REPORT TO
INFRASTRUCTURE VICTORIA
22 JULY 2019

BARWON REGION

INDUSTRY PROFILE
FINAL

C O N T E N T S

C O N T E N T S

BOXES

E X E C U T I V E S U M M A R Y

Overview of region

The Barwon region is situated in southern Victoria along the Bass Strait coastline. The region is bounded by Central Highlands to the north, Melbourne metropolitan area to the east and Great South Coast to the west.

Barwon is a large and diverse regional economy based upon construction, manufacturing, health and education service industries. Economic activity is primarily driven by the City of Geelong (Victoria's second largest city), a major industrial centre with strong transport linkages with Melbourne and an export/import point for surrounding regions via the Port of Geelong and Avalon Airport.

Barwon's coastal townships are popular tourist destinations, generating significant income and employment through tourism-related services. Future population growth is likely to be centred on Geelong and coastal settlements, mainly because of lifestyle benefits such as lower housing costs combined with a close commuting distance to Melbourne.

There are numerous major highways and rail lines linking Barwon to Melbourne's metropolitan area. This puts Geelong within commuting distance of Melbourne by both car and train. Victoria's second largest port – the Port of Geelong – is located in the region along with Avalon Airport providing domestic and international commercial flights and freight export services. Barwon contains infrastructure which is of vital importance to surrounding regions and rest of Victoria.

Revealed comparative advantage (RCA) index methodology

Using the theories and approaches of revealed comparative advantage (RCA) outlined in the accompanying assessment framework report, an analysis of the comparative advantage of Barwon is provided below.

A revealed comparative advantage index (CAI) assumes that the historical economic performance of a region can serve as a good indicator of the industries which have a comparative advantage in that region. The revealed CAI measures the concentration of industries in a particular region compared to the Victorian or Australian economy (that is, it compares the proportion of an industry's contribution to the region's gross value added (GVA), relative to the proportion at the State and National level). Specifically, industries with a CAI above 1 have a higher proportion of GVA in that region compared to the state or national economy and can indicate a potential strength and comparative advantage within the region.

Additional explanation about the RCA and CAI approach used in this profile (including the limitations of the approach) are provided in the body of the report at Chapter 2.

Top 20 highest RCA industries

The following table summarises the highest revealed comparative advantage industries for the local government areas (LGAs) within Barwon using Level 2 ANZSIC[1] data. Water Transport (70.1 CAI Vic comparison) in Queenscliffe LGA and Forestry and Logging (29.4 CAI Vic comparison) in Colac-Otway are sectors with the largest CAI for the Barwon Region. Water transport, which represents the Queenscliffe Ferry, has not grown in the past decade and does not demonstrate similar comparative advantage in other LGAs. On the other hand, the forestry and logging sector in Colac-Otway has grown 109 per cent in the past decade and the secondary industry wood product manufacturing in the same LGA demonstrates a strong CAI 12.1 (Vic comparison) and has grown 41 per cent in the past decade.

Looking across the Barwon region, agriculture, forestry and fisheries, manufacturing and tourism related service industries are the largest industries with the greatest comparative advantage.

The most significant cluster of primary and secondary and service-related sectors is the agriculture, forestry and fisheries industry. There is a diverse mix of agricultural sectors across the Colac-Otway and Surf Coast LGAs including poultry, egg, beef and lamb, wool, pork, wheat, milk and horticulture production. While the supporting service sectors for agriculture demonstrate strong comparative advantage indices, these sectors represent small proportions of GVA for their LGAs. Such services include provision of inputs (seed, chemical and fertiliser) and agronomy advice for example. Wild catch abalone and southern rock lobsters in Colac-Otway and Surf Coast LGAs represent the proportionately small production for the fishing, hunting and trapping sectors that are exported into Asia.

Food product manufacturing is another secondary industry producing value-added products such as milk. This is another sector identified as growing with further international export opportunities for value-added or niche products.

Finally, the tourism industry, which is comprised of service sectors that facilitate the visitor economy, is an important sector for the region. Accommodation has a revealed comparative advantage and is growing in the Surf Coast (74 per cent) and Colac-Otway (24 per cent) LGAs but has experienced a 10 per cent decline in Queenscliffe LGA. Seasonal domestic tourists and international tourists frequent the Great Ocean Road and Twelve Apostles, as well as the region's beaches in the summer months.

Agriculture, forestry and fisheries, related manufacturing and service sectors and the tourism industry present the greatest opportunities for economic development and job creation mainly due to natural resource endowment (farm land and fisheries), proximity to primary industries and markets (manufacturing) and the region's natural assets which attract significant domestic and international visitors.

TABLE ES 1   TOP 20 HIGHEST REVEALED COMPARATIVE ADVANTAGE BY LGA, BARWON

Industry (Level 2 ANZSIC)	LGA	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
48. Water Transport	Queenscliffe (B)**	70.1	66.5	0.5%	6.6%	Top right
3. Forestry and Logging	Colac-Otway (S)	29.4	16.6	109%	2.9%	Top right
14. Wood Product Manufacturing	Colac-Otway (S)	12.1	13.1	41%	4.6%	Top right
50. Other Transport	Queenscliffe (B)	10.7	3.1	46%	1.0%	Top right
17. Petroleum and Coal Product Manufacturing	Greater Geelong (C)	8.7	8.2	-69%	1.3%	Top left
4. Fishing, Hunting and Trapping (appears: 2 times)*	Colac-Otway (S)	8.6	3.9	129%	0.4%	Top right
44. Accommodation (appears: 3 times)	Surf Coast (S)	7.8	5.4	74%	3.8%	Top right
44. Accommodation (appears: 3 times)	Queenscliffe (B)	7.7	5.2	-11%	3.7%	Top left
1. Agriculture (appears: 2 times)	Colac-Otway (S)	7.3	9.4	42%	22.8%	Top right

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[1] Australia and New Zealand Standard Industrial Classification

Industry (Level 2 ANZSIC)	LGA	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
4. Fishing, Hunting and Trapping (appears: 2 times)	Surf Coast (S)	6.5	3.0	1751%	0.3%	Top right
5. Agriculture, Forestry and Fishing Support Services (appears: 2 times)	Colac-Otway (S)	5.2	4.7	71%	1.2%	Top right
52. Transport Support Services	Queenscliffe (B)	5.0	4.6	94%	8.3%	Top right
11. Food Product Manufacturing	Colac-Otway (S)	4.8	6.3	53%	10.7%	Top right
5. Agriculture, Forestry and Fishing Support Services (appears: 2 times)	Surf Coast (S)	4.8	4.3	296%	1.1%	Top right
13. Textile, Leather, Clothing and Footwear Manufacturing	Surf Coast (S)	4.1	4.8	19%	1.0%	Top right
1. Agriculture (appears: 2 times)	Surf Coast (S)	3.9	5.0	66%	12.2%	Top right
9. Non-Metallic Mineral Mining and Quarrying (appears: 2 times)	Colac-Otway (S)	3.8	0.9	-70%	0.2%	Top left
44. Accommodation (appears: 3 times)	Colac-Otway (S)	3.3	2.3	24%	1.6%	Top right
9. Non-Metallic Mineral Mining and Quarrying (appears: 2 times)	Surf Coast (S)	3.3	0.8	139%	0.2%	Top right
37. Other Goods Wholesaling	Surf Coast (S)	3.2	4.9	2%	5.0%	Top right

Note: Revealed industries that appear in more than one LGA are identified "appears: x times. **LGAs are classified as follows: (C) Cities, (S) Shires, and (RC) Rural Cities.

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

SWOT and needs analysis

To help understand what the infrastructure investment opportunities and constraints look like for Barwon, ACIL Allen undertook a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis, as well as a needs analysis. The information underpinning the SWOT and needs analysis was derived from a desktop research process (which examined publicly available data and information), and feedback from regional stakeholders.

Table ES2 provides the results of this analysis for the industries identified in Table ES1. That is, Table ES2 provides the results of the SWOT and needs analysis for those industries identified in Table ES1 that are deemed to have a high CAI and high share of GVA for the LGA they operate in. It identifies the potential investment opportunities and constraints that are important considerations for meeting the future infrastructure requirements of revealed sectors and other sectors important to the region's economy.

Revealed industries identified in Table ES1 are assessed for their RCA comparison to Victoria, the contribution to an LGA's GVA and consideration of an industry's performance over the past decade. This approach identifies the most important industries to the region. This guides the initial SWOT analysis process. However, due to some of the limitations of the RCA (see Section 2.1), it is important to review available industry, sector and regional development literature as well as consult with relevant regional stakeholders to identify industries that the region considers as important for future economic development. In Barwon's case, opportunities have been identified in agriculture, manufacturing, transport and tourism.

Due to the categorisation of industries in the ANZSIC codes, tourism does not have a demonstrated RCA. The data simply will not allow for this calculation to be undertaken. However, this sector demonstrates many economic development opportunities for Barwon.

A further assessment of the priority industries considers service industries that may contribute to the performance of a primary or secondary industry – for Tourism this may include accommodation and services and for Agriculture, this may include Agriculture, Forestry and Fisheries Services Support.

In order to include industries that could be considered emerging or have demonstrated growth but are starting from low base, it is necessary to cross-check the opportunities identified in the literature with the emerging industries presented in Table ES1. Outside of Agriculture, there are no industries in the top 20 that are identified in the literature that either align with the small industries (<1% GVA) demonstrating high RCA or have demonstrated strong growth over the past decade. This may reflect the limitations of the revealed industry categorisation at the ANZSIC code 2-digit level, which presents a high-level industry descriptor.
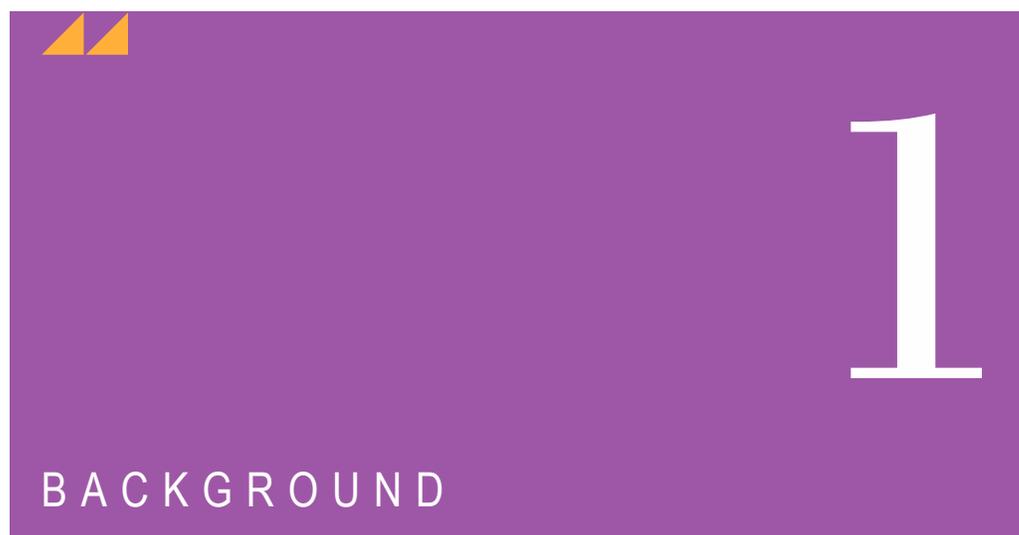
The SWOT analysis is then used to identify actionable or practical issues which are compared against the documented infrastructure needs of the region/industries. This comparison is then used to identify potential opportunities and constraints facing industries which could be addressed through future infrastructure investments, as shown in Table ES2 below.

TABLE ES 2   WHAT ARE THE INFRASTRUCTURE INVESTMENT OPPORTUNITIES AND CONSTRAINTS FOR BARWON?

