Transport and Regional Economic Development

Report

This Report describes a case study of capacity of regional transport infrastructure to meet current and future demands of industry. The selected region is comprised largely of the Australian Bureau of Statistics statistical divisions of the South East division of South Australia and the South Western division of Victoria. The region is an important corridor for the transport needs of other regions. The region's transport infrastructure inlcudes a port, road and rail networks, and airports.

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Bureau of Transport and Communications Economics

REPORT 74

TRANSPORT AND REGIONAL ECONOMIC DEVELOPMENT

AUSTRALIAN GOVERNMENT PUBLISHING SERVICE, CANBERRA

ISSN 1034-4152
ISBN 0 644 24658 8

Printed for AGPS by Better Printing Service, 1 Foster Street, Queanbeyan NSW 2620

FOREWORD

Studies of regional economies and their transport provisions are important sources of information for the planning activities of both government and private bodies. Such studies can provide insights into key local transport issues and the methods by which they may be addressed.

The Bureau has undertaken a case study of a region located in the south-west of Victoria and the south-east of South Australia. The study was based largely on published and unpublished information from authorities providing transport services and the Australian Bureau of Statistics, and entailed the collection of relatively little survey data. This report presents a description of the study and its findings.

Apart from the findings presented for the region, the study has assisted in the development of the Bureau's research base for the study of such issues, and provided a broader focus for studies of transport corridors.

The study was initially carried out by Mr K. Hassall, assisted by Dr Z. Rahmani and Mr E. Elinon. The work was completed under the direction of Mr W. Leslie.

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Bureau of Transport and Communications Economics
Canberra
March 1992

ACKNOWLEDGMENTS

Sincere appreciation is extended to all the following contact organisations who supplied information which was important for the compilation of this paper.

VICTORIA

Department of Conservation, Forests and Lands
Department of Management and Budget
Elders Pastoral Portland
Fletcher Jones and Staff (Warrnambool)
Municipal Association of Victoria
Nestle Pty Ltd
O'Connor Air Services
R. A Pearson and Associates
Phosphate Co-operative Company of Australia
Portland Development Committee Incorporated
Port of Geelong Authority
Port of Portland Authority
Portland Smelter Services Pty Ltd
B. Seppelt and Sons Ltd (Great Western)
Stawell and Grampians Development Association
Vicroads (Roads Corporation) formerly Road Construction Authority
Victorian Dairy Farmers Association
Victorian Farmers Association
Victorian Fishing Industry Council
V/Line
Wimmera Industrial Minerals Pty Ltd

SOUTH AUSTRALIA

Apcel Pty Ltd
Australian National Railways
Coonawarra Winegrowers Association
Department of Fisheries
Department of Road Transport, formerly Highways Department
Government Management Board
Green Triangle Council for Regional Development

K & S Freighters Pty Ltd
Scotts Transport Pty Ltd
United Farmers and Stockowners Association

NATIONAL

Australian Bureau of Agricultural and Resource Economics
Australian Bureau of Statistics
Australian Dairy Products Federation Inc
Australia Quarantine and Inspection Service
Australian Wheat Board
Bureau of Mineral Resources
Department of Immigration Local Government and Ethnic Affairs, Office of Local Government
Department of Primary Industries and Energy
Department of Transport and Communications

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ABSTRACT

This report describes a case study of capacity of regional transport infrastructure to meet current and future demands of industry. The selected region is comprised largely of the Australian Bureau of Statistics statistical divisions of the South East division of South Australia and the South Western division of Victoria. The region is an important corridor for the transport needs of other regions. The region's transport infrastructure inlcudes a port, road and rail networks, and airports.

The study examined the economic structure of the region, the usage of freight transport services and the capacity of those services to meet existing transport demand. The region's potential for production development was assessed. Further, both potential developments outside the region and trends in regulatory and economic policies were appraised as to their likely influence on transport within the region. Finally, a determination was made of the ability of the regional transport infrastructure to meet the transport demand which could stem from development within the region, from external developments of industry and transport affecting the region, and from potential modifications to policies affecting the regulatory and pricing frameworks of transport.

Inputs to the study included data from two surveys conducted by the Bureau, a road transport operator survey and an industry survey.

The principal conclusions of the study were that:

- the infrastructure was generally adequate to meet the current transport demand for all modes;
- there was potential for growth in regional transport demand due to increases in production, and to development within the region and outside it;
- transfers of some transport demand between modes, and between the region and the surrounding area, may result from regulatory and micro-economic reforms;
- transport infrastructure in the region had sufficient capacity to accommodate foreseeable growth and transfer of demand, but appreciable increases in asset preservation costs could occur.

CHAPTER 1 INTRODUCTION

This report analyses the demand on freight transport services made by industry at the regional level. The objective of the study was to determine whether or not there were any potential impediments to the efficient operation of transport services under present and future economic conditions. The objectives also included the costing of transport infrastructure needed to provide for foreseeable industry developments.

At the national level, an assessment of the interaction between economic development and transport services is complicated by the wide diversity of types of transport tasks and of transport infrastructure provisions. While the scale of transport services and commodity flows may be reduced where a small region is examined, such as in this study, the complications may be not be diminished greatly. Further, despite careful selection and definition of the region boundaries to facilitate data collection, the extent of available information is considerably less than that published for Australia as a whole. A secondary objective of the study was to develop suitable analytical methods within the constraints imposed by data limitations, for application to similar studies of other regions or transport corridors.

For this case study a region was selected on the basis of its economic significance and on the range of transport services available. Further, because of the interest of the regional authorities in the role of transport in local development, it was evident that access to data would be facilitated.

The selected study region, which is referred to subsequently as 'the region', is shown in figure 1.1. The region consists of two Australian Bureau of Statistics statistical divisions, the South East of South Australia and the South Western division of Victoria, and Kowree (a part of the Wimmera statistical division).

The South East statistical division consists of the local government areas of Mount Gambier city and shire, Millicent, Tatiara, Naracoorte district council and municipality, Penola, Lacepede, Port Macdonnell, Beachport, Lucindale and Robe. The South Western statistical division consists of the local government areas of the city and shire of Warrnambool, Belfast, Camperdown, Glenelg, Wannon, Dundas, Hamilton, Heywood, Portland, Mount Rouse, Minhamite, Heytesbury, Hampden, Mortlake and Port Fairy.

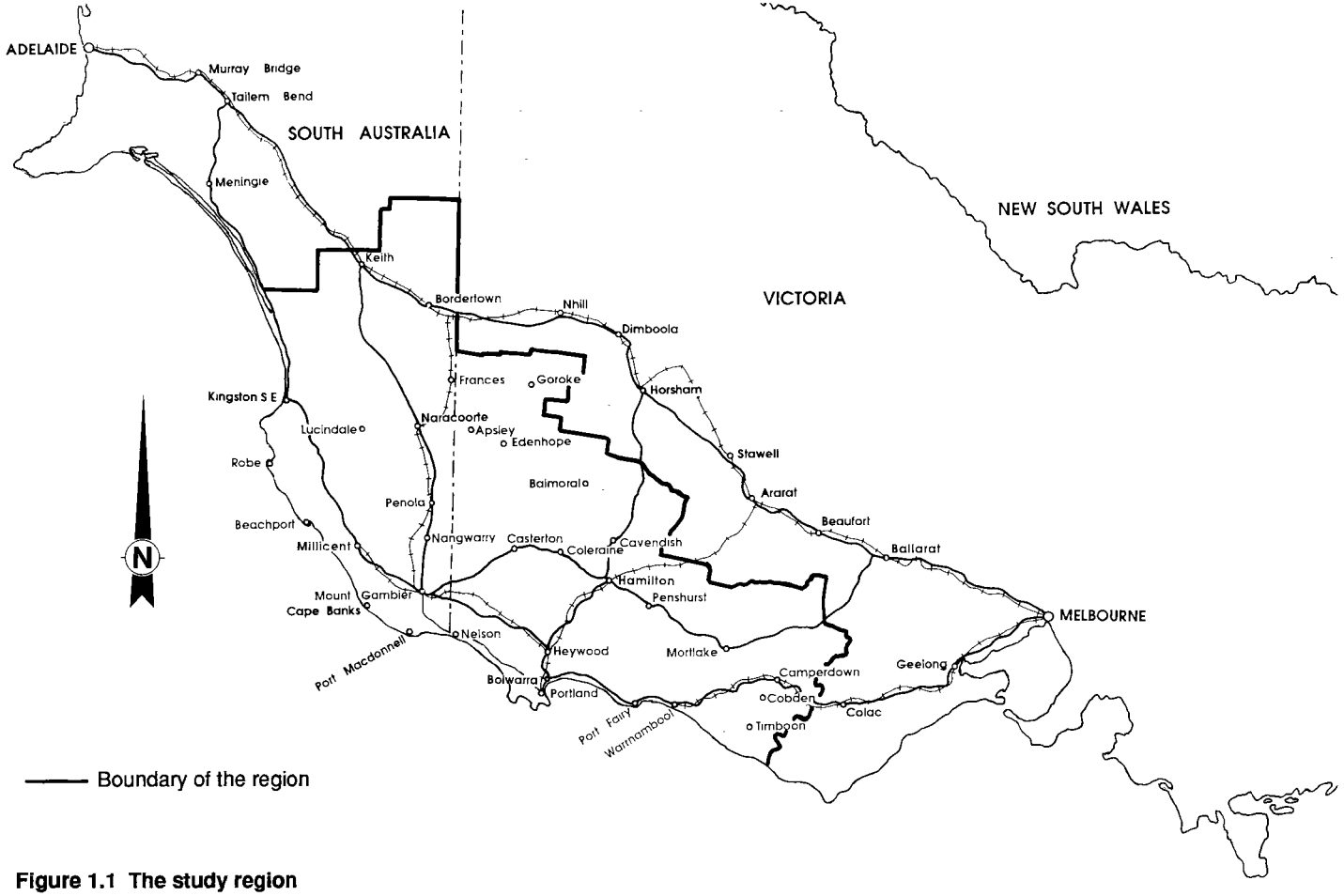


Figure 1.1 The study region

The region has an area of about 50 000 square kilometres and is served by road, rail, sea and air facilities. The production from the region is derived from a range of primary and secondary industries. The principal exports from the port of Portland are bulk grain, woodchips, live sheep and aluminium ingots. The largest single employer is Portland Aluminium which employs about 800 persons.

Previous studies

There have been previous studies on economic development undertaken within, or embracing the region. In these studies some observations were made about transport infrastructure, although a comprehensive analysis of transport issues and facilities, and of the implications of future economic development, was not included.

The previous reports of particular relevance to this study are:

- the studies of Stawell, Warrnambool and Portland by the Victorian Department of Industry, Technology and Resources (DITR 1988a, 1988b, 1989);
- a study of the economic development of south-eastern South Australia by the Department of Economic Development, South Australia (1978);
- a study of the economic development of the south-west of Victoria by the Department of State Development, Decentralisation and Tourism, Victoria (1978);
- a study of the potential development of industry, and of the resource, physical, social and economic characteristics of the region by the Green Triangle Council for Regional Development Ltd (1986).

The DITR studies provide economic profiles which trace the factors leading to development in the two largest population centres of the region. In the DITR studies, transport issues were not addressed specifically, although some observations were made about the development of transport infrastructure in the context of providing services to regional industry.

The Bureau study

The Bureau's study is primarily directed towards transport. The principal modes of freight transport were examined at both the intraregional and interregional levels. An analysis of current land use and industry was undertaken, and an assessment made of the present state of the transport system, to gain an insight relevant to future economic planning.

The study comprised the following sequence of activities:

- assessment of the economic structure and its potential for development;
- appraisal of the commodity production levels and flows, and use of transport facilities;
- examination of the outlook for transport services and of any desirable changes to current transport provisions in the light of economic development.

The economic structure and commodity production levels were assessed by an analysis of statistics on production and employment. Information on the potential for development of industries, and the usage and level of service of transport facilities, was obtained by means of two surveys conducted for this purpose by the Bureau. This information was supplemented by particulars obtained from a number of authorities and from literature.

The report is aimed at all levels of government and is intended to assist the planning of transport investment, operation and regulation.

Structure of the report

In chapter 2 the region and its economy are described. The significance of the commodities of the region is outlined and their demand for transport services is assessed. Trends and new developments are noted, and the outlook for commodities and industries is discussed.

Chapter 3 examines the role of sea transport in the region. The outlook for the Port of Portland is described, together with implications for investment and policy changes in sea transport in the region. User opinions are presented.

Chapter 4 examines the role of road transport in the region, the outlook for demand on the road network, and the potential impact of future demand on road conditions and investment. User opinions of road conditions are described.

Descriptions of the services provided to industry for transport by rail and air are given in chapters 5 and 6 respectively. The implications for future usage, and user attitudes, are discussed.

Chapter 7 gives an overview of transport services in the region, drawn from previous chapters. Some concluding observations are made about the outlook for the economy, for transport demand, and for investment in transport infrastructure, based on the analyses given in the preceding chapters.

The four appendixes include details to support the analyses presented in various chapters.

Appendix I presents data supplementary to that presented in chapter 2.

Appendix II contains the details of the method and results of the survey of industry, through which an indication of the relative importance and the level of usage of each mode was gained. The survey provided an indication of transport service shortcomings by mode, as well as identifying sources of satisfaction and dissatisfaction.

Appendix III discusses the findings from a survey of road freight transport operators. Details of transport operations (type of vehicle by main routes used) were sought, together with the prevailing levels of satisfaction or dissatisfaction with the road network.

Data on roads and traffic in the region are presented in appendix IV, to supplement information provided in chapter 4.

CHAPTER 2 THE REGIONAL ECONOMY

INTRODUCTION

This chapter presents an overview of the structure of the regional economy and an analysis of its major sectors. The chapter also includes a discussion of the transport task and the implications of regional economic development on the demand for transport services.

THE REGIONAL ECONOMY

Table 2.1 provides a comparison of the region with the whole of Australia in terms of key indicators of resources, production and export.

TABLE 2.1 THE REGION IN PERSPECTIVE, 1988–89

	Region	*Australia*	*Region as a percentage of Australia (per cent)*
Area (thousand ha)	5 000	768 284	0.7
Area cultivated (thousand ha)	3 499	46 690	7.5
Population (persons)	166 910	16 538 200	1.0
Employment (persons)[a]	80 600	6 059 900	1.3
Value of production ($ million)	3 061[b]	175 838[b]	1.7
Value of exports ($ million)	1 496[c]	43 462[d]	3.4

a. Employment figures are for 1987–88.

b. Excludes forestry.

c. Value f.o.b, includes woodchip, wool, live sheep and aluminium produced in the region some of which are exported from ports outside of the region. Includes grain and other commodities exported through the Port of Portland originating from other regions. Excludes peas and beans, silicon sand, food products, fodder, live cattle and goats.

d. Value f.o.b, all produce excluding re-exports.

Sources ABS (1991a, 1991b, 1991c).

The region is fertile and productive, with the area cultivated representing 68 per cent of the total land area in the region. The value of regional production[1] in 1988–89 was estimated at $3061 million at current prices. Value of production is used as a measure of the output of agriculture, forestry, fishing, mining and manufacturing industries and is equivalent to gross regional product plus imports. The ratio of values of manufacturing production to agricultural production in the region is about 1.4:1 in contrast to the national ratio of 6.6:1.

Production in the region has a strong export orientation. In 1988–89 an estimated 75 per cent of the region's aluminium production was exported along with almost all of the region's wool production and about 10 to 20 per cent of the output of the food and timber industries. The balance of the region's production goes to domestic markets. There is self-sufficiency in most food items in the region and a regional surplus in some items such as milk, meat, wheat and vegetables.

Population

Appendix I includes population and growth rate estimates for each local government area for the period 1976 to 1986. Across the region, population decreases are seen in the rural districts accompanied by population increases in the urban areas during this eleven-year period. There is evidence to show that some centralisation of services and trade in the urban areas occurred in the region coinciding with this shift from rural to urban areas (DITR 1988b). More recent data indicate that the region's total population remained steady over the period 1982 to 1989 at about 167 000 persons (ABS 1991b, 1991c).

With a total land area of 5.0 million hectares, the region had an overall population density of approximately 0.030 persons per hectare in 1986. The rural local government areas of the region had population densities ranging from 0.007 to 0.080 persons per hectare in contrast to the urban areas which had population densities ranging from 1 to 10 persons per hectare in 1986.

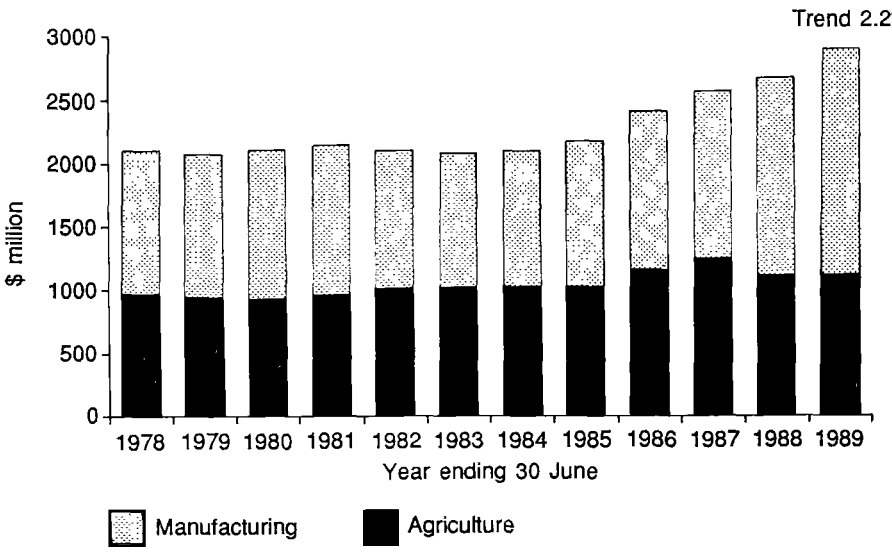
The population performs both producer and consumer roles and thus makes a dual contribution to transportation demand and regional economic development.

Regional production

Manufacturing in the region has incorporated some backward integration by processing industries taking advantage of access to nearby sources of raw materials such as in the paper and wood products industry or the dairy industry. An exception to this has been the Portland aluminium smelter which has its alumina input shipped from Western Australia and electricity provided by the Loy Yang power plant.

As shown in figure 2.1, it was only in recent years that the manufacturing sector became the more important contributor to total value of production. The

1. Throughout this chapter the value of production is measured as turnover.



a. Trend refers to total of manufacturing and agriculture; significant at the 1 per cent level of probability.

Note Deflated by the ABS implicit price index for value of production of agriculture and manufacturing.

Sources ABS (1989a, 1989b, 1990g, 1990h, 1991a, 1991b); BTCE.

Figure 2.1 Value of regional production 1977–78 to 1988–89, at constant 1987–88 prices

acceleration in the manufacturing sector was mainly due to the establishment of newer industries, notably aluminium smelting, coming into the region while agricultural and related food processing sectors remained almost steady.

In 1988–89, manufacturing, with a value of production of about $1.8 billion, accounted for more than half of the region's value of production. The relative importance of the region in terms of value of production of the primary sectors is apparent from the level of contribution to the national value of production. In 1988–89, agricultural value of production was $1182 million, representing a 5.5 per cent contribution to the Australian agricultural value of production. Similarly, fishing had a value of production of about $70 million for the same year, representing a 7.7 per cent contribution to Australian fishing value of production. The pine forestry industry in the region represents about 20 per cent of national pine forestry in terms of tonnages of log production.

Economic indicators

In a BTCE study (BTCE 1989b) on national economic indicators, statistical local areas[2] (SLAs) were ranked on a nationwide basis according to various characteristics. The SLA characteristics used in this study were obtained from the ABS Integrated Register of Industry Statistics (1988). Part 2 of appendix I provides some details of the findings from that study as they apply to the region. Appendix I explains the derivation of the indicators, and presents the rankings of the SLAs in the region based on four criteria.

As shown in appendix I, 17 of the local government areas in the region out of a total 29 were ranked amongst the top 10 per cent in the nation in terms of the criteria of export and import competing orientation, road transport cost sensitivity and tourism. Notably amongst the high ranking local government areas are Heywood, Dundas, Warrnambool, Hampden, Heytesbury and Naracoorte.

TRANSPORT IN THE REGION

The tonnages of the principal commodities transported in 1988–89, to and from the region, and within the region, are given in table 2.2. The tonnages of exports and imports were also included in the tonnages of intraregional and interregional movements. However, where interregional commodity movements involved double-handling within the region, the double-handled tonnages were excluded from the tonnages for intraregional movements. No estimate was made for the tonnage of 'corridor' traffic moving through the region other than that moving through the Port of Portland. For example, no estimates were made for the Melbourne–Adelaide traffic passing through the north of the region in South Australia. Figure 2.2 is a stylised diagram showing the relative size of the flows of the principal commodities into, out of, and within the region in 1988–89.

Exports during 1988–89 amounted to about 1.9 million tonnes, consisting largely of grains, food products, aluminium, woodchips and live sheep. Wool and some food products from the region are exported through the ports in Melbourne and Geelong. Most of the other export commodities are shipped through the Port of Portland. The bulk of the grain export was produced in neighbouring regions.

Imports during 1988–89 amounted to about 0.4 million tonnes, and consisted largely of phosphate rock for fertiliser and raw materials for aluminium production in the region.

The inward interregional flow of about 3.3 million tonnes in 1988–89 consisted largely of retail items, wheat and grains for export through the Port of Portland and alumina from Western Australia used for aluminium production. The outward interregional flow amounted to about 1.1 million tonnes in 1988–89, and consisted

2. For the purposes of recording small area data, the Australian Bureau of Statistics divides Australia into areas having boundaries which can differ from local government area boundaries in certain locations. However, within the study region all SLA boundaries coincide with local government area boundaries.

TABLE 2.2 DISTRIBUTION OF THE COMMODITY TONNAGES, 1988–89

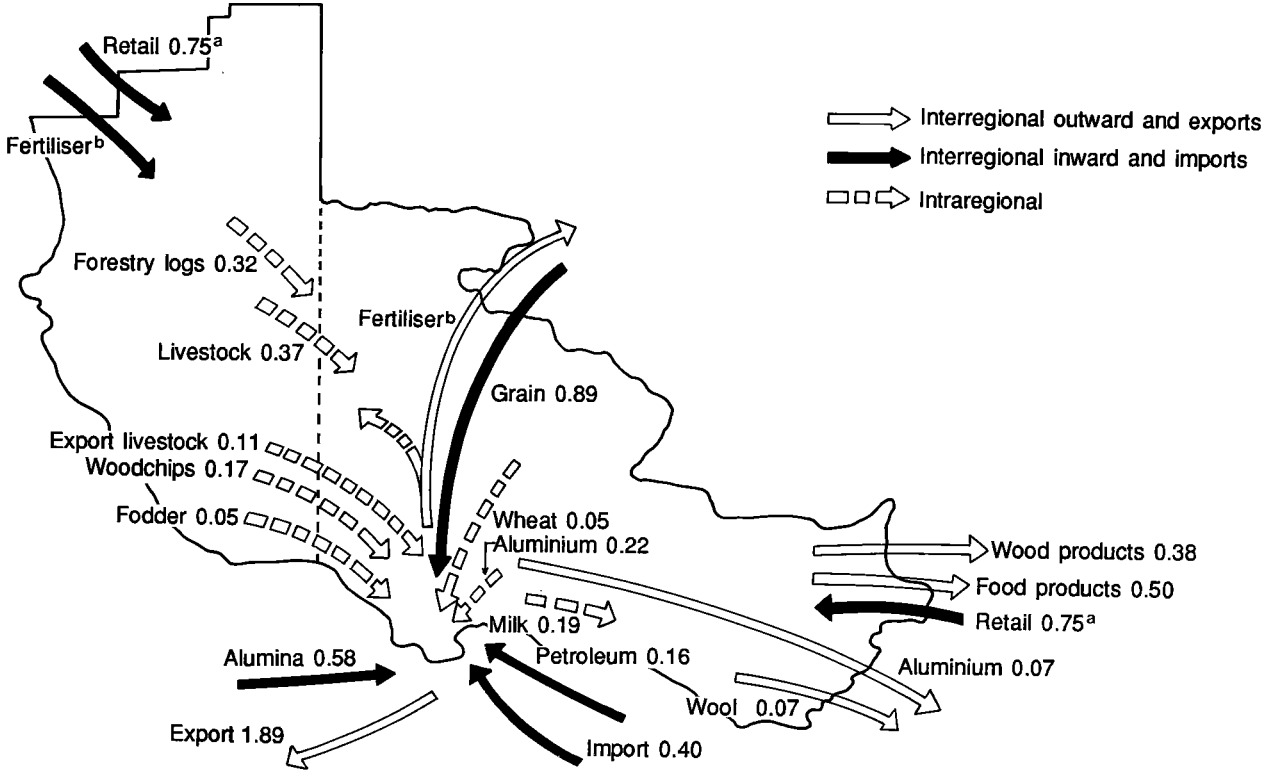
(tonnes)

Industry	*Export*	*Import*	*Interregional inward*	*Interregional outward*	*Intraregional*
Agriculture					
Wool	71 689	0	0	71 689[a]	0
Milk	0	0	0	0	187 033
Wheat	813 440	0	767 879	0	45 561
Barley	57 567	0	57 567	0	0
Peas and beans	65 928	0	65 928	0	0
Grapes	0	0	0	16 332	0
Fertiliser	0	258 274[b]	na	na	na
Live sheep	106 346	0	0	0	483 391
Live cattle and goats	1 240	0	na	na	na
Fodder[c]	46 730	0	0	0	46 730
Subtotal	1 162 940	258 274	891 374[d]	88 021[d]	762 715[d]
Forestry logs	0	0	0	0	316 913
Silicon sand	29 043	0	0	29 043	0
Manufacturing					
Paper products	na	2 386	na	na	na
Sawnwood	0	0	0	174 030	na
Logs and pulpwood	0	0	0	199 649	na
Coal briquettes	0	0	80 000	0	0
Woodchips	169 874	0	0	0	169 874
Aluminium	223 534	0	0	74 511	223 534
Alumina[e]	0	0	577 538	0	0
Clothing and footwear	0	0	0	35 000	0
Food products[f]	302 726	0	0	504 543	na
Petroleum products	0	0	155 207	0	0
Petroleum coke	0	122 279	0	0	122 279
Other smelter materials	0	14 661	0	0	14 661
Subtotal	696 134[g]	139 326	812 745[g]	987 733[g]	530 348[h]
Retail	0	0	1 548 802[i]	0	0
Total[j]	1 888 117[g]	397 600[b]	3 252 921[k]	1 104 797[k]	1 609 976[l]

a. Exported through ports outside of the region, mainly Geelong and Melbourne.
b. Includes raw materials used in the manufacture of fertilisers imported through the Port of Portland (Port of Portland Authority 1990).
c. Fodder is for export livestock.
d. Excludes fertiliser, live cattle and goats.
e. Alumina comes from Western Australia by ship and is off-loaded at the Port of Portland.
f. Largely comprised of meat and dairy products.
g. Excludes paper products.
h. Excludes paper products, sawnwood, logs and pulpwood and food products.
i. BTCE estimates based on retail expenditures and transport costs of 1.5 per cent of value. Includes a small tonnage produced within the region and transported intraregionally, which is not separately quantifiable.
j. Excludes fisheries.
k. Excludes paper products, fertiliser, live cattle and goats.
l. Excludes fertiliser, live cattle and goats, paper products, sawnwood, logs and pulpwood, and food products.

na Not available

Sources Agricultural and forestry production: ABS (1990e, 1990f, 1991a, 1991b); exports and imports: Port of Portland Authority (1990); coal briquettes into and food products out of the region: Public Transport Corporation (pers. comm.); aluminium exports and outward interregional tonnages and aluminium inputs: Portland Aluminium (pers. comm.) ; retail tonnages: BTCE estimates .



a. Assumes half of retail tonnages were transported from Victoria, and the other half from South Australia.

b. Tonnages not available for interregional and intraregional movements.

Sources ABS (1990e, 1990f, 1991a, 1991b); Port of Portland Authority (pers. comm.); Public Transport Corporation (pers. comm.); Portland Aluminium (pers. comm.); BTCE.

Figure 2.2 Principal commodity flows, 1988--89 (million tonnes)

TABLE 2.3 COMMODITY TONNAGES BY ROAD AND RAIL, 1988–89

Industry	Consignment (tonnes) Road	Rail	Road share (per cent)
Agriculture			
Wool	71 689[a]	0	100.0
Milk	187 033	0	100.0
Wheat	121 203	692 237[b]	14.9
Barley	8 577	48 990[b]	14.9
Peas and beans	9 823	56 105[b]	14.9
Grapes	16 332	0	100.0
Fertiliser	na	63 000[c]	na
Live sheep	483 391	0	100.0
Live cattle and goats	na	na	na
Fodder	46 730	0	100.0
Subtotal	944 778[d]	860 332[e]	56.6[d]
Forestry logs	316 913	0	100.0
Silicon sand	29 043	0	100.0
Manufacturing			
Paper products	na	40 000	na
Sawnwood	174 030	na	na
Logs and pulpwood	199 649	na	na
Coal briquettes	0	80 000	0.0
Woodchips	169 874	0	100.0
Aluminium	298 045	0	100.0
Alumina[f]	0	0	0.0
Clothing and footwear	35 000	0	100.0
Food products	264 542	240 000[g]	52.4
Petroleum products	155 207	0	100.0
Petroleum coke[f]	0	0	0.0
Other smelter material	14 661	0	100.0
Subtotal	1 311 008[h]	360 000[i]	78.5[j]
Retail[k]	1 548 802	0	100.0
Total[l]	4 150 544[m]	1 220 332[n]	77.2[o]

a. Includes the tonnages of wool delivered to stores in Portland and transported again after sale by road to Melbourne and Geelong. This tonnage is counted once only, as explained in the text relating to table 2.2.
b. Tonnages carried by V/Line. Rail shares for barley and legumes are estimated from the rail share for wheat.
c. Estimated rail tonnage excludes fertiliser from ports other than the Port of Portland.
d. Excludes fertiliser, live cattle and goats.
e. Excludes live cattle and goats.
f. Alumina and petroleum coke are transported by a 4.5-kilometre conveyor belt from the Port of Portland to the smelter site.
g. Meat shipment from the Borthwicks plant suspended in 1988–89 due to industrial action; figure is for normal operations.
h. Excludes paper products.
i. Excludes sawnwood, logs and pulpwood.
j. Excludes paper products, sawnwood, logs and pulpwood.
k. Retail items carried by rail are assumed to be negligible.
l. Excludes fisheries.
m. Excludes fertiliser, paper products, live cattle and goats.
n. Excludes sawnwood, logs and pulpwood, live cattle and goats.
o. Excludes fertiliser, live cattle and goats, paper products, sawnwood, logs and pulpwood.
na Not available

Sources ABS (1990d, 1990e, 1991a, 1991b); Port of Portland Authority (1990); Public Transport Corporation (pers. comm.); BTCE estimates for retail, barley and legumes modal share.

largely of manufactured products. No interregional tonnages were available for a number of commodities moved to and from other regions, including fertilisers and paper products. Some of these, such as fertiliser, may have amounted to an appreciable proportion of the total estimated outward interregional tonnages.

A further 1.6 million tonnes were moved between origins and destinations within the region in 1988–89. This intraregional traffic consists largely of livestock, milk, aluminium, and woodchips on the way to the processing plant or the Port of Portland.

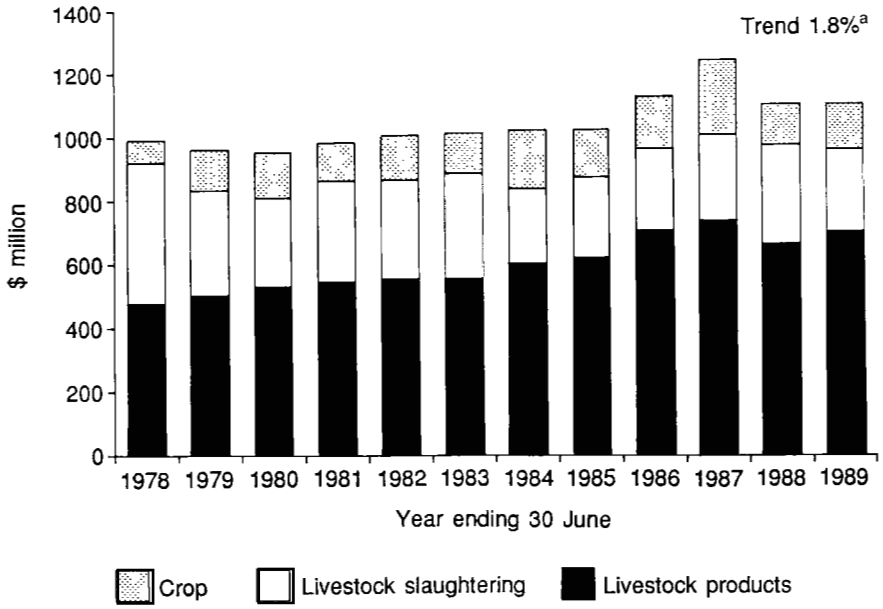
Table 2.3 shows that, of the 5.4 million tonnes consigned to road and rail in 1988–89, nearly 4.2 million tonnes was carried by road and over 1.2 million tonnes by rail, giving road transport over 77 per cent share of the total tonnage consigned. Rail transport accounted for around 85 per cent of the wheat tonnage consigned. Road transport, nevertheless, secured either the total or a large proportion of the other commodities.

