South Australia's Kerbside Waste Performance Report 2020-21

Government of South Australia

Green Industries SA

Acknowledgements

The information in this report is entirely dependent on the accuracy of the data provided by Adelaide metropolitan and SA regional councils, contractors collecting kerbside waste, and the South Australian Local Government Grants Commission. Green Industries SA acknowledges their assistance.

Government of South Australia

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Executive Summary

This report presents data on kerbside waste and recycling collection services in South Australia provided by the 19 metropolitan Adelaide and 49 regional councils in the 2020-21 financial year. It analyses performance and improvements in council waste management efficiency and sustainability over the past 17 years.

The focus is only on waste material collected at kerbside bins provided specifically for residual waste (landfill), co-mingled recyclables and organics (green and/or food). Hard waste, street sweepings, Container Deposit Scheme (CDS) returns and waste collected at drop-off facilities and council-operated commercial services are excluded from the main report. Results of council non-kerbside waste collections are presented in **Appendix 1**.

All 19 metropolitan Adelaide councils offer a three-bin service that has been gradually introduced from about 2001, although six only provide an organics (green and/or food) bin on an opt-in basis. In the regions, approximately half offer a three-bin system, including many where these services are provided to townships only. One regional council offers a fourth bin for paper and cardboard only. There are also some differences between councils in terms of bin ownership, full council ownership versus optional adoption (householder ownership) and collection frequency.

Green Industries SA is committed to working with Local Government councils to improve waste and recycling management to achieve the targets set in the *South Australia's Waste Strategy 2020-25*.

Reporting is based on the gross waste quantities reported in councils' kerbside performance data and provided without further alteration. This data therefore depicts quantities that are inclusive of contamination as measure of householder's behaviour. The complete data enables the examination and analysis of householder behaviours and bin usage, trends and patterns and the relationship and dependency on geography and socioeconomic factors. 'Contamination', or incorrectly placed material, as well as effective diversion rate, are discussed in **section 2.3.3.**

Performance

In 2020-21, across the State:

679,000 tonnes of Municipal Solid Waste (MSW) was collected from kerbside

South Australia recovered:

195,200 tonnes of organics

132,100 tonnes of recyclables

This equates to about:

410 kilograms per person

OR

984 kilograms per serviced household

This represents a total recovery rate of

48.2%

In metropolitan Adelaide:

90% of households have a 3 - bin system

521,900 tonnes of MSW was collected from kerbside

Metropolitan Adelaide recovered:

162,000 tonnes of organics

102,300 tonnes of recyclables

This equates to about:

414 kilograms per person

OR

1,009 kilograms per serviced household

This represents a total recovery rate of

50.6%

In regional South Australia:

157,100 tonnes of MSW was collected from kerbside

Regional areas recovered:

33,200 tonnes of organics

29,800 tonnes of recyclables

This equates to about:

397 kilograms per person

OR

911 kilograms per serviced household

This represents a total recovery rate of

40.1%

Recommendations

The findings of this report suggest that the following changes are necessary to improve the diversion of waste from landfill:

1. Adopting a standardised three-bin system across all metropolitan councils to include as a minimum service to all households:

   a. fortnightly collection of co-mingled recyclables

   b. fortnightly collection of organics, including food waste.

   This will have an immediate impact on raising the kerbside diversion rate. Universal rollout of area-wide food waste diversion systems will raise waste diversion rates and may narrow the gap between best and least performing councils.

   In addition, change of organic collection frequency to weekly collection presents an opportunity to further improve the diversion of waste from landfill.

2. Standardised and consistent messaging on materials collected in kerbside bin-based services across all metropolitan councils

   The state-wide Which Bin campaign launched in May 2019 has aided the consistency of education and awareness efforts as it has a standard list of materials that can be placed in the recycling and organics bins.

   This will reduce confusion for residents about which bin to use, reduce contamination of the recyclables stream and organics stream and divert more food waste from the residual stream.

   Inconsistent messaging where advice and language could vary from council to council was leading to confusion on the easiest way to comply with proper recycling practice. Simplifying and standardising messaging is essential to improve awareness and knowledge to entrench the culture of waste minimisation. Normalising the behaviour of recycling and improving the awareness takes time and requires constant reinforcement of the key messages. Costs on communication and education are also reduced in the longer term by providing the same message in the same format and the same brand to all households across all councils.

3. Standardisation of bin infrastructure to comply with AS 4123.7

   The standard promotes the adoption of common colour coding of waste, recycling and organics kerbside bin collection services across Australia and is intended to support correct recycling 'automatic' and 'unthinking' behaviour.

   South Australia's Waste Strategy 2020-25 recognises the importance to set up consistent systems and technology for MSW and one of the priority actions identified is to ensure that kerbside bins are compliant with the relevant Australian standard on mobile waste containers. It is recommended that in council areas that have blue lidded landfill bins, any lids that need replacing are replaced with red lids. Over time the council will be able to transition to red lids without any cost compared to a complete change over which would be cost prohibitive.

4. Developing Regional Waste Management Plans setting regionally appropriate and progressive waste diversion targets.

   To ensure continued progressive improvement in waste diversion in regional areas, the *South Australia's Waste Strategy 2020-25* includes a new quantitative target for regional areas – by 2023: Regional Waste Management Plans are in place for all South Australian regional local government areas and/or regional city clusters and set regionally appropriate and progressive waste diversion targets. These plans are to be provided to GISA by 2023.

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1 Introduction

1.1 Purpose

Information on waste streams is needed to help monitor progress towards the municipal waste targets set in *South Australia's Waste Strategy 2020-25* (GISA 2020) and to inform decision making, particularly in relation to programs and incentives to improve recycling rates and to target areas most in need.

This report presents data on kerbside waste and recycling collection services provided by the 19 Adelaide metropolitan and 49 regional councils in the 2020-21 financial year and analyses performance and improvements in waste disposal efficiency and sustainability. It also reports on trends over a 17-year period.

The focus is only on waste collected at kerbside in bins provided specifically for residual waste (landfill), co-mingled recyclables and organics (garden and/or food). Hard waste, street sweepings, Container Deposit Scheme (CDS) returns and waste collected at drop-off facilities and council-operated commercial services are excluded.

As such, the recovery rate stated in this report differs from that cited in the South Australia's *Circular Economy Resource Recovery Report 2020-21 (CERRR)*, which includes these other components of the total Municipal Solid Waste (MSW).

It also should be noted that MSW is only one of the three sectors that contribute to SA's total waste, with each having its own recycling rate. In 2020-21, 83.3% of all waste in South Australia was diverted from landfill for recycling and other purposes (Blue Environment 2022).

Residential residual waste accounts for 44% of the total solid waste that goes to landfill. The remainder is commercial and industrial waste (18%) and construction and demolition waste (39%).

1.2 Background

The environmental benefits of a three-bin waste collection system are well established and the 19 metropolitan Adelaide councils have offered this service for a number of years. In regional areas, half of councils have three-bin systems and all have at least one bin collected at kerbside. One regional council implemented a four-bin system several years ago where the extra bin is solely for cardboard and paper. Differences do exist between councils even where the same number of bins are provided, due to different collection frequency and service provision for green and food organics, use of kitchen caddies, and area-wide rollout versus opt-in.

In low-density residential areas, most councils provide a 140L bin for residual waste and 240L bins for comingled recyclables and organics respectively. However, organics bins are optional in some areas and must be purchased by residents.

All metropolitan Adelaide councils collect residual waste bins weekly and recyclables fortnightly, but organics collections vary: all are fortnightly, but some are still opt-in.

The average diversion rate at kerbside by householders from the three-bin system across the 19 metropolitan councils was 50.6% in 2020-21. The effective diversion rate, allowing for misplaced material in the organics and recyclables bins, was 46.7%. The top performing councils – some achieving nearly 60% – were those that provide a weekly residual waste collection, fortnightly recyclables collection and fortnightly organics collection including food waste to all households. Weekly organic and fortnightly recyclable and residual collections could further improve the waste diversion beyond 70%.

Regionally, the recovery rate varies from zero (single bin service for residual waste only) to rates that are on par with metropolitan Adelaide (three-bin systems) with fortnightly organics collection.

Councils often contract collection services to external contractors, many of which are private companies. The contractors collect the residual bins which are transported to landfill transfer stations or directly to landfill sites, mixed-recycling bins which are taken to Material Recovery Facilities (MRFs) for sorting and processing and organics bins (garden and/or food) to composting operations. The quantities are weighed at weighbridges at each location and individual councils are charged a service fee.

1.3 Context

Since 2005 Green Industries SA, formerly Zero Waste SA, has funded metropolitan and regional councils to implement improved kerbside collection systems for residents. In particular, there has been an increased emphasis on diversion from landfill using better performing kerbside systems.

By 30 June 2021, $29.9 million had been provided to 67 councils and 12 of their subsidiaries through a range of GISA grants programs such as: *Circular Economy Market Development Grant; Kerbside Performance Incentives;* the *Kerbside Performance Plus (Food Organics) Incentives* which focuses on food diversion from residual to organics bins; *Council Modernization Grants, "Which Bin" Campaign; Regional Transport Subsidies Program; Regional Infrastructure/Implementation; Business Sustainability Program and Reuse;* and *Recycling Infrastructure Grants.*

The Local Government Association of SA (LGASA) has a strong interest in municipal waste management and recycling, as these services are valued by residents and present a cost to councils. As councils provide waste management and recycling services to their residents, they are the primary custodians of the kerbside waste data.

The SA Local Government Grants Commission (SALGGC) requests waste management data from all councils, which is provided on an annual basis.

All 19 metropolitan Adelaide councils provide their kerbside waste data directly to GISA for the purpose of this report. GISA used SALGGC data to quantify costs incurred by councils for kerbside collections and for reporting waste quantities for regional councils[1].