Industry	Revealed sectors	Relevant LGAs	Identified needs	Opportunities to address needs	Constraints to economic development facing the industry
Agriculture, Forestry and Fisheries	Agriculture (lambs and wool, beef, dairy, poultry and grains)	Surf Coast Colac-Otway	Access to reliable internet on-farm enables adoption of precision agriculture technology which increases productivity	Provide better telecommunications infrastructure that is accessible at cost competitive rates	Inadequate internet connectivity on-farm reduces the potential to adopt technologies which can improve productivity and profitability
	Agriculture (lambs and wool, beef, dairy, poultry and grains)	Surf Coast Colac-Otway	The availability and reliability of infrastructure such as road, rail, air and water freight infrastructure will support the growth in capacity for sustainable agricultural industry growth and niche agricultural opportunities	Improve freight network infrastructure by upgrading priority road, rail, air and water freight infrastructure	Future increases in population economic activity from primary, secondary and services sectors can improve agriculture's supply chain efficiency The availability of road freight and supporting infrastructure is essential to realising growth opportunities
Manufacturing	Wood product, food product, textiles leather, clothing and footwear, food and beverage	Geelong Surf Coast Colac Otway	Infrastructure that improves logistics or supply chain function, supply of energy and water services and waste infrastructure are important for reducing the cost of production, enabling market competitiveness and are essential for attracting investment in greenfield developments	Improve and support the supply chain and logistics infrastructure that connects manufacturing businesses with primary goods and markets – including international markets through Geelong Port and Avalon Airport	Local manufacturing industries will become uncompetitive unless the supply chain and logistics connections between manufacturing industries, primary producers and their markets is optimised
Transport	Transport support services, road, water, air and space	Geelong Queenscliffe Colac-Otway	Maintain and upgrade freight and passenger rail networks, road and water transport infrastructure that connects production with markets and the workforce with businesses	Improve and support the supply chain and logistics infrastructure that connects agricultural production, processing and manufacturing and tourism sectors	Further development of the transport industry and complementary sectors is dependent on reliable and safe road, rail, air and water infrastructure that enables supply chain efficiency

Industry	Revealed sectors	Relevant LGAs	Identified needs	Opportunities to address needs	Constraints to economic development facing the industry
Finance and Insurance Services	Social Insurance (TAC, NDIA, Worksafe)	Geelong	Digital connectivity – fast and reliable internet to enable firms' access to customers and markets outside the region	Investment in digital connectivity infrastructure	Lack of fast and reliable internet services will constrain growth opportunities for the sector
Tourism	Accommodation	Surf Coast Colac Otway Geelong	The urban water supply in small towns in the Colac-Otway LGA (Apollo bay) and Surf Coast LGA (Lorne) may need upgrading in the future to meet the increased visitor population during holiday seasons	Upgrade the urban water supply in Apollo Bay and Lorne	Without access to reliable water utilities in tourist destinations the development of the sector will be constrained
			Improve key transport corridors to reduce travel times between metropolitan Melbourne and coastal regions	Improve transport corridors to reduce travel times between metro areas and coastal townships	Bottlenecks in the transport corridors between Melbourne and tourist locations to encourage additional visitors/tourists by reducing travel times between Melbourne and coastal townships
			Enhance coastal protection infrastructure to help coastal communities and tourism assets mitigate impact of changing coastal conditions	Improve and upgrade coastal protection infrastructure to fortify coastal communities and help protect iconic assets	Without coastal protection infrastructure the increasing severity of storm events areas along the coast may be inundated. Increased coastal erosion will impact on accessing coastal tourism locations and tourism assets i.e. Great Ocean Road.
			Improve internet and mobile phone access and reliability	Identify priority areas that require mobile phone tower access	

1

BACKGROUND

1.1 Overview of Barwon

Barwon is situated in southern Victoria along the Bass Strait coastline. The region is bounded by Central Highlands to the north, Melbourne metropolitan area to the east and Great South Coast to the west. The Barwon region accounts for 2.7 per cent of Victoria's land area (covering an area of 6,247 km^2). As at 2018, Barwon had an estimated resident population (ERP) of 308,953 persons or 4.8 per cent of Victoria's population. Population and land size by local government area (LGA) is shown in Table 1.1.

TABLE 1.1   POPULATION AND AREA, LGA AND SUB-REGION, BARWON REGION, 2018

Local Government Area and (sub-region)	ERP	Share of region ERP	Area (km^2)	Share of region area
City of Greater Geelong (Geelong Regional Hub)	252,217	82%	1,248	20%
Surf Coast Shire (Surf Coast)	32,251	10%	1,533	25%
Colac-Otway Shire (Western Rural Areas)	21,503	7%	3,438	55%
Borough of Queenscliffe (Geelong Regional Hub)	2,982	1%	9	0.1%
Barwon region [1]	308,953	100%	6,247	100%

Notes: (1) totals may not sum to 100 per cent due to rounding.
SOURCE: ABS CAT NO. 3218.0, REGIONAL POPULATION GROWTH, AUSTRALIA.

The sub-regions of Barwon have been aggregated from LGAs based on common economic, social and environmental characteristics. A list of sub-regions and map (see Figure 1.1) are provided below:

— Geelong regional hub (yellow)
— Surf Coast (orange)
— Western rural areas (blue)

FIGURE 1.1   SUB-REGION MAP, BARWON REGION, 2019

SOURCE: BARWON REGIONAL PROFILE 2018.

Barwon is a large and diverse regional economy based upon construction, manufacturing, health and education service industries. Economic activity is driven by the City of Geelong (Victoria's second largest city), a major industrial centre with strong transport linkages with Melbourne, an export/import point for surrounding regions via the Port of Geelong and Avalon Airport and a key employment destination within the region. Barwon's coastal townships are popular tourist destinations, generating significant income and employment through tourism related services. Future population growth is likely to be centred on Geelong and coastal settlements which offer lifestyle benefits (such as lower housing costs and a close commuting distance with Melbourne) to its residents.

Further details of Barwon's key natural and environmental attributes, infrastructure and sub-regions are provided in sections that follow.

1.1.1   Key natural and environmental attributes

Key attributes of Barwon (in terms of natural resources and environmental features) are described below. It is important to note that most natural resource extraction activities have ceased.

Natural resources include:

— timber
— wind energy
— soils supporting agriculture
— brown coal (small share of State deposits)
— sand
— limestone
— basalt
— gravel deposits.

Key environmental assets include:

— Brisbane Ranges
— Great Otway National Parks
— Lorne – Queenscliffe Coastal Reserve.

1.1.2　Key infrastructure

There are numerous major highways and rail lines linking Barwon with the Melbourne metropolitan area. This puts Geelong (the region's largest city) within commuting distance of Melbourne by both car and train. Victoria's second largest port – the Port of Geelong – is located in the region along with Avalon Airport providing domestic and international commercial flights and freight export services. Barwon contains infrastructure which is of vital importance to surrounding regions and rest of Victoria. A summary of key transport, water and power infrastructure is provided in Box 1.1.

BOX 1.1　　　KEY INFRASTRUCTURE, BARWON REGION, 2019

Roads
- Princes Highway (1,898 kms.): Adelaide – Melbourne (services coastal towns and South Australia).
- Midland Highway (452 kms.): Geelong – Mansfield (services central Victoria).
- Hamilton Highway (231 kms.): Geelong – Hamilton (services western Victoria).
- Surf Coast Highway (17 kms.): Geelong – Torquay (short connecting highway).
- Bellarine Highway (33 kms.): Geelong – Queenscliff (short connecting highway).
- Great Ocean Road (243 kms.): Torquay – Allansford (services coastal towns in the Region).

Rail
- Direct passenger rail line from Geelong to Melbourne and Warrnambool.
- Freight rail access to Port of Melbourne and Port of Geelong using lines from Ballarat and Warrnambool.
- Interstate passenger and freight line running between Perth, Adelaide and Melbourne via Ararat and Geelong.

Water
- West Barwon Reservoir (water storage).
- Wurdee Boluc Reservoir (water storage).
- water treatment plants (eight facilities).
- water reclamation plants (eleven facilities).
- pre-treatment plants (two facilities).
- ground water used for irrigation.
- borefield located at Barwon Downs.

Power
- a major wind farm is located in the Region (Inverleigh windfarm - includes solar and battery storage)

Airports
- major airport: Avalon Airport (located 15 kms north-east of Geelong).
- several smaller airports: located at Barwon Heads and Torquay.

Seaports
- major port located in the City of Geelong (Port Geelong).

SOURCE: BARWON REGIONAL PROFILE 2018.

Locations of major transport routes, airports and ports for the region are shown in Figure 1.2.

FIGURE 1.2 TRANSPORT INFRASTRUCTURE, BARWON REGION, 2019

1.1.3 Other regional attributes

Geelong is Barwon's major industrial centre. Barwon is also endowed with natural/environmental coastal features along the Great Ocean Road which attracts tourists. With many townships located within commuting distance of Melbourne, Barwon draws in new residents looking to take advantage of lifestyle benefits such as lower housing cost relative to Melbourne. Major infrastructure assets such as the Port of Geelong and Avalon Airport will underpin future employment and economic growth. A summary of these attributes is provided in **Box 1.2**.

BOX 1.2   OTHER REGIONAL ATTRIBUTES, BARWON REGION, 2019

Geelong
- regional hub, major residential, commercial and industrial centre e.g. oil refining.
- infrastructure to support major residential and industrial developments.
- infrastructure to support export of goods produced locally and in surrounding regions i.e. Port of Geelong and Avalon Airport.
- strong road, rail and public transport linkages with Melbourne suburbs and the Central Business District.

Economy
- diverse industrial base.
- construction sectors e.g. residential construction in coastal townships.
- major producer and exporter of refined petroleum (supplied 50 per cent of Victoria's petroleum).
- growing employment in service industries i.e. health, accommodation and food services.
- increasing demand for skilled labour.

Tourism
- Surf Coast, Great Ocean Road, Otway National Park and cultural attractions in Geelong.
- major source of export income.

Natural environment
- coastal and marine national parks (major tourist attraction).
- suitable conditions for renewable energy generation e.g. wind power.

SOURCE: BARWON REGIONAL PROFILE 2018.

1.2 Sub-regions of Barwon

Differences exist within the Barwon region at the LGA level in terms of its attributes and infrastructure. As an example, some LGAs contain a mixture of industries and several major regional/urban centres while others are largely rural based. Some of the differences in economic, environmental and social characteristics within the region are described below.

Geelong regional hub (City of Greater Geelong and Borough of Queenscliffe)

Comprised of the City of Greater Geelong council and Borough of Queenscliffe, the "Geelong Regional Hub" sub-region (highlighted in yellow in **Figure 1.1**) has 83 per cent of Barwon's population and accounts for 20 per cent of Barwon's area. Key facts about the Geelong regional hub sub-region include:

— largest industry is construction (by GVA), driven by domestic construction on the back of high population growth rate

— growing population

— diverse industry base (major industrial and commercial centre)

— major centre of employment for the surrounding area

— contains several of Victoria's key infrastructure assets (i.e. the Port of Geelong and Avalon Airport).

Surf Coast (Surf Coast Shire Council)

Comprising the Surf Coast Shire Council, the "Surf Coast" sub-region (highlighted in red in **Figure 1.1**) has 10 per cent of Barwon's ERP and 25 per cent of the Barwon region's area. Key facts about the Surf Coast sub-region include:

— contains the coastal townships of Torquay (16,948 | 2016 Census) and Lorne (1,026 | 2016 Census)

— largest industry is construction (based on GVA)

— high levels of residential construction and urban development in coastal settlements
— ageing population and declining working age population
— lower levels of social disadvantage relative to the rest of Victoria.

Western Rural Areas (Colac-Otway Shire Councils)

Comprising the Colac-Otway Shire Councils the "Western Rural Areas" sub-region (highlighted in blue in Figure 1.1) has 7 per cent of Barwon's ERP and 55 per cent of the Barwon region's area. Key facts about the Western Rural Areas sub-region include:
— contains the townships of Apollo Bay (1,366 | 2016 Census) and Colac (11,891 | 2016 Census)
— largest industry is manufacturing (by GVA)
— coastal townships which are major tourist destinations
— inland areas which are predominantly based on dryland agriculture and forestry
— relatively high levels of disadvantage (compared with other LGAs in Victoria)
— high proportion of early school leavers
— high proportion of 15-19-year old engaged in full-time employment as opposed to study or training
— working age population expected to decline out to 2031.

1.3 Industry composition

The Gross Regional Product (GRP) of Barwon is the sum of industrial Gross Value Add (GVA)[2]. Figure 1.3 shows the 2017-18 distribution of GVA across the largest industries for the Barwon and the four LGAs. The biggest industries by GVA in the Barwon are: Health Care and Social Assistance (14 per cent), Construction (11 per cent), Manufacturing (9 per cent), Retail Trade (8 per cent) and Education and Training (8 per cent). These five industries outlined above comprise nearly half of Barwon's GVA.