AGRICULTURE

The region is a major agricultural production area with 69 per cent of the region's total land area being utilised for agriculture in 1988–89. During the same year, a total of 4884 establishments were engaged in various forms of agricultural production. The regional value of agricultural production averaged $1050 million at constant 1987–88 prices over the period 1977–78 to 1988–89 and showed a real annual growth rate of 1.8 per cent over the same period (figure 2.3). The region's value of agricultural production represented a 5.5 per cent share of the national value of agricultural production in 1987–88 (ABS 1990f, 1990g, 1991a).

The largest contribution to the regional value of agricultural production came from livestock products, which includes wool and milk, and livestock slaughterings, which includes beef and live sheep sales. Livestock products, with an average value of production of about $607 million at constant 1987–88 prices over the period 1977–78 to 1988–89, represented 57 per cent of the region's value of agricultural production. Livestock slaughterings, with an average value of production of $295 million at constant 1987–88 prices over the same period, represented about 28 per cent. The value of crop production averaged $147 million at constant 1987–88 prices over the same period and represented about 14 per cent.

The region's agricultural output has been largely geared to the export market, and hence the value of the region's agricultural sector has been dependent on international commodity prices. Structural changes in the agricultural sector such as increased farm sizes, increased mechanisation or capital intensity, and product mix may have well been largely a result of pressures imposed on profitability and business survival by the exposure to competition in the world market over the past three to four decades. This is in contrast to some of their counterparts elsewhere overseas which have enjoyed high levels of protection (ABARE 1991).



a. Trend refers to total of the three industry activities; significant at the 1 per cent level of probability.

Note Deflated by the ABS implicit price indices for value of production of each industry activity.

Sources ABS (1990g, 1990h); BTCE.

Figure 2.3 Value of agricultural production 1977–78 to 1988–89, at constant 1987–88 prices

The region's agricultural sector had been faced with deteriorating farmers' terms of trade as current prices for inputs increased faster than current prices for outputs over the decade to 1990–91. The fall in prices between the years 1989–90 and 1990–91 of wheat, wool and sheep resulted in a sharp deterioration of farmers' terms of trade (ABARE 1991).

Production inputs such as fertilisers, fuel, seed, and farm machinery are transported into the region for use by the agricultural establishments. Agricultural produce also creates a demand for transport to processing facilities or other markets. Livestock are transported to either saleyards or abattoirs in the region, and thereafter meat products are sent to urban or export markets. Similarly with livestock products, milk is collected from farms and transported to processing centres and wool is transported to brokerage agents for auction and eventual export. While the region is a producer of wheat and grains, the location of major wheat storage and handling facilities at the Port of Portland and the neighbouring big wheat growing regions in the Wimmera and the Northern Mallee means the region's transport system takes on an important corridor role.

The livestock products industry

The value of livestock products, including wool and milk, at constant 1987–88 prices (deflated by the Australian Bureau of Statistics implicit price index for livestock products) showed an annual trend rate of growth of 3.6 per cent (figure 2.4).

In 1988–89, the region accounted for 9 per cent of Australian wool tonnage produced (ABS 1990d). During the same period, the South Western statistical division in Victoria contributed 30 per cent to State wool production while the South East statistical division in South Australia contributed 28 per cent to State wool production, indicating the individual and collective contribution and importance of the wool industry in the region (ABS 1991b, 1991c). The largest wool producing areas were Glenelg, Wannon, Dundas, Hamilton and Kowree.

Wool production in the region increased by an average rate of 3.4 per cent yearly over the period from 1976–77 to 1988–89. During this period, however, the industry was characterised by production variability as a result of fluctuating market prices or unfavourable seasonal conditions (figure 2.5).

In 1988–89, the wool industry experienced the peak of a three-year series of increasing world prices and demand for wool. The following year 1989–90, in expectation of further increases in the world price, growers opted for a higher reserve price at auction through the grower-funded Australian Wool Corporation. This led eventually to the scrapping of the wool reserve price as the wool market weakened.

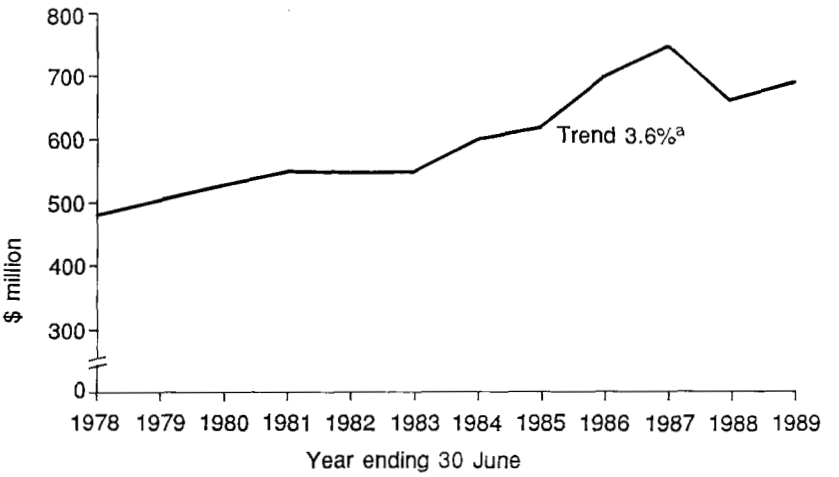
The large wool stores in the region serve as collection points prior to sales at the Melbourne and Geelong auction markets and shipment through the ports after sale. As part of a regional integration effort, about 85 per cent of the wool production from the South Australian part of the region is consigned to the Victorian auction markets in Melbourne and Geelong (ABS 1991a).

The region contains a coordinated dairy farming industry supporting several dairy processing plants, particularly in the area around Warrnambool and Heytesbury. The bulk of the milk produced is used by the dairy products industry in the region.

The population of dairy cattle is shown in figure 2.6. Despite the decreasing cattle population from 1985–86 onwards, milk production has been increasing (ABS 1991c).

Livestock slaughtering and disposals

The region accounted for 4 per cent of total Australian beef cattle population in 1987–88 (ABS 1990d). A decline in beef cattle population (figure 2.7) was reflected in the declining trend in the value of livestock slaughtering during the period 1977–78 to 1988–89 (figure 2.8). This trend was reversed from 1989–90 as the beef market firmed and profitability of beef production improved relative to other broadacre activities (ABARE 1991).

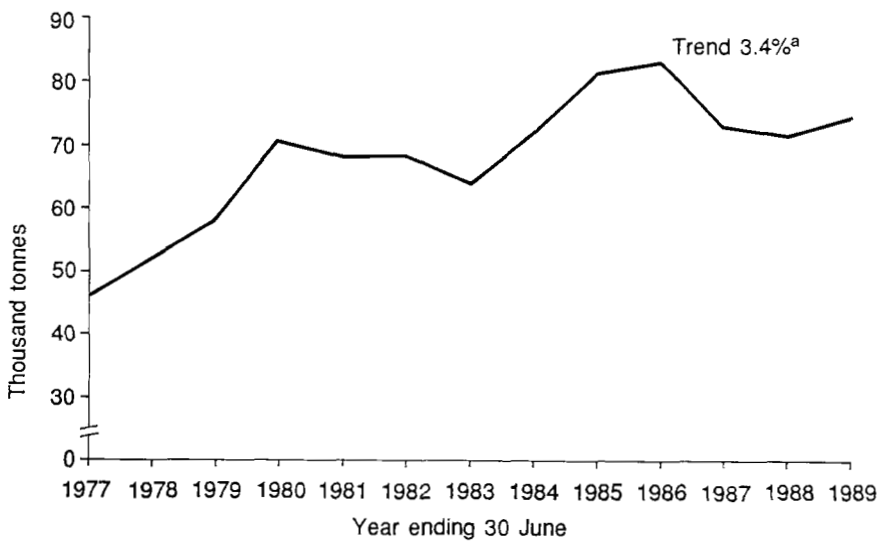


a. Significant at the 1 per cent level of probability.

Note Deflated by the ABS implicit price index for value of livestock products.

Sources ABS (1990g, 1990h); BTCE.

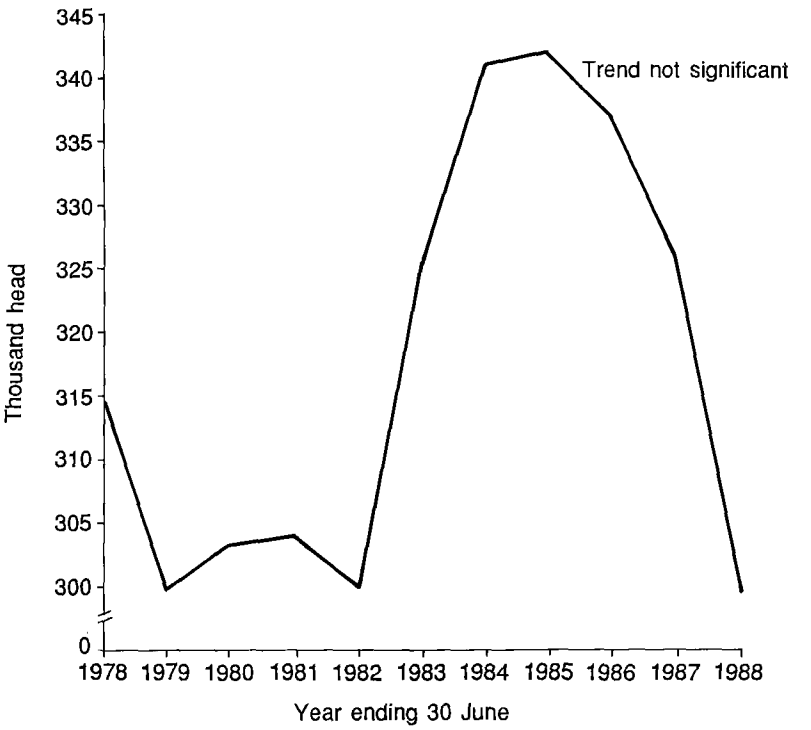
Figure 2.4 Value of livestock products 1977–78 to 1988–89, at constant 1987–88 prices



a. Significant at the 1 per cent level of probability.

Sources ABS (1990e, 1990f); BTCE.

Figure 2.5 Wool production 1976–77 to 1988–89



Sources ABS (1990e, 1990f); BTCE.

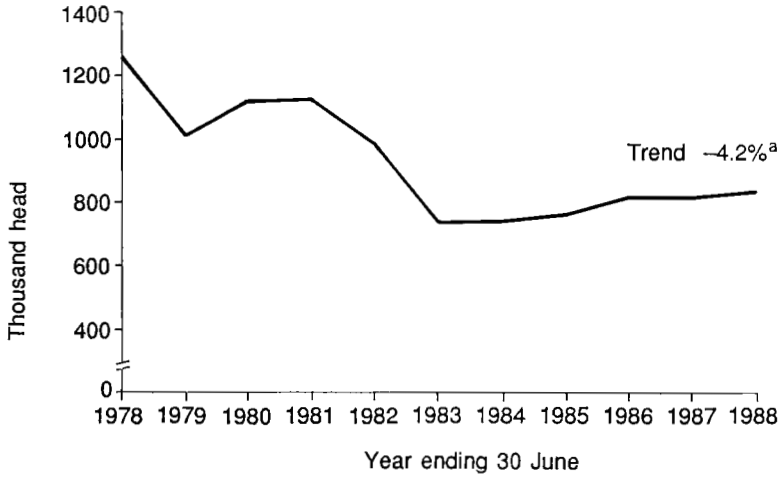
Figure 2.6 Dairy cattle population 1977–78 to 1987–88

As shown in figure 2.8, the value of livestock slaughtering and disposals at constant 1987–88 prices, deflated by the ABS (1990i) implicit price index for livestock slaughtering and disposals, declined at a rate of 2.2 per cent over the period 1977–78 to 1988–89.

The important beef cattle growing areas are Portland, Glenelg, Warrnambool, Minhamite, and Heytesbury on the Victorian side and Lucindale, Tatiara, Lacepede, Beachport and Penola on the South Australian side. The dispersal of the beef industry in the region indicates the tendency to locate around existing saleyards and abattoirs.

As a sector which has been historically export oriented, the beef cattle industry has been sensitive to world market fluctuations. Japan and the Republic of Korea are the more important markets in Asia and, for future years, the value of exports to these countries was expected to exceed the value of exports to the United States, which was the industry's biggest market in 1989–90 (ABARE 1990a).

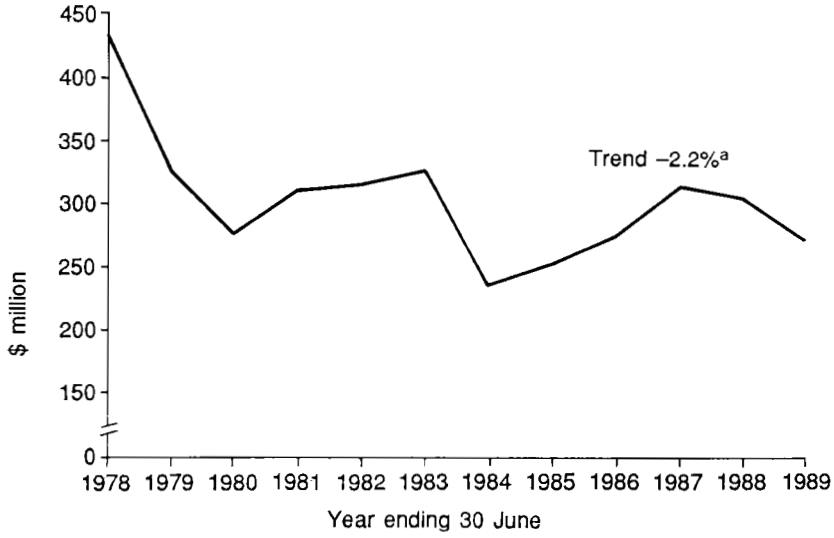
The outlook for the beef industry improved in 1989–90 with the optimism brought about by the firming of import orders and trade liberalisation from the Asian



a. Significant at the 1 per cent level of probability.

Sources ABS (1990e, 1990f); BTCE.

Figure 2.7 Beef cattle population 1977–78 to 1987–88



a. Significant at the 10 per cent level of probability.

Note Deflated by the ABS implicit price index for livestock slaughterings.

Sources ABS (1990g, 1990h); BTCE.

Figure 2.8 Value of livestock slaughterings 1977–78 to 1988–89, at constant 1987–88 prices

markets, and has provided the needed respite for farmers looking for alternative profitable commodities (ABARE 1990a).

The region accounted for about 26 per cent of the live sheep export trade tonnage in 1987–88 (ABS 1991a). This industry with its specific niche in the Middle East market, and the corresponding special requirements, was particularly vulnerable to developments and regulatory requirements in this market.

The short-term outlook for 1990–91 was poor for the live sheep industry, which was faced with excess supply as the Middle East market weakened (ABARE 1990b).

Agricultural crops and horticulture

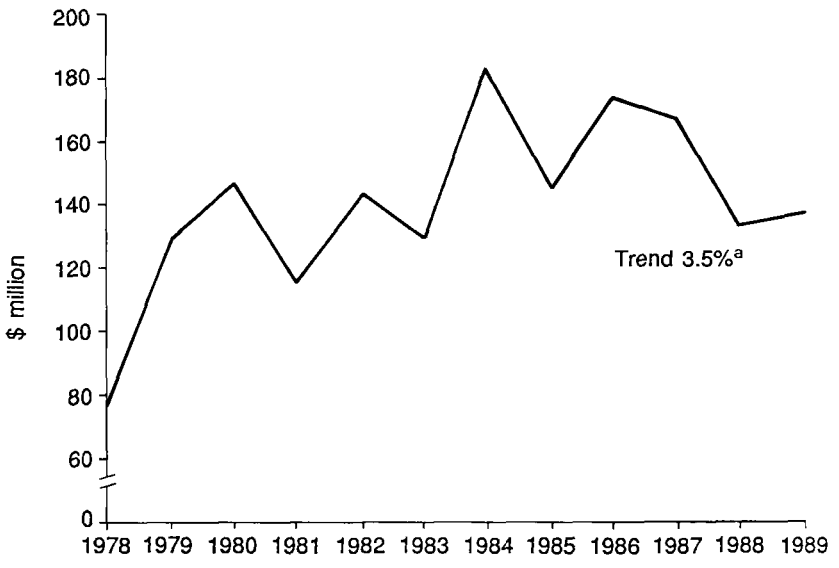
The value of crop production in the region averaged $146.9 million per year in constant 1987–88 prices, deflated by the ABS (1990i) implicit price index for crop production, over the period 1977–78 to 1988–89 and showed an average annual real growth rate of 3.5 per cent despite droughts and intermittent weakening in the export market (figure 2.9). Crop production contributed about 14 per cent of the total value of the region's agricultural production. Similarly the region's value of crop production formed about 1.5 per cent of the Australian value of crop production (ABS 1990c).

In 1986–87 the region produced a peak production of 109 000 tonnes of wheat or about 0.6 per cent of the national output (ABS 1990a, 1990b, 1990c). The total area used for wheat was about 47 951 hectares during this year. More importantly, it is the corridor for the neighbouring regions which are large wheat producers, the Wimmera and the Northern Mallee, for export through the Port of Portland. In 1988–89, some 813 000 tonnes of wheat were exported through the port, of which 768 000 tonnes or 94 per cent came from outside the region.

The region also serves as a corridor for much of the Portland fertiliser imports which are transported to farms to the north of the region.

The market situation for wheat deteriorated during 1988–89 as a result of depressed world prices, in turn due to a record world harvest, and wheat farm profitability dropped. Further exacerbating the problem in this industry was the increase in fuel prices and interest rates which had a greater impact on cropping specialist farms (ABARE 1990a). The size of the national and the regional wheat harvest in 1989–90 was about 5 per cent higher than the previous year but the value of the crop was 17 per cent lower (ABARE 1991). Consequently, the transport task for 1989–90 was at a slightly higher level than in 1988–89. The declining world prices during 1990–91, however, resulted in lower plantings and consequent lower production volumes (ABARE 1991).

Grape production in the region was estimated by ABARE (1990a) to be 32 739 tonnes in 1989–90 and expected to grow by 28 per cent per year, until 1992–93. Comprising mainly the Coonawarra and Padthaway areas in the south-east of South Australia, a large proportion of the grape production is from



a. Significant at the 5 per cent level of probability.

Note Deflated by the ABS implicit price index for crop production.

Sources ABS (1990g, 1990h); BTCE.

Figure 2.9 Value of crop production 1977–78 to 1988–89, at constant 1987–88 prices

high quality wine grape varieties. The transport of grapes to processing sites is mainly by road.

The region also produces citrus and pome fruits (apples, pears), particularly in bordering towns close to the Victorian and South Australian fruit belts. Potatoes and onions are produced in areas around Warrnambool and Hamilton.

FORESTRY

With the growing gap between Australian wood production and consumption, the region's forestry has increased in importance. Actively managed pine forests such as those in the region have much higher productivity than freestanding native or coniferous forests. In 1985, pine plantations produced 36 per cent of the total national log production while representing only 11 per cent of the area of all wood production forests.

There are about 116 000 hectares of radiata pine plantations in the region, plus a smaller area of less important species. Approximately 62 per cent of the total areas planted are in the South Australian side of the region. The region's pine

resources represented 20 per cent of the national radiata pine resources in 1986 (Spencer 1989).

Forest log production was estimated at about 633 827 cubic metres in 1986–87 with about 90 per cent coming from the South Australian side (ABS 1991a). Pulpwood production was about 8 per cent of forest log production or about 50 700 cubic metres during the same year, and this went to the particle board and paper manufacturing industry in the region or as export woodchip (Spencer 1989).

The forestry industry provides the single most important input to two of the region's major manufacturing sectors, the wood and wood products and paper and paper products industries. Increasing demand until 1989–90 for timber, paper and softwood chips similarly increased demand for the forest log input and consequently increased conversion of appropriate land into forests. A feature of the region's forestry industry is the scope for expansion to meet forecast increases in demand. Transport of logs from nearby forests to processing plants is by dedicated road transport vehicles.

Due to the fall in consumption of wood and paper products as a result of the slowdown in the economy in 1989–90, forest log demand was expected to fall as well. Recovery was expected in 1990–91 as a result of forecast increased housing demand (ABARE 1990b).

FISHERIES

The region includes important landing ports for the fishing industry. The Australian Bureau of Statistics Integrated Register of Industry Statistics (IRIS) 1988 data indicated that some 367 persons were employed in the industry in 1988. The largest single area for employment was Portland, which employed about 180 persons or nearly 50 per cent of employment in the industry during this year.

The catch in the region consists of southern rock lobster, finfish, and abalone. In the South Australian side, 1657 tonnes of southern rock lobster and 147 tonnes of abalone and other fishes with a total value of $27.8 million were landed in 1987–88. Some 200 vessels worked the lobster catch in the South Australian side of the region while 6 vessels were responsible for the abalone take. In Portland, a $28.7 million catch was landed in 1987–88 which was comprised largely of finfish. The total catch landed in the region was estimated at $70 million in 1987–88.

Much of the region's catch is exported, with 90 per cent of the lobster and abalone catch destined for markets in Japan, the United States and Europe. Lobsters are high value commodities requiring specialised handling and packaging. In addition, lobsters require rapid transport to the nearest international airport, namely Melbourne Airport. The task of transporting the fishery products is handled by a fleet of specialised refrigerated vehicles operating from the area.

NATURAL RESOURCES

The region is endowed with various sources of energy including natural gas and geothermal energy. Natural gas has been found in Penola, and low-temperature resources, between 30°C and 80°C, are located in the Otway Basin in the south-west of Victoria.

At Portland the existing geothermal system has a potential output of 1600 kilowatts (thermal) of which about 1000 kilowatts is currently being used for heating one swimming pool complex, four civic buildings, one hotel/motel and the police station. The remaining 600 kilowatts (thermal) energy could easily be used to heat Portland Hospital and a number of smaller buildings (DITR 1988c). Energy savings from heating the existing seven commercial buildings by thermal energy rather than gas or diesel oil are estimated at $0.22 million per annum (Buckingham 1989).

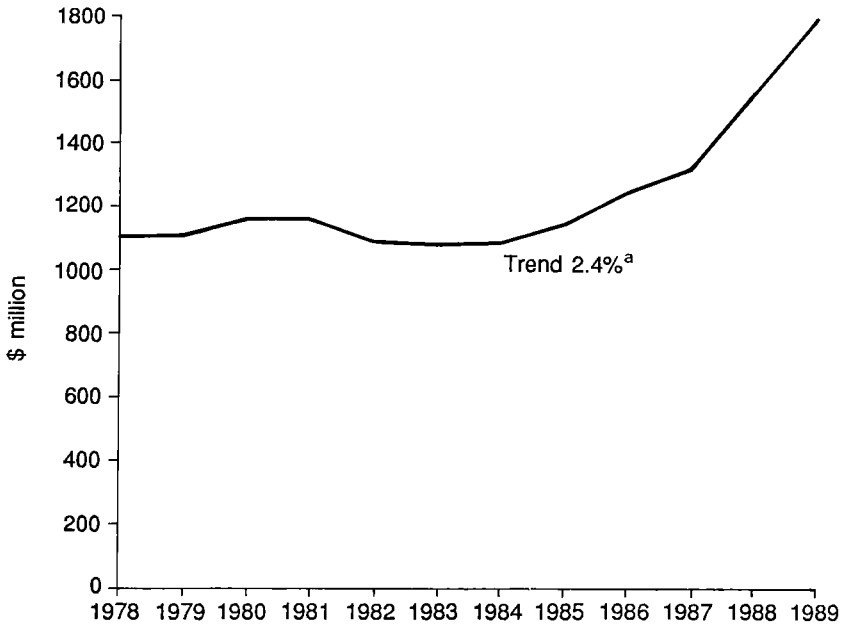
MANUFACTURING

Prior to 1987, manufacturing industry in the region was dominated by the processing of agricultural and forestry products. The region's manufacturing sector grew faster during the decade to 1990 than its agricultural sector, when measured in terms of value of production. Annual growth of value of production of manufacturing industries at constant prices (deflated by the Australian Bureau of Statistics implicit GDP non-farm price index) averaged 2.4 per cent during the period 1977–78 to 1987–88 (figure 2.10).

The region's manufacturing industries accelerated from a lower annual average real growth rate of 0.6 per cent during the period 1978 to 1985, to 9.5 per cent during the period 1985 to 1988. This later rapid growth was largely contributed by the wood and wood products, aluminium and fabricated metals industries, while the dominant sector, food manufacturing, remained steady.

Other sources of output growth in manufacturing during this latter period came from industries, some of which are related to the agricultural sector, such as leather manufacture, and crafts and household items to serve the demands of the growing urban population within the region and elsewhere.

Although manufacturing industries in Australia tend to be concentrated near the main markets in capital cities, the location of the existing manufacturing industries in the region is largely influenced by access to input raw materials and the apparently favourable cost advantages of processing within the region. This tendency to locate processing within the region is further reinforced by a significant level of export orientation, particularly aluminium and dairy products where the other operative location requirement is access to a port, rather than access to the large urban markets. The location pattern, however, indicates a need for efficient transport so as not to outweigh the raw material and other cost advantages in the region.



a. Significant at the 1 per cent level of probability.

Note Deflated by the ABS implicit GDP non-farm price index.

Sources ABS (1989a, 1989b); BTCE.

Figure 2.10 Value of production of manufacturing industries 1977–78 to 1988–89, at constant 1987–88 prices

The manufacturing industries' objective for greater efficiency translates frequently into a shift towards larger scale or world scale plants, with consequential pressures for larger areas of material sources (Spencer 1989). In the region, these pressures are evident in the forest products and to a lesser extent in the dairy industries. Implications for transport in the region include the possibility for both a larger task and possible economies of scale in transport services for the export-oriented industries. Hughes (1990) suggested that improved competitiveness in the world market provided the ability to take full advantage of economies of scale. This is in contrast to an import-competing or substituting orientation which has the absorption capacity of the local market providing the upper limit on industry size or scale.

Employment in the region's manufacturing industries showed no trend over the period 1977–78 to 1987–88 (figure 2.11) as the sector recovered during the later part of the decade. It should be noted, however, that the food industries and wood and wood products industries actually showed a declining trend in employment over this period and that newer industries were able to grow and

absorb the labour shed from the food and forestry related industries. Labor productivity in terms of turnover per employee in all manufacturing, in constant 1987–88 prices, was $94 995 in 1977–78 rising 3.2 per cent annually to $128 624 in 1987–88 (ABS 1989a, 1989b).

The number of establishments in manufacturing was almost steady from 1977–78 to 1987–88. A sharp upturn was seen in 1987–88 as 20 new establishments started operations (figure 2.12).

It is in the manufacturing sector where most of the shifts in resource use and transport services in the region have occurred. The increased levels of manufacturing production indicated an increased demand for transport and an increased load on the transport infrastructure due to this sector.

Food and beverages

The food and beverage industry contributed $605.5 million in 1987–88, 38.7 per cent of the total value of production from the manufacturing sector in the region.

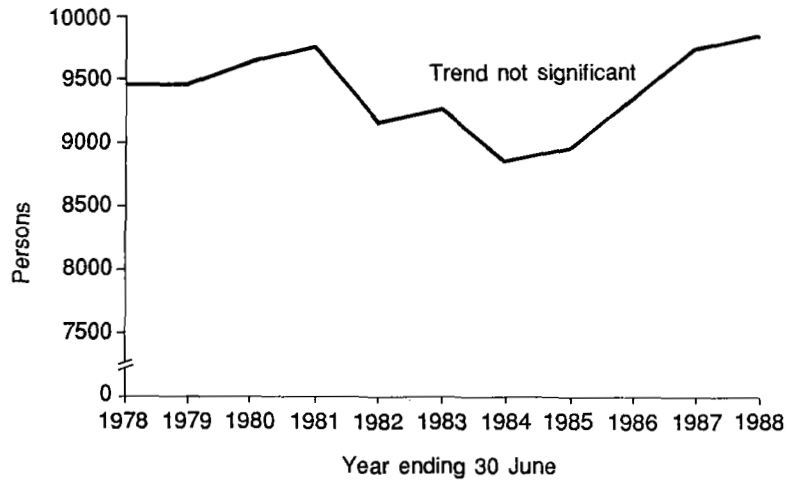
The region's production in 1987–88 represented a share of 2.1 per cent of the total Australian value of production of food and beverages of $27.7 billion (ABS 1991c).

The value of production of the food and beverage industry, at current prices, grew at a rate of 8.8 per cent over the period 1977–78 to 1987–88 but in real terms remained steady as shown in figure 2.13.

There were about 70 establishments in 1987–88 in the food and beverage industry. This number remained steady through the period 1977–78 to 1987–88 as shown in figure 2.14. Several milk processors and dairy producers operate in the larger production areas of Warrnambool and Heytesbury. The more notable of these are the Warrnambool Cheese and Butter Cooperative (which leases its facilities to Kraft), Nestle's and Murray Goulburn.

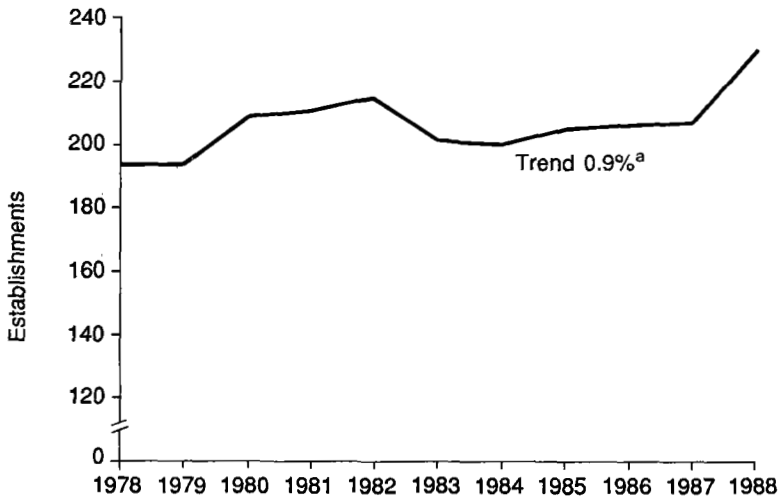
Employment in the food and beverage industry declined by 3.2 per cent over the period 1977–78 to 1987–88 (figure 2.15). Considering the steady levels of production, the declining trend in employment indicates the increased labour productivity of the industry which had occurred during this period. Average employment per establishment decreased from about 50 persons in 1978 to 40 persons in 1988. Labour productivity, in terms of turnover at constant 1987–88 prices per employee, increased from $166 518 in 1977–78 by an average annual rate of 2.5 per cent to $208 417 in 1987–88 (ABS 1989a, 1989b).

The Australian dairy industry exported about 13 per cent of its total turnover in 1987–88, and about 18 per cent of this came from the study region (DITR 1988b). Products for export from the region included butter, cheese, skim and wholemilk powders and fresh and UHT milk. The major dairy export market was Japan, with smaller quantities being sold to North America, Singapore, the EEC, some Middle Eastern countries and developing countries in the Asian region (DITR 1988b).



Sources ABS (1989a, 1989b); BTCE.

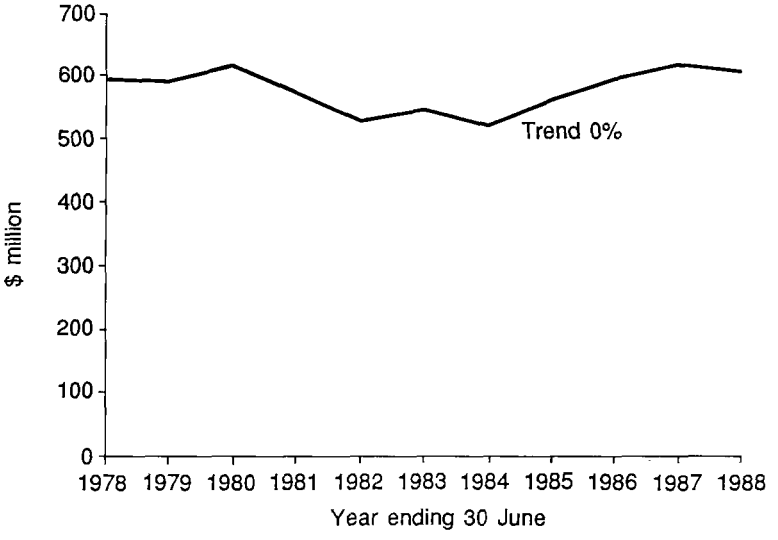
Figure 2.11 Employment in manufacturing industries 1977–78 to 1987–88



a. Significant at the 5 per cent level of probability.

