ACIL ALLEN CONSULTING

REPORT TO
INFRASTRUCTURE VICTORIA
22 JULY 2019

MALLEE REGION

INDUSTRY PROFILE
FINAL

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EXECUTIVE SUMMARY

Overview of the region

The Mallee region is situated in the northwest corner of Victoria bounded by the Murray River and New South Wales in the north, the regions of Loddon Campaspe and Wimmera Southern Mallee in the south and South Australia to the west.

Mallee benefits from its close proximity to the River Murray. Water is used for irrigation in agricultural production of fruit, citrus and grapes, provides drinking water for townships and in the tourism and recreation industries. Sharing borders with South Australia and New South Wales, Mallee region contains key transport infrastructure, with the main freight route between Adelaide and Sydney passing through the city of Mildura.

Major roads and rail lines link Mallee with the rest of Victoria and adjoining states of New South Wales and South Australia. Road transport is particularly important with six major highways/freeways crossing the region. There is a major regional airport based at Mildura (recently upgraded) and several smaller regional airports based at Robinvale and Swan Hill.

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 Mallee 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

Table ES1 summarises the highest revealed comparative advantage industries (Level 2 ANZSIC[1]) for the local government areas (LGAs) within Mallee, using the Victorian CAI comparison. The economic performance of Mallee is highly dependent on its agricultural industries. Mallee produces a diverse

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[1] Australia and New Zealand Standard Industrial Classification.

mix of commodity, high value and niche products for domestic and export markets. Along the Murray River, fruit and nut orchards, including almonds, walnuts, plums, apples, olives, citrus and table grapes, are significant. Dryland wheat, barley, canola and pulses are produced in large scale throughout the Mallee. Dairy milk production is significant in the Gannawarra LGA. Lamb, wool and beef are the major livestock industries. This diverse mix drives strong comparative advantages in the rural LGAs of the region based on agricultural industries including: Buloke (15.4 Victorian CAI, 2 per cent growth and 48 per cent GVA), Gannawarra (11.9 Victorian CAI, 12 per cent growth and 37 per cent GVA), Swan Hill (9.6 Victorian CAI, 18 per cent growth and 30 per cent) and Mildura (5.4 Victorian CAI, 27 per cent growth and 17 per cent GVA). The past decade has been challenging for Agriculture, with extensive periods of drought and unfavourable conditions severely impacting the region's grain production. However, unlike the Wimmera Southern Mallee region, Mallee's access to irrigation water allows it to produce almonds, table grapes, fruit and dairy and buffers it from downturns in the dryland industries (which often occur due to climatic conditions). Equally important has been the relatively high livestock and wool prices in recent years. The diversification into livestock and crops is important for the longer-term economic development of the region. However, all agricultural industries will be exposed to the potential impacts of climate change.

Agriculture, Forestry and Fisheries Support Services also demonstrate strong comparative advantage and growth across all LGAs. Although typically representing 1-2 per cent gross value add, this industry complements the region's primary production industry and will continue to become more important into the future as farm businesses apply more inputs and modern technologies. This industry may also capture the decline in workers employed in Agriculture, as the number of farms consolidate and farm businesses source more labour and contract services, which is particularly relevant for typically large-scale businesses in the region.

Although Mallee produces a diverse mix of high value and niche agricultural commodities, the processing and manufacturing industries have performed poorly in the last decade. In Mildura, Beverage and Tobacco Product Manufacturing (5.7 Victorian CAI, minus 77 per cent growth and 2 per cent GVA) and Food Product Manufacturing (1.2 Victorian CAI, minus 21 per cent growth and 2.7 per cent GVA) have all declined in value-added in the past decade, with the exception of Food Product Manufacturing (1.9 Victorian CAI, 21 per cent growth and 4.2 per cent GVA) in Swan Hill which is a larger industry and experienced reasonable growth. These results can be attributed to the challenging operating conditions for manufacturers in Australia. Competition with lower cost producers and exposure to international commodity markets for some products may be driving the decline. This highlights the importance of making improvements in supply chains, adoption of modern technologies and accessing highly skilled workers. Not all of these improvements relate to infrastructure, but go to the heart of broader industry support and growth initiatives.

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

Industry (Level 2 ANZSIC)	LGA	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
9. Non-Metallic Mineral Mining and Quarrying (appears: 2 times)	Gannawarra (S)	17.3	4.2	-63%	1%	Top left
1. Agriculture (appears: 4 times)	Buloke (S)	15.4	19.4	2%	48%	Top right
1. Agriculture (appears: 4 times)	Gannawarra (S)	11.9	15.2	12%	37%	Top right
1. Agriculture (appears: 4 times)	Swan Hill (RC)	9.6	12.3	18%	30%	Top right
2. Aquaculture	Swan Hill (RC)	8.7	3.2	1116%	0%	Top right
5. Agriculture, Forestry and Fishing Support Services (appears: 4 times)	Swan Hill (RC)	6.0	5.4	38%	1%	Top right
5. Agriculture, Forestry and Fishing Support Services (appears: 4 times)	Gannawarra (S)	5.8	5.2	-5%	1%	Top left
38. Commission-Based Wholesaling	Buloke (S)	5.7	3.2	-67%	1%	Top left
12. Beverage and Tobacco Product Manufacturing	Mildura (RC)	5.7	4.6	-77%	2%	Top left

Industry (Level 2 ANZSIC)	LGA	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
1. Agriculture (appears: 4 times)	Mildura (RC)	5.4	7.0	27%	17%	Top right
4. Fishing, Hunting and Trapping (appears: 2 times)	Buloke (S)**	5.2	2.3	165%	0%	Top right
9. Non-Metallic Mineral Mining and Quarrying (appears: 2 times)*	Buloke (S)	4.2	1.0	-88%	0%	Top left
5. Agriculture, Forestry and Fishing Support Services (appears: 4 times)	Mildura (RC)	4.0	3.7	19%	1%	Top right
17. Petroleum and Coal Product Manufacturing	Mildura (RC)	3.6	3.3	901%	1%	Top right
14. Wood Product Manufacturing	Gannawarra (S)	3.4	3.7	112%	1%	Top right
40. Fuel Retailing	Buloke (S)	3.3	3.0	34%	1%	Top right
4. Fishing, Hunting and Trapping (appears: 2 times)	Swan Hill (RC)	3.0	1.3	97%	0%	Top right
5. Agriculture, Forestry and Fishing Support Services (appears: 4 times)	Buloke (S)	2.9	2.6	-27%	1%	Top left
16. Printing (including the Reproduction of Recorded Media)	Mildura (RC)	2.8	2.7	452%	1%	Top right
82. Adult, Community and Other Education	Buloke (S)	2.6	3.1	340%	1%	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 Mallee, 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.

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 Mallee's case, opportunities have been identified in tourism, food product manufacturing, renewable energy and sand and stone mining.

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 Mallee. 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 Food and Beverage 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 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.
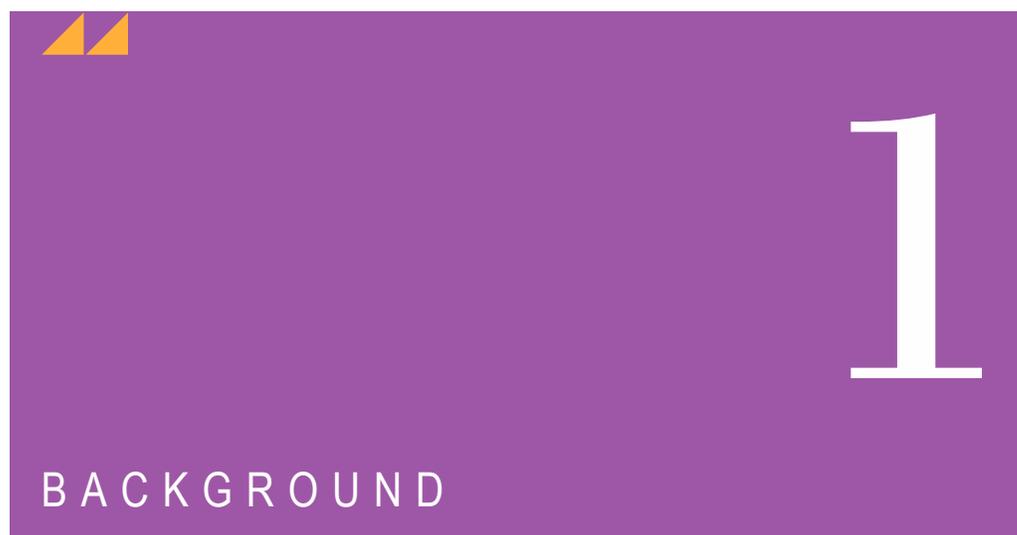
The SWOT analysis is then used to identify actionable or practical issues which are compared against the documented infrastructure needs of the region/industries. This comparison is then used to identify potential opportunities and constraints facing industries which could be addressed through future infrastructure investments, as shown in Table ES2 below.

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

Industry	Revealed sectors	Relevant LGAs	Identified needs	Opportunities to address needs	Constraints to economic development of the industry
Agriculture, Forestry and Fisheries	Agriculture (grain, fruit and nuts)	Buloke Gannawarra Mildura Swan Hill	Upgrades to road freight networks to accommodate increased number of road trains in response to expanding grain, fruit and nut processing industry	Develop road freight networks that link fruit and nut processing industry with producers and markets	Inadequate road infrastructure constrains producers and processors from operating efficiently and minimising transport costs
	Agriculture (grain, fruit and nuts)	Buloke Gannawarra Mildura Swan Hill	Improved access to telecommunication and NBN infrastructure in regional areas, mainly for access by farm businesses and processing facilities	Develop telecommunication and NBN infrastructure in priority blackspot areas, where a potentially high concentration of IoT or other devices could be enabled	Inadequate mobile phone and broad internet connection for farm businesses inhibits their ability to adopt transformational technologies or communicate with people and markets
Manufacturing	Food Product and Beverage and Tobacco Product Manufacturing (Identified as emerging industry, based on the future opportunities identified in the SWOT however, it does not have an RCA as such)	Buloke Gannawarra Mildura Swan Hill	Supply chain linkages including road and rail transport infrastructure	Develop the transport infrastructure that links food and beverage processors with producers and consumers	Inadequate road freight connections between processors, producers and consumers to remain competitive with low cost producers locally and overseas
Energy and mining	Sand and stone mining (Identified as emerging industry, based on the future opportunities identified in the SWOT, however it does not have an RCA as such)		Building of accommodation for mobile or itinerant workforce which features cyclical housing demand due to nature of sand and stone mining Growth in mineral sands mining industries is generating increasing freight traffic throughout the region, with flow on implications for road and rail infrastructure	Enable development of workforce accommodation in proximity to sand and stone deposits to enable development of the industry	Mineral sand and stone deposits have significant economic potential and it is recognised that incompatible development and land uses such as residential and industrial developments in proximity to these resources can lead to constraints on extraction

Industry	Revealed sectors	Relevant LGAs	Identified needs	Opportunities to address needs	Constraints to economic development of the industry
	Renewable energy	Mildura	Address identified constraints within existing transmission infrastructure	Development of enabling infrastructure such as connecting roads and transmission network connections, is essential to the efficient, safe and cost-effective operation of renewable energy assets	Insufficient capacity within existing transmission infrastructure in Western Victoria limits the region's ability to cope with proposed generation

Social license concerns about solar developments taking away prime farming land |
| Tourism | Accommodation, Food and Beverage Services (Identified as emerging industry based on the future opportunities identified in the SWOT, however it does not have an RCA as such) | Gannawarra | Enabling infrastructure such as boat ramps, street scapes, walking and cycling tracks, caravan parks, roads and signage and built amenities.