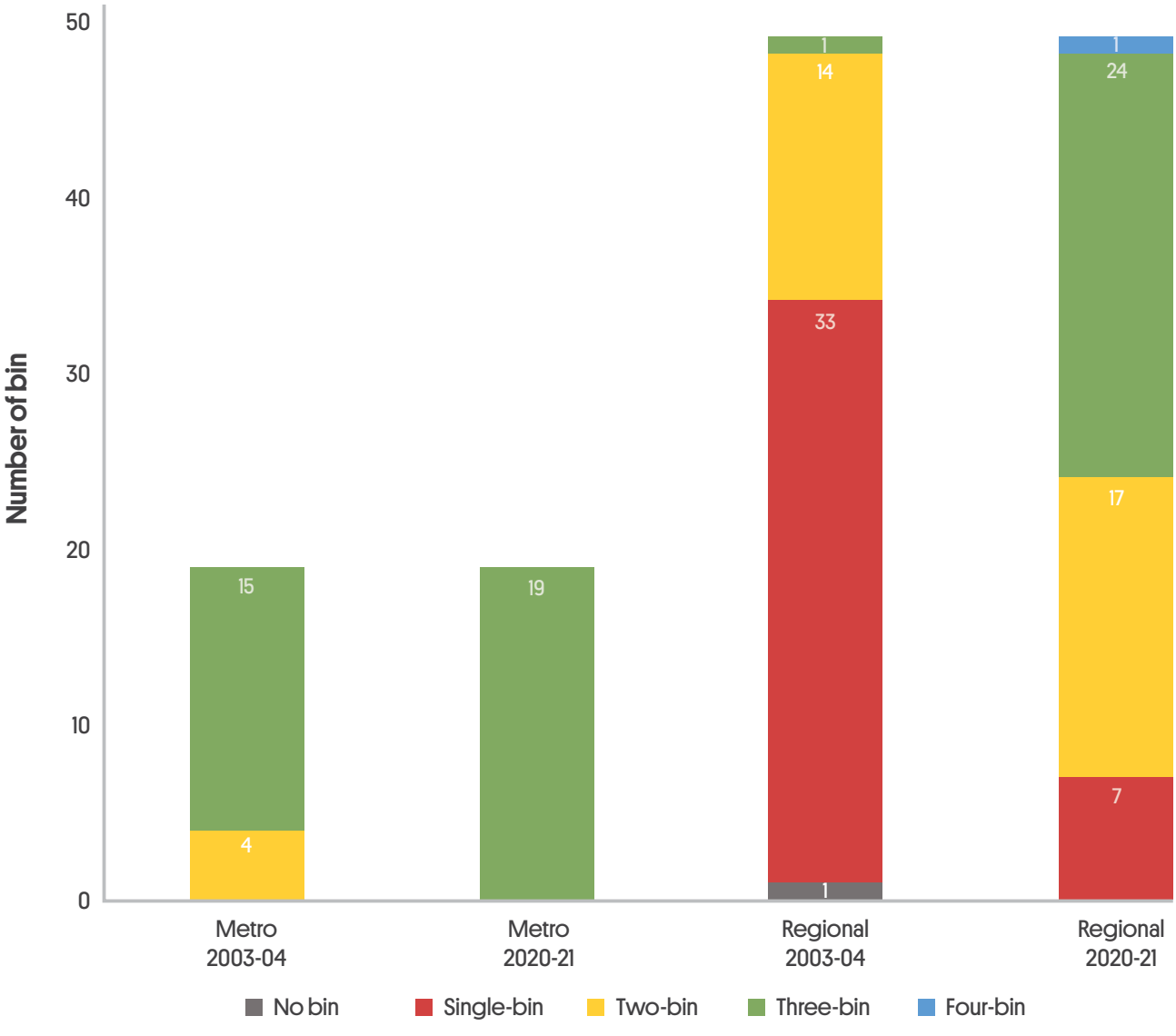
1 In regulations under the Environment Protection Act, if a council sends less than 10,000 tonnes to landfill per year, the waste quantities can be estimated based on a population formula (SA EPA 2009)

2 Findings

2.1 South Australia's Kerbside Waste and Recycling Services

South Australia has 68 councils, 19 of which are metropolitan and 49 regional. In 2020-21, 44 councils across the State offered 3-bin systems to their residents (one offering a 4-bin system), compared with 16 in 2003-04. Only 7 councils now offer a 1-bin system. This improvement in recycling services offered is summarised in **Figure 1**.

Figure 1. Regional and Metropolitan Adelaide Kerbside bin systems compared in 2020-21 and 2003-04



2.2 South Australia's Kerbside Quantities

In SA in 2020-21, approximately 679,000 tonnes of municipal waste was collected from kerbside, 521,900 tonnes from metropolitan areas and 157,100 tonnes from regional areas (**Table 1**). The 19 metropolitan councils account for 77% of the total kerbside waste collected in SA.

Table 1. South Australia's Total Kerbside Waste Quantities, 2020-21

Material	State - SA (tonnes)	Metro (tonnes)	%	Regional (tonnes)	%
Residual	351,700	257,600	73%	94,100	27%
Organics	195,200	162,000	83%	33,200	17%
Recyclables	132,100	102,300	77%	29,800	23%
Total	**679,000**	**521,900**	**77%**	**157,100**	**23%**
Recovery Rate	**48.2%**	**50.6%**		**40.1%**	

Sources: SALGGC (2022) and GISA (2022)

South Australians produced approximately 410 kg per person of MSW at kerbside, or 984 kg per household serviced (**Table 2**). There has been an increase in total waste of 9,450 tonnes from the previous financial year (**Table 3**), much of which is related to people staying home during the COVID-19 pandemic restrictions. **Table 3** also illustrates the significant progress in recovery rates from 2003-04 when a three-bin system rollout had commenced in some councils.

Table 2. South Australian kerbside waste collections per household and per person, 2020-21

Material	State – SA (tonnes)	Waste Per Capita (kg/pp/yr)	Waste Per Household (kg/hh/yr)
Residual	351,700	212	509
Organics	195,200	118	283
Recyclables	132,100	80	192
Total	**679,000**	**410**	**984**

Table 3. South Australian kerbside waste quantities, 2019-20 and 2020-21

Material	2003-04	2019-20	2020-21	12 month difference (%)
Residual	504,600	348,100	351,700	1.0
Organics	83,600	188,400	195,200	3.5
Recyclables	84,800	133,000	132,100	-0.6
Total Tonnes	**673,000**	**669,500**	**679,000**	**1.4**
Recovery Rate	**25.0%**	**48.0%**	**48.2%**	**0.2%**

2.3 Metropolitan Kerbside Waste and Recycling Services

In 2020-21, all 19 metropolitan Adelaide councils offered access to the three-bin system (up from 15 in 2003-04), although three – Playford, Salisbury and Gawler – only provided an organics service on request and the Adelaide Hills Council only covered about two-thirds of households (mostly in townships) for organics service.

An estimated 61% of rate payers in Playford, Salisbury and Gawler chose to pay for an organics bin under Northern Adelaide Waste Management Authority's (NAWMA) voluntary service (NAWMA 2021), with participation increasing since 2011-12. It is estimated that about 90% of metropolitan households now have three bins in use, a figure which has risen as Northern sub-region councils move towards a full three-bin rollout.

All metropolitan Adelaide councils now offer a weekly residual service, fortnightly recyclable collections and fortnightly organics collections.

All use yellow lids for recycling bins and most use green (lime or dark green) for organics bins, but only 12 councils (covering 63% of households) use red lid for residual waste, as set out in Australian standard AS 4123.7 (see **Table 4**). The other seven use blue lids which, according to the standard, are for cardboard and paper only.

Using AS 4123.7 has been found to reduce waste sent to landfill, increase recycling and support consistent education campaigns to reduce resident confusion about how to correctly use kerbside bins collection services (MWRRG 2017).

Table 4. Some kerbside bin colours as recommended in AS 4123.7

Type of materials	Body	Lid
Garbage/General waste	Dark Green or Black	Red
Green Waste/Organics	Dark Green or Black	Lime Green
Recyclables	Dark Green or Black	Yellow
Paper/cardboard	Dark Green or Black	Blue

2.3.1 Metropolitan Adelaide Kerbside Quantities

In 2020-21, residents in the metropolitan area generated 521,900 tonnes of kerbside materials, of which 50.6% was recovered as recyclables or organics, a 0.1% increase on the previous year (**Table 5**). This was driven by a 2.4% increase in organics. These are the raw tonnages presented at kerbside for collection by householders and represent householder behaviour. The issue of incorrectly presented material is discussed in **section 2.3.3.**

Approximately 414 kg of MSW was collected per person, or 1,009 kg per household serviced (**Table 6**).

Table 5. Metropolitan Adelaide Councils: comparisons of 2019-20 and 2020-21 with 2003-04 Kerbside Quantities

Material	2003-04	2019-20	2020-21	12 month difference (%)
Residual	302,300	256,300	257,600	0.5
Organics	66,800	158,100	162,000	2.4
Recyclables	74,300	103,400	102,300	-0.9
Total Tonnes	**443,400**	**517,800**	**521,900**	**0.7**
Recovery Rate	**31.8%**	**50.5%**	**50.6%**	**0.1%**

Table 6. Metropolitan Adelaide kerbside waste collections per household and per person, 2020-21

Material	Metro Adelaide (tonnes)	Waste Per Capita (kg/pp/yr)	Waste Per Household (kg/hh/yr)
Residual	257,600	204	498
Organics	162,000	128	313
Recyclables	102,300	81	198
Total	**521,900**	**414**	**1,009**

Seasonal fluctuations in monthly collection trends (**Figure 2**) can affect quantities. For example, garden waste increases in spring and autumn and general waste around Christmas and Easter. Weather conditions, particularly rainfall, also can affect quantities of garden waste. Despite 2020-21 being a drier than average year (see rainfall figures in **Table 14**), the three bin recovery rates increased due to larger numbers of opt-in organic bins deployed to households.

Fluctuations in the three-bin recovery rate over 2020-21 are shown in **Figure 3**. The peak in November is the result of spring garden organics growth. COVID-19 factors (e.g. lockdowns) may have also contributed to more overall waste recovery.

Figure 2. Metropolitan Adelaide Monthly three-bin Kerbside Quantities, 2020-21

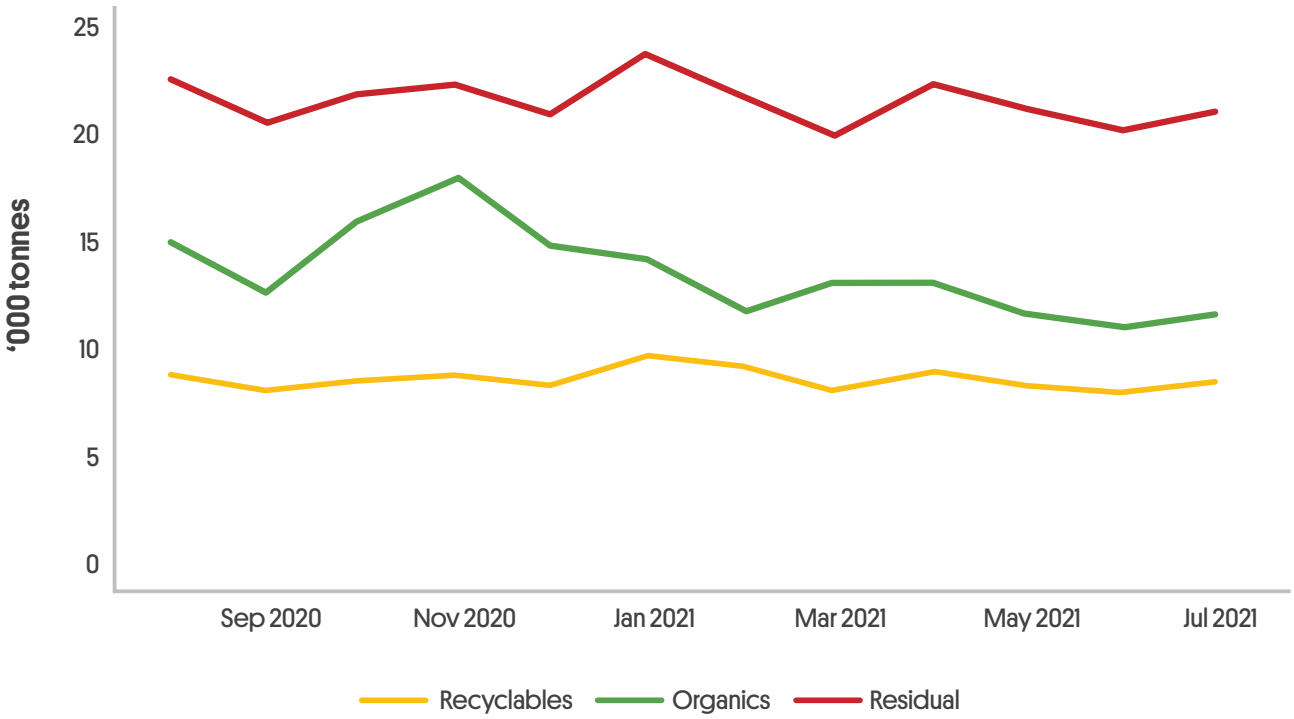
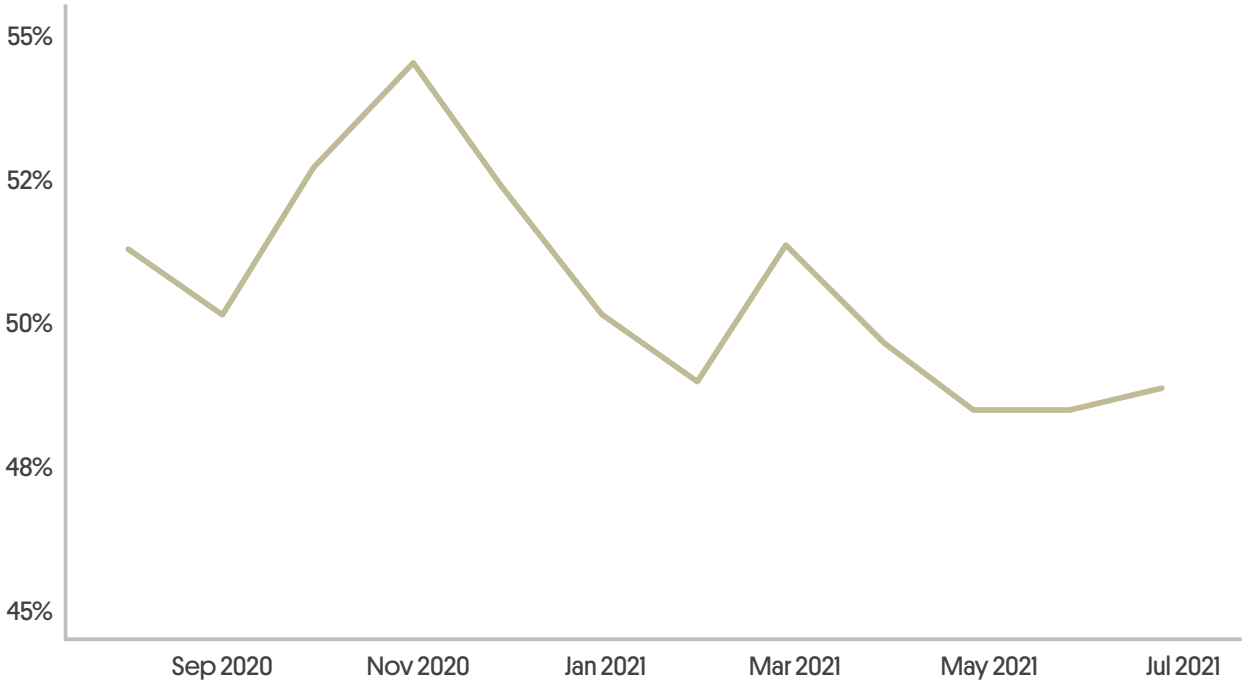


