

LIMESTONE COAST REGION WASTE AND RESOURCE RECOVERY INFRASTRUCTURE PLAN



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Important notes

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Executive summary

Introduction

The Limestone Coast Waste and Resource Recovery Infrastructure Plan (the Limestone Coast Plan) identifies investment priorities and opportunities in new/expanded waste and resource recovery infrastructure for the Limestone Coast over the next 10 years. This includes infrastructure to collect, transfer, process and dispose of waste via municipal services and facilities. The Limestone Coast Plan also considers the capacity of infrastructure owned and operated by the private sector, including facilities that receive and process municipal waste and recyclables, as well as the six priority areas in the Limestone Coast Regional Waste Management Strategic Direction 2018-2023.

Current infrastructure

The Limestone Coast region is home to 34 key pieces of waste and resource recovery infrastructure. This includes two major organics processing facilities, four landfills (one Council owned), a Material Recovery Facility (MRF) and several transfer stations and container deposit legislation (CDL) facilities. These manage a variety of waste and recyclables, with the highest volume from organics waste (by weight), which is processed in the region. The remaining recyclables are collected and sent to local transfer stations or the MRF, and then sent to Adelaide or interstate and potentially overseas, depending on where there is demand for the product.

Future infrastructure needs and opportunities – a 10 year outlook

There is enough capacity in organics processing facilities and landfills to manage expected future volumes in the region. In addition, a second Council-owned landfill in the north of the region has recently been investigated and it was decided to not further pursue this option due to community opposition and the overall costs compared to the benefits of building this piece of infrastructure. The focus for the region and this Limestone Coast Plan is therefore on maximising diversion of remaining recyclables such as glass, plastics, metals and cardboard. Although these are often recycled, quality issues, reduced demand and prices interstate and overseas for these materials and distance from markets provide challenges that can be addressed through waste and resource recovery infrastructure changes in the next 10 years.

With this in mind, upgrades and expansions to municipal waste and resource recovery infrastructure in the Limestone Coast region are estimated to be \$4.3 million over the next 10 years¹. This is included in the table overleaf.

¹ Note this includes upgrades and additional infrastructure only - this Plan does not include investment in infrastructure and equipment to replace existing units at their end of life.

Table 0.1:

Summary of costs for upgrades and expansions to municipal waste and resource recovery infrastructure in the Limestone Coast region in the next 10 years

Infrastructure name	Estimated cost	Description
Regional MRF	\$1,800,000 ²	Investment in a new MRF for the region is an option to consider due to quality concerns at the current MRF and limited control over the destination of materials.
Shared mobile steel baler	\$320,000	The shared mobile baler would be rotated between councils to bale metals stockpiled at transfer stations before selling to markets.
Glass crusher	\$90,000	To process glass into road base.
Static cardboard balers	\$150,000 for 3 small units ³ , \$350,000 for large unit	Would be stored at four Council transfer stations (large baler for Tatiara).
Weighbridges	\$300,000 at 2 transfer stations ⁴	To be located at Mount Gambier transfer station and Bordertown transfer station.
New transfer station	\$500,000	This would replace the existing facility at Beachport.
Comingled recycling compactor	\$158,000	For the Naracoorte Lucindale transfer station.
New kerbside bins	\$177,000	Based on population growth in Mount Gambier, Grant and Wattle Ranges.
Roll out of organics bins to Councils without this service	\$427,000 ⁵	There is an opportunity to introduce kerbside organics recycling in Grant ⁶ , Robe and Kingston to divert more organics from landfill.
Total	\$4,300,000	This is an estimated overall cost for the above infrastructure.

Not included in the cost analysis above but highlighted within this Limestone Coast Plan are other considerations such as increasing demand for recyclables through council's procurement, and key partnerships with other organisations to help drive new initiatives.

² This is for plant and equipment only. See Technical Appendix One for further information

³ i.e. \$50,000 each unit

⁴ i.e. \$150,000 each unit

⁵ This does not include transport or new vehicle costs. See Technical Appendix Four for further detail.

⁶ Note that Grant are planning to implement kerbside organics bins in 2019.

A range of innovative options are also available for the Limestone Coast to help process waste and recyclables locally. These include:

- Plastics processing for local use in roads
- Tyre Processing for use in local roads
- Paper/cardboard remanufacturing in local area
- Small Scale MRF for Single Council
- Small scale combustion energy from waste
- Organics processing including anaerobic digestion, biochar and regional biomass plant.
- Hazardous waste treatment plant

These are not recommended as priority areas in the Limestone Coast Plan due to the high cost relative to current methods of management and/or challenges associated with securing end markets for recycled products. However, these may become viable as the region develops and should therefore be reassessed as required.

Table 0.2:
Infrastructure
priority list

Next steps

The priority areas and actions are outlined in the table below (further details are provided in the body of the Limestone Coast Plan).

Priority	Infrastructure/ area	Actions
Short term (0 – 2 years)	Regional MRF	<ul style="list-style-type: none"> • Councils are currently reviewing and investigating best infrastructure options for managing recyclables. • Explore a more detailed business case behind building and operating a Council-owned facility. • In this investigation, consider how the infrastructure can be shared and utilised, including most effective location. See Technical Appendix One for further details. • In the interim, explore back up options for items not recycled at the current MRF due to inefficiencies. E.g. a plastics baler at the Mount Gambier Transfer Station for C&I plastics.
	Shared mobile steel baler	<ul style="list-style-type: none"> • Explore a more detailed business case behind purchasing and the operating model for a Council-owned baler.
	Various new equipment at Transfer Stations (TSs)	<ul style="list-style-type: none"> • Implement planned waste and recycling infrastructure upgrades such as weighbridges, comingled recycling compactor, static cardboard balers.
	Glass to road base	<ul style="list-style-type: none"> • Further investigate the purchase of the glass crusher and its application to road base before purchasing equipment. • As part of the investigation, contact organisations with experience in this field (e.g. Downer group) to determine the specification requirements (for the glass and equipment).