Infrastructure investments are required to support development along the river system, including quality accommodation (high class tents and cabins)

Enabling infrastructure for the caravan and motor home industry, provision of amenities is important for increasing visitation | Develop nature based enabling infrastructure along Murray River to enable encourage increased visitation | Inadequate public amenities, access to accommodation and water infrastructure is constraining increased visitation at the Murray River |
| | Accommodation, Food and Beverage Services (Identified as emerging industry based on the future opportunities identified in the SWOT, however it does not have an RCA as such) | Buloke | Interpretive signage, walking tracks, a boardwalk, toilets and vehicle parking area, including coach turning circle | Develop nature based enabling infrastructure along Lake Tyrell to enable encourage increased visitation | Inadequate public amenities, signage and road infrastructure is constraining increased visitation at Lake Tyrell |

SOURCE: ACIL ALLEN

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BACKGROUND

1.1 Overview of the Mallee region

The Mallee region is situated in the northwest corner of Victoria bounded by the Murray River in the north, the regions of Loddon Campaspe and Wimmera Southern Mallee in the south and South Australia to the west. The Mallee region accounts for 18 per cent of Victoria's land area (covering an area of 39,934 km^2). As at 2018, the Mallee region had an estimated resident population (ERP) of 93,005 or 1.4 per cent of Victoria's population. The region's population and land size by local government area (LGA) are shown in **Figur**e 1.1 below:

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

Local Government Area and (sub-region)	ERP	Share of region ERP	Area (km^2)	Share of region area
Mildura Rural City (Regional Centres)	55,515	60%	22,083	55%
Swan Hill Rural City (Regional Centres)	20,759	22%	6,115	15%
Buloke Shire (Rural Cropping Areas)	6,184	7%	8,000	20%
Gannawarra Shire (South East Area)	10,547	11%	3,735	9%
Mallee region [1]	93,005	100%	39,934	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 Mallee have been aggregated from LGAs based on common economic, social and environmental characteristics. A list of sub-regions and map (see **Figur**e 1.1) are provided below:

— Regional centres (yellow)
— South east area (green)
— Rural cropping areas (orange)

FIGURE 1.1   SUB-REGION MAP, MALLEE REGION, 2019
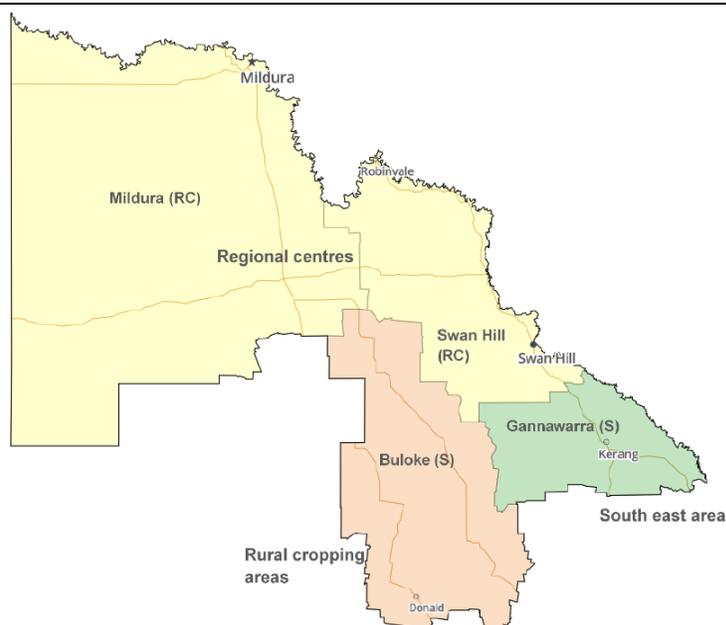
Note: LGAs are classified as follows: (C) Cities, (S) Shires, (RC) Rural Cities.
SOURCE: MALLEE REGIONAL PROFILE 2018.

The region benefits from its close proximity to the River Murray. Water is used for irrigation in agricultural production of fruit, citrus and grapes, providing drinking water for townships and in the tourism and recreation industries. Sharing borders with South Australia and New South Wales, Mallee contains key transport infrastructure, with the main freight route between Adelaide and Sydney passing through the city of Mildura.

Further details of the key natural and environmental attributes, infrastructure and sub-regions are provided in the following sections.

1.1.1   Key natural and environmental attributes

Key attributes of Mallee, in terms of natural resources and environmental features, are described below.

Natural resources include:
— sand and stone
— mineral sands
— clay and clayshale
— limestone, gravel and granite
— gypsum
— solar and geothermal energy.

Key environmental assets include:
— Murray River
— Hattah – Kulkyne National Park
— Gunbower National Park
— Wyperfield National Park
— fertile farmland.

1.1.2 Key infrastructure

Major roads and rail lines link Mallee with the rest of Victoria and adjoining states of New South Wales and South Australia. Road transport is particularly important with six major highways/freeways crossing the region. There is a major regional airport based at Mildura (recently upgraded) and several smaller regional airports based at Robinvale and Swan Hill. A summary of key transport, water and power infrastructure is provided in **Box** 1.1.

BOX 1.1   KEY INFRASTRUCTURE, MALLEE REGION, 2019

Roads
- Calder Freeway (561 kms): Melbourne – Mildura (services northwest Victoria).
- Sturt Highway (947 kms): Adelaide – Wagga Wagga (freight route between Adelaide and Sydney).
- Murray Valley Highway (663 kms): Robinvale – Wodonga-Towong (services northern Victoria).
- Sunraysia Highway (344 kms): Ouyen – Ballarat (services western Victoria).
- Henty Highway (360 kms): Portland – Lascelles (services western Victoria).
- Mallee Highway (377 kms): Tailem Bend – Balranald (services north western Victoria and South Australia).

Rail
- Direct freight rail routes from Mildura, Kulwin and Robinvale lines to Melbourne, Geelong and Portland.

Water
- Lake Hume water storage.
- Northern Mallee and Wimmera Mallee pipelines and private pipelines.

Power
- Majority of electricity for residential and commercial use is generated by coal-fired stations outside the Region.

Airports
- Mildura Airport: passengers, freight and emergency services (third busiest airport in Victoria).
- Robinvale and Swan Hill airports: small local airports

Seaports
- Landlocked region with no seaports.

SOURCE: MALLEE REGIONAL PROFILE 2018 AND LODDON MALLEE REGIONAL STRATEGIC PLAN 2015-2018.

Locations of major transport routes and airports for the region are shown in **Figur**e 1.2.

FIGURE 1.2   TRANSPORT INFRASTRUCTURE, MALLEE REGION, 2019
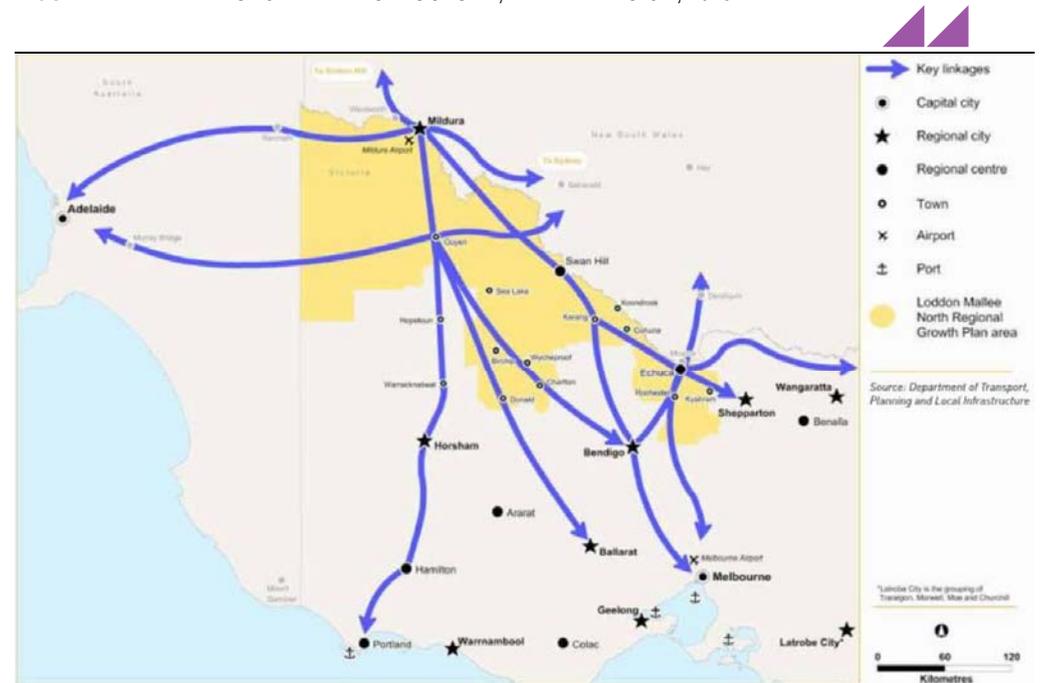
SOURCE: MALLEE REGIONAL PROFILE 2018.

1.1.3   Other regional attributes

Mallee has a natural endowment of land and environmental assets (i.e. the Murray River and fertile farmland which permits irrigated agriculture). Mallee's townships are a major service centre and source of employment. A summary of these other attributes is provided in Box 1.2.

BOX 1.2   OTHER REGIONAL ATTRIBUTES, MALLEE REGION, 2019

Agriculture
- Major producer of fruit citrus and grapes.
- Fruit drying and food processing of locally grown produce.
- Major employer and source of economic activity (accounts for one quarter of gross regional product).

Murray River
- Drinking water for townships (maintains existing settlements and supports future population growth).
- Irrigated water for agricultural production (supports economic growth, employment, exports).
- Recreation and tourism opportunities (attracts visitors, supports employment in hospitality related industries).

Townships
- Mildura and Swan Hill - regional hubs, major service and employment centres.

Geography
- Located on the freight route between New South Wales and South Australia.

SOURCE: MALLEE REGIONAL PROFILE 2018.

1.2 Sub-regions of Mallee region

There are differences across the Mallee region relating to key attributes and infrastructure. A large share of the population lives in several major regional centres while agricultural activity is spread across rural communities. These sub-regional differences are discussed for Mallee region's three sub-regions below.

Regional Centres (Mildura Rural City Council and Swan Hill Rural City Council)

Comprising the Mildura and Swan Hill Rural City Councils, the "Regional Centres" sub-region (highlighted in yellow in Figure 1.1) contains 82 per cent of Mallee region's ERP and 70 per cent of its area. Key facts about the Regional Centres sub-region include:

— contains major regional centres Mildura and Swan Hill
— largest industry is agriculture (by Gross Value Added)
— relocation of health care services from rural areas to regional centres of Mildura and Swan Hill
— higher household incomes compared with rural areas
— growth in the service sector
— higher crime levels relative to the Victorian average.

South East Area (Gannawarra Shire Council)

Comprising the Gannawarra Shire Council, the "South East Area" sub-region (highlighted in light green in Figure 1.1) contains 11 per cent of Mallee's ERP and 9 per cent of its area. Key facts about the South East Area sub-region include:

— contains the township of Kerang (3,633 persons | 2016)
— economy is dominated by the Murray River and irrigated agriculture
— high levels of disadvantage (11th most disadvantaged LGA in Victoria)
— high levels of school leavers in education and training (above Victorian average)
— high proportion of youth employed full-time
— low crime levels relative to other LGAs in the region

Rural Cropping Areas (Buloke Shire Council)

Comprising the Buloke Shire Council, the "Rural Cropping Areas" sub-region (highlighted in light orange in Figure 1.1) contains 7 per cent of Mallee's ERP and 20 per cent of its area respectively. Key facts about the Rural Cropping Areas sub-region include:

— contains the township of Donald (1,395 persons | 2016)
— economy is dominated by dryland agriculture
— high levels of disadvantage (10th most disadvantaged LGA in Victoria)
— high levels of school leavers in education and training (above Victorian average)
— ageing population
— significant decline forecast for the working age population over next 20 years
— high levels of well-being and volunteering
— low crime levels relative to regional and Victorian averages

1.3 Industry composition

The Gross Regional Product (GRP) of Mallee is approximately 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 Mallee region and its four LGAs. The biggest industries by GVA in the Mallee are: Agriculture, Forestry and Fishing (25.7 per cent), Health Care and Social Assistance (10.1 per cent), Construction

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

(8.0 per cent), Manufacturing (7.5 per cent), and Retail Trade (6.6 per cent). These five industries comprise over half of the Mallee regions GVA.