Sources ABS (1989a, 1989b); BTCE.

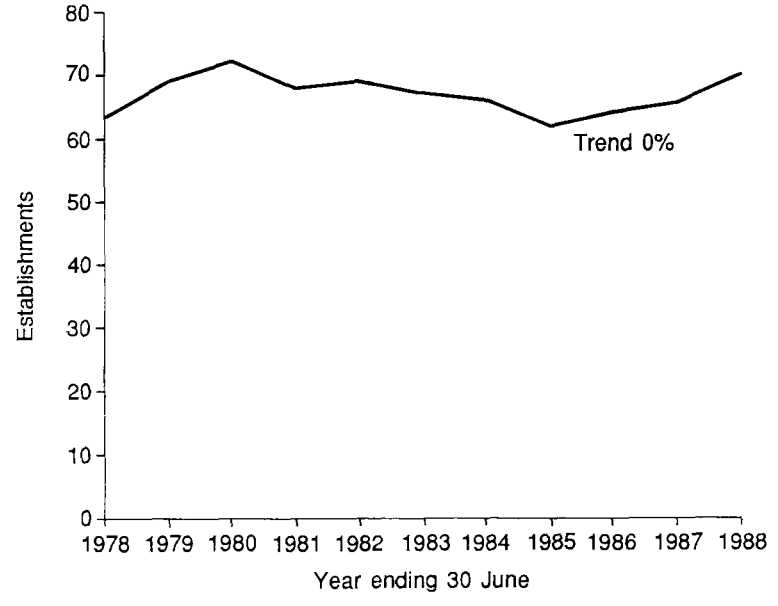
Figure 2.12 Number of establishments in the manufacturing industries 1977–78 to 1987–88



Note Deflated by the ABS implicit GDP non-farm price index.

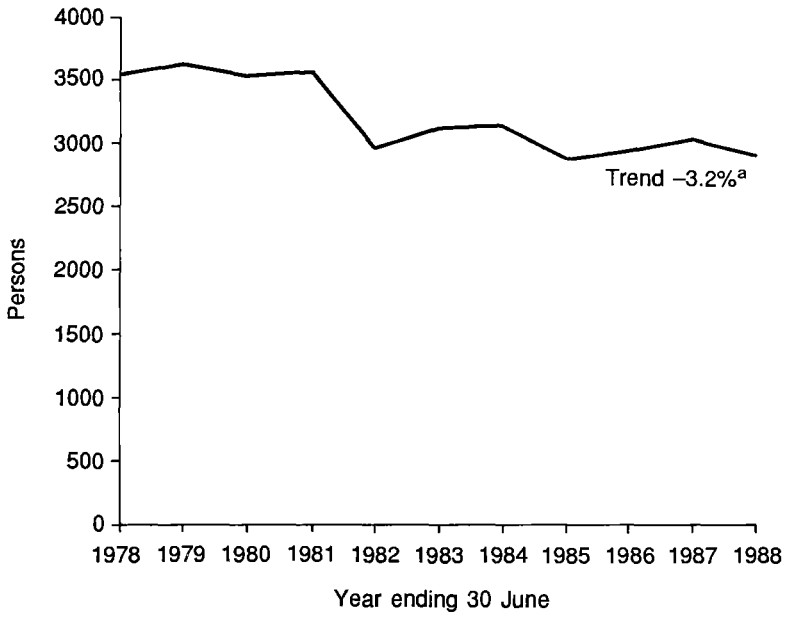
Sources ABS (1989a, 1989b); BTCE.

Figure 2.13 Value of production of the food and beverage industry 1977–78 to 1987–88, at constant 1987–88 prices



Sources ABS (1989a, 1989b); BTCE.

Figure 2.14 Number of establishments in the food and beverage industry 1977–78 to 1987–88



a. Significant at the 1 per cent level of probability.

Sources ABS (1989a, 1989b); BTCE.

Figure 2.15 Employment in the food and beverage industry 1977–78 to 1987–88

Declining world prices for dairy products, as a result of high world stock levels, limited the growth potential of the dairy industry over the ten years to 1989–90 as downward pressure was exerted on the export prices (ABARE 1990a). Returns to Australian milk producers were forecast by ABARE to fall in 1990–91 as domestic prices continued to fall in line with world prices. Production, however, was forecast to rise on the basis of productivity increases and a return to normal seasonal conditions during 1990–91. The national value of dairy production for 1990–91 was forecast by the same agency to fall to $533 million as a result of prices declining by 23 per cent.

The output from the dairy producers and the milk processors is transported by road for export and national distribution using dedicated transport vehicles. The transport task for the food manufacturing industry, particularly the dairy industry, changed as the industry rationalised in its attempt to achieve economies of scale through increased centralised processing. The shift from the concentration on butter production to cheeses and wholemilk meant increased centralisation of production. The milk collecting trucks were upgraded in capacity as the industry grew. This in turn accelerated damage to local roads as larger trucks were put to use. A rationalising process of sharing milk deliveries amongst the producers was implemented in some parts of the region to reduce the overall road task.

The region is home to the wine growing regions of Coonawarra, Keppoch, Padthaway, and Drumbord areas, which are amongst the premium wine growing areas in Australia. Over 20 vineyards contribute to regional wine and grape production with large established holdings from major national companies being responsible for the bulk of the output. The larger of these operators are Seppelts, Wynns, Penfolds, Lindemans, Mildara and Hardy's wines. Estimates of local production levels in 1987–88 indicate a 2.4 per cent share of total national wine production and nearly 7 per cent share of the national grape tonnage. Because of the relatively higher quality and higher unit value of the region's wine production, the region contributed 5.5 per cent of the national value of wine production (ABS 1991c).

The diverse transport requirements of the wine industry reflect the varying production methods and product lines. Only three vineyards in the region make and bottle wine on site. Grapes are moved by larger producers in bulk bins by road from the region to the winemaking centres at Great Western, Mildura and other locations including outer Adelaide for crushing and fermentation. Smaller vineyards, having made their wine on site, transport wine by road tanker to Adelaide and Melbourne for bottling. Specialist tanker transporters have a near monopoly on this road task. Cartons of bottled wines are also transported back to Coonawarra for cellar door sales and for national distribution from the region.

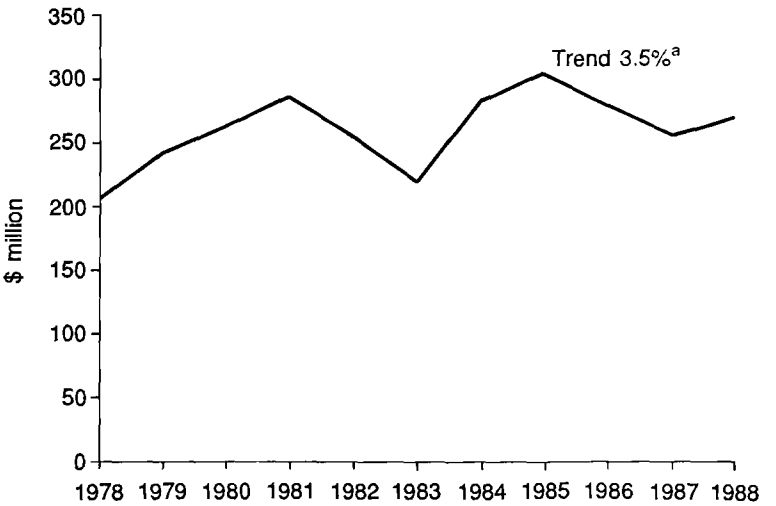
Wood and wood products

One of the fastest growing industries in the region was the wood and wood products industry with 12.1 per cent nominal annual average growth rate or about 3.5 per cent real annual average growth rate in the value of production over the period 1977–78 to 1987–88 (figure 2.16). With the increasing demand for housing during the decade to 1988–89, the demand for wood and wood products similarly increased.

The value of production of wood and wood products in 1987–88, of $270.6 million in current prices, represented 17.3 per cent of the total value of production from manufacturing in the region (ABS 1989a). The region's production represented 3.9 per cent of the national value of production of wood and wood products of about $7.0 billion during 1987–88. About 170 000 tonnes of softwood woodchips were exported in 1987–88, with exports having grown at an average rate of 40 per cent per year since 1984.

The number of establishments in the industry declined by 2.7 per cent over the period 1977–78 to 1987–88 (figure 2.17). This was a result of rationalisation in the industry through mergers or sale of smaller companies in a bid to achieve economies of scale.

Employment in the wood and wood products industry was about 2300 persons in 1987–88 after a slightly declining trend of –0.2 per cent over the ten years to 1987–88 (figure 2.18). The decline in employment was not as sharp as the decline in the number of establishments over the period 1977–78 to 1987–88.

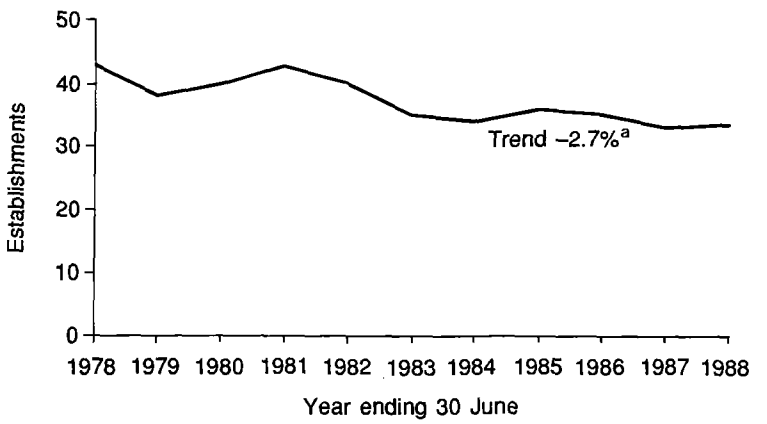


a. Significant at the 5 per cent level of probability.

Note Deflated by the ABS implicit GDP non-farm price index.

Sources ABS (1989a, 1989b); BTCE.

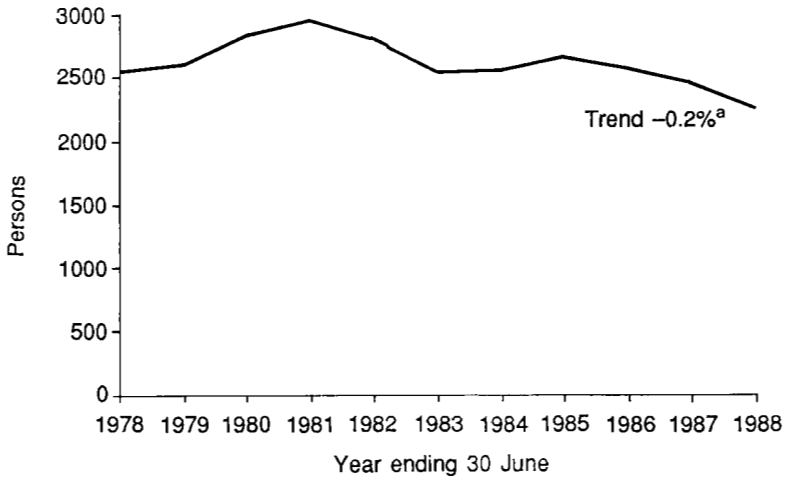
Figure 2.16 Value of production of the wood and wood products industry 1977–78 to 1987–88, at constant 1987–88 prices



a. Significant at the 1 per cent level of probability.

Sources ABS (1989a, 1989b); BTCE.

Figure 2.17 Number of establishments in the wood and wood products industry 1977–78 to 1987–88



a. Significant at the 1 per cent level of probability.

Sources ABS (1989a, 1989b); BTCE.

Figure 2.18 Employment in the wood and wood products industry 1977–78 to 1987–88

Labour productivity in constant 1987–88 prices increased from $81 411 in 1977–78, by an annual average rate of 4.5 per cent, to $120 196 per employee in 1987–88 (ABS 1989a, 1989b).

The transport task for the wood and wood products industry is fairly straightforward, with production units close to the pine plantations. The sawnwood products are shipped to local and interstate markets by road and rail, while the softwood woodchips go by road directly to the Port of Portland stockpile for eventual export.

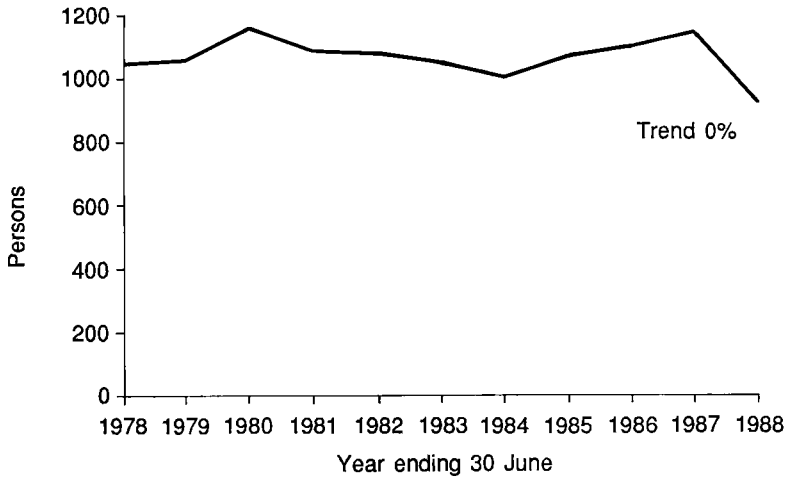
Paper and paper products

With a similar production system to the wood and wood products industry, particularly in usage of the pine log and pulpwood inputs, the paper and paper products industry had a similar transport task.

Employment in the paper and paper products industry remained almost steady at about 1000 persons over the period 1977–78 to 1987–88 (figure 2.19).

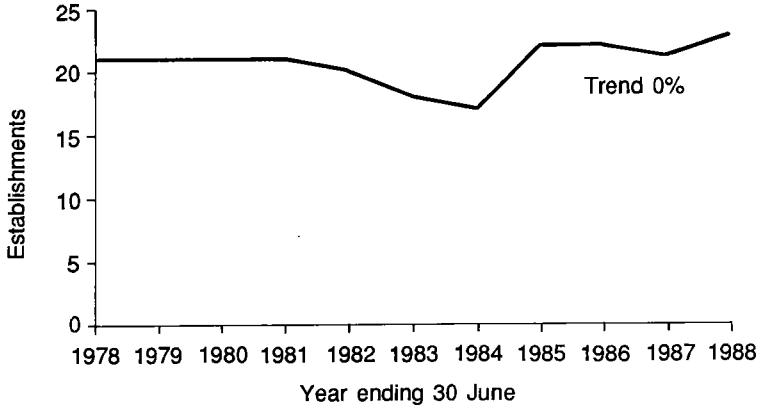
Despite the availability of locally manufactured paper, a significant amount of paper is still imported, indicating a shortfall in certain types of quality paper.

Industrial location in the region is again influenced by the availability of the output of pine forests. An average of about 20 establishments were in the paper and paper products industry in the region over the period 1977–78 to 1987–88, as shown in figure 2.20. The average employment per establishment during this period was about 45 persons.



Sources ABS (1989a, 1989b); BTCE.

Figure 2.19 Employment in the paper and paper products industry 1977–78 to 1987–88



Sources ABS (1989a, 1989b); BTCE.

Figure 2.20 Number of establishments in the paper and paper products industry 1977–78 to 1987–88

The short-term outlook for the region's paper and paper products industry was poor over the period 1989–90 to 1990–91 as a result of the weakened demand in the economy. The fall in total paper consumption resulted from falls in consumption for newsprint and printing and writing papers, while the biggest component, packaging and industrial paper, remained steady during this period (ABARE 1990b).

Aluminium

Production in the Portland Smelter commenced in 1986–87. The equity ownership of this joint venture project is held with four partners, major shares being held by Alcoa of Australia and the Government of Victoria.

The smelter's location was chosen largely as a result of Victorian political determination. The huge demand for electricity in smelting necessitated the establishment of a massive electrical infrastructure to transport power generated at the Loy Yang station in the Latrobe Valley to Portland. Power needs alone were estimated to be $18.5 million per month in 1989.

The smelter is heavily reliant on the Port of Portland for the handling of both its raw materials and finished products. Table 2.4 shows the tonnages of materials used, and produced, by the smelter and transported through the Port of Portland.

In 1988–89, it was estimated that 77 per cent of the output of aluminium production was exported and passed through the Port of Portland. The remainder of production was transported by road to Melbourne. Alumina is transported from the port site to the smelter by a 4.5-kilometre covered conveyor.

The smelter's first potline was commissioned in 1986 and reached full production in June 1987. The second potline became fully operational in October 1988, doubling the smelter's capacity to a level of 300 000 tonnes of aluminium per year. Third and fourth potlines are provided for in the plant design. It is estimated that the 1988 exports were valued at about $800 million. The smelter employed around 800 persons in 1989.

TABLE 2.4 PORTLAND ALUMINIUM RAW MATERIALS AND PRODUCTION

	1985–86	*1986–87*	*1987–88*	*1988–89*
Aluminium ingots (tonnes)	0	33 690	135 448	223 534
Alumina (tonnes)	0	147 433	328 462	577 538
Petroleum coke (tonnes)	4 292	64 670	67 273	122 279
Other (tonnes)	5 012	21 446	31 855	14 661
Total (tonnes)	9 304	267 239	563 038	938 012
Percentage of total port trade tonnage	0.5	14.0	28.6	35.2

Source Portland Aluminium (pers. comm.).

Production and consumption figures for aluminium for 1989–90 indicate lower levels of activity due to the slowdown of world economic growth. The subdued growth in the aluminium-using construction and automobile industries in major industrialised countries accounted for the reduced growth in world demand. For 1990–91, stronger growth was forecast as a result of improved world economic growth (ABARE 1990b).

RETAIL

The retail industry in the region had a total value of turnover of $796.8 million in 1985–86, representing an annual average nominal growth of 11.2 per cent from the turnover of $421.4 million in 1979–80 (ABS 1987a, 1987b).

The purchasing power created from the increasing employment and industrial expansion in the region supported the strong growth in the retail sector over the period 1979–80 to 1985–86. The largest retail industry activities in terms of value of turnover in 1985–86 were food stores and vehicle dealers (figure 2.21). It should be noted, however, that vehicle purchases have a savings or a deferred consumption component and should be considered along the same lines as housing purchases or other capital expenditure.

Figure 2.22 shows the nominal growth rates in retail expenditure by type of activity from 1979–80 to 1985–86.

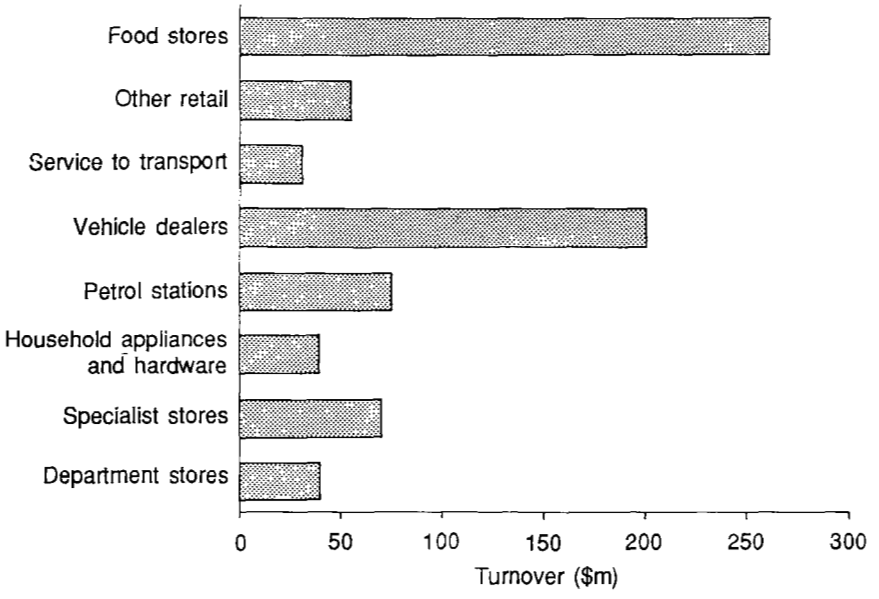
Turnover by transport related retail activities, comprising about $300 million in 1985–86, showed an upward trend over the period 1979–80 to 1985–86 reflecting the increasing demand for transport in the region. Turnover by petrol stations increased at a nominal annual rate of 15.7 per cent during this period. Turnover by vehicle dealers and services to transport had about a 10.9 and 10.7 per cent nominal annual growth respectively .

The nominal growth rate of turnover by food stores was 11.6 per cent per year, or about 3 per cent real growth rate per year, considering an 8 per cent inflation rate. The growth was higher than the population growth rate and was partly due to increased demand for food from the transient population such as students and tourists.

The region's retail industry was estimated to generate a transport demand exceeding that generated by the manufacturing industry. Increasing centralisation of retail centres in major areas meant longer trips for consumers.

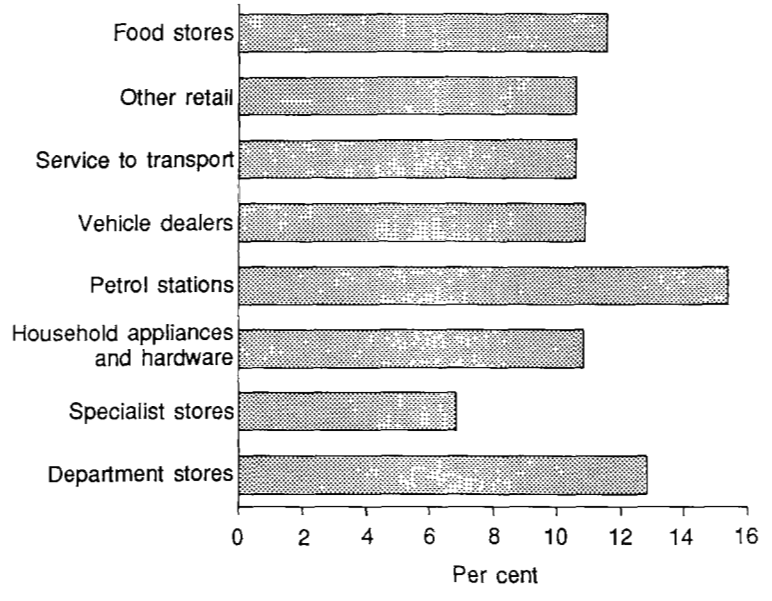
TOURISM

The region has a number of tourist attractions, including the long coastline and inland lakes and cave systems. Portland and Warrnambool in particular have functioned also as resort towns, due to the numerous tourist destinations in these towns and nearby.



Sources ABS (1987a, 1987b).

Figure 2.21 Turnover of the retail industry activities 1985–86



Sources ABS (1987a, 1987b); BTCE.

Figure 2.22 Nominal annual growth rates of turnover in the retail industry activities 1979–80 to 1985–86

The value of tourism in the region in 1987–88 was estimated to be around $60 million to $70 million in direct tourist expenditure in the region (ABS 1989c, 1989d). In 1988, there were about 104 licensed hotels and motels with facilities to serve the tourist trade in the region.

The tourism sector is highly dependent on the motor vehicle as the major mode of transport, with an estimated 80 to 85 per cent of tourists coming to the region by private vehicle. Other passenger modes utilised are air services, rail and charter coaches.

To encourage more tourism in the area, the local tourism group expressed its desire during the VIC ROADS Southwestern Roads Workshop in 1988 (RCA 1989a) to improve signposting deficiencies along the roads leading to the tourist attractions. A lack of harmonisation of interstate coach regulation was noted at the workshop, in that restrictions in South Australia prevented interstate coaches from uplifting and unloading intrastate passengers. Tourism authorities considered this restriction to be a hindrance to tourist access to the region, especially since considerable interstate coach deregulation had been achieved in other States.

CONCLUDING COMMENTS

The region is endowed with resources and infrastructure which enabled the establishment and growth of a set of industries some of which have high export orientation. The availability of raw materials and labour and the existence of a fully developed industrial and transport infrastructure are the major attractions for industrial location in the region.

The same advantages highlight the need for an efficient transport system to ensure that cost advantages will not be eroded. The region's additional role as a corridor for neighbouring regions in the transport of output and inputs further strengthens this need.

CHAPTER 3 THE PORT OF PORTLAND

THE PORT

The Port of Portland is a sheltered, all weather port situated in western Victoria (latitude 38°21′ south, longitude 141°36′ east) almost midway between Melbourne and Adelaide. It has a natural deepwater harbour basin and is the only commercial shipping port between Geelong and Adelaide.

The harbour is bounded by two breakwaters enclosing 101 hectares. The entrance to the harbour is 244 metres wide. It is equipped with six shipping berths with alongside water depths ranging from 10.4 metres to 12.2 metres. It also provides berthage facilities for trawlers, other commercial fishing fleets and recreation crafts. The depth of water in the approaches to, and alongside the grain berth of the K. S. Anderson Wharf is 12.2 metres enabling as large as panamax size vessels to be loaded up to 55 000 tonnes capacity. More specifically the existing facilities include (Port of Portland 1989):

- storage for 180 000 tonnes of grains — 60 000 tonnes in main silos and 120 000 tonnes in the horizontal stores; these are linked with grain terminal and ship loading facilities plus twin transversing ship loaders capable of delivering up to 1000 tonnes per hour;
- two cold/cool stores with a total capacity of 7230 cubic metres with a temperature ranging from –30°C for cold store to +1°C for cool store;
- a 2.6-hectare container park which facilitates storage of 500 conventional and 80 refrigerated containers;
- four bulk tallow tanks with a total capacity of 2200 tonnes, which can be pumped by pipeline to specified berths;
- pipeline connections from the Patterson Oil Wharf to the tank forms for the Shell Co. of Australia and Ampol Petroleum (Vic) Pty Ltd which are about 1.5 kilometres distant with an average discharge rate of 340 tonnes per hour;
- vacuum unloading systems to off-load alumina and petroleum coke from ships and then transport them on a 4.5-kilometre conveyor to storage facilities at Portland Aluminium Smelter.

The Port of Portland is linked to an extensive rail and road network which enables the free flow of commodities from all parts of Australia.

PORT TRADE

The Port has been developed for the handling of bulk cargo. The nature and quantity of trade has varied greatly since Portland was opened officially in 1960. At that time, the principal outbound trades were butter, cheese, wool, grain and carcases, and inbound trades included discharge of petroleum products. At present its principal outbound trades are bulk grain, livestock (sheep, goats and cattle), woodchips and aluminium ingots; and its inbound trades principally include petroleum products, fertiliser components and raw material for use at the Portland smelter. A comparative trade summary, since the Port's inception in 1959–60, is shown in table 3.1.

The data indicate that during the first decade of operation inbound trade exceeded outbound by a ratio of 1.9 to 1, and the total trade attained was close to half a million tonnes in 1968–69. The trade grew in the second decade of operation. It reached one million tonnes for the first time in 1977–78 which was a 62 per cent increase on the previous year. In that year the major factor was an increase of 126 per cent in bulk grain exports and 153 per cent increase in the shipment of livestock and fodder.

Between 1979–80 and 1989–90 the total annual trade was over one million tonnes except in 1982–83 when it fell to 850 128 tonnes. The main reason for this drop of 35 per cent from the previous year was the impact of drought on the export of grain, which was reduced to 67 per cent of the 1981–82 tonnage. However, two years later, in 1984–85, the total trade reached two million tonnes, the main feature being that loaded cargoes comprised 87 per cent of total Port trade. In that financial year the Port loaded 1 739 232 tonnes of cargoes, which is still the highest on record, followed by 1 528 698 tonnes attained in 1988–89. The most significant growth in 1984–85 was associated with grain, which increased by 80 per cent relative to 1983–84 tonnages. The recent increases in the export tonnage are mainly associated with the Portland aluminium smelter and the woodchipping industry.

In 1988–89, another record was set when the total trade exceeded two and a half million tonnes. In that year, apart from loading the second highest tonnage of 1 528 698, the Port established a record level of inbound goods totalling 1 134 519 tonnes. The most striking feature of the year's trading was that the volumes of loaded and discharged tonnages were almost on a par, which points to more evenly balanced trade between outward and inward tonnages than had been seen previously. During the last decade of operation, ending 1988–89, total outward tonnages exceeded total inward, on average, by 2.3 to 1, compared to the previous two decades where trade was heavily biased towards inbound trades.

In 1989–90 the total trade decreased by 9 per cent from the previous year tonnages, to 2 429 451 tonnes. However, despite the overall reduction trade achieved the second highest throughput recorded by the Port of Portland. The ratio of outbound tonnages to inbound in 1989–90 was of the order of 1.3 to 1.

TABLE 3.1 PORT OF PORTLAND TRADE SUMMARY
(tonnes)

Year	*Loaded*	*Discharged*	*Total trade*
1959–60	16 481	170 225	186 706
1960–61	66 274	172 473	238 747
1961–62	113 681	171 341	285 022
1962–63	139 785	202 436	342 221
1963–64	170 701	234 821	405 522
1964–65	180 738	214 989	395 727
1965–66	84 185	238 712	322 897
1966–67	179 570	274 255	453 825
1967–68	47 962	288 241	336 203
1968–69	102 744	378 383	481 127[a]
1969–70	255 256	363 989	619 245
1970–71	508 168	347 799	855 967
1971–72	521 754	415 297	937 051
1972–73	184 546	475 458	660 004
1973–74	103 464	534 476	637 940
1974–75	164 063	418 847	582 910
1975–76	285 416	359 419	644 835
1976–77	274 346	419 708	694 054
1977–78	567 531	559 431	1 126 962
1978–79	527 399	596 119	1 123 518[b]
1979–80	1 438 993	474 355	1 913 348
1980–81	1 115 257	513 522	1 628 779
1981–82	851 113	452 027	1 303 140
1982–83	381 147	468 981	850 128
1983–84	1 000 088	359 098	1 359 186
1984–85	1 739 232	271 646	2 010 878
1985–86	1 469 121	331 171	1 800 292
1986–87	1 382 836	523 704	1 906 540
1987–88	1 226 486	739 127	1 965 613
1988–89	1 528 698	1 134 519	2 663 217[c]
1989–90	1 385 775	1 043 679	2 429 451

a. Ten-year average (1959–69) = 344 799 tonnes per annum.

b. Ten-year average (1969–79) = 788 248 tonnes per annum.

c. Ten-year average (1979–89) = 1 740 112 tonnes per annum.

Source Port of Portland Authority Annual Reports (various).

The 1980–81 to 1989–90 loaded and discharged tonnages are given in table 3.2. The outbound and inbound tonnage percentages are detailed by commodity in figure 3.1. The main features of the inbound and outbound trade movements of the major commodities from the Port (extracted from various Port of Portland Authority's Annual Reports) are summarised in the following paragraphs.

Meat and by-products

The overall tonnage of meat and allied products handled by the Port have varied considerably from year to year. Shipments of frozen mutton from the Port peaked at 15 713 tonnes in 1980–81 when the USSR received 63 per cent of the mutton shipment, followed by 21 per cent for Iran and 16 per cent for Saudi Arabia. After a significant decline since 1983–84, it peaked again in 1987–88, when 2592 tonnes of carcase mutton left Portland for Iran. In 1988–89 only 802 tonnes of mutton were consigned for export due to the closure of the Thomas Borthwick & Sons (Aust) Ltd Portland abattoir for seven months because of an industrial dispute. However, this figure increased to 7689 tonnes in 1989–90.

Livestock and stockfeed

The movement of livestock cargoes through Portland remained dormant for over a decade following two shipments totalling 60 000 head of sheep to Kuwait during 1963. However, regular livestock trade commenced in 1975–76 which has resulted in an increasing use of facilities at the Port for the handling of livestock. Five shipments of live sheep, totalling 52 272 head of stock for slaughter and breeding purposes and 1409 tonnes of stockfeed were exported to Iran during that year. Three years later in 1978–79, live cattle for meat and dairy purposes were uplifted, and in 1979–80 goats were consigned for export markets.

The livestock export trade increased after 1975–76 and in the three years ending 1988–89 it reached record levels. However, the considerable uncertainty associated with Australia's livestock exports has impacted heavily on the Port trade. Live sheep shipment to the Middle East decreased by 40 per cent, from its 1988–89 figure of 1 921 561 head, to 1 158 350 head during 1989–90.

