

# **Western Bay of Plenty smart growth study**

## **Phase 2: Economic drivers and determinants**

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### **Report to SmartGrowth Bay of Plenty**

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December 2002

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## Preface

The New Zealand Institute of Economic Research (NZIER), based in Wellington, was founded in 1958 as a non-profit making trust to provide economic research and consultancy services. Best known for its long-established *Quarterly Survey of Business Opinion* and forecasting publications, *Quarterly Predictions* and the annual *Industry Outlook* with five-yearly projections for 25 sectors, the Institute also undertakes a wide range of consultancy activities for government and private organisations. It obtains most of its income from research contracts obtained in a competitive market and trades on its reputation for delivering quality analysis in the right form, and at the right time, for its clients. Quality assurance is provided on the Institute's work:

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- by exposure of the team's work to the critical review of a broader range of Institute staff members at internal seminars;
- by providing for peer review at various stages through a project by a senior staff member otherwise disinterested in the project;
- and sometimes by external peer reviewers at the request of a client, although this usually entails additional cost.

## Authorship

This report has been prepared at NZIER by Joanna Smith and Phil Briggs. The assistance of Mark Walton, Phillip Bishop, John Ballingall and Doug Steel is gratefully acknowledged.

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## EXECUTIVE SUMMARY

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Our report covers five pieces of analysis. The first three look at the current economic structure of the Western Bay of Plenty sub-region (this region covers the Tauranga and Western Bay of Plenty district council areas).

The first three pieces of analysis are:

- A review of what's been done before in looking at the growth of the sub-region and its economy.
- An analysis of 2001 Census data to see what the present structure of the sub-region looks like.
- Construction of a regional input-output table. This allows us to estimate the area's exports, including exports overseas and exports to other regions of New Zealand.

The second part of the work is more forward looking and looks at the likely shape of the area's economy over the next fifty years. The two pieces of work are:

- A shift-share analysis which compares industry growth within the sub region with national industry growth.
- The production of long-term employment projections. The sub-regional projections are derived in such a way as to be consistent with national employment projections. At both the national and sub-regional levels employment growth, and GDP growth, are constrained by the projected increases in population.

Our projections were derived using 1996 base series, and should thus be used with caution. We intend to re-run our projection model when results from the 2001 census become available.

We now outline the results of each piece of analysis.

### Literature review

The major points:

- The Ministry of Works and Development (1984) produced a series of population projections to 2011. Three migration assumptions were used. Of these, the highest has proven to be the most realistic. It showed population of the Tauranga District reaching 87,000 by 2001, just under the actual 2001 figure of 90,900.
- The MWD's mid range scenario assumed that industry growth rates would remain the same as over the 1976-81 period. Exceptions were agriculture and construction, which were both adjusted up. Agriculture would be driven by horticulture and construction by population growth. The report noted the demand for dwellings by the growing retired component of the population.
- The urban growth strategy by Beca Carter Hollings and Ferner (1991) noted the significant economic and population growth that occurred in the Bay of Plenty region in the 1980s. However at the time the report was being prepared, the New Zealand economy was in a severe downturn, and this was expected to put a dampener on continued strong growth in the region. Hence the medium range of Statistics New Zealand's population projections were used, rather than the high series. In retrospect the dampening influence of national economic growth was overstated.

- A 1993 report by Beca Carter Hollings and Ferner assesses the supply and likely future demand for industrial land. The report identifies the Port of Tauranga as a key driver of regional growth. The report also highlights potential land use tensions i.e. between industrial development and maintaining an attractive lifestyle environment.
- Hughes (1997) acknowledges the significance of the urban area but also emphasises the role of the rural hinterland. The report suggests that establishing a university in Tauranga would increase the region's desirability as a location for firms and would also upskill the existing workforce and attract new workers to the area. An appendix contains an input-output analysis of the region for 1997.
- The Economic Development Review Board (1999) identified 'deficiencies' in the regional economy including: reliance on commodity based industries and population growth for long term prosperity, a low skill base, an absence of world class tertiary education institutions, and the relatively low quality of air services. The report suggested that the district council develop a strategic plan.

## **Analysis of census data for 2001**

This showed that:

- Within the sub region, the share of total employment in agriculture and in retail trade is significantly higher than for the country as a whole. Other industries which employ above average shares are health, construction and transport and storage. Industries employing below average shares are predominantly in the service sector.
- Regarding male employment, the major employers at the regional level are construction, retail trade and agriculture. Over 15% of women are employed in retail trade. Other major employers of women are health and community services, agriculture and education.
- Maori comprise 12% of the total workforce, compared to 11% at the national level. Major employers of Maori are retail trade, agriculture, health and community services, construction, transport and storage.

## **Regional input output table**

An input output table shows the flows of goods and services between industries and sectors (including households, government, and exports). We derived a table for the sub region from the national table using sub regional employment data.

The regional table shows that:

- The largest industries in terms of total output are, in order: construction, food and beverages, agriculture, wholesale trade, retail trade, transport and storage.
- The largest industries in terms of total international exports are, in order: food and beverages, agriculture, transport and storage, wholesale trade, wood and paper products.
- The largest industries in terms of supplying goods and services to the rest of New Zealand are: agriculture, transport and storage, chemicals, construction, health and community services, retail trade. Note that significant proportions of the output of the both the health and retail sectors are likely to be supplied to the eastern areas of the Bay of Plenty. However, the retail sector will also be benefiting from domestic tourism.

Overall, the regional input-output analysis highlights the importance of agriculture, food processing, transport and storage (which includes port activities), and the retail/wholesale sector.

## **Regional tourism**

Due to the nature of the industry, tourism is not a discrete industry in official statistics. We have therefore also looked at data from Statistics New Zealand's Accommodation Survey. Information is only published at the regional council level, so the data considered is for the Bay of Plenty region, which includes the Rotorua district. What this information shows is that the region's share of total New Zealand domestic tourists has been maintained over time, whilst the region's share of international tourists has been declining. However, the number of both groups of visitors have been increasing. Aggregate tourist expenditure data from the Tourism Satellite Account shows that spending on retail items by domestic tourists accounts for 39.2% of their total expenditure. This may partly explain the relative significance of the retail trade industry in the Western Bay of Plenty sub-region.

## **Shift share analysis of employment**

Analysis of employment growth over the 1996-2001 period shows that:

- Sub regional employment growth averaged 3.5% per annum compared to national growth of 1.3% per annum.
- For most industries, employment in the sub region grew faster than at the national level.
- Industries that grew slower than at the national level were: fishing, mining and quarrying, non-metallic minerals (concrete and glass), utilities, and central government.
- Industries that made large contributions to above-average employment growth were, in order: business services, agriculture, health and community services, construction, education, and wholesale and retail trade.

## **Long term employment projections**

Both the national and sub regional employment projections are based on demographic projections of the labour force. Care was taken to ensure that the demographic assumptions on which both the national and sub regional projections have been based are consistent.

### *National projections*

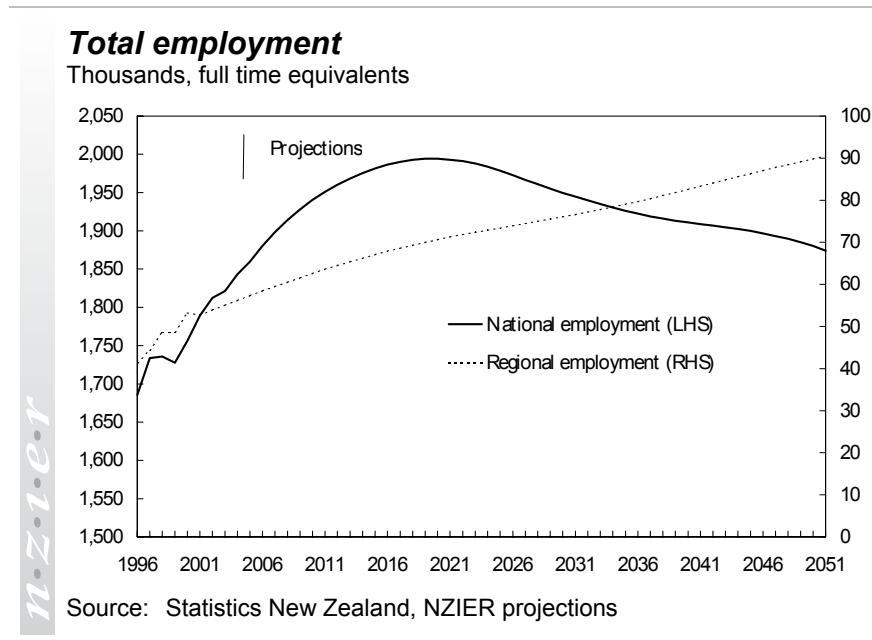
Total real GDP was projected to 2051 based on labour force projections and assumptions about labour productivity growth. Initial projections of real GDP by industry were based on historical growth rates. These initial industry projections were then scaled to be consistent with the projections of total GDP. Projections of employment by industry were derived using trends in labour productivity (real GDP per employee).

### *Sub regional projections*

For each industry, the sub region's share of national employment was calculated. These shares were then projected forward and applied to the national employment projections to obtain employment by industry. These numbers were then scaled so that total sub regional employment was in line with labour force projections for the sub region.

### Results of sub regional projections

The figure below shows employment projections at both the national and sub regional levels. While national employment declines from around 2020, regional employment continues to grow. This reflects continuing inward migration to the sub region.

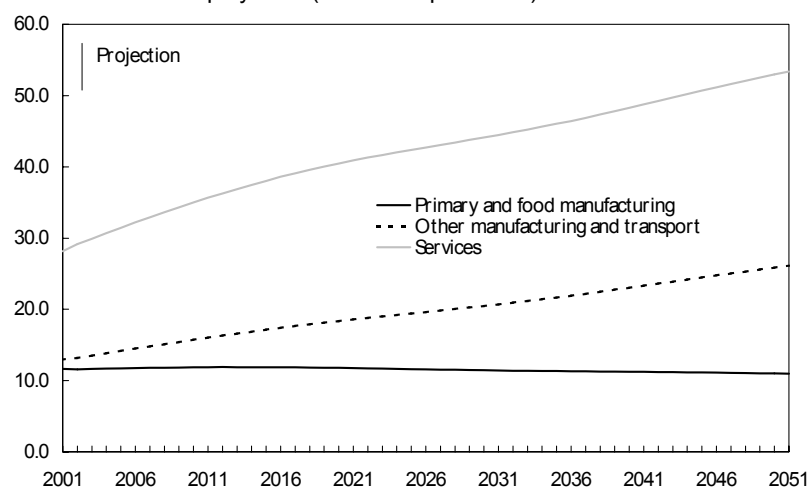


The figure below shows projections of employment by sector for the sub region. These results partly reflect our projections of the sub region's employment shares, but they also reflect the underlying national trend towards higher service sector employment. However, service sector employment should not be confused with high-wage employment; services cover people in high wage sectors like financial services but they also include relatively low paid industries like retail and accommodation.

While the chart shows results for three broad sectors, projections have been produced for 30 industries. In subsequent parts of the study these projections will be used to look in detail at the prospects of moving development of the sub region towards high-wage industries.

### Regional employment by sector

Percent of total employment (full time equivalents)



Source: Statistics New Zealand, NZIER projections

### Summary projections

	2001 level	2021 level	2051 level	% change 2001-2021	% change 2001-2051
Population	130,900	181,300	240,600	38.5	83.8
Labour force	63,100	85,300	108,300	35.2	71.6
Total employment (FTEs)	52,700	71,300	90,500	35.2	71.7

Source: Statistics New Zealand, NZIER

## Employment projections

Full time equivalents

March year	Agriculture	Fishing	Forestry and logging	Mining and quarrying	Food, beverage and tobacco manufacturing	Textiles and apparel manufacturing	Wood and paper products manufacturing
Employment 2001	8,900	500	200	400	1,600	400	1,100
Employment 2021	8,600	400	300	400	2,000	400	1,600
Employment 2051	7,000	400	400	500	2,700	400	2,100
Employment growth, 2001-2021	-4.0	-7.8	27.2	5.5	27.7	-2.7	41.5
Employment growth, 2001-2051	-21.6	-9.5	70.1	14.9	69.3	-0.9	93.3

March year	Printing, publishing and recorded media	Petroleum, chemicals, plastics and rubber products manufacturing	Non-metallic mineral products manufacturing	Metal product manufacturing	Machinery and equipment manufacturing	Furniture and other manufacturing	Electricity, gas and water supply
Employment 2001	500	500	200	600	1,500	500	300
Employment 2021	600	600	200	1,300	1,800	800	300
Employment 2051	900	500	200	3,000	2,300	1,300	300
Employment growth, 2001-2021	28.6	4.8	30.4	113.8	21.7	44.4	-7.5
Employment growth, 2001-2051	97.5	-5.2	43.0	391.8	53.9	134.5	-15.7



March year	Construction	Wholesale trade	Retail trade	Accommodation, cafes and restaurants	Transport and storage	Communication services	Finance and insurance
Employment 2001	5,000	3,000	7,000	1,800	2,300	500	1,000
Employment 2021	7,900	3,700	10,000	3,100	3,200	600	1,100
Employment 2051	11,700	3,900	13,600	5,300	3,400	300	800
Employment growth, 2001-2021	58.0	24.5	44.2	75.0	37.5	25.0	7.4
Employment growth, 2001-2051	133.6	30.4	95.5	204.4	48.7	-37.8	-16.8

March year	Property services	Business services	Govt. admin and defence	Education	Health and community services	Cultural and recreational services	Personal and other community services	TOTAL
Employment 2001	1,400	3,900	1,000	2,800	3,200	700	2,100	52,700
Employment 2021	1,600	6,700	1,700	3,800	5,100	1,200	2,400	71,300
Employment 2051	2,000	10,800	2,900	5,600	4,800	1,200	2,100	90,500
Employment growth, 2001-2021	17.0	73.8	67.5	39.4	57.1	61.3	16.7	35.2
Employment growth, 22001-2051	46.8	179.8	196.5	104.3	47.4	71.2	0.2	71.7

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# 1. LITERATURE REVIEW

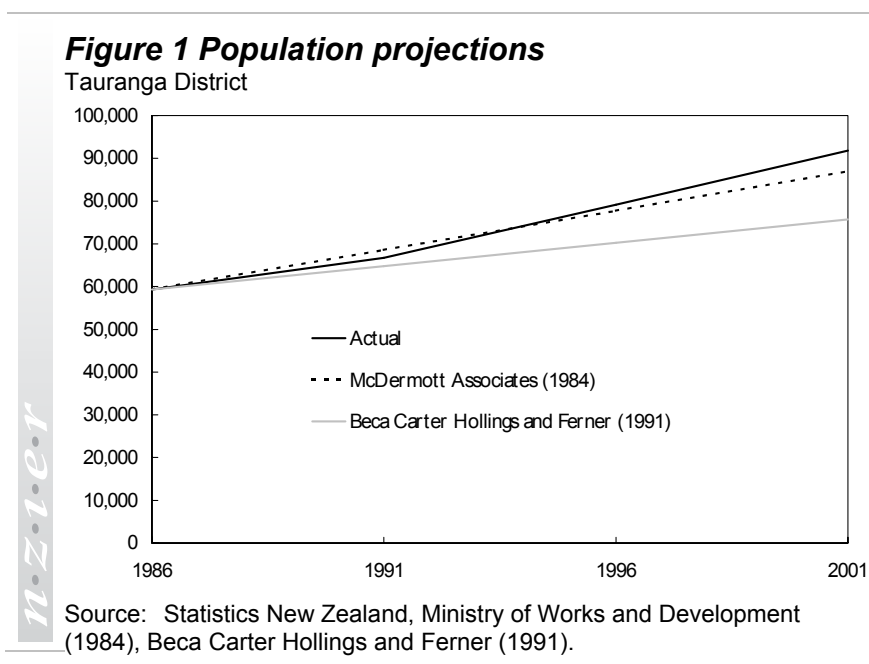
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**Ministry of Works and Development (1984) *Western Bay of Plenty urban development strategy study: Reconnaissance* (Ministry of Works and Development, December 1984).**

This comprehensive and detailed study examines urban growth issues in the sub-region (principally the Tauranga urban area, Mt. Maunganui and Papamoa). It assesses the current planning strategy and appraises future residential housing options in light of population and employment projections to 2011.