Figure 3. Metropolitan Adelaide Average three-bin Recovery Rate by Month, 2020-21



Further analysis of recovery rates by sub-regions within the Adelaide metropolitan area can be seen in **Figure 4**. For explanation of the three bin and recyclables recovery rates refer to **Appendix 2**.

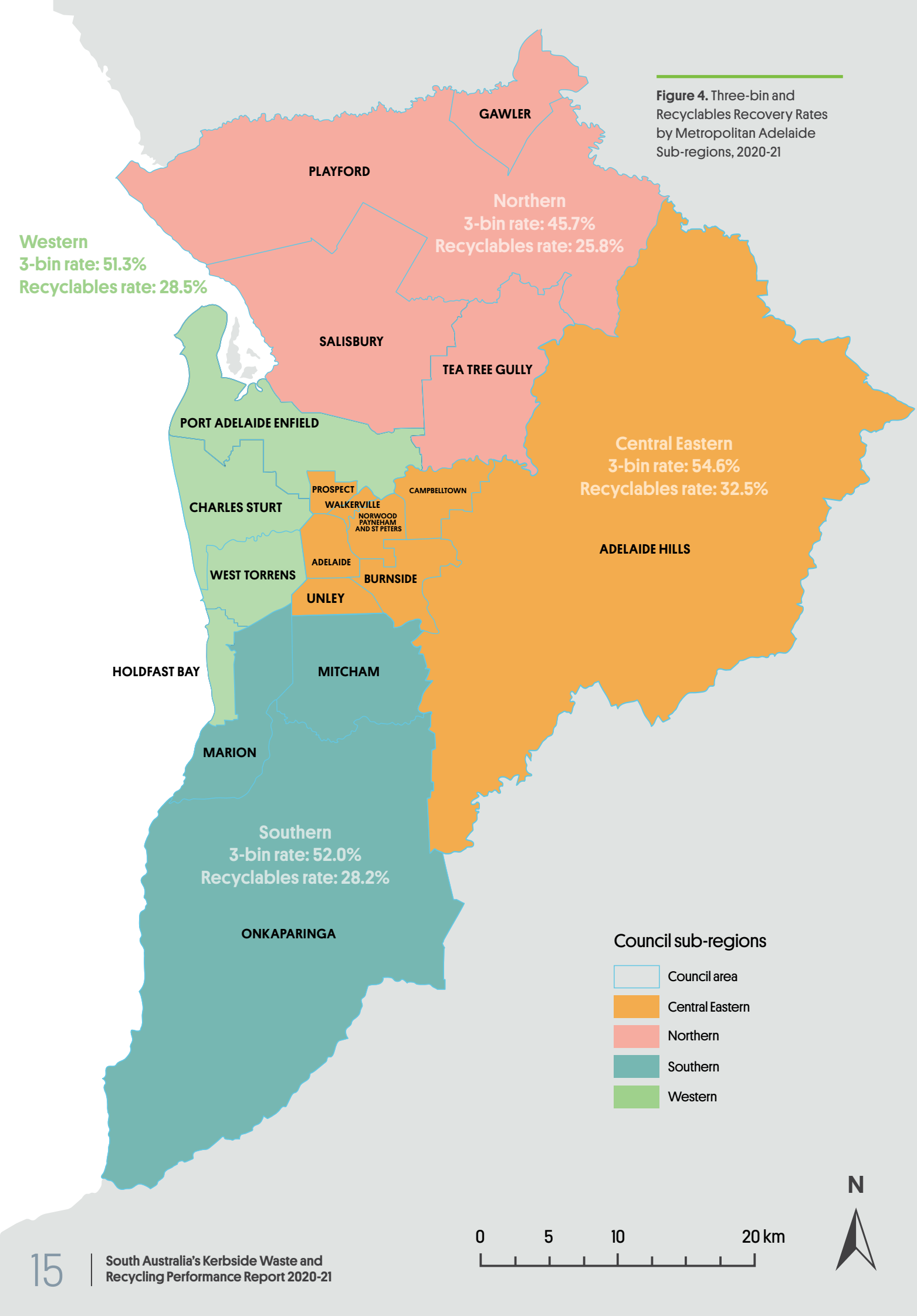


Figure 4. Three-bin and Recyclables Recovery Rates by Metropolitan Adelaide Sub-regions, 2020-21

2.3.2 Metropolitan Adelaide Recovery Rate Performance

Table 7 shows the three different recovery rates for each of the 19 metropolitan councils with the previous year's figures as a contrast. A description of the organics and food waste diversion service they offer residents is also provided. The councils are ranked from highest performer to lowest by the 3-bin recovery rates, but colour coding also provides relative ranking for their recyclables and organics recovery rates. This shows some of the compounding issues that make up the 3-bin recovery rates. For example, the lowest ranked council does not have as much residential garden area and cannot collect organics quantities at levels equivalent to other councils. However, their recyclables recovery rate is close to the Metropolitan Adelaide median value. This is further investigated in **Figure 10**.

Fifteen of these councils achieved three-bin recovery rates greater than 50%.

In general, the best performing councils have full organics bin coverage, supplemented with a food caddy and are located in an area with a high greenness index. However, direct comparisons are difficult due to different underlying factors such as geography, demography, use of food caddies and rainfall.

Figure 5 provides the three-bin recovery rates from the 19 Metropolitan Adelaide councils over a number of years. Although expressed as a three-bin rate, in a small number of councils householders may have had a two-bin only at kerbside as some systems were opt-in.

Figure 5. Metropolitan Adelaide Kerbside three-bin Recovery Rates, 2020-21

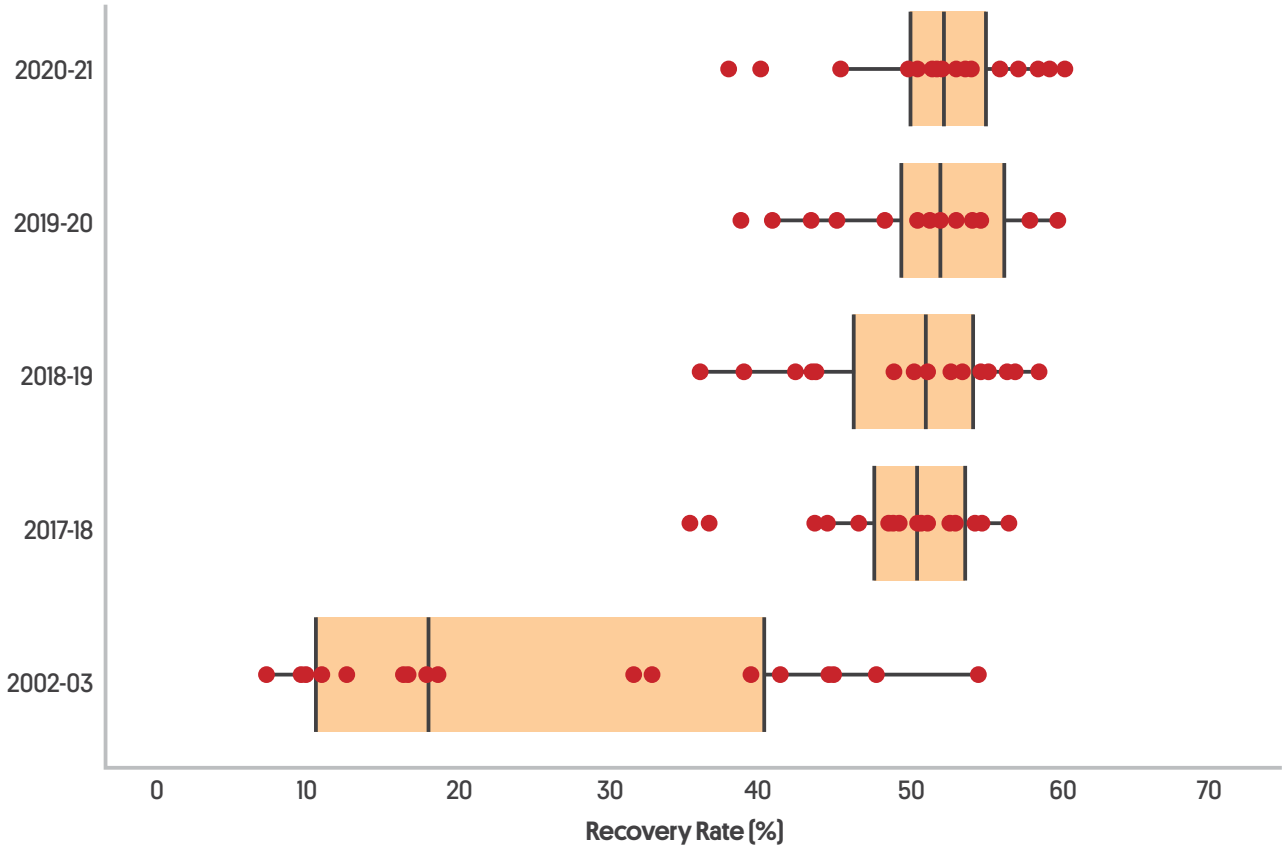


Table 7. Recovery Rates Achieved by each Metropolitan Adelaide Council, 2020-21.