There is noticeable variation in the biggest industries across the LGAs in the region. Some noticeable differences include the large Agriculture, Forestry and Fishing industries in Buloke (49 per cent), Gannawarra (39 per cent) and Swan Hill (32 per cent) relative to Mallee as a whole.

FIGURE 1.3   GVA SHARE OF KEY INDUSTRIES IN MALLEE, 2017-18
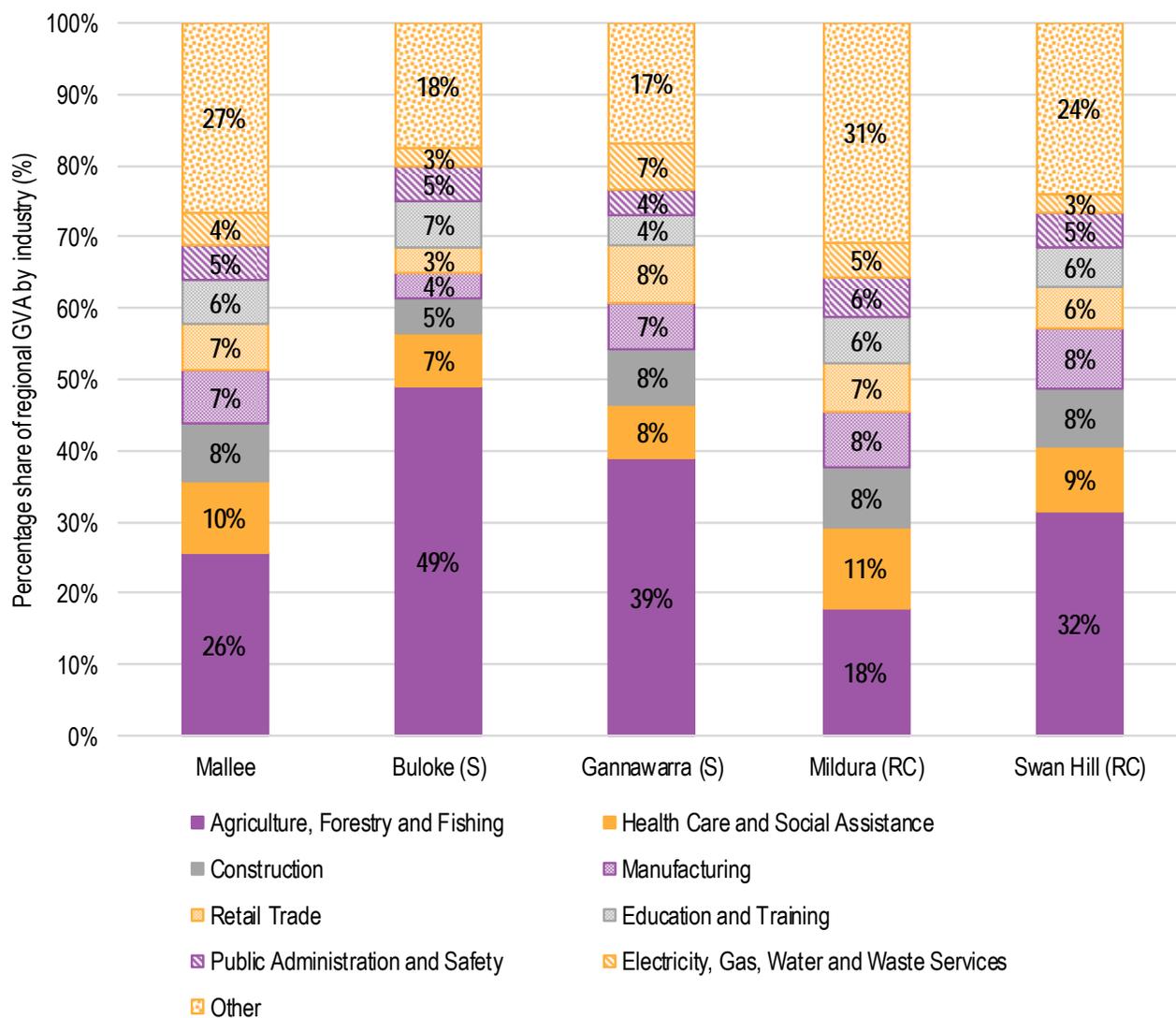
Note: Other includes industries with less than 5 per cent of Mallee GVA: Transport, Postal and Warehousing ;Financial and Insurance Services; Wholesale Trade; Professional, Scientific and Technical Services; Accommodation and Food Services; Administrative and Support Services; Other Services; Rental, Hiring and Real Estate Services; Information Media and Telecommunications; Arts and Recreation Services; and Mining.

Note: LGAs are classified as follows: (C) Cities, (S) Shires and (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 12.6 per cent to 7.5 per cent (a 41 per cent reduction), and Financial and Insurance Services, declining from 4.8 per cent to 4.1 per cent (a 14 per cent decline).

Since 2007-08, there has been an increase in the share of GVA from Health Care and Social Assistance, increasing from 7.6 per cent to 10.1 per cent (a 33 per cent increase). Similarly,

Electricity, Gas, Water and Waste Services' GVA share has increased from 3.4 per cent to 4.5 per cent (a 31 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 MALLEE REGION 1991-92 TO 2017-18

SOURCE: IV DATA 2019

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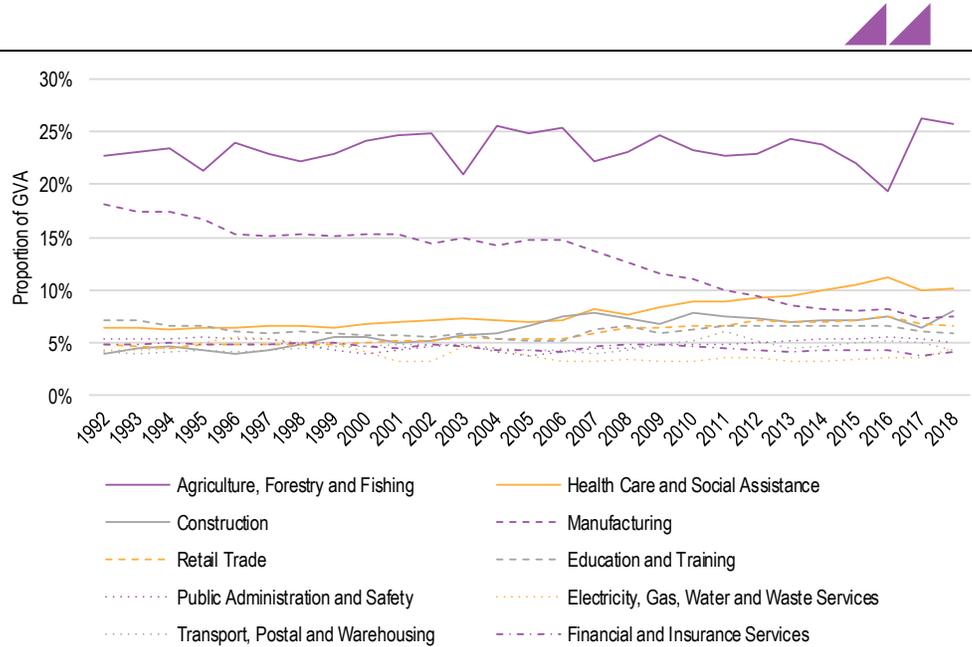
REVEALED COMPARATIVE ADVANTAGE

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 Mallee'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. The strength of an RCA approach is that it 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, for each region, 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 which 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 in indicator of strength and 'importance' to the future of the 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. While there may be policy or other reasons to support these industries, these reasons may not be overtly economic in nature.

2.2 Mallee (Level 1 ANZSIC analysis)

Figure 2.1 shows the CAI index and industry growth for Level 1 ANZSIC industries in Mallee. 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 Mallee which appear to have comparative advantage and potential growth characteristics include Agriculture, Forestry and Fishing; Electricity, Gas, Water and Waste Services; and Health Care and Social Assistance.

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 the Mallee region, this refers to the Education and Training 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 the Mallee region, these include the Transport, Postal and Warehousing; Professional, Scientific and Technical Services; and Arts and Recreation 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 is no comparative advantage or growth – namely, the Mining; Information Media and Telecommunications; and Financial and Insurance 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 – MALLEE 2017-18, LEVEL 1 ANZSIC
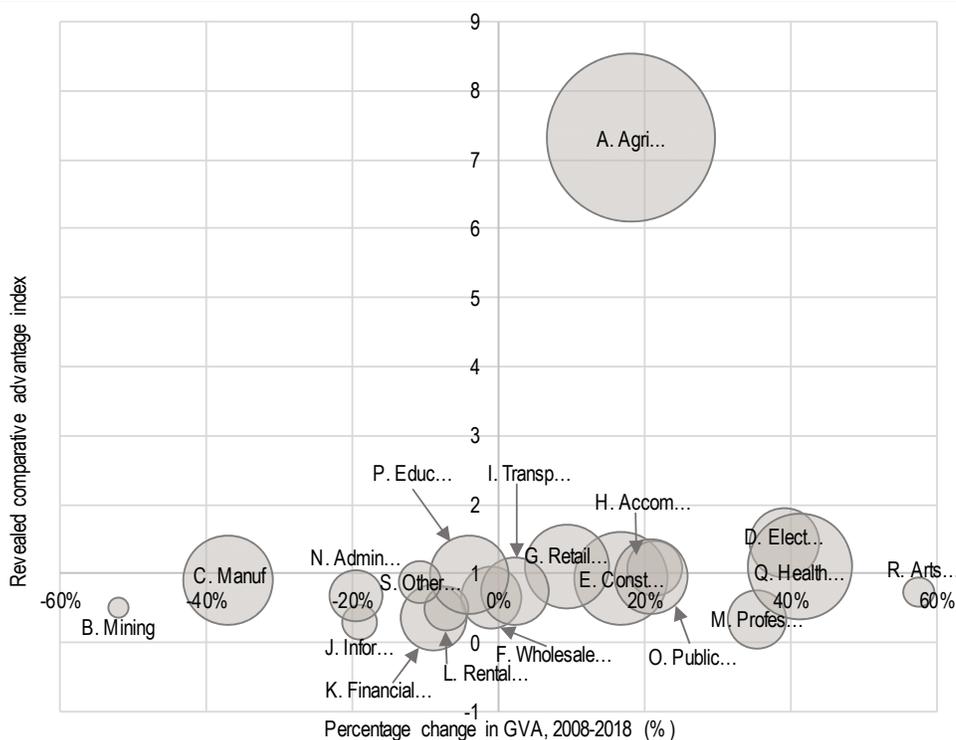
Note: This includes the revealed comparative advantage index of Mallee relative to the Victorian economy.
SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.1 summarises the highest RCA industries (Level 1 ANZSIC) for Mallee. The revealed industries in the table relate to those which have the highest CAI using the Victorian comparison, not the national comparison. The Victorian comparisons have been selected because they are consistent 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 MALLEE, 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	7.3	8.7	18%	25.7%	Top right
D. Electricity, Gas, Water and Waste Services	1.4	1.5	39%	4.5%	Top right

Industry (Level 1 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10-year growth	% of LGA GVA	Quadrant
Q. Health Care and Social Assistance	1.1	1.2	41%	10.1%	Top right
G. Retail Trade	1.1	1.3	9%	6.6%	Top right
H. Accommodation and Food Services	1.1	1.1	21%	2.9%	Top right
P. Education and Training	1.0	1.1	-4%	6.0%	Bottom left
O. Public Administration and Safety	1.0	0.8	21%	5.1%	Bottom right
E. Construction	0.9	0.9	17%	8.0%	Bottom right
C. Manufacturing	0.9	1.1	-37%	7.5%	Bottom left
S. Other Services	0.9	0.9	-11%	1.8%	Bottom left

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

2.3 Mallee LGA analysis (Level 2 ANZSIC analysis)

The following section incudes revealed comparative advantage analysis by Level 2 ANZSIC industries for Mallee's four LGAs: Buloke, Gannawarra, Mildura, and Swan Hill.

