Government of South Australia

Green Industries SA

South Australia's Kerbside Waste Performance Report 2022-23

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.

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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 councils and the 49 regional councils in the 2022-23 financial year. It examines the performance and improvements in council waste management efficiency and sustainability over the past 19 years.

The focus is only on waste material collected at kerbside in 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 this report.

All 19 metropolitan Adelaide councils offer a three-bin service that has been gradually introduced from about 2001, although some only provide an organics (green and/or food) bin on an opt-in basis. There are also some differences between councils in terms of bin ownership, full roll-out of different bins versus optional adoption, 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. The complete data enables the examination and analysis of householder behaviours and bin usage, trends and patterns, as well as the relationship and dependency on geography and socioeconomic factors.

Performance

In 2022-23, across the State:

698,500 tonnes of municipal solid waste was collected from kerbside

This equates to about:

378 kilograms per person

OR

908 kilograms per serviced household

Of the total waste collected, South Australia recovered:

225,900 tonnes of organics

130,700 tonnes of recyclables

This represents a total recovery rate of **51.1%**

In metropolitan Adelaide:

92% of households have a 3-bin system

535,100 tonnes of waste was collected from kerbside

This equates to about:

385 kilograms per person

OR

924 kilograms per serviced household

Of the total waste collected, metropolitan Adelaide recovered:

187,300 tonnes of organics

99,700 tonnes of recyclables

This represents a total recovery rate of **53.6%**

In regional South Australia:

164,300 tonnes of waste was collected from kerbside

This equates to about:

358 kilograms per person

OR

859 kilograms per serviced household

Regional areas recovered:

38,600 tonnes of organics

31,000 tonnes of recyclables

This represents a total recovery rate of **42.6%**

Across South Australia, between 2010-11 and 2022-23, total material collected through kerbside waste collection decreased by 4.8%. The amount of waste going to landfill in the same period fell by 8.1% (30,230 tonnes).

The 2022-23 Adelaide metropolitan area recovery rate of 53.6% is below the *South Australia's Waste Strategy 2020-2025* (GISA 2020) household bin systems target of 70% waste diversion by 2025, making it clear that there is still work to be done.

Analysis shows that the best performing councils in metropolitan and regional in 2022-23 –achieved over 65% recovery rate. The best performing metro council provided a weekly residual waste collection, fortnightly recyclables collection and fortnightly organics collection that includes food waste. The best performing regional council provided fortnightly residual waste collection, fortnightly recyclables collection and fortnightly organics collection that includes food waste.

A trial in 2021 in the Holdfast Bay Council area examined the effect of recovery when residual bins were collected fortnightly and organics weekly. With 73% of households participating in this service, the amount of waste going to landfill was reduced and the overall diversion has increased from 60% to 71%. Those on the sustainable kerbside service[1] had a landfill diversion rate of 83%. Residents were encouraged to place food waste, tissues and paper towels into their organics bin collected weekly which resulted in these high diversion figures.

1 Green Industries SA (2023), SA Better Practice Guide: Sustainable Kerbside Services, available at https://www.greenindustries.sa.gov.au/resources/sa-better-practice-guide-sustainable-kerbside-services

Recommendations

The analysis conducted of the 2022-23 data combined with other findings 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.

   A 2021 trial at the Holdfast Bay Council has demonstrated that the strategy of increasing diversion of organics will have an immediate impact on raising the kerbside diversion rate. Universal rollout of area-wide food waste systems with weekly organics collection will raise waste diversion rates as evidenced in the Holdfast Bay Council's trial and will narrow the gap between best and least performing councils.

2. Standardised, consistent 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 with its 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' behavior.

   South Australia's Waste Strategy 2020-2025 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.

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

   Regional Waste Management Plans are progressing at the regional local government area to leverage and optimise opportunities across major regional centers where practicable. Almost all regional local governments have developed such plans to set appropriate waste diversion goals aligned with the targets set in the *2020-2025 South Australia's Waste Strategy.*

Contents

TABLES

FIGURES

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 recovery rates and to target areas most in need.