	2020-21			2019-20				
Sub-Regions	**3-bin RR**	**Org. RR**	**Recyc. RR**	**3-bin RR**	**Org. RR**	**Recyc. RR**	**Food Waste System**	**Greenness index**
Central Eastern	60.1	48.8	35.8	59.7	48.4	35.3	Area-wide	0.200
Central Eastern	59.1	47.3	35.4	57.9	46.2	34.1	Opt-in	0.176
Central Eastern	58.4	46.3	35.2	57.7	45.1	35.3	Area-wide	0.171
Southern	57.1	46.0	32.3	58.0	46.8	33.5	Opt-in	0.230
Western	55.9	42.7	34.3	57.8	44.8	35.8	Area-wide	0.141
Central Eastern	53.9	40.6	32.8	54.5	41.4	32.9	Area-wide	0.146
Central Eastern	53.9	42.9	29.4	54.1	42.3	30.8	Area-wide	0.152
Central Eastern	53.6	42.4	29.5	53.0	41.4	29.6	Area-wide	0.149
Central Eastern	53.0	38.8	33.1	51.2	36.3	32.3	Opt-in	N/A
Southern	52.1	40.9	28.4	50.4	40.3	25.4	Opt-in	0.163
Western	51.7	40.2	28.5	51.9	40.3	28.9	Opt-in	0.138
Northern	51.3	39.4	28.8	51.3	38.8	29.5	Opt-in	0.173
Western	50.4	39.5	26.7	52.1	41.7	27.0	Opt-in	0.148
Southern	50.0	38.8	26.7	48.2	35.9	27.1	Opt-in	0.178
Western	50.0	38.1	27.7	50.4	38.1	28.6	Area-wide	0.136
Northern	45.4	33.8	24.2	45.1	33.0	24.7	Opt-in	0.147
Northern	45.3	33.2	24.9	43.4	30.9	24.4	Opt-in	0.162
Northern	39.9	24.5	25.4	40.8	24.8	26.5	Opt-in	0.143
Central Eastern	37.9	15.8	29.7	38.8	15.3	31.2	Opt-in	0.111

2.3.3 Bin Presentation and Effective Recovery Rate Performance

Not all the material presented at kerbside was placed in the correct bin by householders. Sometimes this material is incorrectly placed and perceived as "contamination" which represents a lost opportunity. Incorrectly placed material interferes with sorting through materials recovery facilities (MRFs) and commercial composting facilities. Apart from wasting resources that may otherwise be recycled, this also devalues its worth in potential markets. The analysis of the contents of the bins was detailed in **Appendix 1** of *South Australia's Kerbside Waste Performance Report 2018-19* [GISA 2021]. The 2018-19 kerbside report identified that 2% of material in the organics bin on average cannot be recovered. Similarly, the recyclables bin on average has about 17% non-recyclable material. Industry consultations have confirmed that these figures are consistent with their findings and that "contamination" of recycling bins, and to a lesser extent organics bins, continues to be an issue. Taking into account incorrectly placed material at kerbside, an effective Metropolitan Adelaide diversion rate can be calculated and is presented in **Table 8** below.

Table 8. Comparing presentation and effective recovery rates at kerbside.

Bin	Presented	Effective
Residual	258,000	274,000
Organics	162,000	159,000
Recyclables	102,000	89,000
Total Tonnes	**522,000**	**522,000**
Recovery Rate	**50.6%**	**46.7%**

Several kerbside waste audits were undertaken by both metropolitan and regional councils in recent years to determine the behaviour of residents in using the kerbside bins. The audits of metropolitan Adelaide kerbside bins have shown that the residual bin can contain from 35-60% organics (much of which is food organics), as well as around 12-14% recyclables. These materials should have been placed in the organics and recyclables bins respectively. Significant improvements in the recovery rate would be achieved if food waste was placed in the green organics bin. This shows that just considering food organics, conservatively, at least 100,000 tonnes of food material is available to be diverted from residual bins presented at metropolitan Adelaide kerbside.

2.4 Regional Kerbside Waste and Recycling Services

In 2020-21, of the 49 regional councils, 25 councils offered a 3-bin service (one offers a fourth bin for paper and cardboard) compared with one council in 2003-04, and 17 had 2-bin systems, up from 14 in 2003-04. Of the 25 councils with a 3-bin system, 10 offered this service to town residents only and other residents in the council area received a 2-bin service. The number of councils with a 1-bin system decreased several years ago to seven from 33 in 2003-04 (**Figure 1**) and has remained constant since. A number of regional areas provide residents with drop off waste directly to transfer stations which would affect the reported recovery rate.

Table 9. Regional services offered by local councils by bin type

Kerbside Services	Recycling	Organics	Residual
Weekly	0	0	43
Fortnightly	41	20	6
Monthly	2	5	0
No service	6	24	0

The frequency of waste collections offered in regional townships is shown in **Table 9**. This table lists the main kerbside service offered for townships, but if there was no kerbside collection service, the main alternative was noted such as drop-off facilities or an 'at call' service. All 49 regional councils provide a residual kerbside collection with 43 councils collecting residual waste weekly and six fortnightly.

Recyclables are collected fortnightly by 41 councils, monthly by 2 councils, and 6 councils have drop-off facilities only for recyclables. Organics are accepted at drop-off facilities at 21 councils, and 20 councils collect organics fortnightly from kerbside. Five councils have a monthly collection service for kerbside organics. Collection services for individual regional councils can be found in **Appendix 4**.

Since 2004, GISA has provided grants to assist 48 of these councils to expand their kerbside services. This grant recipient number does not include grants to associations or commercial services within a local government area for improvements that would directly affect the council's kerbside collections.

2.4.1 Regional Kerbside Quantities

In 2020-21, residents in regional SA areas generated 157,100 tonnes of kerbside materials, of which 40.1% was recovered as recyclables or organics, a 1.6% increase on the previous year (**Table 10**). This was driven by a 9.6% increase in organics.

Approximately 396 kg of MSW was collected per person, or 909 kg per household serviced in regional areas (**Table 11**).

Table 10. South Australian Regional Councils: comparisons of 2019-20 and 2020-21 with 2003-04 Kerbside Quantities

Material	2003-04	2019-20	2020-21	12 month difference (%)
Residual	202,300	91,800	94,100	2.4
Organics	16,800	30,200	33,200	9.6
Recyclables	10,500	29,700	29,800	0.5
Total materials	**229,600**	**151,700**	**157,100**	**3.5**
Recovery Rate	**11.9%**	**39.5%**	**40.1%**	**1.6%**

Table 11. South Australian Regional Councils: kerbside waste collections per household and per person, 2020-21

Material	Regional (tonnes)	Waste Per Capita (kg/pp/yr)	Waste Per Household (kg/hh/yr)
Residual	93,800	237	544
Organics	33,200	84	192
Recyclables	29,800	75	173
Total	**157,100**	**396**	**909**

2.4.2 Regional South Australia Sub-Regions

To provide some comparisons between councils, sub-regional aggregations have been used. Since 2004-05, populations in all sub-regions have increased (ABS 2021), which has contributed to an increase in total waste generated. Per person and per household analysis has been undertaken and can be seen in **Table 13**.

The box plot in **Figure 7** illustrates the range of kerbside waste recovery performance within each sub-region. The colour codes indicate the number of bins used by each council and clearly show the higher performance of using a three-bin system. The one council with a 4 bin system performs better than the 2 bin systems but lower than most of the three bin systems.

Analysis of recovery rates by local government sub-regions can be seen in **Figure 6**. For explanation of the three bin and recyclables recovery rates refer to **Appendix 2**.

Table 12. Local Government regions: populations and households

Sub-region	Council	Population (2021)	Occupied Private Dwellings (2021)
Central	Adelaide Plains, Barossa, Barunga West, Clare and Gilbert Valleys, Copper Coast, Flinders Ranges, Goyder, Light Regional, Mount Remarkable, Northern Areas, Orroroo Carrieton, Peterborough, Port Pirie, Wakefield, Yorke Peninsula	117,657	50,862
Eyre Peninsula	Ceduna, Cleve, Elliston, Franklin Harbour, Kimba, Lower Eyre Peninsula, Port Augusta, Port Lincoln, Streaky Bay, Tumby Bay, Whyalla, Wudinna	62,264	27,607
Murray Mallee	Berri Barmera, Coorong, Karoonda East Murray, Loxton Waikerie, Mid Murray, Renmark Paringa, Murray Bridge, Southern Mallee	64,207	28,391
Outback	Coober Pedy, Roxby Downs	4,496	1,869
South East	Grant, Kingston, Mount Gambier, Naracoorte Lucindale, Robe, Tatiara, Wattle Range	59,836	25,903
Southern & Hills	Alexandrina, Kangaroo Island, Mount Barker, Victor Harbor, Yankalilla	87,389	37,800
Total		**395,849**	**172,432**

Sources: ABS (2022)

Table 13. Local Government Regions - Total Kerbside Waste Collected, Per Person and Per Household, 2020-21

Sub-region	Recyclables (tonnes)	Organics (tonnes)	Residual (tonnes)	Total waste (tonnes)	Waste per Capita (kg/p/yr)	Waste per Household (kg/hh/yr)
Central	8,890	7,070	27,100	43,100	366	847
Eyre Peninsula	3,500	3,160	17,700	24,400	392	884
Murray Mallee	4,470	4,450	15,800	24,700	385	870
Outback	210	83	1,620	1,920	427	1,030
South East	4,290	5,800	14,700	24,800	414	957
Southern & Hills	8,450	12,600	17,100	38,200	437	1,010
Total[2]	**29,800**	**33,200**	**94,100**	**157,100**	**397**	**911**