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 Buloke

Figure 2.2 shows RCA analysis by ANZSIC Level 2 industries for the Buloke LGA. Key industries of interest with a high CAI in the Buloke LGA include Agriculture; Commission-Based Wholesaling; Fishing, Hunting and Trapping; Non-Metallic Mineral Mining and Quarrying; and Fuel Retailing (see Figure 2.2).

FIGURE 2.2   COMPARATIVE ADVANTAGE INDEX FOR BULOKE, 2017-18, LEVEL 2 ANZSIC
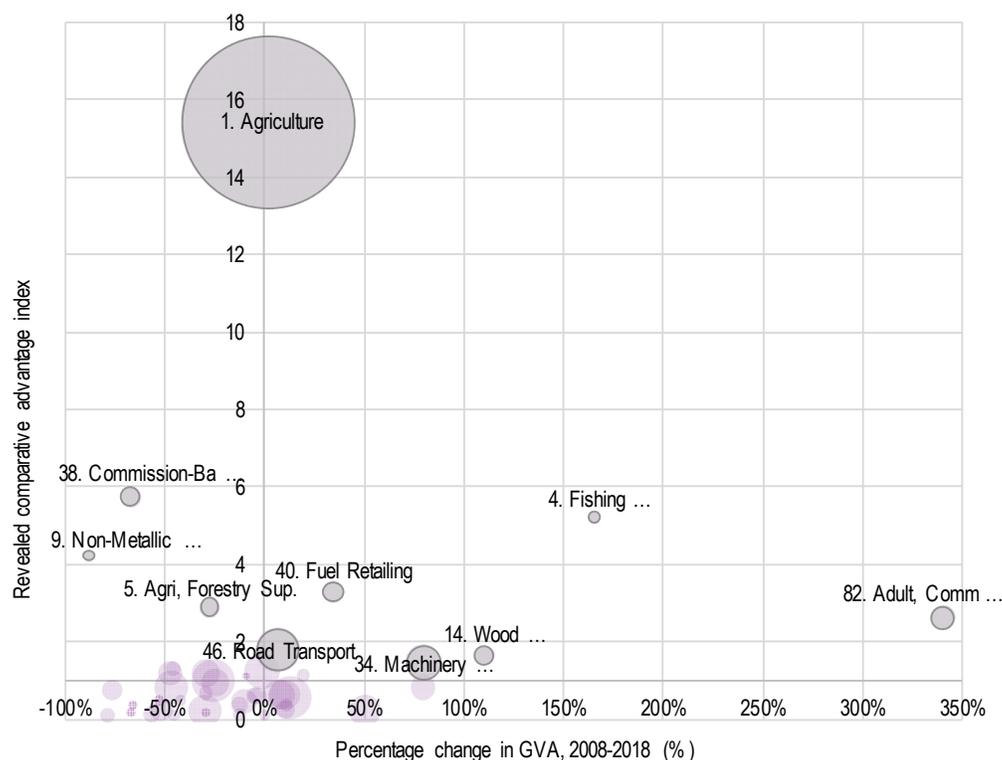
Note: This includes the revealed comparative advantage relative to the Victorian economy.   Chart excludes Adult, Community and Other Education.
SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.2 summarises the highest comparative advantage industries (Level 2 ANZSIC) for the Buloke LGA using the Victorian CAI comparison. Important industries include Agriculture and Road Transport which each have large CAI, have undergone growth over the past 10 years and constitute a relatively large proportion of the LGA's GVA. Also of interest are the industries with high CAI and growth but which are still small, such as: Fishing, Hunting and Trapping; Adult, Community and Other Education; and Wood Product Manufacturing.

Various other industries have high CAI, but have either had low growth or negative growth, such as: Commission-Based Wholesaling; Non-Metallic Mineral Mining and Quarrying; and Agriculture, Forestry and Fishing Support Services.

TABLE 2.2   TOP 10 REVEALED COMPARATIVE ADVANTAGE INDUSTRIES FOR BULOKE

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
1. Agriculture	15.4	19.4	2%	48.1%	Top right
38. Commission-Based Wholesaling	5.7	3.2	-67%	0.7%	Top left
4. Fishing, Hunting and Trapping	5.2	2.3	165%	0.3%	Top right
9. Non-Metallic Mineral Mining and Quarrying	4.2	1.0	-88%	0.2%	Top left
40. Fuel Retailing	3.3	3.0	34%	0.7%	Top right
5. Agriculture, Forestry and Fishing Support Services	2.9	2.6	-27%	0.6%	Top left

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
82. Adult, Community and Other Education	2.6	3.1	340%	1.0%	Top right
46. Road Transport	1.8	1.5	7%	3.1%	Top right
14. Wood Product Manufacturing	1.6	1.8	110%	0.6%	Top right
34. Machinery and Equipment Wholesaling	1.5	1.0	80%	2.0%	Top right

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.3 summarises the largest industries (Level 2 ANZSIC) for the Buloke LGA.

TABLE 2.3   TOP 10 LARGEST INDUSTRIES FOR BULOKE

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
1. Agriculture	15.4	19.4	2%	48.1%	Top right
46. Road Transport	1.8	1.5	7%	3.1%	Top right
84. Hospitals	1.0	3.3	-26%	3.1%	Bottom left
32. Construction Services	0.6	0.5	13%	3.0%	Bottom right
86. Residential Care Services	1.2	1.5	-1%	2.1%	Top left
34. Machinery and Equipment Wholesaling	1.5	1.0	80%	2.0%	Top right
11. Food Product Manufacturing	0.8	1.1	-47%	1.8%	Bottom left
62. Finance	0.2	-	-30%	1.8%	Bottom left
69. Professional, Scientific and Technical Services	0.2	0.2	51%	1.5%	Bottom right
85. Medical and Other Health Care Services	0.6	0.4	10%	1.5%	Bottom right

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

2.3.2   Gannawarra

Figure 2.3 shows RCA analysis by ANZSIC Level 2 industries for the Gannawarra LGA. Key industries of interest with a high CAI in the Gannawarra LGA include Non-Metallic Mineral Mining and Quarrying; Agriculture; Agriculture, Forestry and Fishing Support Services; and Wood Product Manufacturing (see Table 2.4).

FIGURE 2.3   COMPARATIVE ADVANTAGE INDEX FOR GANNAWARRA, 2017-18, LEVEL 2 ANZSIC
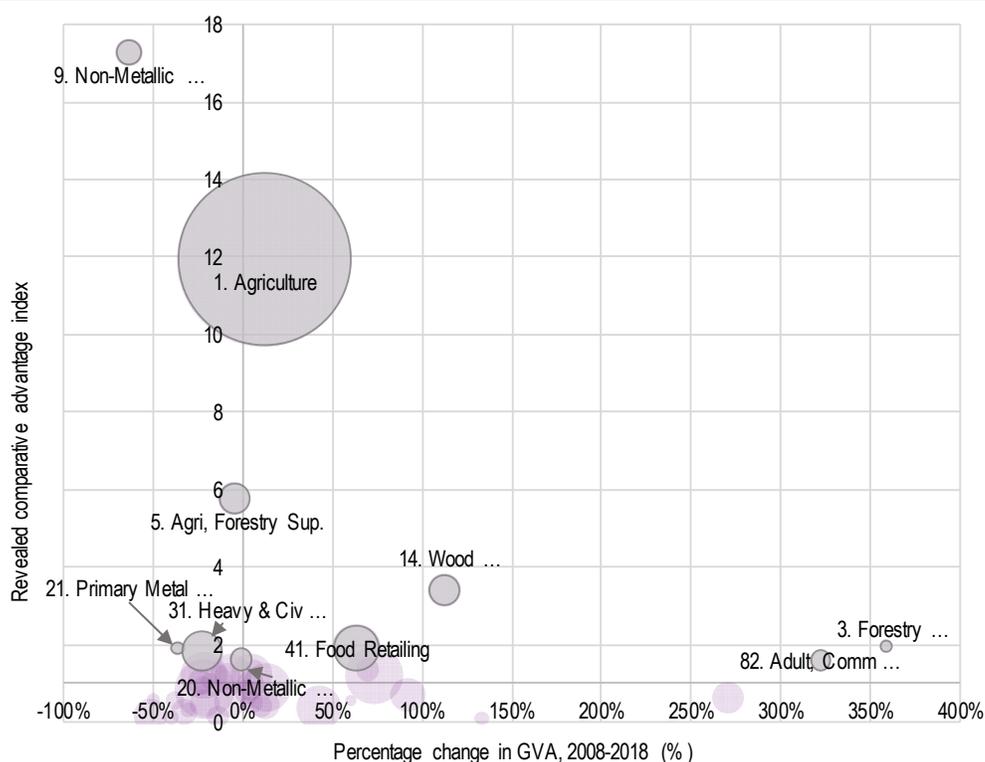
Note: This includes the revealed comparative advantage relative to the Victorian economy.
SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.4 summarises the highest comparative advantage industries (Level 2 ANZSIC) for the Gannawarra LGA, using the Victorian CAI comparison. Important industries include Agriculture; Wood Product Manufacturing; and Food Retailing which each have a large CAI, have undergone notable growth over the past 10 years and constitute a relatively large proportion of the LGAs GVA.

Forestry and Logging and Adult, Community and Other Education have high CAI and have seen large growth. However, these sectors represent a small proportion of Gannawarra's GVA.

TABLE 2.4   TOP 10 REVEALED COMPARATIVE ADVANTAGE INDUSTRIES FOR GANNAWARRA

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
9. Non-Metallic Mineral Mining and Quarrying	17.3	4.2	-63%	0.9%	Top left
1. Agriculture	11.9	15.2	12%	37.3%	Top right
5. Agriculture, Forestry and Fishing Support Services	5.8	5.2	-5%	1.3%	Top left
14. Wood Product Manufacturing	3.4	3.7	112%	1.3%	Top right
3. Forestry and Logging	2.0	1.1	358%	0.2%	Top right
21. Primary Metal and Metal Product Manufacturing	1.9	0.3	-36%	0.2%	Top left
41. Food Retailing	1.9	1.4	63%	2.7%	Top right
31. Heavy and Civil Engineering Construction	1.8	1.3	-22%	2.1%	Top left

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10 year growth	% of LGA GVA	Quadrant
20. Non-Metallic Mineral Product Manufacturing	1.6	1.2	-1%	0.7%	Top left
82. Adult, Community and Other Education	1.6	1.9	322%	0.6%	Top right

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

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

TABLE 2.5   TOP 10 LARGEST INDUSTRIES FOR GANNAWARRA

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10-year growth	% of LGA GVA	Quadrant
1. Agriculture	11.9	15.2	12%	37.3%	Top right
32. Construction Services	0.9	0.7	-21%	4.4%	Bottom left
42. Other Store-Based Retailing	1.2	1.3	73%	4.2%	Top right
84. Hospitals	0.9	3.0	13%	2.8%	Bottom right
41. Food Retailing	1.9	1.4	63%	2.7%	Top right
11. Food Product Manufacturing	1.2	1.6	-21%	2.7%	Top left
69. Professional, Scientific and Technical Services	0.4	0.3	43%	2.4%	Bottom right
86. Residential Care Services	1.2	1.5	5%	2.1%	Top right
46. Road Transport	1.2	1.0	-6%	2.1%	Top left
31. Heavy and Civil Engineering Construction	1.8	1.3	-22%	2.1%	Top left

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

2.3.3   Mildura

Figure 2.4 shows revealed comparative advantage analysis by Level 2 ANZSIC industries for the Mildura LGA. Key industries of interest with a high CAI in the Mildura LGA include Beverage and Tobacco Product Manufacturing; Agriculture; Agriculture, Forestry and Fishing Support Services; and Petroleum and Coal Product Manufacturing (See Table 2.6).