Priority	Infrastructure/ area	Actions
	Plastics and other applications (e.g. tyres) to road base	<ul style="list-style-type: none"> • Contact relevant organisations that have experience in this field and can share their experiences (e.g. Close the Loop, Hume City Council, City of Onkaparinga) • Based on these conversations, conduct a more detailed business case on purchasing and sharing the required equipment to recycle the relevant material to road base.
	Packaging changes	<ul style="list-style-type: none"> • Advocate for legislative changes to packaging to reduce waste generation and increase recycling.
	Increasing demand for recycled products	<ul style="list-style-type: none"> • Councils to explore mandating procuring products made from materials recycled in the Limestone Coast region. • Explore the cost of providing residents with subsidised compost/mulch (bags or bulk) each year if they participate in FOGO collections.
Medium term (2 – 5 years)	Beachport TS upgrade	<ul style="list-style-type: none"> • Continue plans to move and upgrade the Beachport TS and close current TS.
	New kerbside bins	<ul style="list-style-type: none"> • Continue to roll out new kerbside bins as population increases. • Explore the roll out of an organics service to all Councils. • Conduct a trial with a new system, for example fortnightly/weekly FOGO and fortnightly/weekly general waste.
	Increased tonnes from interstate	<ul style="list-style-type: none"> • Maintain contact with Victorian Councils and Waste and Resource Recovery Groups to explore opportunities to move organics, comingled recyclables and other materials into the region.
	Sound partnerships	<ul style="list-style-type: none"> • Continue to build relationships with other relevant stakeholders.
	Education and engagement	<ul style="list-style-type: none"> • Continue to raise public awareness of contamination issues through continued education aimed at reducing contamination. • Ensure that education and engagement is relevant and updated based on waste and resource recovery infrastructure. • Consider waste and recycling avoidance education and engagement to reduce costs for residents, which in turn, reduces need for new waste and recycling infrastructure.
Long term (5+ years)	Innovative infrastructure options	<ul style="list-style-type: none"> • Explore innovative options not currently viable or practical to assess viability as markets, costs, landfill levy and tonnes change.
	Supporting commercial sector	<ul style="list-style-type: none"> • Continue to support the commercial sector as it trials new ideas to increase diversion and the value of recycled products. E.g. an anaerobic digester.

The Limestone Coast has several waste and resource recovery facilities in place to manage its waste and recyclables. Over the next ten years, upgrades and new infrastructure will be required to continue to manage current and increased volumes of waste and recyclables. These have been outlined and costed at a high level within this plan. The Limestone Coast's interest in local resource recovery presents an opportunity to reduce transport costs and increase remanufacturing in the region. This plan also presents a number of opportunities for the region to consider that would ensure materials stay local.

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1. List of Acronyms

Acronym	Full name
ABC	Australian Broadcast Corporation
AD	Anaerobic Digestion
C&I	Commercial and Industrial
C&D	Construction and Demolition
CDL	Container Deposit Legislation
FOGO	Food Organics Garden Organics
GW	General Waste
MRF	Material Recovery Facility
NAWMA	Northern Adelaide Waste Management Authority
TS	Transfer Station

Note: this document refers to the Technical Appendices on occasion. The Technical Appendices are a separate document and are not publicly available as they contain commercially sensitive information.

2. Introduction and context

2.1. Limestone Coast Region

The Limestone Coast region is located in the south-east of South Australia. It covers an area of 21,000 square kilometres and has a population of approximately 65,000⁷ people. The region's economy is based largely on agriculture and primary production as well as horticulture/viticulture, dairying, forestry and associated processing, and fishing. There is also a growing tourism industry with many popular tourist and holiday coastal destinations⁸.

The Limestone Coast includes seven Council areas:

- District Council of Grant,
- Kingston District Council,
- City of Mount Gambier,
- Naracoorte Lucindale Council,
- District Council of Robe,
- Tatiara District Council, and
- Wattle Range Council.

A map of the region can be seen below (Figure 1.1), which includes the region boundaries, key townships and main roads.

Figure 1.1 Map of the Limestone Coast Region



⁷ Australian Bureau of Statistics

⁸ Limestone Coast Region Plan, 2011

2.2. Why consider waste and resource recovery infrastructure planning

Waste and resource recovery infrastructure planning and investment is critical to ensuring waste volumes generated can be managed in an efficient, effective and safe manner, and the targets set by the state can be met by the Limestone Coast. It is also beneficial to consider current and potential waste and resource recovery infrastructure in the region to:

- Maximise diversion of waste from landfill
- Achieve economies of scale
- Identify what critical mass is needed to justify potential infrastructure
- Increase employment opportunities in the region through waste and resource recovery
- Identify potential innovative infrastructure that may help achieve the targets.
- Reduce operating costs for Councils' waste management.

2.3. The Limestone Coast Waste and Resource Recovery Infrastructure Plan

This Limestone Coast Waste and Resource Recovery Infrastructure Plan (the Limestone Coast Plan) assesses the current waste and resource recovery infrastructure in the region and current waste generated and managed by the Limestone Coast Councils, forecasts potential waste generation and subsequent infrastructure requirements and costs based on Council requirements, waste volumes and diversion targets. A ten-year outlook is considered, with qualitative comments on shorter-term and longer-term needs for the region. The Limestone Coast Plan also considers waste and recycling infrastructure needs based on the key streams; organics, comingled recycling and general waste.

Importantly, this Limestone Coast Plan does not include ongoing costs related to maintaining current infrastructure (replacing bins, transfer station repairs, replacing units at the end of their life, landfill capping etc). These costs will be picked up in Council operations and budgets and are not considered here. What is considered is new waste and resource recovery infrastructure, upgrades, and new plant and equipment needed based on population growth (e.g. kerbside bins).

There are a number of stakeholders that play a role in waste generation and management and infrastructure planning for the Limestone Coast region. These include but are not limited to:

- Limestone Coast Local Government Association
- Each of the Councils that comprise the Limestone Coast
- Businesses in the region that generate and manage waste and recyclables
- Regional Development Australia
- Victorian Councils, businesses and waste and resource recovery groups that also generate and manage waste
- Government agencies offering grant funding to encourage infrastructure development that helps achieve state targets.

It is important to consider these organisations and agencies in building, maintaining and using waste and resource recovery infrastructure as effectively as possible and to help meet the targets for the region.

2.4. Considerations impacting the Limestone Coast Plan

Relevant documentation and items that set the context for this Limestone Coast Plan are outlined in the list below. This list provides an overview of some of the key considerations for each document or event. For further details on each of the below items.

Documentation impacting the Limestone Coast Plan

- **Limestone Coast Local Government Association Regional Waste Management Strategic Direction, 2018 – 2023**
Outlines six priority areas in the waste and resource recovery area; 1 – reduced transport costs, 2 – reduced waste generation, 3 – increased landfill diversion, 4 – regional corporation and communication, 5 – resource recovery and 6 – illegal dumping.
- **South Australia Waste Strategy 2015-2020**
The Limestone Coast is focused on working towards the relevant regional targets in this Strategy and recognises the role that waste and resource recovery infrastructure plays in meeting these goals.
- **South Australia Waste and Resource Recovery Infrastructure Plan**
Highlights that the Limestone Coast is estimated to require an additional \$600,000 for municipal solid waste (MSW) infrastructure, \$12.9 million for Commercial and Industrial (C&I) infrastructure and \$200,000 for Construction and Demolition (C&D) infrastructure in addition to maintenance costs for existing infrastructure over the next ten years.

This current plan is different than the state waste and resource recovery infrastructure plan as it looks at both the quality and developing capacity of processing recyclables in the region. It takes a more granular approach.
- **Limestone Coast Infrastructure Plan (currently being drafted)**
Looks at infrastructure needs more broadly for the region and will refer to waste and resource recovery infrastructure.
- **Limestone Coast Regional Growth Strategy, including an Action Plan**
Identifies six priority areas including ‘securing investment to deliver regional infrastructure priorities enabling growth’, which includes resource efficiency, recovery and waste management within hard infrastructure.
- **Limestone Coast Region Plan 2011**
Guides future land use and development in the Limestone Coast region.
- **Relevant Limestone Coast Council Plans and Strategies**
Identify targets and directions for each Council.
- **Regional Public Health and Wellbeing Plan 2014-2017**
Key actions included delivering waste education programs and partnering with businesses to improve waste management practices.