Growth projections were undertaken by McDermott Associates. Three population projection series are derived, all based on medium fertility and mortality rate assumptions, but using differing migration assumptions. A nil migration scenario assumes no net inward migration to the region. The baseline migration scenario assumes that the region will continue to receive that same share of the total New Zealand population (by age group) as it did in the 1976-1981 period, i.e. these shares are held constant over the projection period. And the high migration assumptions takes these shares multiplied by 1.5, and then holds them constant at this higher rate. This high scenario takes the combined population of Tauranga and Papamoa to 87,000 by 2001, and around 100,000 by 2011. Although taking account of population composition by gender and age cohort, the projections do not appear to adjust for ethnicity, and associated differences in fertility rates. The high series is used in further projection work.

Figure 1 compares the population projections from Mc Dermott Associates, with those of Beca Carter Hollings and Ferner (discussed below) and actual outturns.



Employment by broad economic industry is projected, based on historical growth rates (compound annual growth from 1976 to 1981 was 2.8%). The baseline scenario assumes the industry growth rate remains the same as over the 1976-1981 period. The

exceptions to this approach are agriculture and construction. The adjustment to agriculture takes into account the availability of land for further expansion into horticulture, and an on-going structural shift from dairy into kiwifruit. Construction is adjusted up based on the high population projections.

An 'optimistic' employment scenario assumes more rapid growth, particularly in the manufacturing and processing industry (benefiting from downstream effects of growth in forestry and horticulture) and in community oriented services, particularly with respect to the increasing large proportion and number of retirees.

From the population and labour market projections, future housing demand is analysed. The composition of households in the 1981 base year is examined, and the proportions of household types per dwelling type is assessed. Assuming that dwelling preferences of each household type remain constant, the results suggest that the current stock of housing in the Tauranga urban area will need to double by 2011. This takes into account the changing composition of households over the projection period, and implies that a different pattern of housing will need to be planned for.

The trend in housing demand is compared to the anticipated outlook for housing supply in terms of residential capacity. Projections based on historical trends in building permits, and consultation with local planners is contrasted to estimates based on raw valuation data (projections from the latter being considerably higher). The conclusion reached is that a strategy will be needed to cater for a future over-spill of demand for residential housing.

The current 'eastern development' planning strategy sites new residential development in the eastern areas of the region, diverting it away from the high quality agricultural land in the west. The report suggests that this policy is based on the presumption that future demand for housing will be homogeneous. Analysis reveals that the composition of demand is in fact highly heterogeneous and likely to change over the projection period. Moreover, concerns are raised over the characteristics and features of the current location choices (Mt. Maunganui and Papamoa). The report recommends consideration of a western component to the planning strategy, and incorporation of the likely dwelling-type demand of the growing retirement component of the population. An appraisal of the costs and benefits of different location strategies is recommended.

**Ministry of Works and Development (1986) *Western Bay of Plenty urban development strategy study – final report: summary and recommendations* (Ministry of Works and Development, May 1986).**

Subsequent to the reconnaissance report discussed above, the Bay of Plenty United Council requested further, more detailed research into its findings. This included undertaking several major technical studies, covering analysis of future housing demand, and economic, financial, social and environmental assessment of existing and alternative future growth options. The results of these investigations supported and strengthened the findings of the earlier report.

Some slight adjustments to the earlier population projections have been incorporated into this report. The method of spatially allocating population has been changed slightly, as have assumptions relating to housing development capacity. As a result the high population estimates are higher, with the 'greenfield' over-spill totalling an extra 35,000 people.

**Beca Carter Hollings and Ferner (1991), *Tauranga urban growth strategy 1991*. Report to Tauranga District Council, June 1991.**

This report reviews recent growth trends in light of the assumptions and findings of previous growth studies, and recommends an urban growth strategy for the 1990s (up to 2001). The 1980s saw significant economic and population growth in the Bay of Plenty region, and as a result previous planning strategies were revised to address the increase in demands associated with a burgeoning population. However this report sees the contemporary downturn in the national economy as a dampener on continued strong growth in the region. On this basis, the 'medium' range population projections from Statistics New Zealand were selected, rather than the 'high' series as used in the 1986 projections. As a result, annual population growth is projected to drop from 1.8% in 1991 to 1.4% by 2001, to take the population of the Tauranga District to around 75,700.

The fact that strong (above national average) growth was maintained over the decade (with the district's population striking 91,800 in 2001) suggests that the dampening influence of national economic conditions was over-stated. The report does note that urban growth rates tend to be volatile, and do not necessarily mirror national economic activity. In its literature review, the report notes that the 1975 *Papamoa Development Proposals* highlighted drivers of regional growth, which may cause regional growth to exceed projections based purely on historical trend growth. These factors include: the Kaimai railway deviation (providing a rail link to the port on Tauranga), the development of the kiwifruit export industry and the demand for coastal development.

As well as population and demographics, the report includes projections of the number and type of households and subsequent housing demand (e.g. retirement homes), and employment by industry. Recommendations to council include:

- the establishment of a more comprehensive database with which to monitor growth and development
- the implementation of an annual land-use survey
- that the proposed study of commercial zonings confirm the scale of district centres using population estimates.

**Joint Technical Working Party (1993) *Tauranga industrial strategy study, Phase I report: Industrial land supply assessment.***

This is an assessment of the location and amount of industrially zoned land in the Tauranga-Western Bay of Plenty sub-region. It notes that over the period 1982 to 1992, uptake of wholly vacant industrial land averaged 14-15 hectares a year. The rate has dropped off since 1988. However, projecting forward based on the historical average (taken over the entire decade) implies that the present supply of vacant land would last until around 2008. The report notes that there were factors likely to alter this rate in particular areas. For example, the presence of the port in Mount Maunganui was likely to see higher than average growth in this area.

The results of a survey of owners of vacant industrial land is included, and complements the analysis. Conducted in 1992, the survey asked land owners about the medium (5-10 years) and long term (10+ years) plans for their land. The survey also asked whether such plans were dependent on the level of economic activity; 'uncertainty' regarding the national economy at the time of the survey appeared to serve as a dampening influence on investment plans.

**Joint Technical Working Party (1993) *Tauranga industrial strategy study, Phase II report: Industrial demand assessment.***

Based on the results on interviews with key industry players in the sub-region, this report discusses likely future growth trends in the demand for industrial land. Interviews covered firms' perceptions of the likely extent and nature of future industry growth in the area, as well as their perceptions of the current situation regarding land availability, and the criteria used in their selection of sites.

The results stress the significance of the port to the area's industrial base, with growth potential identified in value-added goods exports and bulk shipping services, as well as niche and service sector firms. The importance of maintaining quality of lifestyle and environmental amenity, and of zoning to reduce/mitigate adverse effects of industry on residential and other industries is highlighted. Concern is noted regarding the future availability of sufficient 'back-up' land (although we were unable to find a definition of this).

**Beca Carter Hollings and Ferner (1993) *Tauranga industrial strategy study, Phase III report, Vol. 1. Report to Tauranga District Council and Western Bay of Plenty District Council, August 1993.***

This report assesses the supply and likely future demand for industrial land, in the combined Tauranga-Western Bay of Plenty district. Future demand is based on projections of historical averages. The report identifies and appraises future site options against a suite of criteria, encompassing geotechnical, strategic, social and other factors.

The report identifies the Port of Tauranga as a key driver of growth in the region. It also raises the issue of potential land-use tensions, i.e. between industrial development and lifestyle (including environmental amenities). A proposed objective of a regional industrial land-use strategy is therefore to achieve industrial growth which minimises the impacts on the environment and on communities.

**Beca Carter Hollings and Ferner (1993) *Tauranga industrial strategy study, Phase III report, Vol. 2: Figures. Report to Tauranga District Council and Western Bay of Plenty District Council, August 1993.***

This contains the maps for Volume 1 of the report. The maps detail site boundaries, zones and buffer strips, etc. relevant to the report.

**Beca Carter Hollings and Ferner (1993) *Tauranga industrial performance issues. Report to Tauranga District Council, August 1993.***

The purpose of this report is to review the industrial zones and performance standards in the *Tauranga transitional district plan*, in order to assist the council in managing the effects of industrial activity and fulfilling its responsibilities under the Resource Management Act (1991). The report includes the results of a survey of households and interviews with industry representatives, and documents complaints received from the public concerning industrial activities. Complaints were made regarding nuisance factors such as noise, vibration, discharges and landscaping/screening, with noise being the factor of most concern. The report makes specific recommendations, largely concerning inclusions and wording in the *District plan*.

**Industrial Strategy Study Working Joint Technical Party (August 1993) *Draft industrial strategy.***

This report brings together the results and recommendations of the previous three phases of the review of land use and resource management policies, undertaken by Tauranga District Council and the Western Bay of Plenty District Council. Reports relating to these three phases are discussed above.



**McDermott Fairgray Group and Adrienne Young-Cooper (1994) *Tauranga commercial development strategy*. Report to Tauranga District Council, May 1994.**

This report considers Tauranga's future growth to 2016, focussing on the commercial sector. It projects growth in retail trade (in constant, 1993 dollar terms) and required retail floor space to accommodate this growth. The base year for projections is 1993, with baseline scenarios assuming a continuation of current zoning and planning strategies. Projected growth in retail trade is based on 'medium' range population and household projections. It is assumed that 50% of the sub-region's retail spend occurs in Tauranga. Projections are recorded in level terms: the projected growth rates are not shown, and the projection method is not detailed. The current 'productivity' of retail floor space is derived (\$/m<sup>2</sup>/year) and this productivity rate is applied to the retail trade projections to project future retail floor space needs. Two alternative scenarios are derived, which assume different planning environments.

The net impacts of these alternative scenarios are assessed in terms of how far they go to achieving desired economic, social and environmental objectives. The report states that this assessment involved identifying advantages and disadvantages resulting from each scenario, as well as simulation of consumers' travel time and costs and retail gravity modelling. None of these methods appears to be documented in the report. The resulting impacts are rates on a scale from -2 to +2, and from the summation of the scores a 'net impact' for each scenario is derived. Without reference to any quantitative methods, it appears that these scores are largely based on qualitative factors and judgement.

**Warren Hughes (1997) *The Tauranga economy - Tauranga District strategic plan: prospects and strategies for the Tauranga regional economy* (University of Waikato, August 1997).**

This report examines regional growth over the next 20 years, identifying national and international influences and sectors likely to be key drivers of growth in the area. It performs a SWOT analysis, discussing strengths, weaknesses, opportunities and threats relevant to the region, and makes recommendations on this basis.

Whilst the report acknowledges the significance of Tauranga city as the focus of economic growth in the region, it also emphasises the role of the rural hinterland, specifically of meat and dairy farming, forestry, and fruit growing and other horticulture. It notes the importance of the port of Tauranga for the transport, storage and distribution industry. It suggests that establishing a university in Tauranga would increase the region's desirability as a location for firms in the business services industry, and play a significant part in upskilling the existing workforce and attracting new workers to the area.

The report notes that GDP growth in the region has been the highest of any New Zealand region over recent years, and that strong net immigration to the region has been an important driver of this growth.<sup>1</sup> Population growth has supported the construction industry, maintaining strong growth in demand for residential building. The report suggests that this migration growth, coupled with the strength in the primary industries, has meant that the region's economic growth has been somewhat independent of national economic conditions.

An appendix details a regional impact study for 1997. This study estimates annual regional growth in real GDP (i.e. in 1996 dollar terms) for the year to 1997. The model

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<sup>1</sup> We were unable to find the source for this comment, beyond the reference to the growth estimates in the appendix which refer only to the 1997 year.

looks at growth by 80 sectors, and involves a survey of firms in each of these sectors, to obtain their expectations of growth for the year. Using an input/output model, output multipliers are produced for each sector. The report acknowledges the likelihood of 'double-counting' using multipliers at this level. Outputs of the model are in terms of four economic variables: gross output, net household income, net regional value added and employment (full-time equivalent employees). Minimum, maximum and expected growth rates in these variables are presented.

Regional growth is expected to reach around 7%, compared to 2-3% for the national economy as a whole. This section highlights the importance of growth in the labour force (as opposed to population growth) as an indicator of economic growth.

**Warren Hughes (1999) *Survey and forecasts of economic growth for 1999* (University of Waikato, September 1999).**

This report updates the model in the 1997 report (outlined above), providing industry-level growth forecasts for 1999. In addition to the Tauranga and Western Bay of Plenty sub-regions considered in the previous report, forecasts are also made for Whakatane and Opotiki. This model run uses data for 87 sectors. As with the previous report, firms in each sector are surveyed to obtain estimates of their own growth for the coming year. These forecasts are weighted by firm size, with size measured by number of (full time equivalent) people employed by the firm. In most cases, the resulting growth rate is the one retained for forecast purposes. In some cases this rate is adjusted according to judgement.

**Economic Development Review Board (1999) *Tauranga region economic development review. Report to Tauranga District Council, December 1999.***

The review board have assembled in this document an economic strategy, designed to 'enhance the lifestyle enjoyed by our community'. The report identifies 'deficiencies' in the regional economy, and suggests a strategic plan for the Council. Deficiencies discussed include:

- the region's reliance on commodity-based industries and population growth for long term prosperity
- the low skill base which suggests the region is poorly placed to take advantage of the 'knowledge and technology revolution'
- the absence of world class tertiary education institutions
- the quality of air services.

Suggested initiatives include: local body reform; regional branding; selling investments and forming a community trust; and focussing on knowledge-based industries, services to the elderly and tourism for future growth potential.