Between 1976 and 1990, over 15 million sheep were consigned to the Middle East. During that period Portland gradually increased its share of the export market and handled close to one-third of Australia's overseas livestock export. This trend is envisaged to continue in future years.

Woodchips

The New Zealand based company Carter Merchants Australia Ltd established receival, storage and ship loading facilities on the Port's No. 2 Quay and exported the first consignment of 11 783 tonnes of woodchips for New Zealand in July 1984. By June 30 1985, a total of 47 440 tonnes of woodchips and 16 866 tonnes of timber from the pine forests in the south-east of South Australia were exported to Japan, New Zealand and Taiwan.

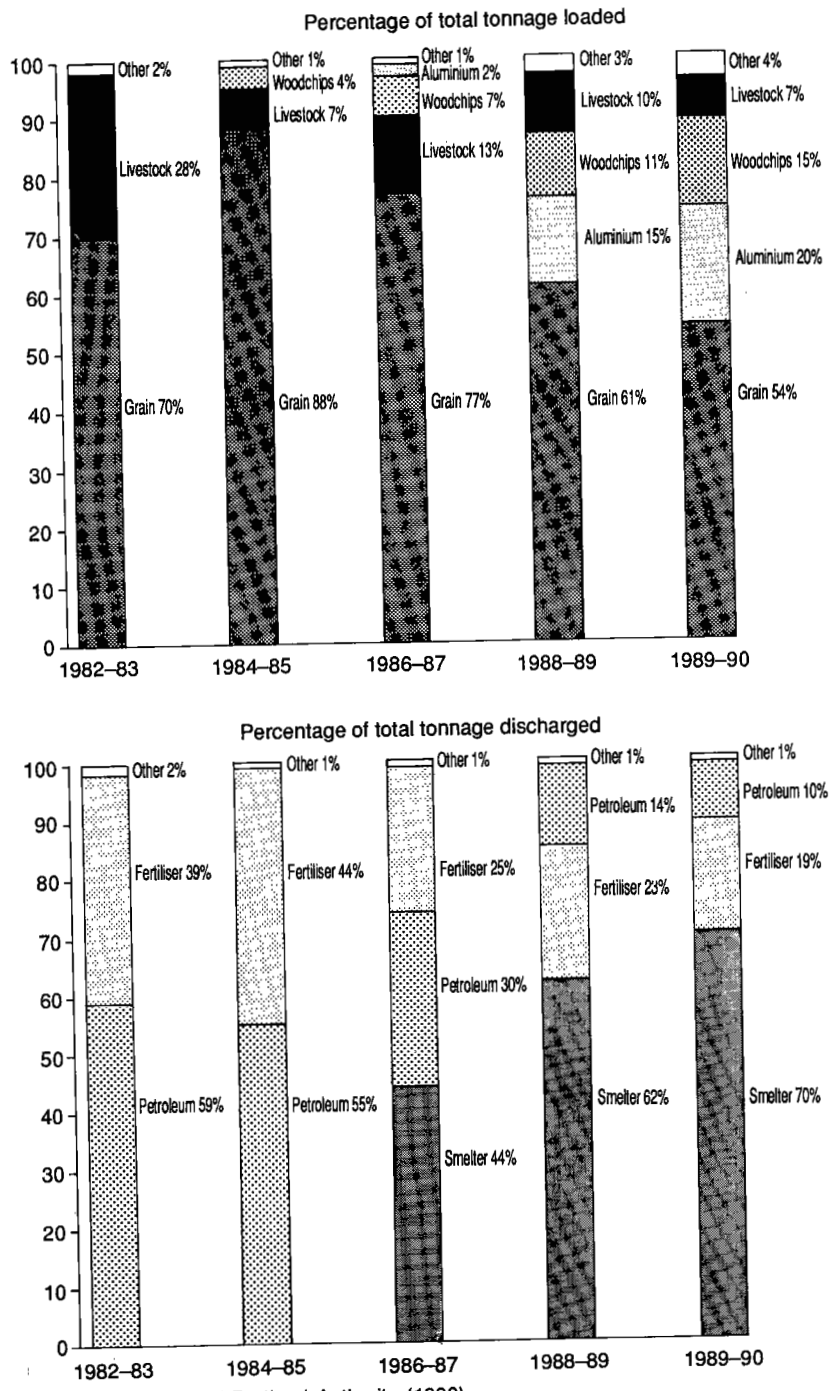
TABLE 3.2 PORT OF PORTLAND COMMODITY TRADE

(tonnes)

	1980–81	*1981–82*	*1982–83*	*1983–84*	*1984–85*	*1985–86*	*1986–87*	*1987–88*	*1988–89*	*1989–90*
Loaded										
Wheat	994 361	746 850	223 460	700 557	1 232 518	1 161 077	921 010	629 704	813 440	521 822
Barley	37 401	–	37 173	137 224	273 218	63 032	37 546	78 939	57 567	150 550
Other grain	31 252	52 559	–	12 088	21 167	17 438	28 052	18 420	5 345	8 320
Peas and beans	–	–	–	–	–	–	81 217	59 355	65 928	73 380
Tallow	4 969	3 686	5 052	2 632	4 747	5 847	5 854	4 135	–	6 647
Fodder	9 227	13 886	29 008	36 238	36 848	42 859	57 256	61 351	46 730	31 225
Live sheep	21 314	26 211	75 193	103 932	89 980	91 815	121 043	108 897	106 346	63 920
Live cattle and goat	419	1 179	1 150	387	747	1 046	1 865	2 442	1 240	240
Meat and by-products	15 713	5 677	8 093	182	80	–	681	2 592	802	7 689
Woodchips	–	–	–	–	47 440	82 261	92 068	117 595	169 874	204 371
Aluminium ingot	–	–	–	–	–	–	33 690	135 448	223 534	275 657
Silica sand	–	–	–	–	–	–	–	–	29 043	21 674
Miscellaneous	601	1 065	2 018	6 848	32 487	3 746	2 554	7 608	8 849	20 271
Total loaded	1 115 257	851 113	381 147	1 000 088	1 739 232	1 469 121	1 382 836	1 226 486	1 528 698	1 385 775
Discharged										
Petroleum products	307 984	208 351	275 727	215 074	151 024	132 644	156 882	142 501	155 207	103 541
Alumina	–	–	–	–	–	–	147 433	328 462	577 538	598 138
Petroleum coke	–	–	–	–	–	4 292	64 670	67 273	122 279	127 100
Other smelter products	–	–	–	–	–	5 012	21 446	31 855	14 661	3 658
Phosphate rocks	141 152	177 042	154 648	99 904	76 054	123 547	88 793	97 866	154 227	86 470
Sulphur	40 260	37 649	11 694	25 507	22 343	27 587	13 149	25 787	48 671	38 655
Potash	15 342	16 652	11 379	14 925	11 834	14 222	10 569	21 780	30 495	25 142
Other fertiliser product	–	–	5 280	–	8 577	22 169	16 331	18 910	24 881	52 248
Paper products	–	–	–	–	–	–	–	2 107	2 386	501
Miscellaneous	8 784	12 333	10 253	3 688	1 814	1 698	4 431	2 586	4 174	8 223
Total discharged	513 522	452 027	468 981	359 098	271 646	331 171	523 704	739 127	1 134 519	1 043 676
Total trade	1 628 779	1 303 140	850 128	1 359 186	2 010 878	1 800 292	1 906 540	1 965 613	2 663 217	2 429 451

– Nil

Source Port of Portland Authority, Annual Report (various years).



Source Port of Portland Authority (1990).

Figure 3.1 Port of Portland distribution of loaded and discharged tonnages by commodity

The long-term prospects for the export of *Pinus radiata* woodchips were enhanced during 1987, when the exporters, Carter Merchants Australia Ltd signed a long-term agreement for the supply of approximately 120 000 tonnes per annum of woodchips to Japanese paper mills. In 1988–89, 169 874 tonnes of woodchips were consigned to Japanese paper mills which was a 45 per cent increase from the previous year. In 1989–90, some 204 371 tonnes were loaded which represented an increase of 20 per cent over the previous year's shipments. More than 700 000 tonnes of woodchip have been consigned from the Port since trade first commenced. It is envisaged that the export of woodchip will continue to increase.

Aluminium ingot

In 1985–86 the Port entered a new era of import trade with the receipt of the first shipment of raw materials for Portland's aluminium smelter. In that financial year 5012 tonnes of electrode pitch, and 4292 tonnes of petroleum coke were discharged for the smelter. Subsequently the Port exported a total of 33 690 tonnes of ingot to Japan and Taiwan in 1986–87. With more than two tonnes of raw material required to manufacture one tonne of aluminium, there has been a corresponding increase in the inbound trade of commodities such as alumina from Western Australia, petroleum coke from the United States and pencil pitch from West Germany. During 1986–87, 147 433 tonnes of alumina, 64 670 tonnes of petroleum coke and 21 446 tonnes of other smelter related products such as electrode pitch, cryolite, aluminium fluoride and fluid coke were discharged. As noted in chapter 2, the second potline of the Portland smelter achieved full production in October 1988. This resulted in an increase in the trade of smelter related products from the Port.

In 1989–90, for the first time, the total cargoes associated with Portland smelter exceeded one million tonnes. In that year smelter related commodities accounted for 41 per cent of total Port trade. Some 80 per cent of the total production from the Portland smelter was exported through the Port.

The Port of Portland handles close to one-third of Australian export of aluminium ingots. Further substantial increase in trade is anticipated with the completion of the third and fourth potlines of the Portland smelter. The timing of full development of the smelter is unknown. The Portland Aluminium Smelter underwent a name change effective from March 1990 and became known as Portland Aluminium.

Grain

Export of grain has played a very important role in the Port's operation. The 21 years to 1989–90 witnessed changing trends in the export of grain. The following points are pertinent for this task:

- Among other grains, the Port was involved in the shipment of maize in 1970–71, sunflower seeds in 1972–73 and linseed in 1975–76.

- The last consignments of bagged flour and bagged grain, mainly to the Middle East, were made in 1977–78 and 1979–80 respectively.
- On two occasions bulk rice has been exported from the Port. The first occasion was in 1977–78 when a full cargo of 21 071 tonnes of bulk rice was consigned to Portland from the Riverina district of New South Wales for export to Spain. During 1981–82, 48 932 tonnes of rice were shipped to Portugal and Spain on behalf of the Rice Growers Co-operative Mills Ltd of New South Wales. In addition to bulk rice in 1981–82, there were 815 tonnes of bagged rice from Southern New South Wales exported to Kenya and Uganda as a Community Aid Abroad project. This was the last time that bagged rice was exported from the Port.
- A potential new trade for the Port of Portland eventuated in 1983–84 with the shipment of 8288 tonnes of lupin seed to Taiwan on behalf of a Wimmera-based company. The trade has continued at irregular intervals. In 1985–86 and 1986–87 it exported over both years a total of 17 270 tonnes of lupin seed to New Zealand.
- Since 1986–87 the export of coarse grains out of Portland has also included safflower and dun peas. The peas were destined to Europe and India and safflower to European and Japanese markets. During the four years ending 1989–90 Portland exported a total of 26 772 tonnes of safflower and 271 141 tonnes of peas. The Port also exported 3300 tonnes of faba beans in 1988–89 and 5448 tonnes in 1989–90. It is envisaged that exports of coarse grains will continue to increase in future years.
- Wheat exports have varied in response to seasonal conditions and a fluctuating world market. Since the commencement of bulk wheat export from the Port in 1975–76, only three times has it reached over a million tonnes: in 1979–80, 1984–85 and 1985–86 with 1 211 718 tonnes, 1 232 518 tonnes and 1 161 077 tonnes being consigned respectively.
- In the late 1980s wheat exports decreased from the 1985–86 figure. This was due to declining wheat prices in 1986–87 with Australian grain growers having to compete for international markets with heavily subsidised wheat from the United States and the European Economic Community. This resulted in many Australian farmers changing to crops such as dun peas, lupin and safflower. However, shipment of bulk wheat showed some increase from its 1987–88 figure of 629 704 tonnes, to 813 440 tonnes in 1988–89.
- During 1989–90 it exported only 521 822 tonnes of wheat which amounted to a 36 per cent downturn from the previous year. However, barley shipment in 1989–90 peaked at 150 550 tonnes and coarse grains including peas and faba beans also recorded increased export tonnages.
- The Port of Portland on the average handles about 6 per cent of the total Australian wheat export market.

Petroleum products

Discharge of petroleum products at the Port have been the prime trade into the Port since its inception. During the 31 years to 1989–90, after a slump to 178 158

tonnes in 1974–75, petroleum peaked at an all-time record level of 349 526 tonnes in 1977–78 when it comprised 62 per cent of the Port inbound trade. However, in 1980–81, the trade in petroleum products was affected, among other things, by the closure of the Mobil Oil Australia Ltd bulk depot at Portland. During that year the amount of petroleum discharged was in the order of 307 984 tonnes; it declined by 30 per cent to 215 074 tonnes in 1983–84, and by a further 30 per cent in 1984–85.

During 1988–89, 155 207 tonnes and, in 1989–90, 103 541 tonnes of petroleum were off-loaded at the Port, which constituted 14 per cent and 10 per cent respectively of the Port's total inbound trade. It is envisaged that future years will see a further decline in this figure, with the closure of the Ampol depot in 1990 and possible modal switch from port to road by the oil companies.

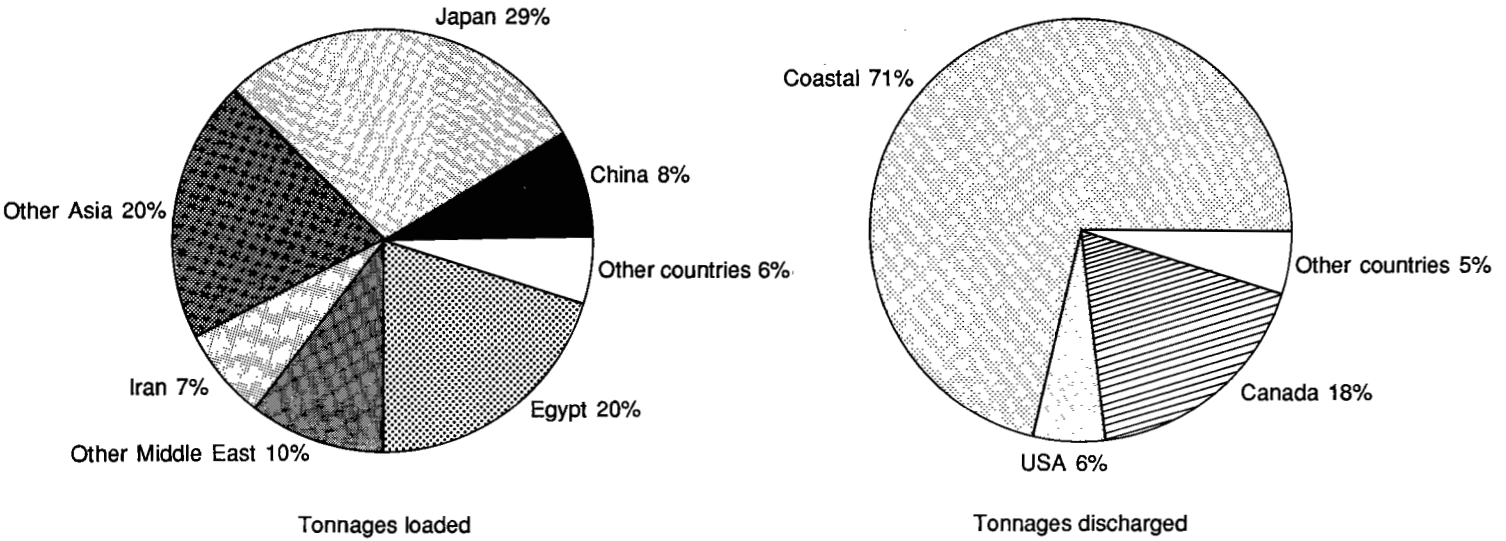
Fertiliser products

A significant development associated with the inbound trade of fertiliser raw materials occurred in 1968–69 when nearly 120 000 tonnes of phosphate rock, sulphur and sulphate of ammonia were off-loaded at the Port for the Cresco Fertiliser plant during its first full year of operation. Later, in 1970, the Phosphate Co-operative Company purchased the Portland plant from Cresco Fertiliser Ltd and upgraded the operation. In 1972–73 the raw materials landed for fertiliser manufacture were up 44 per cent from the previous year and were close to 200 000 tonnes.

In 1984–85 a second fertiliser company, Hi-Fert Pty Ltd, was established in Portland and provided another boost to the inbound trade of fertiliser. In 1985–86 the fertiliser inputs used by Portland's two fertiliser companies increased significantly from a total of 118 808 tonnes in 1984–85 to 187 525 tonnes during 1985–86, an increase of 58 per cent. The overall fertiliser trade dropped to 128 842 tonnes in 1986–87 but recovered in 1987–88 to 164 347 tonnes.

During 1988–89 the Port recorded its highest input of 258 274 tonnes of fertiliser products for the local manufacturers, a 57 per cent increase from 1987–88 figure. The raw materials which have been imported include phosphate-rock from Morocco, Nauru, Christmas Island and the United States, sulphur and potash from Canada and other high grade fertiliser inputs from the United States and Canada.

Although in 1989–90 the fertiliser inputs to the Port decreased by 22 per cent from the previous year, demand for high analysis fertiliser increased from 23 566 tonnes in 1988–89 to 52 248 tonnes in 1989–90 due to changing trends within the rural sector. Although fertiliser imports amounted to 19 per cent of the inbound trade to the Port it was still the second major inbound task after smelter input products.



Source Port of Portland Authority (1990).

Figure 3.2 Port of Portland distribution of tonnages loaded and discharged 1989–90

SHIPPING AND WORLD TRADE LINKS

The level of shipping activities in 1989–90 included 190 vessels loading and discharging cargoes and the total gross registered tonnage of trade vessels was 3 141 098 (Port of Portland, pers. comm.). The world trade links for 1989–90 are shown in figure 3.2 as a percentage of total tonnages loaded and discharged at the Port of Portland.

GRAIN MOVEMENT — FULL AND TOP-UP LOADS

There are currently 19 operative grain ports: three in Queensland (Brisbane, Mackay and Gladstone), three in New South Wales (Sydney, Newcastle and Port Kembla), two in Victoria (Geelong and Portland), seven in South Australia (Adelaide, Ardrossan, Wallaroo, Port Pirie, Port Giles, Port Lincoln and Thevenard) and four in Western Australia (Esperance, Albany, Kwinana and Geraldton). The capacity of these ports to handle vessels of particular size varies. There are only seven ports out of the 19 which are able to fully load vessels of Panamax size (55 000 to 80 000 dwt) or larger. These seven ports are located in Queensland (Brisbane), New South Wales (Sydney, Newcastle and Port Kembla), Victoria (Portland), South Australia (Port Lincoln) and Western Australia (Kwinana). A number of other ports (such as Geelong in Victoria, Port Giles and Wallaroo in South Australia and Albany in Western Australia) are able to accommodate Panamax size vessels but are unable to fully load them because of port depth limitations. As a result, they are topped up at deeper ports (Royal Commission into Grain Storage, Handling and Transport 1988).

Portland competes with Geelong for its grain traffic. Prior to 1988–89 about 30 per cent of Victorian grain traffic was channelled through the Port of Portland and the remainder through the Port of Geelong. During 1988–89, for the first time, more grain was shipped through Portland than Geelong. Figures for the three years to 1988–89 are shown in table 3.3.

TABLE 3.3 EXPORT OF VICTORIAN BULK GRAIN[a]

	Port of Geelong		*Port of Portland*		
Year[b]	*tonnes*	*per cent*	*tonnes*	*per cent*	*Total (tonnes)*
1986–87	2 018 752	65	1 067 825	35	3 086 577
1987–88	1 756 316	69	786 418	31	2 542 734
1988–89	847 843	47	942 280	53	1 790 123

a. Grain includes wheat, barley and other grain.

b. 1989–90 data are not available.

Source Port of Portland Authority (pers. comm.); Port of Geelong Authority (pers. comm.).

TABLE 3.4 NUMBER OF VESSELS HAVING FULL AND TOP-UP WHEAT SHIPMENTS FROM PORTLAND

	1984–85	*1985–86*	*1986–87*	*1987–88*	*1988–89*
Full loads	44	34	27	13	24
Top-up loads	37	28	38	52	24
Total grain vessels	81	62	65	65	48

Note 1989–90 data are not available.

Source Port of Portland Authority (pers. comm.).

At present the Port of Geelong can only fully load vessels up to 40 000 dwt capacity because of the channel depth limitation. Dredging to deepen the channel would be very expensive. To increase this capacity to 50 000 dwt, a capital expenditure of $46 million has been estimated (Royal Commission into Grain Storage, Handling and Transport 1988).

As mentioned earlier, the Port of Portland can readily accommodate loaded vessels of up to 55 000 dwt. Dredging, costing some $350 000 (1990 prices) per annum since the mid-1980s, has already improved berths to enable Panamax vessels to 70 000 tonnes to make limited use of the Port. Progressive deepening to 12.2 metres of all berths, and the provision of a turning circle, will enable the use by 70 000-dwt vessels of all appropriate Port facilities by 1995. Further, the dredging program may continue, and a depth of 13.7 metres may be available by the year 2000.

Since 1975–76, Portland grain movements have included full loads as well as top-up loads. In general vessels up to 60 000 dwt which are partly loaded at the Geelong Port are topped up at the Port of Portland. Top-up loads form a significant proportion of the Portland trade. Table 3.4 provides information on the total number of vessels for full and top-up loads over the five years to 1988–89. Excluding top-up cargoes, the average size of wheat consignments from the Port of Portland during 1988–89 was over 30 000 tonnes with some individual shipments in excess of 41 000 tonnes (Port of Portland Authority 1989).

A significant reduction in the number of top-up loads, from 52 vessel movements in 1987–88 to only 24 in 1988–89, has resulted in the average shipment size increasing from 12 099 tonnes to 19 633 tonnes (Port of Portland Authority, pers. comm.). Also in 1988–89 an increased number of vessels was fully loaded, 24 compared to only 13 in the previous year.

Some of the major port charges include port improvement dues, vessel mooring and unmooring dues, charges levied on vessels to cover the cost of facilities needed to enter, dock and exit, charges for the transfer of bunkers and water, pilotage charges, conservancy dues, health levies, light dues, survey fees, towage charges and stevedoring charges. These charges vary considerably from port to port and in a two port loading situation some of these charges may occur

TABLE 3.5 PORT COST DIFFERENTIAL OF PORTLAND AND GEELONG RELATIVE TO PORT LINCOLN

($ per tonne, 1989 prices)

Port	*Average port and shipping costs*	*Estimated two-port loading cost* [a]	*Port cost adjusted*
Portland	+0.56		+0.56
Geelong	+0.44	+1.03	+1.47

a. The additional cost of two-port loading is shown against the first port.

Source *Daily Commercial News* (1989a).

twice. Loading in two ports thus incurs additional port costs plus additional vessel direct operating costs. As with the freight rate, the two port loading surcharge of about US$1 per tonne is calculated against the total shipment tonnage (not against the tonnage loaded at the second port). With a high freight volume the surcharge could be substantial.

The Australian Wheat Board (AWB) has recently estimated the cost differential for each Australian port relative to Port Lincoln, which is believed to be the most efficient Australian grain port (*Daily Commercial News* 1989b). The port cost differential for Portland and Geelong is shown in table 3.5. According to the AWB the total cost involved at Port Lincoln is about $7.60 per tonne (1989 prices) for port throughput plus or minus the demurrage or dispatch earned on the vessel (which reflects the speed with which it has been loaded). This total cost of $7.60 per tonne is made up of $0.50 per tonne for stevedoring costs, $5.20 a tonne for grain terminal handling and $1.90 per tonne for other port charges. In the case of two port loading between Geelong and Portland, an additional cost of $1.03 is estimated by the AWB.

On the other hand the Port of Portland Authority (pers. comm.) estimated the additional cost of topping up at the Port in the vicinity of 23 per cent of the Port charges, which is about twice that estimated by the AWB.

The Royal Commission into Grain Storage, Handling and Transport (1988) states that the optimum use of the Port is discouraged by the pooling of port charges. Income transfers occur between growers because of the pooling of two port loading charges across all growers within a State, regardless of whether they deliver to a shallow port. If the charges which reflect actual costs are charged to growers or their agents, and are not pooled between ports, economic forces would be allowed to operate and the resultant topping up practices would be based on decisions of least cost.

The Royal Commission further examined a number of alternatives to the 1988 existing institutional arrangement for grain storage, handling and transport, to bring new incentives to alter market behaviour. One of the options tested, using its cost-budgeting model, was to withdraw sole receival rights, remove transport

restrictions and disaggregate costs for port services and sea transport. Based on this option the Royal Commission estimated resource cost savings in Victoria of the order of $7 per tonne (1986–87 prices) over the then existing institutional arrangements for grain distribution. On the other hand, the result based on the Eastern Australia model indicated that under the alternative arrangement (described above) there would be a significant increase in tonnages of grain delivered to Geelong, largely at the expense of Portland. However, the model solutions only give short term responses to changes. Nevertheless, the disaggregation of costs for port services and sea transport would have two major effects: first, it would increase the competitiveness between ports, as growers or their agents delivering to a particular port would pay for the services that reflect the actual cost of shipping grain from the port, and second, ports would lower these charges accordingly to enhance their competitive positions.

Larger vessels are evident in the grain trade in Australia. The effect of ship size on bulk freight cost has been demonstrated by Honu, Shaw and Taplin (1990). Replacing a 30 000-dwt bulk grain carrier on the voyage from Newcastle to Japan with a 70 000-dwt carrier lowers the cost of freight (1988 prices) from about $27 per tonne to about $13 per tonne. Further savings are expected if the ship size increases to 120 000 dwt. However, the lower cost may not eventuate if the large vessels are only partly laden. Currently 70 000-dwt carriers are the largest that can be handled in Australian ports for the haulage of grain. In 1985–86 about 62 per cent of grain was shipped from Australia in vessels up to 40 000 dwt, 28 per cent in vessels between 41 000 and 60 000 dwt and only 10 per cent in vessels between 61 000 and 80 000 dwt.

Given that in the grain trade vessels as large as Panamax sized bulk carriers have been taking advantage of the Portland deepwater harbour, but because of its depth limitation these vessels could not be fully laden, the lower costs associated with increased ship size were not fully realised. However, as the depth limitations are progressively removed Portland is becoming more competitive and will provide complete access to fully laden Panamax sized grain vessels.

SHIPPING SERVICES — THE SURVEY OUTCOME

At the time of the BTCE Production and Transport Choices Survey (appendix II) 43 out of 274 respondents indicated that they were using shipping services for commodities such as live sheep, wool, frozen meat, seafood, vegetables and wheat. Data also indicated that users received fertiliser from Port Adelaide and the Port of Portland, and goods of a general nature such as raw materials, spare parts, pulp and newsprint from the Port of Melbourne. The respondents were further asked to identify the mode of transportation in the movement of these goods from these ports to their establishment. Only one-third of the respondents received fertiliser by rail, the rest received fertiliser and other goods by road.

Respondents were asked to rate their level of satisfaction with shipping services. A breakdown of their responses is shown in table 3.6.

TABLE 3.6 LEVEL OF SATISFACTION WITH SHIPPING SERVICES
(number of respondents)

	Very satisfactory	*Satisfactory*	*Do not know*	*Unsatisfactory*	*Total*
Users	5	21	5	8	39
Non-users	19	32	148	23	222

Source BTCE Production and Transport Choices Survey 1989.

Data indicated that the majority of respondents did not have information to comment on port services. This was apparent even among wheat growers and sheep farmers. However, among the user respondents, data suggested a general level of satisfaction with services.

Regarding port development in the last five years and the type of improvements they would like to see, the respondents' comments were mainly directed to the Port of Portland. On the positive side, developments which had been noted in the previous five years were improved sheep export facilities and bulk grain shipment. On the other hand the main source of dissatisfaction related to industrial disputation, high port charges, slow rate of loading and difficulties in unloading fishing trawlers. Containerisation and wool export facilities from the Port of Portland were the main improvements in the port services respondents cited.

ANNUAL GROWTH AND FINANCIAL OUTLOOK

Since its inception in 1959–60, total Port of Portland trade has exhibited a steady growth, as shown in table 3.1. An average annual growth in tonnage of 10 per cent was estimated for the period 1959–60 to 1989–90.

Financially the Port achieved its first year of profit in 1988–89. During 1988–89 operating revenue increased by 16 per cent compared to the previous year, while operating expenditure decreased by 7 per cent. The result was a net operating surplus of $882 000. Over the three years to 1988–89, the rate of return on assets increased from 7.6 per cent in 1987–87 to 11.7 per cent in 1988–89 (Port of Portland 1989).

Currently the Port of Portland Authority is restructuring its charges in line with the recommendations made by the Inter-State Commission Waterfront Investigation (ISC 1989).

Some of these changes, which aim to improve Port and shipping efficiency, were implemented in August 1990. Under this restructuring, the Port Authority now obtains revenue from charges for actual Port services, rather than under past

practices where about 66 per cent of revenue was raised from wharfage charges levied on cargo (*Daily Commercial News* 1989a).

FUTURE IMPLICATIONS

The Port is able to handle close to one and a half million tonnes of grain for export annually within the existing resources, as it exported similar tonnages in 1979–80 and 1984–85. It has a capacity and supporting rail and road infrastructure to become a major Victorian grain export terminal.

The Port charges reflect, among other things, the vessel size that can be loaded at the Port and the out-load rates that can be achieved. By increasing the out-load rates the berthing times for vessels can be reduced. At present the Portland maximum out-load rate is 1000 tonnes per hour. An increase in the out-load rate say to 2000 tonnes per hour, other factors remaining the same, would reduce the berthing time of a vessel considerably. In contrast, Portland's main competitor, Geelong, has an out-load rate of 1600 tonnes per hour, while other grain ports within Australia, such as Port Kembla in New South Wales and Kwinana in Western Australia, have maximum out-load rates of 5000 tonnes per hour.

A study of the grain out-load rates at the Port of Portland was carried out by the Australian Wheat Board and the Grain Elevators Board in 1986–1987, and the costs and benefits of a substantial upgrading of these facilities were assessed. This upgrading was deferred, as prevailing wheat prices and tonnages were insufficient to justify the necessary investment (Port of Portland, pers. comm.). Further consideration will need to be given to this matter if exports of grain from the Port show a significant increase and if the outlook for grain prices improves.

Within the present infrastructure, the Port of Portland can accommodate future economic development in the region, such as expansion of Portland Aluminium with the introduction of the third potline, and the possible export of some 450 000 tonnes per annum of Murray Basin mineral sand (see chapter 4). It could also accommodate future increases in the livestock and woodchip trades.

It seems likely that the disaggregation of costs for port services and sea transport would result in port switching, as growers would take advantage of the differentials in port services and sea costs that may exist between ports. Further, under a disaggregated pricing policy, the cost of two-port loading would be borne by growers delivering their grain to shallow water ports. It is likely then that the pattern of growers' deliveries could change with increased deliveries to deeper and low cost ports. However, disaggregation of port services and sea transport charges would require significant modifications to existing pricing policies.

State governments are pursuing the commercialisation of port authorities with the aim of permitting greater competition in the provision of port services. This development will have a significant impact on port infrastructure and efficiency. Less cost-efficient ports will have to become more competitive. The Port of

Portland Authority has restructured its charges with aims to improve port and shipping efficiency and to make the Port of Portland more competitive.

The natural features of the Port of Portland make it well suited to handling a variety of cargoes. The Port has also demonstrated its adaptability to integrate with the establishment of large export oriented industries such as Portland Aluminium. The Port of Portland is at present underutilised and has potential for future growth with minimum outlay. The Port of Portland is a key factor in the development of the region.

CHAPTER 4 ROAD TRANSPORT

THE ROAD SYSTEM AND ITS USAGE

The length of road, and the sealed length, for the region and for Australia are given in table 4.1. Appendix IV includes further details of the road system, and also shows the traffic flows for a number of locations on the arterial roads.

Figure 4.1 shows the road system in the region and surrounding regions, as well as road links to Adelaide, Melbourne, Sydney and Brisbane. Table 4.2 lists the arterial roads serving the region.

TABLE 4.1 ROAD ASSETS, 1989

	Length (kilometres)		*Sealed proportion*
Region	*All*	*Sealed*	*(per cent)*
Study region	24 906	11 004	44.2
Australia	798 567	264 420	33.1

Sources BTE (1987a); South Australian Highways Department (pers. comm.); Roads Corporation (pers. comm.).