Greater Geelong has a relatively diversified economy with an almost even spread across multiple sectors. There is noticeable variation in the biggest industries across the LGAs of the Barwon region. Some noticeable differences include the Colac-Otway region which has a large Agriculture, Forestry and Fishing industry (27 per cent) and Manufacturing industry (17 per cent). The Surf Coast region has a relatively large Agriculture, Forestry and Fishing industry (14 per cent) and Construction industry (18 per cent), likely associated with population growth. Queenscliffe is dominated by Public Administration and Safety (19 per cent) and Retail trade (18 per cent).

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[2] GRP is the sum of GVA at basic prices plus taxes less subsidies on products.

FIGURE 1.3   GVA SHARE OF KEY INDUSTRIES IN THE BARWON REGION, 2017-18
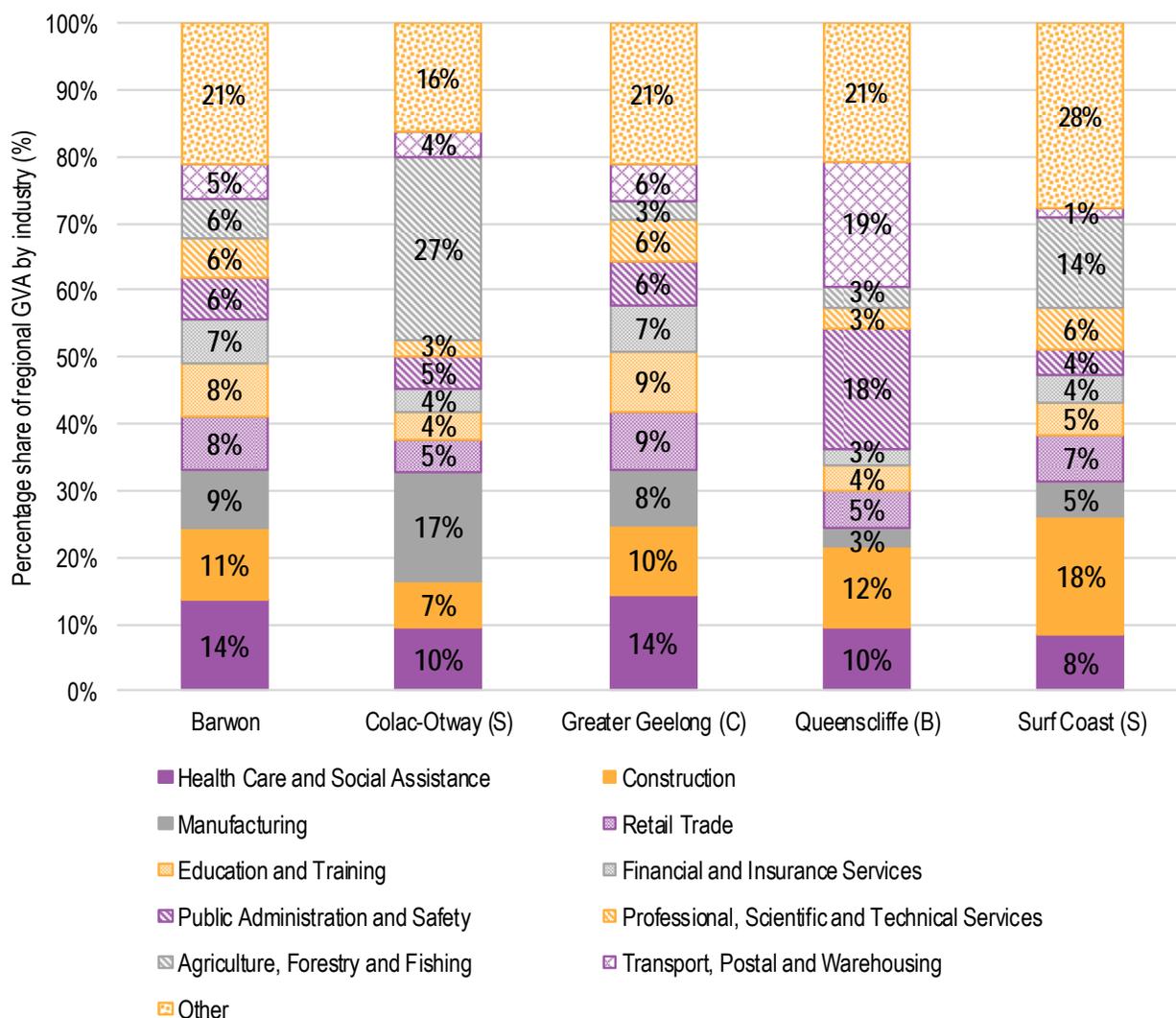
Note: Other includes industries with less than 5 per cent of Barwon GVA: Wholesale Trade; Electricity, Gas, Water and Waste Services; Other Services; Retail Trade; Accommodation and Food Services; Information Media and Telecommunications; Arts and Recreation Services; Mining; Rental, Hiring and Real Estate Services. LGAs are classified as follows: (C) Cities, (S) Shires, (RC) Rural Cities.

SOURCE: IV DATA 2019

Between 2007-08 and 2017-18, there was a sizable decline in the share of GVA from Manufacturing, decreasing from 16 per cent to 9 per cent (a 47 per cent reduction) and Administrative and Support Services, declining from 4.6 per cent to 2.7 per cent (a 41 per cent decline).

Since 2007-08 there has been an increase in the share of GVA from Agriculture, Forestry and Fishing increasing from 3.8 per cent to 5.8 per cent (a 54 per cent increase); Health Care and Social Assistance increasing from 10 per cent to 14 per cent (a 39 per cent increase); and Professional, Scientific and Technical Services, increasing from 4.3 per cent to 5.9 per cent (a 38 per cent increase).

This is somewhat consistent with trends occurring across Victoria, such as a general decline in the manufacturing sectors and an increase in service-based industries, particularly health-related services associated with ageing populations.

FIGURE 1.4   GVA SHARE OF KEY INDUSTRIES IN THE BARWON REGIONS 1991-92 TO 2017-18

Legend:
- Health Care and Social Assistance
- Construction
- Manufacturing
- Retail Trade
- Education and Training
- Financial and Insurance Services
- Public Administration and Safety
- Professional, Scientific and Technical Services
- Agriculture, Forestry and Fishing
- Transport, Postal and Warehousing

SOURCE: IV DATA 2019

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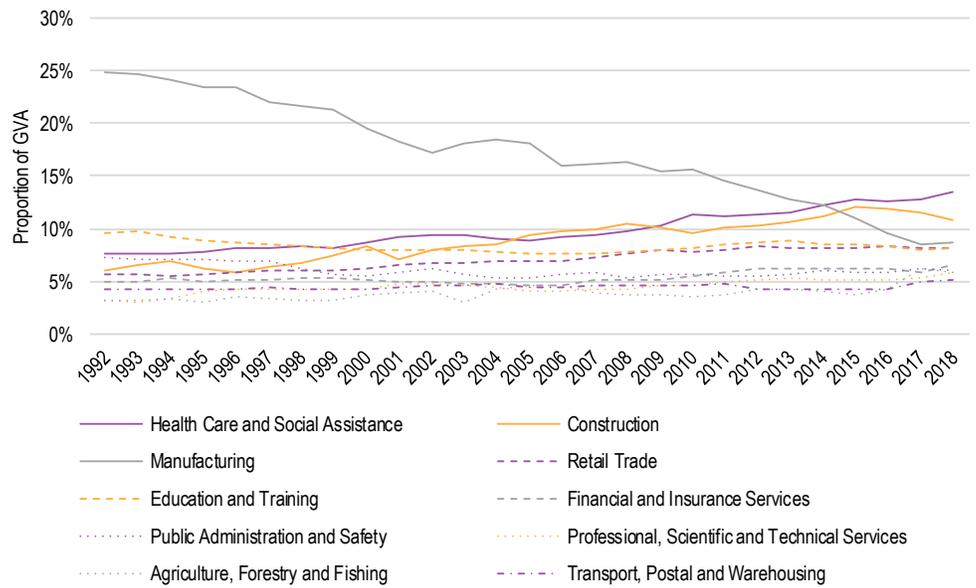
REVEALED COMPARATIVE ADVANTAGE

2.1 Revealed comparative advantage index

Using the theories and approaches of revealed comparative advantage (RCA) outlined in the accompanying assessment framework report, an analysis of Barwon's comparative advantage is provided in this section.

A revealed comparative advantage index (CAI) assumes that the historical economic performance of a region can serve as a good indicator of the industries which have a comparative advantage in that region. An RCA approach enables the identification of significant industries in each region while using a relatively simple and consistent methodology. In other words, with RCA, the results are truly comparative across regions because the results are derived in a consistent way. Specifically, industries with a CAI above 1 have a higher proportion of GVA in that region compared to the state or national economy and can indicate a potential strength of a region.

The revealed CAI measures the concentration of industries in a particular region compared to the Victorian or Australian economy (that is, it compares the proportion of an industry contribution to the regions GVA, relative to the proportion at the State and National level). The reasons why both comparators are important are outlined in Box 2.1 below.

While both comparisons have been used for this analysis and reported in the sections below, the analysis of the top revealed industries focuses on industries assessed against the Victorian CAI. This has been done for two reasons. First, it is consistent with the focus of this study, which is on Victoria's regions. Second, there were some minor gaps in the Level 2 ANZSIC data used to undertake the LGA-level analysis that would have impacted the consistency in which national CAI comparisons can be reported.

Furthermore, the analysis in this chapter reports on rates of industry growth as it provides insight into industries that have grown rapidly over the past decade and hence could be expected to continue to grow in the future. It also identifies industries that have declined over the past decade.

BOX 2.1   EXPLANATION UNDERPINNING ACIL ALLEN'S USE OF VICTORIAN AND NATIONAL CAI
                    COMPARISONS

The RCA approach was developed initially to calculate relative advantage or disadvantage of a country in
certain goods and services as evidenced by trade flows. In recent years, the concept has been adopted to
assess the comparative advantage of industries in a region.

When assessing regional RCA, there was a question of which denominator to use in the index.

A key reason for using a national denominator (in addition to a Victorian denominator) to calculate the CAI for
various industries is that while a particular industry may be significant compared to the Victorian average, it
may not be significant compared to the broader Australian economy. When the CAI for a particular industry,
within a particular region shows a similar strength compared to both the Victorian and the national averages,
this is likely to indicate a stronger comparative advantage than one in which the two CAI's conflict.

Therefore, under this framework, two comparisons (Victorian and national) have been provided to assist IV in
understanding a region's/industry's comparative advantage from multiple perspectives.

For example, the CAI of a mining commodity may be very strong in a particular region compared to Victoria
because there happens to be an economic deposit within that region that is not available elsewhere in Victoria.
When compared to Australia as a whole, however, a low CAI would indicate that there are more competitive
mining provinces elsewhere in Australia. In contrast, a high CAI using both the Victorian and national
denominators is likely to indicate that not only is there an economic deposit present, but that it is potentially a
world class deposit.

SOURCE: ACIL ALLEN

Limitations of CAI

The RCA approach tells us how regions compare to that of the broader economy in terms of size.
Where there is variation in size relative to the broader economy, RCA can be an indicator of an
industry's strength and 'importance' to the future of the regional economy. However, it is only one
indicator and further analysis is needed to determine if the industry warrants future investment and
attention by government. Furthermore, the RCA approach does not tell us if a high CAI industry is a
driver or a consequence of growth. This is important because an industry may only exist as a
consequence of government funding (as is the case for correctional facilities/prisons) and not because
of the private market's demand for its goods and services. There may be policy or other reasons to
support these industries but these reasons may not be overtly economic in nature.

2.2 Barwon (Level 1 ANZSIC analysis)

Figure 2.1 shows the CAI and industry growth for Level 1 ANZSIC industries in the Barwon region.
The size of the bubbles indicates the relative size of the industries. As noted above, the CAI can be
used as an indicator of possible regional strength, particularly when combined with a growing share of
regional GVA. The quadrant framework can assist in mapping the growth potential of an industry with
a RCA.

Top right, comparative advantage and growth: These are the industry sectors that should be looked
upon as most likely to drive regional growth and development. These are sectors for which a region
most likely has comparative advantage in, and which have experienced growth over the past decade.
Government policy should seek to *facilitate* growth in these sectors and attempt to leverage them by
focussing on the economic linkages these sectors have to the region and the Victorian economy.
Industries in Barwon which appear to have comparative advantage and potential growth
characteristics include Agriculture, Forestry and Fishing; Health Care and Social Assistance; Retail
Trade and Education and Training.