**Western Bay of Plenty and Tauranga District Councils (2000) *Development trends: Western Bay of Plenty District, Tauranga District July 1999 - June 2000* (Western Bay of Plenty District Council and Tauranga District Council, October 2000).**

This report offers a description and analysis of sub-division, building and land capacity data from the last 12 months. It takes into account input from industry representatives, and includes a report from ANZ Bank Tauranga on national and regional trends, and outlook for the next year. Overall, the sub-region is still growing faster than most other regions in New Zealand, maintaining demands on housing and associated services. Higher than average population growth is reflected in strong growth in residential building activity. However, house prices in Tauranga have

weakened over the last couple of years, suggesting that some oversupply has built up in the market. In the industrial and commercial sectors, robust export growth has increased capacity pressures, implying some upside for non-residential building investment in the coming year. The report notes, however, that a perceived shortage of industrial land has been responsible for driving up prices, which in turn has become a barrier to development in the area.

**Minutes of the Tauranga District Council Policy/Resources Committee, 27 June 2000.**

The purpose of this meeting was to deliberate on the submissions received regarding the Council's 2000/01 Draft Annual Plan. Included in an Appendix are excerpts from a report by McKinlay Douglas on the Economic Development Review Board's 1999 report (discussed above), and submissions relating to this report.

**Tauranga District Council (2001) *Tauranga District industrial land survey 2000/01*.**

This report assesses the availability of vacant land for industrial purposes, and makes comparisons with results from previous surveys. It notes that the uptake of industrial land has been constant over the last decade, and that the ratio of occupied industrial land to population (i.e. occupied industrial land per capita) has generally been declining.

**Edward L Glaeser *et al* (2000) *Consumer City* (Harvard Institute of Economic Research Discussion Paper 1901, June 2000).**

This paper challenges the received wisdom of urban economics, which theorises that cities provide agglomeration benefits to production, but impose negative agglomeration effects on consumption. Benefits to production include lower transport costs, and improved access to ideas and technology through the networks fostered by agglomeration. Consumption on the other hand suffers from 'congestion effects', such as higher rents, longer commuting times and more crime than lower density areas.

Glaeser's research suggests that, contrary to this prevailing view, urban density plays a significant role in facilitating consumption, and that high amenity cities have grown faster than cities with low amenity levels. Looking at data from the US, and also France and Europe, Glaeser *et al* report the following findings:

- A dry, temperate climate and proximity to the coast are strong predictors of local (county)-level population growth.
- The presence of live performance venues and restaurants is a good predictor of future population growth.
- Amenities appealing to low human capital workers, such as bowling alleys and movie theatres are negatively correlated with population growth.
- Growth in tourism is associated with growth in the city.
- By looking at the rate of growth in urban wages and urban house prices, the report concludes that the demand for urban amenities appears to be rising faster than the urban wage premium.
- Higher income growth is associated with close proximity to CBDs, suggesting that the denser urban areas are becoming increasingly valued by workers with high opportunity costs of time (i.e. higher average incomes).

The increasing 'demand for density' suggested by these results imply that future urban growth will be concentrated in cities possessing high levels of amenity. These 'consumer cities' will be strong on four critical features of urban amenity:

- a rich variety of services and consumer goods
- pleasant aesthetics (including attractive architecture) and physical features
- good public services, including good schools
- speed (transport at high speed/low cost).

Implications for government policy include:

- The need for local government policy to focus on quality of life, specifically good public amenities. Good schools can help attract high human capital workers.
- The need for cities to attract high human capital consumers, rather than manufacturing firms (with their associated negative effects on amenity).
- The recommendation that national policy be guided by spatial neutrality. Location specific policies can artificially distort city size.

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## 2. CURRENT ECONOMIC STRUCTURE

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### 2.1 Analysis of the current economic structure of the sub-region

Using data from the 2001 census, we have compared employment by industry in the Western Bay of Plenty region to the numbers for total New Zealand. The data are classified according to ANZSIC categories, and have been grouped up into the 30 categories used by Statistics New Zealand for GDP data. We look at the composition of employment, by industry, gender and ethnicity, as a way of analysing the structure of economic activity in the area. By comparing data for the region to that for New Zealand as a whole, we can see how the regional economy differs from national averages. Understanding the current economic structure will help us in making long-term projections, as we can assess whether we can expect the region to grow in line with the national economy, or where and why it might differ.

#### 2.1.1 Employment by industry

3.2% of New Zealand's total workforce is located in the Western Bay of Plenty region. Of the 55,700 employed in the area, 10.3%, or 5,700, work in the agricultural industry. This is above the national average of 7.5%, and makes agriculture the region's second most important employer, after retail trade.

The proportion employed in retail trade, at 13.4%, is also above the average rate for this industry in New Zealand as a whole. Other significant industries, which employ above the average national share are: health (9.2%); construction (8.3%); and transport and storage (4.6%).

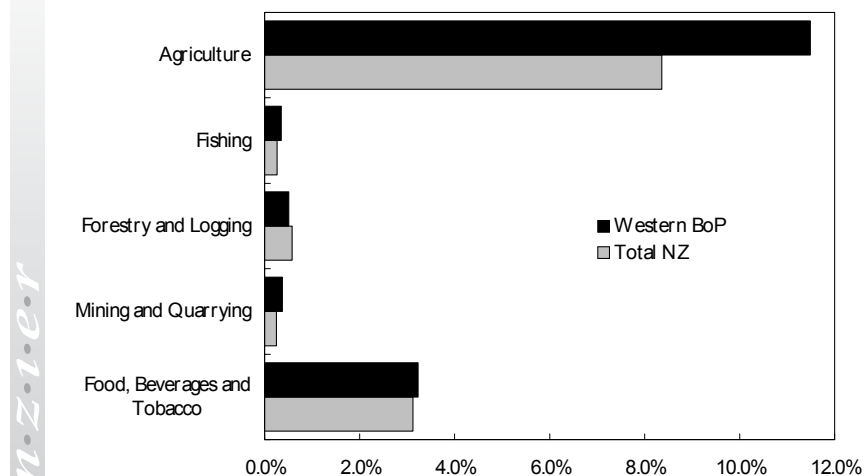
Industries employing below the national shares are predominantly in the service sector. They include business services (7.0%), education (6.1%), accommodation, cafes and restaurants (3.8%), finance and insurance (2.1%) and cultural (1.6%).

The importance of construction reflects the high population growth the region has experienced in recent years. The region's high proportion of retirees translates into extra demand for health care services. And the presence of the port contributes to the relatively high proportion of people employed in the transport and storage industry.

The charts below show the proportion of total employment that is employed by each industry, for the Western Bay of Plenty region, and for total New Zealand.

**Figure 2 Employment by industry: primary production and food manufacturing**

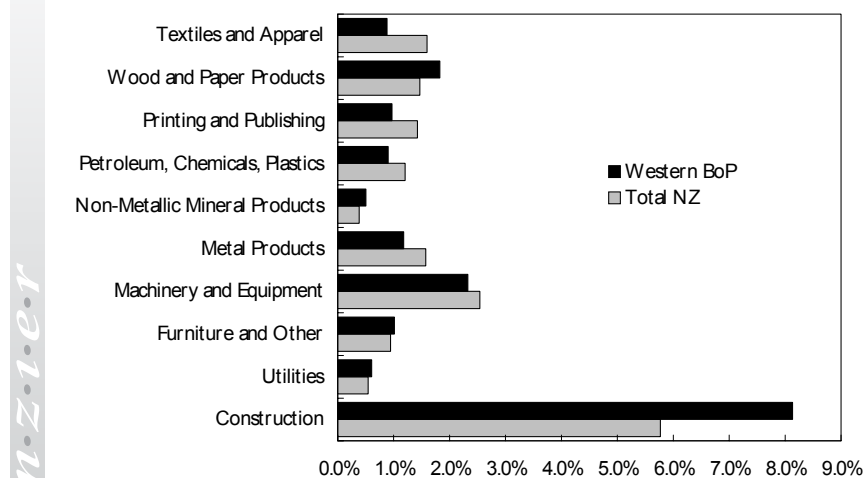
Per cent of total employment



Source: Statistics New Zealand, NZIER

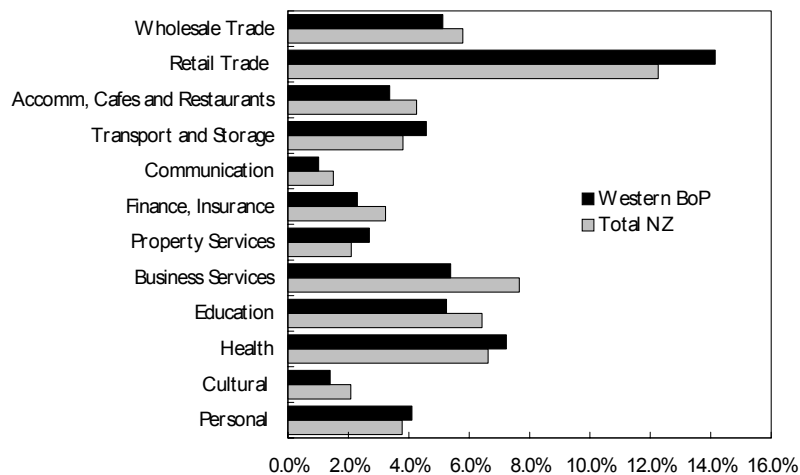
**Figure 3 Employment by industry: manufacturing and construction**

Per cent of total employment



Source: Statistics New Zealand, NZIER

**Figure 4 Employment by industry: services**  
Per cent of total employment



Source: Statistics New Zealand, NZIER

## 2.1.2 Employment by gender

### *Proportion of total industry employment*

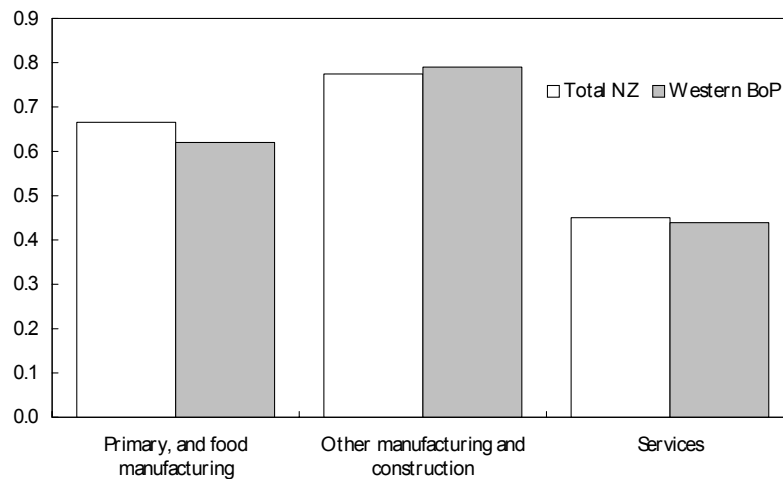
In order to present the data on employment by gender, we have aggregated industries up into three broad sectors: primary, manufacturing and construction, and services. Comment on individual industries is provided where the region differs significantly from national averages.

The primary sector employs a high proportion of males – 67% at the national level. Employment of males in Western Bay of Plenty, in this sector, is below the national average, at 62% (see Figure 5). This is due to the higher than average proportion of females in the agriculture industry, which is probably driven by horticulture (such as kiwifruit growing).

The manufacturing and construction sector also employs a high proportion of males: 77% at the national level. The regional proportion of male employment in this sector is above the national average, at 79%.

**Figure 5 Employment by gender: males**

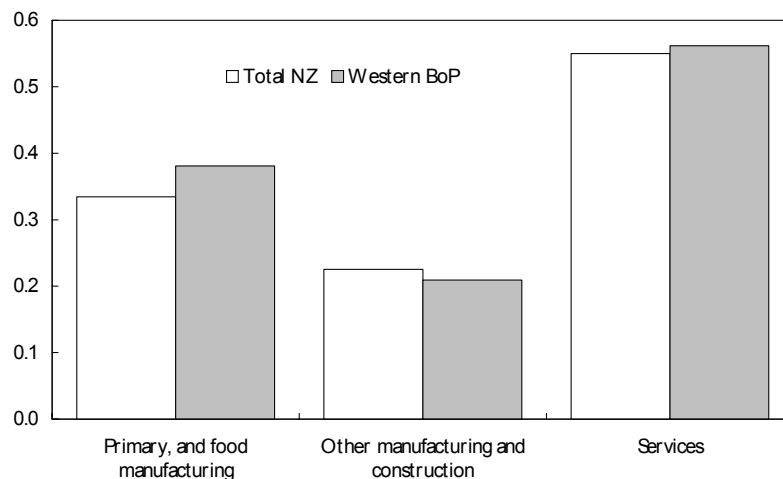
Proportion of total sector employment



Source: Statistics New Zealand, NZIER

**Figure 6 Employment by gender: females**

Proportion of total sector employment



Source: Statistics New Zealand, NZIER

The service sector employs more women than men. At the national level, 55% of employees in this sector are women, and the proportion is similar at the regional level. This sector includes industries such as health and education, which both employ a high proportion of women.

#### **Industry proportion of total male and female employment**

In terms of the proportion of all men employed, the major employers at the regional level are construction, retail trade and agriculture (see Table 1). These proportions are all above the averages for New Zealand as a whole.

Over 15% of all women employed in the region work in the retail trade industry. Other major employers are health and community services, agriculture and education (see Table 2).



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**Table 1 Employment of men by industry**

Major employers, per cent of total men employed

Industry	Western Bay of Plenty	Total NZ
Construction	13.4	9.8
Retail trade	11.7	10.8
Agriculture	11.5	9.0
Business services	6.7	8.7
Transport and storage	6.6	5.2
Wholesale trade	6.6	7.0
Food, beverages and tobacco manufacturing	3.8	3.6

Source: Statistics New Zealand, NZIER

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**Table 2 Employment of women by industry**

Major employers, per cent of total women employed

Industry	Western Bay of Plenty	Total NZ
Health and community services	16.7	14.5
Retail trade	15.3	13.5
Education	9.6	11.2
Agriculture	8.9	5.8
Business services	7.3	9.4
Accommodation, cafes and restaurants	5.4	6.3
Personal and other community services	4.1	4.1

Source: Statistics New Zealand, NZIER

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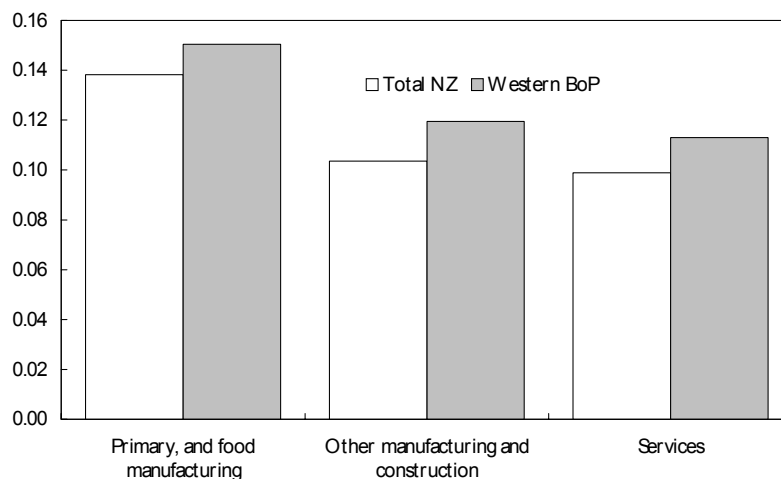
### 2.1.3 Employment by ethnicity

#### ***Proportion of total industry employment***

Maori comprise 11% of the total national workforce, and 12% of the total workforce in the Western Bay of Plenty region. The proportion of Maori employed in the Western Bay of Plenty region is higher in each sector than that for New Zealand as a whole (see Figure 7). The proportions of Maori employed by the transport and storage, non-metallic minerals manufacturing and food manufacturing industries are well above the national averages (Table 3).