TABLE 4.2 ARTERIAL ROADS SERVING THE REGION

Route number	*Name*	*Status*
8	Western Highway	National highway
8	Dukes Highway	National highway
1	Princes Highway	State highway
106	Hamilton Highway	State highway
107	Henty Highway	State highway
112	Glenelg Highway	State highway
149	Midland Highway	State highway
12	Ouyen Highway	State highway
16	Murray Valley Highway	State highway
–	Mount Gambier – Keith Road	State arterial
121	Sunraysia Highway	State highway

Source BP (1990).

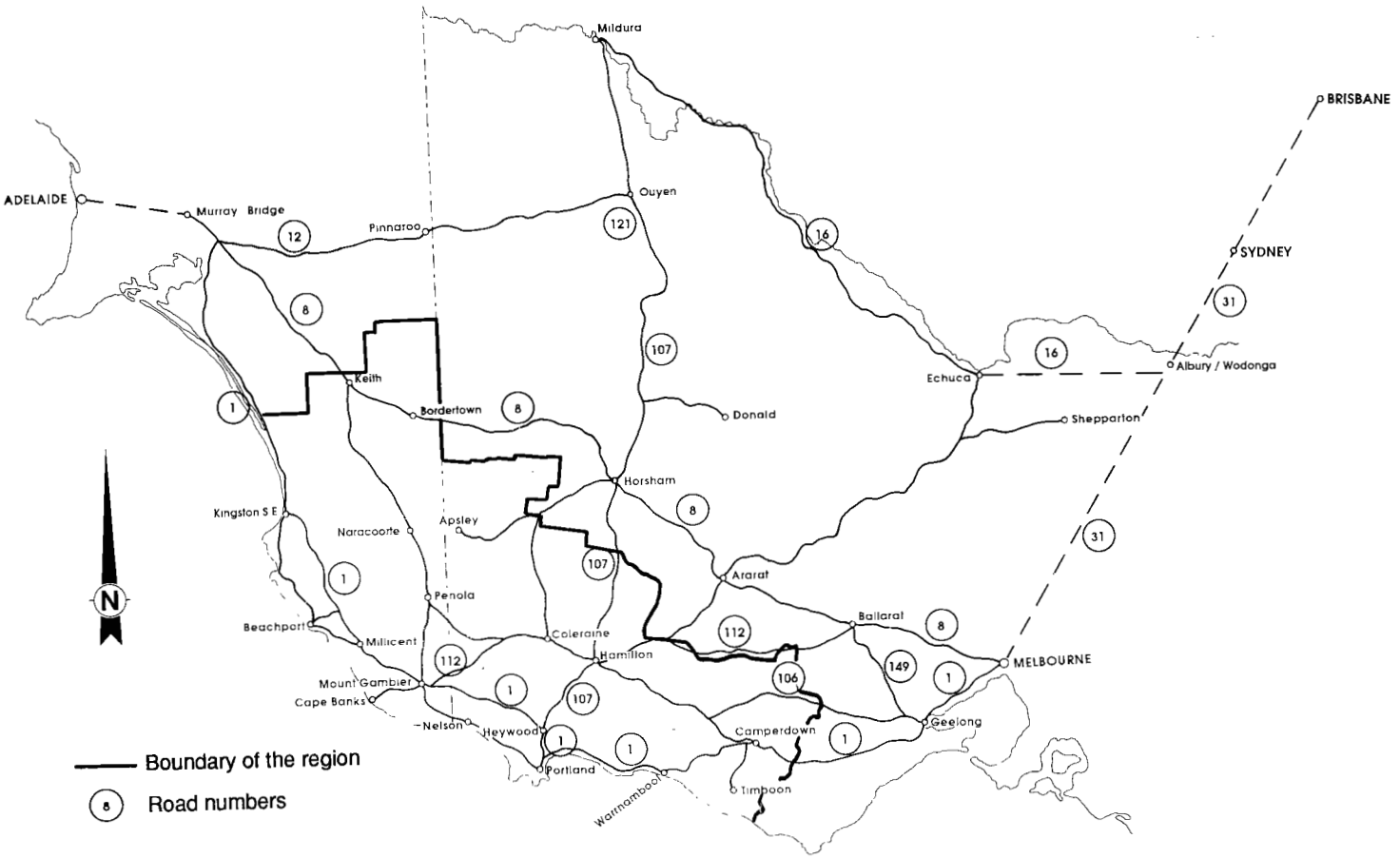


Figure 4.1 Road network

The most important freight routes in the region and adjacent areas lie in the Melbourne–Adelaide corridor. This corridor comprises the direct national highway route, the Western and Dukes Highways, and the three east–west Victorian State arterials, namely the Princes, Glenelg and Hamilton Highways which emerge from Geelong. There are four important north–south arterial roads of major significance which feed the Melbourne–Adelaide corridor. These are: the Midland Highway linking Geelong and Ballarat, the Henty Highway which links Portland to Horsham, the Mount Gambier to Keith Road and the Princes Highway from Mount Gambier which runs north from Kingston to rejoin the Dukes Highway at Tailem Bend. These arterial roads play a vital role in the passage of general freight and rural commodities to Melbourne and Adelaide as well as supporting the movements of commodities to and from the Ports of Portland and Geelong.

Estimates of the tonnages of the main commodities carried by road are given in table 2.3 for the year 1988–89, together with the approximate share between rail and road of land transport consignments for industry groups and commodities. As shown in table 2.3, in 1988–89 the retail industry made the largest demand of all the industries on road transport amounting to about 1.5 million tonnes, and the largest consigned tonnage of an individual commodity was live sheep amounting to nearly 0.5 million tonnes.

Strategies for development of Victorian roads in the region are included in *VIC ROADS 2000* (VIC ROADS 1990). Advance planning of roadworks has also been carried out by the road authority in South Australia. These sources indicate that no major road development project is planned for the region for the period to the year 2000. However, progressive improvements can be expected to be made on a number of arterial roads, as discussed later in the chapter.

ROAD FUNDING

The overall preservation and improvement of road infrastructure is determined by financial support for both road maintenance and construction projects. Financial support is provided from local, State and Federal government sources. Table 4.3 shows road funding from all sources for the region for the 1983–84 to 1987–88 financial years. Appendix IV includes some details of road lengths reconstructed or rehabilitated over the period 1985–86 to 1988–89.

The Federal government assumes financial responsibility for the National Highway System. Within the study region, the only National Highway is the Dukes Highway from the South Australian border to a point 8.5 kilometres north-west of Keith on the north-western boundary of the study region.

THE HENTY HIGHWAY

The Henty Highway, Victorian State Highway number 107, runs north from the Port of Portland to join the Sunraysia Highway in the Wimmera region, a distance of 357 kilometres. There is a discontinuity from Bolwarra to Heywood, near

TABLE 4.3 ROAD FUNDS FROM ALL LEVELS OF GOVERNMENT[a]
('000 dollars, 1987–88 prices)

	Year				
Region	*1983–84*	*1984–85*	*1985–86*	*1986–87*	*1987–88*
South-west Victoria	32 869.7	34 288.5	34 215.3	34 854.5	29 501.9
South-east South Australia	16 820.2	20 177.2	20 148.0	18 212.4	21 026.8
Total	49 689.9	54 465.7	54 363.3	53 066.9	50 528.7

a. Includes local, State and Federal governments.

Sources BTCE (1989a); Victorian Roads Corporation (pers. comm.); South Australian Highways Department (pers. comm.).

Portland, in which the Princes Highway forms a section of the Henty Highway corridor.

Traffic volumes for 1986 and growth data for the period 1976 to 1986 are given in appendix IV for five locations on the Henty corridor within the region. Traffic volumes in 1986 ranged from over 7000 vehicles per day north of Portland to just over 1000 north of Hamilton, while growth rates between 1976 and 1986 were estimated to be in the range of three to nine per cent per year.

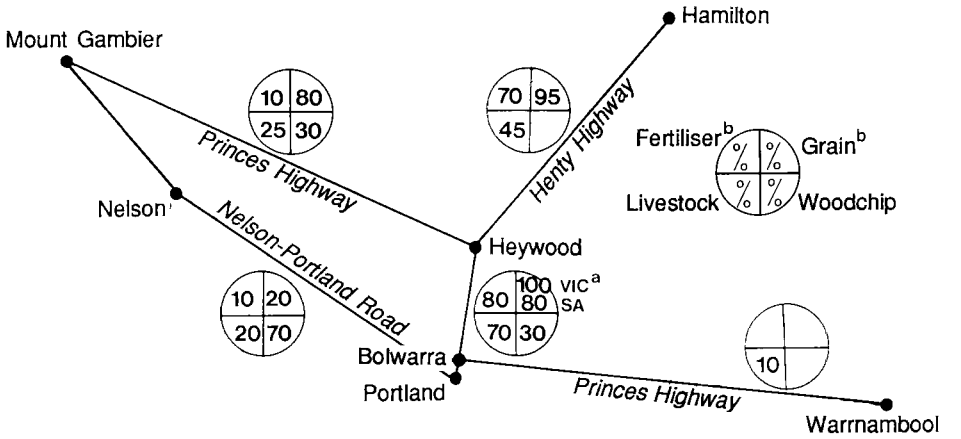
The Henty corridor is an important route for grain, timber products, livestock and superphosphate movements. The Henty Highway corridor could become increasingly important as the Wimmera mineral sands project is developed (VIC ROADS 1990). This project has the potential to add a further load of 450 000 tonnes of export traffic per annum to this route.

The significance of the Henty corridor has been highlighted in both the Road Construction Authority's VIC ROADS Community Consultation working paper (RCA 1989) and in the Henty Highway presentation paper (RCA 1988).

ROADS SERVING THE PORT OF PORTLAND

The road network serving Portland is important to the port and to the movement of export and import commodities. Figure 4.2 shows the main corridors of the network and the proportions of the tonnages of the four major commodities moved to and from Portland in 1988–89 on a number of links in these corridors.

The major commodities included in the road freight to Portland from South Australia are grain, woodchips and livestock (including fodder), and from Portland, fertiliser. There are two main corridors linking the Port to South Australia: one from Mount Gambier via the Princes Highway, joining the Henty Highway at Heywood and then to Portland, and the other from Mount Gambier via Nelson to Portland.



a. Includes 100% Victorian grain and 80% South Australian grain.
b. Percentage may not equal to 100 due to utilization of local roads (eg. 5% of Victorian grain, 10% fertilizer via local roads).

Source Port of Portland Authority (pers. comm.).

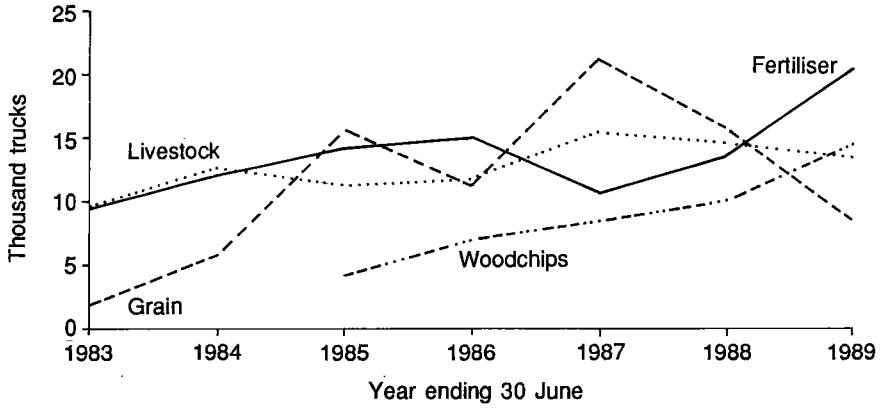
Figure 4.2 Proportions of four major commodities carried by road to and from Portland, 1988-89

As shown in figure 4.2, the percentages of the Portland tonnages of the four major commodities moved across the South Australian border via the Princes Highway comprise 80 per cent of the South Australian grain, 30 per cent of the woodchips, 25 per cent of the livestock and 10 per cent of the fertiliser. The percentages of the tonnages transported by road between the Port and South Australia through Mount Gambier – Nelson – Portland comprise 20 per cent of the South Australian grain, 70 per cent of the woodchips, 20 per cent of the livestock and 10 per cent of the fertiliser. All woodchips exported from Portland originated from South Australia in 1988–89. A new mill in the Dartmoor–Heywood region is likely to double exports from Portland. As a result, the corridor share of the woodchip tonnage carried by the Princes Highway could increase from 30 to 65 per cent.

On the Victorian side of the region, the Henty Highway carried the majority of the traffic flow to and from Portland. As shown in figure 4.2, the Henty Highway, north of Heywood, carried 95 per cent of the road tonnage of Victorian grain to Portland, 45 per cent of the livestock to Portland and 70 per cent of the fertiliser from Portland.

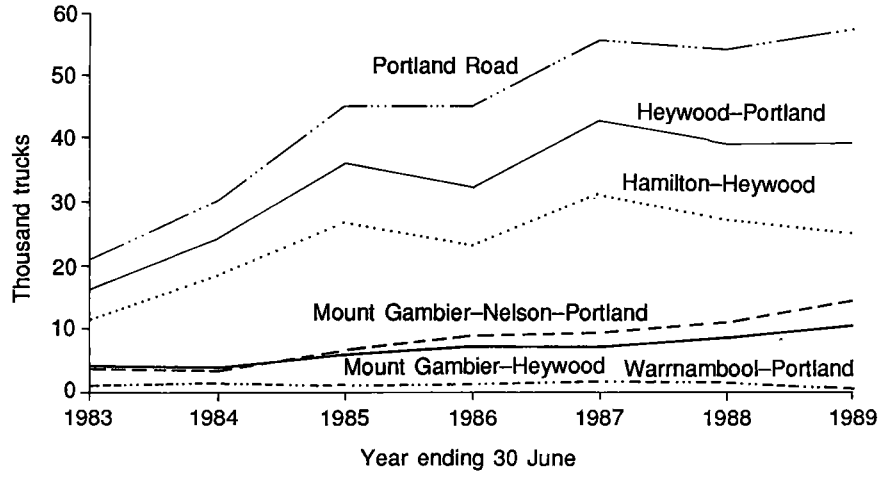
The tonnages on the Heywood–Portland link included both South Australian and Victorian grain and comprised 30 per cent of the woodchips, 70 per cent of the livestock and 80 per cent of the fertiliser. The Warrnambool–Portland corridor, on the Princes Highway, carried livestock, and wool and general freight to Geelong and Melbourne.

Figure 4.3 shows estimates of the annual truck numbers serving Portland via the main corridors between 1982–83 and 1988–89, for the carriage of grain, livestock (and fodder), woodchips and fertiliser. Apart from grain traffic, which is subject



Source Port of Portland Authority (pers. comm.).

Figure 4.3 Annual truck traffic to and from Portland carrying four major commodities on the main corridors



Source Port of Portland Authority (pers. comm.).

Figure 4.4 Annual truck traffic to and from Portland in the major corridors

to seasonal factors, there have been steady increases in woodchip, livestock and fertiliser cartage. The number of trucks generated by the Port of Portland to transport these four bulk commodities has shown an average growth rate of 20 per cent per annum since 1982–83.

Figure 4.4 illustrates the total number of trucks per year involved in carrying these commodities on each of the main corridors. Except for the

Warrnambool–Portland corridor where traffic flow since 1982–83 has been steady, all other corridors have experienced a substantial growth in traffic volume.

REGULATIONS AFFECTING ROAD USE

There are a number of issues affecting the efficient use of road transport in the region which are discussed below. It has not been possible to identify any particularly adverse affect on the region which does not also apply within the whole of Victoria or of South Australia, but there are some differences between the two States.

State B-double regulation

B-doubles are a medium combination vehicle (MCV) bearing 7 or 8 axles. In South Australia B-doubles have been allowed for some years, by permit, to operate on designated routes around Mount Gambier and along the Keith to Mount Gambier arterial road. In Victoria regulation of B-double operations has been more restrictive. Permits were not granted for the transport of goods for route and commodity combinations which would compete with rail transport. Until late in 1991, few B-doubles operated in Victoria.

At a regional workshop held by the Victorian Road Construction Authority in Warrnambool (RCA 1989), a number of workshop participants noted the potential benefits of B-double introduction in the south-western region. These included: Portland Smelter Services, the Commerce, Industry and Freight working group and the Local Government working group. Both in the submission from the Port of Portland Authority and in the workshop summary findings the benefits of B-doubles for the RCA's South Western Region were cited. A need for improved roads in order to achieve the full benefit of B-double operations was identified.

Both the Production and Transport Choices survey and the Transport Operator Route survey indicated that there was a demand for greater use of B-doubles, particularly for carrying wheat, wool, livestock and superphosphate. Stoney (1990) indicated that, in Victoria, changes in B-double usage may depend on a range of other changes associated with the transport industry. He stated:

> The pressure to reduce road freight unit costs will increase the demand for B-doubles (doubly articulated heavy vehicles). Only a few B-doubles under permit have been allowed in Victoria to date. There is considerable local opposition to their operation in or near urban areas. These concerns centre on road safety, the cavalier attitudes of a small proportion of large vehicle drivers, intimidation perceived by many car drivers, environmental considerations, competition with rail and apparent loss of amenity issues. The road freight industry needs to face and resolve these issues with the community before attitudes to B-doubles in Victoria will be relaxed.

Since November 1991 B-doubles have been included in the Federal Interstate Registration Scheme (FIRS), and such vehicles have been permitted to travel on a designated network of routes throughout Australia. Since that date, there has been a substantial increase in the issue of permits for the use of Victorian registered B-doubles on both arterial and local roads.

Commodity transport regulation

The transport of some commodities in Victoria is reserved for rail under certain circumstances. For example VIC ROADS administers regulations which limit trucks from competing with rail for the transport of grain, fertiliser, briquettes, and other commodities (Stoney 1990). In South Australia there is no legislation regulating grain to rail although there is a surcharge levied by Australian National (AN) on road movement between rail-reserved silos. These matters are discussed further in chapter 5.

SURVEY OF PRODUCTION AND TRANSPORT CHOICES

A description of the BTCE survey of production and transport choices is given in appendix II, together with the overall details of the responses concerning the particulars of the respondents' establishment in part 1 of the questionnaire, and a summary of responses to the general questions in part 7 concerning growth of production and business development expectations. As noted in appendix II, it was not possible to determine statistically whether the responses to this survey were representative.

Responses to the questions in part 1 indicated that a high proportion of respondents were dependent on roads for their transport needs. However, transport expenditure by respondents was generally identified as a low percentage of their total expenditure in 1988–89. A high proportion of the raw product supplies to producers was identified as coming from within the region. Further, roads were ranked as high in importance to the respondent's operations.

Responses to the questions in part 2 (road) indicated that a high proportion of respondents transport the principal products of the region initially to destinations within the region. Examples are aluminium to Portland, sheep to Portland and Naracoorte, cattle to Mount Gambier and Naracoorte, and all milk to Warrnambool. Adelaide was also nominated as a significant destination for wool, sheep and cattle. For inbound road freight, fertiliser was given as the major road task and most of this was indicated as entering the region via Portland, but Adelaide was also often indicated as an origin. In response to the questions about which road improvements respondents would like to see undertaken in their area of operations, improved surfacing was nominated most frequently for both local and arterial roads.

An interest in using B-doubles was evident amongst respondents, with 14 per cent of respondents stating that they would use B-doubles for the transport of goods within the region. (There were restrictions on the use of B-doubles, as discussed earlier.) Of this, 78 per cent of respondents were primary producers who transport wool, livestock and superphosphate between farms, ports and sale yards. One timber company indicated a need to use three B-doubles for carting logs from forest to sawmill. A total of 22 per cent, from the manufacturing sector, wanted to use B-doubles for the transport of consumer goods such as beer, cement, particle board and consumer foods.

TRANSPORT OPERATOR ROUTE SURVEY

A description of the BTCE survey of transport operators' operations and a discussion of the findings is given in appendix III. As explained in this appendix, the 24 respondents were not necessarily a representative sample of the 110 road transport operators surveyed, nor of all transport firms operating in the region. Thus the responses can be said to provide only an indication of the characteristics and attitudes of some proportion of the road transport industry operating in the region.

Of the 312 vehicles used by the respondents for this task, 291 were six-axle articulated trucks. In response to the question as to whether they would use B-doubles, eight out of the 18 respondents not already using them said that they would use B-doubles.

OUTLOOK

The demand for roads

Overall traffic growth in the region was substantially higher than that of Victoria, South Australia and Australia generally, during the late 1970s and 1980s. This situation may continue as a result of the development of industries in the region as described in chapter 2. The general demand for road use will be affected by a more complex range of factors.

Some deregulation of commodities previously reserved largely to rail has occurred in recent years. In particular, the carriage of grain has been affected in Victoria. The impacts of deregulation of grain are by no means certain and monitoring of road usage is under way (VIC ROADS 1990).

The matter of cost recovery and pricing for road and rail services has received much attention in recent years, as for example in Railway Industry Council (1990) and ISC (1990). While full cost recovery of rail services in Victoria could result in higher rail freight rates for some commodities, the freight rates for road transport could rise in both States as a result of any higher charges on heavy vehicles introduced to recover the costs which their users impose on the road network. The net effects of these measures on road use in the region are difficult to predict.

The introduction of the widespread use of B-doubles in Victoria should result in less usage of six-axle articulated trucks, and more efficient use of B-doubles operating in South Australia. A small overall reduction in heavy truck flows should result.

The overall effect of these developments on road demand, and on the principal routes, is difficult to determine. However, traffic can be expected to increase on roads in the immediate vicinity of the development of industries at particular sites, such as the expansion of the paper mill south of Millicent. The impact of potential developments which could have far-reaching effects on the road system, such as the export of the Murray Basin mineral sands via Portland, is considered below.

Development of the road network to meet future demand

As indicated above, an analysis of road requirements over the years 1990 to 2000 was given in VIC ROADS (1990). Advance planning studies were also undertaken by the Highways Department of South Australia for the road network within the region in South Australia. These studies found that the existing arterial road network in the region can accommodate traffic levels projected from observed growth rates to the year 2000 without major upgrading of capacity, provided that modifications to alignment and width (including passing lanes) are made at some locations to improve traffic flow and safety.

Strategies for improvements to the Henty corridor within the region over the ten years to the year 2000, as described in *VIC ROADS 2000*, include minor realignment and local widening works between Portland and Hamilton, and pavement widening over about 15 kilometres between Hamilton and the northern boundary of the region. Plans also include the provision of overtaking lanes between Heywood and the junction with the Princes Highway near Bolwarra, and rehabilitation of 40 kilometres (25 per cent of the length in the region) north of Portland.

Two developments can be envisaged which would have substantial impacts on specific arterial roads. First, should the mineral sands in the Murray Basin be exploited, and should the mineral concentrates be transported by road to Portland for export, a significant increase in the number of heavy vehicles using the Henty Highway would occur between Horsham and Portland. Second, a substantial shift of wheat transport from rail to road (for example, as a result of complete deregulation of wheat cartage in Victoria) would particularly affect the Henty Highway, increasing the number of heavy vehicles delivering wheat to Portland.

In appendix IV, an examination is made of the growth in traffic which might result from these two possible developments, the expected growth of other traffic, and the capacity of the Henty corridor to carry such growth in the year 2000. This examination shows that major upgrading of the road capacity within the Henty corridor, such as duplication of the two-lane road link between Bolwarra and Heywood, would not be required by the year 2000. Nevertheless, if there was an appreciable increase in the heavy vehicle flow in the Henty corridor, there would be an accelerated decline in the physical condition of the road asset unless planned improvements in the corridor highway were expedited, and expenditure levels raised accordingly.

The additional cost of pavement maintenance and rehabilitation associated with such developments would depend on the extent of the extra loading, and the type of trucks used. An approximate guide as to the cost of truck loading can be estimated from the road track costs given in ISC (1990). In table 6.5 of this document the track cost of 20.7 cents per kilometre is given for a fully loaded six-axle articulated truck having a gross mass of 42.5 tonnes.

In order to carry the annual output of 450 000 tonnes of mineral sands to the port by road, an average of some 36 000 kilometres per year would be travelled by

trucks with an average load of 25 tonnes over the 132-kilometre distance between Horsham and Portland. The number of six-axle trucks using this road would increase by about 99 vehicles per day on average over the whole year. The resulting track cost would be nearly $1.0 million per year based on the Inter-State Commission unit cost figure. Using similar calculations, the additional track cost of transporting 200 000 tonnes of wheat per year over the 51 kilometres between Hamilton and Portland would be over $170 000 per year.

Another potential impact of the two possible developments referred to above is that there would likely be an increase in the number of road crashes unless planned improvements to the corridor were accelerated.

While sections or links of the road network in the region could be improved, if necessary, to meet an unusually rapid growth in traffic, this would generally result in the delaying of roadworks elsewhere on the road system which are competing for the available funds. On the other hand, should traffic growth in the region fall far short of forecast levels, much of the planned roadworks for the region could be readily postponed. In short, while future demands cannot be defined either for the road system or for individual routes in the region, there is sufficient flexibility in the programming of road works to enable development of the system to meet changing demands, within the limits of the available funds.

CHAPTER 5 RAIL TRANSPORT

The region is served by two rail authorities, namely V/Line in Victoria and Australian National (AN) in South Australia. V/Line also operates cross-border traffics to Mount Gambier. The region's rail network feeds into the Melbourne–Adelaide rail corridor through Wolseley from Mount Gambier, through Ararat from Portland and from Warrnambool through Geelong. The links from the region, covering over 700 kilometres, are depicted in figure 5.1.

THE RAIL TASK

Table 5.1 presents tonnage flows on the major rail links in the region for the five years to 1988–89. Generally, two-way traffic levels have significantly declined across all links in the region since 1975–76 with the exception being the Hamilton to Portland link from Ararat which is the largest direct rail grain route to the Port of Portland. The Portland rail task is closely examined later in this chapter. The data in table 5.1 present the tonnages moving across regional rail links and do not indicate, except in some cases, an origin–destination task.

Bulk commodities form the greatest share of the regional rail task with bulk grains being the largest commodity group. The main grain links in the network are from Ararat via Hamilton to Portland, and via Maroona and Westmere to Geelong. Some grain also flows from South Australia to Portland across the Mount Gambier to Heywood line. This tonnage, however, is estimated to be less than 1 per cent of grain receivals at Portland.

Other major bulk commodities carried across the regional rail network include fertiliser and briquettes. Fertiliser is carried from Portland to the Wimmera and northern wheat growing regions (discussed in detail later in the chapter). Briquettes are delivered to Warrnambool via Camperdown, and to the Apcel paper mill near Snuggery. Snuggery is served by a cross-border service from Heywood to Mount Gambier by V/Line and then by AN from Mount Gambier. Warrnambool and Snuggery each received around 40 000 tonnes of briquettes via rail in 1987–88. Over 40 000 tonnes of paper products destined for Melbourne, Sydney and Brisbane were carried on the Mount Gambier to Heywood line. Paper products were also carried to Adelaide along the Mount Gambier to Keith rail link.

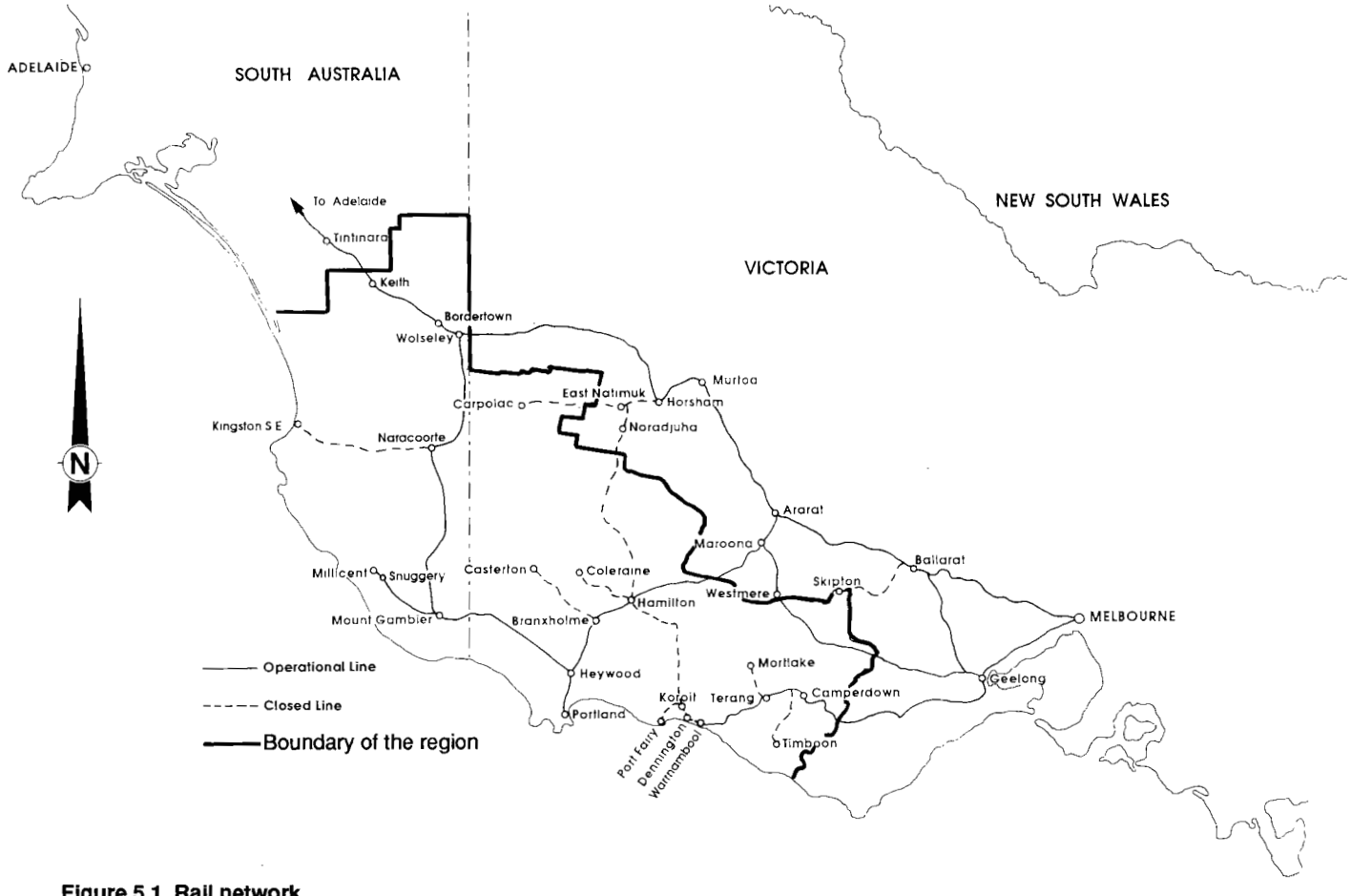


Figure 5.1 Rail network

TABLE 5.1 RAIL TONNAGES, 1975–76 TO 1988–89
('000 tonnes)

	Year				
Link	*1975–76*	*1979–80*	*1983–84*	*1987–88*	*1988–89*
Millicent–Mount Gambier	na	na	95	66	64
Mount Gambier–Millicent	na	na	73	68	60
Mount Gambier–Naracoorte	79	159	90	22	23
Naracoorte–Mount Gambier	72	90	74	31	34
Naracoorte–Wolseley	108	229	107	na	na
Wolseley–Naracoorte	113	159	93	na	na
Mount Gambier–Heywood	145	150	129	60	58
Heywood–Mount Gambier	21	75	79	57	58
Hamilton–Portland	359[a]	1 257	875	na	715
Portland–Hamilton	294[a]	225	25	43	na
Warrnambool–Camperdown	76	55	na	80	na
Westmere–Geelong	348	na	na	176	na
Geelong–Westmere	50	na	na	na	na

a. Includes East Natimuk to Hamilton and return traffics.

na Not available

Sources Australian National Railways (pers. comm.); South Australian Department of Transport (pers. comm.); V/Line, Railway Industry Council (pers. comm.); BTE (1979, 1983).

Residual commodities carried across the rail network in the region are dolomite, timber, general freight and manufactured products.

The Port of Portland rail task

The Portland V/Line Rail Complex is one of Victoria's major freight centres in the region. The Port has main rail track access. There are also additional private sidings to meet the requirements of local industries.

V/Line services Portland via Hamilton, Ararat and Horsham plus the connection from Mount Gambier via Heywood. The Ararat–Portland line, which is about 192 kilometres long, has recently been upgraded for grain traffic. This upgrading included longer crossing loops, easier gradients and new unloading facilities at Portland. As a result 55 wagon trains are operating regularly along the line.