- **Environment Protection (Waste to Resources) Policy 2010**
Specifies waste and resource recovery requirements in South Australia, including items banned from landfill.

Other items impacting the Limestone Coast Plan

- **Transport distances**
Given the higher transport costs in rural areas such as the Limestone Coast, the financial viability of recycling when the price of materials reduces is more challenging. This also applies when transporting residual waste to a landfill, with only two putrescible landfills across the entire Limestone Coast region, as well as transporting organics to processors and then to end markets can also make the recycling of this material more challenging.
- **SA Waste Levy**
The levy has increased over time and the 2016-17 State Government Budget announced a staged increase of the levy to \$51.50 per tonne by the 2019-20 financial year for non-metropolitan councils including the Limestone Coast region.
- **Population changes in the Limestone Coast Region**
The Limestone Coast region is expected to increase in population by approximately 1,050 people by 2026 (10 years)⁹. However, this growth is not consistent across all Councils, with some expected to increase more than others and some expected to decline.
- **Land use planning considerations**
Key considerations for siting large scale waste, recycling and re-manufacturing infrastructure include suitable separation distances (refer to Appendix two), logistical considerations relative to sources and destination of inputs/outputs, technology used (e.g. fully enclosed facilities with air filtration) and access to services infrastructure such as electricity, gas and water). Councils must ensure that their current and potential facilities provide and maintain required buffer distances and any residential and industry planning for their respective council considers these requirements.
- **National China Sword Policy**
In early 2018, China announced changes to acceptable contamination levels in recycled materials it received. These changes made it difficult for material recovery facilities (MRFs) to recover and sell materials, particularly cardboard and plastics, back to China for recycling. This reduced the price of these items, as other markets accepted the materials but at a lower price, which has increased the cost to Councils to have comingled

⁹ Based on population projections for SA local government areas, 2011 – 2031, Feb 2016 release

recyclables collected and processed. This may present opportunities for reprocessing and reuse of recyclables in the region.

- **Community waste and recycling expectations**

Community expectations for a sustainable future have long been an important driving force for waste and recycling infrastructure investment. The community expects Councils to be putting in efforts to maximise recycling and reduce its environmental impact. The community also has affordability expectations

- **Potential economic benefits**

Upgrading and maintaining waste and resource recovery infrastructure in the Limestones Coast region presents potential economic benefits. The diversion of waste from landfill creates six additional FTE's for every 10,000 tonnes diverted¹⁰. However, it is also noted that changes may also increase costs due to increased transport and processing of additional tonnes. Each opportunity therefore needs to be assessed to establish the potential benefits and drawbacks for the region.

- **Victorian businesses and Councils**

The Limestone Coast is located alongside the South Australian-Victorian border. Nearby Councils over the border include Glenelg Shire Council, West Wimmera, Horsham, Southern Grampians, Moyne and Warrnambool. There is also the Barwon South West Waste and Resource Recovery Group. Collaboration with these organisations is important as they generate and manage waste and recyclables in their region. There may be opportunities to collaborate on tonnes or infrastructure to increase economies of scale and reduce costs per tonne to manage waste.

It is also noted that there are some concerns over transportation of hazardous materials such as asbestos over the border into South Australian landfills. This transportation is due to regulatory issues such as landfill levy differences between the two states.

¹⁰ From 2.8 FTEs per 10,000 tonnes sent to landfill to 9.2 FTEs for every 10,000 tonnes recycled, Green Industries SA.

3. 10-year Infrastructure needs for the Limestone Coast region

Snapshot summary of the region – current

- There are currently approximately 34 waste and resource recovery facilities managed by Council and commercial operators in the Limestone Coast region.
- These facilities manage waste and recyclables and include two major organics facilities, three landfills and material recovery facility.
- Council owns 18 waste and resource recovery sites and is currently spending approximately \$800,000 on upgrades to infrastructure at these facilities.
- Industry is also investing in waste and resource recovery infrastructure, with almost \$2.5 million recently spent or to be spent.

Snapshot summary of the region – 10-year outlook

- An estimated \$4.3 million is needed over the next 10 years for planned and recommended upgrades and expansion of municipal waste and resource recovery infrastructure in the Limestone Coast region.
- This includes the potential for a new regional MRF, building a new transfer station, weighbridges, compaction and baling equipment and a glass crusher for civil application.
- This does not include ongoing costs related to maintaining current infrastructure (e.g. replacing bins, transfer station repairs).
- These investments are expected to result in an additional four FTEs for the region for the operational phase plus additional employment during the construction phase.

3.1. Current Waste and resource recovery infrastructure in the Limestone Coast region

The Limestone Coast region hosts numerous waste and resource recovery infrastructure (see Table 2.1 below). Key infrastructure includes:

- Two major organics processing facilities
- Four landfills (one Council owned)
- One Material Recovery Facility (MRF)
- Numerous transfer stations and CDL facilities
- Two scrap metal recyclers
- Two C&D recyclers.

These facilities are included in the table below and map overleaf, which also includes the Council offices.