FIGURE 2.4   COMPARATIVE ADVANTAGE INDEX FOR MILDURA, 2017-18, LEVEL 2 ANZSIC
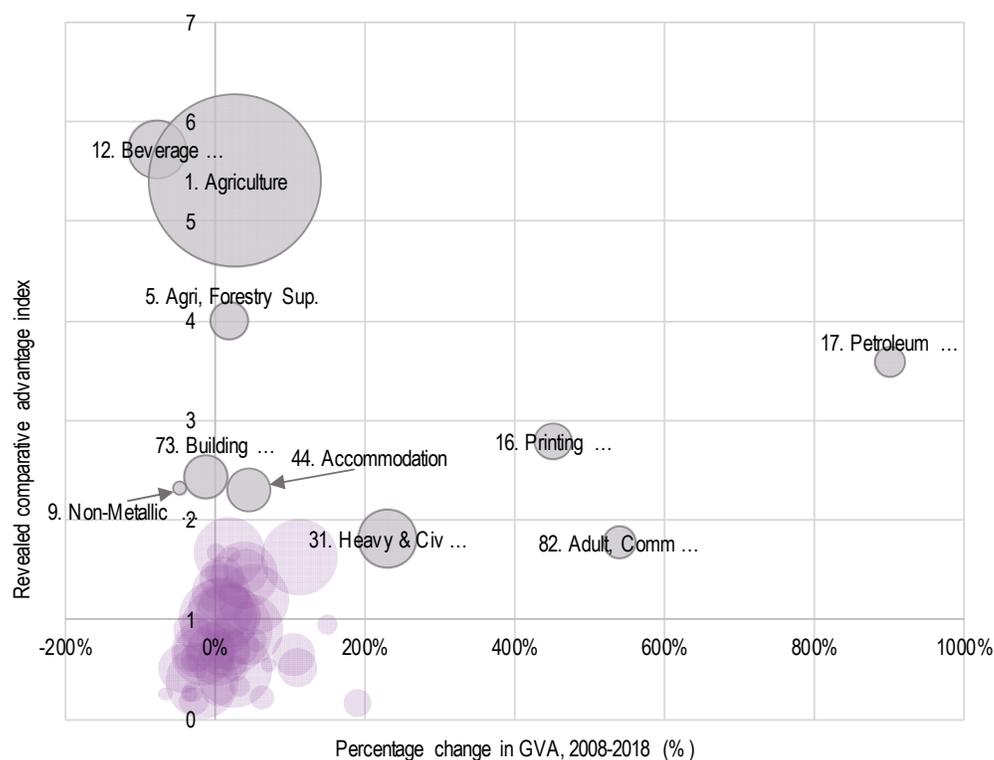
Note: This includes the revealed comparative advantage relative to the Victorian economy.
SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.6 summarises the highest comparative advantage industries (Level 2 ANZSIC) for Mildura LGA, using the Victorian CAI comparison. Important industries include Agriculture, Accommodation and Heavy and Civil Engineering Construction which each have a large CAI, have undergone notable growth over the past 10 years and constitute a relatively large proportion of Mildura's GVA.

While the Agriculture, Forestry and Fishing Support Services; Petroleum and Coal Product Manufacturing; Printing (including the Reproduction of Recorded Media) and Adult, Community and Other Education have high CAI and have seen growth over the past decade, these sectors represent a small proportion of Mildura's GVA.

TABLE 2.6   TOP 10 REVEALED COMPARATIVE ADVANTAGE INDUSTRIES FOR MILDURA

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10-year growth	% of LGA GVA	Quadrant
12. Beverage and Tobacco Product Manufacturing	5.7	4.6	-77%	2.0%	Top left
1. Agriculture	5.4	7.0	27%	16.9%	Top right
5. Agriculture, Forestry and Fishing Support Services	4.0	3.7	19%	0.9%	Top right
17. Petroleum and Coal Product Manufacturing	3.6	3.3	901%	0.5%	Top right
16. Printing (including the Reproduction of Recorded Media)	2.8	2.7	452%	0.8%	Top right
73. Building Cleaning, Pest Control and Other Support Services	2.4	1.6	-12%	1.2%	Top left

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10-year growth	% of LGA GVA	Quadrant
9. Non-Metallic Mineral Mining and Quarrying	2.3	0.6	-46%	0.1%	Top left
44. Accommodation	2.3	1.6	45%	1.1%	Top right
31. Heavy and Civil Engineering Construction	1.8	1.3	231%	2.1%	Top right
82. Adult, Community and Other Education	1.8	2.2	540%	0.7%	Top right

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

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

TABLE 2.7   TOP 10 LARGEST INDUSTRIES FOR MILDURA

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10-year growth	% of LGA GVA	Quadrant
1. Agriculture	5.4	7.0	27%	16.9%	Top right
32. Construction Services	0.9	0.8	15%	4.6%	Bottom right
42. Other Store-Based Retailing	1.0	1.1	4%	3.6%	Top right
87. Social Assistance Services	1.6	2.4	112%	3.3%	Top right
69. Professional, Scientific and Technical Services	0.5	0.4	25%	3.3%	Bottom right
62. Finance	0.4	-	-16%	3.0%	Bottom left
46. Road Transport	1.7	1.4	19%	2.9%	Top right
85. Medical and Other Health Care Services	1.2	0.8	51%	2.8%	Top right
84. Hospitals	0.9	3.1	46%	2.8%	Bottom right
86. Residential Care Services	1.4	1.8	39%	2.5%	Top right

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

2.3.4   Swan Hill

Figure 2.5 shows RCA analysis by Level 2 ANZSIC industries for the Swan Hill LGA. Key industries of interest with a high CAI in the Swan Hill LGA include Agriculture; Aquaculture; Agriculture, Forestry and Fishing Support Services; Fishing, Hunting and Trapping; and Beverage and Tobacco Product Manufacturing (see Table 2.8).

FIGURE 2.5   COMPARATIVE ADVANTAGE INDEX FOR SWAN HILL, 2017-18, LEVEL 2 ANZSIC
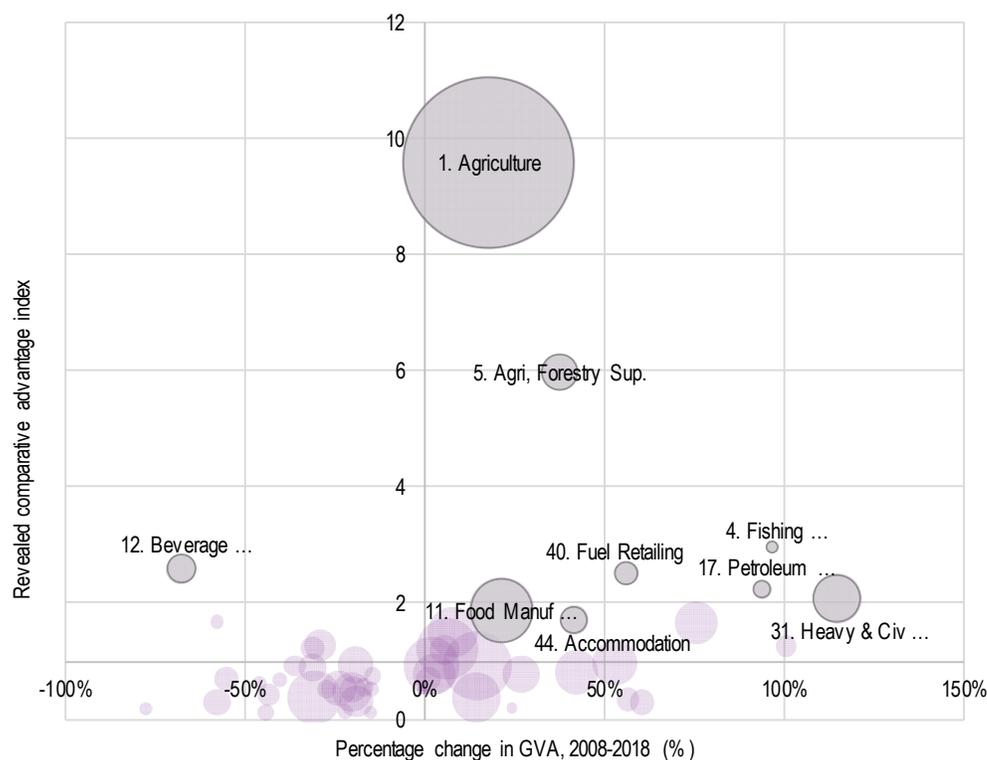
Note: This includes the revealed comparative advantage relative to the Victorian economy. The chart excludes Aquaculture to focus the chart on the key industries.

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.8 summarises the highest comparative advantage industries (Level 2 ANZSIC) for the Swan Hill LGA, using the Victorian CAI comparison. Important industries include Agriculture; Agriculture, Forestry and Fishing Support Services; Heavy and Civil Engineering Construction; and Food Product Manufacturing which each have a large CAI, have undergone notable growth over the past 10 years and constitute a relatively large proportion of the Swan Hill's GVA.

While the Aquaculture; Fishing, Hunting and Trapping; Fuel Retailing; and Petroleum and Coal Product Manufacturing each have high CAI and have seen large growth, these sectors represent a small proportion of Swan Hill's GVA.

TABLE 2.8   TOP 10 REVEALED COMPARATIVE ADVANTAGE INDUSTRIES FOR SWAN HILL

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10-year growth	% of LGA GVA	Quadrant
1. Agriculture	9.6	12.3	18%	29.9%	Top right
2. Aquaculture	8.7	3.2	1116%	0.1%	Top right
5. Agriculture, Forestry and Fishing Support Services	6.0	5.4	38%	1.3%	Top right
4. Fishing, Hunting and Trapping	3.0	1.3	97%	0.1%	Top right
12. Beverage and Tobacco Product Manufacturing	2.6	2.1	-68%	0.9%	Top left
40. Fuel Retailing	2.5	2.3	56%	0.6%	Top right
17. Petroleum and Coal Product Manufacturing	2.2	2.0	94%	0.3%	Top right

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10-year growth	% of LGA GVA	Quadrant
31. Heavy and Civil Engineering Construction	2.1	1.5	115%	2.4%	Top right
11. Food Product Manufacturing	1.9	2.5	21%	4.2%	Top right
44. Accommodation	1.7	1.2	42%	0.8%	Top right

SOURCE: ACIL ALLEN ESTIMATES BASED ON IV DATA

Table 2.9 summarises the largest industries (Level 2 ANZSIC) for the Swan Hill LGA.