Top Left, comparative advantage with no growth: These are the industry sectors which have a
comparative advantage, but have been in decline over the past decade. For Barwon, this refers to the
Manufacturing industry. Government policy should seek to *identify and overcome constraints* to the
growth of these industries caused by infrastructure provision.

Bottom right, growth but not yet comparative advantage: These are the industry sectors that have experienced growth over the past decade but do not have comparative advantage. Our analysis shows that for Barwon region, these include the Financial and Insurance Services; Mining; and Professional, Scientific and Technical Services industries. Government policy should look at this quadrant as identifying *potential emerging industries*.

Bottom left, no growth and no comparative advantage: These are the industry sectors for which there are no comparative advantage or growth – namely, the Information Media and Telecommunications and Administrative and Support Services industries. Government policy might be warranted here to *manage decline* or assist regions to transition out of these industries. Government support for these industries may have less to do with infrastructure provision and other forms (i.e. welfare) of industry support or structural adjustment.

FIGURE 2.1   REVEALED COMPARATIVE ADVANTAGE INDEX – BARWON 2017-18, LEVEL 1 ANZSIC
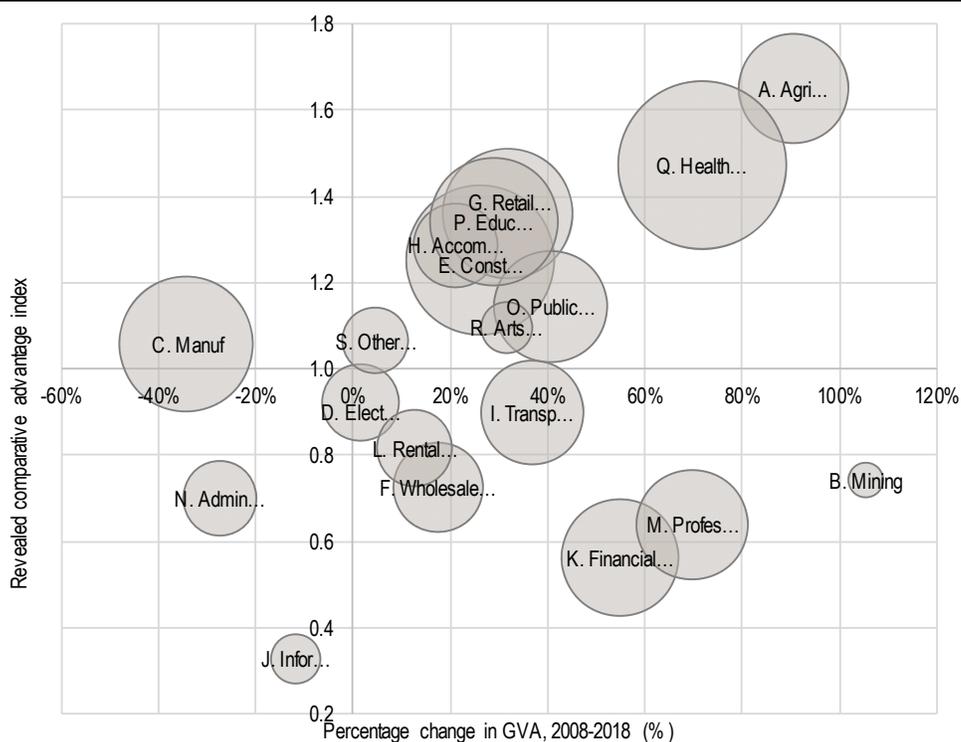
Note: This includes the revealed comparative advantage index of Barwon relative to the Victorian economy.
SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.1 summarises the highest RCA industries (Level 1 ANZSIC) for Barwon. The revealed industries in the table relate to those that have the highest CAI using the Victorian comparison, not the national comparison. The Victorian comparisons have been selected because they are consistent with the regional focus of this study, and because there were some limitations in the ANZSIC data which meant there would have been gaps in the presentation of high-ranking national CAI industries in some LGAs.

TABLE 2.1   TOP 10 REVEALED COMPARATIVE ADVANTAGE INDUSTRIES FOR BARWON, LEVEL 1 ANZSIC

Industry (Level 1 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
A. Agriculture, Forestry and Fishing	1.7	2.0	90%	5.8%	Top right
Q. Health Care and Social Assistance	1.5	1.6	72%	13.5%	Top right

Industry (Level 1 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
G. Retail Trade	1.4	1.6	32%	8.2%	Top right
P. Education and Training	1.3	1.5	29%	8.1%	Top right
H. Accommodation and Food Services	1.3	1.3	21%	3.5%	Top right
E. Construction	1.3	1.2	26%	10.8%	Top right
O. Public Administration and Safety	1.1	1.0	41%	6.1%	Top right
R. Arts and Recreation Services	1.1	1.4	32%	1.3%	Top right
S. Other Services	1.1	1.0	5%	2.2%	Top right
C. Manufacturing	1.1	1.3	-34%	8.7%	Top left

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

2.3 Barwon LGA analysis (Level 2 ANZSIC analysis)

The following section incudes revealed comparative advantage analysis by Level 2 ANZSIC industries for Barwon's four LGAs: Colac-Otway, Greater Geelong, Queenscliffe and Surf Coast.

The analysis focuses on identifying the key Level 2 ANZSIC industries which fall in the *'top right'* and are found to have a likely comparative advantage and growth.

2.3.1   Colac-Otway

Figure 2.2 shows revealed RCA analysis by Level 2 ANZSIC industries for the Colac-Otway LGA. Key industries of interest with a high CAI in the Colac-Otway LGA include Accommodation; Fishing, Hunting and Trapping; Agriculture, Forestry and Fishing Support Services; Textile, Leather, Clothing and Footwear Manufacturing; and Agriculture (see Table 2.2).

FIGURE 2.2   COMPARATIVE ADVANTAGE INDEX FOR COLAC OTWAY, 2017-18, LEVEL 2 ANZSIC
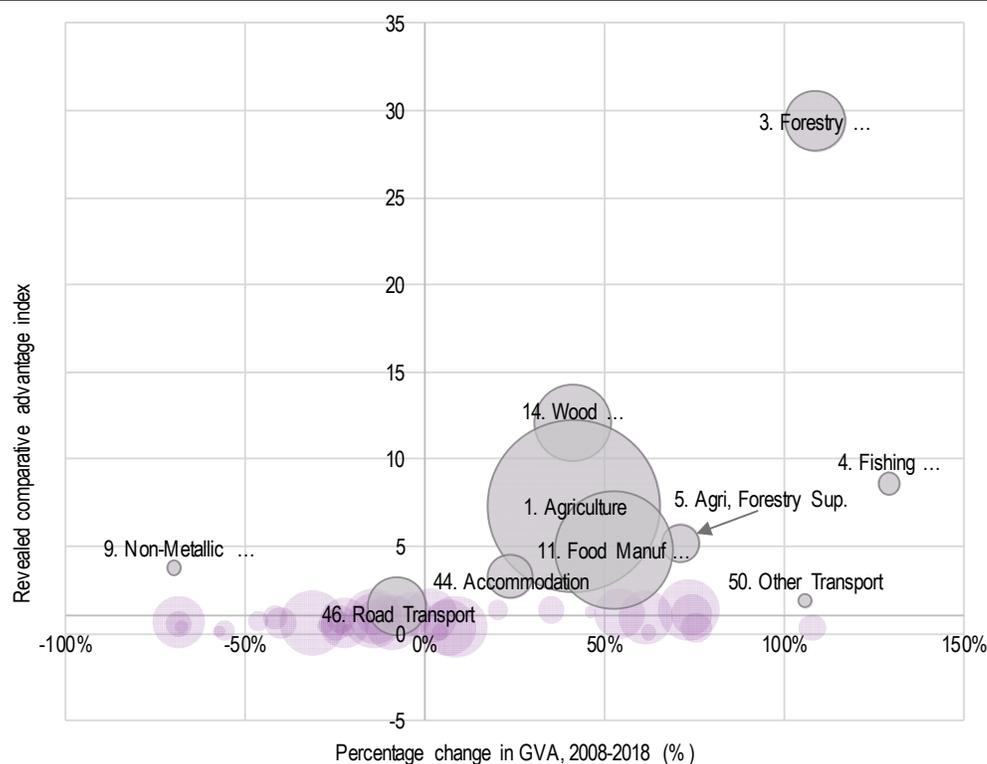
Note: This includes the revealed comparative advantage relative to the Victorian economy.

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.2 summarises the highest comparative advantage industries (Level 2 ANZSIC) for the Colac-Otway LGA, using the Victorian CAI comparison. Important industries include Forestry and Logging, Wood Product Manufacturing, and Agriculture which each have large CAI, have undergone notable growth over the past 10 years and constitute a relatively large proportion of the LGA's GVA. While Fishing, Hunting and Trapping has seen enormous growth over the past 10 years and has a high CAI, it currently accounts for a small proportion of Colac-Otway's GVA.

TABLE 2.2   TOP 10 REVEALED COMPARATIVE ADVANTAGE INDUSTRIES FOR COLAC-OTWAY

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
3. Forestry and Logging	29.4	16.6	109%	2.9%	Top right
14. Wood Product Manufacturing	12.1	13.1	41%	4.6%	Top right
4. Fishing, Hunting and Trapping	8.6	3.9	129%	0.4%	Top right
1. Agriculture	7.3	9.4	42%	22.8%	Top right
5. Agriculture, Forestry and Fishing Support Services	5.2	4.7	71%	1.2%	Top right
11. Food Product Manufacturing	4.8	6.3	53%	10.7%	Top right
9. Non-Metallic Mineral Mining and Quarrying	3.8	0.9	-70%	0.2%	Top left
44. Accommodation	3.3	2.3	24%	1.6%	Top right
50. Other Transport	1.9	0.5	106%	0.2%	Top right
46. Road Transport	1.6	1.3	-8%	2.7%	Top left

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.3 summarises the largest industries (Level 2 ANZSIC) for the Colac-Otway LGA.

TABLE 2.3   TOP 10 LARGEST INDUSTRIES FOR COLAC OTWAY

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
1. Agriculture	7.3	9.4	42%	22.8%	Top right
11. Food Product Manufacturing	.8	6.3	53%	10.7%	Top right
14. Wood Product Manufacturing	12.1	13.1	41%	4.6%	Top right
32. Construction Services	0.6	0.5	-31%	3.2%	Bottom left
62. Finance	0.4	-	9%	3.0%	Bottom right
3. Forestry and Logging	29.4	16.6	109%	2.9%	Top right
87. Social Assistance Services	1.4	2.0	73%	2.8%	Top right
84. Hospitals	0.9	3.1	-14%	2.8%	Bottom left
46. Road Transport	1.6	1.3	-8%	2.7%	Top left
42. Other Store-Based Retailing	0.7	0.8	-9%	2.4%	Bottom left

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

2.3.2   Greater Geelong

Figure 2.3 shows RCA analysis by Level 2 ANZSIC industries for the Greater Geelong LGA. Key industries of interest with a high CAI in the Greater Geelong LGA include Petroleum and Coal Product Manufacturing; Library and Other Information Services; Agriculture, Forestry and Fishing Support Services; Textile, Leather, Clothing and Footwear Manufacturing; Non-Metallic Mineral Mining and Quarrying; and Social Assistance Services (see Table 2.4).

FIGURE 2.3   COMPARATIVE ADVANTAGE INDEX FOR GREATER GEELONG, 2017-18, LEVEL 2
ANZSIC

Note: This includes the revealed comparative advantage relative to the Victorian economy.
SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.4 summarises the highest comparative advantage industries (Level 2 ANZSIC) for the
Greater Geelong LGA, using the Victorian CAI comparison. Important industries include Agriculture,
Forestry and Fishing Support Services and Social Assistance Services which have each have
undergone notable growth over the past 10 years, and, in the case of Social Assistance Services,
constitutes a large proportion of the LGA's GVA.