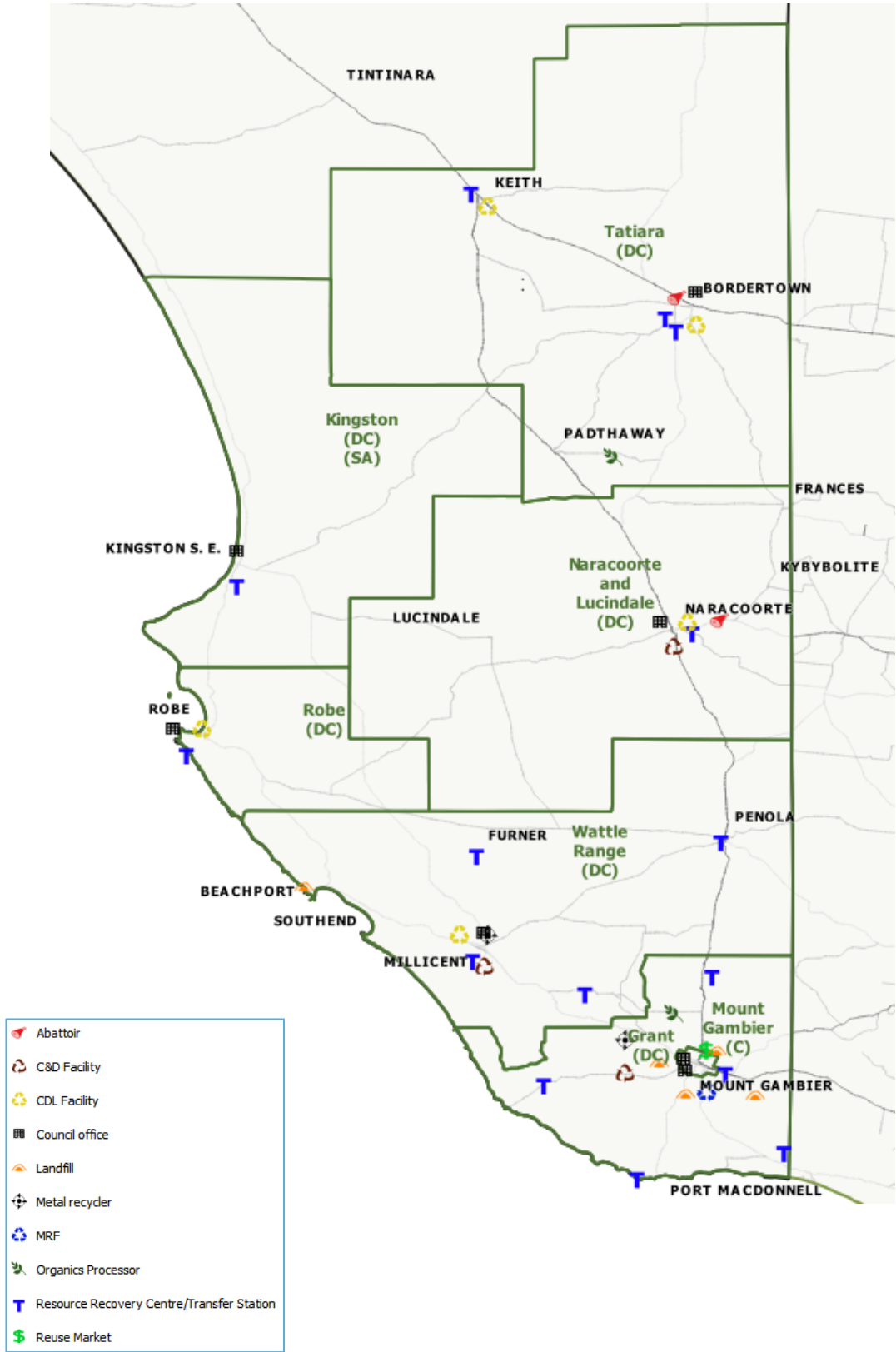
Table 2.1: Key Waste and Resource Recovery infrastructure in the Limestone Coast Region, by Council

Council	Infrastructure type	No. in region
Grant	Resource Recovery Centre/Transfer Station	4 (plus 1 closed but still licenced)
	Organics processor	1
	C&D Facility	1
	Scrap metal recycler	1
	Landfill	3 ¹¹
Kingston	Resource Recovery Centre	1
	Landfill	1 ¹²
Mount Gambier	Resource Recovery Centre/Transfer Station (including re-use shed and receival shed)	1
	MRF	1
	CDL facility	1
Naracoorte Lucindale	Resource Recovery Centre/Transfer Station	1
	C&D Facility	1
	CDL facility	1
	Kerbside trucks, depot	1
Robe	Resource Recovery Centre/Transfer Station	1
	CDL Facility	1
Tatiara	Resource Recovery Centre/Transfer Station	2
	CDL facility	2
	Organics Processor	1
	Depot/ Transfer station	1
Wattle Range	Resource Recovery Centre/Transfer Station	5
	C&D Facility	1
	Scrap metal recycler	1
Total		34

¹¹ These are commercial landfills and do not include the Caroline Landfill.

¹² Note this is the Caroline landfill, which is owned and operated by City of Mount Gambier, but is located in the District Council of Grant

Figure 2.1: Map of waste and resource recovery infrastructure and Council offices in the Limestone Coast region¹³



¹³ See Appendix One for infrastructure definitions

Council owned infrastructure and tonnes managed

Of the infrastructure in the map above, Councils own 18 pieces of infrastructure, including 15 transfer stations/resource recovery centres, one landfill and two CDL facilities. These manage approximately 34,000 tonnes of waste and recyclables each year.

Council also arranges the collection and disposal/processing of kerbside waste and recyclables for its residents. Approximately 22,700 tonnes per annum is collected from kerbside bins (see Table 2.2 below) at an average diversion rate of 42 per cent. The tonnes currently sent to landfill from kerbside collections cost Limestone Coast Councils approximately \$581,000 in landfill levy in 2017-18 (see Appendix three).

Table 2.2: Total kerbside waste collected by Councils per annum¹⁴

Council	GW (t/a)	Com Rec (t/a)	Org (t/a)	Total (t/a)	Recovery %	Data year/ note
Grant	913	348	0	1,261	28%	2016-17
Kingston	641	143	0	784	18%	2017 calendar year
Mount Gambier	5,927	2,176	2,782	10,885	46%	2016-17
Naracoorte Lucindale	1,800	511	800	3,111	42%	2016-17
Robe	566	149	0	715	21%	2016-17
Tatiara	1,300	240	799	2,339	44%	2017-18
Wattle Range	2,051 ¹⁵	753	759 ¹⁵	3,563	42%	2017-18
Total	13,198	4,320	5,140	22,659	42%	This is kerbside collected tonnes only

In addition to the above tonnes, the region manages high volumes of organics, and brings in some organics and general waste from Victoria to process or dispose. In total, there is approximately 250,000 tonnes of waste and recyclables per annum being managed in the region, which is predominately organics.

¹⁴ GW = general waste, Com Rec = comingled recycling, Org = organics

¹⁵ Note the Wattle Ranges GW and Org kerbside tonnes in Table 2.2 are based on the overall reported GW and Org at Wattle Range Council across kerbside and transfer stations, with the splits between kerbside and transfer stations in 2015-16 applied to estimate 17-18 kerbside tonnes collected

Current costs

Councils are currently undertaking a range of initiatives to upgrade their current facilities. Upgrades that are already in place are estimated to cost Councils approximately \$835,000¹⁶. Industry is also currently investing in waste and recycling infrastructure upgrades, with approximately \$900,000 recently spent and a further \$1,500,000 going to be spent by industry on upgrades to their facilities.

Current processing location for recycled materials

Due to the high transport costs transporting materials out of the Limestone Coast region, opportunities to re-manufacture and recycle locally are important to consider. Currently the majority of material by weight is being processed in the region, due to the high organics volumes. However, there are opportunities to explore local processing of other municipal solid waste and recyclables such as glass, plastics and paper/cardboard (see Table 2.3 below).

Table 2.3:
Processing/
disposal location
of materials

Material	Sourced from	Current processing/ disposal destination before sale of product (if applicable)
Organics	Limestone Coast and Victoria	In region
Paper and cardboard	Limestone Coast	Out of region
Metal	Limestone Coast	Out of region
Plastics	Limestone Coast	Out of region
Glass	Limestone Coast	Out of region (if recycled) In region (if stockpiled or landfilled)
General waste	Limestone Coast and small volumes from Victoria	In region and some out of region
Masonry	Limestone Coast	In region

¹⁶ For re-use shed, receival shed and polystyrene extruder at Mount Gambier transfer station. This does not include ongoing costs related to maintaining current infrastructure (e.g. replacing bins, transfer station repairs, landfill capping/ expansion). Planned costs for general upgrades such as the comingled recycling baler at Naracoorte Lucindale Council and weighbridges at the City of Mount Gambier and Tatiara Council are covered in the following sections.