### **Figure 7 Employment of Maori by sector**

Proportion of total sector employment that is Maori



Source: Statistics New Zealand, NZIER

### **Table 3 Industry employment of Maori**

Per cent of total industry employment that is Maori

Industry	Western Bay of Plenty	Total NZ
Food manufacturing	29.1	20.8
Fishing	21.9	33.5
Forestry and logging	21.2	18.8
Transport and storage	20.8	13.5
Wood and paper products manufacturing	20.6	20.8
Non-metallic minerals manufacturing	19.6	12.9

Source: Statistics New Zealand, NZIER

### **Industry proportion of total Maori employment**

The major employing industries of Maori are set out in Table 4.

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**Table 4 Employment of Maori by industry**

Major employers, per cent of total Maori employed

Industry	Western Bay of Plenty	Total NZ
Retail trade	10.3	9.6
Agriculture	9.0	6.5
Health and community services	8.5	7.3
Construction	8.2	6.7
Transport and storage	7.8	4.8
Food manufacturing	7.0	5.9
Education	6.4	7.8

Source: Statistics New Zealand, NZIER

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## 2.2 Regional input-output table

### 2.2.1 Constructing a regional input-output table

An input-output table (or, more correctly, an inter-industry transactions matrix) shows the inter-relationships between sectors. Using a tabular or matrix format, it shows how the outputs from each sector of the economy are distributed amongst other sectors of the economy, and the portion that flows out of the economy. It shows in monetary terms, the flows of goods and services between industries and sectors of the economy.

Input-output tables are produced by Statistics New Zealand, at the national level. The national matrix can be adapted according to the features of the regional economy. We constructed an input-output table for the Western Bay of Plenty region using the national 1996 126-sector input-output table published by Statistics New Zealand in August 2001. We regionalised this in the following way:

- We derived regional household consumption by using 1996 Census population data. We applied the ratio of the regional population to national population to the household consumption column in the national input-output table.
- All other data (i.e. intermediate consumption and the final demand categories excluding household consumption) were derived using 1996 Census employment data. The ratio of regional employees to national employees was applied to both rows and columns in the national input-output table, except to the household column.

We then aggregated the resulting regional 126-sector input-output table to 30 sectors.

### 2.2.2 Results

Results are set out in Appendix A. Table A1 shows how output from each industry in the Western Bay of Plenty region is used by the various sectors of the economy. Output can be sold either as an input to further production by local firms (referred to as intermediate consumption), or as an end product or service in final demand. In the latter case it may be sold to:

- local households,

- local or central government agencies in the region,
- local firms for use in investment activity;
- or it may be exported out of the region, to elsewhere in the country, or overseas.

Gross output is the sum of all these sales, including intermediate consumption.

### ***Nominal industry contribution to exports***

We can see from the table that, in dollar terms, the agriculture and food industries are significant overseas exporters. The transport and storage industry is also a relatively big exporting industry, reflecting the presence of the port in the region.

In dollar terms, the agriculture industry is the most significant exporter of output to the rest of New Zealand. It is followed by the transport and storage industry, then the petroleum, chemical, plastic and rubber, and construction industries. The health and community services industry, and to a lesser degree education, also export a considerable amount to elsewhere in the country. In the case of these two industries, this is likely to be to the rest of the greater Bay of Plenty region (i.e. eastern areas of the regional council region).

### ***Total industry output***

In terms of total output, the major industries in the region are construction, food, agriculture, wholesale and retail trade, and transport and storage. These industries combined generate half of the region's total output. Table A2 shows the contribution of each industry to the region's total gross output.

Table A3 shows the distribution of output from each industry across economic sectors. The rows sum across to total 100% of an industry's output. Around 84% of output from non-metallic mineral product manufacturing is used as inputs to further production processes. Other industries which see most of their output sold as intermediate consumption include business services (75%), printing, publishing and recorded media (73%), finance and insurance (66%), metal product manufacturing (64%) and electricity, gas and water supply (63%).

The accommodation, restaurants and bars industry provides around 62% of its output to households, and retail trade 54%. Other industries which see a large proportion of their output consumed by households include personal and community services (46%) and cultural and recreational services (43%).

### ***Industry exports***

Around one third of output from the mining, and the printing, publishing and recorded media industries is exported out of the region, to elsewhere in New Zealand. And a quarter of output from the health and community services industry is provided to agents outside the Western Bay of Plenty area. As mentioned above, this is likely to be within the greater Bay of Plenty region.

The food industry sees half of its output exported overseas. Other industries with a large proportion of their output being exported internationally include agriculture (38.9%), mining (35.0%) and textiles and apparel manufacturing (30.6).

Table A4 shows the exports and imports to and from the rest of New Zealand, in dollar terms. It also shows whether industries are net importers or exporters from/to the rest of the country. A negative value in the net exports column means that the industry imports more than it exports from the rest of New Zealand.

The health and community services industry is the largest net exporter to the rest of New Zealand, followed by transport and storage, and the petroleum, chemicals, plastic and rubber industry.

The table shows that the food industry is the largest net importer from the rest of the country, followed by agriculture and construction. This result for agriculture is not surprising when we consider that the industry is a significant exporter of output overseas, with almost 40% of its output being exported internationally. It should also be kept in mind that imports in this context are inputs to an industry's production processes, and do not go straight into satisfying final demand for output.

### ***Contribution to national output***

Table A5 shows the regional contribution to national output by industry. Not surprisingly, the Western Bay of Plenty region contributes only a small proportion of total national output in any industry. However, the most significant contribution comes from the agricultural industry, which provides 4.2% of national agricultural output. The construction, and non-metallic mineral product manufacturing industries each contribute 4% of national output. Other relatively large contributions come from the fishing and transport and storage industries.

### **2.2.3 Conclusions and implications**

Our regional input-output analysis has highlighted the importance of the agriculture and food industries to the Western Bay of Plenty region. Taken together these are, in dollar terms, the region's largest international exporting industry. And in terms of contribution to national output, they are the region's most significant industry.

Within agriculture, kiwifruit growing comprises by far the largest proportion of activity, contributing 37.7% of total agricultural output. This is followed by dairy farming, which provides 20.8% of agricultural output in the region (Table A6).

The relative importance of agriculture depicted in our input-output analysis has relevance to long-term regional policy-making. Considered in tandem with the strong population growth that is projected for the region, we could expect competition in terms of land use to become increasingly pertinent. Continued strength and growth in the agricultural industry means it is likely to compete with residential and commercial interests seeking to accommodate and service a burgeoning population. It may be that that policy measures will be needed in order to protect the agricultural industry's ability to remain an important driver of economic growth in the region. Unfortunately, such protection may be at the expense of some of the region's capacity to attract and maintain the projected population growth.

## 2.3 Tourism in the Bay of Plenty region

Noticeably absent from our industry profile is the tourism industry. This is because tourism is not a discrete industry in official economic statistics. Statistics New Zealand's framework for collecting industry statistics brings producers together into groups based on the goods and services they supply. Tourism, however, is not characterised by its products, but rather by the purchasers of those products. As such, tourism cuts across standard industry definitions, including: retail trade, accommodation, transport, and cafes and restaurants.

Statistics New Zealand's monthly Accommodation Survey is hence our best source of information on regional tourism. However, tourism data are available only at the regional council level, and therefore relate to the Bay of Plenty regional council region, rather than the Western Bay of Plenty sub-region. The Bay of Plenty region includes Rotorua.

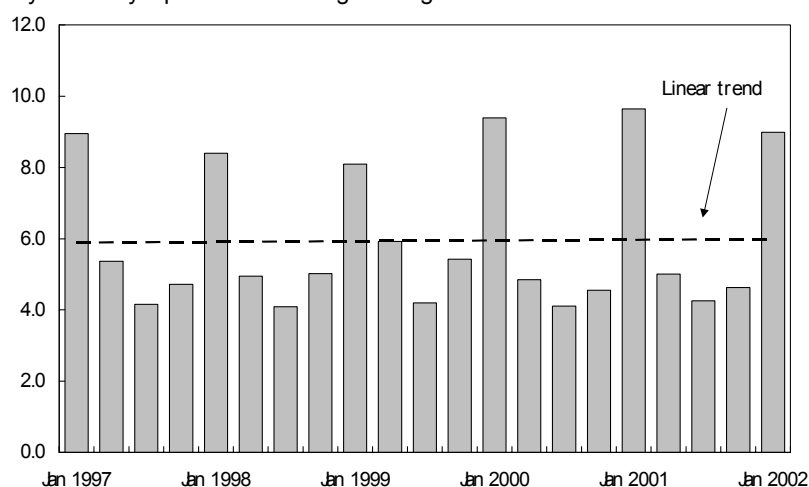
The Accommodation Survey provides information on the number of nights spent in commercial accommodation by visitors to a region ('guest nights'). This is broken down by type of visitor: domestic (from elsewhere in New Zealand) and international (overseas tourists). It should be noted that the survey misses out 'day travellers', and those staying with friends and family.

The survey is conducted monthly, with every third month (January, April, July, October) collecting information on the origin of guests. Information relates to the survey month (rather than, e.g. the quarter).

Figure 8 shows the Bay of Plenty region's share of total New Zealand guest nights spent by domestic tourists. This share has been maintained over time, depicted by a flat linear trend line. In January 2002 the region hosted 9.0% of all domestic tourists. However, note the significant variation in domestic tourists across different times of the year.

**Figure 8 Regional share of domestic tourists**

Bay of Plenty's per cent of total guest nights

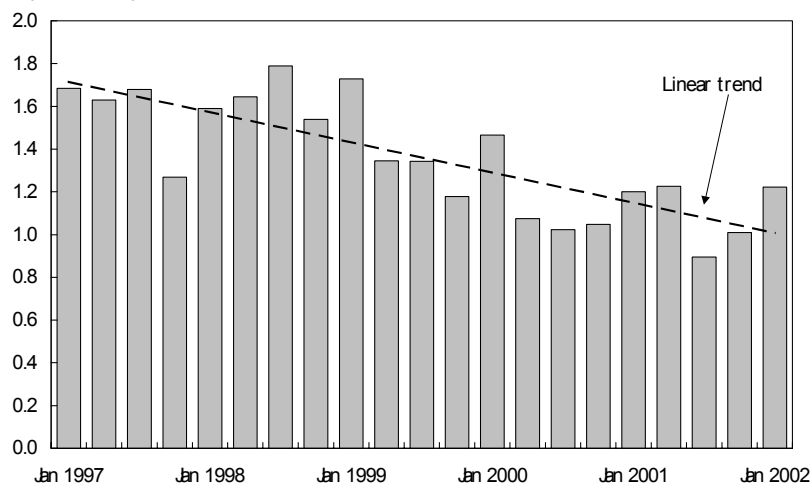


Source: Statistics New Zealand, NZIER

The region's share of international tourists has been declining over time. This is illustrated in Figure 9. In the month of January 2002, 1.2% of all international tourists to New Zealand visited the Bay of Plenty.

**Figure 9 Regional share of international tourists**

Bay of Plenty's per cent of total

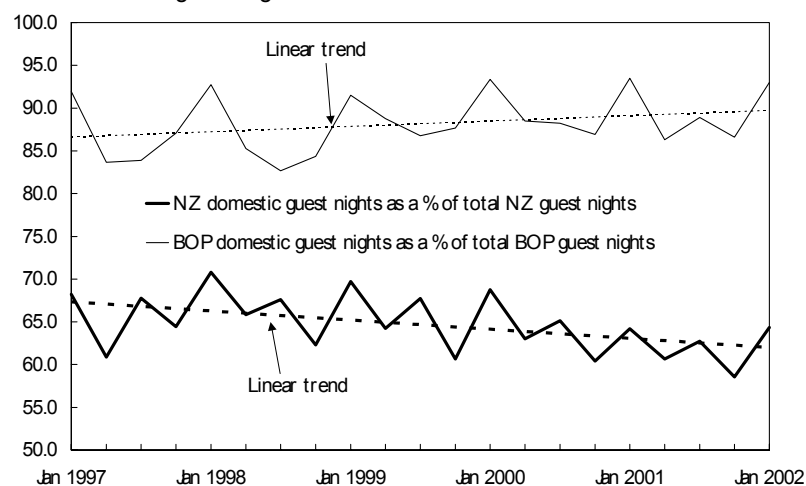


Source: Statistics New Zealand, NZIER

The trend in guest nights spent in the region reflects the type of tourists visiting the area. Guest nights for domestic visitors to the Bay of Plenty region have slightly increased as a proportion of total guest nights. In the month of January 2002, domestic tourists accounted for 93.0% of all guest nights. The increasing proportion of domestic visitor guest nights is in contrast to the trend at the national level, which has seen domestic guest nights declining as a proportion of total guest nights (see Figure 10).

**Figure 10 Domestic guest nights**

Per cent of total guest nights

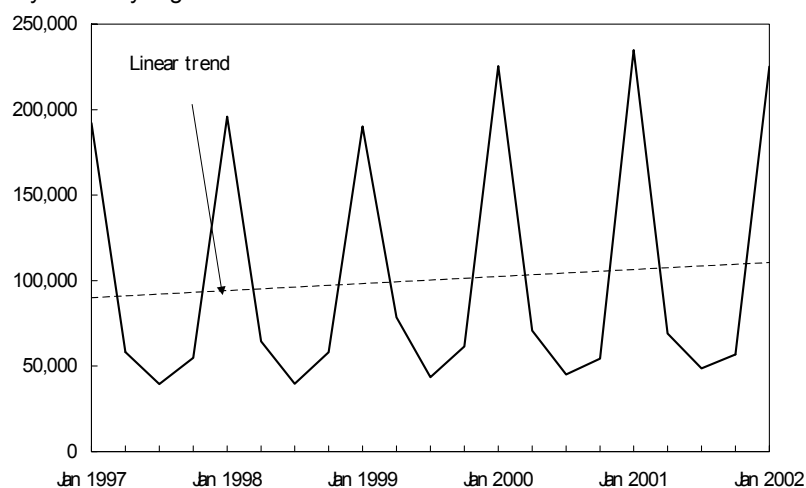


Source: Statistics New Zealand, NZIER

The numbers of both domestic and international tourists to the Bay of Plenty region have been increasing over time. In the month of January 2002, there were 225,220 domestic visitors to the region. This compares to 192,160 domestic visitors in January 1997. The number of international tourists to the region totalled 16,980 in January 2002, up from 16,840 in January 1997. However, because the total number of international visitors to New Zealand has grown at a faster rate, the proportion of international tourists visiting the region has fallen.