2 Total may not add up exactly due to rounding and uncertainty in measurement actual tonnages in some regional areas

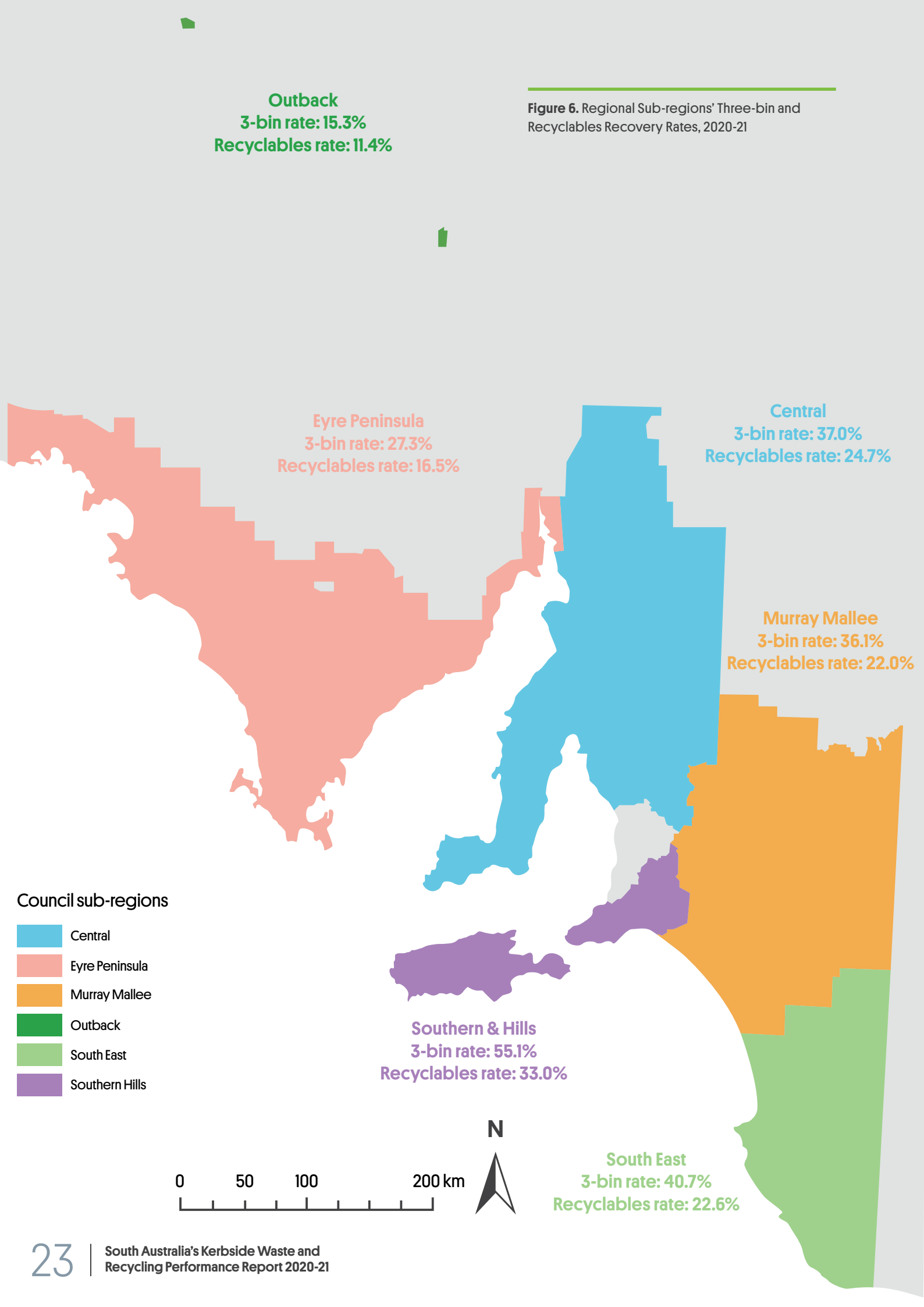
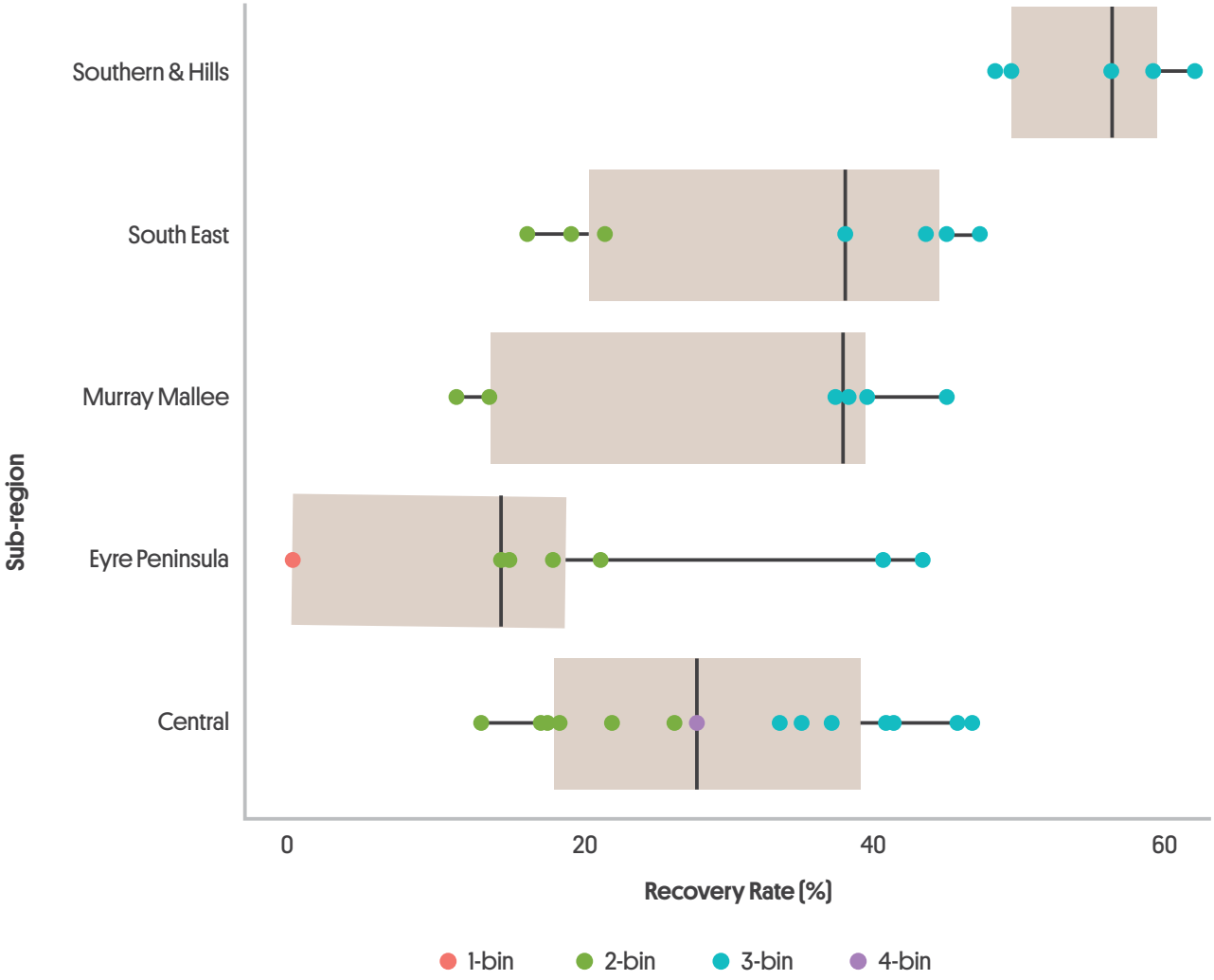


Figure 6. Regional Sub-regions' Three-bin and Recyclables Recovery Rates, 2020-21

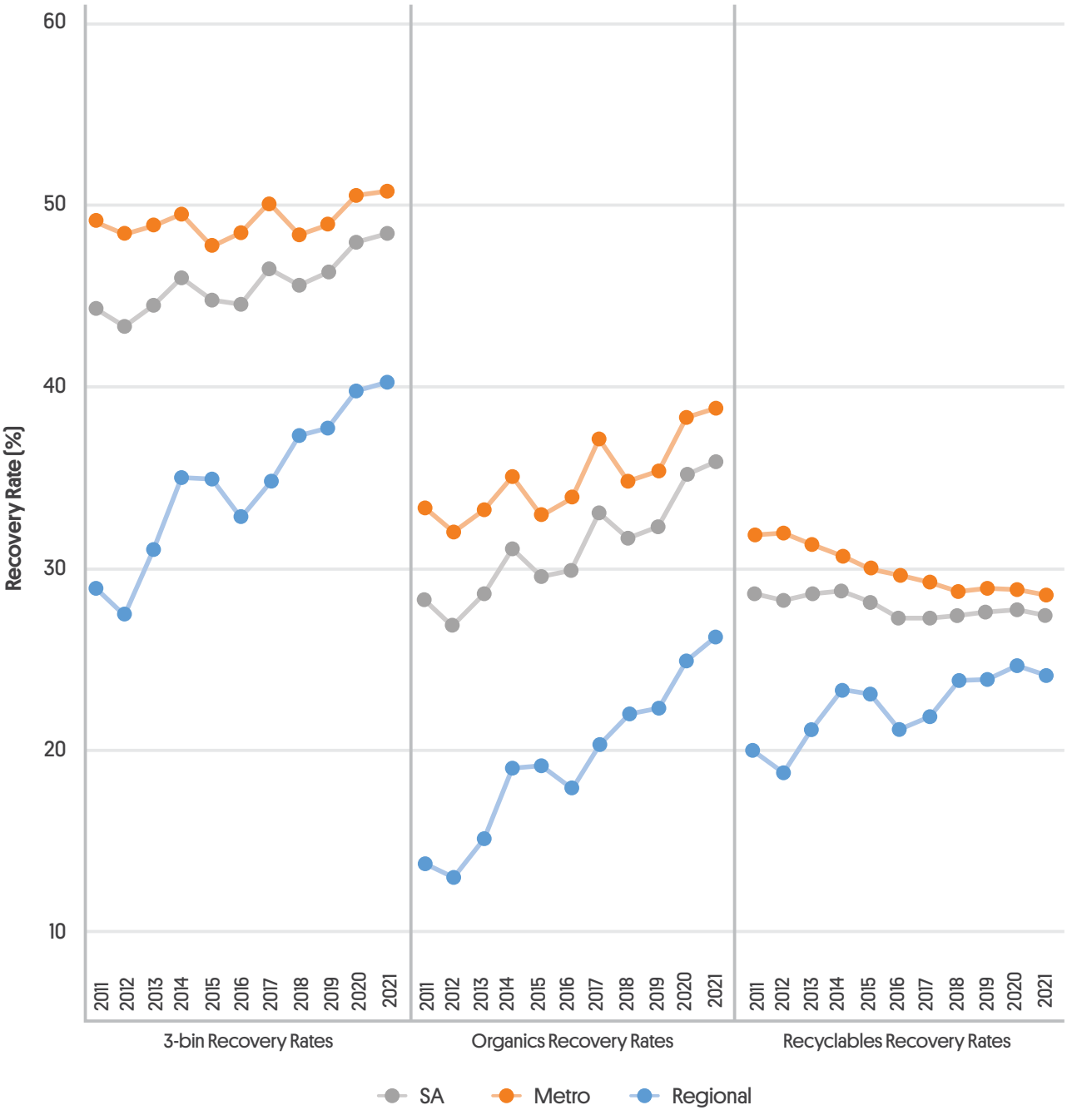
Figure 7. Range of recovery rates of councils within each sub-region



2.5 Long term trends

The long-term recovery trends for metropolitan Adelaide versus Regional SA are represented graphically in **Figure 8**. The recovery rate has improved 0.1% over the previous year for the metropolitan Adelaide area compared with 1.6% improvement against 2010-11 performance. However, in the regional areas, there was a 0.6% improvement from the previous year compared with 11.4% over 2010-11 performance. Regional improvements are due to increased numbers of three-bin services introduced by councils whereas fluctuations in metropolitan Adelaide's rate tend to be due largely to weather factors and garden organics produced.

Figure 8. Comparison of three-bin recovery rates for Metro Adelaide and Regional areas from 2010-11 to 2020-21



3 Factors Affecting Recovery Rates

3.1 Food Waste Collection Systems

Table 7 indicates where food caddy systems have been deployed and how effective these have been for the metropolitan Adelaide area. Currently most of these councils offer free caddies, although in some councils, this is on an opt-in basis rather than council-wide roll-out. For some councils, the availability of food caddy systems on their websites could be more prominent to make it easier for residents, but food caddies may have been promoted in other ways.

A full council-wide rollout of food waste diversion systems, including to multi-unit dwellings, across Adelaide would be expected to lift the recovery rate significantly. Councils with opt-in organics collections should complete the organics bins rollout to all households before more food caddies are deployed. These councils will most likely continue to achieve low recovery rates at kerbside until they do so.

In regional areas, 20 councils offer an opt-in service to at least townships. Details can be found in **Appendix 4**. A few councils encourage home composting systems as an alternative to disposal in the organics bins. No details are available on the uptake rate but, in practice, less waste should be presented at kerbside.

3.2 Garden vegetation

High levels of garden organics tend to boost overall recovery rates (**Table 7**). For example, a Hills council with leafy suburbs has the best three-bin recovery rate, but when organics (the third bin) are discounted, it performs worse than a western suburbs council. Councils with opt-in organics services tend to have lower three-bin recovery rates. Some drier council areas also have alternative recovery options such as resident drop-off facilities, which would not be reflected in three-bin figures.

Adelaide's rainfall was slightly lower in 2020-21 relative to the two previous years (**Table 14**), yet organics collections increased 3.5% compared with 2019-20, likely due to increased numbers of organics bins in place at kerbsides.