3.2. Ten-year outlook

There are a number of waste and recycling opportunities for to help drive towards the region's six priority areas outlined in the Limestone Coast Local Government Association Regional Waste Management Strategic Direction, 2018 – 2023. The infrastructure included in this plan considers this strategic direction (e.g. minimising transport costs through local reprocessing or baling, and initiatives to increase diversion feedback from the region), site visits and in some cases, costs benefit analyses comparing to business as usual (see Technical Appendix One). There is also a range of infrastructure requirements based on population growth and new equipment to council owned resource recovery centres/ transfer stations.

There is also appetite in the Limestone Coast region for innovative approaches to waste management to help keep waste and recyclables in the region. Some of these are currently unviable or impractical. However, these can be revisited as the region evolves, and information about these is provided in Table 2.6.

Estimated overall costs for waste and resource recovery infrastructure – 10 year outlook

Based on high level cost analyses (see Technical Appendices One - Five) and consideration of other benefits to new waste and recycling infrastructure (e.g. increased diversion or local reprocessing), an estimated \$4.3 million is needed over the next 10 years, to upgrade and expand municipal waste and resource recovery infrastructure in the Limestone Coast region. This includes¹⁷:

- Shared infrastructure, such as:
 - \$1.8 million investment in a new MRF for the region (an option for consideration rather than sending it to the commercial MRF).
 - \$320K for a mobile steel baler
 - \$95K investment in glass crushing equipment for glass fines from MRF.
- Infrastructure by Council, such as:
 - \$500K investment in a new transfer station in Beachport to replace existing facility
 - \$177K for rolling out kerbside bins to new dwellings due to expected population growth in Mt Gambier, the District Council of Grant and Wattle Range Council¹⁷.
 - If there is interest, \$427K for rolling out kerbside organics bins to Councils that currently do not offer this service (cost is for bin roll out only)
 - \$300K for two weighbridges
 - \$158K for a recycling compactor at Naracoorte Lucindale TS
 - \$150K for three static cardboard balers (one at each of Naracoorte Lucindale TS, Robe TS and Wattle Ranges TS).

¹⁷ Note this plan does not include investment in infrastructure and equipment to replace existing units at their end of life and ongoing equipment repair and maintenance costs

- \$350K for a large scale cardboard baler at Tatiara TS.

Further detail on these figures is provided below and in the Technical Appendices.

Shared infrastructure

Table 2.4 below provides the estimated investment of shared infrastructure across all councils as well as additional FTEs, tonnes diverted and recommended action. Further details are provided in the Technical Appendices on infrastructure for transfer stations, organics, comingled recycling and residual waste (Technical Appendix Two – Five).

For shared infrastructure, Councils would not be using each piece of infrastructure equally, with cost allocations based on an agreed shared split (e.g. estimated volumes sent to the facility or time using the equipment).

Table 2.4:

Investment by Council and infrastructure type – shared infrastructure

	New regional MRF	Glass crusher ¹⁸	Shared mobile steel baler	Shared mobile cardboard baler ¹⁹
Est capital cost²⁰	\$1,800,000	\$95,000	\$320,000	\$100,000
Additional FTEs to operate infrastructure	-	2	2	NA as not recommended
Additional tonnes diverted from landfill	-	450	-	-
Recommendation	Further explore costs and operating models	Conduct a more detailed feasibility assessment	Conduct a more detailed feasibility assessment	Do not implement (static balers recommended, see Table 2.4)

These investments are expected to result in approximately four FTEs for the region for the operational phase plus additional employment during the construction phase, as well as diverting an additional 450 tonnes of glass from landfill each year.

¹⁸ A glass crusher was selected as it supports the circular economy through local processing and local reuse, reducing transport to other metro markets. Glass crushing to road base is likely to be a more viable option than plastic to road base given the challenges with transporting glass out of the region due to high density. However, it may not be viable due to low tonnes available in region, hence further exploration is recommended.

¹⁹ Grant, Naracoorte, Robe and Wattle Ranges only (other councils have cardboard balers)

²⁰ Note investment in this infrastructure has not been approved in Council Asset Management Plans. This would require further investment above levels identified in this plan.

Individual Council Infrastructure

Potential waste and recycling infrastructure by Council required over the next ten years is estimated around \$2M for the region, which is summarised in Table 2.5. It is estimated that kerbside bin replacement due to population growth will be approximately \$177,000¹⁶. In addition, there is an opportunity to introduce kerbside organics recycling in Grant, Robe and Kingston to divert more organics from landfill. This would require additional investment of about \$427,000 in kerbside bins and would lead to an estimated additional 650 tonnes of organic waste diverted from landfill each year. General transfer station upgrades are estimated to cost \$1.5M over the next ten years.

Table 2.5:
investment by
council and
infrastructure type
– ten-year outlook,
individual Council
infrastructure²¹

Council ²³	Est \$ Capital cost over 10 years ²²			Description/ total
	Total kerbside bin replacement ²⁴	Kerbside organic bin introduction	Transfer station upgrades	
Grant	\$24,000	\$273,000		
Kingston	-	\$112,000		
Mount Gambier	\$119,000		\$150,000	Weighbridge
Naracoorte	-		\$50,000	Static cardboard baler
Lucindale			\$158,000	Comingled recycling compactor
Robe	-	\$42,000	\$50,000	Static cardboard baler
Tatiara	-		\$350,000	Large scale cardboard baler for TS
			\$150,000	Weighbridge
Wattle Range	\$34,000		\$500,000	Beachport TS move and upgrade
			\$50,000	Static cardboard baler
Total over 10 years	\$177,000	\$427,000	\$1,458,000	\$2,062,000

²¹ Business as usual assumes a population growth rate in Grant, Mount Gambier and Wattle Ranges only, and no kerbside organics bin service at DC of Grant, Kingston DC or DC of Robe. Note this Plan does not include investment in infrastructure and equipment to replace existing units at their end of life and ongoing equipment repair and maintenance costs

²² For a more detailed breakdown of these costs, see Technical Appendices Two - Four

²³ Note investment in this infrastructure has not been approved in Council Asset Management Plans

²⁴ Based on population increase and providing new bins to these residents. Note that there will also be additional vehicle operation hours and some minimal costs to meet these demands. See Technical Appendix Two - Four for further details

Innovative options to consider processing and using materials locally

Further investment opportunities were explored such as energy from waste and pyrolysis to biochar technologies. These can be found in Table 2.6 below, which describes some of the innovative infrastructure in more detail.

These innovative options are not recommended as priority areas for the region at this stage. However, contact with stakeholders outlined in the action list in this Plan may lead to further investigation into one of these options (e.g. plastics to road base). As the region evolves, investigation into the below options may be warranted. Further, investment is likely to be undertaken by the private sector over this period. For example, development of an anaerobic digestion facility in the region to process industry residuals or regional biomass plant.