**Figure 11 Number of domestic visitors**

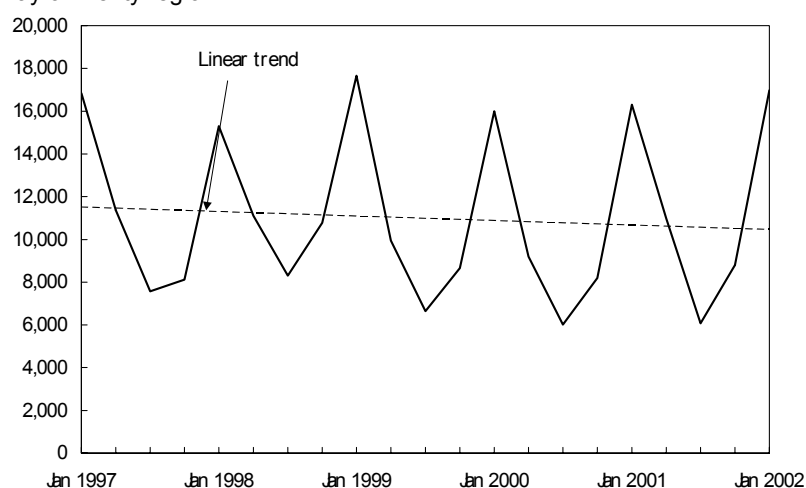
Bay of Plenty region



Source: Statistics New Zealand

**Figure 12 Number of international visitors**

Bay of Plenty region



Source: Statistics New Zealand

Statistics New Zealand's Tourism Satellite Account (TSA) provides us with information on expenditure by tourists. It thus focuses on the 'demand-side' nature of



tourism. The TSA is not regional, but looks at the spending patterns of different types of tourists at an aggregate level.

According to the provisional TSA for 1998-2000, 39.2% of total expenditure by domestic household tourists was on retail items (including fuel and other automotive products, and other retail sales).<sup>2</sup> By comparison, retail sales accounted for 27.0% of expenditure by international tourists.<sup>3</sup> Food and beverages account for 7.9% of expenditure by domestic tourists and 22.3% of spending by international tourists. Accommodation comprises 4.7% of domestic tourists' spending, and 16.5% of international visitor expenditure.

The relatively high importance of retail spending by tourists, particularly by domestic tourists, may partly explain the significance of the retail trade industry in the Western Bay of Plenty sub-region (refer discussion in 2.2.2 ).

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<sup>2</sup> The term tourist is defined slightly differently in the Tourism Satellite Account, than for the Accommodation Survey. Domestic tourists include households, and employees of private businesses and government organisations. We refer to figures for domestic household tourists only.

<sup>3</sup> Figures are exclusive of GST.

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## 3. KEY ECONOMIC DRIVERS

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### 3.1 Industry structure

#### 3.1.1 Shift-share analysis

Our shift-share analysis shows what the Western Bay of Plenty region's industry employment structure and growth would have looked like, had all industries grown at the same rate as nationally. By comparing these projections with actual employment, we can examine the region's performance relative to national averages.

Before undertaking the shift-share analysis, we first converted census data on full and part time employment by industry into full time equivalents (FTEs).

We then calculated the average annual growth rate of employment by industry at the national level, over the period 1996 to 2001. We applied these growth rates to the 1996 regional employment levels, projecting them out to 2001. This shows us what regional industry employment would have looked like, had each industry grown at the national average industry growth rate over this period.

We separated the difference between the regional projections and actual employment figures into a compositional and a performance effect. The compositional effect expresses the regional differences from national averages that is attributable to compositional differences in the region's employment, and can be written as follows:

$$1/ \quad \begin{array}{l} \text{projected total} \\ \text{regional employment} \end{array} \quad - \quad \begin{array}{l} \text{projected sum of} \\ \text{of regional industry} \\ \text{employment} \end{array} \quad = \quad \begin{array}{l} \text{compositional} \\ \text{difference} \end{array}$$

Projected total regional employment is simply total regional employment multiplied by the growth rate for national employment, i.e. we assume each industry grows at the same rate – the overall national industry growth rate.

The performance effect indicates the degree to which the region's economic performance accounts for differences from the national averages, and can be expressed as;

$$2/ \quad \begin{array}{l} \text{actual total} \\ \text{regional employment} \end{array} \quad - \quad \begin{array}{l} \text{projected sum} \\ \text{of regional industry} \\ \text{employment} \end{array} \quad = \quad \begin{array}{l} \text{regional performance} \end{array}$$

Our results are set out in Appendix B. We found that over the 1996-2001 period, the compositional effect was a very small positive (8), while the performance effect was a large positive, at 4,796.

Actual employment for most industries was higher than the projections for 2001. The exceptions were in the fishing, mining and quarrying, non-metallic minerals manufacturing, electricity, gas and water supply, and central government administration and defence industries. In other words, for all industries except these, the growth rate at the regional level exceeded the growth rate at the national level.

This result is likely to be largely a result of the region's population growth over the period, which has been well above the national average. Over the period 1996-2001, the Western Bay of Plenty region experienced an average of 2.8% annual population growth, compared to 0.6% for New Zealand as a whole.

The industries that differed most from the projections were business services, agriculture, health and community services, construction, education, and wholesale trade and retail trade. Employment in these industries in 2001 was significantly higher than if it had grown at the same rate as nationally (see Table B1).

## **3.2 Long-term employment projections**

### **3.2.1 National projections**

#### ***National real GDP projections***

Our projections of national economic growth over the next 50 years for each industry were derived by combining two approaches: 'top-down' and 'bottom-up'.

The top-down approach projects total national GDP growth. This method is demographics-based, using labour force projections to 2051, and assumptions about labour force productivity and the unemployment rate.

We used Statistics New Zealand's 'medium range' projections of the population. These assume medium fertility, and medium mortality rates, and medium migration (which is equivalent to annual average net migration of 5,000). We then used Statistics New Zealand's 'medium' assumption regarding labour force participation to derive the projected labour force. In our projections we have assumed that labour productivity will be 1.3% per annum, similar to the historical average.

For each year of the projection period, we took the percentage growth in real GDP as being equal to the percentage change in the labour force plus the percentage change in labour productivity.

The bottom-up method involves projections of industry-level GDP growth. We derived industry projections of real GDP, at the national level, by using average industry growth rates of the last decade. This gave us our initial industry projections, which when weighted together gave us an initial estimate of national GDP. (In order to do this weighting together we also had to produce projections of nominal GDP by industry. We did this by projecting forward industry shares of nominal GDP, based on historical trends). Finally we adjusted our industry estimates – our 'bottom-up' figures – so that total GDP growth matched the 'top-down' estimates based on growth in the labour force and labour productivity.

#### ***National employment projections***

The total national employment projections assume that employment growth will be the same as total growth in the labour force, and hence that the unemployment rate will remain constant over the period.

Projections of national employment levels by industry were derived using historical productivity trends (real GDP per employee) by industry. The resulting industry estimates were then scaled to sum to the national total employment estimates.

### 3.2.2 Sub-regional projections

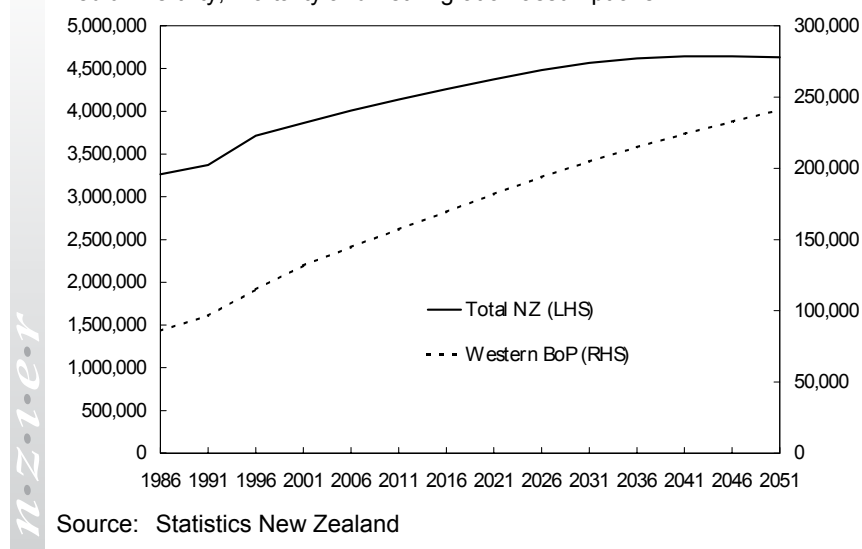
#### *Population and labour force*

We obtained demographic projections for the Tauranga and Western Bay of Plenty districts from Statistics New Zealand, and summed these together to form the Western Bay of Plenty sub-region. To ensure consistency with the national projections, we used the medium range projections of fertility, mortality, net migration, and labour force participation.

The Western Bay of Plenty region's population is projected to nearly double over the next 50 years, growing from 130,860 in 2001 to reach 241,000 by 2051 (Figure 13). Although annual population growth in the Western Bay of Plenty sub-region is projected to slow, from 2.8% in 2001 to 0.7% by 2051, this rate of growth is still much higher than that for total New Zealand, which is projected to become negative by the end of the projection period.

**Figure 13 Projected total population**

Medium fertility, mortality and net migration assumptions



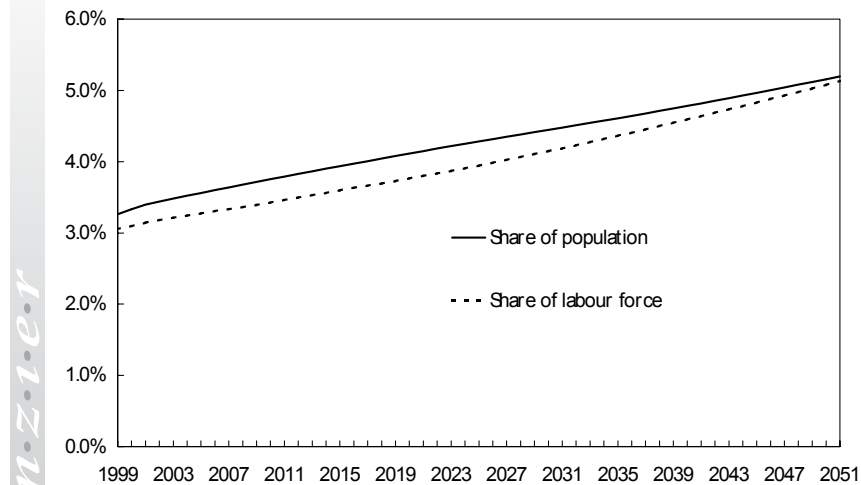
As a result, the region's share of total national population is projected to rise, from 3.4% in 2001 to 5.2% in 2051. The region's share of the labour force is projected to increase also, and at a faster rate (Figure 14). This is due to the changing demographic composition of the regional population, relative to New Zealand as a whole.

Whilst the number of people aged 0-14 years will decline at the national level, it is projected to increase in the Western Bay of Plenty region – by nearly one and a half times – over the next 50 years. The number of working age people (those aged 15-64) will increase much more rapidly in the region than for New Zealand as a whole.

Although growth in the number of people aged 65 and over is higher at the regional level, because of the strong growth in the younger cohorts, the increase in the proportion of older people is slower at the regional level. However, the region had a higher proportion of people aged 65 and over in 2001, and despite slower population ageing, ends the projection period with the same proportion of older people as New Zealand as a whole.

**Figure 14 Regional share of total national population and labour force**

Per cent, medium fertility, mortality and net migration assumptions

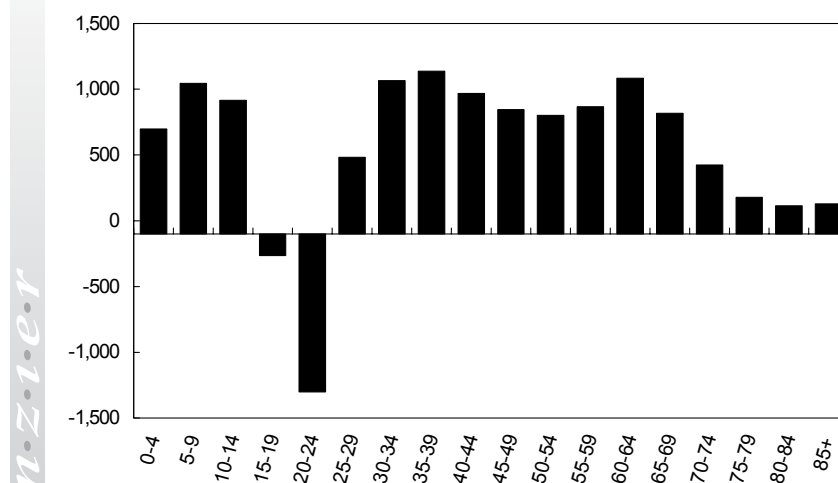


Source: Statistics New Zealand

The assumptions regarding net migration to the region are an important factor driving the demographic change over the projection period. The medium range projections assume net migration of 10,000 over every five year period. As shown in Figure 15, this assumes a net migration loss in the 15-19 and 20-24 age groups. The biggest migration gains come from the 30-34, 35-39, 60-64 and 5-9 age groups. This implies that a substantial proportion of the people moving in to the Western Bay of Plenty region are families with young children. People nearing retirement age also move in to the area.

**Figure 15 Assumed net migration by age, per 5-year period, 2001-2051**

Western Bay of Plenty region



Source: Statistics New Zealand

## Employment by industry

For each industry, we looked at the region's current share of the industry's total employment. Our aim was to project this share, then apply it to the national employment projections for that industry in order to get projections at the regional level. Note that the regional projections are for full time equivalents (FTEs).

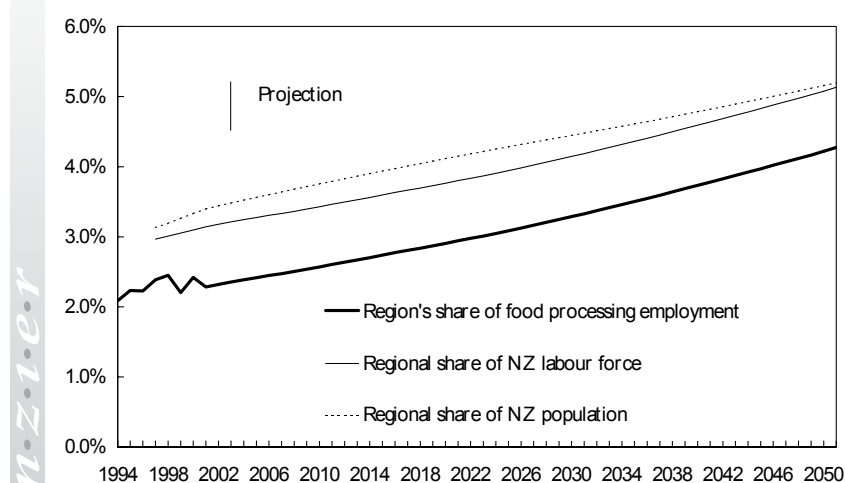
We also looked at the region's current share of the total labour force and total population. We already had projections for these two variables, since we had projections of total labour force and total population at both the national and regional levels. We used these projected shares as guidelines as to how the region's employment share within each industry would change.