TABLE 2.9   TOP 10 LARGEST INDUSTRIES FOR SWAN HILL

Industry (Level 2 ANZSIC)	CAI (Victorian comparison)	CAI (National comparison)	10-year growth	% of LGA GVA	Quadrant
1. Agriculture	9.6	12.3	18%	29.9%	Top right
32. Construction Services	0.9	0.8	15%	4.7%	Bottom right
11. Food Product Manufacturing	1.9	2.5	21%	4.2%	Top right
84. Hospitals	1.2	4.1	6%	3.7%	Top right
42. Other Store-Based Retailing	0.9	1.0	2%	3.2%	Bottom right
62. Finance	0.4	-	-31%	2.9%	Bottom left
46. Road Transport	1.5	1.3	8%	2.6%	Top right
69. Professional, Scientific and Technical Services	0.4	0.3	14%	2.4%	Bottom right
31. Heavy and Civil Engineering Construction	2.1	1.5	115%	2.4%	Top right
87. Social Assistance Services	1.0	1.4	53%	2.0%	Bottom 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 the LGAs within Mallee, using the Victorian CAI comparison. The economic performance of Mallee is highly dependent on the agricultural industries. Mallee produces a diverse mix of high value and niche products for domestic and export markets. Along the Murray River, fruit and nut orchards, including almonds, walnuts, plums, apples, olives, citrus and table grapes, are significant. Dryland wheat, barley, canola and pulses are produced in large scale throughout the Mallee. Dairy milk is significant in the Gannawarra LGA. Lamb, wool and beef are the major livestock industries. This diverse mix drives strong comparative advantages in the region's rural LGAs: Buloke (15.4 Victorian CAI, 2 per cent growth and 48 per cent GVA), Gannawarra (11.9 Victorian CAI, 12 per cent growth and 37 per cent GVA), Swan Hill (9.6 Victorian CAI, 18 per cent growth and 30 per cent) and Mildura (5.4 Victorian, CAI 27 per cent growth and 17 per cent GVA).

The past decade has been challenging for Agriculture, with extensive periods of drought and unfavourable conditions severely impacting the region's grain production. However, unlike the Wimmera Southern Mallee region, Mallee's access to irrigation water allows it to produce almonds, table grapes, fruit and dairy and buffers it from downturns in the dryland industries (which often occur due to climatic conditions). Equally important has been the relatively high livestock and wool prices in recent years. The diversification into livestock and crops is important for the longer-term economic development of the region. However, all agricultural industries will be exposed to the potential impacts of climate change.

Agriculture, Forestry and Fisheries Support Services also demonstrate strong comparative advantage and growth across all rural LGAs. Although typically representing 1-2 per cent GVA, this sector

complements the primary production industry and will continue to become more important into the future as farm businesses apply more inputs and modern technologies. This industry may also capture the decline in workers employed in Agriculture, as the number of farms consolidate and farm businesses source more labour and contract services, which is particularly relevant for typically large-scale businesses in the region.

Although the Mallee produces a diverse mix of high value and niche agricultural products, the processing and manufacturing industries have performed poorly in the last decade. In Mildura, Beverage and Tobacco Product Manufacturing (5.7 Victorian CAI, minus 77 per cent growth and 2 per cent GVA) and Food Product Manufacturing (1.2 Victorian CAI, minus 21 per cent growth and 2.7 per cent GVA) have all declined in value-added in the past decade, with the exception of Food Product Manufacturing (1.9 Victorian CAI, 21 per cent growth and 4.2 per cent GVA) in Swan Hill which is a larger industry and experienced reasonable growth. These results can be attributed to the challenging operating conditions for manufacturers in Australia. The competition with lower cost producers and exposure to commodity markets for some products may be driving the decline. This highlights the importance of making improvements in supply chains, adoption of modern technologies and accessing highly skilled workers.

TABLE 2.10   TOP 20 HIGHEST REVEALED COMPARATIVE ADVANTAGE INDUSTRIES BY LGA, MALLEE

Industry (Level 2 ANZSIC)	LGA	CAI (Victorian comparison)	CAI (National comparison)	10-year growth	% of LGA GVA	Quadrant
9. Non-Metallic Mineral Mining and Quarrying (appears: 2 times)*	Gannawarra (S)**	17.3	4.2	-63%	1%	Top left
1. Agriculture (appears: 4 times)	Buloke (S)	15.4	19.4	2%	48%	Top right
1. Agriculture (appears: 4 times)	Gannawarra (S)	11.9	15.2	12%	37%	Top right
1. Agriculture (appears: 4 times)	Swan Hill (RC)	9.6	12.3	18%	30%	Top right
2. Aquaculture	Swan Hill (RC)	8.7	3.2	1116%	0%	Top right
5. Agriculture, Forestry and Fishing Support Services (appears: 4 times)	Swan Hill (RC)	6.0	5.4	38%	1%	Top right
5. Agriculture, Forestry and Fishing Support Services (appears: 4 times)	Gannawarra (S)	5.8	5.2	-5%	1%	Top left
38. Commission-Based Wholesaling	Buloke (S)	5.7	3.2	-67%	1%	Top left
12. Beverage and Tobacco Product Manufacturing	Mildura (RC)	5.7	4.6	-77%	2%	Top left
1. Agriculture (appears: 4 times)	Mildura (RC)	5.4	7.0	27%	17%	Top right
4. Fishing, Hunting and Trapping (appears: 2 times)	Buloke (S)	5.2	2.3	165%	0%	Top right
9. Non-Metallic Mineral Mining and Quarrying (appears: 2 times)	Buloke (S)	4.2	1.0	-88%	0%	Top left
5. Agriculture, Forestry and Fishing Support Services (appears: 4 times)	Mildura (RC)	4.0	3.7	19%	1%	Top right
17. Petroleum and Coal Product Manufacturing	Mildura (RC)	3.6	3.3	901%	1%	Top right
14. Wood Product Manufacturing	Gannawarra (S)	3.4	3.7	112%	1%	Top right
40. Fuel Retailing	Buloke (S)	3.3	3.0	34%	1%	Top right
4. Fishing, Hunting and Trapping (appears: 2 times)	Swan Hill (RC)	3.0	1.3	97%	0%	Top right
5. Agriculture, Forestry and Fishing Support Services (appears: 4 times)	Buloke (S)	2.9	2.6	-27%	1%	Top left
16. Printing (including the Reproduction of Recorded Media)	Mildura (RC)	2.8	2.7	452%	1%	Top right
82. Adult, Community and Other Education	Buloke (S)	2.6	3.1	340%	1%	Top right

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

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*

2.4.1 Agricultural production by sector

Agriculture forms a large component of GVA for the majority of LGAs in Mallee. Figure 2.6 shows the estimated Agriculture sub-sector GVA for Mallee LGAs with a significant Agricultural industry.

Across the Mallee region, Agriculture is primarily made up of Sheep, Beef Cattle and Grain Farming; Fruit and Tree Nut Growing and Dairy Cattle Farming.

Buloke is primarily Sheep, Beef Cattle and Grain Farming (94 per cent of GVA). Gannawarra is split between Dairy Cattle Farming (51 per cent of GVA) and Sheep, Beef Cattle and Grain Farming (40 per cent of GVA). Both Mildura and Swan Hill have a large proportion of their Agriculture industry comprising of Fruit and Tree Nut Growing.

FIGURE 2.6   COMPOSITION OF LEVEL 2 ANZSIC INDUSTRY, AGRICULTURE, BY LGA
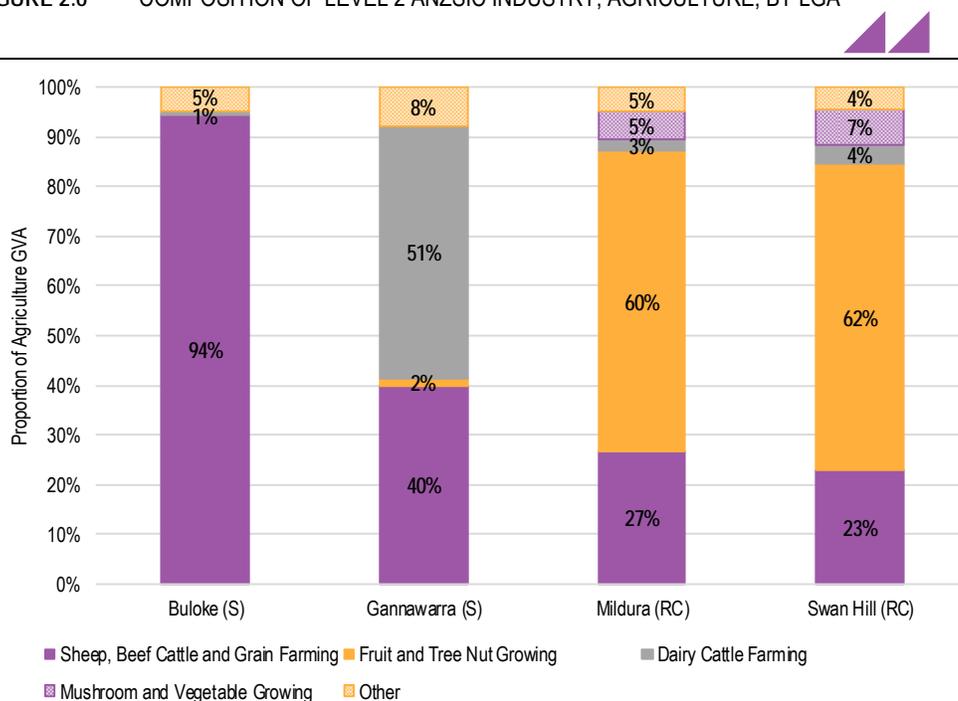
Note: Other includes: Nursery and Floriculture Production; Other Crop Growing; Poultry Farming; Deer Farming; and Other Livestock Farming. LGAs are classified as follows: (C) Cities, (S) Shires and (RC) Rural Cities.
SOURCE: ACIL ALLEN CONSULTING SHARES OF EMPLOYMENT BY INDUSTRY

ANALYSIS OF REVEALED INDUSTRIES

3

This section outlines the SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis and need assessment processes undertaken by ACIL Allen for Mallee. The analysis follows the process outlined in the assessment framework report which accompanies this profile. A SWOT examines the RCA industries identified in Chapter 2. 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. 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 Mallee's case, opportunities have been identified in agriculture, manufacturing, mining and energy 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 Mallee.

A further assessment of the priority industries considers service industries that may contribute to the performance of a primary or secondary industry.

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 potential 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 the revealed industries of Mallee 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 ANALYSIS FOR THE REVEALED INDUSTRIES OF MALLEE

Category	Strengths	Weaknesses	Opportunities	Threats
Cross sector	**Mildura** – Mildura Airport is important asset to the region – Construction of Doppler weather radar at Rainbow	– Lack of access to public transport (between 7-53 per cent) – Lack of dwelling access to internet (63-69 per cent) – Inadequate weather radar reduces farmers ability to make informed decisions, particularly for application of high value inputs (fertiliser and chemical) or harvesting crops – Mobile and digital connectivity is inadequate and constrains productivity and business competitiveness **Population** – Ageing population – loss of population and services in smaller rural centres – Increasing concentration of services in Mildura and Swan Hill – discontinuation of services in rural centres **Industry** – increased future demand for skilled jobs – shift from manufacturing to services (deindustrialisation) – High-school completion rates below state average **Mildura** – Lack of facilities and frequency of public transport services within Mildura limits extent of growth due to the city's distance from major metropolitan centres – Train rail gauge difference across state borders reduces supply chain efficiencies across borders	– Ensuring efficient infrastructure, particularly freight transport networks and logistics – Ouyen is an important transport hub for agricultural inputs, grain, mineral sands from local mines destined for processing in Hamilton. Maintenance and enhancement of transport and freight infrastructure will be important for future development of these industries – 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 – Improve digital connectivity through the Connecting Regional Communities Program and Mobile Blackspots Program **Mildura** – Expansion of Mildura Regional Airport will enhance growth of high value food and beverage product exports **Swan Hill** – Improve public transport services to meet market needs – Enhance walking and cycling links – Enhancing rail services, including passing loops and increase track axle loads to enhance increased freight volume to be transported	– Climate change presents numerous risks to the region, inc. increased incidence of bushfire, severity of storm events and floods and reduced water availability – Climate change risk: water infrastructure vulnerable to fire and flood – Commodity price declines

