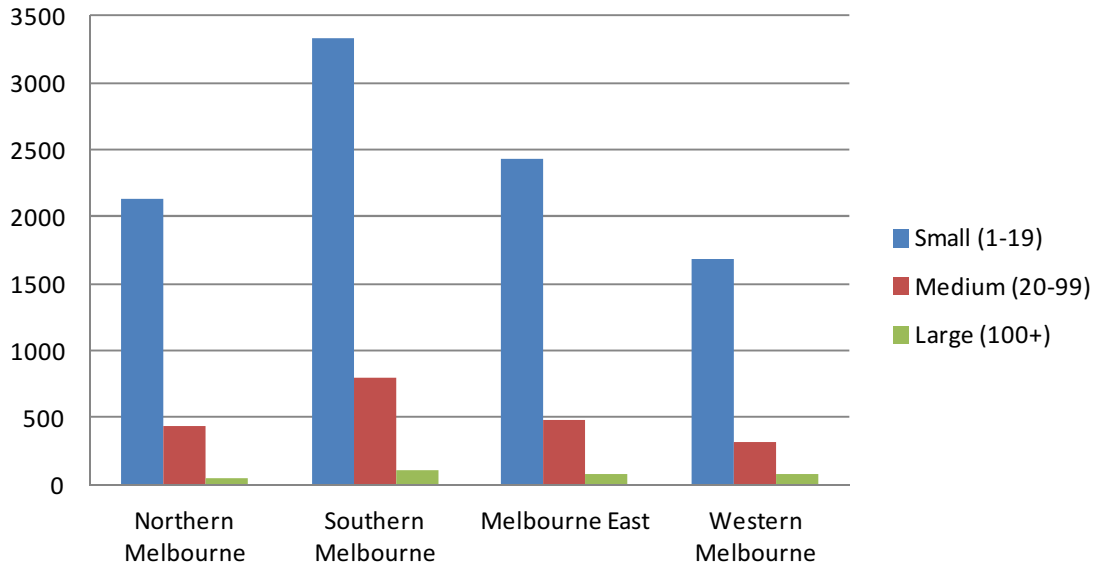
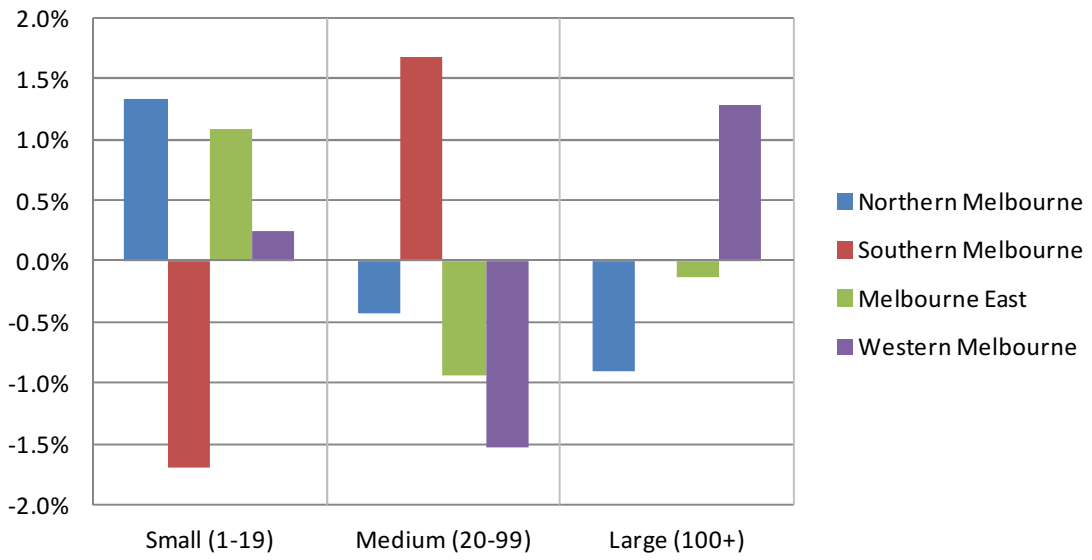


Figure 3.6 shows that Melbourne's North has a higher proportion of small sized businesses relative to the Melbourne Metro average and smaller proportion of large sized businesses relative to the Melbourne Metro average.

Figure 3.6: Proportion of manufacturing businesses by size relative to Melbourne Metro average



Small manufacturing firms have the capacity for rapid growth. What is required in these circumstances are management systems that allow firms to manage sales, production, inventories and accounts effectively through best practice management reporting systems. In this way the firm's productivity and profitability can be managed to ensure the best possible outcomes, a necessity during periods of high growth and market expansion. The effective use of management systems in the manufacturing sector in Melbourne's North should be regarded as a priority for many of the region's manufacturing firms. The implementation of these systems requires leadership from management and a high level of participation from employees.

Improving management systems will allow firms to improve margins and quality service provision to customers – important goals when chasing higher sales targets.

Improved design capability and the use of quality engineers on the shop floor of small to medium size manufacturing firms may also drive productivity improvements, particularly during periods of expansion. This needs careful consideration.

3.2 The role of business incubators in Melbourne's North

Melbourne's North has a history of developing successful business incubators, a particular strength of this growing region. Growing regions probably have a greater need for business incubators, as they are likely to provide a series of new supply chain opportunities including specialist services and R&D to manufacturing. In Melbourne's North, enterprise and business incubators include the Brunswick Business Incubator, the La Trobe Technology Enterprise Centre and the Darebin Enterprise Centre (DECL).

DECL provides business with the next step up from home based enterprises and 30 per cent of its occupants are start-up businesses. It provides facilities, communications and some business services. The old Northcote Police Station is now being used as a creative industries incubator (ArtDECL) for new media, animation, photography and other computer based and arts businesses. This new facility has the capacity to accommodate 12 client businesses, providing appropriate services for relatively hi-tech creative businesses.

Incubators are important as they provide opportunities for start-up businesses to grow and opportunities for people to grow them. Incubators assist in professionalising the start-up company and providing greater networking and market opportunities.

Business incubators are an effective strategy in generating new manufacturing and other growth. They have proved to be effective in creating private sector employment, and it is important for both state and federal governments to support the establishment of new business incubators. A recent study in the US, funded by the Department of Commerce's Economic Development Administration, notes that business incubation is one of the most cost-effective routes to business creation and describes the efficacy of business incubation as a proven job creator.

4. Case study: Melbourne's North and automotive manufacturing

4.1 The automotive industry

The Australian automotive industry has gone through major changes over the decades, some of which are the long term results of policy and world industry adjustments and some that have been more cyclical in nature.

Industry development policies for manufacturing are particularly effective because policies can be efficiently designed to unlock productivity growth, as there is a strong productivity multiplier effect from the assistance provided.

The automotive manufacturing industry has provided well paid and highly skilled employment in Melbourne's North for several decades. Ford Australia has been an important part of the region's industrial landscape since the 1950s, when it established a major manufacturing plant in Broadmeadows.

The automotive manufacturing industry has created the benchmark for manufacturing standards, processes and skills development. This positive impact has flowed through much of the region's manufacturing industry, lifting standards and encouraging better practice throughout the production and customer cycle in a wide range of local businesses.

The automotive supply chain is complex and sophisticated, with just in time delivery and the use of IT systems that manage the supply chain nationally and around the world. There are many manufacturing firms in Melbourne's North that make components for the automotive industry and many other types of businesses in the region rely on the expenditures of automotive workers. The wealth generated by the automotive manufacturing industry is dispersed throughout the broader economy, including to newsagents, cafes, retail outlets and a range of other small businesses in the region.

The future success of the automotive manufacturing industry in Melbourne's North is therefore extremely important to employment and to the local economy.

The high value of the Australian dollar (making imported cars cheaper and manufactured exports more expensive), a consumer shift to smaller cars, increasing fuel costs and the higher costs of manufacturing in Australia are all taking their toll on the industry and its competitiveness.

Because a significant amount of rationalisation and restructuring of the manufacturing sector has already occurred, much of what remains of the industry in the Cities of Hume and Whittlesea is now more focused on advanced manufacturing and the increased use of technology and automation techniques.

The automotive industry structure in Melbourne's North can be described as:

- a before-market manufacturing sector that includes the original equipment manufacturers (OEMs) and the tier suppliers who provide components and other services to the OEMs
- an after-market sector that includes dealerships, body repairs and add on or extras component manufacturers and suppliers who provide services and accessories for a broad range of vehicle types, including passenger vehicles, four wheel drives, vans, trucks and utes. Equipment supplied by after-market companies includes nudge bars, bull bars, bike carriers, cargo barriers, van shelving, sound systems and a range of other accessories.

Over the last 10 years or so there has been a strong trend towards the globalisation of the world automotive industry and the emergence of China and Thailand as major vehicle producers in our region. For Australia, this globalisation has reinforced the already growing export emphasis (including design, engineering and other high level skills) but has increased the competition for local component makers with rising sourcing of content from offshore.

The changes in the automotive industry over time, including globalisation, have:

- concentrated vehicle production in the types in which Australia is most competitive – namely large cars – even though this exposes the industry to risk when oil prices are high and/or rising rapidly
- opened the industry to substantial exports for the first time since the 1960s – also with downsides as well as upsides
- provided a wider market for Australian skills, especially in design and engineering
- resulted in a generally more disciplined and skilled workforce, including assembly line workers
- resulted in employment numbers falling progressively over the decades.

The closure of one of the three remaining car companies (OEMs) would put stress on the supply chain by reducing production volumes. It would have a high direct impact on employment in the region of the assembly plant and indirectly through suppliers that cluster around their major customers.

There are more automotive manufacturing jobs in Victoria than in any other state or territory in Australia. Looking at the period since 1995, Victorian jobs in the sector peaked in 2005, when 44,400 were employed. A rapid decline in employment occurred between 2008 and 2009 as the sector shed 7,800 positions in the state, from 35,700 jobs in 2008 to 27,900 jobs in 2009. By 2009 the employment number was some 37 per cent, or 16,500 jobs, below the 2005 peak employment number. Of all jobs in the motor vehicle assembly and motor vehicle part manufacturing sector in Australia, 50 per cent are located in Victoria.

For Melbourne's North, the decline in automotive manufacturing jobs since the peak in 2005 has been a steady one and the trend continues.

4.2 The long term changes

The Australian automotive industry grew rapidly in the 1950s and 1960s as the Australian population adopted cars and trucks as the predominant form of transport. Peak production was reached in the 1970s, although a significant minority of this production was assembly of low local content vehicles.

A gradual decline set in through the 1970s as the Japanese automotive industry emerged as a strong contender on the world automotive stage and completely built up (CBU) imports rose significantly, largely displacing low volume (and low local content) assembly of European vehicles.

As a result of this trend and the oil crisis of the early 1970s, driving buyers from six-cylinder to four-cylinder cars, the Australian Government amended its passenger motor vehicle (PMV) manufacturing plan to entice the Japanese companies to manufacture their cars in Australia, with the result that Toyota, Nissan and Mitsubishi acquired assembly plants in Australia and a number of Japanese component makers set up manufacturing.

Following the creation of the so-called Button Plan for the automotive industry in the mid-1980s (and subsequent developments in the plan), the industry entered a period of rationalisation and specialisation, which in the 1990s included:

- removal of small cars from production and a focus on the higher volume medium and large cars
- Nissan exiting Australian manufacturing in 1992
- strong growth in automotive exports through the decade, with Toyota and Holden opening up significant markets in the Middle East and also major gains for engine and component exports.

The growth in exports and revitalisation of production continued through most of the 2000s with:

- the four remaining manufacturers focusing on medium-large cars, by this time only Toyota Camry with a four-cylinder engine and the other manufacturers offering only petrol six and V8 engines
- Ford and Holden continuing with utility vehicles based on their passenger cars
- Ford designing and manufacturing the relatively large Territory SUV using the six-cylinder Falcon engine
- light vehicle production reached a peak of 407,537 vehicles in 2004 – less than the 1974 high of 457,894 vehicles, but probably of more value as all the 2004 vehicles were relatively high value and high local content vehicles
- exports of light vehicles reached a peak of 161,956 in 2008.

However, the successes of the industry up to 2008 camouflaged some problems:

- with the partial exception of Toyota, the local industry had re-entered a 'bigger is better' phase, with more powerful engines and larger and heavier cars rather than a priority on fuel economy
- rising oil prices began to push up petrol prices in Australia from 2003; the latter rose 38 per cent between 2002 and 2006
- parallel with this the range of SUVs was widening rapidly, offering improved comfort, space and versatility as well as competitive fuel economy in compact SUVs and/or diesel engine options
- as a result, many car buyers deferred replacement of their large Australian cars or shifted to typically smaller and more fuel economic imported cars or to SUVs; sales in Australia of locally made light vehicles fell from 276,375 vehicles in 2003 to 200,485 in 2007
- a further spike in petrol prices in 2008 compounded the decline and in 2010 sales were down to 146,314.

The trends in vehicle preferences and fuel prices and usage were to collide with wider economic developments from 2008 as:

- sales of the Mitsubishi Magna and subsequent 380 were squeezed by competitive pressures and the declining purchases of the large local cars, resulting in the closure of the Adelaide car plant in early 2008
- the GFC shattered the US owned car companies, with only Ford avoiding administration, and General Motors ending the Pontiac brand with major repercussions for the Holden Commodore exports as the Pontiac G8
- Middle East export markets contracted as the result of the impact of the GFC
- the Australian dollar, which was already rising before the GFC (and at an average USD 0.85 in 2008) rose to USD 1.03 in 2011, severely damaging the profitability of exports to the US and the Middle East
- the result was that, in both 2009 and 2011, light vehicle exports were less than half the 2008 volume and are expected to be lower again in 2012.

Tariffs on PMVs (cars and conventional wagons) fell from 10 to 5 per cent in 2010. Along with the strong exchange rate, this resulted in lower prices for some vehicles, entrenching the gap in price between imported vehicles and large locally made cars that had widened through the 2000s.

4.3 The current situation

In recent months the media has focused on assistance to the Australian automotive industry, largely because of:

- the fall in vehicle production in recent years, including a further fall in 2011
- statements by companies – most notably Holden – that 'co-investment' by Australian governments would be necessary to ensure that future models were designed and/or built in Australia
- most recently, the decision by Toyota and Holden to make significant numbers of jobs redundant because of the expected fall in exports in 2012.

4.4 Automotive industry policy

The Australian Government reviewed its automotive industry policy in 2008 and:

- confirmed that tariffs on PMVs would fall to 5 per cent in 2010
- amended the other existing policy provisions, as well as introducing some new forms of assistance.

The new and amended provisions came into full effect in 2011 (some aspects had already been phased in) and included:

- grants to companies based on production by light vehicle manufacturers, including their production for export
- R&D and investment by all automotive industry companies
- the Green Car Innovation Fund
- the Automotive Industry Structural Adjustment Program, to assist supply chain consolidation and support labour adjustment programs
- the Automotive Supply Chain Development Program, which provides funding for vehicle manufacturers and tier 1 suppliers to assist suppliers in holding and gaining contracts
- additional funding for the Automotive Market Access Program.

The policy changes swung the benefits of the policy more towards export performance by treating vehicle production for export in the same way as for production domestic sales. Previously, export production had received relatively less assistance.

The Green Car Innovation Fund was an earlier election promise and had been partly implemented from 2009. Toyota (for the Camry Hybrid), Holden (for the Cruze small car), Ford (for aspects of engine development) and many component companies (for product development and investment) received assistance, but the scheme was prematurely closed to new projects as a budgetary saving in early 2011.

In January 2012, the government negotiated with Ford and Holden on support for product development for about the next five years. As a result:

- the Australian Government will provide $34 million towards a total Ford investment of over $103 million to boost the fuel efficiency and emissions performance in Ford models; this funding will see the Falcon produced at Broadmeadows in Melbourne to at least the end of 2016
- the Australian and South Australian Governments are in negotiation with Holden concerning assistance for the production of the next models of Cruze and Commodore in Australia; reports suggest that government assistance of up to $200 million is being sought
- Toyota has also recently said that co-investment will be necessary to ensure its future in Australia.

The federal Minister for Manufacturing, Senator Carr, said that there are funds available under the current policy – the Automotive Transformation Scheme – to assist the companies.

The Victorian Government has provided a range of support to automotive industry companies in the form of grants and other assistance, and continues to assist industry companies through:

- facilitating access to appropriate state and federal government programs
- the Victorian Automotive Manufacturing Action Plan, which provides assistance for skills development, product and process innovation, and global market access
- the Victorian Premier reiterating the support of his government for the industry.

This assistance is coordinated by the Victorian Department of Business and Innovation through its Business Offices.

4.5 Outlook for the industry

In a rapidly changing global industry, there must always be some uncertainty about the future of the Australian automotive industry. The weakened financials of the US automotive companies add to this uncertainty because of their major presence in Australia, while the threat of further rapid rises in fuel prices increase the risk.

As far as we can be certain, the future for all three companies seems reasonably assured through their current model cycles – in round terms to 2016 or slightly later.

There are numerous manufacturing firms in the automotive supply chain in Melbourne's North that have traditionally supplied components to all three OEMs.

Ford

- Released the new LPG variants of the Falcon sedan and ute in the second half of 2011, but sales were severely limited by supply.
- Will add 2.0 litre four-cylinder turbo engine variants to the Falcon range by mid-2012.
- Diesel variants were added to the Territory range in mid-2011 and have markedly lifted model sales.

- Is also working, with government assistance, on other initiatives to improve the fuel economy of the Falcon and Territory.
- All of these initiatives should consolidate and to some extent grow Ford Falcon and Territory sales in 2012 and subsequent years.

Holden

- Added 3.0 litre engine variants to its Commodore range in 2009 and subsequently further improved fuel economy of that engine.
- Has a program underway – supported by already-approved Green Car Innovation Fund grants – to make further significant fuel economy improvements to its cars for a major model upgrade in the second half of 2013.
- The Cruze assembly program is proving successful, with the model being the fourth bestselling car on the Australian market in 2011.
- Despite severely weakened export markets, Holden is persisting with markets such as the Middle East and Brazil as well as the Caprice police pursuit vehicle for the USA, which had initial sales of 880 in 2011.
- These programs should also consolidate the Holden presence, lifting sales performance in the years ahead.

Toyota

- Is the biggest exporter of vehicles from Australia, but the exchange rate and the weakness of Middle East markets will reduce exports and thus production in 2012.
- Toyota released the new Camry model at the end of 2011 and will release the new Hybrid Camry and Aurion in 2012, as well as beginning production of the new series engine for the Camry late 2012; it expects some lift in domestic sales to result.
- Subject to the strength of the Australian vehicle market and the exchange rate with respect to exports, Toyota production is likely to lift gradually in the years ahead.

Oil and thus petrol prices are difficult to forecast and major upward movements could spell further difficulties for the local industry. Historically, fuel prices have gone through cycles of rises and then relative stability, which has brought about gradual recovery in large car sales. Furthermore, the initiatives to reduce fuel consumption, and encourage use of LPG and the Hybrid Camry, all point to the industry being able to protect itself more effectively against any future fuel price rises.

NIEIR forecasts that the Australian dollar, after rising to a peak of US$1.11 in 2012, will progressively fall to US$0.80 in 2016. This would:

- reverse the rising price competitiveness of imported vehicles in the Australian market
- more importantly, make Australian vehicle exports more profitable and allow more competitive pricing in export markets.

For 2012 production, volumes will continue to be difficult for component makers and other supply industries but gradual rises in production are likely in future years and will ease the pain.

Exports will be a significant part of success or failure and two of the three car companies have exported strongly through most of the last decade. Exports of skills, such as through design and engineering work, although less apparent, will also be important to sustain the industry.

The decision about new models to be introduced in 2016 and 2017, and the extent of their Australian design and manufacture, will be strongly influenced by sales experience over the next three years, the extent of government assistance and the exchange rate.

However, all three car companies appear to be committed to their presence in Australia and would be reluctant to cease manufacturing.

Figure 4.1: Melbourne's North: Transport equipment manufacturing, JTW employment share of manufacturing – 2011

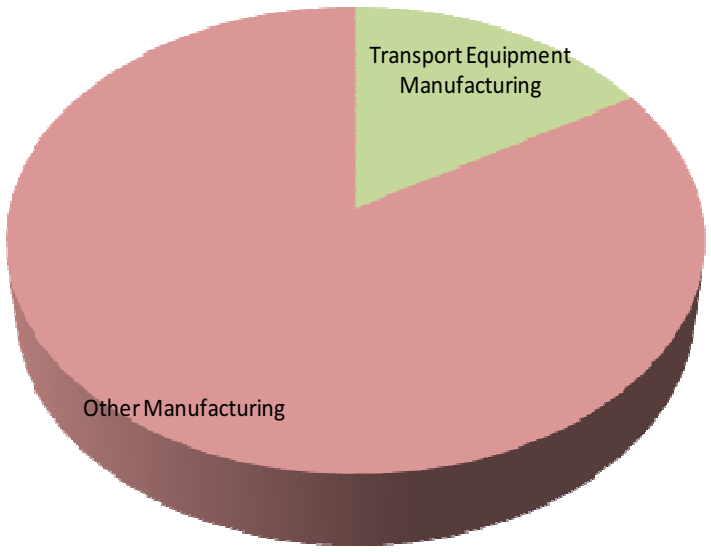
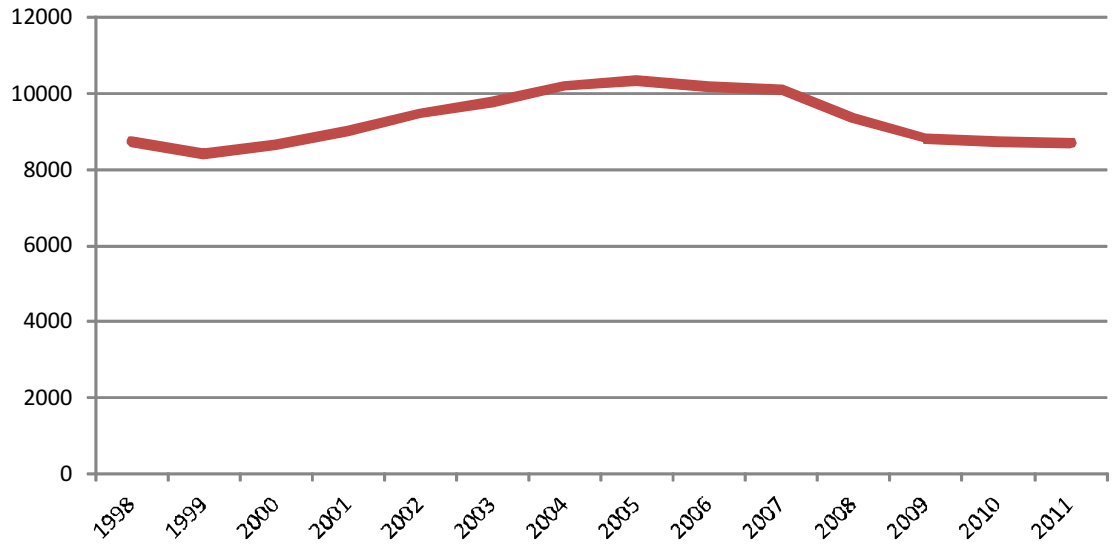


Figure 4.2: Melbourne's North: Transport equipment manufacturing, JTW employment



4.6 The significance of clusters in the automotive manufacturing industry

The automotive industry's historical development pattern in Melbourne has been the geographic clustering of the main car companies with their key suppliers. Historically, this clustering has occurred because of the logistics of moving large numbers of sometimes bulky components in a just in time manufacturing environment and the availability of suitably skilled labour within travelling distance of these clusters. Clusters and supply chains have been weakened because of the globalisation of industry component sourcing while employment in the automotive industry continues to be clustered in a small number of locations across Melbourne. In Melbourne's North, the Cities of Hume and Whittlesea are employment hubs for the automotive industry.