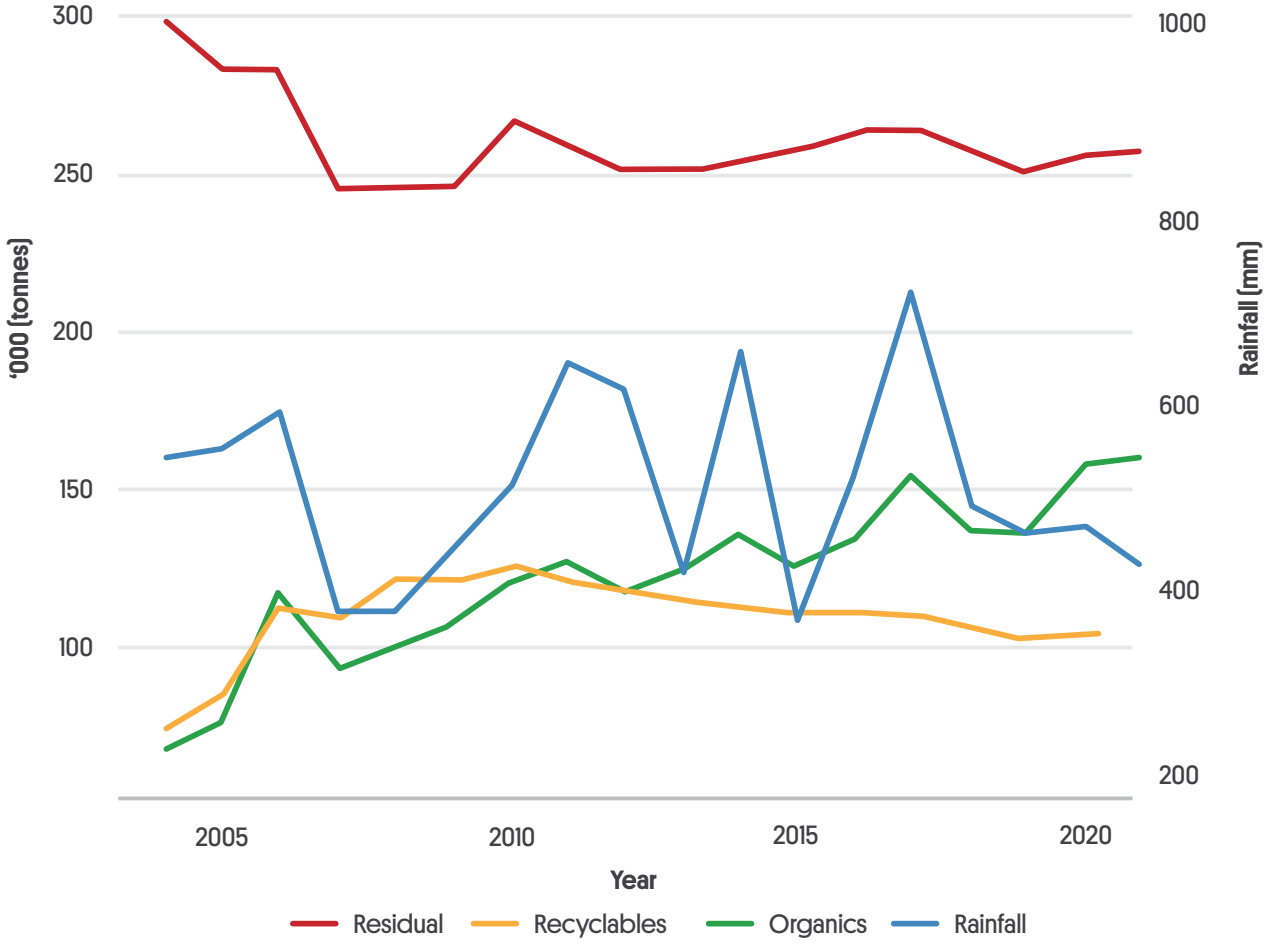
Table 14. Total Rainfall (mm) Recorded at Kent Town/West Terrace for Financial Years (periods ending June 30)

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Rainfall (mm)	609	413	647	377	523	716	487	456	451*	425

**From 2019-20 rainfall measurements were made at West Terrace as the Bureau of Meteorology had closed Kent Town station.*

Figure 9 shows annual rainfall and total of each of bins collected at kerbside for the years 2003-04 to 2020-21. Volumes of organics collected drop in dry years, although this is offset by watering of gardens and rainfall patterns across the year.

Figure 9. Trends of kerbside waste tonnages by bin for Metro Adelaide from 2003-04 to 2020-21

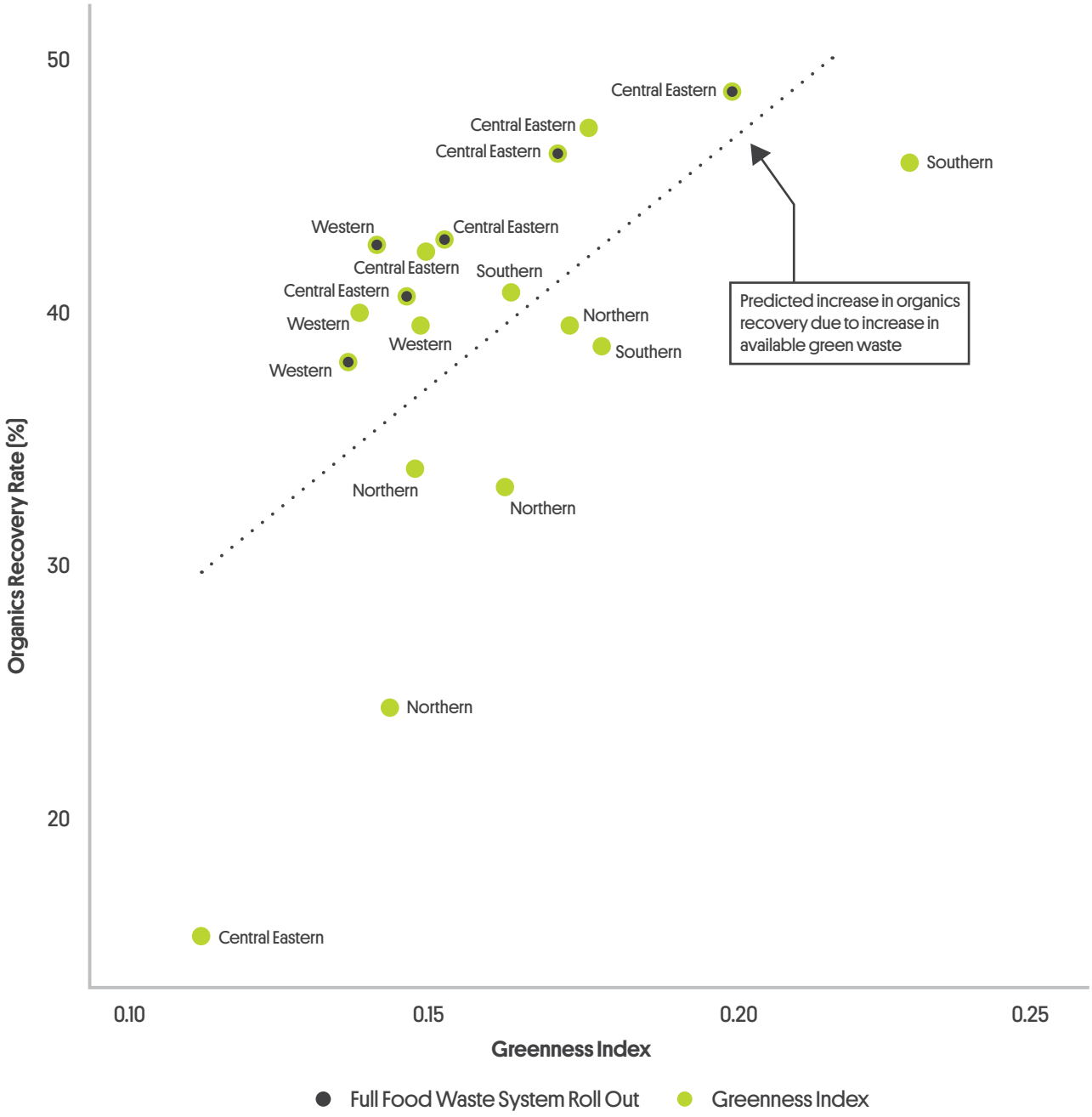


The organics recovery rate was plotted against the greenness index for each metropolitan Adelaide council (except Adelaide Hills) (**Figure 10**) to illustrate that the recovery rate is linked to levels of organic waste presented at kerbside, i.e. councils who can produce more green waste have more waste to recycle and could achieve better recovery rates. Conversely, councils with a residential area served by higher numbers of multi-unit dwellings and very little garden area per dwelling will score lower on a greenness index and are likely to score lower for recovery rates.

Highlighted in **Figure 10** are those councils who have a full food waste system deployed to their residents. All these councils scored above the trend line regardless of their greenness index which confirms that food waste diversion systems when rolled out across whole council areas do increase the recovery rate of waste at kerbside.

Food waste diversion systems when rolled out across whole council areas do increase the recovery rate of waste at kerbside.

Figure 10. Organics recovery rate against the greenness index for each Metropolitan council (except Adelaide Hills)



3.3 Recyclables

In recent years, there has been a trend to reduce the weight of glass and steel packaging or to replace these materials with lighter plastics, and consumers are reading more information digitally which results in fewer physical copies of newspapers and magazines. Newspaper sales fell 44% between 2005 and mid 2018 (see Wikipedia (2019)). Roy Morgan [2019] reports that "Although print readership has declined year-on-year, the latest figures show 1-in-3 Australians (33 per cent) are reading print newspapers".

This has led to a decrease in the volume and, in particular, the weight of material being recycled – though this may be offset to some extend in the future by increased amounts of cardboard as the trend towards online shopping increases, in particular during COVID-19 lockdowns.

Waste avoidance can lead to less waste produced which may lower the recovery rates if this results in less recyclables presented at kerbside. To offset this drop, less material must be presented in residual bins and changes to householder behaviour such as food waste diversion are essential.

3.4 Economic and demographic

Economic and demographic factors influence the amount of kerbside waste and recovery rates. Residual waste per person has remained steady in recent years, but total kerbside waste has increased with population increases. With more waste generated there is the possibility of more recyclables generated. More organics can be produced from gardens being watered in dry years. All these individual factors create a situation where the recovery rate for these residents can go up, but ironically they may be generating more waste overall.

Each council has a mix of residents – from young families to older couples – which affects the profile of waste presented. ABS analysis from the 2016 census shows that some councils have slowing population growth (e.g. Prospect), while others are attracting young families and have increasing populations (e.g. Onkaparinga and Marion). Each situation presents its own demographic and infrastructure challenges.

High-rise developments affect bin system rollouts, and as there are no gardens per household, three-bin recycling rates decrease in areas with large numbers of these developments (e.g. central Adelaide).

The recovery rate is related to household income, and councils with higher household incomes have tended to adopt a full three-bin system with food caddy to all households.

There are also many other factors that underlie this situation – such as awareness programs and education levels of households.

4 Conclusions

This report examines the effectiveness of the kerbside bin systems in South Australia both in metropolitan Adelaide and regional councils, using the recovery rate as an indicator. The most effective system of those in use is the fully implemented three-bin system and providing a weekly residual waste collection, fortnightly recyclables collection and fortnightly organics collection that includes food waste.

All metropolitan Adelaide councils have a three-bin system but some are opt-in only for the organics service. Increasingly, regional councils are offering a similar service, at least in townships. The councils that have the best recovery rates were generally those in which all households have a three-bin system with food waste system, which has achieved up to 60% recovery rate at certain times of the year.

Change of collection frequency can also lead to further improvement to recovery rate. Trials at a metropolitan Adelaide council for weekly organic collection and fortnightly recyclable and residual bins are anticipated to achieve a kerbside recovery rate above 70%.