Agriculture, Forestry and Fisheries	– Large dryland agriculture acreage for grain production
	– Farming system diversity (grain, fruit, nuts, wine, livestock and dairy)
	– Access to local RD&E capacity and capability (e.g. Birchip Cropping Group)
	– Irrigated horticulture (fruit and nuts) along the Murray River
	– Tri-state (VIC, SA, NSW) access to markets
	– Strong farm services industry
	– Gourmet food and wine production, brands such as:
	  – Prime Mallee Lamb, Mallee Honey Mustard and Murray River Salt
	– High value crops such as nuts, oil seeds and wine
	– Murray Basin Rail upgrade (2018) improved access to deep seaports at Melbourne, Geelong and Portland
	– Water infrastructure
	  – Murray River
	  – Sunraysia Water Modernisation Project
	  – Wimmera Mallee Pipeline
		– Region dependent on primary production into export markets which is highly exposed to global economic forces, price fluctuations
		– Encroachment of agricultural activities onto wetlands and other important environmental features
		– Loss of vegetation and biodiversity
		– Rising salinity due to farming
		– Uncertainty of water security challenges for industrial and agricultural water needs under projected climate change scenarios
		– High dependency on continuous and secure water supply leaves the sector vulnerable during times of drought
		– High Transportation costs
		Dairy
		– Murray Goulburn dairy plant closure at Rochester reduces dairy producers' access to processing facilities
			– Opportunities to develop vertically integrated grain production businesses (production, packer, processor)
			– Olive oil production and refining is a growing market opportunity. Ideal climatic conditions and Australia's good reputation as olive oil producer
			– Opportunities to expand nut production and processing capacity, especially almond production
			  – Mallee has strong competitive advantage in growing almonds, increasing domestic and global demand for nuts
			  – Suitable irrigated land for large grows that can generate economies of scale
			  – Diverse secondary product processing opportunities, such as almond milk, almond butter and almond meal
			Buloke
			– Opportunities to expand intensive agriculture investment in poultry (chicken, ducks and eggs) and piggery expansions
			Mildura
			– Opportunity to enhance transport and logistics capability to enhance market access for high value horticulture goods into export markets (Asia). This may include development of
				– More heatwaves and extreme events (damage/costs to infrastructure)
				– Less rainfall (potential costs to farming and infrastructure)
				– Biosecurity risks associated with climate change: changed distribution of pests and diseases
				– Increased bushfire risk from climate change to impact farm businesses
				– Reduction in water security as a potential climate change impact
				– (constraint on economic growth, negative impact on living standards)
				– Climate change potential impact around increased incidence of algal blooms in waterways and irrigation channels
				– Increasing automation across the agricultural sector could lead to a loss of low skilled manual labour jobs

Category	Strengths	Weaknesses	Opportunities	Threats
	Gannawarra – Dairy is the largest sector (nearly 50 per cent agricultural production) – Horticulture (stone fruit, viticulture, walnuts, olives, apples, citrus, vegetables, tomatoes, corn and cotton – Cropping: wheat, barley and canola – Livestock: pigs, sheep and cattle – Several large piggeries south of Kerang – Export Hay		enabling infrastructure at Mildura Transport and Logistics Cluster. This is intended to improve competitiveness of the supply chain by reducing the time to access markets	in the region
Manufacturing	Food Product – Fruit, vegetables, meat and beverage processing mainly at Mildura and Swan Hill	– High input costs (e.g. electricity and gas)	– Support manufacturing sector through development of supply chain linkages and becoming a processing hub for neighbouring regions and across state borders – Opportunities to align new manufacturing businesses with alternative energy generation and secure water supply through modern water delivery infrastructure Gannawarra – Opportunity to develop milk processing facilities at Cohuna. The plant would process local dairy milk and include a drying plant for export and domestic production and a potential butter plant	– Cheaper imported products reduce demand for locally processed commodities
Mining and Energy	Renewable resources – Solar – Geothermal Mineral extraction – Sand and stone extraction Mildura – Kiamal Solar Farm (Ouyen, South of Mildura) 256 MW – Solar System's 1.5-megawatt power plant – the largest solar electricity plant using solar dishes in Australia – Planned $174 million biomass power plant at Carwarp – Balfour Beatty Investments Biomass Power Plant	– Cost effective connection to the National Electricity Market (NEM) for renewables	– Mining of mineral sands, gypsum, sand and stone and gold, and salt extraction are opportunities Renewable energy – 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 – AEMO's recommendation of a planned upgrade to transmission network in Victoria's west which will improve transmission network capacity to accommodate new renewable generation in Western Victoria – Renewable energy increasingly becoming cost competitive compared to traditional energy sources – Economic opportunities arising from the increasing viability of renewable and alternative energy including solar, geothermal and biofuels. – On-farm production of renewable energy generation such as bioenergy/biofuels using agricultural waste – Carbon market initiatives to use carbon off-sets alongside agricultural land	– Land use competition between agriculture and renewable energy sectors
Tourism	– Murray River and National Parks – Mildura	– Under-supply of accommodation, public amenity and water waterway infrastructure to enable development of the tourism sector	– Further tourism growth is dependent on investment in tourist attraction, strategically located accommodation and facilities	– Reduced water flow on the Murray River due to Climate Change and

Category	Strengths	Weaknesses	Opportunities	Threats

	– Port of Echuca
	– Swan Hill Pioneer Settlement
	– Activities: boating, camping, recreational fishing, bush walking
	– Events
	   – Mildura Jazz Food and Wine Festival
	   – Opera by the Lock
	   – Southern 80 Ski Race
	   – Riverboats Music Festival
	   – Echuca Steam Rally
	   – Murray Marathon
	
	Buloke
	– Lake Tyrrell (Vic largest salt lake)
	   – Significant demand from Chinese tourists due to photography opportunities
	– Sea Lake (town) significant accommodation and food and beverage service demand from tourists
	
	Mildura
	– Lake Mungo
	– Mildura Riverfront
	
	Gannawarra
	– The Murray River, Gunbower Forest and Kerang Lakes
	– Nature based experiences include fishing, camping, water sports, house cruise boats, paddle steamers
		along the Murray River
		Gannawarra
		– The local airports art currently underutilised and may be an area of opportunity to develop for tourism related activities. Facilitate a feasibility study that aims to utilise aviation facilities linked to a major tourism proposal at the Kerang lakes
			– Opportunities to develop agritourism opportunities in the region
			
			Buloke
			– Visitation to Lake Tyrrell can increase from 40 000 to 192 000 visitors (2025) per year with investment in local infrastructure
			   – Interpretive signage, walking tracks, a boardwalk, toilets and vehicle parking area, including coach turning circle.
			
			Gannawarra
			– Emerging opportunities exist in development of adventure tourism with mountain bike, canoeing and orienteering.
			– Local food culture is emerging with the Redgum Food Group, Koondrook and Barham Farmers Markets
			– Infrastructure investments are required to support development along the river system, including quality accommodation (high class tents and cabins)
			   – Enabling infrastructure such as boat ramps, street scapes, walking and cycling tracks, caravan parks, roads and signage and built amenities. E.g. Koondrook Wharf
			– Enabling infrastructure for the caravan and motor home industry, provision of amenities is important for increasing visitation
			– Opportunities to improve tourist experiences at the Kerang Lakes
				over allocation to Agriculture industries

Category	Strengths	Weaknesses	Opportunities	Threats

SOURCE: VARIOUS SOURCES

AITHER (2019) MALLEE REGIONAL PROFILE: AN ANALYSIS OF REGIONAL STRENGTHS AND CHALLENGES. ACCESSED 4 JUNE 2019 (HTTPS://WWW.INFRASTRUCTUREVICTORIA.COM.AU/WP-CONTENT/UPLOADS/2019/04/AITHER-MALLEE-REGIONAL-PROFILE-MARCH-2019.PDF)

VICTORIAN GOVERNMENT (2014) LODDON MALLEE NORTH REGIONAL GROWTH PLAN. ACCESSED 4 JUNE 2019 (HTTPS://WWW.PLANNING.VIC.GOV.AU/POLICY-AND-STRATEGY/REGIONAL-GROWTH-PLANS/LODDON-MALLEE-NORTH-REGIONAL-GROWTH-PLAN)

VICTORIAN GOVERNMENT (2018) THE MALLEE INVEST IN VICTORIAN AGRICULTURE AND FOOD. ACCESSED 3 JUNE 2019 (HTTPS://INVEST.AGRICULTURE.VIC.GOV.AU/#/REGION/MAL)

BULOKE SHIRE COUNCIL (2017) ECONOMIC DEVELOPMENT AND TOURISM STRATEGY 2018 – 2021

ABC (2019) VICTORIA'S BIGGEST SOLAR FARM UNDER CONSTRUCTION AMID DEBATE OVER LOST AGRICULTURAL LAND. ACCESSED 4 JUNE 2019 (HTTPS://WWW.ABC.NET.AU/NEWS/2018-10-26/VICTORIA-BIGGEST-SOLAR-FARM-UNDERWAY-AMID-AGRICULTURE-DEBATE/10428558)

REGIONAL DEVELOPMENT VICTORIA (2016) REGIONAL CITIES ECONOMIC PROFILE: MILDURA

GANNAWARRA SHIRE COUNCIL (2014) STRATEGIC TOURISM PLAN 2015-2020. ACCESSED 4 JUNE 2019 (HTTP://WWW.GANNAWARRA.VIC.GOV.AU/FILES/ASSETS/PUBLIC/DOCUMENT-RESOURCES/STRATEGIES-AND-PLANS/STRATEGIC-TOURISM-PLAN.PDF)

GANNAWARRA TIMES (2018) $130 MILLION DAIRY PROJECT MOOTED. ACCESSED 4 JUNE 2019 (HTTP://WWW.GANNAWARRATIMES.COM.AU/STORY/5250852/130-MILLION-DAIRY-PROJECT-MOOTED/)

VICTORIAN GOVERNMENT (2019) REGIONAL PARTNERSHIPS MALLEE: OUR ROADMAP.

RDV (2019) (HTTPS://WWW.RDV.VIC.GOV.AU/__DATA/ASSETS/PDF_FILE/0006/1733235/MALLEE-OUTCOMES-ROADMAP_MAY-19.PDF)

RDV (2019) (HTTPS://WWW.RDV.VIC.GOV.AU/__DATA/ASSETS/PDF_FILE/0005/1733252/CENTRAL-HIGHLANDS-OUTCOMES-ROADMAP_MAY-19.PDF) AND (HTTPS://WEB1.ECONOMICDEVELOPMENT.VIC.GOV.AU/ECODEV/CONNECTING-VICTORIA/CONNECTING-REGIONAL-COMMUNITIES-PROGRAM)

VICTORIAN GOVERNMENT, REGIONAL ADAPTATION SNAPSHOT – LODDON MALLEE: HTTPS://WWW.CLIMATECHANGE.VIC.GOV.AU/__DATA/ASSETS/PDF_FILE/0031/392926/D18-001.REGCCASNAPSHOTREPORTS_LODDONMALLEE_FALR.PDF

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

AEMO HTTPS://ENERGYLIVE.AEMO.COM.AU/NEWS/WESTERN-VICTORIA-TO-RECEIVE-CRITICAL-NETWORK-INVESTMENT

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.

3.1.1   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?

Agriculture (almonds, pistachios, table grapes and olives)

Mallee produces a diverse mix of high value crops including almonds, pistachios, table grapes and olives. These crops perform well in the Mallee's 'Mediterranean-like' climate with irrigation water sourced from the Murray River. Each of these products requires processing and transport through the supply chain to domestic and export markets. Some of the produce is processed locally, however, there are distinct opportunities to increase the value-add for this sector. For example, with the region's nut production growing due to international demand, almonds can be processed into milk, butter and meal products.