This report presents data on kerbside waste and recycling collection services in South Australia for the 19 metropolitan Adelaide councils and the 49 regional councils in the 2022-23 financial year. It analyses performance and improvements in waste management efficiency and sustainability. It also reports on trends over a 19-year period.

The focus is only on waste collected at kerbside in bins provided specifically for residual waste (landfill), co-mingled recyclables and food and/or garden organics. Hard waste, street sweepings, Container Deposit Scheme (CDS) returns and waste collected at drop-off facilities and council-operated commercial services are excluded. Details of the analysis methodology can be found in the companion document on the GISA website.

As such, the recovery rate stated in this report differs from that cited in the *South Australia's Circular Economy Resource Recovery Report 2022-23*, 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 2022-23, 82.3% of all waste was diverted from landfill for recycling and other purposes (Blue Environment 2023).

Residential residual waste accounts for 38% of the total solid waste that goes to landfill. The remainder is commercial and industrial waste (54%) and construction and demolition waste (8%).

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. 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 areawide rollout versus opt-in.

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. Organics collections, although all are now fortnightly, still have some opt-in. Regionally, more councils are adopting the 3-bin system in township areas.

The average diversion rate at kerbside by householders from across the metropolitan councils was 53.6% in 2022-23. The effective diversion rate, allowing for misplaced material in the organics and recyclables bins, was 49.8%. The top performing councils in 2022-23 – some achieving over 60% – were those that provide a weekly residual waste collection, fortnightly recyclables collection and fortnightly organics collection including food waste. The Holdfast Bay Council's trial demonstrated that even higher recovery rates are achievable.

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 collection of all kerbside bins.

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, mixed-recycling bins which are taken to Material Recovery Facilities (MRFs) for sorting and processing and green organics bins to composting facilities. 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 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 2023, $39.7 million had been provided to 67 councils and 10 of their subsidiaries through a range of GISA grants programs such as:

- Kerbside Performance Plus (Food Organics) Incentives
- Regional Infrastructure/Implementation
- Regional Transport Subsidies Program
- Council Modernisation Grants
- RMF Regional and Remote Communities

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 significant 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.

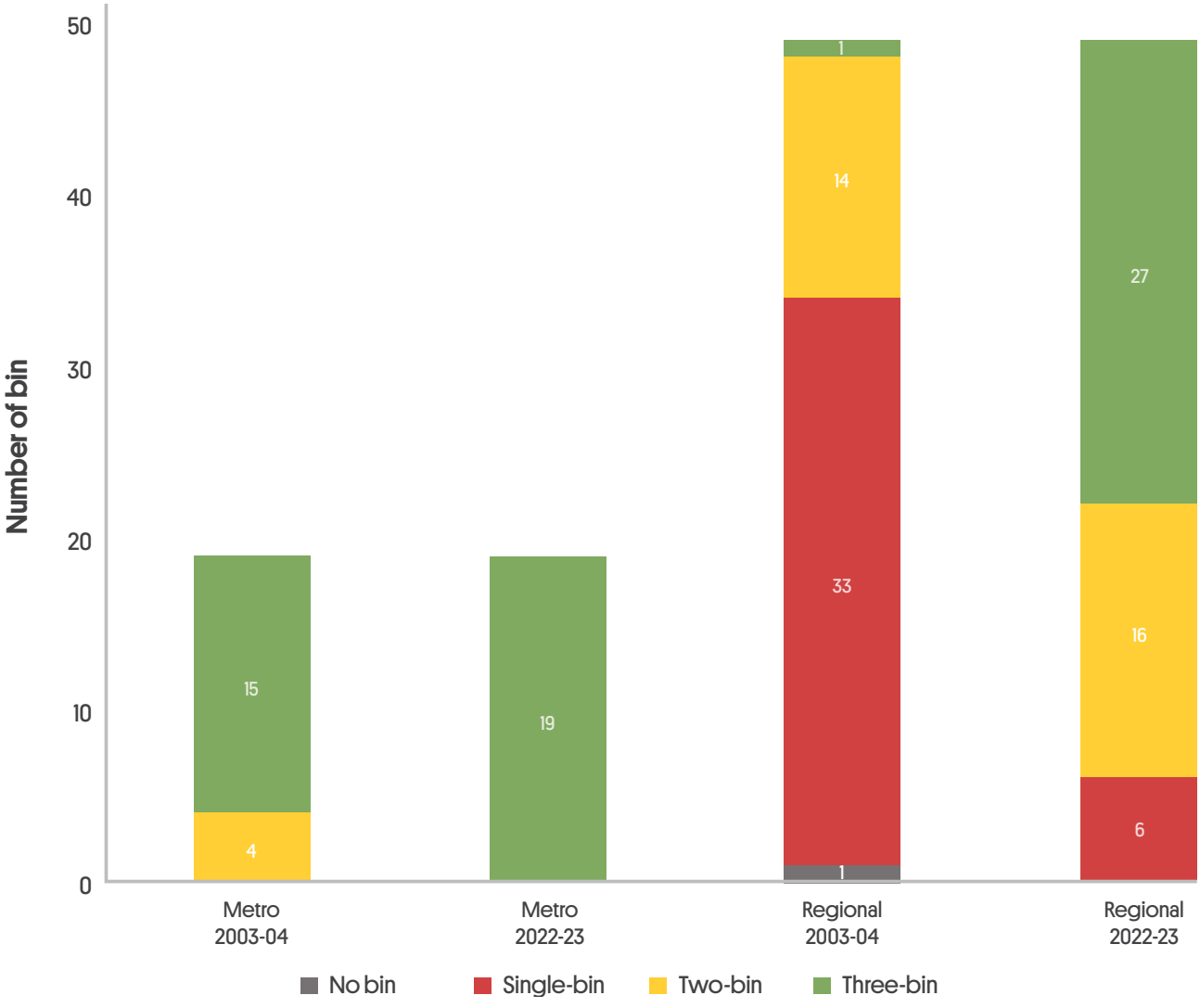
All 19 metropolitan Adelaide councils provide their kerbside waste data directly to GISA for the purpose of this report. GISA used SALGGC data to quantify costs incurred by councils for kerbside collections and for reporting waste quantities for regional councils.