Table 2.6:

Innovative options to keep material local

Potential additional innovative infrastructure	Description of innovative waste and resource recovery infrastructure	Considerations
Plastics processing for local use in roads	<ul style="list-style-type: none"> Plant and equipment that can process plastics to be suitable for blended use in roads. Plastics may come from MRF or other plastic sources 	<ul style="list-style-type: none"> Supports circular economy through local processing and local reduce, reducing transport to other metro markets. May not be viable based on low tonnes available in region versus alternatives. Would need to partner with bitumen supplier in the regions with experience in the application (e.g. Downer). Supply and end market would need to be agreed before progressing. Separate full business case to be considered.
Tyre processing for use in local roads	<ul style="list-style-type: none"> Tyre crumbing infrastructure to process tyres to a quality suitable for including in road surfaces It is noted that selected Councils in the region have trialled this technology 	<ul style="list-style-type: none"> Supports circular economy through local processing and local reduce, reducing transport to other metro markets. May not be viable on low tonnes available in region versus alternatives. High capital costs and specialised equipment (~\$500k+) Would need to partner with bitumen supplier in the regions with experience in the application. Supply and end market would need to be agreed before progressing. Separate full business case to be considered (noting that some Councils may have commenced this already). For councils in the region that have trialled this technology, consider sharing learnings with other Councils to help build and expand this initiative to other Councils.

Potential additional innovative infrastructure	Description of innovative waste and resource recovery infrastructure	Considerations
Paper/ cardboard re-manufacturing in local area	<ul style="list-style-type: none"> Processes and equipment to feed paper and cardboard from the region into existing/new processes 	<ul style="list-style-type: none"> Supports circular economy through local processing and local reduce, reducing transport to other metro markets. Region has relatively low tonnes available (<10,000 tonnes) and most of these tonnes are being recycled, which will impact on viability. Current pulp/paper making infrastructure in the region (e.g. KCA) may not have plant and products that are suitable for the region's paper and cardboard streams. Further investigation and assessment will be required.
Small scale MRF for single Council	<ul style="list-style-type: none"> Smaller scale Materials Recycling Facilities for individual (or two Councils) to sort comingled recycling prior to baling 	<ul style="list-style-type: none"> Processes locally comingled stream into selected materials that are then baled. Glass can be removed and crushed for local use and other baled products (paper/cardboard, plastics, cans) sent to markets. Local labour intensive with limited mechanical infrastructure Cost per tonne to process is usually very high compared to alternative. Separate detailed business case to be considered before progressing, if the regional MRF across the seven Councils is not implemented. Future technology may improve economics.
Small scale combustion Energy from Waste	<ul style="list-style-type: none"> Smaller scale energy from waste facility to recover energy from residual waste stream Option for a biomass energy from waste facility 	<ul style="list-style-type: none"> Currently, energy from waste is only viable on a much larger scale (>150ktpa) compared to that available in the region (<50ktpa). Capital cost very high for proven technology (~ \$150m for 150ktpa). Economics may change as technology improves and may be worth revisiting within 10 years. Proven smaller scale units that are viable may become available in this period. Benefit of this infrastructure is that it deals with general waste locally and could be used to supplement fuel/electricity needs of industrial processes. There may be other biomass streams (e.g. agricultural residues) that could be converted to energy. An assessment of the feasibility behind such a venture would be necessary.

Potential additional innovative infrastructure	Description of innovative waste and resource recovery infrastructure	Considerations
Organics processing including anaerobic digestion and biochar	<ul style="list-style-type: none"> • Range of potential infrastructure to value add to processing organics stream 	<ul style="list-style-type: none"> • Generating renewable energy from processing organics streams via anaerobic digestion is available. Business case will need to be fully assessed including considering the organics stream (agriculture residues, FOGO, other organic streams). • Most likely this will be led by the private sector, but it could be a Private Public Partnership, processing Councils' FOGO stream. • Biochar is being implemented in the region currently and has the potential to be expanded. It is best to monitor the success of this technology as it is implemented before taking further action. • A regional biomass plant is also an option to be considered in future but is currently not recommended as an initiative to be conducted by Councils (the commercial sector can drive the development of such infrastructure). See the small-scale combustion energy from waste innovative option above.
Hazardous waste treatment plant	<ul style="list-style-type: none"> • New infrastructure to undertake treatment of hazardous waste 	<ul style="list-style-type: none"> • Currently treated in either Adelaide or Melbourne. • New facility could treat and dispose of hazardous waste generated in the region by residents and industry. • This is a specialist facility that will need EPA approval and safety/environmental controls. It must be in an appropriate zoned area and ensure that practices are legal and environmentally sound. • Viability needs to be assessed given relatively low volumes of hazardous waste in the region. Transport less of an impact compared to the higher cost per kg to appropriately treat, and with the low tonnes it is not a high priority area currently. • It is also noted that there is a preference to restrict hazardous waste (e.g. asbestos) coming into LC Region/SA from Victoria, and a hazardous waste treatment plant may encourage more hazardous waste materials to be sent over the border.

3.3. Partnerships

Partnerships are critical to justify the implementation of some of the above infrastructure and to explore other opportunities. Partnerships currently exist and have been used in the past to reduce Council costs. For example, the City of Mount Gambier, the District Council of Grant and Wattle Ranges Council have joint procured the processing of their recyclables to reduce costs. Other partnerships may include:

- **Between Councils.**

For example, joint procuring kerbside tonnes of comingled recyclables (mentioned above but expanding to additional Councils) or organics to minimise processing costs. If a new MRF is built in the region, combining the tonnes from all or at least a collection of Councils in the Limestone Coast region would be necessary to justify the business case. Further investigations would be required to determine the best location and ownership model for a new MRF if there is interest, based on participating Councils. One option is a subsidiary-run MRF, similar to NAWMA in northern Adelaide, where constituent Councils sit on the Board responsible for the governance, management and strategic direction of the MRF, but the MRF itself is run by a third party. The shared metal baler will also require collaboration between Councils if it is to be implemented in the region. See Technical Appendix One for further details.

- **With commercial organics re-processors and organics generators.**

Organics is currently being well captured and re-processed. However, there are opportunities to build other organics re-processing infrastructure such as an anaerobic digester, biochar gasification unit or an energy from waste facility from the wood residue which may capture additional organics materials and convert it to another product (energy, biochar etc). Commercial entities are already looking into these options, and Councils/ Limestone Coast LGA could support through guaranteeing tonnes that will be sent to these facilities.

- **With adjacent Victorian Councils and Waste and Resource Recovery Groups.**

Adjacent Victorian Councils are open to sending organics and comingled recyclables over the border into the Limestone Coast if it is a commercially and legally viable option²⁵. These Councils are regularly releasing tender documentation for kerbside collection and re-processing, and Limestone Coast businesses could tender for these. The Barwon South West Waste and Resource Recovery Group is also looking at opportunities to better manage organics generated in the region. Building a strong working relationship with this organisation would be useful to identify potential opportunities for additional

²⁵ Note there are currently multiple streams being transported over the SA/Vic border, including general waste, FOGO, comingled recyclables and metals. There are some restrictions to transporting organics over the border. However, these restrictions are limited and subject to meeting biosecurity risks, this is a legal practice.

tonnes to be brought into the Limestone Coast region for re-processing. In addition, it is noted that hazardous materials are being transported over the border to be disposed to landfill. At the moment this may be driven by a number of factors, such as differences in levy prices between South Australia and Victoria. Limestone Coast Councils have limited control over this area but will continue to monitor this to ensure a response is possible if OHS risks increase, or landfill capacity becomes an issue.