Figure 4.3: Automotive manufacturing: Assembly and component manufacturing employment

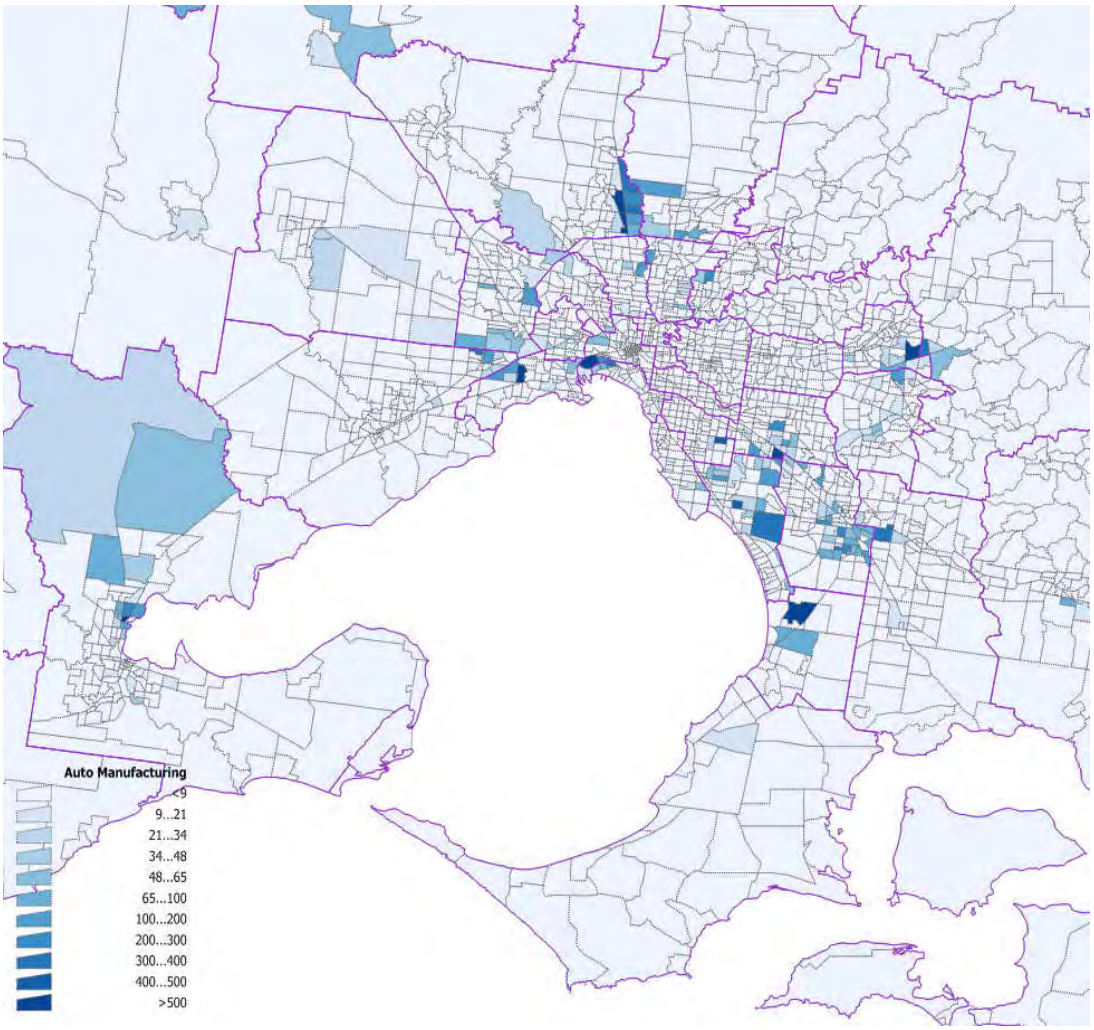
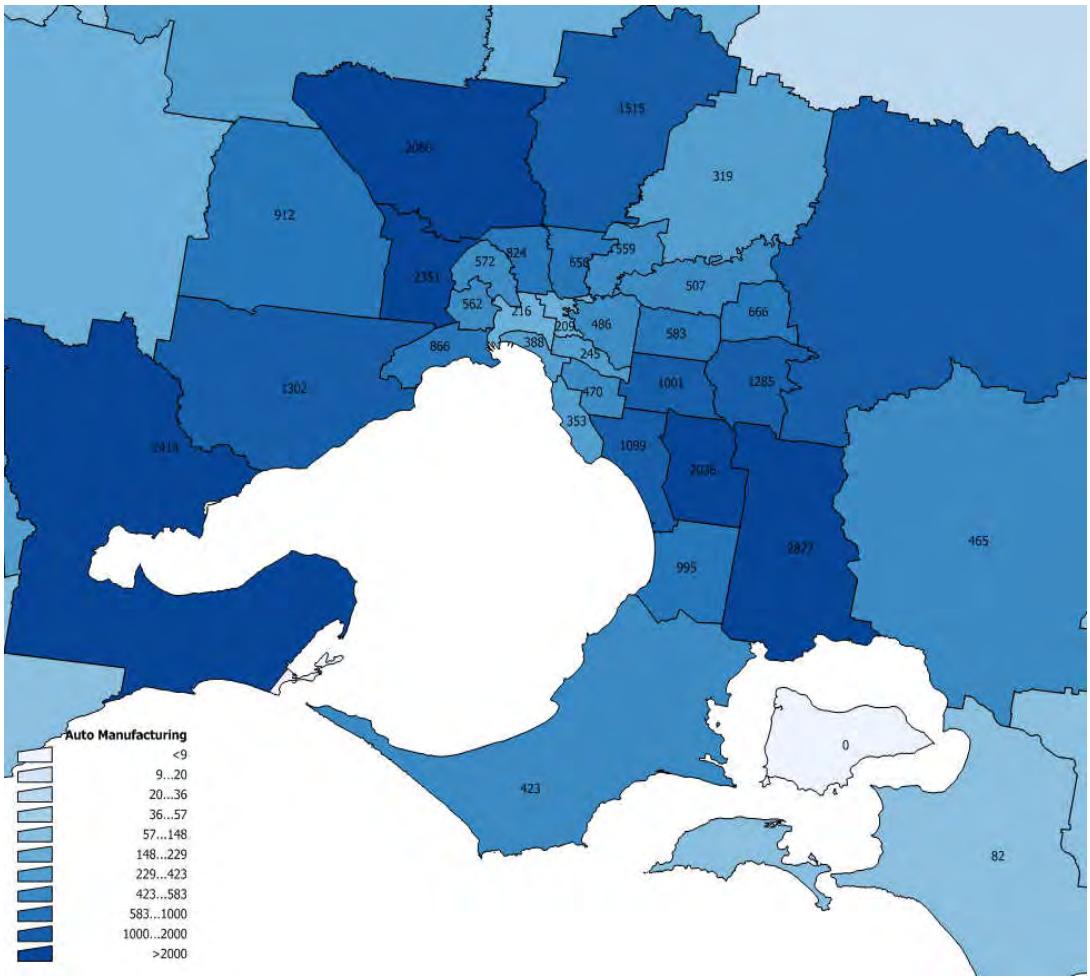


Figure 4.4: Resident employment in automotive manufacturing: Assembly and component – 2010



Source: NIEIR.

4.7 The impact of a major plant closure on jobs

In a study for Hume and Whittlesea in 2010, NIEIR developed models that give estimates for the loss of jobs created by the theoretical closure of a major automotive manufacturing firm. There is no implication that this will occur. The exercise was undertaken to demonstrate just how important the presence of Ford is to the North's regional economy and the impact the company has on employment in the broader Victorian economy.

One model scenario considered the number of jobs that would have been lost had Ford Australia decided to close its manufacturing operations to assess the maximum influence of a worst case scenario. Under this scenario Greater Geelong residents, partly because of their high level of employment capture locally, would face the largest impact. For Hume the reduction in resident jobs in total employment would peak at 1,980 positions in the fourth year of theoretical closure.

For Whittlesea the peak is also reached after four years, this time with 910 fewer resident employment positions. The strategic issue here is that the impact of such a closure is long term, with regional economies struggling to replace the jobs lost. This issue is even more complex in that replacing jobs may be one thing, but replacing jobs with equivalent positions in terms of skills and relatively high salaries will be quite another.

It is likely that the retrenched workers with lower qualifications will find it the hardest to find equivalent employment, stranding the lowest skilled workers in casual work or long term structural unemployment – particularly in Hume and Whittlesea.

Table 4.1 Scenario 1 (Ford closes local manufacturing operations) – Ford contribution to resident employment (assembly and component)

LGA	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Greater Geelong (C)	3248	3197	3968	4328	3968	3505
Hume (C)	1621	1604	1860	1980	1860	1707
Whittlesea (C)	765	758	862	910	862	799
Brimbank (C)	752	746	844	890	844	785
Moreland (C)	602	596	685	726	685	632
Moonee Valley (C)	504	500	572	605	572	528
Casey (C)	472	470	500	514	500	482
Banyule (C)	431	428	479	503	479	448
Darebin (C)	430	426	481	507	481	448
Monash (C)	380	378	408	422	408	390
Kingston (C)	374	372	398	409	398	383
Greater Dandenong (C)	347	346	366	375	366	354
Rest of Victoria	6255	6201	7001	7374	7001	6521
Total	**16182**	**16022**	**18423**	**19543**	**18423**	**16982**

Source: NIEIR's Automotive study for Hume and Whittlesea.

Note: These numbers represent the total impact in a specific year and preceding years across the whole economy.

In terms of JTW employment the outcome for Hume is by far worst, with a peak reduction in industry employment of 6,030 industry positions in the fourth year of theoretical closure. As for resident employment, the impact of the closure is shown to be long term with 5,168 fewer industry employment positions in Hume as far out as six years after closure. It is the downstream impacts on employment in Hume that will be particularly severe. Total loss of industry jobs peaks at 19,598 positions throughout Victoria in the fourth year of closure.

Table 4.2	Scenario 1 (Ford closes local manufacturing operations) – Ford contribution to industry employment (assembly and component)					
LGA	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Hume (C)	4899	4845	5653	6030	5653	5168
Greater Geelong (C)	3597	3540	4403	4806	4403	3885
Melbourne (C)	727	720	824	873	824	762
Kingston (C)	682	680	710	725	710	692
Monash (C)	665	663	692	706	692	674
Greater Dandenong (C)	476	475	497	508	497	484
Brimbank (C)	312	311	331	341	331	319
Banyule (C)	281	280	294	301	294	286
Glen Eira (C)	280	279	291	296	291	284
Maroondah (C)	274	273	287	293	287	278
Darebin (C)	262	261	279	288	279	268
Port Phillip (C)	225	223	258	275	258	237
Rest Of Victoria	3546	3517	3954	4158	3954	3692
Total	**16227**	**16067**	**18475**	**19598**	**18475**	**17030**

Source: NIEIR's Automotive study for Hume and Whittlesea.

These figures demonstrate just how important the automotive manufacturing sector is to the broader economy. To stress again, it is not only the loss of jobs that is important here – the loss of skilled and knowledge based employment that would occur would have a long lasting and corrosive impact on opportunities for future economic growth.

The supply chain is yet another issue and one with particular relevance to automotive manufacturing. Here we are not just talking about the closure of a major plant but the closure or downsizing of smaller firms in the supply chain, leading to a cycle where productivity gains from rationalisation by one firm can be neutralised by the spill-over consequences for the industry, the cluster and/or the supply chain. The hollowing out of the industry supply chain:

- leads to increased unit costs of production in supplying industries from the loss of demand
- reduces the economies of scale and scope in R&D effort
- reduces the connectiveness of the supply chain with final consumers, which reduces the capacity to innovate
- reduces the capacity of the supply chain to attract/generate its unique skilled labour requirements
- increases the risks and uncertainty of operating in the supply chain.

5. Case study: Opportunities for growth? Melbourne's North food product manufacturing

The idea of developing a food product manufacturing hub in Melbourne's North is not a new one and an industry cluster continues to develop.

From a long term and strategic point of view there are issues such as food security, the growing demand for food products in the Asia Pacific and the increasing opportunities (as wealth and populations grow) for value adding to food products. There are issues of food safety, and Australia has the opportunity to provide its region with safe and uncontaminated processed foods.

Given the diversity of population in Melbourne's North, opportunities exist for the development of specialised food and beverage manufacture for people from Asia and the Middle East. Products could be both for Australian consumption and for export.

The relocation of the Melbourne Wholesale Fruit and Vegetable Market to Epping from its original location in Footscray will add to hub or cluster type opportunities by strengthening the local supply chain and expertise in all things food and beverage. The turnover of the relocated market is likely to be slightly less than $2 billion.

Figure 5.1: Melbourne's North: Food product manufacturing, JTW employment share of manufacturing – 2011

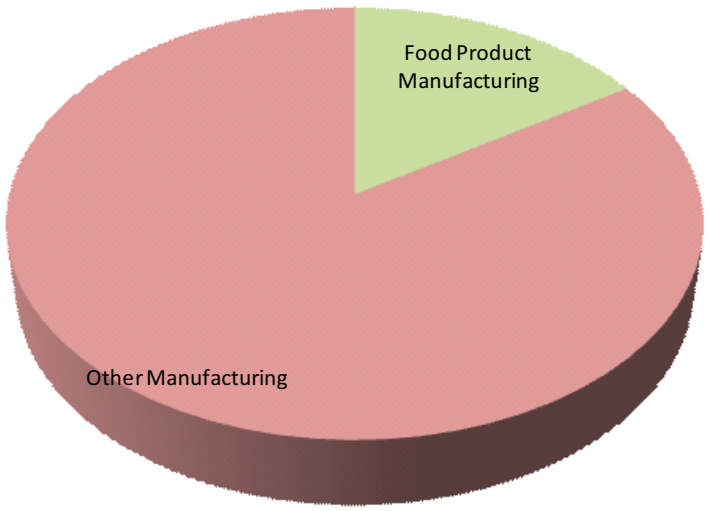
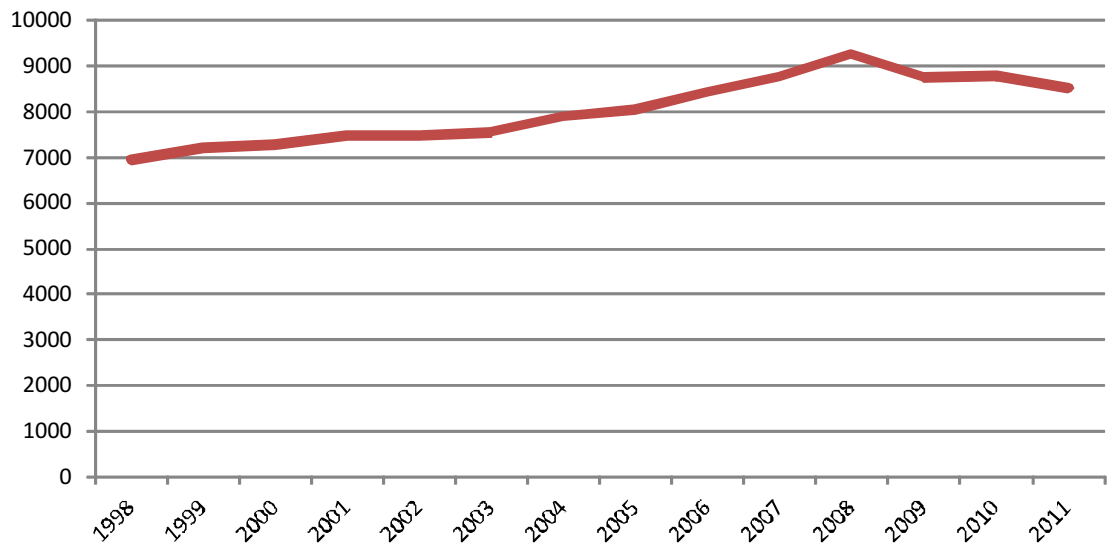


Figure 5.2: Melbourne's North: Food product manufacturing, JTW employment



If the manufacturing industry categories of food product manufacturing and beverage and tobacco manufacturing are added together, these become the largest JTW employer within the manufacturing sector in Melbourne's North – that is, greater than transport equipment manufacturing.

Given the rise of the food product manufacturing industry in the region and the growing opportunities described here, it is possible to imagine the industry as one that can continue to grow and to flourish.

In many industry sectors the development of brands is the key to value adding products. This can be said to be particularly the case in food product manufacturing where relatively simple ingredients, which are commodities in their original form, can be converted by processing and branding/marketing to significantly higher value added products on the retailer shelves. There are, of course, more complex value adding opportunities.

So why then are food product manufacturing companies experiencing, at least in some instances, tough times? One of the critical issues in Australia is the supply chain itself and the influence on it exerted by the major retailers who are powerful enough to drive down prices, import alternative products more cheaply and create their own competing brands that may be manufactured elsewhere.

Add this problem to other problems that have the effect of hollowing out the food product manufacturing supply chain:

- cheaper packaged foods imported from overseas and displacing local growers and manufacturers
- imported foods that are cheaper because of agricultural subsidies in other parts of the world
- offshoring of some food processing companies, particularly if they are part of an international group.

Is not challenging these underlying trends strategically sensible, not only for Melbourne's North but for national outcomes? Are major opportunities for the industry (including Australia's growers) being lost because food processing manufacturers are having difficulties accessing the retail market at levels that provide enough financial return from which to develop an export market?

Two underlying principles in relation to Australian manufacturing apply.

1. Australian manufacturing has failed to offset the negative effects of sustained structural change; that is, increasing import penetration by developing new demand expansion initiatives based on export growth.
2. An analysis of Australian trade by country shows that Australian manufacturing has been adversely affected by the trend in trade flows, in terms of losses in demand and productivity. Trade with Australia's top trading partners has inflicted most of the damage.

These underlying trends and principles tend to suggest that what is required is greater pressure from campaigns to assist the food product manufacturing industry to access shelf space at major retailers (buy local campaigns, etc), which in turn will create the capacity to develop export markets. Export markets will provide opportunities for significant future growth, which will improve as the value of the Australian dollar declines.

6. Case study: Melbourne's North and chemical manufacturing

The chemical manufacturing industry remains an important employer within the manufacturing sector, where it is the third largest manufacturing employer and the third largest contributor to GRP in the region's manufacturing sector.

Chemical manufacturing is particularly important, as chemicals are used in a wide range of other manufacturing processes. Chemical based products are an essential input into most sectors of the Australian economy. It would not be possible to manufacture a large proportion of the finished products that are currently produced without the use of chemical products.

Because at least part of the industry is very heavily knowledge based, chemical manufacturing provides the opportunity for ongoing research, relationships between universities and cooperative research centres, the development of IP, licensing and new product development.

Over the last decade there has been a steady decline in the number of people employed in the chemical manufacturing industry in Melbourne's North. The decline appears to have accelerated in the last few years.

Figure 6.1: Melbourne's North: Chemical manufacturing, JTW employment share of manufacturing – 2011

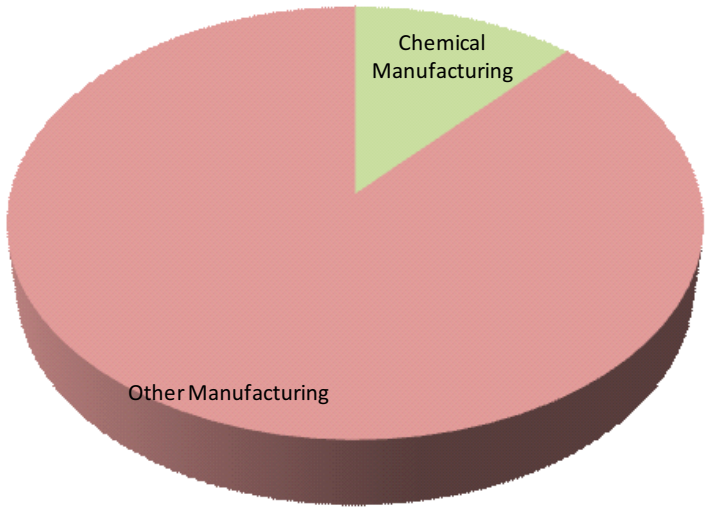


Figure 6.2: Melbourne's North: Chemical manufacturing, JTW employment

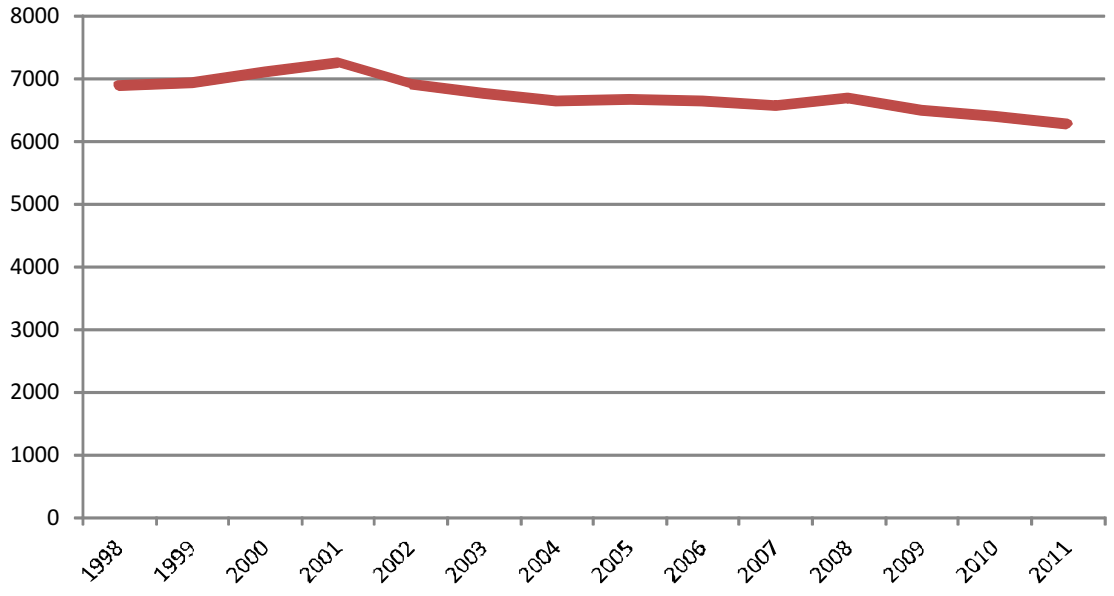


Table 6.1 provides an outline of the structure to the chemical manufacturing industry, classifying the range of products manufactured by the industry. The trend has been to offshoring of basic chemicals where production is less expensive and regulations less exacting.

Medicinal and pharmaceutical manufacturing has an important base in Melbourne's North and is also a knowledge based sector with significant export potential, IP development and licensing, and relationships with the region's research organisations.

Some firms producing cosmetics and toiletry products or other products sold through retailers may be struggling to maintain shelf space for their brands because of the power of the major retailers. For these manufacturers this has meant loss of brand value (as brands compete with generics) and the need to create a much broader range of products, both trends reducing profitability.