2 Findings

2.1 South Australia's Kerbside Waste and Recycling Services

South Australia has 68 councils, 49 of which are regional. In 2022-23, 45 councils across the State offered 3-bin systems to their residents, compared with 16 in 2003-04. Only 6 councils now offer a 1-bin system. This improvement in recycling services offered is summarised in **Figure 1.**

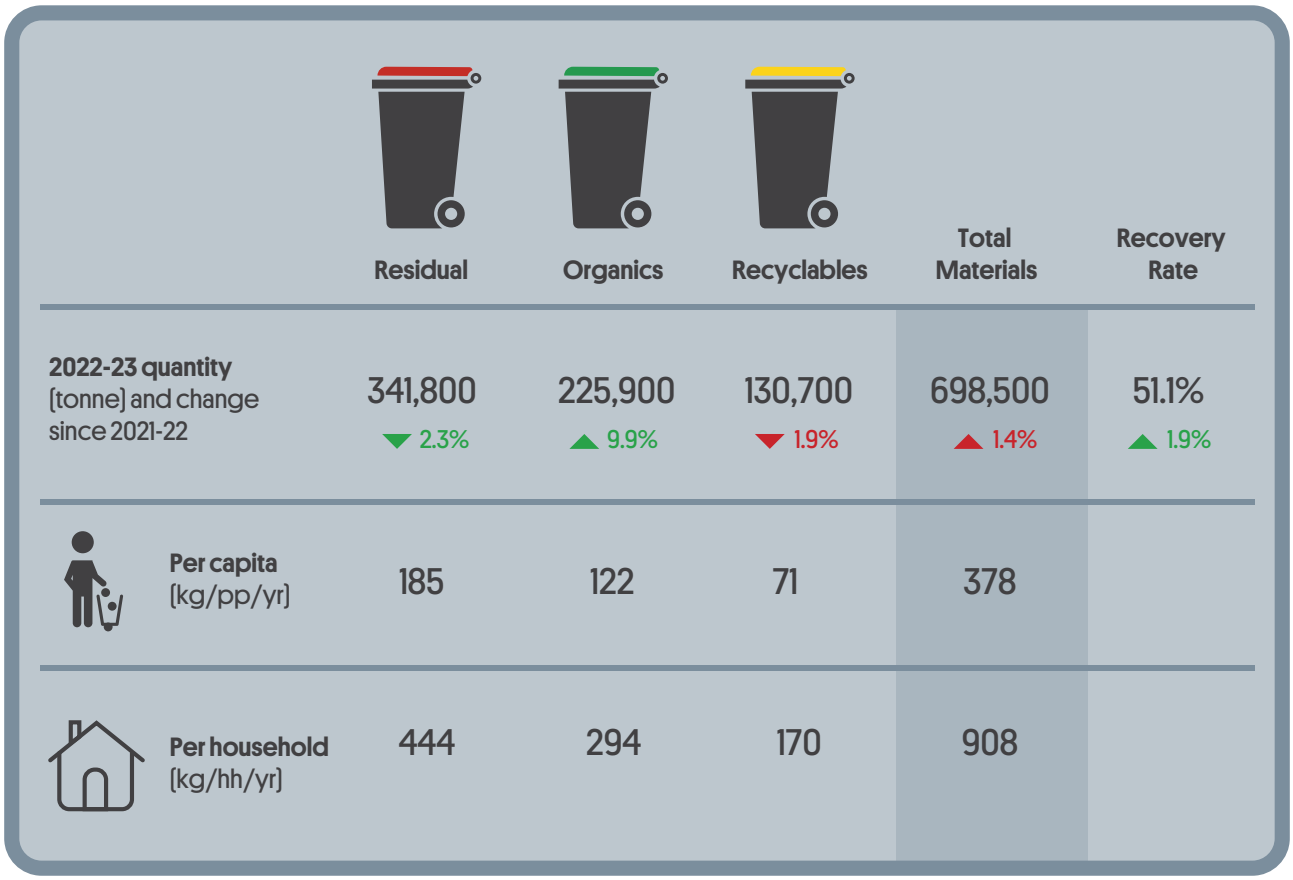
Figure 1: Regional and Metropolitan Adelaide Kerbside bin systems compared in 2022-23 and 2003-04



2.2 South Australia's Kerbside Quantities

In SA in 2022-23, approximately 698,500 tonnes of municipal waste was collected from kerbside, 535,100 tonnes from metropolitan areas and 163,400 tonnes from regional areas (**Figure 2**). The 49 regional councils account for 23.4% of the total kerbside waste collected in SA.

Figure 2. Summary of South Australia's Kerbside Waste Performance in 2022-23



Sources: SALGGC [2023] and GISA [2023]

South Australians produced approximately 378 kg per person of MSW at kerbside, or 908kg per household serviced in 2022-23 (**Figure 2**).

Please note that it is difficult to obtain accurate population and household number in a non-census year. Any discrepancies in per capita waste value between this report and the previous report results from updated population figures being used. The previous report used the latest available figures at that time which was 2021 Census data whereas this report uses ABS population estimates as at March 2023. For dwellings, census data have been used in the previous reports as actual total dwellings tend to be inaccurate and hard to quantify. This year, the waste per household is being estimated using the latest ABS population estimate multiplied by the number of individuals per dwelling reported in the previous census (2.4). These more recent figures are considered more reliable and direct comparisons between this report and the previous report are less reliable.

2.3 Metropolitan Kerbside Waste and Recycling Services

In 2022-23, 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. Also, Adelaide Hills Council's organics collection service only covered about two-thirds of households (mostly in townships) and green waste disposal vouchers are provided to households outside of the collection area.