TABLE 2.4   TOP 10 REVEALED COMPARATIVE ADVANTAGE INDUSTRIES FOR GREATER
GEELONG

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
17. Petroleum and Coal Product Manufacturing	8.7	8.2	-69%	1.3%	Top left
60. Library and Other Information Services	2.7	15.2	10%	0.1%	Top right
5. Agriculture, Forestry and Fishing Support Services	2.3	2.2	245%	0.5%	Top right
13. Textile, Leather, Clothing and Footwear Manufacturing	2.2	2.6	-40%	0.5%	Top left
9. Non-Metallic Mineral Mining and Quarrying	2.1	0.5	14%	0.1%	Top right
87. Social Assistance Services	1.8	2.8	161%	3.7%	Top right
40. Fuel Retailing	1.8	1.7	34%	0.4%	Top right

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
20. Non-Metallic Mineral Product Manufacturing	1.7	1.3	-4%	0.7%	Top left
63. Insurance and Superannuation Funds	1.7	-	235%	2.7%	Top right
84. Hospitals	1.6	5.7	53%	5.0%	Top right

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.5 summarises the largest industries (Level 2 ANZSIC) for the Greater Geelong LGA.

TABLE 2.5   TOP 10 LARGEST INDUSTRIES FOR GREATER GEELONG

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10-year growth	% of LGA GVA	Quadrant
32. Construction Services	1.2	1.1	34%	6.4%	Top right
42. Other Store-Based Retailing	1.6	1.8	44%	5.5%	Top right
69. Professional, Scientific and Technical Services	0.8	0.7	57%	5.1%	Bottom right
84. Hospitals	1.6	5.7	53%	5.0%	Top right
81. Tertiary Education	1.5	8.5	34%	3.8%	Top right
87. Social Assistance Services	1.8	2.8	161%	3.7%	Top right
62. Finance	0.4	-	14%	3.5%	Bottom right
85. Medical and Other Health Care Services	1.4	1.0	65%	3.2%	Top right
30. Building Construction	1.4	1.3	31%	3.1%	Top right
67. Property Operators and Real Estate Services	0.8	0.5	25%	2.8%	Bottom right

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

2.3.3   Queenscliffe

Figure 2.4 shows RCA analysis by Level 2 ANZSIC industries for the Queenscliffe LGA. Key industries of interest in the Queenscliffe LGA include Water Transport; Other Transport; Accommodation; and Transport Support Services, each of which have a high CAI (See Table 2.6).

FIGURE 2.4   COMPARATIVE ADVANTAGE INDEX FOR QUEENSCLIFFE, 2017-18, ANZSIC LEVEL 2
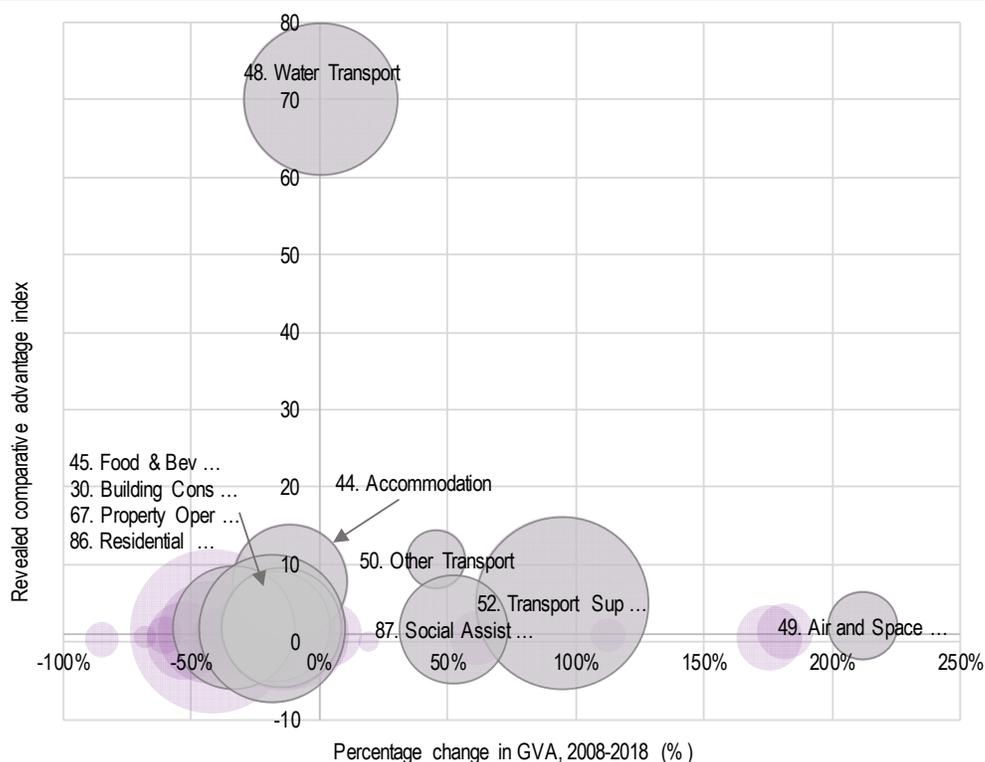
Note: This chart excludes Water Transport to focus the chart on the cluster of moderate CAI industries. This includes the revealed comparative advantage relative to the Victorian economy.
SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.6 summarises the highest comparative advantage industries (Level 2 ANZSIC) for Queenscliffe LGA using the Victorian CAI comparison. Important industries include Water Transport and Accommodation which each have high CAI and form a relatively large part of the LGA's GVA, however both have had no growth over the past 10 years. However, Other Transport, Transport Support Services, and Air and Space Transport industries have a relatively large CAI, form a sizeable part of the economy and have seen growth over the past 10 years.

TABLE 2.6   TOP 10 REVEALED COMPARATIVE ADVANTAGE INDUSTRIES FOR QUEENSCLIFFE

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
48. Water Transport	70.1	66.5	0%	6.6%	Top right
50. Other Transport	10.7	3.1	46%	1.0%	Top right
44. Accommodation	7.7	5.2	-11%	3.7%	Top left
52. Transport Support Services	5.0	4.6	94%	8.3%	Top right
49. Air and Space Transport	2.1	1.8	212%	1.3%	Top right
86. Residential Care Services	2.0	2.4	-17%	3.4%	Top left
30. Building Construction	1.9	1.7	-33%	4.2%	Top left
45. Food and Beverage Services	1.8	1.5	-15%	4.1%	Top left
67. Property Operators and Real Estate Services	1.7	1.0	-19%	6.0%	Top left
87. Social Assistance Services	1.6	2.3	52%	3.3%	Top right

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.7 summarises the largest industries (Level 2 ANZSIC) for the Queenscliffe LGA.

TABLE 2.7   TOP 10 LARGEST INDUSTRIES FOR QUEENSCLIFFE

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
52. Transport Support Services	5.0	4.6	94%	8.3%	Top right
32. Construction Services	1.4	1.3	-42%	7.5%	Top left
48. Water Transport	70.1	66.5	0%	6.6%	Top right
67. Property Operators and Real Estate Services	1.7	1.0	-19%	6.0%	Top left
30. Building Construction	1.9	1.7	-33%	4.2%	Top left
45. Food and Beverage Services	1.8	1.5	-15%	4.1%	Top left
44. Accommodation	7.7	5.2	-11%	3.7%	Top left
86. Residential Care Services	2.0	2.4	-17%	3.4%	Top left
87. Social Assistance Services	1.6	2.3	52%	3.3%	Top right
42. Other Store-Based Retailing	0.9	1.0	-10%	3.3%	Bottom left

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

2.3.4   Surf Coast

Figure 2.5 shows RCA analysis by Level 2 ANZSIC industries for the Surf Coast LGA. Key industries of interest with a high CAI in the Surf Coast LGA include Accommodation; Fishing, Hunting and Trapping; Agriculture, Forestry and Fishing Support Services; and Textile, Leather, Clothing and Footwear Manufacturing (see Table 2.8).

FIGURE 2.5   COMPARATIVE ADVANTAGE INDEX FOR SURF COAST, 2017-18, LEVEL 2 ANZSIC
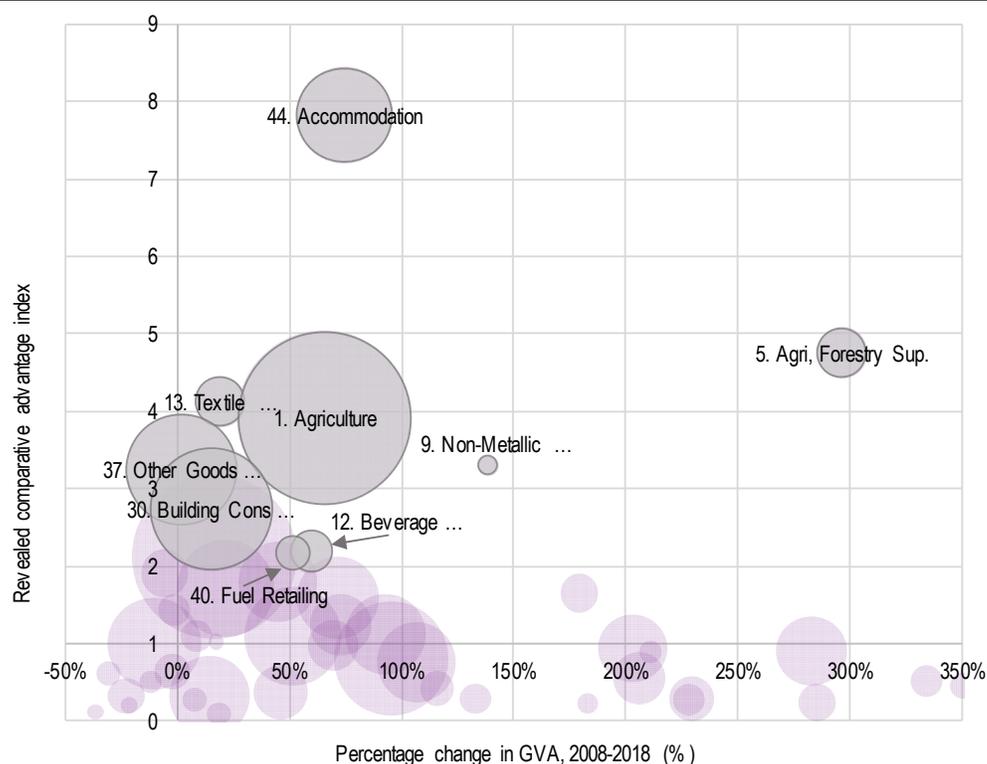
Note: This includes the revealed comparative advantage relative to the Victorian economy. The chart excludes Fishing, Hunting and Trapping to focus the chart on the key industries.
SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.8 summarises the highest comparative advantage industries (Level 2 ANZSIC) for the Surf Coast LGA using the Victorian CAI comparison. Important industries include Accommodation; Agriculture, Forestry and Fishing Support Services; and Agriculture which each have a large CAI, have undergone notable growth over the past 10 years and constitute a relatively large proportion of the Surf Coast's GVA. Fishing, Hunting and Trapping has a high CAI and has had very large growth over the past 10 years but still accounts for a small proportion of the economy.

TABLE 2.8   TOP 10 REVEALED COMPARATIVE ADVANTAGE INDUSTRIES FOR SURF COAST

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
44. Accommodation	7.8	5.4	74%	3.8%	Top right
4. Fishing, Hunting and Trapping	6.5	3.0	1751%	0.3%	Top right
5. Agriculture, Forestry and Fishing Support Services	4.8	4.3	296%	1.1%	Top right
13. Textile, Leather, Clothing and Footwear Manufacturing	4.1	4.8	19%	1.0%	Top right
1. Agriculture	3.9	5.0	66%	12.2%	Top right
9. Non-Metallic Mineral Mining and Quarrying	3.3	0.8	139%	0.2%	Top right
37. Other Goods Wholesaling	3.2	4.9	2%	5.0%	Top right
30. Building Construction	2.7	2.5	15%	6.1%	Top right

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
12. Beverage and Tobacco Product Manufacturing	2.2	1.8	60%	0.8%	Top right
40. Fuel Retailing	2.2	2.0	52%	0.5%	Top right

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.9 summarises the largest industries (Level 2 ANZSIC) for the Surf Coast LGA.