The major rail link into the study region is the Ararat line to the Port of Portland. Table 5.2 summarises the total Portland rail tonnage over the ten-year period

TABLE 5.2 PORTLAND RAIL TASK, 1979–80 TO 1988–89

Year	Grain		Other (tonnes)	Total (tonnes)
	Tonnes	Per cent[a]		
1979–80	1 285 979	85	219 015	1 504 994
1980–81	1 017 170	81	245 685	1 262 855
1981–82	790 946	78	225 957	1 016 903
1982–83[b]	217 519	58	156 448	373 967
1983–84	879 706	88	115 764	995 470
1984–85	1 420 549	83	293 562	1 714 111
1985–86	1 045 775	85	182 917	1 228 692
1986–87	803 113	80	202 540	1 005 653
1987–88	667 658	85	121 662	789 320
1988–89	741 930	88	103 959	845 889
Average	887 034	83	186 745	1 073 779

a. Percentages of the total rail task.

b. Drought year.

Sources Port of Portland Authority (pers. comm.); V/Line (pers. comm.).

ending 1988–89, and the share of inward rail grain movements as a proportion of this task, which averaged 83 per cent of the total rail task. The tonnages of other commodities (such as fertiliser) transported by rail declined over this period.

Despite the decline in 'other' rail tasks over the ten-year period ending 1988–89, the grain traffic on the Ararat to Portland rail route remained fairly steady apart from seasonal fluctuations in grain production.

V/Line has rail access to the Grain Elevators Board terminal at the Port. The Portland Rail Complex is underutilised and has the capacity to double the current intake of grain. It has the capacity to handle four bulk trains per day which, in total, can deliver over 12 000 tonnes of grain. In 1988–89 the inward traffic into Portland comprised only two grain trains per day at the most.

The second highest component of the Portland rail task is fertiliser. Large quantities of fertiliser are transported from Portland to wheat growing districts, mainly in Victoria. There are one or two outward fertiliser trains daily between January and June from Portland, depending upon demand. V/Line has increased its interstate transport of fertiliser from Portland, and in 1989–90 supplied New South Wales with over 25 000 tonnes of fertiliser from the Portland plant.

For the three years to 1988–89 V/Line underwent major changes with respect to its fertiliser cargoes (*V/Line News* 1989). It consolidated the number of distribution rail depots in Victoria from 104 to 50. These 50 key fertiliser service centres accounted for over 90 per cent of the bulk fertiliser distribution by V/Line in 1988–89. It also has phased out the use of all four-wheel wagons and has introduced bulk trains. In servicing the Victorian network, V/Line ran trains with a minimum of 14 wagons to distribution centres mainly on the Gippsland, South Gippsland and north-eastern lines from Geelong and Portland. Although V/Line no longer provides fertiliser services directly to destinations where lines have been closed, these sites are supplied by coordinated rail and road services managed by V/Line.

Trends for the six years 1983–84 to 1988–89 in rail and road shares of grain transport, and for the ten years 1979–80 to 1988–89 for fertiliser shares are displayed in figure 5.2. The data indicate that for Portland the ratio of tonnages between rail and road in the grain industry is 9 to 1. On the other hand, more fertiliser has been carried by road from the Port of Portland in recent years and the proportion of fertiliser carried by rail has been decreasing. The modal shares between road and rail for the major commodities moved through the region for 1988–89 are shown in figure 5.3.

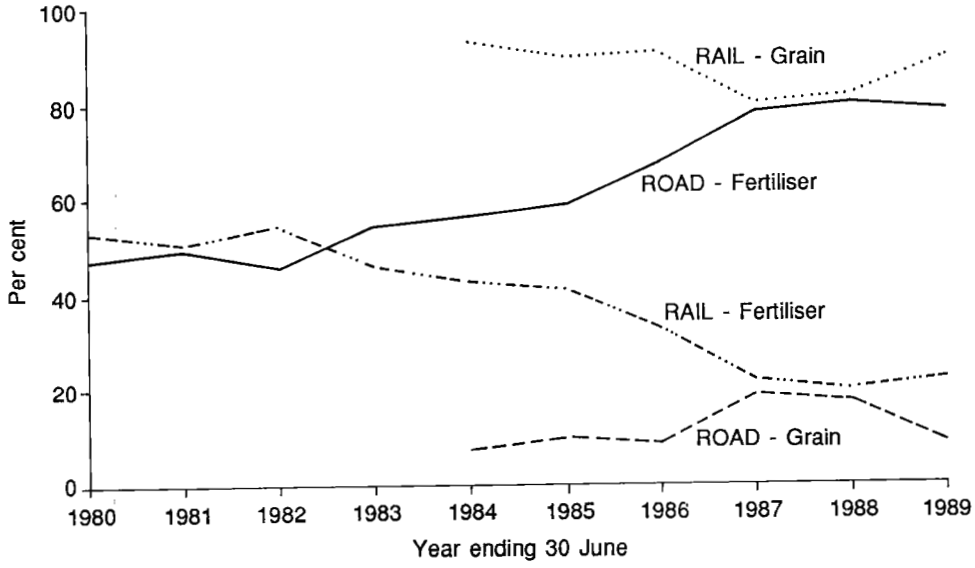
Among other commodities (table 5.2), the Portland Rail Complex in 1988–89 handled 1000 tonnes of scrap metal and, on the average, 50 tonnes per day of general cargo. There is a daily goods train between Portland and Mount Gambier and between Portland and Melbourne via Ararat.

V/Line also delivered post-sale wool from Portland to Melbourne prior to 1987–88. For example it delivered 21 300 tonnes of wool in 1979–80 which declined to only 1500 tonnes of wool in 1986–87. No wool was transported by rail in 1987–88 and 1988–89.

Further, large deposits of mineral sand containing titanium, zircon and other minerals have been discovered in the Murray Basin near Horsham. As discussed previously, an estimated 450 000 tonnes of mineral sand per annum may be transported to export markets via Portland or Geelong. At this early stage the Port of Portland appears to be a strong contender for this export market and rail appears to be the more desirable means for transporting this bulk commodity over such a distance. The alternative means of transport for this commodity to the Port of Portland is via the Henty Highway as discussed in chapter 4.

DEVELOPMENTS IN RECENT YEARS

Apart from the developments in the transportation of grain and fertiliser discussed earlier, there have been other developments of significance across the rail network within the study region: the new Dartmoor bridge across the Glenelg River has improved cross-border rail traffic, the Ararat to Portland rail link has been upgraded and the new intermodal freight centre at Mount Gambier became operational in 1989. The development of this intermodal centre was a joint



Sources Port of Portland Authority (pers. comm.); Phosphate Co-operative Company of Australia (pers. comm.).

Figure 5.2 Rail and road shares of grain and fertiliser tonnages to and from the Port of Portland

Sources ABS (1990e, 1990f); Port of Portland Authority (pers. comm.); BTCE.

Figure 5.3 Rail and road transport shares of major commodity tonnages, 1988–89

TABLE 5.3 RAIL CLOSURES

Closed lines	*Closure date*	*Kilometres*
Coleraine–Coleraine Junction (near Hamilton)	12.9.1977	37
Casterton–Branxholme	12.9.1977	52
Coleraine Junction–Koroit	12.9.1977	83
Koroit–Port Fairy	12.9.1977	18
Koroit–Dennington	12.9.1977	10
Mortlake–Terang	1.8.1978	21
Noradjuha–Hamilton	1.7.1979	114
Timboon–Timboon Junction	8.12.1986	35
East Natimuk–Corpolac[a]	8.12.1986	61
East Natimuk–Noradjuha	8.12.1986	11
Horsham–East Natimuk[a,b]	10.1988	22
Kingston–Naracoorte	2.1989	87
Total closure length		551

a. Includes some part of lines outside the study region.

b. Service suspended.

Sources V/Line, AN (pers. comm.).

undertaking by Australian National and K & S Freighters, a major regional road transport company based in Mount Gambier. This centre provides transfer facilities for containerised general freight destined for Adelaide and Perth which otherwise would have gone by road transport. This development reflected the regional establishment of major integrated road–rail operations to benefit both regional road and rail operators.

Rail network rationalisation

In an effort to improve the efficiency of rail freight in the region there has been a large rationalisation of services in the regional rail networks over the period September 1977 to March 1989. The twelve most uneconomical lines were closed over this period, eleven in south-west Victoria and one in south-east South Australia. As can be seen in table 5.3 and figure 5.1, a total track distance of 551 kilometres was removed from the regional rail network over this period.

Deregulation of grain trainsport

The Commonwealth's *Wheat Marketing Act 1989* restated the Australian Wheat Board's sole responsibility for marketing wheat exports and widened the Board's charter to cover other grain exports. The Act also included provisions to override

certain State regulations with respect to marketing, storage, handling and transport of export grain. The Act and ensuing regulations could, therefore, be perceived as the legislative basis whereby the transport, storage and handling of export wheat has been deregulated nationally.

In 1989, nine silos in South Australia switched from being serviced by rail to being serviced solely by road. In Victoria the immediate regional development which flowed from the deregulatory effects of the *Wheat Marketing Act 1989* was the establishment of a private grain handling facility near Portland — Portland Grain Handling. This facility is now handling grain, crops and legume traffic from both the Wimmera and the South East of South Australia districts.

Victorian rail pricing initiatives

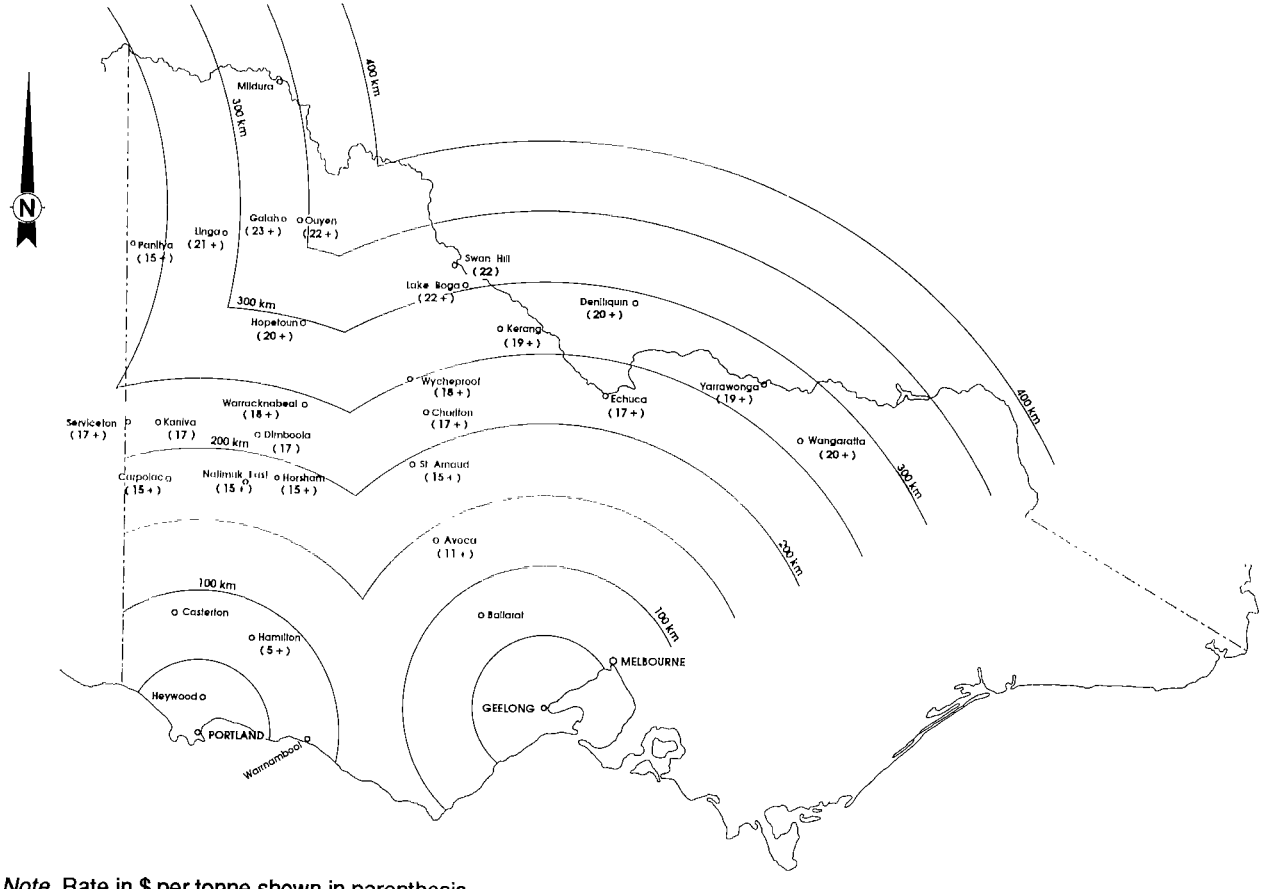
Three major rail pricing initiatives were undertaken by V/Line and the Victorian government recently. First, V/Line replaced its previous radial pricing policy for grain transport (see figure 5.4) and freight rate escalation formula (see BTCE 1988a) by direct freight rate negotiations with the Australian Wheat Board. Second, the Victorian *Transport Amendment Act 1989* removed the obligation for V/Line to include 'underwheel' rail costs in its freight pricing and charges. This meant that costs such as track maintenance were not necessarily recoverable from rail users. Third, whether as a direct result of either or both of the above two initiatives, V/Line introduced a new set of rail wheat haulage rates, which became operational on 1 November 1989. These new rates represented an estimated 11 per cent reduction on previous rate schedules and applied to 239 V/Line served locations.

The old radial pricing policy set rail freights on the basis of zones determined by intersecting concentric rings using the grain export port as the centre of the associated circles. Figure 5.4 shows the early 1989 freight rates for 23 towns (V/Line 1989 pers. comm.) superimposed on concentric rings centred on Portland and Geelong. This demonstrates that the 1989 rates still had an approximate radial structure, with variations occurring in the 250-kilometre radial bands and beyond.

The Melbourne to Adelaide rail corridor

The Melbourne to Adelaide rail corridor crosses the north-west of the region and includes the Wolseley to Keith section. This section of the rail corridor carries two-way Melbourne and Geelong traffic to Adelaide, two-way Victorian and South Australian generated traffic and Melbourne to Perth two-way traffic. This section is also fed by Perth and Adelaide freight destined for Mount Gambier and Mount Gambier traffic destined for these two ports. This section of line carries predominantly general freight. The major bulk grain flows bypass this rail section, and enter the corridor at Dimboola and Murtoa from the north and at Ararat and Ballarat via Maryborough in the eastern part of the corridor.

A BTCE study on non-bulk freight flows in Australian corridors (1990) examined, among other things, the tonnage flows along the Melbourne–Adelaide



Note Rate in $ per tonne shown in parenthesis.

Source BTCE, V/Line (pers. comm.); Royal Commission into grain storage handling and transport (1988).

Figure 5.4 1989 V/Line wheat freight rates for selected towns to the Port of Portland and Geelong, superimposed on the old radial pricing structure

corridor over the twenty-year period 1964–65 to 1984–85. The freight carried in both directions in the Melbourne–Adelaide corridor was estimated to be nearly one million tonnes in 1984–85. For the twenty-year period, the two-way rail freight traffic along the Melbourne–Adelaide corridor grew at an annual rate of 2.9 per cent. This study projected an annual growth rate of 1.9 per cent to the year 2000 for the two-way traffic along the Melbourne–Adelaide corridor. It was assumed that there will be no fundamental change in past patterns, real gross domestic product in Australia was forecast to grow on average by 2.5 per cent annually and real freight rates were forecast to remain constant over the period. On the same basis a growth rate of 3.7 per cent along the two-way Eastern States – Perth corridor was estimated.

REGIONAL PERCEPTIONS OF RAIL

In mid 1989 the BTCE conducted the Survey of Production and Transport Choices in the region (appendix II). Observations from the survey regarding rail freight services are outlined here.

The survey included 49 current rail users within the region. The survey also included some 152 users who had switched from rail freight services to road transport. Of these 152 respondents, 43 either owned or leased their trucks, 31 contracted road transport and 21 did both. The remaining 57 respondents were non-committal. During the survey the 152 former rail users were asked to indicate their reasons for not using rail transport. The major reasons cited for not using rail services included:

- the lack of current services (134 respondents);
- rail delivery time was long (61 respondents);
- the infrequency of services (58 respondents); and
- the high cost of rail transport (55 respondents).

The 49 respondents who were using rail services were asked to identify the main reasons for doing so. The main reason given by almost half of these respondents was that rail services were cheaper than road transport. Convenience and government regulations were cited by 32 per cent and 10 per cent of these respondents, respectively, as a major reason for using rail.

One-third of the users indicated that they were using the rail service more than twice a month, whereas the rest indicated that they used rail at irregular intervals and less often. On average the rail users were about 14 kilometres away from their nearest rail receival point. The average distance for the non-farming, or production and manufacturing, respondents was 10 kilometres, whereas for farmers it was 16 kilometres. For comparative purposes the Royal Commission into Grain Storage, Handling, and Transport (1988) found that the average distance for Australian wheat farmers was 17 kilometres from their local rail receival point.

TABLE 5.4 RESPONSES ON SATISFACTION WITH THE RAIL FREIGHT SERVICES

	Satisfactory	*Need some improvement*	*Need extensive improvement*	*Never use it*	*Total responses*
Number of responses	37	24	80	131	272

Source BTCE Survey of Production and Transport Choices.

Respondents were asked to indicate what additional rail freight rates they would be willing to pay if offered door-to-door goods pickup/delivery services. The majority of respondents, 129 of 241, stated that they would still not use rail services. Some 75 respondents stated they would consider using such a facility but would not pay any more for this added service. Another 23 respondents were willing to pay 5 per cent above current freight rates for door-to-door service, whilst only 14 respondents were willing to pay more than this amount.

Changes in rail schedule was cited by 81 respondents as causing difficulties. For these respondents changes in rail services had increased their rail costs and reduced their use of rail. Respondents were also asked to rate the freight services on a scale ranging from 'satisfactory' to 'need extensive improvement'. Excluding the group who never used the services, 57 per cent of the respondents indicated rail services were in need of extensive improvement (table 5.4).

OUTLOOK

The rail task is comprised, almost exclusively, of bulk commodities, such as grain and fertiliser, carried over longer distances. While the overall rail task decreased over the ten years to 1988–89, rail retained a substantial role in the carriage of wheat, which is by far the largest component of the rail task.

Although the effects of deregulation concerning the mode of transportation to port for export of wheat are not yet clear, the V/Line view is that in the short term, deregulation of grain transport will have only a minimal effect on V/Line grain freight (V/Line 1990 pers. comm.). Further results of a recent BTCE study on coal transportation (Batterham, Mikosza and Ockwell 1991) indicated the comparative efficiency of rail over road transport in the transport of bulk commodities. It thus seems likely that in future years V/Line will retain its major share in the carriage of wheat provided V/Line remains competitive with road.

The rail industry has taken a number of steps in recent years to become more competitive with road freight, including V/Line's reduction in its freight charges by 11 per cent. Furthermore V/Line and AN have rationalised and consolidated track infrastructure and have embarked on large rail capital investment strategies in the region. Initiatives to integrate road and rail operations in the region include the construction of the new intermodal centre in Mount Gambier.

The rail complex at Portland is at present underutilised and has the capacity to double its 1988–89 grain freight volume. Significant growth could also be accommodated in the movement of bulk fertiliser. Based upon cost estimates generated by Canac Consultants (1984) (that is, estimated fixed cost of $6000 per kilometre and a variable cost of 0.1 cent per gross tonne-kilometre of maintaining Victorian branch lines) the cost associated with additional volume carried on these branch lines would be minimal. Furthermore, with modern systems, a single track can readily accommodate more than five million tonnes of freight a year (Honu, Shaw & Taplin 1990). The total Portland rail task averaged just over one million tonnes per year for the period 1979–80 to 1988–89 and peaked in 1984–85 at 1 714 111 tonnes. In this respect, present infrastructure could sustain a substantial increase in the overall freight tonnages at virtually no cost in congestion and could support significant growth in throughput at the Port of Portland.

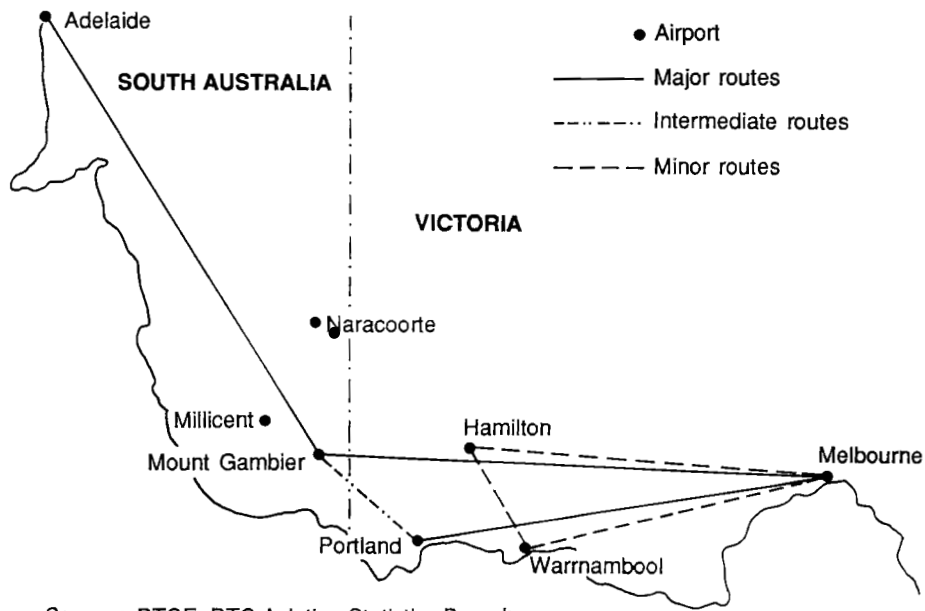
The Prime Minister's *One Nation Statement* in February 1992 included a proposal for the Federal government to provide $115 million to standardise the rail gauge between Melbourne and Adelaide. Investment alternatives for branch lines have yet to be fully studied, and the impact of standardisation on regional transport is difficult to assess at this stage.

The *One Nation Statement* also included an offer of $20 million of Federal funds for the upgrading of the South Dynon freight terminal. V/Line had been making concerted efforts to establish an integrated road–rail transfer centre at the Melbourne Dynon South container terminal (*V/Line News* 1989). Should Dynon South become a more efficient transfer terminal, various manufacturers and road transport operators in the region are likely to reconsider the potential use of rail for their Sydney and Brisbane transport operations, especially if the delivery time is shortened by overcoming gauge problems.

CHAPTER 6 AIR TRANSPORT

This chapter describes current airfreight services and their trends over recent years.

Currently the region is served by two commuter operators, O'Connor Airlines and Kendell Airlines. O'Connor Airlines run scheduled services Adelaide – Mount Gambier – Melbourne as well as charter operations to Warrnambool, Hamilton and Portland. Kendell Airlines also run regular services Melbourne – Mount Gambier – Adelaide as well as providing Melbourne – Portland – Mount Gambier services. The major routes and airport locations are presented in figure 6.1.



Sources BTCE; DTC Aviation Statistics Branch.

Figure 6.1 Air network

TABLE 6.1 MOUNT GAMBIER'S AIRFREIGHT TASK, 1980–81 TO 1989–90

(tonnes)

Year	*Regional*	*Commuter*	*Total*
1980–81	66	31	97
1981–82	61	63	124
1982–83	66	26	92
1983–84	53	22	75
1984–85	56	21	77
1985–86	19	38	57
1986–87	–	39	39
1987–88	–	41	41
1988–89	–	48	48
1989–90	–	47	47

– Nil

Source DTC Aviation Statistics Branch.

AIRFREIGHT SERVICES

Airfreight from the region comprises a variety of general freight lines as well as seasonal outbound movements of lobster cargoes. Airfreight trends for Mount Gambier are outlined in table 6.1. Regional airfreight services to Mount Gambier ceased towards the end of 1985 when Airlines of South Australia discontinued operations.

For the ten-year period 1980–81 to the end of 1989–90, Mount Gambier was responsible for 80 per cent of the estimated regional airfreight task. Airfreight from the combined ports of Portland, Hamilton and Warrnambool account for the bulk of the remaining 20 per cent. The average task handled at Mount Gambier between 1986–87 and 1989–90 has been of the order of 44 tonnes per annum.

PERCEPTIONS OF AIRFREIGHT SERVICES

The BTCE Production and Transport Choices survey (appendix II) indicated that air services are used to carry a number of products of high value and time-sensitive nature such as spare parts, vegetables, frozen meat, flowers, fish products and general freight. The frozen fish products, frozen meat and flowers are destined for overseas markets, especially Japan.

A number of respondents (over 10 per cent) indicated that they would like to use airfreight services for overseas export markets, including lobsters and frozen meat to the United States and Japan, and vegetables to Singapore. There

TABLE 6.2 RESPONSES ON SATISFACTION WITH THE AIRFREIGHT SERVICES

	Number of responses	*Percentage*
Satisfied to very satisfied	49	36
Indifferent	71	52
Dissatisfied to very dissatisfied	16	12
Total	136	100

Source BTCE Production and Transport Choices Survey.

appears to be some potential to utilise airfreight services for overseas export markets directly from the region.

During the survey respondents were also asked to indicate their level of satisfaction with freight services. Their responses are summarised in table 6.2.

The data indicated that, among those who responded, the majority were neither satisfied nor dissatisfied with air services. Over one-third of the respondents registered their general satisfaction with freight services. The data also suggested that the majority of respondents were not aware of any changes in air services that may have taken place over the previous five years. Some 10 per cent of the respondents indicated that increasing costs, infrequent services and closure of some existing services have affected their business operations.

CONCLUDING OBSERVATIONS

The high value and time-sensitive nature of the commodities transported by air and the lack of suitable alternatives, because of the perishability of the freight, make airfreight services more viable than other modes of transportation. The replacement of regional services with commuter services in 1986 was followed by a reduction in the airfreight volume into and out of the region. From the region's major airport, Mount Gambier, the average annual freight carried during the four years ending 1989–90 was of the order of 44 tonnes. These tonnages include high-value commodities such as lobsters, fish products, frozen meat, flowers and vegetables. However, responses on the BTCE Production and Transport Choices survey indicated that the majority of users were not dissatisfied with the available freight services.

CHAPTER 7 TRANSPORT OVERVIEW

The purpose of this chapter is to review the major findings of the study concerning the nature, role and task of freight transport in the region and the outlook for its development. The ramifications of conducting a more extensive transport study of the region are also discussed.

EXISTING TRANSPORT SERVICES

The region's transport facilities include a port, road and rail networks, and airports. The transport infrastructure has been meeting the demand for transport services without evidence of congested operations on a regular basis in any of these transport modes.

The Port of Portland is Victoria's only deepwater port, handling a total of 2.4 million tonnes of cargo in 1989–90. In that year some 70 per cent of the tonnage of imports were inputs to the Portland smelter, while grain comprised over 50 per cent of the export tonnage.

There is a road network of about 25 000 kilometres of which about 11 000 kilometres are sealed. The network includes arterial roads running east–west through the region (the Princes, Hamilton and Glenelg Highways) and north–south feeders into the Melbourne to Adelaide road corridor (the Mount Gambier to Keith road in south-east South Australia and the Henty Highway in Victoria). A substantial portion of the road freight task is derived from each of the retail, manufacturing, agriculture, and forestry industries. About 4.5 million tonnes of freight were moved by road in 1988–89 to or from points within the region, amounting to nearly 80 per cent of the region's land transport task.

The region is served by two rail authorities operating networks which together comprised about 700 kilometres in 1990. The Melbourne to Adelaide line passes to the north of the region and through its north-west corner in South Australia. There are several links to this line from the region and a rail link to Melbourne via Geelong. The principal commodities carried by rail are grain and fertiliser. In 1988–89, about 1.2 million tonnes of freight were carried by rail in the region, excluding 'through' freight on the Melbourne to Adelaide line.

Air services are provided by two commuter operators who service Warrnambool, Portland, Hamilton and Mount Gambier, which has the region's largest airport. In 1989–90 these operators carried 47 tonnes of general freight.

TRANSPORT GROWTH IN THE REGION

Growth in the transport task to and from the region over the 10 years to 1988–89 was mainly confined to the sea and road tasks. Trends for the individual modes were as follows:

- Tonnages handled by the Port of Portland Authority increased fourfold over the 20-year period to 1988–89.
- Road freight traffic, as measured by the growth in commercial vehicle flows, experienced significant growth on nearly all major rural arterial roads in the region. The recorded flows of commercial vehicle traffic showed an average annual growth of over 5.0 per cent during the period 1976 to 1986. Over the same period the average annual growth rate for all vehicles was approximately 5.9 per cent on the regional rural arterial road links.
- Rail tonnages generally fell over the network during the period 1975–76 to 1988–89, with the exception of the Hamilton–Portland link where no downward (or upward) trend could be identified.
- Annual tonnages carried by the scheduled airlines dropped by about 50 per cent over the period 1980–81 to 1989–90, from 97 tonnes per year to 47 tonnes.

REGULATION

Certain regulatory constraints have affected the supply of transport services as discussed in chapters 3, 4 and 5.

In Victoria very few B-doubles had been given permits prior to 1991 for their use in most parts of the State, including the region. This had the effects of both preventing a reduction in the per unit cost of certain road freight transport, and of restricting certain cross-border movements of such vehicles from South Australia. Federal legislation was enacted during 1991 to include B-doubles in the Federal Interstate Registration Scheme. This resulted in considerably wider B-double use in the region.

In Victoria, certain bulk commodities, such as wheat, are effectively reserved as rail traffics beyond a 60-kilometre distance from ports. In South Australia, wheat cartage by road is subject to a surcharge when carried between rail reserved silos. However, the *Wheat Marketing Act 1989* has facilitated greater competition between road and rail. While various changes to wheat transport arrangements have occurred, the impact of this Act on the relative use of road and rail is still uncertain.

USER ATTITUDES

The indication of two BTCE surveys (a survey of producers and a survey of road transport operators) as to the level of service provided by the road system in the region, was that respondents were generally satisfied with road conditions. The respondent transport operators viewed the lack of overtaking lanes as their principal concerns, citing particularly the Henty Highway, the Princes Highway, the Portland–Nelson road and the Mount Gambier – Keith road. Improved surface condition was quoted most frequently by industries as a necessary road improvement. Respondents to both surveys indicated an interest in the unrestricted use of B-doubles, for example, for logging purposes. Industries expressed dissatisfaction with rail far more so than with the other transport modes, with lack of current services being quoted as the main source of dissatisfaction.

The expectation of the respondent industries for growth over the five years to 1994 was that slight growth would occur in production and investment, but that little growth in employment could be expected. The principal barriers to expansion quoted by industries were lack of capital and the increased cost of new materials. Industries most commonly quoted increased costs, particularly of wages, fuel and new materials, as the principal factors adversely affecting business in the last five years.

OUTLOOK FOR DEMAND AND THE NEED FOR INVESTMENT

The outlook for regional production was discussed in chapter 2. The outlook for manufacturing and forestry is for growth in some elements with a steady overall pattern. Following rapid growth in recent years, production in the aluminium industry has stabilised. The likelihood of growth in output and markets is low for much of the agricultural industry, and in particular wheat production may show little growth in the short term, depending on developments in the international grain market. Some growth in the short and medium term is expected for the retail industry in the region.

Based on the outlook for future production, the overall demand for use of the various modes in the foreseeable future is likely to be as follows:

- increased use of road and possibly also of sea transport; and
- steady use of rail and air.

Effects on future demand level and modal share cannot yet be deduced from moves to reform regulations affecting the transport of grain, nor from impending measures aimed at recovery of road track costs from heavy vehicles. Furthermore, a shift in demand could follow any moves to introduce cost recovery from the railway system in Victoria. The combined effect of these changes is difficult to determine at this stage.

The assessment of the capacity of each transport mode to accommodate future loadings should desirably have been based on forecasts of demand (for example,

demand by commodity to the year 2000). Given the uncertainty surrounding the variables described above, the likely future demand for transport services cannot be based solely on the projected levels of commodity output. Hence the assessment was primarily based on foreseeable developments in the region and adjacent areas. Some account was also taken of the potential for a substantial transfer of grain between modes. The implications of the assessment, in terms of infrastructure requirements, are summarised below.

The main prospect for new major development is the mineral sands venture just north of the region. This could lead to an appreciable increase in the land transport demand for either rail or road transport in the region and for shipping services. Progressive dredging to adequately accommodate fully loaded ships of 70 000 dwt or greater is well under way. The most significant potential for expansion of existing industries is that for implementation of the final development stage at Portland Aluminium.

Development of the aluminium smelter to its design capacity could double the demand for sea transport of smelter inputs and outputs. Inputs amounted to about 70 per cent of the tonnage discharged at Portland in 1989–90, and aluminium comprised some 20 per cent of the tonnage loaded in that year. The export of mineral sands through Portland would add around 15 per cent to the 1989–90 export tonnage by the year 2000.