- **Between Regional Development Australia and the Limestone Coast LGA.** Regional Development Australia are undertaking work on infrastructure in the region presently which links to this Limestone Coast Plan.

- **With funding bodies.**

There are opportunities for grant funding that may be the catalyst for new infrastructure in the region. A round of grants was recently awarded, however future grant funding would be useful for some of the infrastructure requirements and opportunities identified.

- **With organisations currently recycling products in road base.**

The partnership of Close the Loop and the City of Onkaparinga are examples of trialling the re-manufacturing of recycled products to road base. These organisations may share learnings with Councils looking to trial similar initiatives.

3.4. Other key considerations

Creating demand for recycled materials through procurement

Increasing demand for products made from recyclables creates a stronger business case for building or upgrading waste and resource recovery infrastructure. If demand for recyclable products is guaranteed, the investment in infrastructure is more feasible. Council has some control over this, currently purchasing various products that could be made from materials collected and recycled in the Limestone Coast region. Examples include:

- Purchasing mulch, compost and other organic materials from organics re-processors in the region and using on Council operations.
- Providing free or reduced cost mulch to the public at transfer stations.
- Selling compost at public transfer stations, ideally at locations where the public can drop off organics.
- Purchasing road base with minimum levels of recycled glass, plastics or tyres from the region.
- Purchasing kerbside bins with minimum proportions of recycled plastics.
- Purchasing 100% recycled paper (and other stationary) in Council offices.

Councils can look into their procurement requirements and make adjustments to ensure that when purchasing products, they are creating demand for recycled materials generated in the region.

Assessing the business case

A more detailed business case will need to be undertaken on proposed infrastructure investments to confirm infrastructure costs and variability. It is also noted that various organisations (both Councils and private sector) are currently completing feasibility studies on several initiatives.

Community education and engagement

Through programs such as the ABC's 'War on Waste', the community is currently engaged in waste and recycling. However, contamination levels are varied across Councils and diversion rates are relatively low²⁶. There are therefore opportunities to increase engagement and awareness of what residents can do to improve their waste and recycling habits. Councils in the Limestone Coast region could share their stories to try to improve performance, for example learning from the low recycling contamination rate at Tatiara Council²⁷. Ongoing education is recommended to maintain and improve current performance.

Training and talent retention

Workforce planning, training and talent retention supports and adds value to investment in physical infrastructure. A range of initiatives can improve outcomes, such as:

- Encouraging people to work in the industry through site visits, work experience and further promoting the good work the industry is doing.
- Developing courses in the region that provide training on waste and resource management.
- Delivering information on career pathways in the industry to career advisors and counsellors across schools and other institutions in the region.

²⁶ Based on a 2016 audit in Mount Gambier, comingled recycling contamination was approximately 16%, while in Tatiara, comingled recycling contamination is reported to be only 3%. Diversion rates range between 18% and 46%, depending on the Council (see Table 2.2)

²⁷ Note that this process is occurring on some level, for example through the Regional Waste Management Committee. These types of activities should continue.

Integrated waste data systems

Integrated waste data systems measure and help drive improvements in resource recovery. Timely and verifiable waste and recycling data, through systems such as RFID equipped bins and on-truck bin weighing technology, will bring several benefits. The technology can measure and provide feedback to households and businesses on their waste generation and landfill diversion performance or help target and measure the effectiveness of waste education campaigns aimed at increasing resource recovery.

Reducing waste generation

Reducing waste generation is the second priority area in the Limestone Coast waste management strategic direction. Limestone Coast LGA and its Councils may be able to influence this area through actions such as advocacy for legislation on limiting packaging volumes or promoting food waste reduction strategies such as supporting roll out of best practice food waste reduction programs at cafes and restaurants²⁸.

Future changes

Potential long-term (15+ years) initiatives are likely to be impacted by various factors such as legislative changes, landfill levy rate increases, cost increases, current infrastructure shutting down and so on. Potential infrastructure opportunities may alter with these changes, with options for local re-manufacturing becoming more, or less, viable. Councils should continue to consider such changes and whether this may present an opportunity for the region. Currently unviable or impractical innovative solutions may become an ideal solution with such changes, and these options can be revisited on a regular basis to assess their viability.

²⁸ E.g. see <https://beyondfoodwaste.com/leading-food-waste-reduction-programs-by-the-nsw-epa/>

4. Next steps

This plan presents a number of infrastructure needs and opportunities for the Limestone Coast region. There are many options presented, however further investigation required to determine if it is right for the Limestone Coast.

High level cost benefit analyses have been undertaken, but a more detailed business case is recommended for initiatives of interest. The table overleaf (2.6) includes an action list based on short, medium- and long-term priorities for the region.

These actions will help the Limestone Coast Councils to form key partnerships with the local industry, state government and nearby councils, create demand for recycled products, better understand the feasibility behind a range of initiatives, reduce waste generation and increase diversion, increase public awareness, and ensure Councils plan for these infrastructure changes in budgets and enable funding to be sought through grants for upgrades.

Table 2.6:

Infrastructure priority list

Priority	Infrastructure/ area	Actions
Short term (0 – 2 years)	Regional MRF	<ul style="list-style-type: none"> Councils are currently reviewing and investigating best infrastructure options to manage recyclables. Explore a more detailed business case behind building and operating a Council-owned facility. In this investigation, consider how the infrastructure can be effectively shared and utilised, including most effective location. For example, an authority model for the regional MRF based on interested Councils (see Technical Appendix One). Explore back up options for items not recycled at the current MRF due to inefficiencies. For example, C&I plastics (e.g. a plastics baler at the Mount Gambier Transfer Station).
	Shared mobile steel baler	<ul style="list-style-type: none"> Explore a more detailed business case behind building and the operating model for a Council-owned baler. See Technical Appendix One for more information.
	Various new equipment at TSs	<ul style="list-style-type: none"> Implement planned waste and recycling infrastructure upgrades such as weighbridges, comingled recycling compactor, static cardboard compactors.
	Glass to road base	<ul style="list-style-type: none"> Further investigate the purchase of the glass crusher and its application to road base before purchasing equipment. As part of the investigation, contact organisations with experience in this field (e.g. Downer group) to determine the specification requirements (for the glass and equipment).
	Increasing demand for recycled products	<ul style="list-style-type: none"> Councils look at mandating procuring products made from materials recycled in the Limestone Coast region. In particular, road base with glass and compost/ mulch. This includes providing the compost for sale at transfer stations where residents bring in organics. Explore the cost to provide residents with subsidised compost/mulch (bags or bulk) each year for those that participate in the FOGO collections.
	Packaging changes	<ul style="list-style-type: none"> Advocate for legislative changes to packaging.
	Plastics and other (e.g. tyres) applications to road base	<ul style="list-style-type: none"> Contact relevant organisations that have experience in this field and can share their experiences (e.g. Close the Loop, Hume City Council, City of Onkaparinga, Tyre Stewardship Australia) Based on these conversations, conduct a more detailed business case on purchasing and sharing the required equipment to recycle the relevant material to road base, prioritising glass to road base.