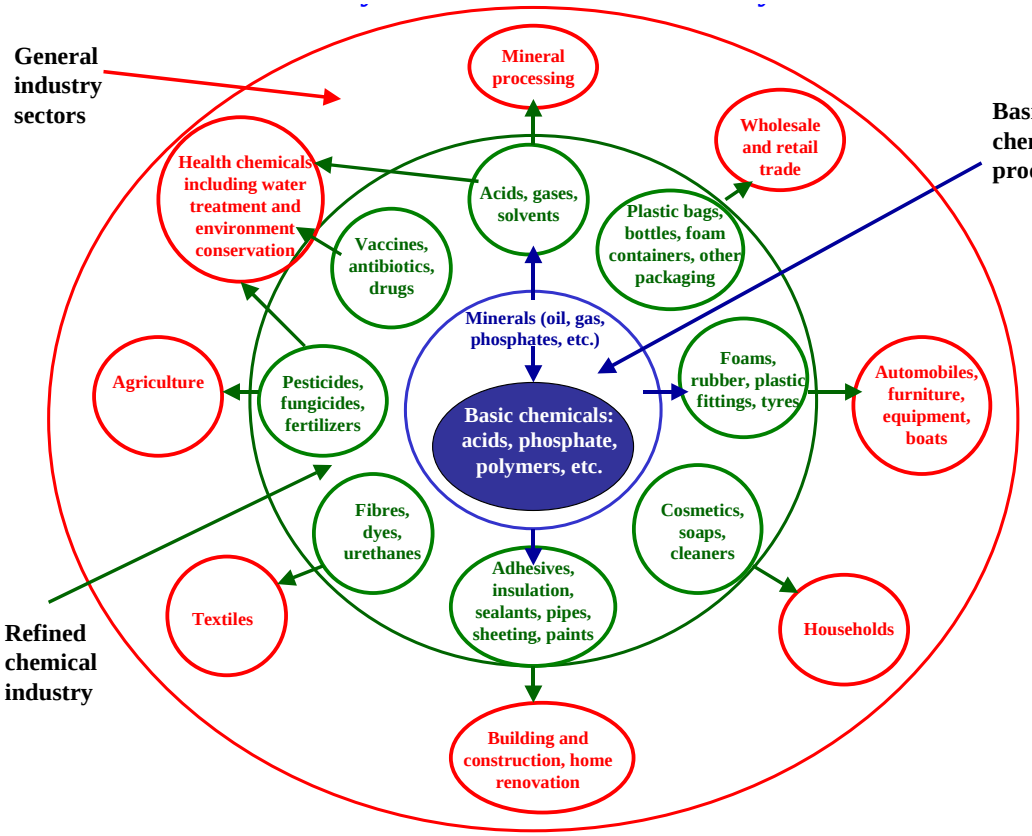
For more health based products this is less likely to be the case.

Table 6.1	The sub-sectors, industries and products framework of Australian chemicals		
Sub-sectors	**Industries**	**Principle products**	**Production and product characteristics**
Basic chemicals sub-sector	Fertilizer manufacturing	Ammonia (fertilizer), ammonium nitrate, ammonium phosphate, superphosphate, urea, fertilizers (fishmeal, potash, etc.).	■ Capital intensive – relatively large scale enterprises. ■ High volume – importance of economies of scale for competitiveness. ■ Low degree of product differentiation – many products, commodities. ■ High barriers to entry.
	Industrial gas manufacturing	Acetylene gas, carbon dioxide, carbon monoxide, hydrogen, nitrogen, oxygen.	
	Synthetic resin	Plastic raw materials, polyethylene, polypropylene, polystyrene, polyvinyl chloride, synthetic rubber, etc.	
	Organic industrial chemicals	Organic acids, dye base, phenol, pigment, styrene, urea (high grade), vinyl chloride.	
	Inorganic industrial chemical manufacturing	Chlorine, fluoride, acids (nitric, hydrochloric, phosphoric, sulphuric), sodium (bicarbonate, carbonate, hydroxide), zinc oxide.	
Knowledge products sub-sector	Medicinal and pharmaceutical products	Antibacterial products, antibiotic products, medical gas, ointments, toxins, vaccines, vitamins.	■ Very high degree of differentiation between products. ■ Products focused on delivering specific outcomes for humans, animals, plants, etc. ■ Sustained innovation necessary for continued competitiveness. ■ High levels of R&D and marketing expenditures
	Cosmetics and toiletry products	Face, hand or skin lotions or creams, deodorants, hair shampoos and conditioners, nail polish, sunscreen, perfume, and lipstick.	
	Soap and other detergents	Detergents, soaps, disinfectants, laundry bleach, toothpaste, washing powders or liquids.	
	Pesticide manufacturing	Dip, fly spray, fungicide, insecticides, insect repellents, animal poisons, weed killer.	
Specialty products sub-sector	Explosives	Dynamite, blasting powder, fuses.	■ High degree of product differentiation. ■ Flexible manufacturing techniques can be employed for economic, relatively low production runs. ■ Medium levels of R&D and marketing expenditures.
	Paints	Paint, putty, stains, primers, fillers.	
	Rubber product manufacturing	Boots, erasers, gloves, hoses, mattresses, sheeting, sponges, washers, water bottles.	
	Rubber tyres	Motor vehicle tyres, tubes, retreads.	
	Plastic blow moulded products	Bottles.	
	Plastic extruded products	Hoses, pipes.	
	Plastic bags and film manufacture	Bags, food wrapping, film, garbage bags.	
	Plastic product, rigid fibre reinforced products	Automotive components, rigid plastic sheets, swimming pools, water tanks.	
	Plastic foam products	Fast food containers, foam padding.	
	Plastic injection moulded products	Buckets, garbage bins, plastic kitchenware, floor coverings.	
	Ink products	Writing, drawing or printing ink.	
	Other chemical products	Antifreeze, adhesives, glues, dry cleaning components, removers (rust, stain, fat), surface cleaners.	

Source: NIEIR.

Figure 6.3 shows how important the chemicals manufacturing industry is to other sectors in the economy. Like the automotive manufacturing and food product manufacturing sectors there is a strategic role for the chemical manufacturing industry, particularly given the industry's significance in the supply chain and the knowledge intensive components of some of the industry. Of all manufacturing industries, chemical manufacturing is likely to be one where cooperative research centres and university research organisations can drive change and industry development. A re-energised chemical industry would have a substantial economic spill-over and be of benefit to many sectors within the economy.

Figure 6.3: Chemical products are used in all sectors of the economy



Source: PACIA/NIEIR.

Some of the issues faced by the chemical manufacturing industry in Australia (and these inevitably filter through to Melbourne's North) include:

- the decline in chemical engineering in tertiary education
- skilled people relocating to other industries including the drain of skills to the mining boom, which increases costs and pushes out time frames
- the chemical manufacturing industry in Australia is not price competitive, particularly in the manufacture of basic chemicals where price differences are very significant.

Some of the opportunities for R&D in Melbourne's North include:

- medical and pharmaceutical manufacturing
- a move towards building a bio based chemical industry; that is, a move away from petrochemical feedstocks to bio based feedstocks as carbon costs drive change and patterns of investment
- Australian advantages – proximity of raw materials and existing knowledge intensity of the industry that needs protecting, as China in particular invests heavily in research.

Evidence suggests that competing nations are using the following strategies to maintain market share in the chemical manufacturing industry:

- moving their production output up the value added chain
- focusing on high value added export markets
- intensifying R&D exports
- intensifying export expansion programs.

The question for Melbourne's North is how can research developments at Latrobe University play their part in revitalising the chemical manufacturing industry in Melbourne's North? Are new opportunities from research outcomes from the Biosciences Research Centre and the Institute for Molecular Sciences being created and, if so, how will the links to industry work?

7. Case study: Fabricated metal product manufacturing

There has been a significant decline in employment in the fabricated metal product manufacturing industry in Melbourne's North over the last decade or so. The trend of diminishing employment in the sector appears to be increasing.

There has been controversy in recent months regarding Australia-wide difficulties being faced by the fabricated metal product manufacturing industry in light of the resources boom, as fabricated metal production for resource infrastructure is imported from China and elsewhere. This sector provides the opportunity to introduce, if briefly, the issues faced by the manufacturing industry in light of the resources boom.

A recent NIEIR study for the Australian Steel Institute – *Maximising Australia's resources boom* – found that the impact of the resources boom includes:

- activity associated with the boom has prompted fears of inflation; this is driving up interest rates and encouraging imports of labour to alleviate skill shortages for particular trades in particular locations
- the boom is driven by high commodity prices, which are associated with a high exchange rate
- most of the actual construction for the resources boom is taking place in about 5 per cent of Australia's LGAs, with strong spinoff in construction support (materials, design) in about a further 10 per cent of municipalities; spinoffs elsewhere are positive but small
- high exchange rates and high interest rates associated with the resources boom are seriously impacting the viability of businesses in non-mining trade-exposed industries (manufacturing, tourism, education, etc); businesses are operating at below capacity, skilled workers are underemployed and employment is falling.

The point being that:

- it should be remembered that the stimulus of mining investment is temporary and may be expected to subside; similarly, the high exchange rate is most likely a bubble, particularly given the ongoing balance of payments deficit
- when the mining construction phase ends, the jobs generated by this construction will need to be replaced; the expectation is that these will be generated in the non-mining trade-exposed industries made competitive once again by the fall in the exchange rate.

Considerations being:

- if policy surrounding the resources boom should be more considerate of the needs of Australia's manufacturing industry
- the strategic importance of manufacturing employment in future employment in Melbourne's North and all other regions in Australia.

It is evident in 2012 that the high value of the Australian dollar has had a serious impact on the health of Australian manufacturing, including on the firms in Melbourne's North.

The study goes on to conclude:

> *"At a regional level Australia is far from fully employed, with some metals and machinery regions having high levels of underutilised labour. This study finds that around half the decline in capacity from normal levels can be directly linked to the negative consequences of rapid mining expansion. Steel industries are operating at historically low levels of capacity utilisation of around 50 per cent. If nothing is done to lift utilisation rates, substantial capacity will be closed over the next five years.*
>
> *In many cases this will be in regions with already high effective unemployment rates. The number of regions adversely impacted by the effects will be between 43 and 52 of the 67 NIEIR State of the Regions report regions. Regions that are most seriously vulnerable are those with high proportions of knowledge-based industries in Victoria, New South Wales and South Australia (particularly the manufacturing belts)."*

8. Manufacturing industry in Melbourne's North survey findings

8.1 Survey results

An important part of this study was the survey of manufacturing firms in Melbourne's North. In all, 30 firms contributed to the study by completing a face to face survey/discussion to inform the study recommendations. In as much as it was possible, firms were selected from a broad range of manufacturing industries. Respondents are not identified in the interest of confidentiality.

8.2 Industry trends

Steel products manufacturing: Influx of imports, which means our strategies are driven by keeping costs down. This often means taking resources out rather than investing in improved efficiencies. China's manufacturing capacity is increasing and it has world scale production. The GFC has created longer term change in our industry and we have never got back to full production of our steel products.

Metal manufacturing: We grew our business by acquisition, brand development and overseas expansion of manufacturing operations. The business has grown significantly as a result of this strategy. We had the financial resources to change our business significantly, what it does and where it operates. Without these financial resources and the management/board skills to create these changes, the business would no longer exist.

Specialist chemicals: Market is growing but flooded with imports, and the value of the Australia dollar is constraining our export opportunities.

Specialist clothing manufacture: We (Australians) have dismantled the foundations of our industry, losing skills, no technical colleges training young people in our industry, education producing service type workers.

Caravan manufacturing: Hardest thing is finding good staff. GFC had an immediate and short term impact then sales took off, market ahead looks soft again. Culturally diverse workforce and workers may have developed their skills overseas. English language skills can be an issue.

Automotive: There has been a massive reduction in the volume of local manufacturing. Manufacturing today is far more niche. Post GFC, carbon tax will be an issue.

Plastic moulding: The firm produces state of the art injection moulding and has diversified from car parts to a number of other plastic products. The supply of parts to car manufacturers is in decline, but the new product areas are proving to be growth areas.

The GFC accelerated the decline of motor parts, but the real hit was the spike in the value of the Australian dollar, which means that the firm has to be mindful of Asian competition, including subsidised competition.

Plastic products manufacturing: We manufacture basic consumer goods. Market consolidated at wholesale and retail levels and market dominance of major players is now greater than before. Retailers, including hardware stores, are dominated by major companies.

Machine tools manufacturing: The cost of materials has gone through the roof and the exchange rate is really hurting us. We are in the aerospace industry and state government assistance has been very helpful. We are considered a world leader and the benchmark manufacturer for our major global customers. We have invested in a great deal of R&D.

Metal product manufacturing: The offshoring of metal manufacturing tends to be by multinational companies. We have access to semi-skilled labour at reasonable rates. Not sure about impact from the resources boom, nothing evident. Since GFC we have noticed a greater reluctance for smaller firms to source manufacturing offshore as overseas manufacturers demand payment before shipping goods to Australia. There has been a lot of development work since the GFC as firms in our industry try to get into more hi-tech markets (more IP). Since the GFC, our workforce has been far more stable. In the next five to six years China may become more expensive.

Refrigeration manufacturing: Chinese imports have made us shift our focus to display fridges that are also now being copied by Chinese competitors. Labour market regulations in Australia and changing legislation mean that we are cautious when it comes to employing people. We were insulated from the GFC because of forward orders.

Copper products: High margins now gone. We are changing our business model because of Chinese imports, in part to reduce costs. The GFC has accelerated trends and kicked things on.

General engineering: Market is shrinking rapidly as work is sourced overseas. The driver is price not quality. We are now less competitive because of the high dollar.

Building materials manufacture, floor coverings: Consolidation of industry globally and better quality and more variety of products. Consolidation has meant larger and more powerful companies. Post GFC government stimulus projects created spike and we had a large backlog, boom year in 2010. In 2011 we noticed major commercial projects postponed and this has now hit us. We are exposed to exchange rate and in our region small and low cost manufacturers are developing. Open market policy is not a level playing field. There has been a growing burden of compliance over the last 10 years. Companies like ours comply with social responsibilities, safe ingredients, kids and floors etc. There are strict regulations in Europe and the USA.

Lighting products: Now more outsourcing of production with stronger network of suppliers, now a bigger business. Competition is coming from China and higher volume production. Top end of market has collapsed as large companies send their work offshore.

Printing: Jobbing printing, in our case continuous stationery, is a shrinking industry because of computers and associated technology. Four colour process printing is more likely to go offshore.

Newspaper printing: There is a decline in volume as the media market fragments because of cross platform media developments and the increasing penetration of online products. Decline in volume and decrease in advertising sales are more marked since the GFC.

Specialised stationery fine paper: Significant changes, the internet has opened up the market for us and had a significant impact on our business. The internet now makes us an Australia wide company. Many of our customers purchase our products online; customers include corporate and individual customers, particularly young women. Social media has created a new market opportunity. The GFC resulted in consolidation of market as competition is now less – we have boomed.

Building products: Value of Australian dollar has had an impact on our ability to export. We have major share of domestic market so need exports to grow. Because of the cost of labour we have now opened our own factory in China and this is going well. Since GFC there has been a downturn in the building industry; commercial and domestic building products have different cycles but at the moment they are both down. We are now two years into a five year plan of moving production to China.

Cosmetic and toiletry product manufacturing: Retailers have increased in strength through consolidation. They have increased focus on developing home brands or generics that are likely to be manufactured overseas. The importing of generics is now huge, the budget section of the consumer market is growing and is a feature of the market; there is considerable evidence that consumers are trading down. There is greater competition from overseas, particularly China and South East Asia. The GFC has created a monster where the consumer expects everything to be continuously on sale.

Aftermarket automotive manufacturing: The skilled workforce is ageing. Imports are making their mark on local manufacturing but sales in the aftermarket are going well. Lack of local capacity as supply chain has hollowed out, we have less buying power as there are fewer suppliers in the chain so less competition. Manufacturing parts is becoming harder because of reduced manufacturing capacity and diversity in the local supply chain.

Automotive and jobbing manufacturing: We have had to diversify away from supplying the main automotive manufacturing firms because of decline in volumes and offshoring of component manufacture. We now only work for one of the three automotive manufacturing firms.

Tanker manufacturing: Low barriers to entry, easy for overseas companies to come here. Two main features of the industry are increased competition from overseas companies, both imports and buying local firms, as the market has declined because of the GFC.

Equipment manufacturing: More and more fabrication is being sent overseas and local manufacturing is declining. There is an issue with skilled trades in the industry. Skilled people are hard to find as fabrication is thought of as being hard and fitters earn less than plumbers and electricians. Confidence has been a big issue since the GFC, availability of capital has also been an issue. Because of the order cycle it often takes longer for manufacturing to feel the impact of major economic events as there is work in the pipeline. We are now facing stiff competition from overseas. Our costs are the major issue – our costs the highest in the world, particularly on-costs to salaries.

Bag manufacturer: Our products are now being copied globally so we have lost the ability to provide a unique product, competition is coming from US and Europe. The high value of the Australian dollar is having a major impact on our profitability as we have to reduce prices to remain competitive.

Furniture manufacturing: The strength of national retailers has increased resulting in heavy downward pressure on pricing. There is also pressure to dumb down products to meet price points. This makes it difficult for us to retain points of difference in our products. Retailers are dumbing down innovation. There has been a major rationalisation in manufacturing base in our industry, probably about 60 per cent has now been lost. It is getting very difficult to find or retain skilled staff; people do not want to work in factories. Not much impact from GFC, trends described shaping circumstances.

Bedding manufacturing: Contraction of local industry and massive increase in imports. Retailers driving prices down and the consumer is missing out from a quality point of view. Retailers are pushing down quality because of pricing. Our products are high quality and we are seeing growing demand via the internet but quilts and pillows are hard to sell unseen as consumers like to touch and feel them before purchase. We find we can export to Asia, tourist market, because of our high quality luxury type products.

Food processing manufacture: Our markets have plenty of growth potential. There is greater acceptance of dairy products in Asia. People are eating more and there is big growth in quick service restaurant markets. GFC made things a little bit harder but we have had support from the Victorian Government (both funding and advice) in building our export market. This has been very helpful.

8.3 Exports

Of firms responding to the question relating to the level of out of state export of their production there was a high level of exports to other Australian states, with 66 per cent of businesses interviewed exporting at least 50 per cent of their production. 74 per cent of firms were exporting 25 per cent or more of their production interstate. As for international exports, 10 per cent of firms reported exporting at least 25 per cent of their production. International exports are regarded as a driver of growth for at least some firms. Current macroeconomic circumstances are making international export opportunities much harder to realise.

Level of exports %	Interstate: % of firms exporting	International: % of firms exporting
80	10	
60	60	
50	66	3
25	74	10
10	76	30

8.4 Supply chain

60 per cent of those interviewed manufactured products directly for the consumer. The remaining firms manufactured products that were part of the manufacturing supply chain.

17 per cent of firms interviewed sourced their inputs to production locally.

63 per cent of firms interviewed sourced their inputs to production both locally and overseas.

20 per cent of firms interviewed sourced their inputs to production predominantly from overseas.

There were cases where firms wanted to source inputs locally but these were no longer available because of the hollowing out of the supply chain.

8.5 Where would the firm's manufacturing occur if the firm ceased operations?

36 per cent of firms interviewed stated that their production was likely to remain in Australia.

64 per cent of firms interviewed stated that 80 to 100 per cent of their production was likely to go overseas.

8.6 Import replacement opportunities

40 per cent of firms interviewed believed there was likely to be little or no opportunity for their firm to manufacture products that could replace imports.

13 per cent of firms interviewed scored their chances of manufacturing products that would replace imports at midpoint in the questionnaire.

47 per cent of firms interviewed believed there were more likely to be opportunities for their firm to manufacture products that could replace imports; this depended largely on the exchange rate.

8.7 Upgrade of equipment and plant

66 per cent of firms interviewed had completed significant upgrades to plant and equipment in the last five years.

40 per cent of the firms interviewed were established prior to 1960.

47 per cent of firms interviewed were established between 1960 and 2000.

13 per cent of firms interviewed were established after 2000.

Firms of all ages were upgrading their plant and equipment, some reporting a constant round of equipment upgrades to remain competitive.

8.8 Product age and market share

Each company interviewed made a selection of their most important products or outputs.

32 per cent of products were introduced before 1980 (these product types had evolved to meet changing market requirements so had not necessarily aged).

54 per cent of products were introduced from 1980 to 2000 (again, these product types had evolved to meet changing market requirements so had not necessarily aged).

14 per cent of products were introduced post 2000.

Markets had typically grown, as had imports that directly competed with locally produced manufactures. Despite this some firms still reported an increase in market share. Firms typically had difficulty in identifying the size of the market and therefore their share of it. Respondents made the best estimates they could.

30 per cent of respondents reported that their market share had grown since 2000.

30 per cent of respondents reported that their market share had declined since 2000. This may have been because the market grew but the firm's production did not because of the competitive nature of imports.

40 per cent of respondents were unsure about the change in market share since 2000.

8.9 Changes in volume and value

For the selected group of products:

- 63 per cent of firms reported that the volume of production had increased since 2000; production volumes may have been volatile over that period
- 37 per cent of respondents reported that the volume of production had declined.

In terms of value of this production, 53 per cent of respondents reported that the value (sales) of production had increased since 2000.

47 per cent of respondents reported that the value of production had declined or remained at similar levels. An increase in volume did not necessarily translate into an increase in value because of the high levels of competition from imports.

8.10 Main reasons for changes of volume or value

This was a multi-choice question and the number of times each reason was chosen by respondents is reported here.

Change in domestic customer requirements was the most cited, followed by change in plant capacity and change in exports. Change to import penetration followed these with nine citations.

Number of times chosen	Reason for change
20	Change in domestic customer requirements
11	Change in plant capacity
11	Change in exports
9	Change in import penetration
8	Decline in domestic demand
4	Closure of domestic plant
0	Vulnerability of production methods and products to a carbon tax

8.11 Market development expenditure compared to 10 years ago (as a percentage of sales)

33 per cent of respondents reported that their market development expense was higher today than it was 10 years ago.

33 per cent of respondents reported that their market development expense was similar today to what it was 10 years ago.

20 per cent of respondents reported that their market development expense was lower today than it was 10 years ago.

14 per cent of respondents were unsure about the comparison.

8.12 R&D expenditure compared to 10 years ago (as a percentage of sales)

40 per cent of respondents reported that their R&D expense was higher today than it was 10 years ago.

33 per cent of respondents reported that their R&D expense was similar today to what it was 10 years ago.

3 per cent of respondents reported that their R&D expense was lower today than it was 10 years ago. Much of this expenditure was not formally accounted for but was on-the-job research.

24 per cent of respondents were unsure about the comparison.

8.13 Probability that products manufactured by the firm will be around in 10 years' time

For the selected group of supplier products:

43 per cent of respondents reported that the probability was that they expected volumes to be greater in 10 years' time.

3 per cent of respondents reported that the probability was that they expected volumes to be similar in 10 years' time.

37 per cent of respondents reported that the probability was that they expected volumes to be less in 10 years' time.

17 per cent of respondents were unsure.

8.14 Propensity to relocate from Melbourne's North

10 per cent of respondents indicated there was some future probability of relocating manufacturing operations, with China mentioned as a possibility. Most firms have large investments in place in infrastructure and plant, and relocating would not be practical unless there were significant increases in property values and this became an incentive to relocate, say, from inner regions of Melbourne.

8.15 Comments about Melbourne's North as a location for the manufacturing plant

Labour force is available here.

There is a culture of working in factories.

A lot of our production goes to Queensland and New South Wales, so logistics good.

Real estate costs are reasonable.

Hard to recruit professional staff such as engineers and estimators, so Melbourne's North not working so well for us.

Manufacturing workforce is ageing stressed.

Difficulty with some planning processes as our factory adjoins a residential area in Darebin.

Good location, benefits include access to airport and CBD.

Good manufacturing hub with supply chain support, firms are however closing down so manufacturing capacity has reduced.

Access to infrastructure generally excellent.

Growing population and hence workforce.

Northern networks are valuable and working hard to improve things for everyone.

Fire brigade levy expensive as we are in a CFA region and not an MFB region.

Great place, industrial corridors, population corridors.

In 15 years or so potential astronomical.

Lot of people who we call on to supply goods and services, spare parts, metal fabrication.

Ford is very important.

Large range of manufacturers close by.

Close to major highways, ideal location and not too many obstacles.

Our website drives sales so cheaper location to operate in when compared to CBD.

We choose well and it stands the test of time, not particularly pretty though.

Community offers support, labour availability.

A lot of competitors based in one area, we are a lot more central and this works in our favour.

Access to distributors and rail coming into our site.

For companies not totally vertically integrated we are surrounded by people who we can outsource to. Support services very alive.

Downfall is broadband access – this is a greenfield site and no cable access. New industrial land developments must consider the needs of manufacturing, this means appropriate gas and electrical supply otherwise we are just creating business parks suitable for warehousing and distribution.

We have no gas supply in street so we have had to convert all our machines to electricity, makes us far less competitive and far more greenhouse intensive (also a cost).