The Port of Portland has sufficient capacity to accommodate foreseeable demand from both growth in production and possible new developments affecting the region. The conclusions of chapter 3 are that little investment in port facilities would be necessary to cater for either the full development of the Portland smelter or the export of the projected output of the Murray Basin mineral sands development proposal. However, speedier grain outloading facilities may be warranted.

The road network generally has the capacity to cater for foreseeable increases in production or new development, as discussed in chapter 4. Progressive implementation of planned improvements to specific road sections should maintain an overall level of service equivalent to that prevailing elsewhere on the roads in the two States responsible for roads in the region. Nevertheless any appreciable increase in the level of heavy vehicle usage would incur an additional cost in pavement wear for which funds have not been specifically earmarked. A pavement wear cost in the vicinity of $1 million per year could result from full development of the Murray Basin mineral sands if the projected output were to be carried by road to Portland.

As indicated in chapter 5, the rail network can accommodate substantially higher tonnages than were carried in 1989–90 without further investment in infrastructure. If the requirement arose for rail cartage of the Murray Basin mineral sands, this could add up to half a million tonnes per year to the rail task between Horsham and Portland, which was over 40 per cent of the average Portland rail task over the period 1979–80 to 1988–89. This is within the capacity of the

existing rail line to Portland, and would not require investment in rail infrastructure within the region. However, the proposal to standardise the Melbourne to Adelaide broad gauge line has implications for investment in rail facilities in the region, and these have yet to be fully investigated.

The projected need for transport infrastructure investment is currently confined primarily to the further progressive upgrading of the roads system as traffic volumes increase, particularly along the Henty Highway. However, the possibility exists that some additional rail and port investment may be required over the decade to the year 2000.

FUTURE RESEARCH

The current study has provided a general overview of demand for transport services in the region defined as the south-west of Victoria and the south-east of South Australia.

A broad attempt was made to gauge likely implications for transport demand arising from industry developments and shifts in the production base of the region. However, no attempt was made to estimate all of the costs associated with supplying transport services or to provide a comparative assessment of the relative efficiency of transport modes in meeting current and projected transport tasks. Such an assessment is important to ascertain the overall implications for investment in transport infrastructure and the economically optimum role for each mode. The data requirements to undertake such a task include the conduct of surveys of the origins and destinations of commodities together with their tonnages. The resource costs of transport of each commodity by each mode, and between each zone of origin and destination, would need to be determined. A significantly more extensive study would have been needed to determine such transport supply costs.

Recent BTCE research has highlighted the comparative efficiency of rail over road transport in the carriage of coal (Batterham, Mikosza & Ockwell 1991). Current research in the BTCE is attempting to analyse the infrastructure requirements for transport in the major interstate corridors. Such studies have attempted to forecast the likely long-term demand for transport and assess the relative resource cost efficiency of modes in undertaking that transport task. Such analysis is based on economic theory relevant to a two-sector trade model, which is also relevant to the issue at hand. That is, the region has a demand for goods and services to be provided from outside the region, while the 'rest of the world' has a demand for the goods and services produced by the region. The transport costs associated with the flow of goods and services must be less than the price differentials for goods and services for trade to occur between the two regions.

The present study has provided important insights into the theoretical and analytical issues associated with such commodity flows, and hence has direct applications to the Bureau's interstate transport research.

The study was directed specifically at freight transport. Another dimension to such regional studies is the demand and supply of passenger transportation. Such analysis involves considerable understanding of the underlying demographics of a region, and of likely growth in the services sector, such as tourism. This then provides the basis of a multi-modal multi-task transportation study. However, the data and analytical requirements of such studies require a high level of resource commitment. For these reasons such an approach was not attempted in the present study.

APPENDIX I SUPPLEMENTARY INFORMATION FOR THE REGION

This appendix presents supplementary information about the region. Part 1 presents information on population; part 2 presents the relevant results of the BTCE study on economic indicators and the economic significance of the region.

PART 1 — POPULATION

Population

Table I.1 presents the population and growth details in the statistical local areas (SLAs) examined in this study over the ten-year period from 1976 to 1986. Overall, growth of the region comprised a modest 0.3 per cent per annum, with population growth in the South East division of South Australia of 0.43 per cent per annum being roughly double that of the SLAs in the South Western division of Victoria. Strongest growth occurred in Robe, Mount Gambier, Portland city, Warrnambool city and Heywood shire, which attained growth rates exceeding one per cent per annum. The largest population declines were in Kowree, Mortlake, Wannon, Naracoorte district and Penola.

PART 2 — ECONOMIC SIGNIFICANCE OF THE REGION

The economic potential of each of the statistical local areas (SLAs) in a region may be evaluated in terms of various economic criteria. Indicators for a set of criteria were defined in BTCE (1989b). In that paper, indicator values were derived for all SLAs in Australia. The SLAs were then ranked on a national basis separately for each indicator. The indicator for each economic criterion was called the national economic index (NEI) and was defined as shown in equation 1.

$$NEI_{ij} = \sum_{k=1}^{n} M_{jk} \times N_{ik} \qquad (1)$$

where NEI_{ij} is the NEI for SLA i and criterion j, k refers to industry k, M_{jk} is the industry rating given for criterion j and industry k, and N_{ik} is the number of persons employed in industry k in SLA i.

TABLE I.1 POPULATION GROWTH, 1976 TO 1986

Statistical local area[a]	Population (persons) 1976	1986	Annual average growth[b] (per cent)
South Western division, Victoria			
Belfast	1 633	1 435	–1.28
Camperdown	3 596	3 458	–0.39
Dundas	3 420	3 460	0.01
Glenelg	4 840	4 237	–1.32
Hamilton	9 504	9 969	0.48
Hampden	7 574	7 072	–0.68
Heytesbury	7 901	7 487	–0.54
Minhamite	2 229	1 950	–1.33
Mortlake	3 728	3 125	–1.75
Mount Rouse	2 569	2 263	–1.26
Port Fairy	2 399	2 504	0.43
Portland	8 298	10 934	2.80
Heywood[c]	6 368	7 211	1.25
Wannon	3 363	2 856	–1.62
Warrnambool (C)	20 195	22 706	1.18
Warrnambool (S)[d]	8 161	8 030	–0.16
Kowree	4 385	3 682	–1.70
Subtotal	100 163	102 388	0.22
South East division, South Australia			
Beachport	1 739	1 721	–0.10
Lacepede	2 183	2 377	0.86
Lucindale	1 517	1 555	0.25
Millicent	8 099	7 984	–0.14
Mount Gambier (C)	17 858	18 729	0.48
Mount Gambier (DC)	5 687	7 129	2.29
Naracoorte (M)	4 571	4 636	0.14
Naracoorte (DC)	2 136	1 985	–0.73
Penola	3 908	3 635	–0.72
Port MacDonnell	2 196	2 248	0.23
Robe	958	1 206	2.33
Tatiara	6 846	7 046	0.29
Subtotal	57 698	60 251	0.43
Total	157 861	162 639	0.30

a. These areas coincide with the local government areas in the region.

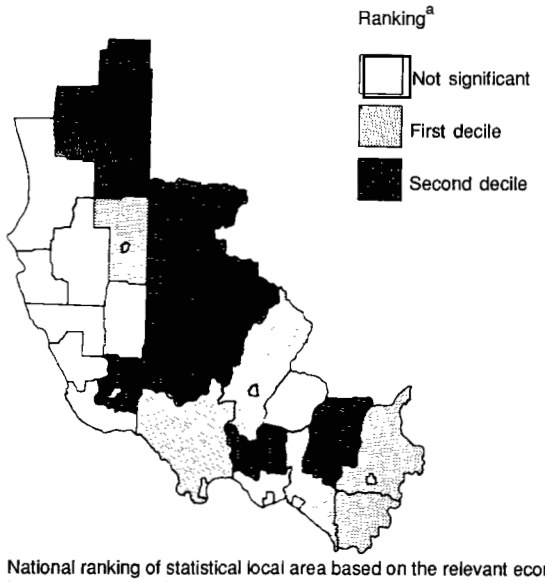
b. Average annual compound growth rate.

c. Formerly Portland shire.

d. Warrnambool shire includes Koroit.

C City
DC District Council
M Municipality
S Shire

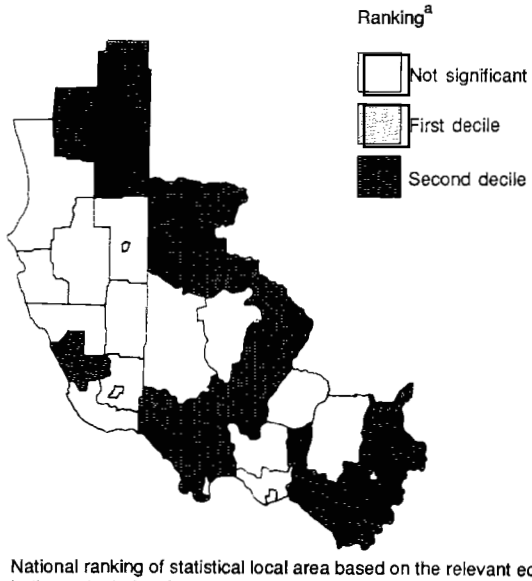
Source ABS (1981, 1986).



a. National ranking of statistical local area based on the relevant economic indicator for industries within the area.

Source BTCE (1989b).

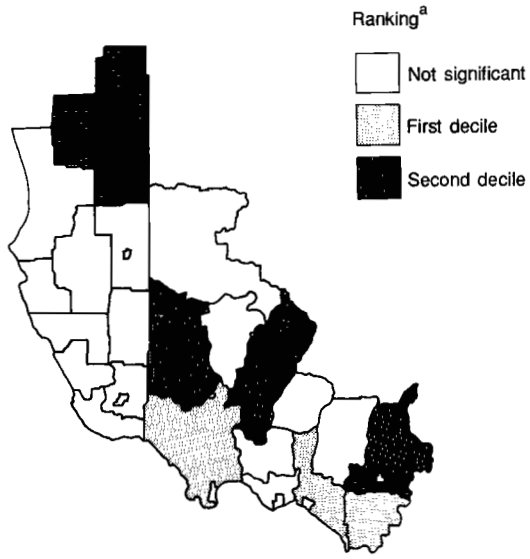
Figure I.1 Export orientation, 1988



a. National ranking of statistical local area based on the relevant economic indicator for industries within the area.

Source BTCE (1989b).

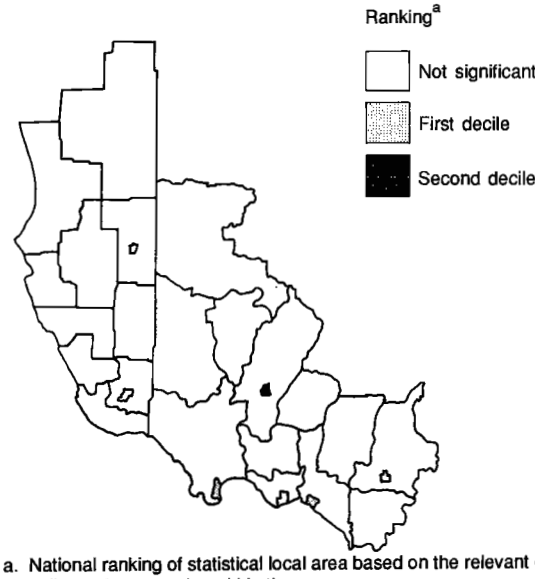
Figure I.2 Import-competing orientation, 1988



a. National ranking of statistical local area based on the relevant economic indicator for industries within the area.

Source BTCE (1989b).

Figure I.3 Road transport cost-sensitivity, 1988



a. National ranking of statistical local area based on the relevant economic indicator for industries within the area.

Source BTCE (1989b).

Figure I.4 Tourism, 1988

The values of the NEIs for the SLAs within the region are presented in this appendix for the following four criteria:

- export orientation, measured as the value of exports divided by turnover;
- import-competing orientation, measured as the ratio of the value of imports over domestic consumption subtracted from one;
- road transport cost-sensitivity, measured as the ratio of truck running expenses over turnover; and
- tourism, measured in terms of takings from tourist accomodation.

Rankings of SLAs in the region

The SLAs in the region whose calculated NEI ranked in the first and second deciles nationally in 1988 are presented for the four criteria in figures I.1, I.2, I.3 and I.4.

Table I.2 summarises the decile rankings and lists the 17 SLAs (of the 29 SLAs in the region) which belonged to either the first decile nationally or the second decile nationally for one or more of the four criteria. Of the SLAs with first or second decile rankings, thirteen ranked highly in terms of export orientation, nine ranked highly in terms of import competition, seven ranked highly in terms of road transport cost-sensitivity, and three ranked highly in terms of tourism.

TABLE I.2 NATIONAL ECONOMIC INDEX RANKINGS OF SLAS IN THE REGION

		Decile ranking in each criterion[a]			
Code	*Name*	*Export orientation*	*Import competing*	*Road transport cost-sensitive*	*Tourism*
Victoria					
5920	Heywood	1	2	1	–
4040	Kowree	2	2	–	–
2440	Dundas	1	2	2	–
7920	Warrnambool (S)	1	2	1	–
7880	Warrnambool (C)	–	2	–	1
3240	Hampden	1	2	2	–
3440	Heytesbury	1	2	1	–
3040	Glenelg	2	–	2	–
7720	Wannon	2	–	–	–
4800	Minhamite	2	–	–	–
5040	Mortlake	2	–	–	–
5880	Portland	–	–	–	1
3200	Hamilton	–	–	–	2
South Australia					
7630	Tatiara	2	2	2	–
4200	Millicent	–	2	–	–
5180	Naracoorte (DC)	1	–	–	–
4690	Mount Gambier (S)	2	–	–	–
SLAs in the first 10 per cent nationally		6	0	3	2
SLAs in the second 10 per cent nationally		7	9	4	1

a. A rating of 1 is given to SLAs who are amongst the top 10 per cent nationally for the particular criteria and a rating of 2 is given for SLAs amongst the second 10 per cent nationally for the particular criteria. A dash indicates the SLA does not rank in either the first or the second 10 per cent nationally for the particular criterion.

S Shire
C City
DC District Council

Source BTCE estimates based on data from ABS (1988).

APPENDIX II SURVEY OF PRODUCTION AND TRANSPORT CHOICES

This appendix describes the BTCE Survey of Production and Transport Choices carried out in the region in 1989, and certain results. The survey booklet consists of seven parts and is reproduced in attachment 1 to this report. The responses to parts 1 and 7 of the survey are discussed below. These are primarily results of a more general nature which are not specific to a particular transport mode. Findings from parts 2 to 6, which are relevant to particular transport modes, are included in the corresponding chapters 3 to 6.

NATURE OF THE SURVEY

The survey of the region's agricultural commodity producers and manufacturers was undertaken to examine general satisfaction with the existing transport infrastructure and the level of transport services available. The survey questions also examined transport choices, changes that have taken place in the transport infrastructure in the last five years and the effect of these changes on business operations. Further expectations for the development of business over the next five years were explored, together with the factors which may prevent planned or potential expansions. Questions were also directed at the nature of commodity flows.

The survey was a cross-sectional survey which could not measure processes or dynamics, and information of past events rested mainly on respondents' recall. It was intended to gain information on transport infrastructure and its related issues from a number of respondents spread over various industries and localities.

The objective was to cover about 5 per cent of the farmers in the study region and to distribute 1100 survey questionnaires. The decision to distribute this number of questionnaires was based on a compromise between overheads, both financial and human, and the need to collect a reasonable number of responses from various industries over the region.

Among non-farming industries, 300 surveys were despatched. Attempts were made to cover all small industries such as producers of dairy products and seafood, quarries and logging companies. Among other manufacturing

TABLE II.1 DISTRIBUTION OF RESPONDENTS BY INDUSTRY
(number of respondents)

Industry group	*South Australia*	*Victoria*	*Total*
Agriculture and fishing			
Agriculture (for example, sheep, cattle, wool, grain)	103	108	211
Fishing (for example, lobsters, prawns)	6	4	10
Mining (for example mineral sand, sand and gravel, clay)	1	5	6
Manufacturing			
Food and beverages (for example meat, cheese, butter, wine)	4	7	11
Wood and wood products (for example log sawmilling, timber)	5	4	9
Other (for example textile, paper, chemical, metal and non-metal)	6	7	13
Wholesale and retail trades (for example machinery, wool brokers, appliances)	10	8	18
Other (for example transport construction, business and community services)	5	4	9
Total	140	147	287

industries a random selection was made to cover a wide variety of industries of different sizes situated at different localities.

A total of 287 usable responses were received. Over 6 per cent of the distributed surveys were returned unanswered. Since the selection of the survey population was not strictly controlled, it was not possible to estimate whether respondents were statistically representative of the industries and localities in the study region. However, table II.1 indicates that the responses were drawn from a variety of industries in the region. The respondents were also spread widely over the region.

RESPONSE TO PART 1: ESTABLISHMENT

Of the 287 respondents to the survey, the majority (over 85 per cent) were sole proprietorships or partnerships. Their average number of employees was 18 persons, of which the average number of full-time employees was 14. The proportion of these employees engaged in labour or production activities was approximately 75 per cent, while some 25 per cent were engaged in managerial or clerical and administrative types of duties.

A high proportion of the respondents (66 per cent) indicated that they were solely (100 per cent) dependent on road transport, whereas less than one per cent indicated a 100 per cent dependency on other modes. Some 34 per cent of respondents used road as well as rail and other modes of transport with varying proportions for their transport needs.

Some 60 per cent of respondents indicated that over 50 per cent of their goods were consigned to destinations within the region and 80 per cent of the

respondents received over 50 per cent of their raw materials which originated from within the region. The stated proportions of expenditure devoted to transport were less than 10 per cent, which was relatively small compared with the proportions devoted to materials, wages and overheads.

Over 70 per cent of respondents expressed dissatisfaction with transport infrastructure or services related to railways. Only 20 per cent of respondents were dissatisfied with road and 6 and 4 per cent with air and shipping services respectively. For the road transport facilities over 90 per cent of the respondents rated both arterial and local roads highly as regards their importance to their business operations.

RESPONSE TO PART 7: GENERAL

There were expectations amongst 70 per cent of the respondents that production and capital investment would grow over the next five years, at least slightly if not strongly. Only slight increases in employment were expected over the period by some 33 per cent of respondents.

Lack of capital was the most common factor, quoted by 28 per cent of respondents, amongst those factors which might prevent planned or potential expansion. Increased costs of new materials was the next most common factor, quoted by 20 per cent of the respondents, followed by government policy, expressed by 16 per cent. The number of respondents quoting the increased cost of transporting finished goods (14 per cent) as a constraint was followed by the number quoting changes in tariffs (11 per cent), shortage of labour (8 per cent) and lack of adequate premises (3 per cent).

The factor most commonly quoted (by 15 per cent of respondents) as adversely affecting their business in the last five years was increased costs, particularly wages, fuel and raw materials costs. A very small proportion of respondents (less than one per cent) indicated that the expansion of their operation had been stopped by the inadequate provision of transport infrastructure or services.

APPENDIX III TRANSPORT OPERATOR ROUTE SURVEY

BACKGROUND

This appendix presents a description and discussion of the findings of the Transport Operator Route Survey which was conducted over the period February to May 1989. A total of 110 transport operators were surveyed, of which 24 responded. A copy of the questionnaire is reproduced as attachment 2.

The names of the surveyed companies were provided by the Green Triangle Council for Regional Development and also obtained through telephone books. Many did not respond because of confidentiality reasons, or because the study region was not an area of their operation, or because they were not in the business any more.

It was not possible to assess the characteristics of non-respondents or to examine whether the non-response rate was randomly distributed. The findings of the survey should therefore be treated only as an indication of the transport operators' business operations and their attitudes towards the transport infrastructure in the study region.

Road freight companies were asked to provide details on the size of their operation, annual tonnage carried, the types of freight hauled and the number of trucks in their fleets. The freight companies were also presented with a set of road characteristics and were asked for their assessment, on a five-point scale varying from very important/very satisfied to not important/not satisfied, of the roads provided in their region of operation. Although the survey focused on the study region, most respondents gave assessments of all routes used by their companies.

THE SURVEY QUESTIONNAIRE

The questionnaire reproduced in attachment 2 includes only one response sheet. Additional copies of this sheet were included in the survey document to allow for possible responses for six different routes.

SURVEY RESPONSE

Nature of the respondents and their freight task

Table III.1 shows the overall characteristics of the respondents' fleets and their usage. From the survey results, six-axle trucks comprised 93 per cent of the truck fleet. Table III.2 defines the six broad freight commodity categories within the region and these classifications are used in table III.3 to subdivide the total surveyed tonnage.

TABLE III.1 RESPONDENTS' FLEET CHARACTERISTICS

Size of fleet	*Number of fleets*	*Number of trucks*	*Number of six-axle trucks*[a]	*Total tonnage on all routes*
Less than 3	4	5	1	18 290
3 to 4	8	28	17	90 468
5 to 10	2	17	17	65 028
11 or more	6	262	256	1 239 400
Subcontractors	1	na	na	6000
Not stated	2	na	na	38 422
Totals	23	312	291	1 457 608

a. This group contains two eight-axle B-doubles.

na Not available

Source BTCE Transport Operator Route Survey.

TABLE III.2 COMMODITY CLASSIFICATION GROUPS

Group name	*Grouped commodity definition*
General freight	Parcel freight, bulk freight, sundry, containers, scrap, sheds, furniture, cars, beer, groceries, machinery, empty barrels, empty drums, empty cases
Grain and cereal	Bulk grain, stock feed supplement, pellets, seeds, spray, grain, vegetable oils
Timber and timber	Timber, woodchips, bark, particle board, paper, paper products, resin, pulp
Minerals	Dolomite, gas, aluminium ingots, superphosphate, glass grade limestone, quarry products, fertiliser, bulk slag, cement
Fuel	Petroleum
Stock	Cattle, sheep, wool, livestock, fish

Source BTCE unpublished definitions used for the Transport Operator Route Survey.

TABLE III.3 COMMODITY SHARES IN THE TRANSPORT OPERATORS SAMPLE, 1988–89

Size of fleet	*General freight*	*Grain and cereal*	*Timber and timber products*	*Minerals*	*Fuel*	*Stock*	*Total*
Commodity tonnages							
Less than 3	13 000	–	–	–	–	5 290	18 290
3 to 4	26 497	3 722	5 318	758	9 786	44 387	90 468
5 to 10	–	–	–	13 028	–	52 000	65 028
11 or more	578 400	17 000	395 500	182 500	48 000	18 000	1 239 400
Subcontractors	6000	–	–	–	–	–	6000
Not stated	14 305	19 993	–	4 124	–	–	38 422
Total	638 202	40 715	400 818	200 410	57 786	119 677	1 457 608
Percentage of total tonnage	43.8	2.8	27.5	13.7	4.0	8.2	100.0

– Nil

Source BTCE Transport Operator Route Survey.

The annual tonnages carried on the most utilised route sections used by respondents are presented in descending order in table 111.4.

The respondents together carried about 1.5 million tonnes of freight in 1989. General freight comprised over 40 per cent of this task. Timber and timber products comprised the second largest component and accounted for over one-quarter of their task. Among the remaining commodities, the transport of minerals was the largest, amounting to less than 15 per cent of the total task carried by the respondents.

Woodchips, generated in the Mount Gambier – Kalangadoo – Tarpeena region, were generally destined for export from the Port of Portland. The Mount Gambier – Nelson – Portland Road plays an important role in these movements. Woodchips are also transported to Ballarat from the Mount Gambier region. Movements of bark are directed to Melbourne and Adelaide. Timber, particle board and other timber products are transported to Melbourne, Adelaide, Sydney and Brisbane from both Mount Gambier and Portland. Resin and pulp, originating from Melbourne, are also brought into the region via the Hamilton and Princes Highways.

The minerals group was dominated by the interregional movements of aluminium from Portland for Melbourne and from Geelong to Adelaide. The bulk of aluminium movements by road, however, are internal to the region moving between the Portland smelter and the Port of Portland.

Quarry products, generally dolomite and limestone, moved from Portland to Hamilton and from Mount Gambier to both Portland and Melbourne. Other

TABLE III.4 HIGHEST ROUTE SECTION TONNAGES ON THE REGIONAL NETWORK, 1988–89

('000 tonnes)

Arterial	*Route section*	*Annual tonnage*
Princes Highway	Geelong–Melbourne	637.1
Princes Highway	Warrnambool–Geelong	449.8
Princes Highway	Portland–Warrnambool	381.8
Princes Highway	Tailem Bend–Murray Bridge	336.0
Princes Highway	Murray Bridge–Adelaide	330.5
Dukes Highway	Keith–Tailem Bend	304.5
Glenelg Highway	Hamilton–Coleraine	266.7
Glenelg Highway	Coleraine–Mount Gambier	260.8
Princes Highway	Bolwarra turn-off–Heywood[a]	244.9
Mount Gambier–Keith Road	Mount Gambier–Naracoorte	202.0
Mount Gambier–Keith Road	Naracoorte–Keith	199.0
Hamilton Highway	Hamilton–Mortlake	198.0
Western Highway	Melbourne–Ballarat	192.0
Hamilton Highway	Mortlake–Geelong	189.7
Henty Highway	Heywood–Hamilton	159.4
Western Highway	Ballarat–Horsham	150.6
Western Highway	Horsham–Bordertown	132.8

a. Bolwarra turn-off is the junction of the Princes and Henty Highways.

Source BTCE Transport Operator Route Survey.

movements included glass from Hamilton to Melbourne and Melbourne to Mount Gambier.

Use of B-doubles

Of the twenty respondents answering the questions on B-doubles, two South Australian respondents currently used B-doubles. However eight of the other eighteen respondents said they would use B-doubles, of which six respondents were from Victoria. Not surprisingly, the eight potential B-double users were using six-axle vehicles.

Freight rates

The analysis of road freight rates was limited due to the small number of operators responding to the request for this optional and confidential information. Even with such a limited response some observations were possible. On a tonne-kilometre rate, it was found that:

- livestock rates, around 9 cents per tonne-kilometre, were higher than general freight rates;
- both prime and back-haul rates did exist for general freight;
- back-haul rates did exist both to and from capital cities;
- rates from minor provincial towns were generally higher than those from the larger provincial towns;
- rates for general freight haulage originating from the study region destined to Melbourne or Adelaide ranged from 6.06 to 8.71 cents per tonne-kilometre; and
- for freight originating within the region the tonne-kilometre rate to Sydney was lower than that offered to Melbourne or Adelaide.

Operator attitudes to road infrastructure

Freight operators were asked to indicate their overall satisfaction with the routes used in their operations. Operators were asked to specifically indicate their satisfaction, or dissatisfaction, with each route across six level-of-service factors. The responses, presented in table III.5, indicated that there was a general perception that a high level-of-service was provided by road infrastructure in the region. The source of some dissatisfaction, as can be seen in table III.5, was the lack of overtaking lanes. Those routes cited as deficient in overtaking lanes are presented in table III.6.

TABLE III.5 REPORTED SATISFACTION WITH ROAD SERVICE FACTORS

Factor	*Very satisfied*	*Satisfied*	*Indifferent*	*Not very satisfied*	*Not satisfied*	*Total*
Congestion	8	28	18	7	3	64
Road width	6	28	16	8	6	64
Number of overtaking lanes	4	19	13	7	15	58
Surface condition	5	20	19	8	9	61
Bridge crossings	4	33	12	4	4	57
Bends and turns	5	29	15	8	5	62
Overall service level	5	26	19	7	7	64

Source BTCE Transport Operator Route Survey.

TABLE III.6 OVERTAKING LANE DEFICIENCIES: CITED ROUTES

Origin–destination	*Route*	*Arterials used*
Portland–Hamilton	Henty Highway	Henty/Princes Highways
Horsham–Portland	Henty Highway	Henty/Princes Highways
Mildura–Portland	via Hamilton	Calder/Sunraysia/Henty Highways
Mildura–Mount Gambier	via Hamilton and Casterton	Calder/Sunraysia/Henty/ Glenelg Highways
Portland–Adelaide	via Nelson and Mount Gambier	Port Nelson Road Mount Gambier–Keith Road/Dukes Highway
Kalangadoo–Portland	via Mount Gambier and Nelson	Nelson to Port Road
Warrnambool–Mount Gambier	via Princes Highway	Princes Highway
Warrnambool–Melbourne	via Princes Highway	Princes Highway
Mount Gambier–Nhill	via Mount Gambier–Keith–Bordertown–Nhill	Mount Gambier–Keith Road/ Dukes/Western Highways
Bordertown–Melbourne	Western Highway	Dukes/Western Highways
Bordertown–Adelaide	Dukes Highway	Dukes Highway
Geelong–Adelaide	Western/Dukes Highways	Midland/Western/Dukes Highways

Source BTCE Transport Operator Route Survey.

APPENDIX IV SUPPLEMENTARY ROAD DATA

ROAD LENGTH

Table IV.1 shows the length of road in the region, with details for four surface types.

TABLE IV.1 ROAD LENGTH, 1988

(kilometres)

	Road type				
Area	*Sealed*	*Formed and surfaced*	*Formed only*	*Unformed*	*Total*
Victoria	7 879	3 885	1 385	1 392	14 541
South Australia	3 125	4 960	970	1 310	10 365
Total	11 004	8 845	2 355	2 702	24 906

Sources Roads Corporation (pers. comm.); South Australian Highways Department (pers. comm.).

TRAFFIC GROWTH

Growth in road usage is indicated by trends in the average daily traffic flow, and in the truck component of the flow.

Figure IV.1 shows the arterial roads which lie within, and immediately adjacent to, the region. An examination of growth rates of regional traffic flows was undertaken for all traffic, and separately for commercial vehicles, at 29 selected points on these roads. The most recent counts were for 1986. Table IV.2 shows the 1986 flow estimates for each of the 29 locations and the growth rates over the period 1976 to 1986. The average traffic growth rate across the network was estimated at 5.9 per cent per annum. This figure exceeded the Australia-wide growth rates of 3.2 and 3.9 per cent for rural arterial roads and National Highways, respectively, estimated for 1981-1989 by the BTE (1987a).