TABLE 2.9   TOP 10 LARGEST INDUSTRIES FOR SURF COAST

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
1. Agriculture	3.9	5.0	66%	12.2%	Top right
32. Construction Services	2.1	1.9	16%	11.0%	Top right
30. Building Construction	2.7	2.5	15%	6.1%	Top right
69. Professional, Scientific and Technical Services	0.8	0.7	95%	5.2%	Bottom right
37. Other Goods Wholesaling	3.2	4.9	2%	5.0%	Top right
42. Other Store-Based Retailing	1.1	1.2	52%	3.9%	Top right
45. Food and Beverage Services	1.7	1.4	22%	3.9%	Top right
44. Accommodation	7.8	5.4	74%	3.8%	Top right
67. Property Operators and Real Estate Services	1.0	0.6	-10%	3.5%	Top left
86. Residential Care Services	1.6	2.0	72%	2.7%	Top right

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

2.4   Summary (Level 2 ANZSIC analysis)

Table 2.10 summarises the highest RCA industries (Level 2 ANZSIC) for Barwon's LGAs. Water Transport (70.1 CAI Vic comparison) in Queenscliffe LGA and Forestry and Logging (29.4 CAI Vic comparison) in Colac-Otway are sectors with the largest CAI for the Barwon region. Water transport (mainly representing the Queenscliffe Ferry) has not grown in the past decade and does not demonstrate similar comparative advantage in other LGAs. On the other hand, the forestry and logging sector in Colac-Otway has grown 109 per cent in the past decade and the secondary industry wood product manufacturing in the same LGA demonstrates a strong CAI (12.1 Vic comparison) and has grown 41 per cent in the past decade.

Looking across the Barwon region, the largest industries with the highest RCA are agriculture, forestry and fisheries; manufacturing and tourism related service industries.

The most significant cluster of primary and secondary and service-related sectors is in the agriculture, forestry and fisheries industry. There is a diverse mix of agricultural sectors across Colac-Otway and Surf Coast LGAs including poultry, egg, beef and lamb, wool, pork, wheat, milk and horticulture production. While the supporting service sectors for agriculture in Colac-Otway and Surf Coast LGAs demonstrate strong comparative advantage indices, these sectors represent small proportions of gross value add for their LGAs. Such services include provision of inputs (seed, chemical and fertiliser) and agronomy advice for example. Wild catch abalone and southern rock lobsters in Colac-Otway and Surf Coast LGA represent the proportionately small production for the fishing, hunting and trapping sectors that are exported into Asia.

Food product manufacturing is another secondary industry producing value-added products such as milk and is another sector identified as growing with further international export opportunities for value-added or niche products.

Finally, the tourism industry, which is comprised of service sectors that facilitate the visitor economy, is an important sector for the region. Accommodation has a revealed comparative advantage and is growing in the Surf Coast (74 per cent) and Colac-Otway (24 per cent) LGAs but has experienced a 10 per cent decline in Queenscliffe LGA. Seasonal domestic tourists and international tourists frequent the Great Ocean Road and Twelve Apostles, as well as the region's beaches in the summer months.

Agriculture, forestry and fisheries and its related manufacturing and service sectors and the tourism industry present the greatest opportunities for economic development and job creation mainly due to natural resource endowment (farm land and fisheries), proximity to primary industries and markets (manufacturing) and the region's natural assets which attract significant domestic and international visitors.

TABLE 2.10   TOP 20 HIGHEST REVEALED COMPARATIVE ADVANTAGE BY LGA, BARWON

Industry (Level 2 ANZSIC)	LGA	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
48. Water Transport	Queenscliffe (B)**	70.1	66.5	0%	6.6%	Top right
3. Forestry and Logging	Colac-Otway (S)	29.4	16.6	109%	2.9%	Top right
14. Wood Product Manufacturing	Colac-Otway (S)	12.1	13.1	41%	4.6%	Top right
50. Other Transport	Queenscliffe (B)	10.7	3.1	46%	1.0%	Top right
17. Petroleum and Coal Product Manufacturing	Greater Geelong (C)	8.7	8.2	-69%	1.3%	Top left
4. Fishing, Hunting and Trapping (appears: 2 times)*	Colac-Otway (S)	8.6	3.9	129%	0.4%	Top right
44. Accommodation (appears: 3 times)	Surf Coast (S)	7.8	5.4	74%	3.8%	Top right
44. Accommodation (appears: 3 times)	Queenscliffe (B)	7.7	5.2	-11%	3.7%	Top left
1. Agriculture (appears: 2 times)	Colac-Otway (S)	7.3	9.4	42%	22.8%	Top right
4. Fishing, Hunting and Trapping (appears: 2 times)	Surf Coast (S)	6.5	3.0	1751%	0.3%	Top right
5. Agriculture, Forestry and Fishing Support Services (appears: 2 times)	Colac-Otway (S)	5.2	4.7	71%	1.2%	Top right
52. Transport Support Services	Queenscliffe (B)	5.0	4.6	94%	8.3%	Top right
11. Food Product Manufacturing	Colac-Otway (S)	4.8	6.3	53%	10.7%	Top right
5. Agriculture, Forestry and Fishing Support Services (appears: 2 times)	Surf Coast (S)	4.8	4.3	296%	1.1%	Top right
13. Textile, Leather, Clothing and Footwear Manufacturing	Surf Coast (S)	4.1	4.8	19%	1.0%	Top right
1. Agriculture (appears: 2 times)	Surf Coast (S)	3.9	5.0	66%	12.2%	Top right
9. Non-Metallic Mineral Mining and Quarrying (appears: 2 times)	Colac-Otway (S)	3.8	0.9	-70%	0.2%	Top left
44. Accommodation (appears: 3 times)	Colac-Otway (S)	3.3	2.3	24%	1.6%	Top right
9. Non-Metallic Mineral Mining and Quarrying (appears: 2 times)	Surf Coast (S)	3.3	0.8	139%	0.2%	Top right
37. Other Goods Wholesaling	Surf Coast (S)	3.2	4.9	2%	5.0%	Top right

Note: *Revealed industries that appear in more than one LGA are identified "appears: x times. **LGAs are classified as follows: (C) Cities, (S) Shires, (RC) Rural Cities.
*SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA*

2.4.1   Agricultural production by sector

The Level 2 ANZSIC industry, Agriculture, forms a large component of GVA for both the Surf Coast and Colac-Otway LGA. Figure 2.6 shows the estimated GVA of each of the sub industries which form Agriculture.

In the Colac-Otway LGA, Agriculture comprises 51 per cent Dairy Cattle Farming and 37 per cent Sheep, Beef Cattle and Grain Farming. In the Surf-Coast LGA, Agriculture comprises 57 per cent Sheep, Beef Cattle and Grain Farming, 18 per cent Other livestock Farming and 10 per cent Dairy Cattle farming.

FIGURE 2.6   COMPOSITION OF LEVEL 2 ANZSIC INDUSTRY, AGRICULTURE, BY LGA
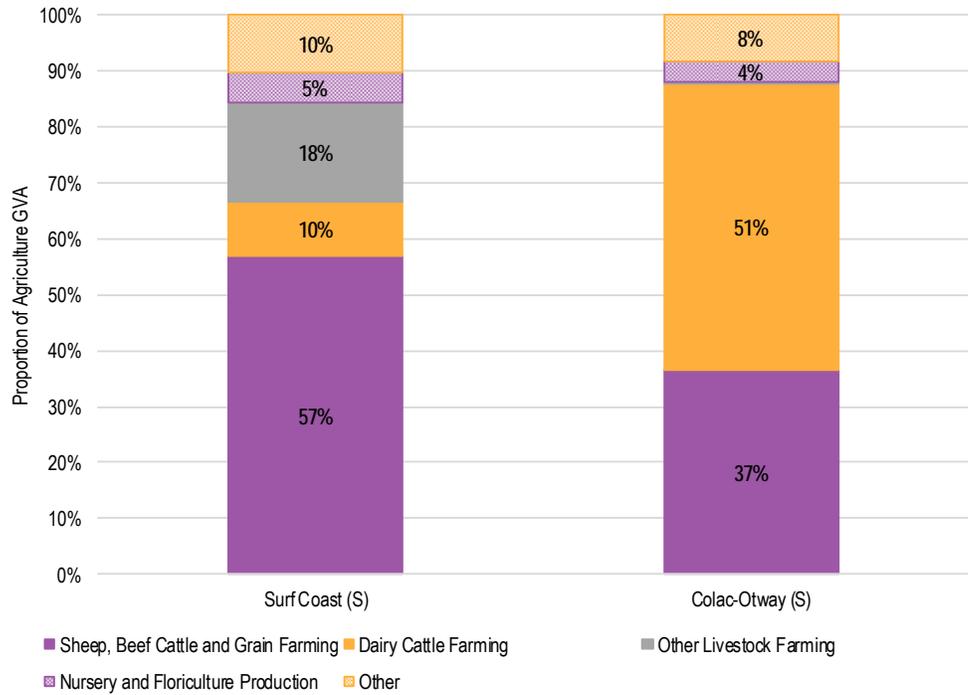
Note: Other includes: Mushroom and Vegetable Growing; Poultry Farming; Fruit and Tree Nut Growing; Other Crop Growing; and Deer Farming. LGAs are classified as follows: (C) Cities, (S) Shires, (RC) Rural Cities.

SOURCE: ACIL ALLEN CONSULTING SHARES OF EMPLOYMENT BY INDUSTRY

REVEALED INDUSTRIES ANALYSIS

3

This section outlines the SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis and need assessment processes undertaken by ACIL Allen for the Barwon region. The analysis follows the process outlined in the assessment framework report which accompanies this profile. The justification for inclusion of specific revealed industries in the SWOT is based on assessment of several factors.

Firstly, revealed industries identified in Table 2.10 are assessed for their RCA comparison to Victoria, the contribution to an LGA's GVA and consideration of the past decade's performance. This approach identifies the most important industries to the Barwon region and guides the initial SWOT analysis process. However, due to some of the limitations of the RCA (see Section 2.1), it is important to review available industry, sector and regional development literature as well as consult with relevant regional stakeholders to identify industries that are important to the region's future economic development. In Barwon's case, opportunities have been identified in food product manufacturing, agricultural production, tourism and transport.

Due to the categorisation of industries in the ANZSIC codes, tourism does not have a demonstrated RCA. Data simply will not allow for this calculation to be undertaken. However, this sector demonstrates many economic development opportunities for Barwon. A further assessment of the priority industries considers service industries that may contribute to the performance of a primary or secondary industry - for Agriculture, this may include Tourism and supporting services.

In order to include industries that could be considered emerging or have demonstrated growth but are starting from a low base, it is necessary to cross-check the opportunities identified in the literature with the emerging industries presented in Table 2.10.

The SWOT analysis is then used to identify actionable or practical issues which are compared against the documented infrastructure needs of the region/industries. This comparison is then used to identify the opportunities and constraints facing industries which could be addressed through future infrastructure investments.

3.1 SWOT analysis of the region and revealed industries

A summary of the SWOT for Barwon is provided in Table 3.1 below. Information for the SWOT has been derived from multiple sources (which are largely publicly available) including IV profiles, regional plans, stakeholder consultations and industry and sectoral strategies.