Our industry sector has a dense cluster of competing firms in Melbourne's North and they are all pinching staff off each other.

Only place to be for manufacturing.

We employ 12 people but support another 50 locally, benefit is we have a lot of local people to support us and good partnerships can be developed.

Positive, not a lot of competition for our labour, not a lot of our type of manufacturing in the region.

Our region changing from heavy industrial to mixed industrial, houses getting closer.

Close to airport, good for interstate visitors.

Good network of suppliers.

Land available, potential customers as new companies move to the North.

Staff live in the region and we have a stable workforce.

Appropriate power is a problem, particularly electricity.

Issues with skilled labour (building products).

8.16 Focus on corporate strategy

Combined weighting of all respondents on focus strategy suggests a focus on new product development, cost reduction and expansion of exports.

		Weight (weight adds to 100)
(i)	Current production more or less maintained with focus on reducing costs	27
(ii)	Contract current operations with your products being replaced by imports	6
(iii)	Expand exports of some of current products	25
(iv)	Cease manufacturing operations entirely	1
(v)	Introduce new products being manufactured by your firm	41
	– R&D intensive, developed by your firm	majority
	– Licensed IP from elsewhere	
	TOTAL	**100**

8.17 Exchange rate

Respondents had the following exchange rate preferences (percentage of respondents by AUD to USD).

65-70 cents – 8 per cent.

70-80 cents – 33 per cent.

80-90 cents – 42 per cent.

90-100 cents – 4 per cent.

100 + cents – 13 per cent.

The respondents who preferred that the AUD was at higher values against the USD were importing products for sale in the Australian market and not exporting products overseas.

8.18 Is the firm more or less profitable than 10 years ago?

47 per cent of respondents stated that their firm was less profitable than it was 10 years ago.

43 per cent of respondents stated that their firm was more profitable than it was 10 years ago.

10 per cent of respondents did not respond to this question.

A number of firms commented that, even though they were more efficient than they were 10 years ago, market circumstances meant that they were less profitable.

8.19 Ownership structure of firm

86 per cent of firms interviewed were owned by sole proprietors or small groups of investors, including family firms.

7 per cent of firms interviewed had their parent company offshore.

7 per cent of firms interviewed were listed on the ASX.

8.20 Is value of land increasing where the factory is located?

33 per cent of respondents stated that, for their location, land values were increasing.

67 per cent of respondents believed that, for their location, land values were not increasing.

8.21 Was the respondent aware of new investments within their sector?

63 per cent of respondents said they were not aware of any investments in plant or infrastructure by competing firms.

20 per cent of respondents said they were aware of investments in plant or infrastructure by competing firms. This often related to competing firms that had been acquired by competitors (often overseas firms) as the industry sector consolidated.

17 per cent of respondents were unsure.

8.22 Enterprise Connect findings

In a separate survey conducted by Enterprise Connect of 85 manufacturers who completed a Business Review under the Enterprise Connect Program, the top 10 recommendations to improve the firms' productivity were:

- 63 recommendations for **Financial and Operational Measures** to improve reporting systems, identify key performance indicators and improve business results
- 50 recommendations for **Lean Systems/Manufacturing Innovation** to optimise supply chains, quality, material flows, stock management, productivity, equipment up-time, preventative maintenance, housekeeping and safety
- 40 recommendations for **Marketing and Growth** to explore opportunities for growth including increased market share, new opportunities in new markets and joint venture partnerships
- 36 recommendations for **Leadership Culture** to better communicate policies, values and to establish continuous improvement and innovation

- 34 recommendations for **Strategic Business Planning** to implement essentials for the future including business assumptions, market trends, capital investments, human resources, succession planning, business requirements, mergers or takeovers
- 24 recommendations for **Human Resource Management** to assess employee development and training needs, retention of skilled people and to create a supportive and cooperative work environment
- 23 recommendations for **Innovation and Technology Strategies** to explore new technology to achieve distinctive offerings, differentiation and unique product/process innovation, and international technology collaborations
- 16 recommendations for **Quality Management Systems** to monitor and minimise cost associated with non value-added wastes and to build quality practices into both production and administrative functions
- 8 recommendations for **Manufacturing Resource Planning** to maximise on-time deliveries, customer order entry, material requirements, inventory management, stores and warehouse control and documentation accuracies
- 8 recommendations for **Customer Service and Relationship Strategies** to facilitate more effective communication with customers and markets and to receive customer feedback regarding future requirements.

9. Employment, skills and training in Melbourne's North manufacturing

The manufacturing sector in Melbourne's North has contributed to the region over a long period of time by providing training for the catchment's manufacturing workforce and by providing skilled and well paid employment. The wealth and skills created by the manufacturing sector in the region have created benefits that have flowed through to regional, state and national economies.

9.1 Characteristics of the manufacturing workforce in Melbourne's North

As part of this study, manufacturing firms in Melbourne's North were asked a series of questions relating to employment and training. The firms interviewed during the course of the study collectively employed 2,092 staff in 2001 and in 2011 they employed 2,115. There were a number of trends; some smaller firms had grown their employment while some larger firms had reduced staff through retrenchments or by not replacing staff who had retired or moved to other firms or industries.

When questioned about the supply of quality staff available:

- for graduates (and not all firms, particularly if they were small in size, employed graduates), 68 per cent of firms responding to the question stated that they believed the supply of graduates to the manufacturing sector was not adequate. Some firms believed that graduates were not attracted to the manufacturing sector. The remaining 32 per cent of firms interviewed believed the supply of graduates to the manufacturing industry was adequate for their needs
- for quality graduates, firms were asked to rate undersupply and oversupply on a scale of 1 to 10 (with 1 being undersupply). The score for this question was 3.5, an undersupply on the scale of measurement
- for quality technicians, 72 per cent of firms responding to the question stated that they believed the supply of technicians to the manufacturing sector was not adequate. Some firms believed that this group of workers were choosing to work on major infrastructure projects such as Victoria's desalination plant or to follow the resources boom, industries and projects in which salaries were far higher. The remaining 28 per cent of firms interviewed believed the supply of quality technicians to the manufacturing industry was adequate for their needs. A number of firms stated that training of technical staff was a focus of their training activities and that good staff were often hard to find. In specialised manufacturing, technical staff had to be trained in company systems and in the specific technical and process requirements of the firm
- for technicians, firms were asked to rate under supply and oversupply on a scale of 1 to 10 (with 1 being undersupply). The score for this question was the same as graduates at 3.5, an undersupply on the scale of measurement.

Retaining quality employees

Again on a scale of 1 to 10 (with 1 being easy and 10 being difficult), firms were asked whether it was easy or difficult to retain quality employees. 62 per cent stated that it was easy to retain quality employees. 24 per cent of firms stated that it was difficult to retain quality employees, with a further 14 per cent choosing a midpoint on the scale between easy and difficult. The overall score for this question was 4, trending towards easy to retain quality employees.

Staff turnover

When asked about staff turnover, 65 per cent of firms gave their annual staff turnover at less than 5 per cent. 31 per cent of firms gave their annual staff turnover at 5 to 10 per cent, with a further 4 per cent reporting a figure of over 10 per cent. A number of firms reported a strong core of longer term employees, with a fringe of casual or more itinerant workers who came and went more quickly.

When asked how trends relating to staff turnover had changed in the last 10 years, 65 per cent of firms reported there was little change and the situation was similar to 10 years ago. 35 per cent of firms reported that trends had changed. The reasons given were difficult circumstances had meant retrenchments and not replacing employees who had retired. Some firms reported higher levels of staff turnover due to competing firms poaching staff or staff leaving to join other industry sectors where salaries were higher. This was seen as being disruptive to their business performance. Replacing highly skilled employees who had left the firm with employees with similar levels of skills was seen as an issue in today's market and that significant training was required by the firm. There was also a general loss of skills because of the hollowing out of the supply chain as firms closed or moved offshore and when significant numbers of older and highly skilled workers had retired from the manufacturing industry as workforces aged.

The question about staff turnover ignited the issue of training for the manufacturing industry:

"There is a depressed feeling about training in Australia and the implications of this."

Firms reported they believed training organisations to be out of touch with market needs and new technologies. As a result young people joining manufacturing firms need significant retraining, and often they become disillusioned and leave.

Average age of employees

The general view is that employees of manufacturing firms are ageing. This study attempts to quantify the extent of ageing within the industry by shop floor workers/admin staff/managers and directors. Detailed questions were asked about ageing.

	Average age of employees in 2000	Average age of employees in 2011
Shop floor staff	36	41
Administration staff	38	40
Managers/Directors	45	48

Comments include:

- actively looking for young people to introduce new ideas and to assist with innovation of products and systems
- administration systems require computer literacy and this means younger people who know the software
- stable workforce ageing in situ.

Clear career progression path within the firm?

This question was scored on a scale of 1 to 10 (where 1 was none at all and 10 was clear path).

The overall score for 'does the firm have a clear career progression path' was 5 (the midpoint of the scale). This suggests that more could be done to provide a career progression path for employees within the manufacturing sector.

The scale of manufacturing business does have an influence on the opportunity to promote employees, with small companies possibly finding it difficult to develop these pathways. Career progression opportunities are an indicator of health within an organisation, creating the opportunity to reward effort and to grow the business.

Do employees in the manufacturing firm have the knowledge and skills to continue to innovate products and develop export markets around the world?

This question was also scored on a scale of 1 to 10 (with 1 being no and 10 being yes). The overall score for this question was 7.

While there are a great number of skilled people working in the manufacturing industry in Melbourne's North, this score is a little disappointing. It suggests there may be a lack of capacity in some firms, particularly smaller firms, to spend resources to develop their businesses in new ways and markets. This means having the skills within the business to analyse market needs and opportunities. Rapidly changing markets and sales channels require faster response times. Product innovation and export markets were seen by firms as key levers of growth.

Comments:

- Do not have the skills now but need training to teach these skills within the firm.
- Issues relating to competitiveness, such as value of the Australian dollar and customer demands for constantly lower prices, means it is hard to get new things in place.
- This area is key to the future success of the firm.
- Owner manages export development and staff very supportive.
- Innovation and ideas often come from shop floor.
- We are targeting Asia so marketing staff are Chinese.

- Need to continue to develop the firm's resources in these areas.
- Experience and skills assist us in developing a world class system.

Adequate access to training needs in Melbourne's North?

Again, this question was scored on a scale of 1 to 10 (with 1 being no and 10 being yes).

The overall score for 'were there adequate access to training needs in Melbourne's North' was 5.5.

This is not a high score for this question. Firms were concerned that, as the supply chain hollows out, the critical mass that allows for provision of specialised training was diminishing. Some firms had no access to training in relation to their particular sector or systems. There was a degree of criticism about the way training had changed and a perceived lack of understanding of new technologies and current practice by training providers.

- Staff have to travel significant distances to access suitable courses.
- Industry associations are good at keeping us up to date with industry trends and training.
- Skills-for-growth funding has been useful. Melbourne has some good training organisations.
- Training providers tend to focus on really easy things and that is not what we need. With trades such as boilermakers, fitters, light and precision metal, it is difficult to find suitable training courses during the apprenticeship period.
- No support for what we do.
- Adequate.
- We are very specialised so no technology training available in Melbourne, the industry here is too small.
- Our core technology is in the textile sectors. Most people with the skills we need have retired; our manager is one of only five people in Australia with the skills we need.
- We conduct in-house training.
- The quality of training is questionable and quality has become worse; not as good as it was and this appears to be the general perception.
- Training too generic, so we do training in house.
- Companies will target skilled people, who get poached.
- Training represents a significant cost to the business as staff are away from the business and are not productive.
- Training is a shambles. RTOs have poor training systems combined with huge costs. TAFEs are out of touch with no understanding of market or technologies. Many instructors have no practical experience. After training, students need to be retrained and they become disillusioned.

- Our industry association used a TAFE course but this ended because of lack of interest as numbers were not high enough. Ideally we should go back to the old system which should be strong again.
- Specialist plastic courses not available anymore, the last industrial engineers course is at Monash. Most of our industry's global executives have an industrial engineering background.

Does the firm engage in business networking and co-development of ideas and products with other firms?

69 per cent of firms reported they engaged in business networking through industry associations, NORTH Link and others. The incidence of collaboration with other firms was rarer unless firms were discussing product manufacturing specifications with their customers in the supply chain. Some firms did, however, have strategic alliances with major firms such as BP and cooperative resource centres. Of the firms interviewed, there was no evidence of alliances with tertiary institutions.

31 per cent of firms stated that they did not engage in business networking.

Comments:

- People underestimate the power of networking.
- Our priority is to develop partnerships with suppliers and customers.
- Good local business and government networks and support.
- Open innovation and collaboration with customers.
- Meeting new suppliers and customers is important.
- We network globally or when it makes sense.
- Soft networking through industry associations but innovation internal.
- Networking but no co-development.
- We should but we don't.

Does the firm have a succession plan?

48 per cent of respondents stated that their firm had a succession plan in place.

52 per cent of respondents stated that their firm did not have a succession plan in place.

Succession plans are important, and small and medium size firms often have difficulty in establishing such plans. Sudden loss of company knowledge and the loss of a particular set of management skills specific to the business can cause significant problems within the business and its markets.

Do local managers make the decisions?

For the group of companies interviewed:

93 per cent of respondents stated that local managers made the decisions for their firm.

7 per cent of respondents stated that local managers did not make the decisions for their firm.

This question was asked in an attempt to understand the vulnerability of firms to overseas decisions. Larger firms may be part of a global organisation and vulnerable to strategic decision making that takes a global view, with outcomes that might include moving the firm's manufacturing to Asia. Smaller companies tend to be locally owned or family type companies so their decision making may take a different path, with different priorities. For many small firms the idea of offshoring production is too complex and costly, and therefore not an option.

Comments on rise of firm's superannuation guarantee levy contribution to 12 per cent

- Comes off our bottom line. I feel sorry for the staff as our contributions are eroded by fees.
- Increases our labour costs, not such an issue by itself but when added to all the other on-costs has an impact on our competitiveness. We are paying a higher set of wage on-costs than our group companies overseas. We do need a national savings plan and self-funded retirement is necessary. Transfer of the cost of social services to company payroll is not a good idea.
- Good idea.
- Not in favour of it, do not believe increase is necessary.
- Can't afford it, another cost impost. Even though China's salary on-costs are high, this is off a much lower salary cost base (about 10 per cent of Australian salaries). This means China is about one sixth of Australian staffing costs.
- Good strategy given ageing population, funding it is the difficult part and we will have to absorb costs. How we are going to pay for it we don't know.
- It is a pay rise and staff need to understand that. Not a problem if all industries are doing the same but we will need to increase prices to pay for it.
- Adds cost, another cost to business and it makes it harder to make employment decisions. Very hard for small business.
- So many on-costs on wages, feel it is a good idea but employee should contribute as well, then you get a stronger retirement package.
- Additional costs are never good, 3 per cent of payroll is 1 per cent of turnover. There should be a trade-off such as a reduction in payroll tax. This is, however, not just an issue of cost; the key issue is what the super industry is doing with the money. We are short selling the opportunity the funds could provide (infrastructure, innovation research etc). Not good enough.

- An additional cost for manufacturing firms so will hurt us; employees will still want a pay rise. Great for employees.
- Should be 15 per cent, must be planned from staff point of view. Staff think that government is giving them the super contribution, it is in fact a pay rise and we don't sell that message well enough.
- Just makes it harder for small business and it is difficult to pass on costs as we do not have the opportunity to increase our prices because of market conditions.
- Makes employees more expensive but don't disagree with principle.
- Additional cost – will push prices up. It will be very hard for us to increase prices though because of increase in competition from overseas; overall a negative impact on our business.
- Necessary and needs to be done, I can see the point of it. Worry about our competitiveness and the combination of on-costs on salaries. We are now employing a part time person to administer these on-costs. On-costs a big issue for us.
- We do 14 per cent anyway so not much impact on us, particularly with senior staff.
- Additional cost which we are not really able to pass on. Makes us slightly less competitive with international firms. The Australian dollar is a bigger factor.
- Not a level playing field out there.
- Investment in super is a good idea, I would feel better about it if money was used on long term infrastructure projects and the like rather than in the stockmarket where it inflates share prices.
- I would rather super funds invest in innovation and opportunities for kids to get jobs. What is done with the money should be considered. Investing in innovation would provide a greater return than the sharemarket. Do not have much of a problem with the increase.
- The increase will cause some hardships and will end up being reflected in our pricing.

9.2 Technology and the internet

Do the firm's managers and employees have the capability to integrate new information technologies to improve productivity and competitiveness?

The answers to this question were measured on a scale of 1 to 10 (with 1 being no and 10 being yes).

The overall score for 'do the firm's managers and employees have the capability to integrate new information technologies to improve productivity and competitiveness' was 7.8.

There was reasonable confidence that firms had the capacity to understand and to utilise new technologies to their advantage.

Use of internet

Again, out of a score of 10, the overall score for 'what is the staff's capacity to keep abreast of changes in technology and to increase the use of the internet' was 7.5.

Firms are typically using the internet for marketing type activities. Fewer firms are using the internet to integrate supply chain activity with suppliers and customers. The strategy of embedding/integrating the firm in customers' IT and supply chain systems locally, nationally and globally seems remote among the firms who responded to the survey. Some firms believed they did not leverage the internet well enough. There is potential for firms to develop a greater level of internet activity and do so in more advanced ways. Perhaps opportunities will develop with the delivery of the NBN to Melbourne's North.

9.3 General characteristics of employment and unemployment

Important contributors to employment within a given LGA are:

- age characteristics of the population
- working age population growth relative to new employment capacity being generated
- the size of the labour market catchment and access to employment
- the level of household skills and English language skills.

Higher levels of unemployment at the LGA level are likely to occur when:

- there is a high proportion of young people within an LGA seeking employment because young people have found it more difficult to access employment since the GFC
- there are clusters of older retrenched workers
- there are larger numbers of workers with poor English language skills
- there are large increases in working age population relative to employment locally available, with a large number of people with the same or relatively low skill sets competing for the jobs available.

During the period surrounding the GFC, employers reduced the hours worked by their staff but tried to keep their existing workforce in at least some employment to retain the skills they needed when economic circumstances improved. The result of this was that the burden of additional unemployment was largely borne by entrants to the labour market – chiefly young people but also migrants and particularly unskilled migrants.

What is happening now is that employers may have less resilience to retaining employees with the uncertain prospect of better times ahead. This means more retrenchments in the manufacturing sector and the potential for skills to be lost to other industry sectors such as mining and, in the case of retrenched workers unable to find equivalent employment, the inability to keep skills current with industry demand.

In the current economic circumstances, the broader factors that influence employment include:

- individuals already in employment have a better chance of staying employed than new entrants to the labour market have of finding employment
- individuals with skills that are in demand have a better chance of retaining or finding employment
- individuals with the capacity to access regions with high job availability relative to labour supply (that is, a good residential location in relation to employment availability or the capacity to spend time and money commuting) have a better chance of retaining or finding employment
- the least skilled individuals employed in the manufacturing sector who are retrenched are less likely to find equivalent employment because of the number of similarly low skilled individuals competing for a diminishing pool of jobs.

9.4 Skills and employment

This means training opportunities and clearly defined pathways to re-employment are critically important for manufacturing workers unfortunate enough to have been retrenched. Resident skills need to match industry requirements for skills within any employment catchment.

Figures 9.1 to 9.3 demonstrate the increasing association of the manufacturing regions with disadvantage appearing in the education attainment maps. The inner and middle regions have the highest concentrations of tertiary-qualified households and the highest rate of growth of tertiary-qualified households. In at least some manufacturing regions, there is evidence of high concentrations of low-skilled households and the slowest rate of decline in low-skilled households.

Figure 9.1: Percentage of households with highest qualification – Bachelor or higher, 2012

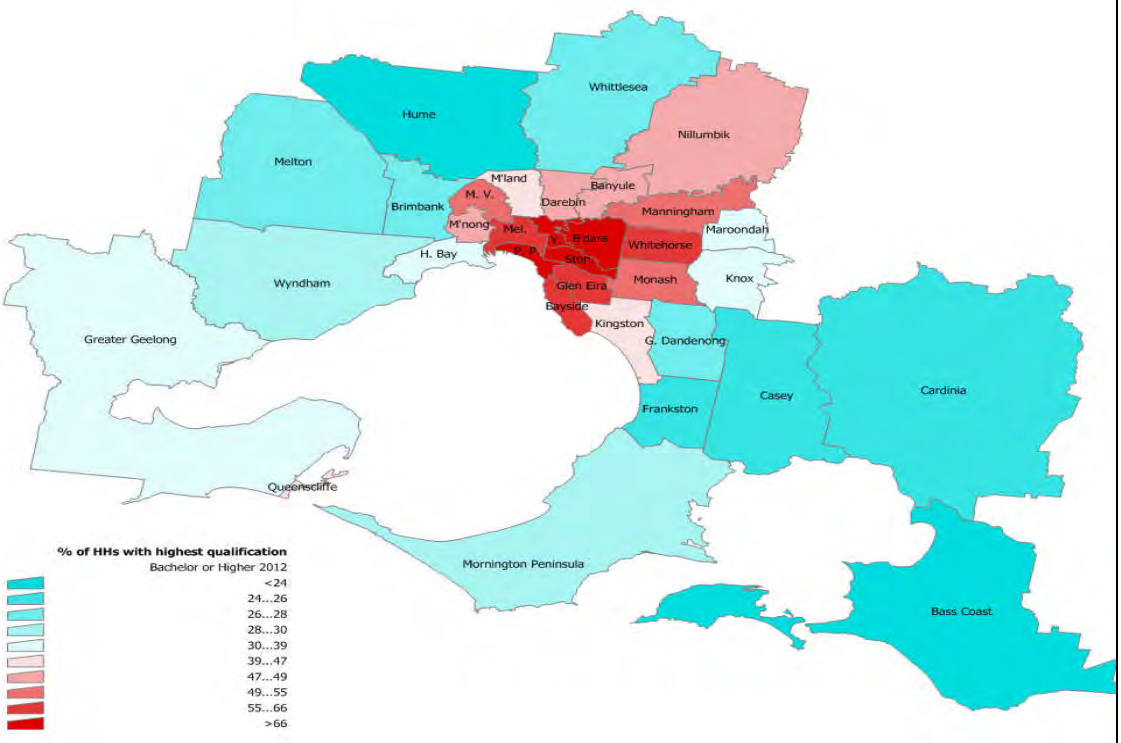


Figure 9.2: Percentage of households with highest qualification – Certificate III/IV, 2012