For some industries we looked at the gap between the industry's employment share and the region's labour force share, and kept this gap constant. We did this for manufacturing industries. In effect, we assumed that the region's employment share in these industries would grow in line with the region's labour force share.

Let's take the food manufacturing industry as an example. The region's share of total employment in this industry in 2001 was 2.3%. The region's share of the total New Zealand labour force was 3.1%. We assume that the gap between these two numbers remains the same across the projection period. We do this by using our labour force projections, which show that the region's share of the total New Zealand labour force will increase over the projection period, to reach 5.2% by 2051. As shown in Figure 16, the gap between the industry share and the labour force share stays the same across the projection period.

**Figure 16 Projection of region's share of food processing employment**

Percent of national total; projections are unscaled



Source: Statistics New Zealand, NZIER

For service sector industries we looked at the gap between the industry's employment share and the region's population share and again kept this gap constant. In these industries we were assuming that the region's employment share would grow in line with the region's population share.

There were a number of exceptions to this approach:

- In the primary sector, specifically the agriculture, fishing, and mining and quarrying industries, we held the industry employment share constant at the 1996 level. This partly reflects the uncertainty surrounding historical BD data for these sectors,

especially for agriculture. But it also seems like a reasonable assumption. Unlike the manufacturing and service sectors, where output will largely be driven by the size of the labour force and population, output from the primary sector will largely be driven by natural resources. Hence it doesn't seem unreasonable to assume that growth in output and employment in these sectors at the local level will generally be in line with growth in these sectors at the national level. In effect we are tying growth in these sectors to the sub-region's share of national resources.

- For education, we used the gap between the industry's employment share and the region's share of the population aged 0-19 years. We did this in order for the employment growth in this industry to more closely reflect the future demand for education services in the region, which are concentrated in this age group.
- For health, we used the gap between the industry's share of employment, and the region's share of projected government spending on national health. We took health cost weights by age group from Treasury's long-term fiscal model (LTFM), and applied these to our regional and national population projections by age group. From this we derived projections of average health costs. By doing this, we weighted employment growth in this industry to the demographic projections, thereby accounting for the changing age structure of the population, in particular population ageing.

The projected industry shares were applied to the national employment projections to obtain levels of employment by industry. The employment numbers were then scaled so that total employment matched the totals derived from the regional labour force projections.

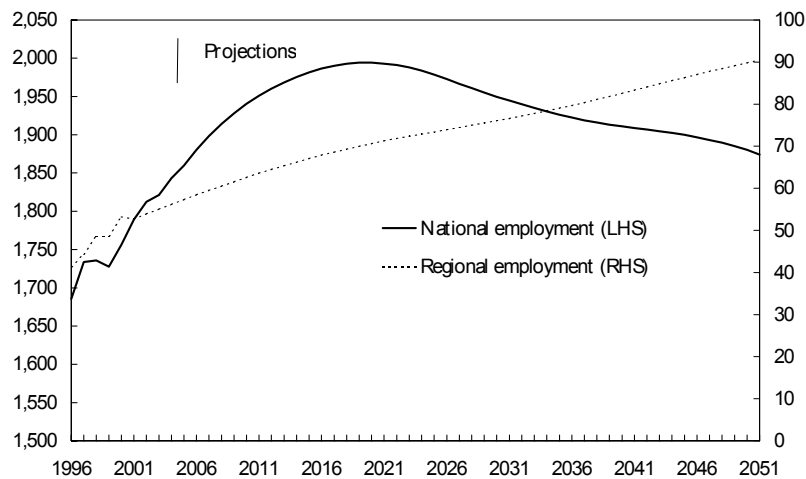
## **Results**

Detailed results are set out in Appendix C.

The following charts show projections for total real GDP and employment levels, both for the region and the nation.

**Figure 17 Total employment projections**

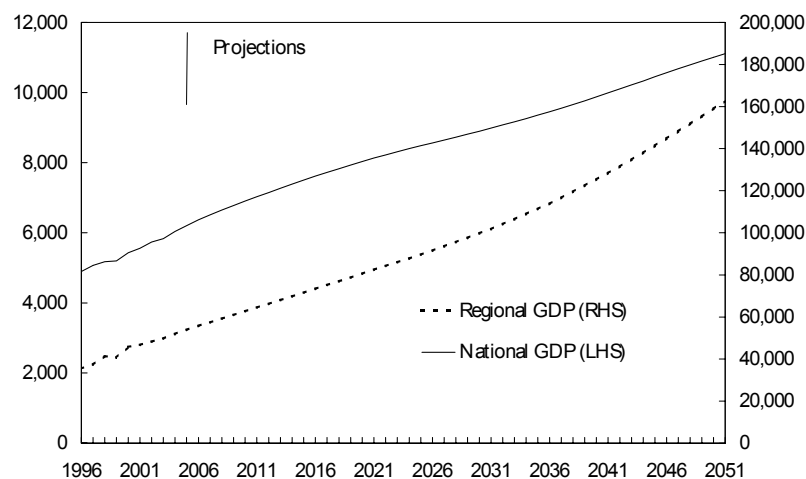
Thousands



Source: Statistics New Zealand, NZIER projections

**Figure 18 Total real GDP projections**

Dollar thousands, 1995/96 prices



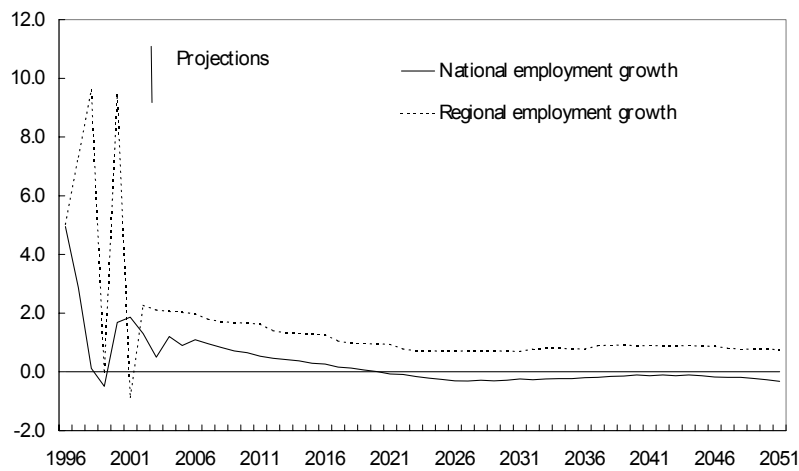
Source: Statistics New Zealand, NZIER projections

Figure 19 and Figure 20 plot the annual average per cent change in national and regional total employment and total real GDP. They show that projected employment and GDP growth for the Western Bay of Plenty is above the national average across the projection period.



**Figure 19 Total employment growth**

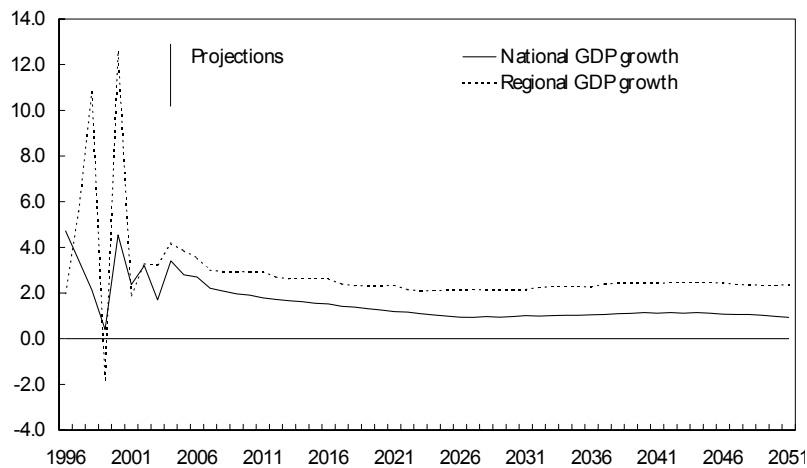
Annual average per cent change



Source: Statistics New Zealand, NZIER projections

**Figure 20 Total real GDP growth**

Annual average per cent change

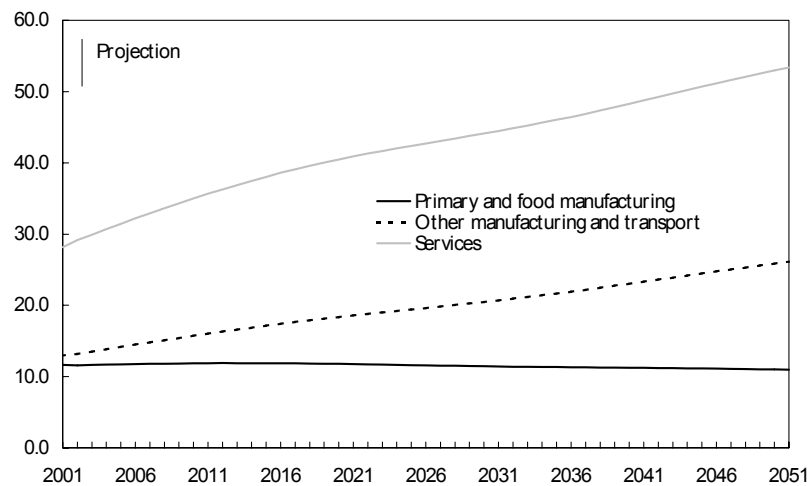


Source: Statistics New Zealand, NZIER projections

Figure 21 shows the number of people employed in each sector. Employment in the primary sector is projected to decline. The number of people employed in the other manufacturing and transport, and in the service sectors is projected to climb steadily over the projection period.

**Figure 21 Regional employment by sector**

Per cent of total employment



Source: Statistics New Zealand, NZIER projections

Table 5 shows the proportion of total employment in each sector. Employment in the primary sector is projected to decline in relative terms, both at the regional and national level. The proportion of people employed in other manufacturing and transport will increase regionally and nation-wide. The share of regional employment in the service sector also increases, closing the gap on the proportion of national employment in the service sector.

**Table 5 Employment shares by sector**

Per cent

	2001		2051	
	Western Bay of Plenty	Total NZ	Western Bay of Plenty	Total NZ
Primary and food manufacturing	22.1	12.6	12.1	9.8
Other manufacturing and transport	24.5	23.3	28.9	26.5
Services	53.4	64.1	59.0	63.8

Source: Statistics New Zealand, NZIER projections

Table C1 details the regional employment projections by industry.

## APPENDIX A: REGIONAL INPUT-OUTPUT ANALYSIS

**Table A1 Distribution of output by industry**

Dollar millions

Industry	Intermediate consumption (sales to local industry)	Household consumption (sales to households and private non-profit institutions serving households)	Government (sales to local and central government)	Investment (gross fixed capital formation and stocks)	Exports to the rest of New Zealand	Exports overseas	Gross output
Agriculture	172.8	9.1	0.0	3.9	77.8	167.9	431.5
Forestry and Logging	23.8	0.8	0.0	5.6	6.8	12.9	49.8
Fishing	21.6	0.1	0.0	0.1	2.8	6.6	31.2
Mining	13.8	0.2	0.0	0.9	13.9	15.5	44.4
Food, Beverage and Tobacco Manufacturing	90.9	107.8	0.1	12.0	33.1	246.3	490.2
Textiles and Apparel Manufacturing	12.8	13.2	0.0	0.7	0.4	12.0	39.1
Wood and Paper Product Manufacturing	85.0	3.8	0.0	2.6	25.3	46.6	163.2
Printing, Publishing and Recorded Media	44.3	9.2	0.0	0.4	4.3	2.3	60.5
Petroleum, Chemical, Plastic and Rubber	72.2	10.3	1.1	1.4	50.4	26.7	162.1
Non-metallic Mineral Product Manufacturing	47.8	1.2	0.0	1.1	4.7	2.4	57.3
Metal Product Manufacturing	56.6	2.3	0.0	4.5	7.5	18.0	88.9
Machinery and Equipment Manufacturing	44.0	20.9	0.1	58.4	7.6	31.3	162.2
Furniture and Other Manufacturing	11.1	11.6	0.0	11.7	3.9	6.9	45.1
Electricity, Gas and Water Supply	87.8	36.1	0.0	0.2	14.0	1.2	139.3
Construction	131.4	2.7	0.0	327.9	49.8	2.1	513.8

Industry	Intermediate consumption (sales to local industry)	Household consumption (sales to households and private non-profit institutions serving households)	Government (sales to local and central government)	Investment (gross fixed capital formation and stocks)	Exports to the rest of New Zealand	Exports overseas	Gross output
Wholesale Trade	149.5	105.7	2.4	31.9	27.6	61.5	378.5
Retail Trade	74.1	200.8	4.1	17.7	44.5	30.2	371.3
Accommodation, Restaurants and Bars	5.7	44.5	0.0	0.3	0.8	20.6	71.8
Transport and Storage	150.6	33.3	0.5	1.5	67.4	103.1	356.3
Communication Services	53.2	23.4	0.0	3.2	3.2	4.9	87.8
Finance and Insurance	112.4	41.1	0.1	0.3	13.9	2.7	170.3
Property Services	110.4	47.9	0.0	27.2	31.7	5.8	223.0
Ownership of Owner-occupied Dwellings	0.0	169.0	0.0	0.0	0.0	0.0	169.0
Business Services	166.5	5.9	2.1	15.1	27.0	6.7	223.2
Central Government Administration and Defence	7.1	2.3	86.5	0.6	0.9	1.0	98.4
Local Government Administration	3.4	1.0	39.0	1.3	0.1	0.4	45.1
Education	9.4	12.5	58.5	0.2	20.2	4.5	105.2
Health and Community Services	13.6	43.8	86.1	0.4	46.7	1.5	192.0
Cultural and Recreational Services	23.3	27.4	2.0	0.1	1.6	9.4	63.7
Personal and Other Community Services	20.5	31.6	0.7	0.5	13.1	2.9	69.4
TOTAL	1,815.4	1,019.0	283.3	531.4	600.9	853.6	5,103.6

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**Table A2 Industry contribution to total gross output**

Industry	% of total gross output
Agriculture	8.5
Forestry and Logging	1.0
Fishing	0.6
Mining	0.9
Food, Beverage and Tobacco Manufacturing	9.6
Textiles and Apparel Manufacturing	0.8
Wood and Paper Product Manufacturing	3.2
Printing, Publishing and Recorded Media	1.2
Petroleum, Chemical, Plastic and Rubber	3.2
Non-metallic Mineral Product Manufacturing	1.1
Metal Product Manufacturing	1.7
Machinery and Equipment Manufacturing	3.2
Furniture and Other Manufacturing	0.9
Electricity, Gas and Water Supply	2.7
Construction	10.1
Wholesale Trade	7.4
Retail Trade	7.3
Accommodation, Restaurants and Bars	1.4
Transport and Storage	7.0
Communication Services	1.7
Finance and Insurance	3.3
Property Services	4.4
Ownership of Owner-occupied Dwellings	3.3
Business Services	4.4
Central Government Administration and Defence	1.9
Local Government Administration	0.9
Education	2.1
Health and Community Services	3.8
Cultural and Recreational Services	1.2
Personal and Other Community Services	1.4
TOTAL	100.0