TABLE 3.1   SWOT ANLAYSIS FOR THE REVEALED INDUSTRIES OF BARWON

Industry	Strengths	Weaknesses	Opportunities	Threats
Cross-Industry	— Geelong is the largest regional city in Vic, in close proximity to Melbourne — Geelong CBD provides an employment, education, health and service hub for the wider region. Relocation of government led social insurance (i.e. TAC, NDIA, WorkSafe) made Geelong a social insurance hub — A diverse region consisting of urban, peri-urban, rural and coastal areas. — Growth in the accommodation and food services, and construction industries — Significant agricultural land and production assets (Inc. wind energy, timber, good quality arable land and soils, and high rainfall in coastal areas) — Higher education facilities (TAFEs, Deakin University campuses in Geelong) — Barwon has major regional, intrastate, interstate and international transport assets which include national and state highways, freight and passenger rail networks, the Port of Geelong and Avalon Airport. — Regional coach and town bus networks provide links to employment precincts, education facilities, activity centres and transport hubs. Regional pedestrian and bicycle trails and linkages are tourism assets — Regional Rail Link, along with the other proposed passenger rail initiatives in the region, will improve access between Geelong and other cities. Also has linkages to Melbourne wholesale markets and saleyards in Geelong, Colac and Ballarat	— Mobile and digital connectivity is inadequate and constrains productivity and business competitiveness — Public transport services into Geelong are limited, particularly from coastal townships — Urban water supply issues for coastal towns, particularly Apollo Bay, as they are reliant on surface water, highly dependent on season flows and have seasonal storage — The high cost of provision vs peak user customers means that the expansion of the gas network (outside of Bannockburn and Winchelsea) is unlikely. Small to mid-sized and coastal towns' capacity to support significant population growth will be limited by existing gas infrastructure	— To attract high value add industries (such as tourism and advanced manufacturing) to Barwon's largest sub-regions that capitalise on its key attributes and proximity to Melbourne — Victoria's Climate Change Act 2017 establishes a long-term target of net zero greenhouse gas emissions by 2050, creating opportunities for low/zero emission sectors across the economy — Opportunities associated with the Geelong City Deal — Improve digital connectivity through the Connecting Regional Communities Program and Mobile Blackspots Program — Opportunities around addressing enabling infrastructure barriers to existing and future investment opportunities such as improved energy and water infrastructure — Opportunities around establishment and enhancement of public transport connections to Avalon Airport — Opportunities around investments in rail services between Geelong and Melbourne and potential for enhanced inter and intra-regional public transport (e.g. Geelong – Colac – Warrnambool; PT connection to Surf Coast) — New opportunities from the construction and establishment of the Geelong Convention and Exhibition Centre. — Opportunities in population led sectors such as construction, health and education due to Geelong growth areas — Central service provision in Melbourne and Geelong will continue to support high and growing proportion of resident's work being outside the Surf Coast LGA — Runway Geelong – providing support to budding entrepreneurs in regional locations	— Utilities – The impact of climate change, in terms of frequency of storm events, on drainage system capacity and rising sea levels on capacity of outfalls and on other coastal located infrastructure — Failure of infrastructure to keep pace with rapid growth in population in Surf Coast and Geelong LGAs leading to congestion, reduced quality of life leading to skills shortages — Higher temperatures and changing water supply as a result of climate variability and change will be a key driver (potentially depressing economic growth) — Erosion along the coastline is likely to increase with rising sea levels and storm surges — Coastal hazards present and increasing risk to the surf coast region with inundation and erosion events likely to increase and impact both coastal communities and environmental assets — This region is predisposed to bushfire and floods, bushfires and grassfires a natural feature of the environmental assets

Industry	Strengths	Weaknesses	Opportunities	Threats
Agriculture, Forestry and Fisheries	— Significant agricultural land and high levels of production **Colac-Otway** — Agriculture is largest industry by GVA in region — Forestry located in the South of the Western Rural areas (Inc. softwood plantations) **Surf coast** — Two main land uses are agriculture and forestry, and parkland — Inland land use is predominantly dryland grazing (sheep and beef) dairy and forestry plantations.	**Surf coast** — The high proportion of lifestyle properties along the coast are analysed as agriculture land use but do not operate as typical commercial entities	— To provide transport infrastructure that better links the region's diary, beef and gain industries to domestic and international markets	— Reduction in water availability for agriculture due to climate change/lack of drought-proof water infrastructure — Heat stress on livestock and crops as a result of climate change — The frequency and severity of natural hazards (e.g. bush fires, droughts and floods) will impact agriculture, forest and urban areas — Biosecurity risks associated with climate change: changed distribution of pests and diseases — Increased bushfire risk from climate change to impact farm businesses. Cost of recycled water remains prohibitive to its use for agricultural production — Land use conflicts: The desire to protect landscapes has been identified in rural land use strategies. This desire creates a conflict between 'right to farm' and preserving landscapes
Manufacturing	— Transition towards advanced manufacturing e.g. carbon fibre, robotics, nanotech — Established transport and airfreight infrastructure provide opportunities to take new goods and services to market (esp. international markets) **Colac-Otway** — Important food manufacturing industries closely associated with local agriculture	— General decline in manufacturing as a proportion of economic activity (not just a Barwon trend but across the state and nationally as well)	— Barwon's population growth, and growing agriculture and manufacturing sectors will place increasing importance on efficient freight corridors between Barwon and metropolitan Melbourne — Manufutures - purpose built advanced manufacturing innovation hub developed in partnership with the Victorian Government by Deakin University which will support up to 15 commercial enterprises and 150 people working in advanced manufacturing industries (start-ups to global corporation). Hub has secured seven tenants (Insight Engineering, HeiQ, Flaim Systems, Partington Advanced Engineering, FormFlow, Conflux Technology and The Smart Think)	— Increasingly competitive international markets place pressure on the ability of Barwon's manufacturing industries to compete in domestic and overseas markets

Industry	Strengths	Weaknesses	Opportunities	Threats
Mining and energy	— Coastal environments highly suited to wind and alternative energy generation **Colac-Otway** — Wind energy production is being established in western rural areas sub region. A wind farm is under construction and expected will be finished mid-2018, and another co-located solar and battery storage site is planned	— Cost effective connection to the NEM for renewables	— Victoria's Climate Change Act 2017 establishes a long-term target of net zero greenhouse gas emissions by 2050. This increases viability of renewable energy investments into the future. — Release of new planning guidelines for large-scale solar farms — Opportunities exist to reduce greenhouse gas emissions and support a low carbon growth economy through use of alternative energy sources, including waste to energy, cogeneration and more effective building design **Surf coast** — Renewable resource mapping and investigation have suggested potential geothermal power resources may be found in the area, particularly near Anglesea, but further scoping is needed.	— Lack of political and community support for traditional mining and energy sectors undermines opportunities to invest in further enabling infrastructure to support these industries
Transport	— Established transport corridors support goods and service flows between major townships and Melbourne — Avalon Airport, only international airport in Regional Victorian Government — Port of Geelong – largest regional port in Victoria	— Congestion on major highways between Melbourne and the region reduces supply chain efficiency	— Barwon's population growth, and growing agriculture and manufacturing sectors will place increasing importance on freight. — New road connections and road upgrades will enhance connectivity and the movement of people and goods. — The location of future transport corridors, such as the proposed transit link between Geelong and Torquay/Jan Juc via the Armstrong Creek area and the North and West Growth Areas, are required **Colac-Otway and Surf Coast** — Concentration of jobs and services, primarily in the urban centre of Geelong, will place more emphasis on transport corridors for those who reside in rural areas or Geelong and commute	— Climate change and the introduction of carbon reduction policies by governments
Tourism and other services	— Tourism and assets (e.g. Great Ocean Road, coastal regions and the Otway's National Park) — High holiday population along the surf coast, particularly during summer and holiday months — Twelve Apostles, Great Ocean Road — Tourists visit Victoria for nature-based, food and wine	— Concentrated seasonal visits impact the environment, create crowding and poor visitor experience — High proportion of day visitation is impacting on the yield in the region's economy. — Housing access and affordability, particularly for tourism workers	— Provide enabling infrastructure which help to raise the tourism potential of Point Lonsdale Lighthouse Reserve — Opportunities associated with transformative visitor economy projects to increase product and length of stay such as implementation of the proposed Eden	— Climate change will impact some regional assets, particularly erosion of coastal roads and coastal properties as well as open space, sporting fields, coastal public parks and reserves — Population growth will place additional

Industry	Strengths	Weaknesses	Opportunities	Threats
	experiences aligned to the environment **Greater Geelong** — Strong tourism sector (cultural, heritage and environmental attractions) — Growth in provision of hotel and apartments (sharing economy) accommodation **Surf Coast** — Tourism relies upon its important environmental assets, including coastal and marine national parks and proximity to major population centres of Geelong and Melbourne	— Difficulty attracting and retaining workers in tourism sector — Key highways of insufficient capacity/quality to move large number of tourists/visitors from Melbourne to coastal regions — High increase in water demand in these towns during tourist seasons is a key challenge to water security — Accommodation offering not meeting demand impacting on the length of stay in the region	Project at the former Anglesea Coal Mine and the Geelong Convention and Exhibition Centre — Avalon Airport expansion of its domestic operations, introduction of international operations and its curfew-free status will drive the business and tourism sectors. — Increase regional areas exposure to day trip visitation through upgrades of major freeways (to service the growing commuter population between Geelong and Melbourne) — The location of future transport corridors, such as the proposed transit link between Geelong and Torquay/Jan Juc via the Armstrong Creek area, is required — Establishment of the Great Ocean Road Parks Authority — Construction of the Geelong Convention and Exhibition Centre will support the visitor economy and associated tourism activities **Surf coast** — Strong tourist activity will generate future opportunities for services sectors	pressure on existing recreation assets and facilities requiring appropriate management, protection and enhancement regimes

SOURCE: VARIOUS SOURCES

AITHER (2019) BARWON REGIONAL PROFILE: AN ANALYSIS OF REGIONAL STRENGTHS AND CHALLENGES. ACCESSED 20 MAY 2019 (HTTPS://WWW.INFRASTRUCTUREVICTORIA.COM.AU/WP-CONTENT/UPLOADS/2019/04/AITHER-BARWON-REGIONAL-PROFILE-MARCH.2019.PDF)

VICTORIAN GOVERNMENT (2013) G21 REGIONAL GROWTH PLAN. ACCESSED 20 MAY 2019 (HTTPS://WWW.PLANNING.VIC.GOV.AU/POLICY-AND-STRATEGY/REGIONAL-GROWTH-PLANS/G21-REGIONAL-GROWTH-PLAN)

VICTORIAN GOVERNMENT (2019) REGIONAL PARTNERSHPS BARWON: OUR OUTCOMES ROAD MAP. ACCESSED 12 JUNE 2019 (HTTPS://WWW.RDV.VIC.GOV.AU/__DATA/ASSETS/PDF_FILE/0003/1733259/BARWON-OUTCOMES-ROADMAP_MAY-2019.PDF)

QUEENSCLIFFE LOCAL GOVERNMENT (2019) POINT LONSDALE LIGHTHOUSE RESERVE. ACCESSED 12 JUNE 2019 (HTTP://WWW.QUEENSCLIFFE.VIC.GOV.AU/COUNCIL/NEWS-AND-NOTICES/CURRENT-PROJECTS/ITEM/POINT-LONSDALE-LIGHTHOUSE-RESERVE?HIGHLIGHT=WYJWB2LUDCISIIDWB2LUDCISINBVAW50J3MILCJSB25ZZGFSZSISIMXVBNNKYWXLJ3MILCJSAWDODGHVDXNLIIWICG9PBNOGBG9UC2RHBGUILCJWB2LUDCBSB25ZZGFSZSBSAWDODGHVDXNLIIWIBG9UC2RHBGUGBGLNAHROB3VZZSJD%20:%20HTTP://WWW.QUEENSCLIFFE.VIC.GOV.AU/IMAGES/DRAFT_LANDSCAPE_MASTERPLAN_WEB.PDF)

VICTORIAN GOVERNMENT, REGIONAL ADAPTATION SNAPSHOT – BARWON SOUTH WEST: HTTPS://WWW.CLIMATECHANGE.VIC.GOV.AU/__DATA/ASSETS/PDF_FILE/0033/392919/D18-001.REGCCASNAPSHOTREPORTS_BSW_FALR.PDF

VICTORIAN GOVERNMENT, REGIONAL ADAPTATION SNAPSHOT BARWON SOUTH WEST: HTTPS://WWW.CLIMATECHANGE.VIC.GOV.AU/__DATA/ASSETS/PDF_FILE/0033/392919/D18-001.REGCCASNAPSHOTREPORTS_BSW_FALR.PDF

VICTORIAN GOVERNMENT, HTTPS://WWW.CLIMATECHANGE.VIC.GOV.AU/__DATA/ASSETS/PDF_FILE/0021/60744/GIPPSLAND.PDF

VICTORIAN GOVERNMENT, HTTPS://WWW.PREMIER.VIC.GOV.AU/A-BRIGHT-FUTURE-FOR-GEELONGS-ADVANCED-MANUFACTURING/: HTTPS://WWW.DEAKIN.EDU.AU/SEBE/MANUFUTURES

VICTORIAN GOVERNMENT, HTTPS://WWW.CLIMATECHANGE.VIC.GOV.AU/REDUCING-EMISSIONS/EMISSIONS-TARGETS

VICTORIAN GOVERNMENT, HTTPS://WWW.PREMIER.VIC.GOV.AU/NEW-LARGE-SCALE-SOLAR-GUIDELINES-BOOST-SECTOR-CONFIDENCE/

To ensure the SWOT can be translated into actionable strategies, ACIL Allen has used a technique which applies four fundamental questions to the information provided above. These questions are derived from combining elements of the SWOT. They help to identify the region's 'opportunities' and 'constraints' that could be progressed/addressed through future infrastructure investment.

Strengths – Opportunities assessment

This part of the SWOT considers: Which of the region's/sector's strengths can be used to maximise the opportunities identified?