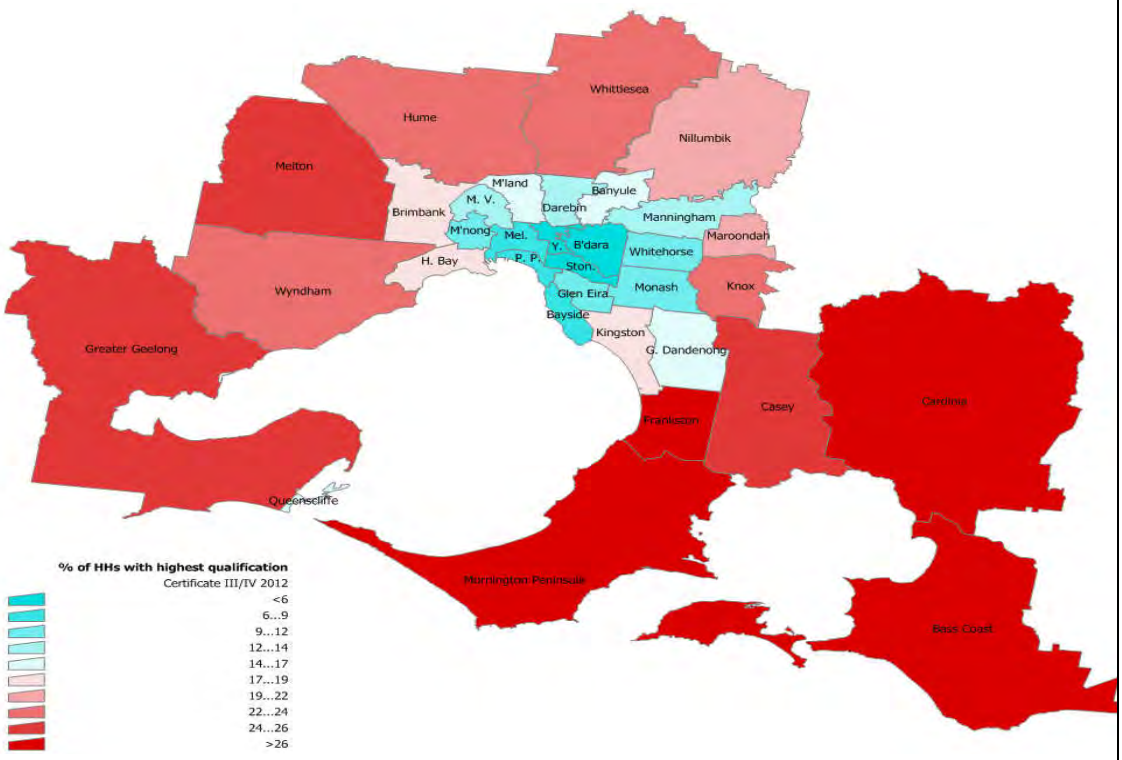
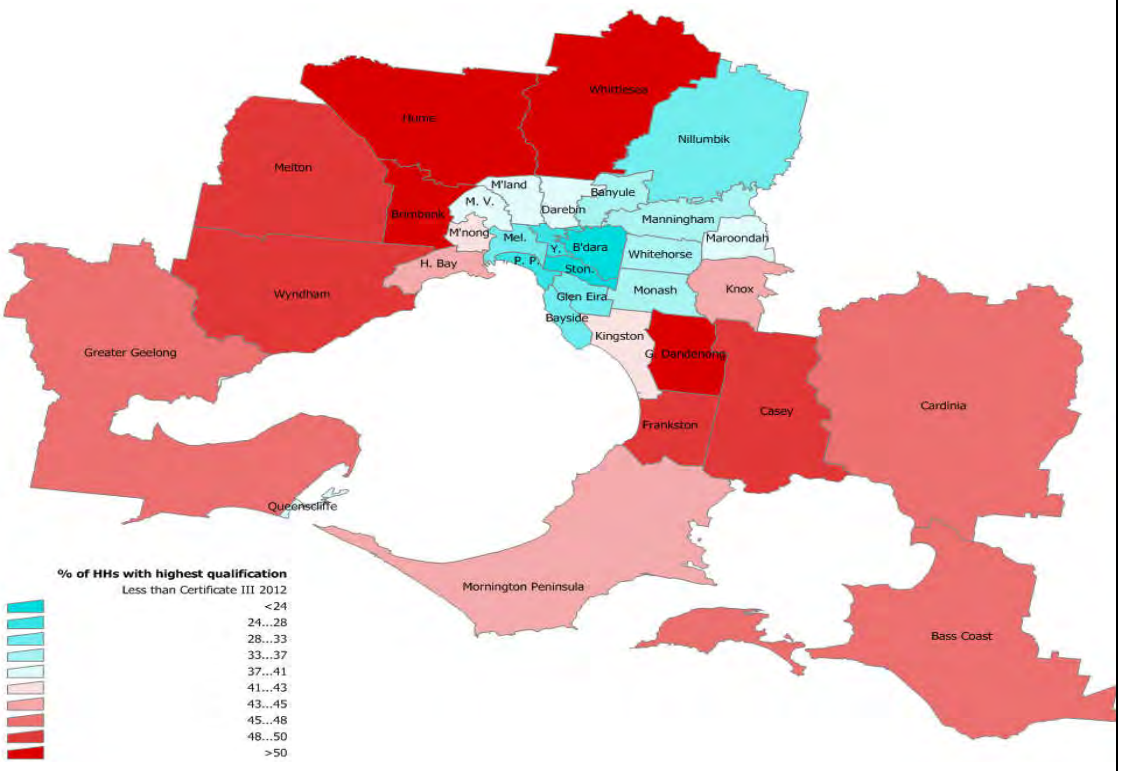


Figure 9.3: Percentage of households with highest qualification – Less than Certificate III, 2012



These high concentrations of low skilled households mean that it is probable that low skilled regions have not been able to improve the skills of existing residents at a rate fast enough to keep up with changing industry skills demand. The danger of this situation is that there is a greater probability that low skilled workers will become stranded in long term structural unemployment or, at best, low paid casual employment. This circumstance represents a considerable cost to government in terms of benefit payments provided to low skilled and longer term unemployed households. There are also significant wellbeing issues for this group and associated medical and social costs.

9.5 Skills and unemployed people

Long term unemployed people are far less likely to find employment in an economic downturn. The longer the period of unemployment, the remoter the individual from opportunities to keep their skill sets in line with industry requirements.

A UK study examined how vulnerable groups fared in past economic recessions (Stafford & Duffy 2009). The study team examined data from the recessions of the early 1970s, 1980s and 1990s. The study found that, since the 1980s, less skilled workers experienced an increase in, and longer duration of, unemployment than people with higher level skills. While the numbers of older workers who became unemployed may not increase relative to other workers, once unemployed, they remain so for a longer duration than others.

In the last decade there have been a number of automotive manufacturing plant closures around the world. Such closures in Australia are also not without precedent. *The impacts of automotive plant closure* is a study particularly relevant to Melbourne's North. The study, by Flinders University and the Birmingham Business School, analyses the impacts from the closure of the MG Rover automotive manufacturing plant in the British Midlands and the Mitsubishi automotive manufacturing plant in Adelaide, South Australia.

The authors and researchers of this longitudinal study include Kathy Armstrong, David Bailey, Alex de Ruyter, Michelle Mahdon and Holli Thomas. Longitudinal surveys of former workers from both MG Rover and Mitsubishi (laid off in 2004 and 2005) were conducted over a 12-month period to track the labour market outcomes of the retrenched workers. The research examined how the loss of employment arising from the closure of Mitsubishi at Lonsdale, a significant manufacturing plant, and voluntary redundancies at Mitsubishi at Tonsley Park (also subsequently closed in 2008), impacted the lives of the former workers.

"Flinders University Professor Andrew Beer said not enough attention had been paid to the 'mental anguish' of redundancies."

The Adelaide study, which followed some 400 respondents, examined the processes of adjustment and change including the impacts on health, employment and loss of income. The three stages of data collection occurred during the period immediately prior to retrenchment, to three years after retrenchment. Information collected included the demographic profile of the retrenched workers, their perceived and actual likelihood of finding permanent full time employment following the closure, health issues that could be linked to redundancy and a variety of different housing outcomes that arose as former employees changed their jobs and consequent income status.

When the United Kingdom and Australian experiences are compared, differences emerge. Australia at the time of the Mitsubishi closure was in the midst of a significant debate about skills shortages because of the mining boom and growth of the defence industry in South Australia. In the case of South Australia, the opportunity to retrain retrenched workers with skills that would be useful to the growth industries was largely missed. The result of this was that workers left the workforce to retire or found themselves on lower paid casual or part time employment, with the resulting consequences on household wellbeing.

The study's findings regarding the workers that had been retrenched by the Mitsubishi plant closure included:

1. greater levels of mental health distress compared to the general male population, with workers feeling a 'lower sense' of control
2. 50 per cent of the workers believed the job losses had affected their social life, with nearly a fifth not involved in formal social or group activities
3. while many had secured jobs, 40 per cent were in short term or casual employment, with many respondents expecting median wages to fall from $35,000 to $25,000
4. workers on disability pensions were particularly vulnerable, with one contemplating suicide.

In the British case there was a greater level of labour market intervention programs, which included higher funding assistance and other forms of targeted support. Even in the British case outcomes were not always good and many of the workers experienced a decline in income and loss of job security.

Later research by Bailey *et al* in 2008 found that over 90 per cent of MG Rover workers were once again employed, and around 60 per cent had engaged in educational or training activities. However, over 40 per cent regarded their new employment as being less satisfying than at MG Rover. The British workers also experienced a fall in income, this time in the order of £5,600.

The findings indicated that too great a reliance on the flexible labour market was not enough to facilitate transition to new forms of secure and well paid employment but rather a more active policy intervention was needed, particularly one that would improve and broaden the skills of these workers.

Issues arising during the transition phase included the capacity of Job Network providers to appropriately deal with the needs of skilled workers, and the know-how of workers in terms of gaining access to Job Network services.

The findings suggest that monies are best invested in further training and re-skilling of the retrenched workers. The point being that training, particularly training targeted to growth industries, is the best way to assist retrenched workers.

Again we come back to recognising the importance of skills and ongoing training and education to facilitate transition to re-employment.

The issue for Melbourne's North is also to consider how manufacturing workers can be assisted to transition from manufacturing sectors in decline to those sectors with more positive growth prospects. Even within the automotive sector, there should be consideration in regard to how before-market manufacturing employees can transition to the after-market sector of the automotive industry. The point here is to ensure valuable manufacturing skills are not lost to the industry because of barriers to moving from one sector to another and the costs to workers and government of unnecessary long term employment.

9.6 Younger workers and the transition from education

The manufacturing sector in Melbourne's North needs to attract younger employees and young people need the manufacturing industry for stable employment opportunities. Yet there appear to be barriers to entry and dissatisfaction from employers about the job readiness of young people. Issues for young people transitioning to employment and likely barriers to young people finding employment in the manufacturing industry in the region include the following.

1. There is a greater emphasis on trades education in Victoria's secondary schools. Why does this trend not appear to be translating into employment pathways into the manufacturing industry?

2. That provision of career guidance at school level and beyond has plenty of room for improvement and much more could be done to assist with career planning. How does the manufacturing industry network with young people?

3. TAFE is seen by many parents as a second rate option and manufacturing as providing an old-fashioned and unpleasant workplace. How can these perceptions be changed?

4. The job readiness of many young people in Melbourne's North is likely to be an issue.

5. It is likely that there is a disadvantaged group of young people in transition from education to employment, that skill sets in this disadvantaged group are low and that this represents a significant skills gap when compared to employer needs. How can Hume and Whittlesea in particular engage young people in building skills with a view to working in the local manufacturing industry?

6. It is likely that employer needs in relation to skills are at a much higher level and that this trend will continue as business activity becomes more complex and globalised, further marginalising the least qualified young people in Melbourne's North.

9.7 Labour market programs

The Hume and Whittlesea automotive skills report considered the different types of labour market programs. In its report, *Active labour market programs, a review of evidence from evaluations* by Amit Dar and Zafiris Tzannatos (1999), the World Bank analyses more than 100 studies of active labour market programs.

Labour market programs are usually a direct result of high unemployment, where the program's purpose is to create new jobs within a given region or economy. This type of labour market program could be driven by an increase in the public works program. In essence, a stimulus of infrastructure investment and employment with the benefit of greater economic efficiency downstream as a result in improved infrastructure. Other labour market programs will be structured to enable the retraining of retrenched workers because of industry restructuring or specific plant closures. The report points out that, while retraining is offered to some groups of retrenched workers, the existing unemployed are not given the same opportunity, and if they had been could have filled the jobs that the retrenched workers were being trained in.

It is likely that the most appropriate approach is to target groups of workers who will be or have been retrenched for appropriate retraining into growth industries while maximising the training effort for existing and longer term unemployed. It must be understood just how important the level of skills in a community is in relation to driving economic performance.

The World Bank study summarises its research in terms of the benefits of particular labour market programs in this way:

- **public works programs** do assist disadvantaged groups (older workers, the long term unemployed and those in distressed regions) as a poverty/safety net program. Public works programs were shown to be ineffective instruments in combating long term unemployment. Wages for workers in these programs tended to be lower

- **job search assistance programs** are positive and cost-effective relative to other labour market programs but work best in periods of strong economic performance. It was found that these programs were unlikely to improve the employment prospects or wage levels of young people
- **training for the long term unemployed programs** is positive in periods when the economy is improving. Small-scale, tightly targeted on-the-job training programs, often aimed at women and older groups, offer the best returns. The study concludes that the cost-effectiveness of these programs is generally disappointing
- **retraining for those laid off in mass retrenchment programs** were found to have little positive impact and (as in case for the structurally unemployed) these programs were found to be more expensive and no more effective than job search assistance programs
- **youth training programs** were not found to be a good substitute for the education system generally and have no positive impact on employment prospects or post-training earnings
- **micro-enterprise development programs** were only adopted by a small fraction of the unemployed and the failure rate of these businesses was quite high. The study found that women and older individuals had a greater likelihood of success
- **wage subsidy programs** were viewed as negative because they had substantial deadweight and substitution effects. Wage and employment outcomes of participants were also regarded as having poor outcomes, and careful supervision of these programs was necessary to ensure that firms do not use the program as a permanent subsidy.

While some of these findings may seem counterintuitive, it should be recognised that the World Bank study is an international one and that a successful program in one country may not be as successful in another. The study emphasises the importance of program design and effective program delivery (a shortcoming of governments) and finds that a successful program from the past may not be successful in the future. The study also makes the point that the impact and cost-effectiveness of labour market programs depends not only on their design, but also on the overall macro and labour market framework in which they are designed.

9.8 New opportunities for employment in the manufacturing sector

The *Melbourne's North: a new knowledge economy* report identified a range of advanced manufacturing industries with significant potential for the region:

- aerospace cluster associated with existing infrastructure in the Melbourne Airport precinct
- 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.

9.9 Employment and skills in the manufacturing industry

Studies conducted by NIEIR suggest the following skills are important to successful manufacturing firms:

- senior management skills, particularly adapting to change
- engineers across a range of automotive industry disciplines
- design and engineering skills more broadly
- product launch and marketing skills
- supply chain management skills
- specialised IT skills
- highly technical skills with problem solving capabilities
- robotics skills – more technology and automation so more can go wrong
- designers
- CAD staff
- product management and marketing
- supervisors with a broad set of specialised skills
- team leaders
- higher level production workers
- specialist trades such as structural steel and welding workers.

9.10 The role of management

Larger global firms have personnel departments, training budgets, international gatherings and retreats, and training plans for their senior executives. These features of larger firms help managers to think strategically and adapt to rapidly changing markets and circumstances. In larger firms there is peer pressure for managers to keep up to date and it is easier to formulate decisions based on in-depth knowledge in this group context. Managers in the smaller firms that dominate the manufacturing sector in Melbourne's North are likely not to have the same opportunities offered by the larger firms. So how do managers of smaller firms manage their businesses and what are their references for decision making? This question is hard to answer. But it is a very important one in the current context of the region's manufacturing industry.

Training and learning opportunities for senior management are very important.

10. Technology, diffusion and best practice management

One big question is – how do small and medium size manufacturing firms keep up to date with the knowledge they need to manage changing markets and technologies? The way knowledge diffusion in a region works has an enormous impact on whether a region is successful in building a strong foundation of higher value add and export driven manufacturing.

The ability of managers and senior executives within the manufacturing industry to understand the factors influencing their firms' prospects (both opportunities and risks) is critical to the future success or failure of the firm. Learning means managers must be able to stand back from their businesses, even for short periods, to engage in strategic dialogue with industry experts internationally. This includes general management training as well as training in areas specific to manufacturing. Learning how to think strategically is very important.

There are many talented managers across Melbourne's North but it is worth making the point that if managers sometimes have a weak point, it might be a reluctance to undertake further training (or learning). Issues such as 'no time for non-productive activity' or 'I know what I need to know' are barriers to that learning process. These attitudes are likely to make best practice competitors very happy. None of us can afford to stop learning in a rapidly changing world and that particularly applies to managers in a complex and fast changing manufacturing sector.

High level knowledge acquisition means finding the best courses available. These may be in Europe or the USA, including short courses at the Saïd Business School, University of Oxford or Harvard Business School – courses such as aligning strategy and sales, or building and sustaining competitive advantage.

The point here is to work towards creating a region in Melbourne's North of best practice technology diffusion activities and highly trained executives in tandem to gain strategic advantage over other competing regions and create opportunities for developing high value added manufacturing exports. The goal is constant improvement in standards of management capacity and ability, linked to a significant escalation in knowledge diffusion activities.

NIEIR modelling indicates that the gains in investing in best practice technology diffusion activities are impressive, given the availability of skills and labour. The benefits for best practice technology diffusion regions in the US are that, for every $1 invested in technology diffusion agencies operating at best practice levels, a benefit of $22 is returned in additional gross state product.

It is probably correct to say that Melbourne's North is lagging behind best practice in terms of executive training and strategic knowledge diffusion activities. It is probably also correct to say that at least part of the framework to begin the process of continual improvement in knowledge building already exists in Melbourne's North through its industry networks. Government support in improving management learning and knowledge diffusion activities could make a significant impact in changing the region's manufacturing outcomes. This strategy is about investing in the region's people to build the capacity of firms in Melbourne's North to achieve world best practice standards. The benefit of government investment therefore resides in the region's workers rather than in the firm alone.

10.1 Executive training

The *Financial Times*, a Pearson plc company, ranks business schools internationally. The top 20 schools running executive education programs in 2011 are shown in Table 10.1.

In total 65 colleges are rated for this measure. The *Financial Times* says that:

> *"Although the headline ranking figures show changes in the data year to year, the pattern of clustering among the schools is equally significant. Some 295 points separate the top school from the school ranked number 65. The top 11 schools, from Iese Business School to University of Oxford: Saïd, form the elite group of providers of open enrolment programs. The second group runs from MIT: Sloan to Aalto University Executive Education, ranked 46. Some 105 points separate these two schools. The third group is headed by UQ Business School."*

Table 10.1 Top 20 schools running executive education programs in 2011

Rank 2011	Average 3 year rank	School	Country
1	3	Iese Business School	Spain
2	2	Harvard Business School	U.S.A.
2	6	Thunderbird School of Global Management	U.S.A.
4	3	IMD	Switzerland
5	3	University of Virginia: Darden	U.S.A.
6	6	London Business School	U.K.
7	12	HEC Paris	France
8	12	Essec Business School	France/Singapore
9	8	Center for Creative Leadership	U.S.A./Belgium/Singapore
10	11	Fundação Dom Cabral	Brazil
10	18	University of Oxford: Saïd	U.K.
12	10	MIT: Sloan	U.S.A.
12	11	Stanford Graduate School of Business	U.S.A.
14	14	Northwestern University: Kellogg	U.S.A.
15	21	ESMT European School of Management and Technology	Germany
16	19	University of Chicago: Booth	U.S.A./U.K./Singapore
17	12	University of Western Ontario: Ivey	Canada/China
18	18	Insead	France/Singapore
19	13	IE Business School	Spain
20	23	Esade Business School	Spain

Source: Financial Times, London, May 2011.

10.2 Technology diffusion activities

To put it simply, technology diffusion activities assist policies that aim to improve a firm's productivity, profitability and rate of sales growth by optimising the firm's decision making and outcomes in terms of technology acquisition, skills development, capital employed and R&D priorities to name a few.

Knowledge diffusion is about creating channels that enable manufacturing firms in Melbourne's North to access information about best practice relating to all aspects of their operations. Best practice in this case means influencing the factors that drive a firm's productivity. These include:

- management and business practices
- skills and training
- product design
- process technology and ICT systems
- quality control
- plant layout
- material handling
- inventory control.

Knowledge/technology diffusion may occur via seminars, conferences, web based information forums, publications and demonstrations, and through links and networks. The theory is that productivity improvements in one firm in a region spill over to other firms in the supply chain with more competitive pricing, better quality and greater innovation.

An example of how technology diffusion activity can be stimulated at the regional level is the USA's Manufacturing Extension Partnership, a catalyst for strengthening American manufacturing – "*accelerating the manufacturing industry in the USA's transformation into a more efficient and powerful engine of innovation driving economic growth and job creation.*"

> *"The National Institute of Standards and Technology's Hollings Manufacturing Extension Partnership (MEP) works with small and mid-sized US manufacturers to help them create and retain jobs, increase profits, and save time and money. The nationwide network provides a variety of services, from innovation strategies to process improvements to green manufacturing. MEP also works with partners at the state and federal levels on programs that put manufacturers in position to develop new customers, expand into new markets and create new products.*
>
> *MEP field staff has over 1,300 technical experts – centered on five critical areas: technology acceleration, supplier development, sustainability, workforce and continuous improvement.*
>
> *Innovation is at the core of what MEP does. Manufacturers that accelerate innovation are far more successful and realise greater opportunities to participate in the global economy. By placing innovations developed through research at federal laboratories, educational institutions and corporations directly in the hands of US manufacturers,*

MEP serves an essential role in sustaining and growing America's manufacturing base. The program assists manufacturers to achieving new sales, leading to higher tax receipts and new sustainable jobs in the high paying advanced manufacturing sector.

As a public/private partnership, MEP delivers a high return on investment to taxpayers. For every one dollar of federal investment, the MEP generates $32 in new sales growth. This translates into $3.6 billion in new sales annually. For every $1,570 of federal investment, MEP creates or retains one manufacturing job.

America needs a robust manufacturing base and MEP is critical to the small and mid-sized US manufacturers who strengthen that base."

There are similar examples in Europe. QMI solutions in Queensland, where manufacturing appears to be growing, has also had a significant impact on technology diffusion activities within that state.

10.3 Understanding the need for technology diffusion activities and outcomes

Stimulating interest in technology diffusion activities might include:

- demonstration of new technologies
- facilitating comparisons between the firm's performance and that of world best practice firms
- ongoing measurement of firms' performance against best practice
- helping lagging firms to move towards best practice by assisting the strategic planning process
- doing these things intensively to increase the probability of successful outcomes.

10.4 Stages in intensive technology diffusion activity

Technology diffusion activity planning for a firm might look something like the following.

- Identify best practice technology that provides greatest opportunity for improving competitiveness.
- Conduct a detailed firm assessment, identifying barriers to implementation of best practice technology diffusion.
- Assess opportunities for product modification and market potential for sales growth.
- Select solutions.
- Identify resources required to successfully implement the transfer.
- Implementation, market development and training.

10.5 How can government reduce obstacles to successful outcomes in knowledge diffusion activities?

1. Provide financial assistance in cases where the firm's balance sheet cannot justify the costs of financing technology diffusion activities.
2. Provide training programs where highly specialised skills are required.
3. Provide export market development assistance.
4. Provide R&D assistance, particularly where best practice knowledge diffusion outcomes suggest altering product characteristics.

11. Roadmap and recommendations

This roadmap links short term and long term goals for the manufacturing industry in Melbourne's North. The roadmap is, by its nature, a macro view. It is not about picking winners but instead suggests a strategic pathway to the future.

The purpose of the roadmap is to encourage discussion about how Melbourne's North should navigate its manufacturing future. The roadmap suggests measures that require ongoing management at the regional level and provides a framework to assist macro planning.

This roadmap is intended to address the key issues facing manufacturing in the region.

11.1 Level one: The highway

Manufacturing helps to maintain an overall balanced economic structure that allows long term sustainable growth in living standards. For a region this suggests a manufacturing share in total product of around 15 to 16 per cent. Manufacturing share of GRP in Melbourne's North has fallen from 26.5 per cent in 1998 to 16.3 per cent in 2011. This does not only mean decline in the manufacturing sector, but also that other sectors have grown their share of GRP.

The issue here is that if manufacturing GRP declines further, this really means problems for local supply chains and starts creating an imbalance in the macroeconomic structure of the region's economy. Continued decline of manufacturing GRP share is likely to mean an increase in long term structural employment in Melbourne's North because so many of its residents' skills are manufacturing industry skills. As manufacturing can be a high value adding industry because people are engaged in making products, replacing manufacturing jobs with jobs with less value adding potential should not be the answer.

The goal must be to maintain and to hold manufacturing share of GRP in the Melbourne's North economy at between 15 and 16 per cent.

11.2 Level two: The high street

How can manufacturing share of GRP be held at 15 to16 per cent?