Similar opportunities exist in olive oil production and refining with growing market opportunities domestically and Australia's credentials as a quality olive oil producer. Both olive oil and nut products would require unskilled and skilled workers, efficient and reliable transport linkages from farms to refineries/crushers and onto Melbourne, Sydney and Adelaide markets. There is potential for more value-added products to be sent via the Mildura Regional Airport following the upgrade.

Agriculture (wheat, barley, canola and pulses)

Mallee is significant producer of dryland wheat, barley, canola and pulse crops. These crops are well suited to the soil, climate and winter dominant rainfall. Mallee farms are typically large scale, relatively inexpensive land and have efficient supply chain linkages via road and rail. The region is also supported by the world leading grains RD&E organisation Birchip Cropping Group. These features support the Mallee's strong comparative advantage in broadacre cropping. These industries are driven by incremental productivity gains, but opportunities exist to increase the value-add through vertically integrated business models. An example would be a business that produces, processes and markets grains which leverage the natural features of the region, the reputation of quality, safety and sustainability features.

Food product manufacturing (horticulture and dairy)

The Mallee's diverse horticulture industry demonstrates strong comparative advantages and, when supported by positive market conditions and irrigation allocations, can generate significant returns. Although the processing sector is highly competitive and has experienced challenging market conditions, the long-term sentiment remains positive for value-added goods sold into Asia in particular. Development of supply chain infrastructure that links neighbouring regions including Riverina New South Wales and Southern Mallee will improve the competitiveness of food and beverage processing in Mallee. The proposed dairy processing facility at Cohuna is an example of an investment that would develop a modern processing business, generate local employment and reduce the freight cost for local producers. It would be necessary to develop the necessary transport linkages, utilities connections and road infrastructure for the business to be accessible to producers and markets.

Mining and Energy

Through the *Climate Change Act 2017*, the Victorian Government has set a long-term target of net zero emissions by 2050. This is a key opportunity for the renewable energy sector across the state.[3]

The availability of renewable energy sources including wind, solar, geothermal and bioenergy in the Mallee region highlight the region's potential as a renewable energy hub. This potential is supported

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[3] https://www.climatechange.vic.gov.au/reducing-emissions/emissions-targets

by the development of the Kiamal Solar Farm (Mildura LGA). There are also opportunities for on-farm production of renewable energy generation such as bioenergy/biofuels using agricultural waste.

In terms of minerals resources, the region's endowment with mineral sands, gypsum, sand, stone, gold and salt extraction represent opportunities to further leverage into the future.

Tourism

The tourism industry is a significant driver of economic activity for the region. Nature based tourism experiences are centred on the Murray River and Lake Tyrrell in particular. These sites are valued for their cultural and recreational qualities. Lake Tyrrell is an example of the Mallee's potential to attract overseas tourists. The influx of Chinese tourists has created demand for local accommodation, food and beverage and retail trade services. Opportunities exist to increase the lakes visitation from 40,000 to 192,000 by 2025. This will require investment in interpretive signage, walking tracks, a boardwalk, toilets and vehicle parking area, including coach turning circle. Enabling infrastructure such as this will support the expansion of the Lake experiences and help better support the seasonal tourist population.

There are also opportunities to develop infrastructure along the Murray River, such as boat ramps, camping sites, walking and bike trails can facilitate increased visitor populations access the river.

3.1.2   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 diversity of Mallee's agricultural produce is its key strength. This can mitigate the risk of changes in commodity markets, which the region is typically exposed to. In the longer term, the threat of climate change is significant for the region. Climate change is likely to increase the incidence and severity of droughts, extreme weather events and reduce the average rainfall. The best approach for the agricultural industries is continued focus on incremental productivity gains, diversification of crops produced and application of RD&E technologies. To achieve this, the barriers to accessing information and applying it on farm need to be removed. In Mallee's case, this can be through improvements in the region's digital connectivity and access to telecommunication infrastructure. These improvements will enable agricultural industries to adapt to the impacts of climate change.

3.1.3   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 recent closure of the dairy processing facility at Rochester is a significant constraint for local dairy producers, particularly in the Gannawarra LGA. This adds additional freight costs to producers' cost of production, which reduces profitability in the long run. In response, a dairy processing facility is being scoped for Cohuna, which would present an opportunity for dairy producers in Mallee and outside the region to market their milk. To facilitate the development of the plant, road and other transport linkage infrastructure would need to be constructed.

3.1.4   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 Murray River is an important tourist destination within the region. A significant proportion of visitors are local or from other regions. Mallee also relies on the Murray River as the source of irrigation for agriculture. The latest projections for expected impacts of climate change on the region identify reduced water availability as a significant risk. Mallee needs to consider these implications for the future agricultural output of the region and how it can diversify the economy to manage prolonged dry periods. By increasing the tourist activity of the region, particular from overseas visitors, there is potential to generate other sources of income. This may involve upgrading or improving access to regional airports in the Gannawarra LGA, to enable better access to the Kerang lakes.

3.2 Needs analysis of the region and relevant industries

This section identifies the needs for industry sectors and at Level 2 ANZSIC for Mallee and the Buloke, Gannawarra, Mildura and Swan Hill LGAs. These needs have been developed based on the SWOT analytical processes.

3.2.1 What is important to the region?

Agriculture, Forestry and Fisheries

The agriculture, forestry and fisheries industries are the largest source of GVA, demonstrate strong CAI and source of growth for the region in the last decade:

— Buloke (15.4 Victorian CAI, 2 per cent growth and 48 per cent GVA)

— Gannawarra (11.9 Victorian CAI, 12 per cent growth and 37 per cent GVA)

— Swan Hill (9.6 Victorian CAI, 18 per cent growth and 30 per cent)

— Mildura (5.4 Victorian CAI, 27 per cent growth and 17 per cent GVA).

The economic performance of Mallee is highly dependent on the primary production of almonds, table grapes, dairy, wheat, barley, canola, lamb and wool. Future growth of these sectors can depend on productivity gains on-farm, developing existing or new markets to capture greater value and enhancing the supply chain infrastructure to reduce the cost of production.

What needs could be addressed by government?

— Improved access to telecommunication and NBN infrastructure in regional areas, mainly for access by farm businesses and processing facilities.

— Improved road and rail infrastructure linkages to manage increased freight tonnage.

Manufacturing

Food Product Manufacturing and Beverage and Tobacco Manufacturing are important industries for the Mallee, which demonstrated modest comparative advantage, but have not performed well over the past decade. They remain important future industries for the Mallee.

What needs could be addressed by government?

— Supply chain linkages including road and rail transport infrastructure.

Mining and energy

Through the *Climate Change Act 2017*, the Victorian Government has set a long-term target of net zero emissions by 2050. This is a key opportunity for the renewable energy sector across the state.[4]

The renewable energy sector in Mallee is an emerging industry. Development of the Kiamal Solar Farm (Mildura LGA) highlights the potential growth opportunities for Mallee. Other potential sources of renewable energy in the region include wind, geothermal and bioenergy. In terms of minerals resources, the region's endowment with mineral sands, gypsum, sand and stone and gold and salt extraction represent long-term opportunities.

What needs could be addressed by government?

— Road transport linkages to the Kiamal Solar Farm site.

— Electricity network transmission connection infrastructure.

— Growth in mineral sands mining industries is generating increasing freight traffic throughout the region, with flow on implications for road and rail infrastructure.

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[4] https://www.climatechange.vic.gov.au/reducing-emissions/emissions-targets

— Address identified constraints within existing transmission infrastructure to support the growth of the renewable energy industry. This could include consideration of alternative ways to respond to the transmission infrastructure shortage (i.e. synchronous condensers solution for the Kiamal Solar Farm).

Tourism

The Tourism sector is anecdotally a strong performer in Mallee. Although, no specific CAI exists due to the way data is captured, Mallee is a destination for significant numbers of domestic and international tourists.

What needs could be addressed by government?

— Enabling infrastructure such as boat ramps, street scapes, walking and cycling tracks, caravan parks, roads and signage and built amenities.

3.2.2 What opportunities and constraints does Government face in addressing these needs?

Table 3.2 summarises the opportunities and constraints government could consider in addressing the infrastructure needs of the revealed industries of Mallee 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 MALLEE?

Industry	Revealed sectors	Relevant LGAs	Identified needs	Opportunities to address needs	Constraints to economic development of the sector
Agriculture, Forestry and Fisheries	Agriculture (grain, fruit and nuts)	Buloke Gannawarra, Mildura Swan Hill	Upgrades to road freight networks to accommodate increased number of road trains in response to expanding grain, fruit and nut processing industry	Develop road freight networks that link fruit and nut processing industry with producers and markets	Inadequate road infrastructure constrains producers and processors from operating efficiently and minimising transport costs
	Agriculture (grain, fruit and nuts)	Buloke Gannawarra Mildura Swan Hill	Improved access to telecommunication and NBN infrastructure in regional areas, mainly for access by farm businesses and processing facilities	Develop telecommunication and NBN infrastructure in priority blackspot areas, where a potentially high concentration of the internet of things (IoT) or other devices could be enabled	Inadequate mobile phone and broad internet connection for farm businesses inhibits their ability to adopt transformational technologies or communicate with people and markets
Manufacturing	Food Product and Beverage and Tobacco Product Manufacturing (Identified as emerging industry, based on the future opportunities identified in the SWOT however, it does not have an RCA as such)	Buloke Gannawarra Mildura Swan Hill	Supply chain linkages including road and rail transport infrastructure	Develop the transport infrastructure that links food and beverage processors with producers and consumers	Inadequate road freight connections between processors, producers and consumers to remain competitive with low cost producers locally and overseas

Industry	Revealed sectors	Relevant LGAs	Identified needs	Opportunities to address needs	Constraints to economic development of the sector
Energy and mining	Sand and stone mining (Identified as emerging industry, based on the future opportunities identified in the SWOT however, it does not have an RCA as such)	Many	Building of accommodation for mobile or itinerate workforce which features cycling housing demand due to nature of sand and stone mining Growth in mineral sands mining industries is generating increasing freight traffic throughout the region, with flow on implications for road and rail infrastructure	Enable development of workforce accommodation in proximity to sand and stone deposits to enable development of the industry	Mineral sand and stone deposits have significant economic potential and it is recognised that incompatible development and land uses such as residential and industrial developments in proximity to these resources can lead to constraints on extraction
	Renewable energy	Mildura	Address identified constraints within existing transmission infrastructure	Development of enabling infrastructure such as connecting roads and transmission network connections, is essential to the efficient, safe and cost-effective operation of renewable energy assets	Insufficient capacity within existing transmission infrastructure in Western Victoria limits the region's ability to cope with proposed generation Social license concerns about solar developments taking away prime farming land
Tourism	Accommodation, Food and Beverage Services (Identified as emerging industry based on the future opportunities identified in the SWOT however, it does not have an RCA as such)	Gannawarra	Enabling infrastructure such as boat ramps, street scapes, walking and cycling tracks, caravan parks, roads and signage and built amenities Infrastructure investments are required to support development along the river system, including quality accommodation (high class tents and cabins) Enabling infrastructure for the caravan and motor home industry, provision of amenities is important for increasing visitation	Develop nature based enabling infrastructure along Murray River to enable encourage increased visitation	Inadequate public amenities, access to accommodation and water infrastructure is constraining increased visitation at the Murray River
	Accommodation, Food and Beverage Services (Identified as emerging industry based on the future opportunities identified in the SWOT however, it does not have an RCA as such)	Buloke	Interpretive signage, walking tracks, a boardwalk, toilets and vehicle parking area, including coach turning circle	Develop nature based enabling infrastructure along Lake Tyrell to enable encourage increased visitation	Inadequate public amenities, signage and road infrastructure is constraining increased visitation at Lake Tyrell

SOURCE: ACIL ALLEN

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