Infrastructure priority list continued

Priority	Infrastructure/ area	Actions
Medium term (2 – 5 years)	Beachport TS upgrade	<ul style="list-style-type: none"> Continue plans to move and upgrade the Beachport TS and close down current TS.
	New kerbside bins	<ul style="list-style-type: none"> Continue to roll out new kerbside bins as population increases. Councils that do not currently offer an organics service could explore implementing kerbside organics collection. Consider collection frequency changes to maximise diversion (e.g. weekly/fortnightly FOGO, fortnightly/weekly General Waste). Explore the option to provide residents with bags of compost if it is an opt in FOGO service.
	Increased tonnes from interstate	<ul style="list-style-type: none"> Maintain contact with Victorian Councils and Barwon South West Waste and Resource Recovery Group to explore opportunities to move organics, comingled recyclables and other materials into the Limestone Coast for re-use in the region.
	Sound partnerships	<ul style="list-style-type: none"> Continue to build relationships with other relevant stakeholders (see Partnerships in the previous section).
	Education and engagement	<ul style="list-style-type: none"> Continue to raise public awareness of contamination issues through continued education aimed at reducing contamination. Ensure that education and engagement is relevant and updated based on waste and resource recovery infrastructure changes. Consider waste and recycling avoidance education and engagement to reduce costs for residents, which in turn, reduces need for new waste and recycling infrastructure.
Long term (5+ years)	Innovative infrastructure options	<ul style="list-style-type: none"> Explore innovative options not currently viable or practical to assess viability as markets, costs, landfill levy and tonnes change.
	Supporting commercial sector	<ul style="list-style-type: none"> Continue to support the commercial sector as it trials new ideas to increase diversion and the value of recycled products. E.g. an anaerobic digester. Re-visit other organics processing options if the commercial sector is not taking action in this space, assessing the feasibility of relevant plant and equipment, e.g. a regional biomass plant. This may be particularly relevant for the District Council of Grant.

5. Appendices

5.1. Appendix One - Waste infrastructure types and definitions

Infrastructure class	Infrastructure type	Description
Collection infrastructure	Kerbside source separation bin systems	Kerbside bins for collection of MSW waste.
	Skip bins	Bins for collection of C&I and C&D waste (which range from 120 litres up to 20 cubic meters).
	Collection vehicles	Vehicles to collect waste, including side-lift, rear-lift, front-lift, Pantech, flatbed trucks, hook lift and other waste collection vehicles.
	Vacuum systems	An automated collection system which transports waste underground from a series of waste inlets to a collection station through a closed pipe network.
Resource recovery infrastructure	Transfer stations (including compaction equipment)	Transfer stations are permanent sites set up to receive, minor sorting, and temporarily store waste and recyclables prior to be taken to a reprocessing or disposal facility. This infrastructure also includes compaction equipment, such as balers, to reduce the volume and associated costs for transport.
	Transfer vehicles	Large vehicles for bulk transport of waste (e.g. a walking floor trailer).
	Material recovery facility (MRF)	A facility where mixed recyclable materials are received, stored and sorted to specifications, then baled, shredded, crushed, compacted or otherwise prepared for shipment to market.
	CDL facilities	Depots where container deposit legislation (CDL) bottles/cans can be dropped off by businesses or the general public for refund (currently 10 cents per container) and are sorted to specifications for shipment to market.
	Drop-off facilities	Depots where waste under product stewardship schemes (e.g. computers and TVs, waste paints) may be dropped off and are aggregated for transfer to suitable recyclers.
	Other	A facility that does not fit the above definitions which receives and undertakes minor processing of a single waste stream, such as used motor

Infrastructure class	Infrastructure type	Description
Reprocessing infrastructure		vehicles, foundry sands, grease trap wastes, biowaste or bulky wastes.
	Composting facilities (open windrow)	Facilities where source separated organics are composted using open windrow technology. The material is set out in long triangular cross section windrows in the open air with no enclosures or covers.
	Composting facilities (covered / tunnel)	Facilities where source separated organics are composted using covered windrow or fully enclosed tunnel technologies. These technologies minimise the potential for fugitive odour emissions from the piles and provide totally enclosed conditions where near-optimal composting conditions can be controlled and maintained.
	Energy-from-waste facilities – thermal treatment	Facilities where waste is thermally treated, and energy is recovered.
	Energy-from-waste facilities – anaerobic digestion	Facilities where microorganisms break down biodegradable waste in the absence of oxygen to produce methane, which is recovered for energy.
	Glass crushing equipment	Plant and equipment that can crush glass, removed contamination (labels, lids etc) to be suitable for use in roads or other civil applications. Glass may come from MRF or other glass sources.
	Mechanical biological treatment	Facilities that combine a sorting facility with a form of biological treatment such as composting or anaerobic digestion.
	Construction and demolition processing facilities	Facilities that sort, crush, screen and recycle building materials.
	Other processing facilities (medium technology)	Other medium technology waste processing technologies that are grouped based on having capital and operating expenditures in the same order of magnitude. This includes reprocessing facilities for glass, plastics, paper/cardboard, metals, grape marc and meat rendering.

Infrastructure class	Infrastructure type	Description
Hazardous Waste infrastructure	Other processing facilities (high technology)	Other high technology waste processing technologies that are grouped based on having capital and operating expenditures in the same order of magnitude. Potential examples include low volume, high capital processing facilities such as nickel cadmium, lithium ion battery and CCA-treated post processing and mercury distillation.
	E-waste processing facilities	Facilities where e-waste is refurbished for reuse or disassembled manually, machine crushed or via automated equipment or high-tech smelting processes with various valuable components extracted and reprocessed.
	Hazardous waste facilities	Facilities which store and treat hazardous waste. Treatment types include recycling, chemical/physical treatment, thermal, energy recovery, immobilisation, biological and other.
	Soil storage and remediation facilities	Facilities that store and remediate contaminated soil so that it can be beneficially reused.
	Emerging waste streams facilities	Facilities that process emerging waste streams (e.g. e-waste).
Disposal infrastructure	Landfills	Facilities where waste is disposed into suitably constructed engineered cells.
	Medical waste disposal	Facilities that treat medical waste, including autoclave and incineration technologies.

5.2. Appendix Two - Air separation distances for waste and recycling activities

Infrastructure type	Air separation distance (metres)
Landfill	500
Transfer station/ resource recovery centre	300

5.3. Appendix Three – levy impact in the region

Current contribution to the landfill levy and estimated future contribution (from kerbside general waste only).

Financial year	Levy (\$/t) non-metro councils	Approximate contribution from kerbside general waste per annum
17-18	\$44	\$581,000
18-19	\$50	\$660,000
19-20	\$51.50	\$680,000