- Moving production output up the value added chain.
- Focusing on high value added export markets.
- Intensifying R&D exports.
- Intensifying export expansion programs.
- Intensifying knowledge diffusion activities in tandem with high level management training.
- CRITICAL FOR MELBOURNE'S NORTH: Introducing policy levers to maximise the opportunity for automotive manufacturing to remain viable in Melbourne's North, to avoid significant long term job losses and significant declines in supply chain capacity and skills.

11.3 Level three: The carriage way

- Training: Aim to have the best trained and skilled manufacturing industry managers possible in Melbourne's North, with strategic skills and in-depth knowledge of markets. Goal: provide local managers, particularly from medium sized manufacturing firms, with the opportunity to access world class manufacturing training (mostly short courses in strategic management, market development, product development and finance).
- Knowledge diffusion activities: Assist manufacturing firms with export, hi-tech and new product development potential. Goal: use regional and government networks, skills and resources to open up new markets internationally.
- Create a culture within manufacturing firms in Melbourne's North that embraces the use of best practice management systems to improve productivity and profitability.
- Strengthen links to research organisations and universities in Melbourne's North. This needs to become a real planning focus with significant effort being put into creating and measuring results. Goal: create growth in hi-tech manufactures based on local research and IP.
- Address barriers to potential growth industries in Melbourne's North manufacturing, particularly the barrier created by dominance of the retail sector. Goal: find a way around barriers to create the opportunity for export growth.
- Employment: from the lessons learnt from major manufacturing closures of the past, create individual pathways for retrenched manufacturing workers to new forms of manufacturing related employment. Goal: not to lose skills and to avoid long term structural unemployment or low paid casual re-employment. Strategy may seem difficult but will be a lot easier and cheaper than the alternative outcome created by not putting this policy in place.
- Promote the Cities of Hume and Whittlesea in particular as manufacturing centres of excellence and ensure that the appropriate hard and soft infrastructure required by manufacturing firms is available in industrial developments. This means (among other things) gas supply, electrical supply suitable for manufacturing operations, broadband and specialised industry training. Goal: ensure we are planning for a manufacturing future and not just a warehousing and distribution future, and create the capacity to retain and attract manufacturing firms in and to the region.
- Consider lowering the bar for entry to the Enterprise Connect program so that smaller but rapidly growing firms (that could gain significant advantage from the Enterprise Connect program and at the time they need it most) can qualify for this successful program. Reduce lower turnover eligibility limit so that it is $1 million to $1.5 million and make qualifying for this program slightly easier.
- Support the establishment of new business incubators. Both state and federal governments should have a role in this.

Appendix 1: RDA Manufacturing Survey – Product and Supply Chain

Q.1

Firm: .....

Contact: .....

Is the Melbourne factory the main operating location .....

Q.2 Industry trends

Briefly list the key issues and trends that impact on the firm and the broader market and comment on the changes over the last 10 years

.....

.....

.....

.....

.....

Post GFC

.....

.....

.....

.....

.....

IF YOUR FIRM HAS MANY PRODUCTS AND DIVISIONS, PLEASE COMPLETE QUESTION 3

Q.3

Describe as accurately as possible and list each main product and provide answers for each product stream. Use the numbering system consistently throughout Questions 3, 4 and 5 so that your products can be clearly identified and associated with your inputs. Also ensure consistent numbering for inputs so these can be tracked through the survey

Your main products (describe as accurately as possible)	% exported other Aust states	% exported overseas	Total number of employees in Australia	
			AUST	VIC
P1.				
P2.				
P3.				
P4.				
P5.				
P6.				
P7.				
P8.				
P9.				
P10.				

Q.4

Product links, in this question you are describing (A. below) the raw materials used in your products (inputs) by product type using the product classification from question 3 and (B. below) the use and market for your products.

A. Describe what are the main raw materials (inputs) used in the product (outputs)?	**B. Is the product from Question 3 used as a raw material for other manufactured products or directly by consumers? If so, what are the manufactured products and markets?**
P1.	M1.
P2.	M2.
P3.	M3.
P4.	M4.
P5.	M5.
P6.	M6.
P7.	M7.
P8.	M8.
P9.	M9.
P10.	M10.

Note: P1, P2, etc. refers to product outputs from the table in Question 3. As an example, if your product (P1) from Question C was paint, the answer to Question 4 column A for P1 would be the associated raw materials for paint, and in column B for M1 would be the use of your paint, i.e. motor vehicles.

Q.5

If your firm were no longer to manufacture its products in Australia, would these be replaced by imports or manufactured locally by competitors?

❑ Imports ❑ Locally

If you have answered imports, what percentage of your total sales would be moved to overseas production?
Please use same product code as per Question 3

Product	**%**
P1.	
P2.	
P3.	
P4.	
P5.	
P6.	
P7.	
P8.	
P9.	
P10.	

Conversely, do you believe that your firm has an opportunity to develop products that could replace imports in your market sector? What is the likelihood of developing import replacement products?

Very unlikely 1 2 3 4 5 6 7 8 9 10 **Very likely**

COMPANY INFOMRATION

Q.6

When were the firm's major manufacturing facilities established?

.....

And when were these facilities last upgraded?

.....

Q.7

Does your firm have any major developments, new equipment, new factories, etc. underway? If so what are they?

.....

.....

.....

.....

.....

Q.8

When were your products first offered and how has this changed over time? (USE THE PRODUCT CLASSIFICATION)

Express market share in ranges 0–10/10–20/20–40/40–60/ etc.

- Ensure that you use the "Product" numbering system (P1, P2, etc.) consistently throughout the Questions so that your products can be clearly identified.

Product/service	First year offered	Estimated market share (%)			
		Victoria		Australia balance	
		2000	Current	2000	Current
P1.					
P2.					
P3.					
P4.					
P5.					
P6.					
P7.					
P8.					
P9.					
P10.					

Q.9

Volume change of production – how has this changed over time?

Product type	Volume change in production for 2010-11 compared with 10 years ago (% PLUS or MINUS)	
	Volume	**Value**
P1		
P2		
P3		
P4		
P5		
P6		
P7		
P8		
P9		
P10		

Q.10

What were the main reasons for changes in production volume and value?

(Please use numbers from chart below)

Code	Main reason for change
1	Decline in domestic demand
2	Change in import penetration
3	Change in plant capacity
4	Closure of domestic plant
5	Change in exports
6	Change in domestic customer requirements
7	Vulnerability of your production methods and products to a carbon tax

Product/service	Reasons for change in production volumes *(Please use numbers from chart above)*
P1.	
P2.	
P3.	
P4.	
P5.	
P6.	
P7.	
P8.	
P9.	
P10.	

Please comment

.....

.....

.....

Q.11

What level of investment is required to maintain your product and markets and how has the level of investment changed over time?

GROSS INVESTMENT	Current gross investment as a % of sales	Gross investment as a % of sales – 10 years ago	Required minimum average gross investment as a % of sales to maintain current market share for next decade
P1			
P2			
P3			
P4			
P5			
P6			
P7			
P8			
P9			
P10			
MARKET DEVELOPMENT EXPENSE	**Current market development expense as a % of sales**	**Market development expense as a % of sales 10 years ago**	**Required minimum average market development expense as a % of sales to maintain current market share for next decade**
P1			
P2			
P3			
P4			
P5			
P6			
P7			
P8			
P9			
P10			

EXPORTS	Current exports as a % of domestic sales	Exports as a % of domestic sales – 10 years ago	Required minimum average exports as a % of domestic sales to maintain current market share for next decade
P1			
P2			
P3			
P4			
P5			
P6			
P7			
P8			
P9			
P10			
R&D EXPENDITURE	**Current R&D as a % of sales**	**R&D as a % of sales – 10 years ago**	**Required minimum average R&D as a % of sales to maintain current market share for next decade**
P1			
P2			
P3			
P4			
P5			
P6			
P7			
P8			
P9			
P10			

Q.12

Probability that product being manufactured today will be produced in 10 years' time?

Note: For each row, columns (1) to (3) should add to 100. For new products column (2) should have 100%. If it is certain that a product's production will be ended in Australia then column (4) will have 100. If it is less than current levels the column (3) will have 100 and column (4) may be, for example 50 per cent. This would mean that it is certain that there will be a contraction but a 50/50 probability that production will cease.

	(1) At current levels	(2) Greater than current levels	(3) Less than current levels	(4) Not at all	(5) Relocation from Victoria to somewhere else in Australia
Existing products					
P1.					
P2.					
P3.					
P4.					
P5.					
P6.					
P7.					
P8.					
P9.					
P10.					
Potential new products/group					
1					
2					
3					
4					
5					
ALL PRODUCTION					

Q.13

Is Melbourne's North a positive location for your manufacturing firm? What are the LOCAL benefits/obstacles (listed in decreasing order of relevance) that must be developed/overcome if your present manufacturing operations are to remain competitive?

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Q.14

Focus of corporate strategy over next decade?

		Weight (weight adds to 100)
(i)	Current production more or less maintained with focus on reducing costs	
(ii)	Contract current operations with your products being replaced by imports	
(iii)	Expand exports of some of current products	
(iv)	Cease manufacturing operations entirely	
(v)	Introduce new products being manufactured by your firm	
	– R and D intensive, developed by your firm	
	– Licensed IP from elsewhere	
	TOTAL	100

Please comment

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Q.15

What minimum exchange rate would be required ($A/$US) to give satisfactory profitability to product?

Product group	$US/$A exchange rate
P1	
P2	
P3	
P4	
P5	
P6	
P7	
P8	
P9	
P10	

Q.16

Is your company more or less profitable today than it was 10 years ago?
Please comment.

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Q.17

This question relates to the ownership structure or equity interests in the firm.

Ownership	Ownership structure of the firm – per cent of each possible type	
	2000	Current
ASX listed		
Parent company Australian (includes offshore listed)		
Parent company offshore		
Sole proprietor/partners		
Total		

Q.18

Is the firm located in an area of Melbourne's North where land use is changing and property values are increasing?

❑ Yes ❑ No

Would you consider to relocating your firm elsewhere in Victoria/Australia?
Please comment.

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Q.19

Are you aware of any major new investments being made by competing businesses?
If so please describe plant and its location.

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EMPLOYEE INFOMRATION

Q.20

How many employees are in the firm in Victoria?

Current number of …… employees

10 years ago …… employees

Q.21

How many employees in the firm as a whole in Australia?

Current number of …… employees

10 years ago …… employees

Q.22

Is there an adequate supply of quality graduates entering the manufacturing industry?

❑ Yes ❑ No

Please indicate on the scale below

Undersupply 1 2 3 4 5 6 7 8 9 10 **Oversupply**

Q.23

Is there an adequate supply of quality technicians/trades in the manufacturing industry?

❑ Yes ❑ No

Please cirlce

Undersupply 1 2 3 4 5 6 7 8 9 10 **Oversupply**

Q.24

Is it difficult to retain quality employees?

Indicate on a scale of 1 to 10, with 10 being very difficult. Please circle

Easy 1 2 3 4 5 6 7 8 9 10 **Difficult**

Q.25

What is your level of staff turnover on average per year?

Please indicate the yearly change in the ranges below.

❑ No change ❑ 0-5% ❑ 5-10% ❑ 10-15% ❑ 20%+

Q.26

Has this changed since 2000 *Please comment*

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Q.27

What is the average age and number of employees? Has this changed markedly over the past 10 years?

Please fill in the table below and comment if applicable.

Number and average age of executives – 10 years ago and current				
	2000		**Current**	
Category	**Age**	**Number**	**Age**	**Number**
Factory worker				
Administration/support staff/technical				
Line manager				
Director				
Partners/principals				

Please comment

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Q.28

Are there clear career progression paths within your manufacturing firm?

Please indicate on the scale below.

None at all 1 2 3 4 5 6 7 8 9 10 **Clear path**

Q.29

Do you believe that the employees in your manufacturing firm have the knowledge and skills to continue to innovate products and develop export markets around the world?

No 1 2 3 4 5 6 7 8 9 10 **Yes**

Please comment

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Q.30

Is there adequate access to your training needs in Melbourne's North?

No 1 2 3 4 5 6 7 8 9 10 **Yes**

Please comment

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Q.31

Does your firm engage in business networking activities and co-development of ideas and products with other firms? Please indicate the extent of these.

Please comment

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Q.32

Do you have a succession plan for the firm?

Please comment

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Q.33

Do local managers make the key decisions about your firm's strategic goals or are these decisions taken outside of Victoria/Australia? Please comment

No 1 2 3 4 5 6 7 8 9 10 **Yes**

Please comment

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Q.34

Do you believe that your managers and employees have the capability to integrate new information technologies to improve the productivity/competitiveness of your firm?

No 1 2 3 4 5 6 7 8 9 10 **Yes**

What is your staff's capacity to keep abreast of changes in technology and to increase use of the internet?

Poor 1 2 3 4 5 6 7 8 9 10 **Very high**

Please comment about how your firm might benefit from the NBN

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Appendix 2: Definitions

A2.1 Definition: Gross Local Product

Gross Product is identical with Gross Value Added for any geographic area. It comprises the sale value of goods and services produced in the region in a time period, less the costs of raw materials and other inputs purchased from other businesses and less taxes. The basic concept is very similar to the tax base for GST.

Ideally, Gross Local Product would have the same definition as Gross National Product or Gross State Product. However, it is not possible to allocate the Gross Operating Surplus of corporate businesses (including any surplus of government enterprises) to LGAs. (The Gross Operating Surplus comprises corporate Gross Value Added less wages and related payments.) Gross Local Product therefore comprises:

- employee compensation paid in respect of production in the LGA; plus
- gross value added by unincorporated enterprises in the LGA less employee compensation paid by those enterprises (equivalent to Gross Mixed Income generated in the LGA); plus
- imputed Gross Value Added of owner-occupied houses in the LGA.

Corporate businesses are those incorporated with shareholders, who ultimately control the company and are entitled to dividends when paid. Various other forms of legal incorporation, which lack the shareholder-dividend component, are not treated as incorporated, save that the definition includes branches of overseas companies and is extended by the ABS on an ad-hoc basis to include businesses organised as co-operatives, credit unions and mutual societies where these businesses maintain full accounts and operate in a manner similar to shareholder companies. The extension includes trusts whose chief activity is the holding of financial assets. All other businesses and non-profit-making organisations are excluded from the definition – these exclusions include partnerships, trusts that operate businesses (especially in the agricultural sector), community and philanthropic non-profit institutions and any other non-shareholder organisations not specifically transferred to the corporate sector. In all cases Gross Mixed Income generated by the organisation is calculated after employee compensation is paid. It will be noted that non-profit organisations are exempt from personal and corporation taxes so that the Gross Mixed Income they generate has to be estimated directly.

As regards organisations which generate taxable Mixed Income, the ABS definition is influenced by the definition used by the Tax Commissioner. This allows taxpayers to declare as business income any income in which compensation for the taxpayer's labour is mixed with a capital return that is not legally separable from the labour return (as it is when incorporation requires the separation of employee compensation from dividends to shareholders). The Tax Commissioner allows the declaration of mixed income in respect of trusts operating in primary industry, but not otherwise. The ABS adjusts the net taxable income so declared back to Gross Mixed Income, adding back deductions declared by taxpayers, estimates for various non-taxable components and finally an estimate for understatement on tax returns. This is published by industry and postcode of taxpayer residence.

Control totals for Gross Local Product are available from the ABS State Accounts. NIEIR distributes the components as follows.

- Employee compensation by local employment by industry (Census JTW adjusted and updated) and earnings (Census JTW, also tax statistics imputed by industry from area of residence back to area of work by JTW).
- Gross taxable mixed income (including losses) generated by a similar process to employee compensation.
- Gross non-taxable mixed income by local employment in such industries, from Census JTW.

A2.2 Regional indicators

Population

Residential population by region for 2006 to 2010 is taken from the *ABS estimated resident population* (ERP) series. The 2011 population was derived from the household growth for 2010/2011 and constrained to 2011 state population growth. The 2011 household total was derived by increasing the 2010 household total by the number of dwelling approvals.

No. of households

The number of households per region uses the *ABS Census* for 2001 and 2006. From the 2006 benchmark, new residential building approvals data is used to grow the stock of houses in a region. This data is provided by the ABS and reported quarterly. If the new building approvals data is added to the stock in 2006, an overestimation will occur due to the demolition of old houses. National Economics uses estimated demolition rates so no double counting occurs.

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 2006 to 2011. 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 the Department of Social Security (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 National Economics' measure of employment is the adjusted labour force as defined above, minus the estimated National Economics unemployment level. This means that, since 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

This is derived from unemployment numbers from DEEWR and the excess disability figure discussed above. It combines the official definitions of unemployed with an adjustment for any excess shift to DSPs.

Social security take-up

This is a National Economics measure derived from Centrelink data. It includes all people aged 16 to 64 years receiving Newstart Allowance, DSPs, Parenting Payment – Single, and Youth Allowance for non-students/apprentices. It is expressed as a per cent of the population aged 16 to 64 years.

Headline unemployment

This is the unemployment rate produced by DEEWR. Their *Small Area Labour Markets* publication 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. Hence, 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 NIEIR workforce. It includes all those classified as long term unemployed, those receiving DSPs, 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.

Hours per week per working age population

This is a measure of the amount of work available relative to the number of people available to work. In effect it is a measure of underemployment in that a low ratio indicates that the adult population is under-utilised in an employment sense.

Not Employed share of working age population

This is a simple measure of those not in employment as per the NIEIR Employment definition as a proportion of the working age population.

Not in Employment share of working age population (Full Time Equivalent)

This is similar to the above measure but the employment definition is adjusted to Full Time Equivalent and hence also measures over time, shifts in the part time/full time balance.

Income flows and productivity

Source: ATO Taxation Statistics, National Accounts Data.

This panel uses National Accounts definitions. All state totals are reconciled to the household accounts in the Australian Bureau of Statistics' 'State Accounts'.

The household disposable income indicator for each region is household disposable income from wages and salaries (including supplements, eg 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 2008-09 prices.

To 2008-09 all data are derived from the postcode tax statistics. The data is estimated for 2009-10 and 2010-11 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 postcode to Local Government Area concordance derived from the latest available census.

Again, farm income is estimated using rainfall data as a proxy for the impact of 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 our estimate of the impact of drought, we obtain a reasonably accurate distribution of incomes.

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 2006 to 2009 figure is based on reported taxation statistics. The 2010 and 2011 figures have been adjusted by state control totals, and using estimates of income created earlier.

Benefits

This figure is an estimate of the total amount of government benefits as defined in the National Accounts, received at the local level. The Local Area distribution of the National Accounts data is achieved, utilising the postcode distribution of commonwealth benefits sourced from the Australian Taxation Office publication Taxation Statistics and a population component to capture those not required to submit tax returns.

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. National Economics 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 macroeconomic 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 that the rising level of household debt in the late 1990's National Economics developed a Household Debt Model which 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 rather 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 2006 to 2011 reflects the continued strong growth in household debt throughout the same period.

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 hence National Economics relies on state trends to derive the 2010 and 2011 estimates.

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:

(i) imputed owner occupier rental income

(II) depreciation.

Imputed owner occupier rental income is based on the value of owner occupied property in a region. 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, and aggregated to regions.

Business value added

Business value added is wages and salaries plus business income. Business value added excludes the gross surplus of companies, since this is difficult to allocate to any small geographic area. The measures in this table are on a residential basis, and hence represent value added by the businesses in which the residents work rather than value added by businesses located in the region. For isolated regions, business value added represents the region's capture of gross regional product. For regions in major metropolitan areas, this is not necessarily the case because of commuting.

Business productivity

Business productivity is Business Value Added divided by NIEIR employment, again on a residential basis.

Social Security

Source: Centrelink.

Original data are by postcode, converted to LGAs, added to regions and divided by population.

Cash Benefits Share of Disposable Income

This is simply Benefits as a per cent of Disposable Income, both components are part of the Income Flows Table data discussed above.

Population change

Source: ABS Census.

Based on ABS Census and National Economics' population and migration modelling program called PopInfo.

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 2009, 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.

Unfortunately patent data was not available for update in this publication.

Hi-Tech and IT applications per 100,000 people

The patent application data is grouped into 31 different classifications. The following classifications were identified as 'Hi-Tech':

- electrical devices and engineering
- information technology
- optics
- instrumentation
- medical engineering
- polymers
- pharmaceuticals
- biotechnology
- environmental processes
- nuclear engineering
- space technology, weapons.

Temperature

Source: Commonwealth Bureau of Meteorology, National, Climate Centre.

Numbers given are the average maximum daily temperature for meteorological stations in the region. NB: as with all other series in this report, averages are for financial years.

Rainfall

Source: Commonwealth Bureau of Meteorology, National, Climate Centre, Australian Monthly Rainfall.

Specially requested monthly rainfall data from each available Australian weather station is assigned into the appropriate region and then totalled and averaged to generate the average annual rainfall for each region. As for all other series in this report, rainfall is for financial years.

Population

Source: ABS Estimated regional population.

The ABS publication provides regional estimates to 2008 and state estimates to 2009. Figures for 2009 and 2010 are NIEIR estimates.

Innovative start-ups

Source: Dunn and Bradstreet

Innovative start-ups are defined as the number of companies in hi-tech industries which were noted by Dunn and Bradstreet as starting in each year, expressed per 100,000 employed persons in each region.

Household wealth and debt

All wealth and debt 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, namely 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, eg 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 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 Taxation 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 to allow for repayments divided by disposable income.

The household income measure used for the debt to income ratio is household disposable income plus depreciation plus interest paid.

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 National Economics construction models.

Employment generating capacity

Estimates of commercial floor area recently completed, under construction or approved are converted to an annual rate of completions and multiplied by average employment to commercial floor space ratios.

Mining boom

For detailed definitions for series in this panel see Chapter 2. All series are calculated by including a mining construction boom at approximately current annual level in the NIEIR modelling system and comparing the results with a run in which the boom is omitted. The construction impact is that of mining construction alone; all other impacts apply to the resulting changes in mine output. These include positive impacts (gross expansion) and negative impacts (gross crowding out). The positive and negative can be offset, with the negative impacts at full intensity (net full crowding out) or at half intensity (net half crowding out). The one-year impact measures the effect of one year's mining construction; the five-year impact is the accumulated effect of five years of continuous mining construction.

Consumption

Consumption is defined as in the ABS National Accounts, state accounts. NIEIR has allocated state consumption, as estimated by the ABS, to regions according to regional population characteristics and incomes, using microsimulation methodology based on the Household Expenditure Survey.

Housing

Source: Australian Property Monitor; various derived statistics on dwellings and income.

The average value of dwellings is the average value of dwellings sold in the region (both houses and flats) as reported by the Australian Property Monitor. It has been deflated by the National Accounts consumption deflator.

The ratio of average dwelling price to household disposable income is calculated using average household disposable income for the region.

The mortgage burden on average dwelling purchase is derived from the ratio of average dwelling price to household disposable income, by assuming that a household purchases a dwelling at the average regional price financed by a mortgage at an interest rate of 7.2 per cent with a deposit of 25 per cent of value. The mortgage thus calculated is reported as a percentage of average household disposable income for the region.

Greenfield construction-costs have been calculated from benchmark costings prepared for the five largest metropolitan areas by the National Housing Supply Council. The costings are valid for 2008, and have been forward and back-projected using a combination of the ABS price indices for new project homes and house prices. The average cost so calculated is divided by the RESI average value of all dwellings sold in the region. The comparison is valid for the 2000s, but owing to the uncertainties of back-projection the 1990s values should be treated with caution.

The mortgage burden on new construction is derived from greenfield construction-costs using the same methodology as for the ratio of mortgage payments to disposable income for the average house purchase. The caution concerning 1990s value applies here also.

Adult population per dwelling derives from the ABS Estimated regional populations, projected by NIEIR to 2011.

National Broadband Network

For detailed explanation of these indicators see Chapter 3. These indicators differ from the usual contents of the *State of the Regions* appendix in that they refer to the future as modelled by the methodology laid out in Chapter 3.

The base case refers to the existing telecommunications system including estimated coverage of high-speed ADSL, derived from the Telstra list of enabled exchanges. The NBN case refers to the rollout of fibre to the premise foreshadowed by the National Broadband Network Co, supplemented by fixed wireless and satellite connections.