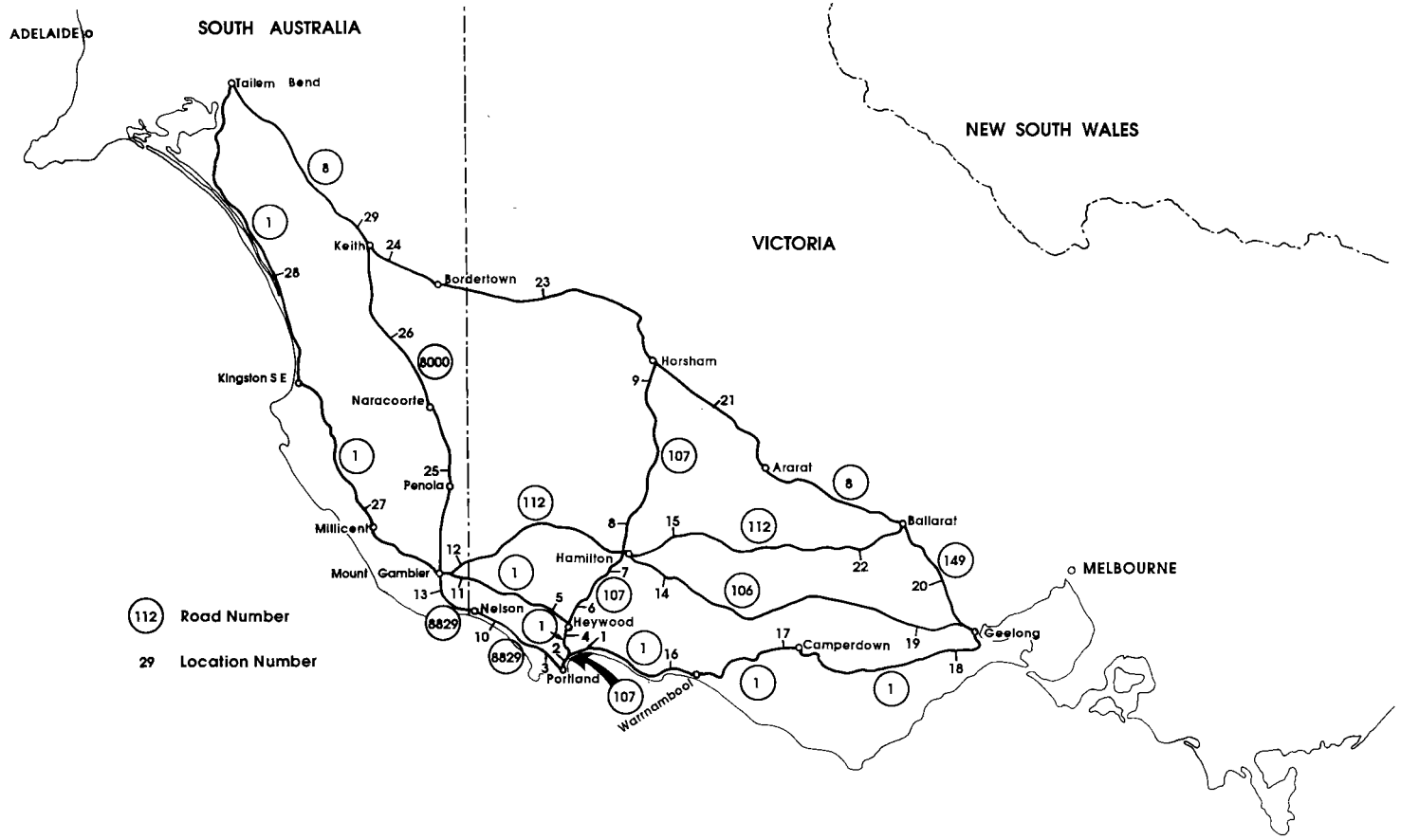


Figure IV.1 Road traffic count locations

TABLE IV.2 ARTERIAL ROAD TRAFFIC IN THE REGION

Location number[a]	Road number	Nearest town	All vehicles		Commercial vehicles		
			AADT[b] 1986	Annual growth rate 1976 to 1986 (per cent)	AADT[b] 1986	Proportion of all vehicles (per cent)	Annual growth rate 1976 to 1986 (per cent)
1	1	Portland	2 250	6.0	495	22	na
2	107	Portland	7 161	9.4	716	10	na
3	8829	Portland	733	2.0	88	12	na
4	1	Heywood	3 391	6.3	542	16	na
5	1	Heywood	1 617	1.9	356	22	na
6	107	Heywood	1 690	3.3	389	23	–2.5
7	107	Hamilton	1 388	6.8	374	27	6.8
8	107	Hamilton	1 079	5.1	137	13	5.1
9	107	Horsham	980	na	na	na	na
10	8829	Nelson	394	4.1	na	na	na
11	1	Mount Gambier	880	0.8	na	na	na
12	112	Mount Gambier	421	0.4	136	32	15.6
13	8829	Mount Gambier	1 800	12.6	na	na	na
14	106	Hamilton	838	7.6	120	14	3.6
15	112	Hamilton	1 744	8.7	200	11	4.6
16	1	Warrnambool	2 711	7.8	373	14	7.8
17	1	Camperdown	3 660	–1.5	532	15	7.7
18	1	Geelong	6 040	na	750	12	na
19	106	Geelong	2 180	na	250	11	na
20	149	Geelong	4 390	na	750	17	na
21	8	Ararat	4 060	na	750	18	na
22	106	Ballarat	1 060	na	300	28	na
23	8	Bordertown	1 900	0.9	551	29	na
24	8	Keith	2 280	1.8	684	30	na
25	8000	Penola	1 750	4.8	na	na	na
26	8000	Naracoorte	856	3.6	137	16	na
27	1	Millicent	1 140	–0.6	na	na	na
28	1	Kingston	760	–3.8	91	12	na
29	8	Keith	3 990	12.3	na	na	na

a. See figure IV.1.
b. Annual average daily traffic, that is, the daily traffic flow averaged over the year.
na Not available
Sources South Australian Highways Department (pers. comm.), RCA (1988), Roads Corporation (pers. comm.).

The highest traffic growth rate in the region was recorded on the Henty Highway outside Portland which achieved a 9.4 per cent growth rate from 1976 to 1986. Available data on the number of commercial vehicles, as a proportion of total annual average daily traffic, ranged from 10 to 32 per cent on certain arterials. The average growth rate in commercial vehicle traffic flows, for locations where data were available, was estimated at 5.6 per cent per annum over the ten-year period. This figure was only slightly below the average growth rate of 5.9 per cent per annum for all traffic on arterial roads in the region over this period.

ROAD CONSTRUCTION

Table IV.3 shows the lengths of road reconstructed or rehabilitated within the region by the State road authority in Victoria during the period 1985–86 to 1988–89. Table IV.4 shows these data for the South Australian part of the region for the period 1983–84 to 1988–89.

A point of particular interest arising from these background tables is that the reconstruction of all 72 kilometres of National Highway in the region occurred between 1983–84 and 1987–88.

TABLE IV.3 LENGTHS OF ROAD RECONSTRUCTED OR REHABILITATED IN SOUTH-WESTERN VICTORIA BY THE ROADS CORPORATION, 1985–86 TO 1988–89

(kilometres)

Year	*State highways*	*Main roads*[a]	*Total*
1985–86	19	50	69
1986–87	40	44	84
1987–88	52	65	117
1988–89	23	39	62
Total	134	198	332
Length maintained by Roads Corporation	767.6[b]	1 901[c]	2668.6
Proportion reconstructed (per cent)	17.51	10.4	12.6
Percentage rate per annum	4.4	2.6	3.2

a. Includes main roads, tourist and forest roads.

b. Includes 2.99 kilometres of freeway.

c. Includes 1806 kilometres of main roads, 44.7 kilometres of tourist roads and 50.3 kilometres of forest roads.

Source Roads Corporation (pers. comm.).

TABLE IV.4 LENGTHS OF ROAD RECONSTRUCTED OR REHABILITATED IN SOUTH-EAST SOUTH AUSTRALIA BY THE SOUTH AUSTRALIAN HIGHWAYS DEPARTMENT, 1983–84 TO 1988–89

(kilometres)

Year	*National highway*	*Rural arterial*	*Total*
1983–84	25	28	53
1984–85	18	34	52
1985–86	24	20	44
1986–87	2	32	34
1987–88	3	17	20
1988–89	0	20	20
Total	72	151	223
Length maintained by Highways Department	72[a]	1 467[b]	1 539
Proportion reconstructed (per cent)	100	10.3	14.5
Percentage rate per annum	16.7	1.7	2.4

a. All of the Dukes Highway within the region was reconstructed over the six-year period, and its average age was 3.8 years in 1988–89.

b. Includes 4 kilometres of rural local roads.

Source South Australian Highways Department (pers. comm.).

IMPACT OF FORESEEABLE DEVELOPMENTS

If the mineral sands output of 450 000 tonnes per year was carried by road to Portland at an average load per truck of 25 tonnes, an average of about 49 return truck trips per day would result from Horsham to Portland. This development would increase the traffic volume by about 98 trucks per day.

A significant transfer of wheat from rail to road could occur in addition to the mineral sands transport on the Henty corridor. For example, if an additional 200 000 tonnes of wheat (about 29 per cent of the tonnage carried to Portland by rail in 1988–89) were to be carried by road over the three months of December to February, this would add an average of about 178 trucks per day to the traffic flow. Based on the observed ratio of annual average daily traffic to weekday peak hour of about ten to one, an additional daily truck volume of 276 would add an additional weekday load of about 28 trucks in the peak hour.

The Henty corridor comprises a short length (2.8 kilometres) of four-lane divided road between Portland and the junction with the Princes Highway near Bolwarra, and a two-lane sealed road over the remainder. The capacity of this road would be between 800 and 1200 vehicles per hour on the two-lane sections and up to 4000 per hour on the divided section. These figures were derived using the method presented in the capacity guide in Underwood (1990). For particular road sections the capacity will vary according to the width and curvature of the road section, the proportion of heavy trucks, the directional distribution of flow and a number of other factors prevailing at the time that capacity conditions are reached.

Traffic flows in the Henty corridor in 1986 amounted to about 7200 vehicles per day between Portland and the Princes Highway intersection near Bolwarra, 3400 between Bolwarra and Heywood, and progressively dropped from nearly 1700 north of Heywood to about 1000 north of Hamilton. Based on the data given in table IV.2, the traffic flow in the year 2000 would be about 25 000 between Portland and the Princes Highway junction, and about 8000 between this junction and Heywood. These volumes would result in weekday peak hour flows of the order of 2500 and 800 respectively. The latter flow would be approaching the capacity of the link between Bolwarra and Heywood. However, VIC ROADS has records from a permanent traffic counting station (established in 1988) seven kilometres south of Heywood on this link, which show that the 1990 flow was only 2247, having dropped from about 2400 in 1988. A similar pattern of traffic fall was recorded at a number of other sites in the general vicinity of Portland. The reason for the fall in traffic is not certain, but it followed the establishment of the Portland aluminium smelter. It seems likely that the 1986 traffic flow between Portland and Heywood (and the growth rate in the preceding few years) had been boosted by activities associated with the construction of the smelter and the commissioning of the first potline in that year. In the circumstances, the probability of reaching the hourly capacity (as referred to above) of this link by the year 2000, even with the additional weekday peak hour loading of 28 trucks referred to above, is extremely low.

ATTACHMENT 1 SURVEY OF PRODUCTION AND TRANSPORT CHOICES IN SW-VICTORIA AND SE-SOUTH AUSTRALIA 1989

bureau of transport and communications economics

SURVEY OF PRODUCTION AND TRANSPORT CHOICES IN SW - VICTORIA AND SE - SOUTH AUSTRALIA 1989

INSTRUCTIONS

The survey consists of seven sections

- Establishment
- Road Transport
- Rail Transport
- Air Transport
- Shipping
- Telecommunications
- General

Not all these sections may be of direct relevance to your operations. Please examine each section as **some** questions may be relevant even if you do not use that mode of transportation.

Your answers will be treated in the **strictest confidence.** The results of the study will be used only in an aggregated form.

On completion of this questionnaire please put it in the reply-paid envelope and send it back to us.

Any queries regarding this survey can be directed to (reverse charge call), either,

Kim Hassall : (062) 74 6825

OR

Zak Rahmani : (062) 74 6890

The address is:

Bureau of Transport and Communications Economics
GPO Box 501
CANBERRA ACT 2601

Thank you for your cooperation and support.

2

SURVEY NUMBER .....

COMPANY NAME (if applicable) .....

Address .....

.....

State ..... Postcode .....

Municipality (or Shire) .....

Nearest town .....

Distance of your establishment from nearest town

..... km

Major type of operation
(eg. farming, fishing, industrial, manufacturing etc.)

.....

Contact Respondent .....

Phone ..... Fax .....

PART 1: ESTABLISHMENT

1. *How many people does this establishment employ?*

   Full-time .....

   Part-time .....

   Total .....

2. *How many of these employees are involved in the following duties?*

   Managerial/Executive .....

   Labour/Production .....

   Clerical/Administrative .....

   Other .....

3. *Is this establishment:*

   Please tick an appropriate box

   Sole proprietership/partnership ☐

   Branch Plant ☐

   Wholly owned subsidiary ☐

   Regional Headquarter ☐

   Headquarter ☐

   Other (please specify) ..... ☐

   *If **NOT** 'sole proprietership/partnership' then please specify:*

   Name of Group .....

   Location of Headquarters .....

4. *What percentage of goods produced from this establishment in the last five years were consigned to customers?*

   In the Green Triangle/
   SW-Vic region .....

   Elsewhere in Australia .....

   Overseas .....

5. *In the last five years what percentage of your establishment's raw product supplies came from:*

Within the Green Triangle/SW-Vic region	.....
From elsewhere within Australia	.....
Overseas	.....

6. *What percentage of your establishment's transport needs depend on the following modes of transport?*

	Freight task
Road	..... %
Rail	..... %
Air	..... %
Ship	..... %

7. *How much did your establishment spend on transport in the 1988-89 financial year?*

	Freight task
Road	$ .....
Rail	$ .....
Air	$ .....
Ship	$ .....

8. *What are the estimated expenditures for business travel required by your establishment during the 1988-89 financial year?*

Road	$ .....
Rail	$ .....
Air	$ .....

9. *Do you have a problem with loss or damage to your goods on the following transport modes? If **YES** please estimate a dollar value for such loss or damage occurring during the 1988-89 financial year*

	Please tick	Estimated $ value of Loss/damage
No loss	☐	
Road	☐	.....
Rail	☐	.....
Air	☐	.....
Ship	☐	.....

10. *What percentage of your total expenditure in the last financial year 1988-89 was on:*

Materials consumed in production .....%

Wages and salaries .....%

Overheads .....%

Capital .....%

Transportation .....%

Other (Please specify) .....%

.....

11. *How important are the following to your operation?*

Circle your rating for each transport mode:
5 means **very important**, **1** means **very unimportant**

State arterial roads	5	4	3	2	1
Local roads	5	4	3	2	1
Rail services	5	4	3	2	1
Air freight services	5	4	3	2	1
Air passenger services	5	4	3	2	1
Shipping services	5	4	3	2	1

12. *What types of transport infrastructure or service do you think are the* ***most unsatisfactory*** *in your area?*

.....

.....

13. *What developments in road, rail, air or port infrastructure or services, over the past five years, would you consider to have been the* ***most important*** *for your operation?*

.....

.....

PART 2: ROAD

14. Does your establishment own or lease its trucks?

Please tick

Yes ☐ No ☐

*If **YES** please specify your establishment's vehicle fleet (types: eg articulated truck, rigid (includes table-top), panel vans and utilities).*

	Type	Number of axles	Number of such trucks	Gross mass (loaded)	Average age	Average replacement capital cost ($)
Vehicle 1	.....	.....	.....	.....	.....	.....
Vehicle 2	.....	.....	.....	.....	.....	.....
Vehicle 3	.....	.....	.....	.....	.....	.....
Vehicle 4	.....	.....	.....	.....	.....	.....

15. Are there any government restrictions that adversely affect your road transport operations?

Please tick

Yes ☐ No ☐

*If **YES** please specify* .....

.....

16. Would your establishment be likely to use B-Double vehicles?

Please tick

Yes ☐ No ☐

*If **YES**:*

How many .....

On what routes .....

For what commodities .....

17. *Does your establishment contract road transport services?*

Please tick

Yes ☐ No ☐

If **NO**, please go to Question 20.

18. *For what products/commodities does your establishment contract road services?*

	Commodity	Transport cost ($/tonne)	Destination
Product 1	.....	.....	.....
Product 2	.....	.....	.....
Product 3	.....	.....	.....
Product 4	.....	.....	.....

19. *What types of trucks are used for contract services?*

Estimated number of axles	Estimated tonnes per vehicle load	Frequency of services (trips per week)
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

20. *What are the principal road routes used by your establishment for transporting product/commodities **from** your establishment?*

	Product/ commodity	Route: Origin	Route: Destination (nearest town)	Principal road name (or route number)
Product 1	.....	.....	.....	.....
Product 2	.....	.....	.....	.....
Product 3	.....	.....	.....	.....
Product 4	.....	.....	.....	.....

21. What are the principal road routes used by your establishment for transporting products/commodities **to** *your establishment?*

	Product/ commodity	Route: Origin	Route: Destination (nearest town)	Principal road name (or route number)
Product 1	.....	.....	.....	.....
Product 2	.....	.....	.....	.....
Product 3	.....	.....	.....	.....
Product 4	.....	.....	.....	.....

22. With what ***frequency*** *does your establishment currently use arterial and local roads for your business operation?*

	Please tick: Arterial roads	Local roads
More than once a day	☐	☐
Once a day	☐	☐
3-4 times a week	☐	☐
1-2 times a week	☐	☐
2-3 times a month	☐	☐
Less frequently	☐	☐

23. Have any major road improvements in the last five years significantly affected your business operations?

Please tick

Yes ☐ No ☐

If **NO**, go to Question 26.

24. Have these improvements been on:

	Please tick
Local roads	☐
Major arterials	☐
Both local and major arterials	☐

25. *Have these road improvements meant cost savings to your operation?*

Please tick

Yes ☐ No ☐

*If **YES** please put a time and dollar value estimate on these savings.*

Time savings/year .....

Dollar/year .....

26. *What road improvements would you like to see undertaken in your area of operations for **local roads**?*

Please tick appropriate **boxes**

Improved surface condition ☐

More Bitumen sealing ☐

Improved bridge crossings ☐

Road widening ☐

More frequent maintenance ☐

Improved useability in bad weather ☐

Other (Please specify) ☐

.....

27. *What road improvements would you like to see undertaken in your area of operations for major **arterial roads**?*

Please tick appropriate **boxes**

Improved surface condition ☐

Wider roads ☐

More overtaking lanes ☐

Less bends and turns ☐

Improved bridge crossings ☐

Less congestion ☐

Other (Please specify) ☐

.....

PART 3: RAIL

28. *How would you rate the rail freight service available to you?*

	Please tick
Satisfactory	☐
In need of some improvement	☐
In need of extensive improvement	☐
Never use it	☐

29. *Is your establishment at present using rail transportation?*

Please tick

Yes ☐ No ☐

If **NO** please go to Question 35.

30. *If your establishment uses rail services, what is distance to the nearest rail receival point that you use?*

..... km

31. *If your establishment uses rail services is it because:*

Please tick **any** appropriate **boxes**

Rail transport is cheaper than road transport	☐
The rail receival point is near to you	☐
Rail offers more frequent services	☐
Government regulations require the use of rail	☐
Rail services cause less loss and damage	☐
Other reasons (Please specify)	☐

.....

32. *If you use rail services, how often do you use them for moving products to or from your establishment?*

	Please tick
More than once a day	☐
Once a day	☐
3-4 times a week	☐
1-2 times a week	☐
2-3 times a month	☐
Less often (Please specify)	☐

.....

33. *If you use rail services, what products have you moved **from** your local rail receival point in the 1988-89 financial year?*

	Commodity	Tonnes/year	Town of final destination	Freight rate ($tonne)
Product 1	.....	.....	.....	.....
Product 2	.....	.....	.....	.....
Product 3	.....	.....	.....	.....
Product 4	.....	.....	.....	.....

34. *If you use rail services, what products have you brought **to** your local rail receival point in the 1988-89 financial year?*

	Commodity	Tonnes/year	From what town	Freight rate ($/tonne)
Product 1	.....	.....	.....	.....
Product 2	.....	.....	.....	.....
Product 3	.....	.....	.....	.....
Product 4	.....	.....	.....	.....

If you **use** rail freight services please go to Question 37

35. *Did your establishment ever use rail services for the transport of your products?*

Please tick

Yes ☐ No ☐

36. *If your establishment* ***does not*** *use rail services is it because of:*

Please tick **any** appropriate **boxes**

- The high cost of rail services ☐
- The lack of rail services in your area ☐
- The infrequency of services ☐
- Rail services do not carry your product ☐
- You have no requirement for rail services ☐
- Delivery time is too long ☐
- The loss or damage done to your goods ☐
- Other reasons or comments (please specify) ☐

.....

37. *In the last five years, have there been any changes to the rail system which have adversely affected the operation of your business?*

Please tick

Yes ☐ No ☐

If ***YES****, have these changes:*

Please tick **any** appropriate **responses**

- Increased the costs of using rail ☐
- Increased your usage of other modes of transport ☐
- Reduced your use of rail ☐
- Reduced the level of your productivity ☐
- Other (please specify) ☐

.....

38. *If you were offered a door-to-door goods pickup/delivery service, what additional rail freight rates, if any, would you be willing to pay to use this extra service.*

	Please tick
Would still not use rail	☐
Would not be willing to pay any more	☐
Up to 5% increase in freight rates	☐
Between 6 and 10% increase in freight rates	☐
Between 11 and 20% increase in freight rates	☐
Up to 50% increase in freight rates	☐

39. *Are there any improvements in rail freight services or the rail network you would like to see? (Please specify)*

.....

.....

.....

PART 4: AIR

40. Are air freight services currently used by your establishment?

Please tick

Yes ☐ No ☐

*If **YES** please specify:*

	Commodity	Destination	Tonnage	Cost ($/kg)
Product 1	.....	.....	.....	.....
Product 2	.....	.....	.....	.....
Product 3	.....	.....	.....	.....
Product 4	.....	.....	.....	.....

If you **use** air freight services please go to Question 42.

41. If you do not use air freight would you ever consider using air services?

Please tick

Yes ☐ No ☐

*If **YES**, what product would you send by air freight?*

	Commodity	Destination	Frequency (trips/month)	Kg/trip
Product 1	.....	.....	.....	.....
Product 2	.....	.....	.....	.....
Product 3	.....	.....	.....	.....
Product 4	.....	.....	.....	.....

42. *Please indicate your level of **satisfaction** with the **air freight** services in your area*

Please **circle** an appropriate number

Very satisfied	Satisfied	Indifferent	Dis-satisfied	Very dis-satisfied
5	4	3	2	1

43. *Please indicate your level of **satisfaction** with **air passenger** services in your area*

Please **circle** an appropriate number

Very satisfied	Satisfied	Indifference	Dis-satisfied	Very dis-satisfied
5	4	3	2	1

44. *Do you use air services for business travel?*

Please tick

Yes ☐ No ☐

*If **YES** please specify for 1988-89 financial year:*

Destination	Frequency (trip/month)	Total cost of return trip
.....	.....	.....
.....	.....	.....
.....	.....	.....

45. *In the last five years have there been any changes in air services that have affected your business?*

Please tick

Yes ☐ No ☐

*If **YES**, please specify*

.....

.....

PART 5: SHIPPING

46. Is shipping ever used by this establishment?

Please tick

Yes ☐ No ☐

If **NO**, go to Question 52.

47. What products and tonnages does your establishment currently send to port?

	Commodity	Tonnage/year	Cost for sea services ($/tonne)
Product 1	.....	.....	.....
Product 2	.....	.....	.....
Product 3	.....	.....	.....
Product 4	.....	.....	.....

48. What has been the average size of shipment sent to port by your establishment in the last five years?

Tonnes per shipment .....

Frequency of movements

to port (trips/month) .....

49. Does your establishment receive products/commodities from a port?

Please tick

Yes ☐ No ☐

If **NO**, go to Question 52.

50. *What commodity/products do you receive and through which port(s)?*

Port	Commodity/product	Tonnage (per year)
.....	.....	.....
.....	.....	.....
.....	.....	.....

51. *How are these products moved to your establishment?*

By rail		OR	By road	
Product	Transport cost ($/tonne)		Product	Transport cost ($/tonne)
.....	.....		.....	.....
.....	.....		.....	.....
.....	.....		.....	.....

52. *How do you rate the shipping services offered through your port?*

	Please tick
Very good	☐
Satisfactory	☐
Unsatisfactory	☐
Do not know	☐

53. *In the last five years what port developments have affected your business operations?*

.....

.....

.....

54. *What improvement would you like to see in the port services available to you ?*

.....

.....

PART 6: TELECOMMUNICATIONS

55. *How much did your establishment spend on telecommunications services for business purposes in the last financial year 1988-89?*

$.....

56. *Over the last five years have there been any developments in the telephone network that you are aware of which have benefited your business operations?*

.....

.....

57. *What problems, if any, are there with telecommunications services in your area?*

.....

.....

PART 7: GENERAL

58. *What are your expectations for the development of your business over the next five years?*

Please tick **an** appropriate **box**

	Strong	Slight	No change	Do not know
Production				
Growth	☐	☐	☐	☐
Contraction	☐	☐	☐	☐
Employment				
Growth	☐	☐	☐	☐
Contraction	☐	☐	☐	☐
Capital Expenditure				
Growth	☐	☐	☐	☐
Contraction	☐	☐	☐	☐

59. *What factors might prevent the planned expansion or potential expansion of your business*

Please tick **any** appropriate **boxes**

Lack of capital ☐

Shortage of labour ☐

Lack of adequate premises ☐

Increased raw material costs ☐

Increased cost of transporting finished goods ☐

Changes in tariffs ☐

Other government policy (Please specify) ☐

.....

Other (Please specify) ☐

.....

60. *What major factors have adversely affected your business in the last 5 years*

Please tick **any** appropriate **boxes**

- Recession during the period ☐
- Lack of capital ☐
- Shortages of labour ☐
- Currency valuations ☐
- Road transport problems ☐
- Rail transport problems ☐
- Tariff reduction on imports ☐
- Costs of fuel - transport ☐
- Costs of fuel - operations usage ☐
- Cost of raw materials ☐
- Increased competition ☐
- Wages costs ☐
- Communications costs ☐
- Increases in imports ☐
- Government regulations (Please specify) ☐

.....

- Planning restrictions (Please specify) ☐

.....

- Other (Please specify) ☐

.....

61. *Has the inadequate provision of transport infrastructure or services ever stopped expansion of your operation? If* ***yes****, please specify.*

.....

.....

62. *Do you have any additional comments about the impact of local transport infrastructure and transport services on your business that you would like to make? If so, please specify:*

.....

.....

THANK YOUR FOR YOUR TIME AND CONSIDERATION IN THE COMPLETION OF THIS SURVEY.

ATTACHMENT 2 TRANSPORT OPERATOR ROUTE SURVEY 1989 SW VICTORIA AND SE SOUTH AUSTRALIA

Note that only one response sheet of the questionnaire has been reproduced here (for route no. 1). Additional copies of this sheet were included in the survey document to allow for possible respones for six different routes.

bureau of transport and communications economics

Transport Operator Route Survey 1989

SW Victoria and SE South Australia

DEFINITION OF TERMS

ORIGIN	-	The town or city or rural location of pick up.
DESTINATION	-	Cargo delivery point eg. Portland, Adelaide, Geelong.
PRIMARY ROUTE	-	Choice of routes by volume of freight carried, eg. route 1 is your major operational route.
COMMODITY	-	A particular cargo, eg. wheat, livestock, logs, general freight, etc.
BACKHAUL	-	Backhaul journeys are distinct routes: eg. Hamilton-Melbourne is different from Melbourne-Hamilton. Say 'empty' if empty backhauls are usual. Otherwise list commodities carried on this backhaul route.
FREIGHT RATE	-	$ per tonne or $ per kilo (please specify unless company confidentiality applies).
ROUTE CHOSEN	-	The name of the route eg. Henty Highway, Princes Highway, if a name exists. Otherwise name of town origin and destination.
ROUTE IMPORTANCE	-	The measure of reliance on this route for your company's operation.
ROUTE SATISFACTION	-	Route appreciation through various levels of service offered by the road.

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NAME _____ POSTAL ADDRESS _____

COMPANY NAME _____ _____

_____ POSTCODE _____

_____ TELEPHONE _____

TRUCK FLEET SIZE _____ NUMBER OF DRIVERS UTILISED _____

TRUCK TYPE(S) _____

FLEET DESCRIPTION

TRUCK TYPE(S)	UNITS	TARE	MAX GROSS MASS	NUMBER OF AXLES

(Continue on spare sheets if necessary)

Does your company utilise B-doubles currently?

If **YES**:

. How many B-doubles? _____

. On what routes do they operate? _____

. For what commodities? _____

If **NO**:

. Would your company utilise B-doubles? _____

. To what extent? _____

. For what commodities? _____

. On what routes? _____

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EXAMPLE

[ROUTE NO. 1]

Please indicate below an estimated volume of freight you carried for the past 12 months by origin destination, commodity carried, annual tonnage, route chosen, freight rate. Use separate sheet for each route. An example is attached for your information.

Origin Melbourne Destination Adelaide

COMMODITY CARRIED	ANNUAL TONNAGE	ROUTE CHOSEN	FREIGHT RATE (optional)
General Freight	3,000	Melbourne-Hamilton	(10c/kilo)
		(Glenelg Highway)	
General Freight	3,500	Hamilton-Mt Gambier	(10c/kilo)
		(Glenelg Highway)	
Woodchips	4,000	Mt-Gambier Adelaide (Princes Highway)	(37.50/tonne)

(Continue on spare sheets if necessary.)

Now we would like to know your perception of this route. Please register your responses by circling an appropriate number. The scale is:

Very Important/ Satisfied	**Important/ Satisfied**	**Indifferent**	**Not Very Important/ Satisfied**	**Not Important/ Satisfied**
5	**4**	**3**	**2**	**1**

. What is the level of importance of this route for your operation? 5 4 3 2 1

. What is your level of satisfaction with the service level this route provides in terms:

- Level of road congestion 5 4 3 2 1
- Road width 5 4 3 2 1
- Number of overtaking lanes 5 4 3 2 1
- Surface condition (roughness) 5 4 3 2 1
- Bridge crossings 5 4 3 2 1
- Bends and turns 5 4 3 2 1
- Overall satisfaction 5 4 3 2 1

. With what road sections (scores 2 or 1) are you dissatisfied? _____

. What percent of total business payloads carried on this route? _____

. Please feel free to make any additional comments with respect to transport infrastructure affecting your operation. _____

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EXAMPLE

[ROUTE NO. 2]

. Please indicate below an estimated volume of freight you carried for the past 12 months by origin destination, commodity carried, annual tonnage, route chosen, freight rate. Use separate sheet for each route. An example is attached for your information.

Origin Adelaide Destination Melbourne

COMMODITY CARRIED	ANNUAL TONNAGE	ROUTE CHOSEN	FREIGHT RATE (optional)
General Freight	9,000	Adelaide-Ballarat	(Confidential)
		(Western Highway)	
Vegetable Produce	5,000	Ballarat-Melbourne	
		(Western Highway)	($30/tonne)

(Continue on spare sheets if necessary.)

Now we would like to know your perception of this route. Please register your responses by circling an appropriate number. The scale is:

Very Important/ Satisfied	Important/ Satisfied	Indifferent	Not Very Important/ Satisfied	Not Important/ Satisfied
5	4	3	2	1

. What is the level of **importance** of this route for your operation? 5 4 3 2 1

. What is your level of **satisfaction** with the service level this route provides in terms:

- Level of road congestion 5 4 3 2 1
- Road width 5 4 3 2 1
- Number of overtaking lanes 5 4 3 2 1
- Surface condition (roughness) 5 4 3 2 1
- Bridge crossings 5 4 3 2 1
- Bends and turns 5 4 3 2 1
- Overall satisfaction 5 4 3 2 1

. With what road sections (scores 2 or 1) are you dissatisfied? _____

. What percent of total business payloads carried on this route? _____

. Please feel free to make any additional comments with respect to transport infrastructure affecting your operation. _____

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[ROUTE NO. 1]

. Please indicate below an estimated volume of freight you carried for the past 12 months by origin destination, commodity carried, annual tonnage, route chosen, freight rate. Use separate sheet for each route. An example is attached for your information.

Origin _____ Destination _____

COMMODITY CARRIED	ANNUAL TONNAGE	ROUTE CHOSEN	FREIGHT RATE (optional)

(Continue on spare sheets if necessary.)

Now we would like to know your perception of this route. Please register your responses by circling an appropriate number. The scale is:

Very Important/ Satisfied	Important/ Satisfied	Indifferent	Not Very Important/ Satisfied	Not Important/ Satisfied
5	4	3	2	1

. What is the level of **importance** of this route for your operation?	5	4	3	2	1
. What is your level of **satisfaction** with the service level this route provides in terms of:					
- Level of road congestion	5	4	3	2	1
- Road width	5	4	3	2	1
- Number of overtaking lanes	5	4	3	2	1
- Surface condition (roughness)	5	4	3	2	1
- Bridge crossings	5	4	3	2	1
- Bends and turns	5	4	3	2	1
- Overall satisfaction	5	4	3	2	1

. With what road sections (scores 2 or 1) are you dissatisfied? _____

. What percent of total business payloads carried on this route? _____

. Please feel free to make any additional comments with respect to transport infrastructure affecting your operation. _____

_____

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REFERENCES

Abbreviations

ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
AGPS	Australian Government Publishing Service
BTCE	Bureau of Transport and Communications Economics
BTE	Bureau of Transport Economics
DITR	Department of Industry, Technology and Resources
ISC	Inter-State Commission
RCA	Road Construction Authority of Victoria

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ABBREVIATIONS

AADT	Average annual daily traffic
ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
ABRD	Australian Bicentennial Road Development (program)
ACRD	Australian Centennial Road Development (program)
ALG	Australian Local Government
ALTP	Australian Land Transport Program
AN	Australian National
ASIC	Australian Standard Industry Classification
ATAC	Australian Transport Advisory Council
AWB	Australian Wheat Board
BTE	Bureau of Transport Economics
BTCE	Bureau of Transport and Communications Economics
cif	Costs, insurance and freight
DITR	Department of Industry Technology and Resources
DPIE	Department of Primary Industries and Energy
DRC	Dairy Research Council
DTC	Department of Transport and Communications
dwt	Deadweight tonnes
EEC	European Economic Community
ESAL	Equivalent Standard Axle Load
FIRS	Federal Interstate Registration Scheme
f.o.b.	Free on board
GDP	Gross domestic product
IAC	Industries Assistance Commission
IRIS	Integrated Register of Industry Statistics
ISC	Inter-State Commission
MAV	Municipal Association of Victoria
MCV	Medium Combination Vehicle

NEI	National economic index
PGH	Portland Grain Handling
PPA	Port of Portland Authority
PTC	Public Transport Corporation
RC	Roads Corporation
RCA	Road Construction Authority
RFITF	Road Freight Industry Task Force
RTA	Road Traffic Authority
SLA	Statistical local area
UHT	Ultra high temperature treated
VFF	Victorian Farmers Federation