The combined agriculture, forestry and fisheries industries represent the largest source of economic activity and growth in the Barwon region. The region's close proximity to ports, saleyards, Avalon Airport and Geelong and Melbourne markets presents opportunities to increase the supply of value-added food manufacturing and wood product manufacturing products to these markets. These opportunities can be realised through support for food product manufacturing and the agriculture industries, for which the Colac-Otway LGA has a comparative advantage and has experienced economic growth.

The transport sector which includes support services, water, air and space and other services have significant comparative advantages and have experienced growth in the past decade particularly in the Queenscliffe and Colac-Otway LGAs. Although these sectors are small contributors to economic activity, each have experienced growth which can be attributed the increased agricultural and forestry production and tourism trade across the Surf Coast LGA and Colac-Otway LGA. Improvements in supply chain efficiencies through provision of roads, rail, sea and air freight networks will facilitate domestic and international market development opportunities.

Strengths – Threats assessment

This part of the SWOT considers: How can the region's/sector's strengths be used to minimise the threats identified?

The region's agricultural industries have a strong comparative advantage and have experienced growth in the past decade. The potential threats posed by climate change including increased extreme weather events such as flood, fire and drought can inhibit the industry's economic and environmental sustainability for the region. Increased adoption of new technologies and practices will enable agricultural industries to mitigate the risks and adapt to the impacts of climate change.

Barwon has experienced variable performance in its mineral extraction and manufacturing industry over the past decade. The growth in non-metallic mineral mining and quarrying in the Greater Geelong LGA contrasts with the decline in the petroleum and coal, textile, leather, clothing and footwear and non-metallic mineral product manufacturing sectors. Whilst in the Queenscliffe LGA, the comparative advantage across transport support services, water, air and space and other service sectors contrasts with the decline of the construction and service sectors which support the buoyant tourism sector. To encourage further growth in the transport sector, support for the local tourist service sectors including property operators and real estate services, food and beverage services and accommodation is important. There may be investment opportunities in infrastructure (such as public transport infrastructure) to support the workers of declining industries in some areas of the region to have better physical access to sectors that are growing in other areas.

Weaknesses -Opportunities assessment

This part of the SWOT considers: How can the region's/sector's weaknesses be minimised by using the opportunities identified?

The gradual decline of the resource extraction and traditional manufacturing sectors (textiles) in the last ten years presents opportunities for commercial and industrial areas in the region to transition to advanced manufacturing or repurpose current infrastructure for food or wood product manufacturing (if that is technically and economically feasible). This approach could take advantage of the potential opportunities for value-add agriculture and the food and wood product manufacturing sectors which are near domestic and export markets.

The traditional large-scale petroleum and coal, textile, leather, clothing and footwear and non-metallic mineral product manufacturing sectors in the Greater Geelong LGA have declined in the past decade. This structural shift, in particular markets, presents opportunities for new technologies and industries (such as carbon fibre manufacturing for example) to develop and capture growth opportunities.

Weaknesses – Threats assessment

This part of the SWOT considers: How can a region's/sector's weaknesses be minimised to avoid the threats it/they are facing?

The resource and manufacturing sectors have experienced a gradual decline in the last ten years due to strong competition from lower cost domestic and international competitors.

In the presence of climate change, customers and the public will increasingly demand low-carbon and sustainably produced goods. Through the *Climate Change Act 2017*, the Victorian Government has set a long-term target of net zero emissions by 2050.

For industries to manage the risk that changing consumer preferences present as well as to respond to the Victorian Government's long-term target of net zero emissions by 2050, there is potential for investment in more efficient plant and equipment and to utilise renewable energy sources to bolster the sustainability credentials and manage operating expenditure price risks.

3.2 Needs analysis of the region and revealed industries

This section identifies the needs for industry sectors and at Level 2 ANZSIC for Barwon and within the Greater Geelong, Queenscliffe, Surf Coast and Colac-Otway LGAs. These needs have been developed based on the SWOT analytical processes outlined in the assessment framework report.

3.2.1 What is important to the region?

Agriculture

Agriculture, forestry and fishing, the supporting services and manufacturing sectors which value-add primary goods such as grain, milk, beef, lamb and horticulture goods are the main source of economic activity for the Barwon region. Improvements in supply chain efficiencies and the enabling technologies that improve productivity and reduce cost is essential to sustained economic growth.

The following sectors and LGAs have comparative advantages and have experienced sectoral growth in the past decade:
— agriculture (Surf Coast LGA, Colac-Otway LGA)
— agriculture forestry and fishing support services (Greater Geelong LGA, Surf Coast LGA and Colac-Otway LGA).

During the same period other primary and manufacturing industries with comparative advantages have contracted in value:
— petroleum and coal product manufacturing, non-metallic mineral product manufacturing (Greater Geelong LGA)
— non-metallic mineral mining and quarrying (Colac-Otway LGA).

What needs could be addressed by Government?

The availability and reliability of infrastructure such as potable water supply, access to recycled water, electricity, transport and telecommunications (digital connectivity) will support agriculture, forestry and fisheries sector growth including niche marketing opportunities. For example, improved digital connectivity (broadband) enables adoption of precision agriculture technologies which can increase farm business productivity and profitability.

Manufacturing

Manufacturing has historically been and continues to be an important industry for the region. Wood product, food product, textile, leather, clothing and footwear manufacturing and food and beverage

manufacturing have comparative advantages and have experienced growth across the Surf Coast LGA and Colac-Otway LGAs in the past decade.

What needs could be addressed by Government?

All manufacturing sectors demand primary products (meat, grain, dairy, wood, fish) which are generally sourced locally. These sectors also rely on significant sources of energy and water inputs and waste disposal services. Infrastructure that improves logistics or supply chain function, supply of energy and water services and waste infrastructure are important for reducing the cost of production, enabling market competitiveness and are essential for attracting investment in greenfield developments. Similarly, transport and logistic routes including road, rail, ports and airports need to be optimised to ensure good connectivity within the region for the movement of people and goods.

Transport

Agriculture, forestry and fishing, manufacturing and tourism sectors are heavily reliant on efficient transport support services, road, water, air and space and other services sectors. The provision of transport and logistics infrastructure and services enable these industries to be cost competitive and accessible.

The transport and supporting sectors have comparative advantages and have experienced growth across the Queenscliffe LGA and Colac-Otway LGA. These sectors support the comparative advantage of agriculture and manufacturing sectors which are reliant on transport and services for inter-region and market connectivity.

What needs could be addressed by Government?

To enhance the transport support services, road, water, air and space and other services sectors the government can continue to maintain and upgrade freight and passenger rail networks, road and water transport infrastructure that connects production with markets and the workforce with businesses. This would enable the sectors to capture the growth opportunities related to agricultural production, processing, manufacturing and tourism sectors.

Finance and Insurance Services

While the RCA for this sector is limited to Greater Geelong only, it is worth noting that Greater Geelong is becoming a social insurance hub. The city is home to the headquarters of the Transport Accident Commission, National Disability Insurance Agency and Worksafe

What needs could be addressed by Government?

Digital connectivity is important for this sector. Fast and reliable internet will allow firms to efficiently and effectively connect and do business with clients and customers within and outside the region.

This sector could also be served well by strong inter-regional and intra-regional transport connectivity (both by private and public transport).

Tourism

Tourism is an important industry to the Barwon region, particularly in the coastal LGAs of Queenscliffe, Surf Coast and Colac-Otway. Tourism provides employment in accommodation and generates demand for retail trade, beverage and food services. The accommodation sector has a comparative advantage in the Colac-Otway LGA and Surf Coast and has experienced growth in the last decade.

What needs could be addressed by Government?

To facilitate the expansion of the tourism sector in the Barwon reliable water, sewerage, roads and public transport is important. For example, the urban water supply in small towns in the Colac-Otway LGA (Apollo bay) and Surf Coast LGA (Lorne) are under pressure during tourist seasons. Upgrading utility services such as these will enable sustainable development of towns which supports economic development of the visitor economy.

The upgrade of major transport corridors will also reduce the travel times between the region's coastal townships and metropolitan Melbourne during peak visitation periods. Greater accessibility to coastal areas will increase the desirability of them as a tourist destination.

Climate change impacts and coastal erosion points to the need for investment towards safety improvements/coastal protection infrastructure along the Great Ocean Road.

Tourism will benefit greatly from region-wide reliable internet access, particularly in key tourist sites.

3.2.2 What are the infrastructure investment opportunities and constraints facing the region?

Table 3.2 summarises the opportunities and constraints government could consider in addressing the infrastructure needs of the revealed industries of Barwon which have a RCA and are deemed to be important to the region.

TABLE 3.2   WHAT ARE THE INFRASTRUCTURE INVESTMENT OPPORTUNITIES AND CONSTRAINTS FOR BARWON?

Industry	Revealed sectors	Relevant LGAs	Identified needs	Opportunities to address needs	Constraints to economic development facing the industry
Agriculture, Forestry and Fisheries	Agriculture (lambs and wool, beef, dairy, poultry and grains)	Surf Coast Colac-Otway	Access to reliable internet on-farm enables adoption of precision agriculture technology which increases productivity	Provide better telecommunications infrastructure that is accessible at cost competitive rates	Inadequate internet connectivity on-farm reduces the potential to adopt technologies which can improve productivity and profitability
	Agriculture (lambs and wool, beef, dairy, poultry and grains)	Surf Coast Colac-Otway	The availability and reliability of infrastructure such as road, rail, air and water freight infrastructure will support the growth in capacity for sustainable agricultural industry growth and niche agricultural opportunities	Improve freight network infrastructure by upgrading priority road, rail, air and water freight infrastructure	Future increases in population economic activity from primary, secondary and services sectors can improve agriculture's supply chain efficiency The availability of road freight and supporting infrastructure is essential to realising growth opportunities
Manufacturing	Wood product, food product, textiles leather, clothing and footwear, food and beverage	Geelong Surf Coast Colac Otway	Infrastructure that improves logistics or supply chain function, supply of energy and water services and waste infrastructure are important for reducing the cost of production, enabling market competitiveness and are essential for attracting investment in greenfield developments	Improve and support the supply chain and logistics infrastructure that connects manufacturing businesses with primary goods and markets – including international markets through Geelong Port and Avalon Airport	Local manufacturing industries will become uncompetitive unless the supply chain and logistics connections between manufacturing industries, primary producers and their markets is optimised
Transport	Transport support services, road, water, air and space	Geelong Queenscliffe Colac-Otway	Maintain and upgrade freight and passenger rail networks, road and water transport infrastructure that connects production with markets and the workforce with businesses	Improve and support the supply chain and logistics infrastructure that connects agricultural production, processing and manufacturing and tourism sectors	Further development of the transport industry and complementary sectors is dependent on reliable and safe road, rail, air and water infrastructure that enables supply chain efficiency

Industry	Revealed sectors	Relevant LGAs	Identified needs	Opportunities to address needs	Constraints to economic development facing the industry
Finance and Insurance Services	Social Insurance (TAC, NDIA, Worksafe)	Geelong	Digital connectivity – to fast and reliable internet to enable firms' access to customers and markets outside the region	Investment in digital connectivity infrastructure	Lack of fast and reliable internet services will constrain growth opportunities for the sector
Tourism	Accommodation	Surf Coast Colac Otway Geelong	The urban water supply in small towns in the Colac-Otway LGA (Apollo bay) and Surf Coast LGA (Lorne) may need upgrading in the future to meet the increased visitor population during holiday seasons	Upgrade the urban water supply in Apollo Bay and Lorne	Without access to reliable water utilities in tourist destinations the development of the sector will be constrained
			Improve key transport corridors to reduce travel times between metropolitan Melbourne and coastal regions	Improve transport corridors to reduce travel times between metro areas and coastal townships	Bottlenecks in the transport corridors between Melbourne and tourist locations to encourage additional visitors/tourists by reducing travel times between Melbourne and coastal townships
			Enhance coastal protection infrastructure to help coastal communities and tourism assets mitigate impact of changing coastal conditions	Improve and upgrade coastal protection infrastructure to fortify coastal communities and help protect iconic assets	Without coastal protection infrastructure the increasing severity of storm events areas along the coast may be inundated. Increased coastal erosion will impact on accessing coastal tourism locations and tourism assets i.e. Great Ocean Road
			Improve internet and mobile phone access and reliability	Identify priority areas that require mobile phone tower access	

SOURCE: ACIL ALLEN

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