The amount of kerbside waste materials generated by South Australian households has remained relatively stable over the study period. Improved recycling services have increased the amount of resources recovered and reduced the amount of material being disposed to landfill.

The recovery rate is an indicator of recycling performance. Both three-bin and recyclables recovery rates have been discussed and the latter attempts to show waste diversion without seasonal effects. Various factors influence the recovery rate at a local level or regional level:

- Weather – rain tends to increase organics weight and inflates recovery rates
- Packaging – may reduce the recycling rate in the longer term as heavier material such as glass and steel cans are light-weighted or replaced by lighter plastics, or with materials not recyclable at kerbside
- Less newsprint is being presented at kerbside
- Geography – density of housing and natural rainfall affects opportunities for vegetation growth
- Councils without any organics collections tend to have significantly lower recovery rates, but this may be partly off-set by resident drop-offs
- In the Adelaide metropolitan area, the use of opt-in system for organics collections in some councils has led to performances where recovery rates are seven to 10 percentage points lower than those with full organics bin roll out.
- Education programs, in addition to state-wide communications campaigns will assist councils to raise recovery rates through consistency of message across the state.
- Deploying a uniform three-bin system with food caddies will lead to greater recovery rates
- Economic and social attributes, such as household income and spending, influence the recovery rate. Additionally, the residual waste per person should also be viewed when considering long term trends. The data used for this report and some obtained from other sources show that there are still potential opportunities for greater diversion of recyclable material from the residual bins.
- Uniformity in the waste management message to residents across the whole SA community reduces confusion and increases good waste management practices and recovery rates.

Appendix 1
Non-kerbside bin waste collections

In 2020-21, South Australian councils reported collecting 679,000 tonnes of waste from bins placed at kerbside, but also handled an additional 183,700 tonnes not arising from the householder kerbside bins. The material discussed in this section is householder waste which is not collected in a kerbside bin but is usually presented in drop-offs by residents at transfer stations and council depots, but also includes street sweepings, hard waste collection, and public place recycling. As the tonnages are a mixture of MSW, C&I and C&D streams, it is not possible to separate the portions into each stream. The summary is the aggregate totals of the waste as reported to the LGCC by councils.

The non-kerbside waste collections include drop-offs of food and garden organics (FOGO), recyclables and residual wastes, the quantities of which are affected by the bin services offered in a given council area. For example, it would be expected that a regional council that does not offer a green or yellow bin may make provisions for householders to drop-off green organics or recyclables waste at depots such as transfer stations. Due to lesser numbers of 3-bin systems deployed regionally, the patterns in waste drop-offs are not the same in metropolitan Adelaide versus regional council areas.

In addition to residual, recyclables and organics wastes, there are also non-kerbside bin wastes such as street sweepings, street litter bins, hard waste, e-waste and hazardous waste. **Table A1.2** shows the tonnages of non-kerbside bins waste collected in metropolitan Adelaide and regional areas.

Table A1.1. Total tonnes of waste collected by South Australian councils by presentation type

Waste types presented	Waste Per Household (kg/hh/yr)
Kerbside bins	679,000
Drop-offs, special collections, sweepings etc	183,700
Total	**862,700**

The non-bin collections are shown by location (metro versus regional) in **Table A1.2.**

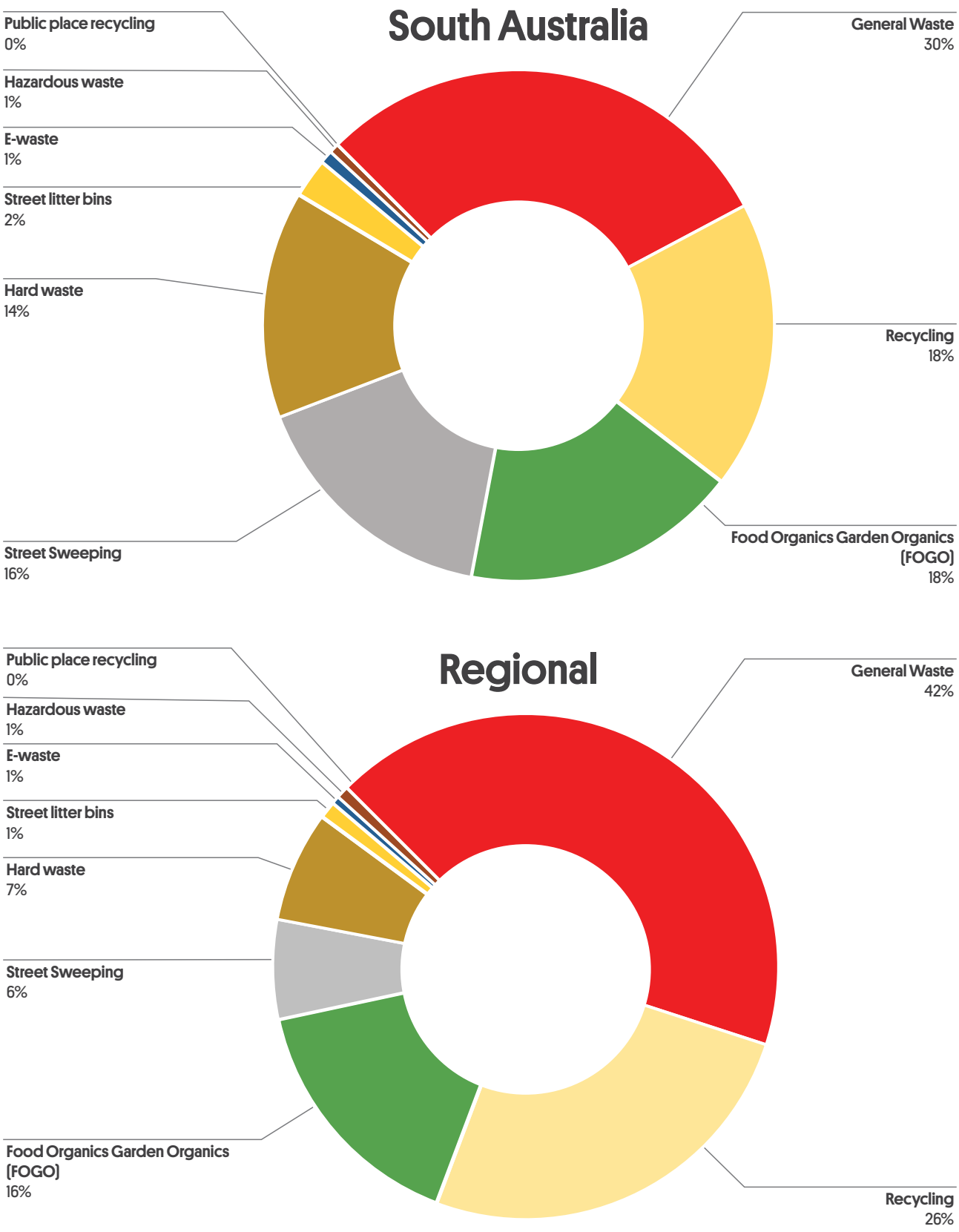
Table A1.2. Total tonnes of non kerbside bin waste collected by South Australian councils by region

Waste Type	Metro	Regional	SA
Residual (drop-off point)	5,800	48,800	54,600
FOGO (drop-off point)	13,900	18,300	32,200
Recycling (drop-off point)	3,900	29,600	33,500
Street Sweepings	22,500	7,300	29,800
Hard Waste	18,250	8,150	26,400
Street Litter Bins	3,300	1,300	4,600
e-Waste	920	580	1,500
Hazardous Waste	220	900	1,100
Public Place Recycling		10	10
Total	**68,800**	**114,900**	**183,700**

About 65% of the non-kerbside bins waste consists of organics, recyclables and residual waste similar to the material presented in kerbside bins. When street sweepings and hard waste are added, these collectively total to 96% of non-kerbside bins waste.

As previously shown in **Figure 1** in the main report, a lesser number of regional councils have 3-bin collection systems at kerbside and of those that do, many restrict collections (particularly of organics) to townships only. As a result, councils often put in place drop-off provisions for their residents. This explains the higher quantity of FOGO and recycling drop-off in regional areas. Similarly, the larger quantities of e-waste collected regionally would also reflect the lesser number of e-waste drop-off options compared to drop-off sites in metropolitan Adelaide, many of which are not council owned or managed.

Figure A1.1. Percentages of non-bin waste collected in South Australia as a whole and in regional SA only



Appendix 2

A2.1 Methodology

This report collates waste and recycling data from GISA, councils, contractors and the SALGGC.

Metropolitan Adelaide councils provide GISA with a monthly breakdown, in tonnes, of residual waste, co-mingled recyclables and organics whereas regional councils' tonnages are sourced from the SALGGC. Some regional councils' data was supplied to GISA in follow-ups of the data quality to clarify problems arising with data provided to SALGGC. Small amounts of commercial and industrial waste collected by councils are not counted separately as these are considered negligible and it is not possible to separate these quantities.

As the waste material streams are weighed on weighbridges, the accuracy of metropolitan Adelaide data is relatively high. While many regional councils waste goes over a weighbridge, the data supplied for some regional areas comprised all MSW waste, rather than only kerbside collected. It is also noted that the data quality for some regional councils is not as high as metropolitan data, due to the lack of weighbridges in some areas.

Data in this report has been adjusted to ensure it is kerbside only that is reported. All waste and recycling quantities in this report have been rounded to improve readability and reflect accuracy[3].

Data provided annually by councils to the SALGGC is the source of many of the details of council waste services, such as bin systems and frequency of collection. As councils can offer a range of different waste services, this report summarises the main kerbside services offered to residents.

GISA has grouped councils by geographic location and other existing associations into regions taking into consideration household numbers. It should be noted that co-operative arrangements between councils in relation to waste management may exist outside the council groupings used in this report.

3 Some totals in tables may not add up due to rounding of numbers.

The three-bin recovery rate is defined as the percentage of waste that is recovered for recycling from the total kerbside waste. It can be expressed as:

$$\text{3–Bin Recovery Rate} = \frac{\text{organics + recyclables}}{\text{organics + recyclables + residual}} \times 100\%$$

The organics recovery rate is defined as the percentage of total waste from the residual and organics bin that is recovered for recycling using the organics kerbside waste. It can be expressed as:

$$\text{Organics Recovery Rate} = \frac{\text{organics}}{\text{organics + residual}} \times 100\%$$

Similarly, the recyclables recovery rate is used as a way to examine trends in the recovery rate without the effects of variations in annual rainfall. It is expressed as:

$$\text{Recyclables Recovery Rate} = \frac{\text{recyclables}}{\text{recyclables + residual}} \times 100\%$$

Demographic data (population and household figures) is based on figures from the Australian Bureau of Statistics (ABS) and is based largely on the census result of 2021. Some households are in unincorporated areas and do not receive council kerbside services, so these figures are not included in this report. 'Occupied dwellings' is used for serviced-households figures from ABS 2021 Census data.

A2.2 Greenness Index

Different councils have varying geographical areas, rainfall and home garden areas per household. To help in assessing the effect of relative "greenness" of a council on the rate of recovery due to green waste, a greenness index was calculated for each metropolitan Adelaide council. Spatial analysis applied to imagery of the metropolitan Adelaide area produced Normalised Difference Vegetation Index (NDVI) values ranging from +1.0 to -1.0. Higher NDVI values indicate healthier, or greener, vegetation. Only 18 of the 19 metropolitan Adelaide councils are covered as the aerial survey did not include Adelaide Hills Council.