Source: NZIER, Statistics New Zealand

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**Table A3 Proportional distribution of industry output**

Per cent of industry's total gross output

Industry	Intermediate consumption	House- holds	Government	Investment	Export to rest of NZ	International exports
Agriculture	40.0	2.1	0.0	0.9	18.0	38.9
Forestry and Logging	47.8	1.6	0.0	11.1	13.6	25.9
Fishing	69.3	0.2	0.0	0.4	9.1	21.1
Mining	31.2	0.5	0.0	2.0	31.3	35.0
Food, Beverage and Tobacco Manufacturing	18.5	22.0	0.0	2.4	6.7	50.3
Textiles and Apparel Manufacturing	32.8	33.8	0.0	1.7	1.1	30.6
Wood and Paper Product Manufacturing	52.1	2.3	0.0	1.6	15.5	28.5
Printing, Publishing and Recorded Media	73.2	15.2	0.0	0.6	7.2	3.7
Petroleum, Chemical, Plastic and Rubber	44.5	6.3	0.7	0.9	31.1	16.5
Non-metallic Mineral Product Manufacturing	83.5	2.1	0.0	1.9	8.2	4.2
Metal Product Manufacturing	63.7	2.6	0.0	5.0	8.5	20.3
Machinery and Equipment Manufacturing	27.1	12.9	0.1	36.0	4.7	19.3
Furniture and Other Manufacturing	24.6	25.6	0.0	26.0	8.6	15.2
Electricity, Gas and Water Supply	63.1	25.9	0.0	0.1	10.1	0.8
Construction	25.6	0.5	0.0	63.8	9.7	0.4
Wholesale Trade	39.5	27.9	0.6	8.4	7.3	16.2
Retail Trade	20.0	54.1	1.1	4.8	12.0	8.1
Accommodation, Restaurants and Bars	7.9	61.9	0.0	0.4	1.1	28.7
Transport and Storage	42.3	9.3	0.1	0.4	18.9	28.9
Communication Services	60.5	26.6	0.0	3.6	3.7	5.6
Finance and Insurance	66.0	24.1	0.1	0.2	8.1	1.6
Property Services	49.5	21.5	0.0	12.2	14.2	2.6
Ownership of Owner-occupied Dwellings	0.0	100.0	0.0	0.0	0.0	0.0
Business Services	74.6	2.6	0.9	6.8	12.1	3.0
Central Government Administration and Defence	7.2	2.3	87.9	0.6	0.9	1.0
Local Government Administration	7.5	2.3	86.4	2.8	0.2	0.9
Education	8.9	11.8	55.6	0.2	19.2	4.3
Health and Community Services	7.1	22.8	44.8	0.2	24.3	0.8
Cultural and Recreational Services	36.6	42.9	3.1	0.2	2.6	14.7
Personal and Other Community Services	29.5	45.6	1.0	0.7	18.9	4.2
TOTAL	35.6	20.0	5.6	10.4	11.8	16.7

**Table A4 Net exports to the rest of New Zealand by industry**

Industry	Exports to the rest of New Zealand	Imports from the rest of New Zealand	Net exports to the rest of New Zealand <sup>1</sup>
	(\$ million)	(\$ million)	(\$ million)
Agriculture	77.8	101.8	-24.0
Forestry and Logging	6.8	2.1	4.7
Fishing	2.8	3.5	-0.7
Mining	13.9	10.6	3.2
Food, Beverage and Tobacco Manufacturing	33.1	82.8	-49.7
Textiles and Apparel Manufacturing	0.4	1.6	-1.2
Wood and Paper Product Manufacturing	25.3	42.4	-17.1
Printing, Publishing and Recorded Media	4.3	6.8	-2.4
Petroleum, Chemical, Plastic and Rubber	50.4	24.9	25.5
Non-metallic Mineral Product Manufacturing	4.7	6.2	-1.5
Metal Product Manufacturing	7.5	10.0	-2.4
Machinery and Equipment Manufacturing	7.6	14.9	-7.3
Furniture and Other Manufacturing	3.9	5.1	-1.2
Electricity, Gas and Water Supply	14.0	8.4	5.6
Construction	49.8	71.4	-21.6
Wholesale Trade	27.6	36.3	-8.7
Retail Trade	44.5	44.7	-0.2
Accommodation, Restaurants and Bars	0.8	4.1	-3.2
Transport and Storage	67.4	33.6	33.9
Communication Services	3.2	0.8	2.5
Finance and Insurance	13.9	6.7	7.1
Property Services	31.7	14.1	17.6
Ownership of Owner-occupied Dwellings	0.0	0.0	0.0
Business Services	27.0	13.2	13.8
Central Government Administration and Defence	0.9	4.8	-3.9
Local Government Administration	0.1	0.8	-0.7
Education	20.2	3.5	16.7
Health and Community Services	46.7	12.0	34.7
Cultural and Recreational Services	1.6	5.1	-3.4
Personal and Other Community Services	13.1	8.0	5.2
TOTAL	600.91	334.4	266.5

1) A negative sign (-) denotes that the industry is a net importer from the rest of New Zealand.

**Table A5 Regional contribution to national output**

Gross output by industry

Industry	Regional gross output (\$ million)	National gross output (\$ million)	Regional output as per cent of national
Agriculture	432	10,316	4.2
Forestry and Logging	50	2,613	1.9
Fishing	31	798	3.9
Mining	44	1,859	2.4
Food, Beverage and Tobacco Manufacturing	490	16,746	2.9
Textiles and Apparel Manufacturing	39	2,816	1.4
Wood and Paper Product Manufacturing	163	5,707	2.9
Printing, Publishing and Recorded Media	61	3,078	2.0
Petroleum, Chemical, Plastic and Rubber	162	6,650	2.4
Non-metallic Mineral Product Manufacturing	57	1,423	4.0
Metal Product Manufacturing	89	4,663	1.9
Machinery and Equipment Manufacturing	162	6,648	2.4
Furniture and Other Manufacturing	45	1,441	3.1
Electricity, Gas and Water Supply	139	5,443	2.6
Construction	514	12,806	4.0
Wholesale Trade	379	14,733	2.6
Retail Trade	371	10,963	3.4
Accommodation, Restaurants and Bars	72	3,155	2.3
Transport and Storage	356	9,615	3.7
Communication Services	88	4,763	1.8
Finance and Insurance	170	8,409	2.0
Property Services	223	7,559	2.9
Ownership of Owner-occupied Dwellings	169	8,694	1.9
Business Services	223	11,230	2.0
Central Government Administration and Defence	98	5,539	1.8
Local Government Administration	45	2,745	1.6
Education	105	4,798	2.2
Health and Community Services	192	6,307	3.0
Cultural and Recreational Services	64	3,469	1.8
Personal and Other Community Services	69	1,906	3.6
TOTAL	5,104	186,892	2.7



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**Table A6 Components of agricultural production**

Western Bay of Plenty region

Sub-sector	Gross output (\$ million)	% of total agriculture output
Other horticulture	53.3	12.3
Apple and pear growing	3.2	0.7
Kiwifruit growing	162.9	37.7
Other fruit growing	14.9	3.5
Mixed livestock and cropping	9.7	2.2
Sheep and beef cattle farming	32.7	7.6
Dairy cattle farming	89.9	20.8
Other farming	23.6	5.5
Services to ag, hunting and trapping	41.4	9.6
<i>Total agriculture</i>	<i>431.5</i>	<i>100.0</i>

Source: Statistics New Zealand, NZIER

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## APPENDIX B: SHIFT-SHARE ANALYSIS

**Table B1 Results of shift-share analysis**

Census employment numbers, converted to full time equivalents

Industry	Total regional employment 1996	National employment growth, 1996-2001	Regional employment growth, 1996-2001	Actual regional employment less projection (2001)
Agriculture	5,009	-0.7	1.5	567
Fishing	160	18.1	6.2	-151
Forestry and Logging	234	-17.2	-9.3	53
Mining and Quarrying	181	-3.8	-15.5	-71
Food, Beverages and Tobacco	1,552	0.7	1.1	26
Textiles and Apparel Manufacturing	405	-4.6	-2.3	41
Wood and Paper Products Manufacturing	868	-0.3	3.7	183
Printing, Publishing and Recorded Media	427	-0.9	3.0	87
Petroleum, Chemical, Plastics & Rubber Man.	427	-1.7	5.2	157
Non-Metallic Mineral Products Manufacturing	230	-0.2	-6.5	-63
Metal Product Manufacturing	562	-0.3	1.9	63
Machinery and Equipment Manufacturing	1,104	-0.9	3.6	264
Furniture and Other Manufacturing	467	-0.1	3.3	84
Electricity, Gas and Water Supply	296	-7.8	-15.5	-70
Construction	3,829	2.1	3.8	374
Wholesale Trade	2,405	1.0	3.7	355
Retail Trade	6,000	0.8	1.9	353
Accommodation, Cafes and Restaurants	1,345	3.1	5.5	191
Transport and Storage	2,130	1.4	3.3	223
Communication Services	422	-1.0	2.1	68
Finance, Insurance	1,052	-0.2	1.5	93
Property Services	1,212	1.0	2.9	128
Business Services	2,402	4.5	8.8	673
Central Govt Admin and Defence	884	-2.6	-3.3	-26
Local Government Administration	226	-0.4	10.9	158
Education	2,238	3.7	6.4	363
Health and Community Services	2,972	5.4	8.3	561
Cultural and Recreational Services	581	4.1	5.3	41
Personal and Other Community Services	1,704	1.4	1.9	48
<b>Total</b>	<b>41,365</b>	<b>1.3</b>	<b>3.5</b>	<b>4,796</b>

Source: Statistics New Zealand, NZIER

## APPENDIX C: LONG TERM EMPLOYMENT PROJECTIONS

**Table C1 Regional employment projections by industry**

Thousands, full time equivalents

March year	Agriculture	Fishing	Forestry and logging	Mining and quarrying	Food, beverage and tobacco manufacturing	Textiles and apparel manufacturing	Wood and paper products manufacturing
1994	3.8	0.2	0.2	0.2	1.4	0.5	0.9
1995	4.7	0.2	0.2	0.2	1.6	0.4	1.0
1996	5.0	0.2	0.2	0.2	1.6	0.4	0.9
1997	6.0	0.2	0.3	0.2	1.6	0.4	0.9
1998	7.7	0.3	0.2	0.2	1.7	0.4	1.0
1999	7.5	0.3	0.2	0.2	1.6	0.5	1.0
2000	9.1	0.5	0.2	0.4	1.6	0.4	1.0
2001	8.9	0.5	0.2	0.4	1.6	0.4	1.1
2002	9.0	0.5	0.2	0.4	1.6	0.4	1.1
2003	9.0	0.5	0.2	0.4	1.6	0.4	1.2
2004	9.0	0.5	0.2	0.4	1.7	0.4	1.2
2005	9.0	0.5	0.2	0.4	1.7	0.4	1.2
2006	9.0	0.5	0.2	0.4	1.7	0.4	1.2
2007	9.0	0.5	0.2	0.4	1.7	0.4	1.3
2008	9.1	0.5	0.2	0.4	1.8	0.4	1.3
2009	9.1	0.5	0.2	0.4	1.8	0.4	1.3
2010	9.0	0.5	0.2	0.4	1.8	0.4	1.3
2011	9.0	0.5	0.3	0.4	1.8	0.4	1.4
2012	9.0	0.5	0.3	0.4	1.9	0.4	1.4

March year	Agriculture	Fishing	Forestry and logging	Mining and quarrying	Food, beverage and tobacco manufacturing	Textiles and apparel manufacturing	Wood and paper products manufacturing
2013	9.0	0.5	0.3	0.4	1.9	0.4	1.4
2014	9.0	0.5	0.3	0.4	1.9	0.4	1.4
2015	9.0	0.5	0.3	0.4	1.9	0.4	1.5
2016	8.9	0.5	0.3	0.4	2.0	0.4	1.5
2017	8.9	0.5	0.3	0.4	2.0	0.4	1.5
2018	8.8	0.5	0.3	0.4	2.0	0.4	1.5
2019	8.8	0.5	0.3	0.4	2.0	0.4	1.5
2020	8.7	0.5	0.3	0.4	2.0	0.4	1.6
2021	8.7	0.5	0.3	0.4	2.1	0.4	1.6
2022	8.6	0.5	0.3	0.4	2.1	0.4	1.6
2023	8.6	0.5	0.3	0.4	2.1	0.4	1.6
2024	8.5	0.4	0.3	0.4	2.1	0.4	1.6
2025	8.4	0.4	0.3	0.4	2.1	0.4	1.6
2026	8.4	0.4	0.3	0.4	2.1	0.4	1.6
2027	8.3	0.4	0.3	0.4	2.2	0.4	1.7
2028	8.3	0.4	0.3	0.4	2.2	0.4	1.7
2029	8.2	0.4	0.3	0.4	2.2	0.4	1.7
2030	8.1	0.4	0.3	0.4	2.2	0.4	1.7
2031	8.1	0.4	0.3	0.4	2.2	0.4	1.7
2032	8.0	0.4	0.3	0.4	2.3	0.4	1.7
2033	8.0	0.4	0.3	0.4	2.3	0.4	1.8
2034	7.9	0.4	0.3	0.4	2.3	0.4	1.8

March year	Agriculture	Fishing	Forestry and logging	Mining and quarrying	Food, beverage and tobacco manufacturing	Textiles and apparel manufacturing	Wood and paper products manufacturing
2035	7.9	0.4	0.3	0.4	2.3	0.4	1.8
2036	7.8	0.4	0.3	0.4	2.4	0.4	1.8
2037	7.8	0.4	0.3	0.4	2.4	0.4	1.8
2038	7.7	0.4	0.3	0.4	2.4	0.4	1.9
2039	7.7	0.4	0.3	0.4	2.4	0.4	1.9
2040	7.6	0.4	0.3	0.4	2.5	0.4	1.9
2041	7.6	0.4	0.3	0.4	2.5	0.4	1.9
2042	7.5	0.4	0.3	0.4	2.5	0.4	2.0
2043	7.5	0.4	0.3	0.4	2.5	0.4	2.0
2044	7.4	0.4	0.3	0.5	2.6	0.4	2.0
2045	7.4	0.4	0.4	0.5	2.6	0.4	2.0
2046	7.3	0.4	0.4	0.5	2.6	0.4	2.0
2047	7.3	0.4	0.4	0.5	2.6	0.4	2.1
2048	7.2	0.4	0.4	0.5	2.6	0.4	2.1
2049	7.2	0.4	0.4	0.5	2.7	0.4	2.1
2050	7.1	0.4	0.4	0.5	2.7	0.4	2.1
2051	7.1	0.4	0.4	0.5	2.7	0.4	2.1