Functionality relative to requirements is the average land-line connection speed, by LGA, in relation to NIEIR's estimate of the speed required to take full advantage of developments in computing. Actual productivity extraction is the functionality estimate multiplied by an estimated level of take-up in each future year. It is equivalent to the increase in industry productivity expected as a result of the adoption of advanced telecommunications.

The other indicators all refer to consequences of the switch from the existing system to high-speed broad band.

Hours and dollars per hour

The starting point for estimating hours and dollars per hour is the estimation of hours and dollars per hour at the one-digit ANZSIC 2006 level at the State/Territory level. This is done by deriving total hours worked per quarter by industry and State/Territory from the ABS Labour Force Bulletin. The wages and salaries plus mixed income series are tables from the ABS Annual State Accounts Bulletin, converted to $/hour by dividing by the estimates of total hours worked by industry. The annual series have then been converted to quarterly series by ensuring that the total industry quarterly estimates sum to state wages and salaries plus mixed income series from the ABS Quarterly State Accounts.

Hours of work by industry and dollars per hours at the LGA level for usual residents were estimated from a country-wide calculation, per quarter, where the LGA hours and $/hour column income constraints were derived as outlined above. The row constraints were the state industry totals as outlined above. There were also group LGA constraints imposed at the one-digit industry level derived from the quarterly regional estimates from the ABS Labour Force Bulletin.

The base matrix was derived for 2006.3 from the Census.

Industry estimates of employment hours of work and $/hour by employment location, were obtained by projecting workplace employment from the 2006.3 Census benchmark. Floorspace completion estimates by building type and by LGA were used to update the 2006.3 matrix of employment by location by industry. The employment location estimates were then estimated by 'back engineering' via the updated journey to work matrix based on usual residents, employment, hours and dollars per hour.

Finally, because of the erratic nature of the Labour Force data, five and seven quarter moving averages were passed through the data.

A2.3 Notes on NIEIR modelled National Accounts data set

The National Accounts regional econometric model, developed by NIEIR, is based on replicating the outputs of the National Accounts framework for local areas such as LGAs, using a range of data sources to model the accounts to show local trends.

National accounts provide a systematic statistical framework for summarising and analysing economic events, and wealth of an economy and its components. The principal economic events recorded in national accounts have been production, consumption, and accumulation of wealth. National accounts have also recorded the income generated by production, the distribution of income among the factors of production and the use of the income, either by consumption or acquisition of assets.

NIEIR has three regional models. The State (SIMP) and Regional IMP (RIMP) models are used for forecasting state and regional economic activity, and assessing state and regional impacts. The Regional Household Information System (RHIS) uses microsimulation techniques to distribute estimates of household expenditure and incomes to small regions.

These models provide estimates of state economic activity on both a quarterly and an annual

basis. Both models are based upon the detailed ABS state accounts with quarterly updates based on key aggregates. The annual model incorporates a detailed industry disaggregation and input-output structure. The dynamic input-output modelling used in this structure allows for detailed impact assessments to be made which incorporate local effects.

An **input-output model** depicts the inter-industry relations of an economy. It shows how the output of one industry is an input to each other industry. Using a matrix representation of an area's economy, a given input is typically enumerated in the column of an industry and its outputs are enumerated in its corresponding row. This format shows how dependent each industry is on all others in the economy both as customer of their outputs and as supplier of their inputs.

NIEIR state and regional models contain over 400,000 variables at the local level and provide estimates of:

- population growth
- dwelling commencements
- housing stock
- employment by industry
- output by industry
- investment by industry
- imports and exports by industry
- gross regional product
- estimated consumption expenditure.

Inputs to these models are continually being refined, and are available for different time periods, from five-yearly (census) to quarterly (labour force). These inputs include, but are not necessarily limited to:

- Population Census data (working population)
- ABS National Accounts (income, expenditure and product)
- ABS State Accounts
- ABS Labour Force Survey regional employment and hours estimates
- ATO Income tax estimates by postcode
- Centrelink payments by postcode
- Real Estate Institute (state) housing price and rent estimates
- ABS Household Expenditure Survey.

Appendix 3: Melbourne's North economy described

Melbourne Northern Inner

Melbourne North begins five kilometres north of the CBD, on the other side of Royal Park, and extends to the inner ring road. The western half of the region is relatively flat, and its development was originally based on brick-making manufacturing. For over a century this part of the region was working class but the decline of manufacturing has resulted in its joining the hillier eastern half of the region gentrification and commuting. LaTrobe University is the centre of a knowledge precinct and Heidelburg of a medical precinct. The region is noted for its ethnic diversity.

Major centres:

Coburg, Richmond, Greensborough

LABOUR FORCE

	Number ('000s)						Percentage Change					%p.a. growth	
	2006	2007	2008	2009	2010	2011	2006 to 2007	2007 to 2008	2008 to 2009	2009 to 2010	2010 to 2011	2006 -2009	2009 -2011
Population	469	476	482	491	496	500	1.5%	1.4%	1.7%	1.1%	0.8%	1.5%	0.9%
No. Households	171	172	173	174	175	178	0.3%	0.6%	0.7%	0.8%	1.3%	0.5%	1.0%
NIEIR Workforce	255	260	273	271	283	293	2.1%	4.8%	-0.8%	4.6%	3.3%	2.0%	4.0%
NIEIR Employment	236	244	258	256	266	276	3.6%	5.5%	-0.7%	4.1%	3.5%	2.7%	3.8%
NIEIR Unemployment	19.4	16.2	15.3	14.9	16.8	17.0	-16.6%	-5.4%	-2.7%	12.6%	1.1%	-8.4%	6.7%

UNEMPLOYMENT AND UNDER EMPLOYMENT

	Percentage						Percentage Point Change					Average % Point Change pa	
	2006	2007	2008	2009	2010	2011	2006 to 2007	2007 to 2008	2008 to 2009	2009 to 2010	2010 to 2011	2006 -2009	2009 -2011
NIEIR U/E Rate	7.6%	6.2%	5.6%	5.5%	5.9%	5.8%	-1.4	-0.6	-0.1	0.4	-0.1	-0.7	0.1
Headline U/E Rate	6.1%	5.1%	4.7%	4.4%	5.0%	4.9%	-1.0	-0.4	-0.3	0.6	-0.1	-0.6	0.3
NIEIR Structural U/E Rate	10.0%	9.5%	9.2%	8.7%	8.5%	8.2%	-0.5	-0.2	-0.5	-0.2	-0.3	-0.4	-0.3
Social Security Takeup	12.3%	11.4%	10.7%	11.1%	10.4%	10.6%	-0.9	-0.7	0.4	-0.7	0.2	-0.4	-0.3
Hours Per Week (1)	23.5	23.8	24.6	23.7	24.0	24.9	0.3	0.9	-0.9	0.3	0.9	0.1	0.6
Not Employed Share (1)	27.9%	26.5%	23.7%	25.7%	24.3%	22.6%	-1.4	-2.8	2.1	-1.5	-1.7	-0.7	-1.6
Not In Employment (1)	38.1%	37.4%	35.2%	37.6%	36.7%	34.5%	-0.7	-2.3	2.5	-0.9	-2.3	-0.2	-1.6

Note: (1) Relative to Working Age Population.

INCOME FLOWS & PRODUCTIVITY

	Level $m cvm						Per Capita $cvm						%p.a. Growth of Level	
	2006	2007	2008	2009	2010	2011	2006	2007	2008	2009	2010	2011	2006 -2009	2009 -2011
Wages/Salaries	11,271	12,116	12,935	12,798	12,967	13,431	24,049	25,467	26,822	26,087	26,156	26,807	4.3%	2.4%
Taxes Paid	3,067	2,984	3,390	3,318	3,119	3,584	6,545	6,272	7,028	6,763	6,290	7,153	2.6%	3.9%
Benefits	2,191	2,218	2,179	2,768	2,403	2,468	4,674	4,662	4,518	5,642	4,848	4,925	8.1%	-5.6%
Business Income	1,788	1,993	1,945	1,797	1,854	1,834	3,814	4,190	4,033	3,662	3,740	3,661	0.2%	1.0%
Interest Paid	1,280	1,610	1,918	1,690	1,827	2,184	2,732	3,384	3,977	3,445	3,685	4,360	9.7%	13.7%
Property Income	2,089	2,420	2,700	2,544	2,763	3,100	4,456	5,087	5,598	5,186	5,572	6,187	6.8%	10.4%
Disposable Income	15,801	17,135	17,731	18,374	18,599	18,809	33,715	36,017	36,767	37,452	37,516	37,541	5.2%	1.2%
Rank							18	17	18	22	20	26		
%Rank #1							65%	63%	63%	63%	60%	58%		
Resident GRP (Local)	18,836	20,429	21,921	21,790	22,039	21,749	57,568	61,462	64,939	63,276	62,671	61,113	5.0%	-0.1%
Rank							19	15	14	15	16	18		
Industry GRP (Local)	16,390	17,436	18,241	18,033	18,395	17,864	81,712	85,608	87,500	86,904	85,688	80,244	3.2%	-0.5%
Rank							15	12	13	13	15	22		

Note: (1) All years stated above are fiscal year 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 Resident GRP (Local) are per working age population and figures for Industry GRP (Local) are per industry employee.
(5) $m cvm = $ million chain volume measure, which is flows of constant 2008-09 value converted from current values by the ABS using their chain volume methodology.

Melbourne Northern Inner

SOCIAL SECURITY

	% Pop	Australian Average
Disability Support (aged 15-20)	0.07%	0.09%
Disability Support (aged 21-24)	0.12%	0.14%
Disability Support (aged 25+)	3.64%	3.31%
Parenting Payment - Single (aged 15-20)	0.02%	0.04%
Parenting Payment - Single (aged 21-24)	0.15%	0.20%
Parenting Payment - Single (aged 25+)	0.96%	1.23%
Unemployed Long Term	1.55%	1.45%
Unemployed Short Term	0.95%	0.92%
Youth Allowance - Non Student	0.23%	0.39%
Youth Allowance - Student	1.78%	1.29%

Cash Benefits Share of Disposable Income	Share	Rank
2010	13.1%	44
2009	12.9%	44
2008	15.1%	42
2007	12.3%	43
2006	12.9%	42
2005	13.9%	38

POPULATION CHANGE

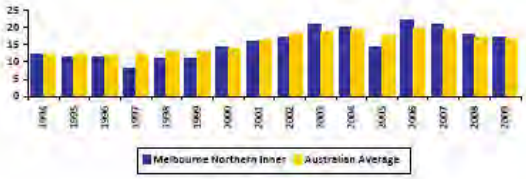
	1996	2001	2006	2011
Share of Population				
Age 0-19	22.5%	21.8%	21.0%	19.7%
Age 20-29	19.3%	17.8%	17.7%	19.5%
Age 30-54	34.9%	36.8%	37.5%	37.9%
Age 55+	23.3%	23.7%	23.7%	22.9%
Population Change (average between years)				
Age 0-19		-589	1	19
Age 20-29		-1,261	553	2,854
Age 30-54		1,953	1,930	2,713
Age 55+		443	873	612
Average Annual Growth		0.1%	0.7%	1.3%

PATENT APPLICATIONS

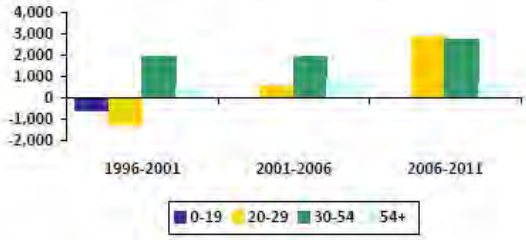
	No	Aust Avg	Rank
Average p.a. (1994-2009)	70.72	3,109.81	13
Average p.a. per capita	15.34	15.69	15
Hi Tech p.a. (1994-2009)	22.42	864.69	12
Hi Tech p.a. per capita	4.86	4.33	13
Info. Tech p.a. (1994-2009)	7.15	342.17	15
Info. Tech p.a. per capita	1.55	1.70	14
Average per capita (1994-2001)	11.85	13.06	18
Average per capita (2001-2009)	18.50	18.09	14
2001-09 avg /1994-00 avg	1.56	1.39	10

Note: Per capita = 100,000 people 2010 data not available

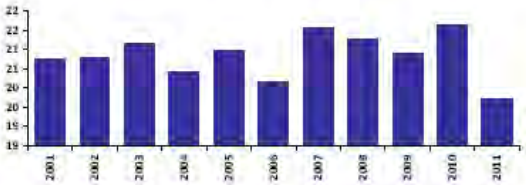
Patent Applications per 100,000 residents



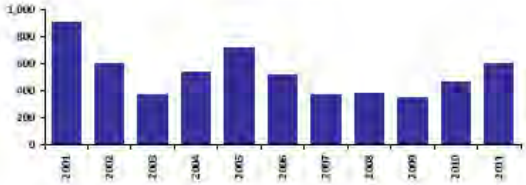
Population Change by Age Group



Average Temperature



Annual Rainfall



TEMPERATURE AND RAINFALL

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Temperature (Avg (C))	21	21	21	20	21	20	22	21	21	22	20
Rank	53	49	49	51	48	56	50	50	49	48	45
Rainfall (mm)	906	599	371	539	720	520	368	378	346	469	598
Rank	24	40	51	42	32	46	54	56	62	55	56

POPULATION

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Population	450	447	445	446	449	451	450	451	450	452	454	456	458	462	469	476	482	491	496	500

INNOVATIVE STARTUPS

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Startups	62.5	85.1	93.3	84.5	114.4	121.4	116.5	101.2	75.5	39.6	48.8	55.4	53.4	43.5	30.1	32.0	22.9	16.9	6.5
Rank	16	13	21	17	13	13	6	8	9	16	9	7	7	9	22	11	13	13	25

Note: (1) Data source Dun and Bradstreet database. The Dun and Bradstreet database does not represent all business entities.
(2) Counts are per 100,000 employed.

Melbourne Northern Inner

HOUSEHOLD WEALTH & DEBT

	Year			Rank			%Rank 1		
Indicator	2001	2006	2011	2001	2006	2011	2001	2006	2011
Wealth per Household ($cvm '000s)	579	679	939	13	15	10	31%	33%	40%
Value of Property and Unincorporated Business	489	596	886	10	14	7	46%	48%	64%
Value of Financial Assets	172	222	255	37	34	30	19%	22%	22%
Value of Household Liabilities	82	139	202	45	33	29	54%	55%	46%
Disposable Income after Debt Service Costs	73	86	96	42	35	43	60%	57%	47%
Household Debt Service Ratio	12%	17%	22%	49	36	17	62%	68%	82%
Household Debt to Gross Income Ratio	0.96	1.37	1.70	49	36	17	62%	68%	82%

RESIDENTIAL AND NON-RESIDENTIAL BUILDING CONSTRUCTION

	2002 -2004	2005	2006	2007	2008	2009	2010	2011	Percentage Increase 2006-08 to 2009-11
Value $m cvm per annum									
Residential	1,529	655	600	546	572	727	807	1,068	51%
Non Residential	1,399	312	334	390	439	502	560	536	37%
Total	2,928	967	934	936	1,011	1,229	1,367	1,604	46%
Value per capita $cvm									
Residential	1,117	1,418	1,281	1,147	1,186	1,482	1,628	2,132	45%
Non Residential	1,023	674	712	820	911	1,023	1,129	1,069	32%
Total	2,140	2,092	1,993	1,967	2,097	2,505	2,757	3,201	40%
Rank (value per capita)									
Residential	48	47	48	53	51	34	30	16	
Non Residential	18	50	54	47	47	33	33	41	
Total	38	50	53	54	54	33	31	27	

Note: (1) Percentage increase represents the increase (or decrease) of the last three years average when compared to the average of the three years prior to those.

EMPLOYMENT GENERATING CAPACITY

Indicator	Value	Rank
Commercial Floorspace Generating Capacity	5,238	19
% of National Employment Generating Capacity	1.51%	19
Ratio of Generating Capacity to Working Age Pop	0.82	51

MINING BOOM

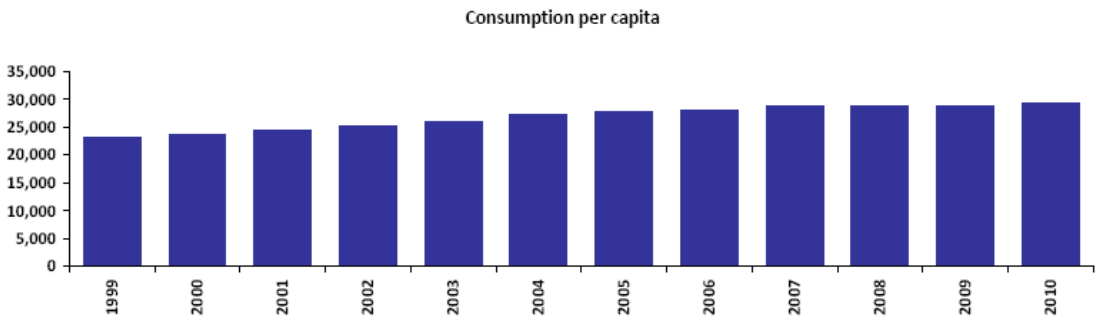
		Production Impact					
Indicator	Construction (Annual Average)	Gross expansion (1 Year)	Gross crowding out (1 Year)	Net full crowding out (1 Year)	Net half crowding out (1 Year)	Net full crowding out (5 Years)	Net half crowding out (5 Years)
Industry Hours	0.62	0.20	-0.94	-0.74	-0.27	-3.63	-1.33
Local Industry Product	0.69	0.23	-0.95	-0.72	-0.25	-3.56	-1.24
Resident Employment	0.59	0.22	-0.77	-0.55	-0.16	-2.70	-0.81

Note: Indicator values represent percent change from base case (where the base case excludes accelerated mining expansion).

CONSUMPTION

Indicator	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Growth
Consumption ($m cvm)	10,442	10,686	11,070	11,369	11,750	12,444	12,713	13,021	13,511	13,754	13,931	14,188	2.8%
Consumption Per Cap ($cvm)	23,187	23,716	24,593	25,159	25,891	27,302	27,756	28,158	28,829	28,911	28,887	29,420	2.2%
Consumption Per Cap Rank	15	17	16	16	15	17	18	17	17	18	17	18	33

Note: All years stated above are calendar years.



Melbourne Northern Inner

HOUSING

Housing Indicator	1991.3	1997.3	2001.3	2006.3	2008.2	2010.2	2011.2	1997.3 Rank	2011.1 Rank	Annual Growth 1997-11
Avg value of dwellings ($cvm '000s)	174.5	197.3	316.8	426.7	506.0	560.7	548.7	19	11	7.7%
Avg dwelling prices to household disposable income (%)	n/a	2.9	4.3	5.1	5.9	6.2	6.2	17	5	5.6%
Mortgage burden on average dwelling purchase (%)	n/a	23.4	34.7	40.5	46.7	49.7	49.5	17	5	5.6%
Greenfield construction costs to avg dwelling price (%)	n/a	n/a	n/a	1.1	1.0	0.9	0.9	n/a	49	n/a
Catchment dwelling purchase income support ($cvm)	56,594	64,015	70,389	86,368	89,835	86,721	87,360	11	16	2.3%
Dwelling affordability - average mortgage on existing dwelling to catchment income support (%)	n/a	24.6	35.9	39.4	45.0	51.6	50.1	22	12	5.3%
Dwelling affordability - average mortgage on new dwelling to catchment income support (%)	n/a	n/a	n/a	45.1	43.9	47.0	47.2	n/a	11	n/a
Community services available in catchment - hours/capita	140.7	158.8	165.6	175.7	181.9	189.2	189.1	8	2	1.3%
Adult population per dwelling	2.3	2.2	2.2	2.2	2.3	2.3	2.3	23	34	0.3%

NATIONAL BROADBAND NETWORK

Indicator	2015	2020	2025	2030	2035	2040	2015 Aust	2020 Aust	2025 Aust	2030 Aust	2035 Aust	2040 Aust
Functionality Relative to Requirements - Base Case	73.7	33.0	19.5	15.2	15.2	15.2	53.0	36.3	29.5	24.9	24.1	24.1
Functionality Relative to Requirements - NBN Case	100.0	98.0	98.0	97.0	97.0	97.0	73.9	92.8	92.6	91.1	91.0	91.0
Actual Productivity Extraction - percent (Base Case)	2.4	2.9	3.0	3.0	2.9	2.9	2.0	2.6	3.2	3.6	4.0	4.2
Actual Productivity Extraction - percent (NBN Case)	2.5	4.1	6.5	9.2	11.6	13.3	2.1	3.5	5.8	8.3	10.4	12.0
Industry Hours of Work (% of Base Case)	0.0	-0.1	-0.5	-0.9	-1.1	-1.2	0.0	-0.1	-0.2	-0.3	-0.4	-0.4
Real Wages (% of Base Case)	0.0	0.8	2.7	5.1	7.3	8.9	0.0	0.7	2.2	4.2	6.0	7.4
Resident Income (% of Base Case)	0.0	0.7	2.0	3.8	5.5	6.8	0.0	0.6	2.1	3.9	5.6	6.9
Local Industry Product (% of Base Case)	0.0	0.7	2.2	4.1	6.1	7.5	0.0	0.6	2.0	3.8	5.6	7.0
Resident Employment (% of Base Case)	0.0	-0.2	-0.5	-0.9	-1.2	-1.4	0.0	-0.1	-0.3	-0.5	-0.6	-0.6
Consumption Expenditure (% of Base Case)	0.0	0.8	2.5	4.6	6.5	7.9	0.0	0.6	2.1	3.8	5.4	6.6

EMPLOYED, HOURS WORKED AND INCOME (UR=Place of Residence, JTW=Place of Work)

Indicator	1991.3	1996.3	2001.3	2006.3	2011.1	1991.3 Rank	1996.3 Rank	2001.3 Rank	2006.3 Rank	2011.1 Rank
UR Emp	208,403	208,714	216,947	242,136	278,437	12	13	17	15	14
UR Hours	92,027	92,920	93,237	103,251	115,561	12	13	16	15	14
UR Income	2,260	2,532	2,890	3,833	4,344	15	15	15	17	16
JTW Emp	170,038	180,268	188,343	205,805	223,885	11	12	12	14	15
JTW Hours	74,917	79,341	79,974	86,903	92,099	12	12	12	14	14
JTW Income	1,933	2,200	2,485	3,159	3,378	13	12	12	11	13
UR Avg Weekly Hours Per Employee	34.0	34.2	33.1	32.8	31.9	40	34	35	42	48
UR Avg Hourly Rate Per Employee ($cvm)	24.6	27.3	31.0	37.1	37.6	61	48	42	17	25
JTW Avg Weekly Hours Per Employee	33.9	33.9	32.7	32.5	31.6	40	44	43	47	51
JTW Avg Hourly Rate Per Employee ($cvm)	25.8	27.7	31.1	36.4	36.7	51	43	40	18	30

INDUSTRY GROUPS

		Place of Residence (UR)					Place of Work (JTW)				
		1991.3	1996.3	2001.3	2006.3	2011.1	1991.3	1996.3	2001.3	2006.3	2011.1
A	Agriculture, Forestry and Fishing	571	637	769	676	759	244	274	289	239	261
B	Mining	213	370	423	447	626	131	187	177	217	302
C	Manufacturing	37,458	32,146	26,106	23,090	24,056	31,629	30,580	27,000	25,391	25,362
D	Electricity, Gas, Water & Waste Services	1,977	1,268	1,364	1,860	1,729	832	603	618	884	1,069
E	Construction	11,242	11,289	12,761	16,488	20,533	9,485	10,076	11,704	15,446	19,365
F	Wholesale Trade	9,659	10,116	8,837	9,752	8,932	10,764	11,879	10,752	12,082	9,704
G	Retail Trade	22,874	20,517	22,883	22,270	22,248	23,111	22,041	25,139	24,583	23,703
H	Accommodation and Food Services	9,866	12,948	14,505	15,512	20,308	7,232	9,850	11,195	11,798	14,459
I	Transport, Postal and Warehousing	14,581	10,203	9,059	10,204	12,139	7,403	5,758	5,144	5,875	6,426
J	Information Media and Telecoms	6,209	6,553	8,058	9,484	10,571	3,964	4,287	4,948	5,455	5,501
K	Financial and Insurance Services	9,896	9,268	9,975	12,735	13,113	6,302	5,898	5,906	7,230	7,351
L	Rental, Hiring and Real Estate Services	3,121	2,020	2,807	3,279	3,226	2,515	1,841	2,554	3,073	2,796
M	Prof, Scientific & Technical Services	11,759	16,422	19,561	24,971	27,698	8,362	11,356	12,809	15,566	17,941
N	Administrative and Support Services	5,099	6,963	8,705	8,719	9,329	3,472	4,885	6,076	6,098	6,958
O	Public Administration and Safety	13,651	12,338	12,738	15,310	16,264	8,258	7,747	7,608	8,746	8,849
P	Education and Training	16,155	17,988	19,783	23,226	25,305	11,645	13,258	14,549	16,444	18,136
Q	Health Care and Social Assistance	21,262	23,936	25,165	28,387	38,766	23,297	27,560	29,906	33,427	39,562
R	Arts and Recreation Services	2,475	4,031	4,690	6,326	9,084	1,565	2,463	2,703	3,461	3,719
S	Other Services	10,335	9,700	8,757	9,400	13,750	9,826	9,725	9,266	9,791	12,422
	Total	208,403	208,714	216,947	242,136	278,437	170,038	180,268	188,343	205,805	223,885
	Hi Tech	24,044	26,345	27,125	32,152	35,124	18,787	21,147	21,126	24,069	26,233
	Hi Income	24,121	30,058	35,032	43,545	47,032	16,478	20,221	22,290	26,534	29,505
	Infrastructure Services	39,892	45,955	49,639	57,939	73,155	36,508	43,281	47,157	53,332	61,417

Melbourne Northern Outer

The western part of Melbourne Outer North comprises gentle basalt slopes, the sites of manufacturing industries and increasingly of wholesale and logistics enterprises attached to the southern end of the Hume Highway and Melbourne Airport – which lies on the boundary of Western Melbourne. The population of this half of the region was traditionally working class and ethnically diverse, and so quite distinct from the people of the hilly commuter residential area which comprises the east of the region. Latrobe University lies at the junction of the two.