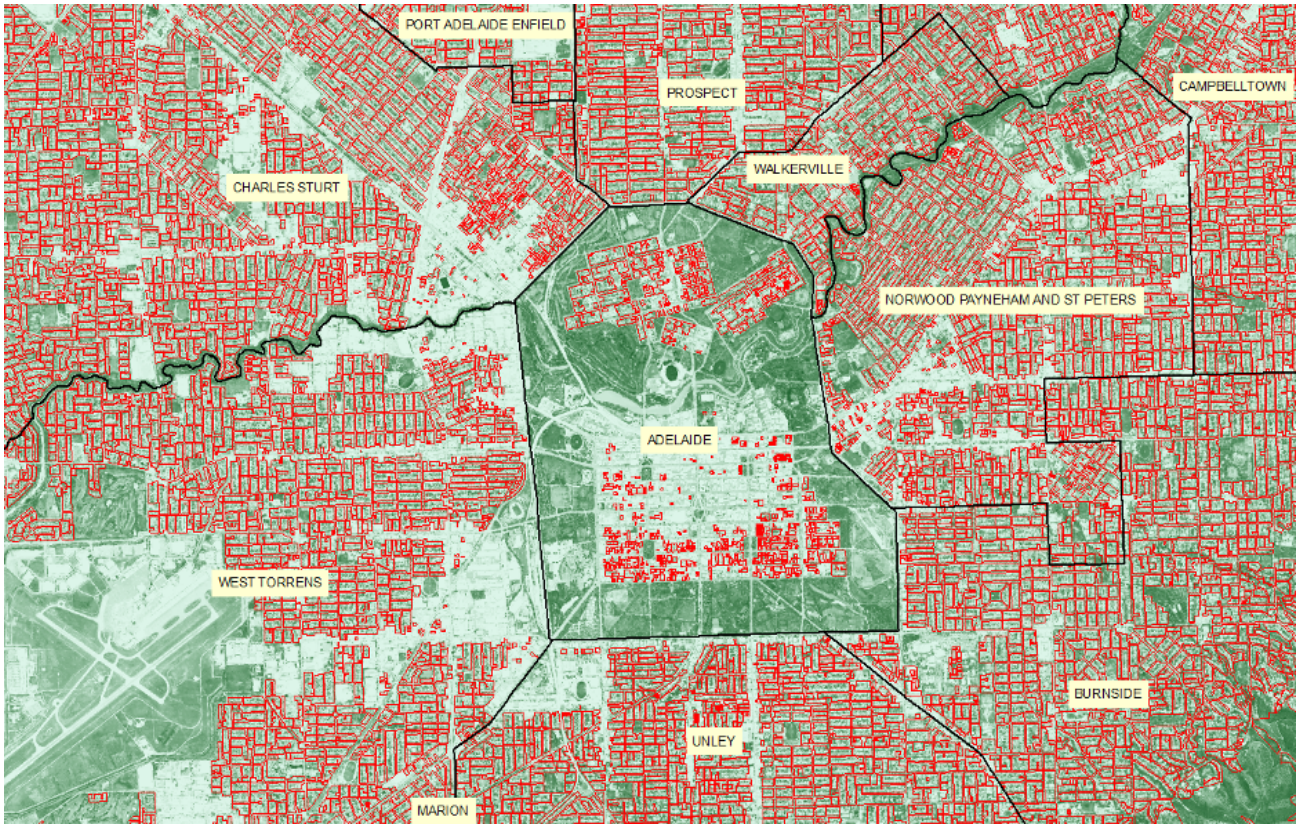
The survey was carried out in late September 2018 by Aerometrex for the Department for Environment and Water who authorised its use by GISA. The timing of the aerial capture of the imagery is appropriate for the purpose since local conditions ensure that vegetation is at its greenest and it is expected that this accurately reflects the difference between greener and drier areas.

To ensure a focus on residential waste presented at kerbside, only residential areas were selected from the land use dataset (Department for Infrastructure and Transport, 2019). This ensures results only include green waste arising from residential land and exclude parks, street trees, etc. (Figure A2.1).

The zonal statistics tool was used to calculate an average greenness value of all the residential properties within a council boundary for each local government area.

Note that deriving a future set of average greenness index values will depend on local conditions at that time, such as immediate past rainfall and the season. Consequently, any such calculations are expected to vary from those generated in this initial work.

Figure A2.1. Example of Metropolitan Adelaide LGA with residential area overlaying NDVI imagery



Appendix 3

South Australia's Waste Management Costs

The South Australian Local Government Grants Commission (SALGGC) surveys SA's local government councils each year to make recommendations to the Minister for Local Government on the distribution of untied Commonwealth Financial Assistance Grants to local councils in South Australia. SALGGC reports publicly on the amount spent by each council in 15 different categories of which waste management is one. Determining kerbside-only costs from the figures supplied should be possible, but in many cases the data provided by some councils lacks detail to cost services for kerbside alone. The only uniform indicator of council costs is the waste management total which is inclusive of other waste management issues besides kerbside.

In 2020-21, the 68 SA local government councils spent $249.1 million in operating expenses on waste management of which $173.0 million was incurred in Metropolitan Adelaide and $76.1 million in regional councils. Across South Australia councils spent an average $344 per year on waste management per occupied household. Included in these amounts are ordinary solid waste collection and disposal, green waste collection and processing, recycling collection and processing, waste disposal facility, other waste management, so the figures do not relate to kerbside collections alone.

SA local government councils also earned revenue while managing the waste facilities, mainly in regional areas ($59.9 million) as opposed to the metropolitan Adelaide councils. In regional areas, there are more council owned landfills and transfer stations and these accept waste from commercial and industrial and construction and demolition sources as well as MSW streams.

Table A3.1. South Australia's LG Councils total and per occupied dwelling operating expenditure on waste management (not only kerbside), 2020-21

	Metropolitan	Regional	SA
Total ($ millions)	173.0	76.1	249.1
Per occupied Household (nearest $)	344	441	361

Appendix 4

Regional kerbside bin collection frequency

Council	Number of bin	Residual	Recycling	Organics	Food waste system
Adelaide Plains	Towns 3-bin, Rural 2-bin	Fortnightly	Fortnightly	Fortnightly	Opt-in townships
Alexandrina	Towns 3-bin	Fortnightly	Fortnightly	Fortnightly	Opt-in townships
Barossa	Towns 3-bin (green opt-in), Rural 2-bin	Weekly	Fortnightly	Fortnightly	Opt-in townships
Barunga West	4-bin	Weekly	Monthly	Monthly	None
Berri Barmera	3-bin	Weekly	Fortnightly	Fortnightly	None
Ceduna	1-bin	Weekly	-	-	None
Clare and Gilbert Valleys	2-bin	Weekly	Fortnightly	-	None
Cleve	2-bin	Weekly	Fortnightly	-	None
Coober Pedy	1-bin	Weekly	-	-	None
Coorong	3-bin	Weekly	Fortnightly	Fortnightly	None
Copper Coast	3-bin (green opt-in)	Weekly	Fortnightly	Monthly	None
Elliston	2-bin	Weekly	Fortnightly	-	None
Flinders Ranges	2-bin	Weekly	Fortnightly	-	None
Franklin Harbour	1-bin	Weekly	-	-	None
Goyder	2-bin	Weekly	Fortnightly	-	None
Grant	2-bin	Fortnightly	Fortnightly	-	None
Kangaroo Island	Towns 3-bin	Fortnightly	Fortnightly	Fortnightly	Opt-in townships
Karoonda East Murray	2-bin	Weekly	Monthly	-	None
Kimba	2-bin	Weekly	Fortnightly (opt-in)	-	None
Kingston	2-bin	Weekly	Fortnightly	-	None
Light	Towns 3-bin, Rural 2-bin	Weekly	Fortnightly	Fortnightly	Opt-in townships
Lower Eyre Peninsula	1-bin	Weekly	-	-	None
Loxton Waikerie	Towns 3-bin, Rural 2-bin	Weekly	Fortnightly	Fortnightly	Opt-in townships
Mid Murray	2-bin	Weekly	Fortnightly	-	None
Mount Barker	Towns 3-bin, Rural 2-bin	Weekly	Fortnightly	Fortnightly	Opt-in townships
Mount Gambier	3-bin	Weekly	Fortnightly	Fortnightly	Opt-in townships
Mount Remarkable	2-bin	Weekly	Fortnightly	-	None
Murray Bridge	Towns 3-bin, Rural 2-bin	Weekly	Fortnightly	Fortnightly	Opt-in
Naracoorte Lucindale	3-bin	Weekly	Fortnightly	Fortnightly	None
Northern Areas	2-bin	Weekly	Fortnightly	-	None

Council	Number of bin	Residual	Recycling	Organics	Food waste system
Orroroo Carrieton	2-bin	Weekly	Fortnightly	-	None
Peterborough	2-bin	Weekly	Fortnightly	-	None
Port Augusta	3-bin	Weekly	Fortnightly	Fortnightly	Accept FOGO but no caddy provided
Port Lincoln	2-bin	Weekly	Fortnightly	-	None
Port Pirie	3-bin	Weekly	Fortnightly	Fortnightly	None
Renmark Paringa	3-bin	Weekly	Fortnightly	Fortnightly	None
Robe	2-bin	Weekly	Fortnightly	-	None
Roxby Downs	3-bin	Weekly	Fortnightly	Monthly	None
Southern Mallee	2-bin	Weekly	Monthly	-	None
Streaky Bay	1-bin	Weekly	-	-	None
Tatiara	Towns 3-bin, Rural 2-bin	Weekly	Fortnightly	Fortnightly	None
Tumby Bay	1-bin	Weekly	-	-	None
Victor Harbor	Towns 3-bin	Fortnightly	Fortnightly	Fortnightly	Opt-in townships
Wakefield	3-bin	Weekly	Fortnightly	4-Weekly	None
Wattle Range	3-bin	Weekly	Fortnightly	Fortnightly	Townships
Whyalla	3-bin	Weekly	Fortnightly	Fortnightly	Opt-in townships
Wudinna	1-bin	Weekly	-	-	None
Yankalilla	3-bin	Fortnightly	Fortnightly	Fortnightly	Townships
Yorke Peninsula	3-bin	Weekly	Fortnightly	Monthly	None

Glossary

Commercial and Industrial waste (C&I)	Comprises solid waste generated by the business sector as well as solid waste created by state and federal government entities, schools, and tertiary institutions.
Construction and Demolition waste (C&D)	Includes waste from residential, civil and commercial construction and demolition activities, such as fill material (e.g. soil), asphalt, bricks and timber. C&D waste excludes construction waste from owner/ occupier renovations, which is included in the municipal waste stream.
Container Deposit Scheme (CDS)	A refundable charge imposed on a range of recyclable beverage containers. The deposit is included in the retail price and refunded when the container is returned to a collection point.
Food caddy	A kitchen benchtop food container for the collection of household food waste, to be placed in the organic waste bin. It also accepts AS 4736 / AS 5810 barrier bags and fibre-based materials.
FOGO	Food Organics Green Organics, a common name used for the green organics bin
Food Organics	Organic waste derived from food preparation and/or surplus food. It includes compostable items such as paper straws and contaminated pizza boxes.
Garden organics	Organics derived from garden sources e.g. grass clippings, tree prunings.
Hard waste	Large materials that are not suitable for collection in the kerbside three-bin system. Common items include furniture, appliances and mattresses.
Kerbside collection	Collection of household waste, recyclable materials (separated or co-mingled), and organic waste that are left at the kerbside for collection by local council collection service.
Municipal solid waste (MSW)	Solid waste generated from domestic (household) premises and council activities such as street sweeping, litter and street tree lopping. May also includes waste dropped off at recycling centres, transfer stations and construction waste from owner/occupier renovations.
NAWMA	Northern Adelaide Waste Management Association is a regional subsidiary of local councils formed under the Local Government Act 1999 to provide waste management and resource recovery services for the City of Salisbury, City of Playford and Town of Gawler. Its clients also include businesses, industry and regional councils.

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