March year	Printing, publishing and recorded media	Petroleum, chemicals, plastics and rubber products manufacturing	Non-metallic mineral products manufacturing	Metal product manufacturing	Machinery and equipment manufacturing	Furniture and other manufacturing	Electricity, gas and water supply
1994	0.4	0.4	0.1	0.5	0.9	0.5	0.3
1995	0.4	0.4	0.2	0.5	1.2	0.5	0.3
1996	0.4	0.4	0.2	0.6	1.1	0.5	0.3
1997	0.4	0.4	0.2	0.6	1.2	0.5	0.3
1998	0.4	0.4	0.2	0.6	1.2	0.5	0.3
1999	0.4	0.5	0.2	0.6	1.2	0.5	0.2
2000	0.4	0.5	0.2	0.6	1.3	0.5	0.3
2001	0.5	0.5	0.2	0.6	1.5	0.5	0.3
2002	0.5	0.5	0.2	0.6	1.5	0.5	0.3
2003	0.5	0.5	0.2	0.7	1.5	0.6	0.3
2004	0.5	0.5	0.2	0.7	1.5	0.6	0.3
2005	0.5	0.6	0.2	0.7	1.5	0.6	0.3
2006	0.5	0.6	0.2	0.8	1.6	0.6	0.3
2007	0.5	0.6	0.2	0.8	1.6	0.6	0.3
2008	0.5	0.6	0.2	0.8	1.6	0.6	0.3
2009	0.5	0.6	0.2	0.9	1.6	0.6	0.3
2010	0.5	0.6	0.2	0.9	1.6	0.6	0.3
2011	0.5	0.6	0.2	0.9	1.7	0.7	0.3
2012	0.5	0.6	0.2	1.0	1.7	0.7	0.3

March year	Printing, publishing and recorded media	Petroleum, chemicals, plastics and rubber products manufacturing	Non-metallic mineral products manufacturing	Metal product manufacturing	Machinery and equipment manufacturing	Furniture and other manufacturing	Electricity, gas and water supply
2013	0.6	0.6	0.2	1.0	1.7	0.7	0.3
2014	0.6	0.6	0.2	1.1	1.7	0.7	0.3
2015	0.6	0.6	0.2	1.1	1.7	0.7	0.3
2016	0.6	0.6	0.2	1.1	1.7	0.7	0.3
2017	0.6	0.6	0.2	1.2	1.8	0.7	0.3
2018	0.6	0.6	0.2	1.2	1.8	0.7	0.3
2019	0.6	0.6	0.2	1.2	1.8	0.8	0.3
2020	0.6	0.6	0.2	1.3	1.8	0.8	0.3
2021	0.6	0.6	0.2	1.3	1.8	0.8	0.3
2022	0.6	0.6	0.2	1.4	1.8	0.8	0.3
2023	0.6	0.6	0.2	1.4	1.8	0.8	0.3
2024	0.6	0.6	0.2	1.4	1.8	0.8	0.3
2025	0.6	0.6	0.2	1.5	1.9	0.8	0.3
2026	0.7	0.6	0.2	1.5	1.9	0.8	0.3
2027	0.7	0.6	0.2	1.6	1.9	0.9	0.3
2028	0.7	0.6	0.2	1.6	1.9	0.9	0.3
2029	0.7	0.5	0.2	1.6	1.9	0.9	0.3
2030	0.7	0.5	0.2	1.7	1.9	0.9	0.3
2031	0.7	0.5	0.2	1.7	1.9	0.9	0.3
2032	0.7	0.5	0.2	1.8	2.0	0.9	0.3
2033	0.7	0.5	0.2	1.8	2.0	0.9	0.3
2034	0.7	0.5	0.2	1.9	2.0	1.0	0.3

March year	Printing, publishing and recorded media	Petroleum, chemicals, plastics and rubber products manufacturing	Non-metallic mineral products manufacturing	Metal product manufacturing	Machinery and equipment manufacturing	Furniture and other manufacturing	Electricity, gas and water supply
2035	0.8	0.5	0.2	2.0	2.0	1.0	0.3
2036	0.8	0.5	0.2	2.0	2.0	1.0	0.3
2037	0.8	0.5	0.2	2.1	2.0	1.0	0.3
2038	0.8	0.5	0.2	2.1	2.1	1.0	0.3
2039	0.8	0.5	0.2	2.2	2.1	1.0	0.3
2040	0.8	0.5	0.2	2.3	2.1	1.1	0.3
2041	0.8	0.5	0.2	2.3	2.1	1.1	0.3
2042	0.8	0.5	0.2	2.4	2.1	1.1	0.3
2043	0.8	0.5	0.2	2.4	2.1	1.1	0.3
2044	0.9	0.5	0.2	2.5	2.2	1.1	0.3
2045	0.9	0.5	0.2	2.6	2.2	1.2	0.3
2046	0.9	0.5	0.2	2.7	2.2	1.2	0.3
2047	0.9	0.5	0.2	2.7	2.2	1.2	0.3
2048	0.9	0.5	0.2	2.8	2.2	1.2	0.3
2049	0.9	0.5	0.2	2.9	2.2	1.2	0.3
2050	0.9	0.5	0.2	2.9	2.3	1.2	0.3
2051	0.9	0.5	0.2	3.0	2.3	1.3	0.3



March year	Construction	Wholesale trade	Retail trade	Accommodation, cafes and restaurants	Transport and storage	Communication services	Finance and insurance
1994	2.8	2.0	5.6	1.2	1.7	0.4	1.1
1995	3.5	2.4	5.8	1.2	1.8	0.4	1.1
1996	3.8	2.4	6.0	1.3	2.1	0.4	1.1
1997	4.3	2.7	6.2	1.4	2.1	0.4	1.1
1998	5.0	2.8	6.6	1.5	2.2	0.5	1.1
1999	5.1	2.6	6.8	1.5	2.0	0.4	1.1
2000	5.2	2.9	7.0	1.8	2.3	0.3	0.9
2001	5.0	3.0	7.0	1.8	2.3	0.5	1.0
2002	5.2	3.0	7.1	1.8	2.4	0.5	1.0
2003	5.3	3.1	7.3	1.9	2.4	0.5	1.0
2004	5.5	3.2	7.5	2.0	2.5	0.5	1.0
2005	5.7	3.2	7.7	2.0	2.6	0.5	1.1
2006	5.9	3.3	7.9	2.1	2.6	0.6	1.1
2007	6.0	3.3	8.1	2.2	2.7	0.6	1.1
2008	6.2	3.4	8.2	2.2	2.7	0.6	1.1
2009	6.3	3.4	8.4	2.3	2.8	0.6	1.1
2010	6.5	3.5	8.6	2.4	2.8	0.6	1.1
2011	6.7	3.5	8.7	2.4	2.9	0.6	1.1
2012	6.8	3.5	8.9	2.5	2.9	0.6	1.1

March year	Construction	Wholesale trade	Retail trade	Accommodation, cafes and restaurants	Transport and storage	Communication services	Finance and insurance
2013	7.0	3.6	9.1	2.6	3.0	0.6	1.1
2014	7.1	3.6	9.2	2.6	3.0	0.6	1.1
2015	7.2	3.6	9.4	2.7	3.0	0.6	1.1
2016	7.4	3.7	9.5	2.8	3.1	0.6	1.1
2017	7.5	3.7	9.6	2.8	3.1	0.6	1.1
2018	7.6	3.7	9.8	2.9	3.1	0.6	1.1
2019	7.8	3.7	9.9	3.0	3.2	0.6	1.1
2020	7.9	3.7	10.0	3.0	3.2	0.6	1.1
2021	8.0	3.8	10.2	3.1	3.2	0.6	1.1
2022	8.1	3.8	10.3	3.2	3.2	0.6	1.1
2023	8.2	3.8	10.4	3.2	3.2	0.6	1.1
2024	8.3	3.8	10.5	3.3	3.2	0.5	1.1
2025	8.5	3.8	10.6	3.4	3.2	0.5	1.1
2026	8.6	3.8	10.7	3.4	3.2	0.5	1.1
2027	8.7	3.8	10.8	3.5	3.2	0.5	1.0
2028	8.8	3.8	10.9	3.5	3.3	0.5	1.0
2029	8.9	3.8	11.0	3.6	3.3	0.5	1.0
2030	9.0	3.8	11.1	3.7	3.3	0.5	1.0
2031	9.1	3.8	11.2	3.7	3.3	0.5	1.0
2032	9.2	3.8	11.3	3.8	3.3	0.4	1.0
2033	9.3	3.8	11.4	3.9	3.3	0.4	1.0
2034	9.5	3.8	11.6	4.0	3.3	0.4	1.0

March year	Construction	Wholesale trade	Retail trade	Accommodation, cafes and restaurants	Transport and storage	Communication services	Finance and insurance
2035	9.6	3.8	11.7	4.0	3.3	0.4	1.0
2036	9.7	3.8	11.8	4.1	3.3	0.4	1.0
2037	9.8	3.8	11.9	4.2	3.3	0.4	1.0
2038	10.0	3.8	12.0	4.3	3.3	0.4	0.9
2039	10.1	3.9	12.2	4.3	3.3	0.4	0.9
2040	10.3	3.9	12.3	4.4	3.4	0.4	0.9
2041	10.4	3.9	12.4	4.5	3.4	0.4	0.9
2042	10.5	3.9	12.6	4.6	3.4	0.4	0.9
2043	10.7	3.9	12.7	4.7	3.4	0.3	0.9
2044	10.8	3.9	12.8	4.8	3.4	0.3	0.9
2045	11.0	3.9	13.0	4.9	3.4	0.3	0.9
2046	11.1	3.9	13.1	4.9	3.4	0.3	0.9
2047	11.3	3.9	13.2	5.0	3.4	0.3	0.9
2048	11.4	3.9	13.3	5.1	3.4	0.3	0.9
2049	11.5	3.9	13.5	5.2	3.4	0.3	0.9
2050	11.7	3.9	13.6	5.3	3.4	0.3	0.9
2051	11.8	3.9	13.7	5.4	3.4	0.3	0.8

March year	Property services	Business services	Govt admin and defence	Education	Health and community services	Cultural and recreational services	Personal and other community services	TOTAL
1994	1.0	2.2	1.0	1.9	2.5	0.5	1.6	35.5
1995	1.3	2.3	1.0	1.9	2.8	0.6	1.6	39.3
1996	1.2	2.4	1.1	2.2	3.0	0.6	1.7	41.3
1997	1.2	2.6	1.0	2.3	3.3	0.6	1.9	44.3
1998	1.4	3.1	1.1	2.3	3.3	0.6	2.0	48.6
1999	1.3	3.2	1.1	2.5	3.6	0.6	2.0	48.6
2000	1.4	3.8	0.9	2.7	3.8	0.7	2.2	53.2
2001	1.4	3.9	1.0	2.8	3.2	0.7	2.1	52.7
2002	1.4	4.0	1.0	2.6	3.9	0.8	2.1	53.9
2003	1.4	4.2	1.1	2.7	4.0	0.8	2.1	55.1
2004	1.4	4.3	1.1	2.8	4.1	0.8	2.2	56.2
2005	1.4	4.5	1.1	2.8	4.2	0.9	2.2	57.3
2006	1.4	4.6	1.2	2.9	4.3	0.9	2.3	58.5
2007	1.4	4.8	1.2	2.9	4.4	0.9	2.3	59.5
2008	1.4	4.9	1.2	3.0	4.5	0.9	2.3	60.5
2009	1.5	5.1	1.3	3.1	4.6	1.0	2.4	61.5
2010	1.5	5.3	1.3	3.1	4.6	1.0	2.4	62.6
2011	1.5	5.4	1.3	3.2	4.7	1.0	2.4	63.6
2012	1.5	5.5	1.4	3.3	4.8	1.0	2.4	64.5

March year	Property services	Business services	Govt admin and defence	Education	Health and community services	Cultural and recreational services	Personal and other community services	TOTAL
2013	1.5	5.7	1.4	3.4	4.8	1.1	2.4	65.3
2014	1.5	5.8	1.4	3.4	4.9	1.1	2.4	66.2
2015	1.5	6.0	1.5	3.5	4.9	1.1	2.4	67.0
2016	1.6	6.1	1.5	3.6	4.9	1.1	2.5	67.9
2017	1.6	6.3	1.5	3.6	5.0	1.1	2.5	68.6
2018	1.6	6.4	1.6	3.7	5.0	1.1	2.5	69.3
2019	1.6	6.5	1.6	3.7	5.0	1.2	2.5	69.9
2020	1.6	6.6	1.6	3.8	5.1	1.2	2.4	70.6
2021	1.6	6.8	1.7	3.8	5.1	1.2	2.4	71.3
2022	1.6	6.9	1.7	3.9	5.1	1.2	2.4	71.8
2023	1.6	7.0	1.8	3.9	5.1	1.2	2.4	72.4
2024	1.6	7.1	1.8	4.0	5.1	1.2	2.4	72.9
2025	1.7	7.2	1.8	4.0	5.0	1.2	2.4	73.4
2026	1.7	7.3	1.9	4.1	5.0	1.2	2.4	73.9
2027	1.7	7.5	1.9	4.1	5.0	1.2	2.4	74.4
2028	1.7	7.6	1.9	4.2	5.0	1.2	2.4	75.0
2029	1.7	7.7	2.0	4.2	5.0	1.2	2.3	75.5
2030	1.7	7.8	2.0	4.3	5.0	1.2	2.3	76.0
2031	1.7	7.9	2.1	4.3	5.0	1.2	2.3	76.6
2032	1.8	8.1	2.1	4.4	5.0	1.2	2.3	77.2
2033	1.8	8.2	2.1	4.5	4.9	1.2	2.3	77.8
2034	1.8	8.3	2.2	4.5	4.9	1.2	2.3	78.4

March year	Property services	Business services	Govt admin and defence	Education	Health and community services	Cultural and recreational services	Personal and other community services	TOTAL
2035	1.8	8.4	2.2	4.6	4.9	1.2	2.3	79.0
2036	1.8	8.6	2.3	4.6	4.9	1.2	2.3	79.6
2037	1.8	8.7	2.3	4.7	4.9	1.2	2.2	80.4
2038	1.8	8.9	2.3	4.8	4.9	1.2	2.2	81.1
2039	1.8	9.0	2.4	4.8	4.9	1.2	2.2	81.8
2040	1.9	9.2	2.4	4.9	4.9	1.2	2.2	82.6
2041	1.9	9.3	2.5	5.0	4.8	1.2	2.2	83.3
2042	1.9	9.5	2.5	5.0	4.8	1.2	2.2	84.0
2043	1.9	9.6	2.6	5.1	4.8	1.2	2.2	84.8
2044	1.9	9.8	2.6	5.2	4.8	1.2	2.2	85.5
2045	1.9	9.9	2.7	5.2	4.8	1.2	2.2	86.3
2046	1.9	10.1	2.7	5.3	4.8	1.2	2.2	87.1
2047	2.0	10.3	2.8	5.4	4.8	1.2	2.1	87.8
2048	2.0	10.4	2.8	5.4	4.8	1.2	2.1	88.4
2049	2.0	10.6	2.9	5.5	4.8	1.2	2.1	89.1
2050	2.0	10.7	2.9	5.6	4.8	1.2	2.1	89.8
2051	2.0	10.9	3.0	5.6	4.8	1.2	2.1	90.5