Major centres:

Whittlesea, Broadmeadows

LABOUR FORCE

	Number ('000s)						Percentage Change					%p.a. growth	
	2006	2007	2008	2009	2010	2011	2006 to 2007	2007 to 2008	2008 to 2009	2009 to 2010	2010 to 2011	2006 -2009	2009 -2011
Population	346	355	366	378	391	404	2.5%	3.0%	3.3%	3.6%	3.2%	2.9%	3.4%
No. Households	103	105	108	110	114	118	1.9%	2.2%	2.4%	3.1%	3.7%	2.2%	3.4%
NIEIR Workforce	185	190	196	201	211	220	2.9%	3.2%	2.6%	4.6%	4.3%	2.9%	4.5%
NIEIR Employment	168	175	181	186	193	201	4.1%	3.4%	2.6%	3.7%	4.1%	3.4%	3.9%
NIEIR Unemployment	16.4	15.0	15.2	15.6	18.0	19.2	-8.7%	1.8%	2.5%	15.4%	6.2%	-1.6%	10.7%

UNEMPLOYMENT AND UNDER EMPLOYMENT

	Percentage						Percentage Point Change					Average % Point Change pa	
	2006	2007	2008	2009	2010	2011	2006 to 2007	2007 to 2008	2008 to 2009	2009 to 2010	2010 to 2011	2006 -2009	2009 -2011
NIEIR U/E Rate	8.9%	7.9%	7.8%	7.8%	8.6%	8.7%	-1.0	-0.1	0.0	0.8	0.2	-0.4	0.5
Headline U/E Rate	6.1%	5.1%	4.9%	4.9%	6.0%	6.2%	-1.0	-0.2	0.0	1.1	0.2	-0.4	0.7
NIEIR Structural U/E Rate	9.7%	9.4%	9.3%	9.0%	8.8%	8.8%	-0.3	0.0	-0.4	-0.1	-0.1	-0.2	-0.1
Social Security Takeup	12.3%	11.7%	11.3%	11.9%	11.2%	11.7%	-0.6	-0.4	0.6	-0.7	0.5	-0.1	-0.1
Hours Per Week (1)	23.1	23.2	23.2	22.8	22.9	23.1	0.1	0.0	-0.4	0.1	0.3	-0.1	0.2
Not Employed Share (1)	29.5%	28.5%	28.4%	29.0%	28.3%	27.5%	-1.0	-0.1	0.6	-0.7	-0.7	-0.2	-0.7
Not In Employment (1)	39.3%	38.9%	38.9%	40.1%	39.8%	39.1%	-0.4	0.1	1.1	-0.3	-0.7	0.3	-0.5

Note: (1) Relative to Working Age Population.

INCOME FLOWS & PRODUCTIVITY

	Level $m cvm						Per Capita $cvm						%p.a. Growth of Level	
	2006	2007	2008	2009	2010	2011	2006	2007	2008	2009	2010	2011	2006 -2009	2009 -2011
Wages/Salaries	7,629	8,189	8,583	8,718	8,840	9,124	22,031	23,075	23,477	23,080	22,593	22,538	4.5%	2.3%
Taxes Paid	1,896	1,850	2,023	1,988	1,887	2,150	5,474	5,214	5,533	5,262	4,823	5,310	1.6%	4.0%
Benefits	1,376	1,432	1,389	1,847	1,639	1,721	3,974	4,037	3,798	4,889	4,190	4,251	10.3%	-3.5%
Business Income	965	1,086	1,021	946	980	971	2,787	3,059	2,794	2,506	2,504	2,398	-0.6%	1.3%
Interest Paid	946	1,053	1,258	1,202	1,190	1,515	2,733	2,968	3,441	3,182	3,040	3,743	8.3%	12.3%
Property Income	1,184	1,362	1,496	1,435	1,563	1,728	3,420	3,838	4,093	3,798	3,995	4,268	6.6%	9.7%
Disposable Income	10,138	11,142	11,334	12,029	12,239	12,324	29,278	31,397	31,001	31,844	31,278	30,443	5.9%	1.2%
Rank							48	43	51	56	56	57		
%Rank #1							56%	55%	53%	53%	50%	47%		
Resident GRP (Local)	11,724	12,587	13,103	13,260	13,583	13,458	49,085	51,379	51,813	50,686	50,535	48,591	4.2%	0.7%
Rank							48	40	42	45	48	55		
Industry GRP (Local)	10,082	10,877	11,366	11,438	11,890	11,756	72,737	74,419	74,443	73,311	72,879	69,499	4.3%	1.4%
Rank							45	41	48	50	53	60		

Note: (1) All years stated above are fiscal year 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 Resident GRP (Local) are per working age population and figures for Industry GRP (Local) are per industry employee.
(5) $m cvm = $ million chain volume measure, which is flows of constant 2008-09 value converted from current values by the ABS using their chain volume methodology.

Melbourne Northern Outer

SOCIAL SECURITY

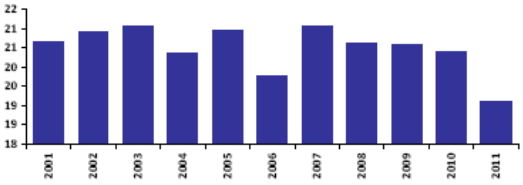
	% Pop	Australian Average
Disability Support (aged 15-20)	0.09%	0.09%
Disability Support (aged 21-24)	0.14%	0.14%
Disability Support (aged 25+)	3.64%	3.31%
Parenting Payment - Single (aged 15-20)	0.01%	0.04%
Parenting Payment - Single (aged 21-24)	0.03%	0.20%
Parenting Payment - Single (aged 25+)	0.35%	1.23%
Unemployed Long Term	1.48%	1.45%
Unemployed Short Term	0.94%	0.92%
Youth Allowance - Non Student	0.37%	0.39%
Youth Allowance - Student	1.84%	1.29%

Cash Benefits Share of Disposable Income	Share	Rank
2010	14.0%	39
2009	13.4%	41
2008	15.4%	41
2007	12.3%	45
2006	12.9%	44
2005	13.6%	43

POPULATION CHANGE

	1996	2001	2006	2011
Share of Population				
Age 0-19	33.4%	32.1%	30.7%	29.4%
Age 20-29	16.3%	14.4%	14.1%	15.1%
Age 30-54	37.7%	38.3%	37.2%	35.8%
Age 55+	12.6%	15.2%	18.0%	19.7%
Population Change (average between years)				
Age 0-19		1,215	1,047	2,531
Age 20-29		-183	662	2,449
Age 30-54		2,685	1,670	3,096
Age 55+		2,421	2,893	3,407
Average Annual Growth		2.1%	1.9%	3.1%

Average Temperature

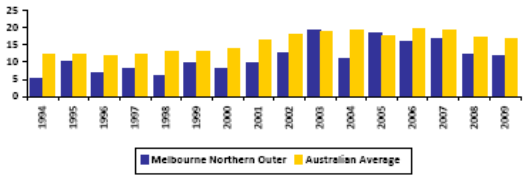


PATENT APPLICATIONS

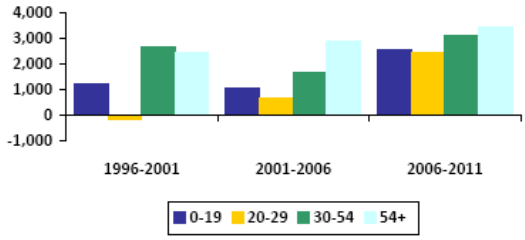
	No	Aust Avg	Rank
Average p.a. (1994-2009)	37.08	3,109.81	26
Average p.a. per capita	11.34	15.69	23
Hi Tech p.a. (1994-2009)	7.92	864.69	26
Hi Tech p.a. per capita	2.38	4.33	22
Info. Tech p.a. (1994-2009)	1.79	342.17	31
Info. Tech p.a. per capita	0.54	1.70	35
Average per capita (1994-2001)	7.98	13.06	35
Average per capita (2001-2009)	14.17	18.09	20
2001-09 avg./1994-00 avg.	1.78	1.39	2

Note: Per capita = 100,000 people 2010 data not available

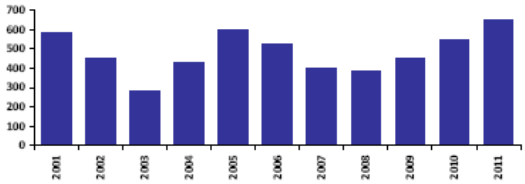
Patent Applications per 100,000 residents



Population Change by Age Group



Annual Rainfall



TEMPERATURE AND RAINFALL

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Temperature (Avg (C))	21	21	21	20	21	20	21	21	21	20	19
Rank	54	48	50	52	49	58	57	56	53	57	52
Rainfall (mm)	586	453	282	431	601	527	401	382	448	549	650
Rank	53	54	61	56	44	44	50	55	50	51	54

POPULATION

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Population	263	270	274	279	284	288	294	301	307	315	321	327	333	340	346	355	366	378	391	404

INNOVATIVE STARTUPS

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Startups	46.9	70.2	86.0	76.5	89.8	79.9	83.5	80.1	57.0	30.8	38.0	45.0	49.3	40.2	30.8	34.8	23.1	16.9	13.6
Rank	30	24	25	23	23	32	16	19	17	24	17	16	9	14	20	4	12	14	3

Note: (1) Data source Dun and Bradstreet database. The Dun and Bradstreet database does not represent all business entities.
(2) Counts are per 100,000 employed.

Melbourne Northern Outer

HOUSEHOLD WEALTH & DEBT

	Year			Rank			%Rank 1		
Indicator	2001	2006	2011	2001	2006	2011	2001	2006	2011
Wealth per Household ($cvm '000s)	394	449	619	34	48	29	21%	22%	27%
Value of Property and Unincorporated Business	369	436	646	21	36	20	35%	35%	46%
Value of Financial Assets	155	183	185	52	58	58	17%	18%	16%
Value of Household Liabilities	130	170	212	4	13	23	86%	68%	48%
Disposable Income after Debt Service Costs	83	92	96	21	21	44	68%	61%	46%
Household Debt Service Ratio	16%	19%	23%	5	16	10	86%	77%	87%
Household Debt to Gross Income Ratio	1.34	1.56	1.79	5	16	10	86%	77%	87%

RESIDENTIAL AND NON-RESIDENTIAL BUILDING CONSTRUCTION

	2002 -2004	2005	2006	2007	2008	2009	2010	2011	Percentage Increase 2006-08 to 2009-11
Value $m cvm per annum									
Residential	1,758	595	555	608	675	815	1,067	1,175	66%
Non Residential	1,044	373	402	552	755	688	612	633	13%
Total	2,802	968	957	1,160	1,430	1,503	1,679	1,809	41%
Value per capita $cvm									
Residential	1,791	1,752	1,603	1,713	1,847	2,159	2,726	2,904	51%
Non Residential	1,064	1,098	1,160	1,555	2,066	1,820	1,564	1,565	4%
Total	2,854	2,850	2,763	3,269	3,912	3,979	4,290	4,468	28%
Rank (value per capita)									
Residential	22	31	35	29	25	15	8	6	
Non Residential	14	16	22	14	9	10	17	17	
Total	19	26	29	24	14	12	13	10	

Note: (1) Percentage increase represents the increase (or decrease) of the last three years average when compared to the average of the three years prior to those.

EMPLOYMENT GENERATING CAPACITY

Indicator	Value	Rank
Commercial Floorspace Generating Capacity	8,699	10
% of National Employment Generating Capacity	2.51%	10
Ratio of Generating Capacity to Working Age Pop	1.12	39

MINING BOOM

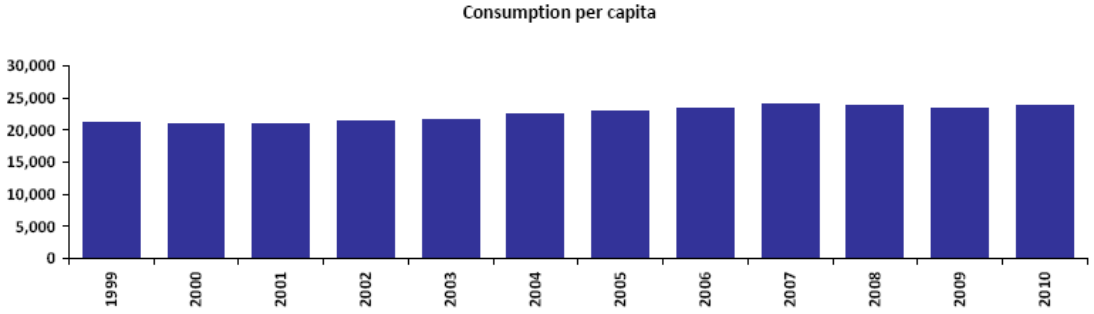
		Production Impact					
Indicator	Construction (Annual Average)	Gross expansion (1 Year)	Gross crowding out (1 Year)	Net full crowding out (1 Year)	Net half crowding out (1 Year)	Net full crowding out (5 Years)	Net half crowding out (5 Years)
Industry Hours	0.86	0.24	-1.22	-0.98	-0.37	-4.79	-1.82
Local Industry Product	0.93	0.26	-1.26	-1.00	-0.37	-4.89	-1.83
Resident Employment	0.73	0.23	-1.04	-0.81	-0.29	-3.99	-1.45

Note: Indicator values represent percent change from base case (where the base case excludes accelerated mining expansion).

CONSUMPTION

Indicator	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Growth
Consumption ($m cvm)	6,258	6,287	6,462	6,740	6,942	7,404	7,642	7,910	8,310	8,461	8,581	8,740	3.1%
Consumption Per Cap ($cvm)	21,258	20,903	21,030	21,403	21,627	22,613	22,952	23,285	23,997	23,842	23,472	23,906	1.1%
Consumption Per Cap Rank	29	36	43	44	45	43	45	45	47	51	54	53	61

Note: All years stated above are calendar years.



Melbourne Northern Outer

HOUSING

Housing Indicator	1991.3	1997.3	2001.3	2006.3	2008.2	2010.2	2011.2	1997.3 Rank	2011.1 Rank	Annual Growth 1997-11
Avg value of dwellings ($cvm '000s)	174.5	163.9	239.3	319.1	340.4	406.0	406.2	29	25	6.8%
Avg dwelling prices to household disposable income (%)	n/a	2.0	2.9	3.5	3.7	4.3	4.5	39	24	5.9%
Mortgage burden on average dwelling purchase (%)	n/a	16.3	23.1	27.6	29.8	34.5	36.0	39	24	5.9%
Greenfield construction costs to avg dwelling price (%)	n/a	n/a	n/a	1.2	1.2	1.0	1.0	n/a	41	n/a
Catchment dwelling purchase income support ($cvm)	53,485	60,034	65,030	77,626	80,669	77,937	78,503	30	33	2.0%
Dwelling affordability - average mortgage on existing dwelling to catchment income support (%)	n/a	21.8	29.4	32.8	33.7	41.6	41.3	34	23	4.8%
Dwelling affordability - average mortgage on new dwelling to catchment income support (%)	n/a	n/a	n/a	40.3	39.3	42.1	42.2	n/a	25	n/a
Community services available in catchment - hours/capita	131.4	147.0	151.5	159.2	164.7	169.3	169.3	22	16	1.0%
Adult population per dwelling	2.5	2.4	2.4	2.4	2.5	2.5	2.5	7	9	0.4%

NATIONAL BROADBAND NETWORK

Indicator	2015	2020	2025	2030	2035	2040	2015 Aust	2020 Aust	2025 Aust	2030 Aust	2035 Aust	2040 Aust
Functionality Relative to Requirements - Base Case	44.9	19.2	13.4	11.4	11.4	11.4	53.0	36.3	29.5	24.9	24.1	24.1
Functionality Relative to Requirements - NBN Case	44.9	98.0	98.0	97.0	97.0	97.0	73.9	92.8	92.6	91.1	91.0	91.0
Actual Productivity Extraction - percent (Base Case)	1.7	1.8	1.7	1.7	1.6	1.6	2.0	2.6	3.2	3.6	4.0	4.2
Actual Productivity Extraction - percent (NBN Case)	1.7	2.5	4.5	6.6	8.4	9.7	2.1	3.5	5.8	8.3	10.4	12.0
Industry Hours of Work (% of Base Case)	0.0	-0.1	-0.1	0.1	0.3	0.6	0.0	-0.1	-0.2	-0.3	-0.4	-0.4
Real Wages (% of Base Case)	0.0	0.6	2.5	4.7	6.8	8.3	0.0	0.7	2.2	4.2	6.0	7.4
Resident Income (% of Base Case)	0.0	0.6	2.2	4.3	6.3	7.8	0.0	0.6	2.1	3.9	5.6	6.9
Local Industry Product (% of Base Case)	0.0	0.5	2.4	4.8	7.1	8.9	0.0	0.6	2.0	3.8	5.6	7.0
Resident Employment (% of Base Case)	0.0	-0.1	-0.3	-0.4	-0.4	-0.3	0.0	-0.1	-0.3	-0.5	-0.6	-0.6
Consumption Expenditure (% of Base Case)	0.0	0.6	2.2	4.2	6.0	7.3	0.0	0.6	2.1	3.8	5.4	6.6

EMPLOYED, HOURS WORKED AND INCOME (UR=Place of Residence, JTW=Place of Work)

Indicator	1991.3	1996.3	2001.3	2006.3	2011.1	1991.3 Rank	1996.3 Rank	2001.3 Rank	2006.3 Rank	2011.1 Rank
UR Emp	113,026	133,604	151,731	173,637	200,231	25	25	23	23	23
UR Hours	49,996	59,857	65,494	74,339	83,581	25	25	24	23	22
UR Income	1,482	1,673	1,911	2,492	2,790	24	24	27	26	27
JTW Emp	109,833	119,299	126,880	142,181	168,865	21	23	23	23	20
JTW Hours	48,728	54,331	55,834	62,058	71,827	21	23	23	21	20
JTW Income	1,329	1,461	1,599	2,038	2,358	21	23	24	22	24
UR Avg Weekly Hours Per Employee	34.0	34.5	33.2	32.9	32.1	39	27	32	35	43
UR Avg Hourly Rate Per Employee ($cvm)	29.7	27.9	29.2	33.5	33.4	17	43	53	39	61
JTW Avg Weekly Hours Per Employee	34.1	35.0	33.9	33.6	32.7	36	11	20	13	32
JTW Avg Hourly Rate Per Employee ($cvm)	27.3	26.9	28.6	32.8	32.8	30	51	53	41	62

INDUSTRY GROUPS

		Place of Residence (UR)					Place of Work (JTW)				
		1991.3	1996.3	2001.3	2006.3	2011.1	1991.3	1996.3	2001.3	2006.3	2011.1
A	Agriculture, Forestry and Fishing	1,106	1,532	1,382	1,117	1,043	1,206	1,615	1,514	1,262	1,199
B	Mining	146	209	155	294	393	113	148	140	201	275
C	Manufacturing	24,937	29,263	28,802	28,910	31,379	33,253	34,846	33,296	32,934	34,864
D	Electricity, Gas, Water & Waste Services	1,349	1,097	1,131	1,578	1,213	1,458	1,118	1,091	1,529	1,588
E	Construction	7,328	9,164	12,171	17,995	23,059	7,476	8,744	11,032	15,640	20,212
F	Wholesale Trade	5,875	7,223	7,123	8,204	7,378	5,997	7,020	6,654	7,537	10,679
G	Retail Trade	13,841	15,206	19,173	19,381	20,583	10,513	10,936	13,281	13,339	15,679
H	Accommodation and Food Services	3,502	6,252	8,663	9,565	14,118	3,130	5,171	6,652	7,248	10,115
I	Transport, Postal and Warehousing	9,559	10,364	10,332	13,096	15,870	17,390	15,888	15,487	19,132	24,038
J	Information Media and Telecoms	2,834	2,821	3,353	3,491	3,836	1,029	1,045	1,188	1,261	1,293
K	Financial and Insurance Services	5,621	5,409	5,581	6,572	6,214	1,294	1,251	1,180	1,377	1,428
L	Rental, Hiring and Real Estate Services	1,545	1,218	1,871	2,314	2,507	1,334	1,017	1,447	1,795	1,861
M	Prof, Scientific & Technical Services	4,699	6,660	7,545	9,003	10,965	2,086	2,943	3,067	3,586	4,229
N	Administrative and Support Services	2,406	3,789	5,299	5,854	6,419	1,691	2,566	3,347	3,577	4,064
O	Public Administration and Safety	6,235	6,311	7,078	8,880	8,879	4,435	4,373	4,552	5,506	5,621
P	Education and Training	6,202	7,481	9,059	10,765	11,174	6,617	7,746	8,826	10,269	10,882
Q	Health Care and Social Assistance	8,814	11,415	13,676	16,225	19,851	5,916	7,333	8,263	9,518	11,549
R	Arts and Recreation Services	1,167	1,766	2,114	2,571	3,142	778	1,149	1,266	1,532	1,618
S	Other Services	5,860	6,423	7,222	7,822	12,209	4,115	4,389	4,596	4,938	7,671
	Total	113,026	133,604	151,731	173,637	200,231	109,833	119,299	126,880	142,181	168,865
	Hi Tech	13,496	16,833	17,230	19,642	22,102	13,398	14,651	13,802	15,170	16,088
	Hi Income	11,493	14,131	15,706	18,555	20,435	4,231	5,653	6,001	6,941	7,911
	Infrastructure Services	16,182	20,662	24,849	29,561	34,166	13,311	16,228	18,356	21,319	24,048

Regional Development

Regional Development Australia
and Regional Development Victoria
NORTHERN MELBOURNE

An Australian Government Initiative