An estimated 90% 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 2020), with participation increasing since 2011-12 (37%). It is estimated that about 92% 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 1**). 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 1: Some kerbside bin colours as recommended in AS 4123.7

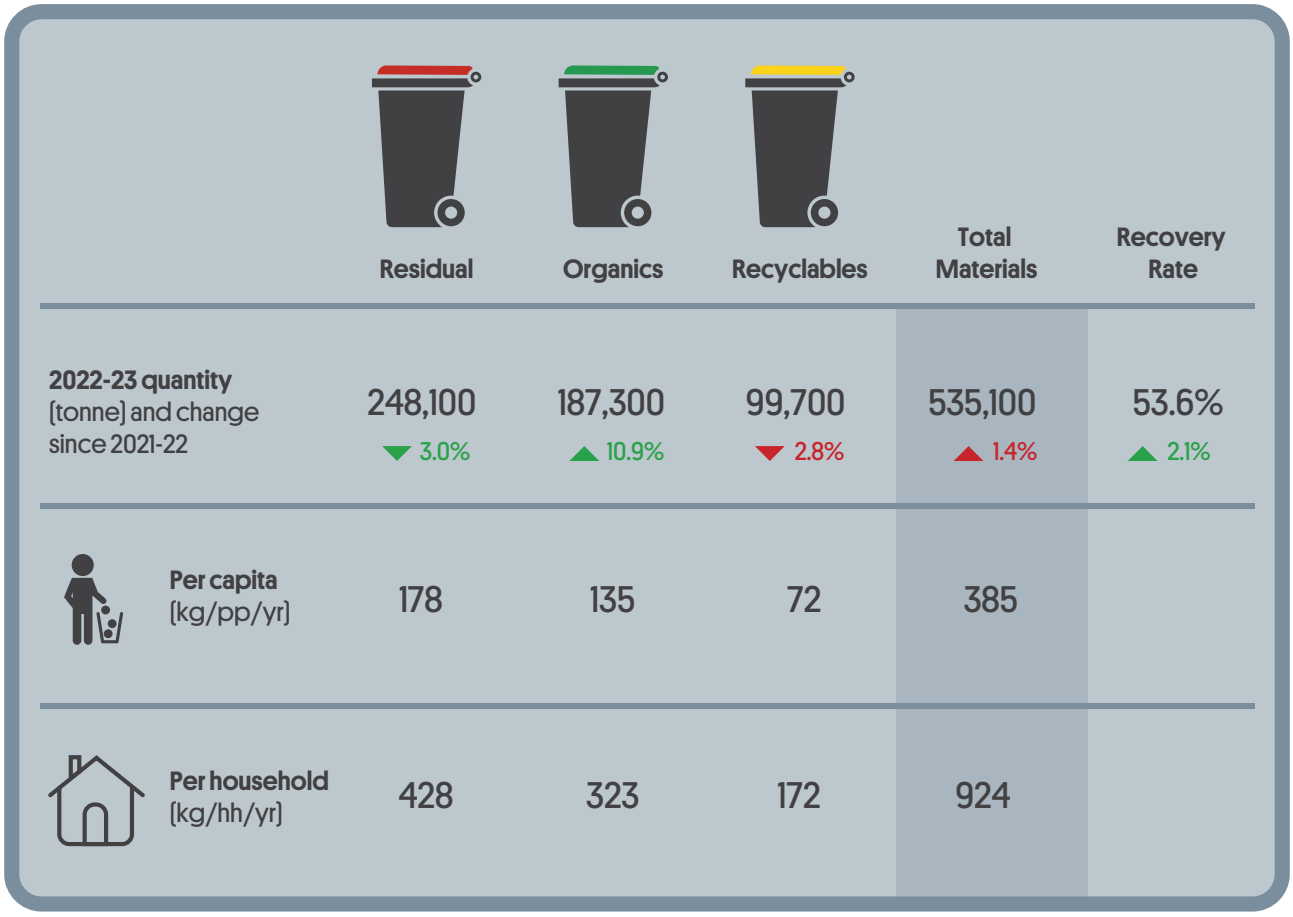
Type of materials	Body	Lid
Garbage/General waste	Dark Green or Black	Red
Green Waste/Organics	Dark Green or Black	Lime Green
Recyclables	Dark Green or Black	Yellow
Paper/Cardboard	Dark Green or Black	Blue

2.4 Metropolitan Adelaide Kerbside Quantities

In 2022-23, residents in the metropolitan area generated 535,100 tonnes of kerbside materials, of which 53.6% was recovered as recyclables or organics, a 2.1% increase on the previous year (**Figure 3**). This is due to a nearly 11% increase in organics recovery which was offset by a 2.8% drop in recovered recyclables. 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 2.4.3.

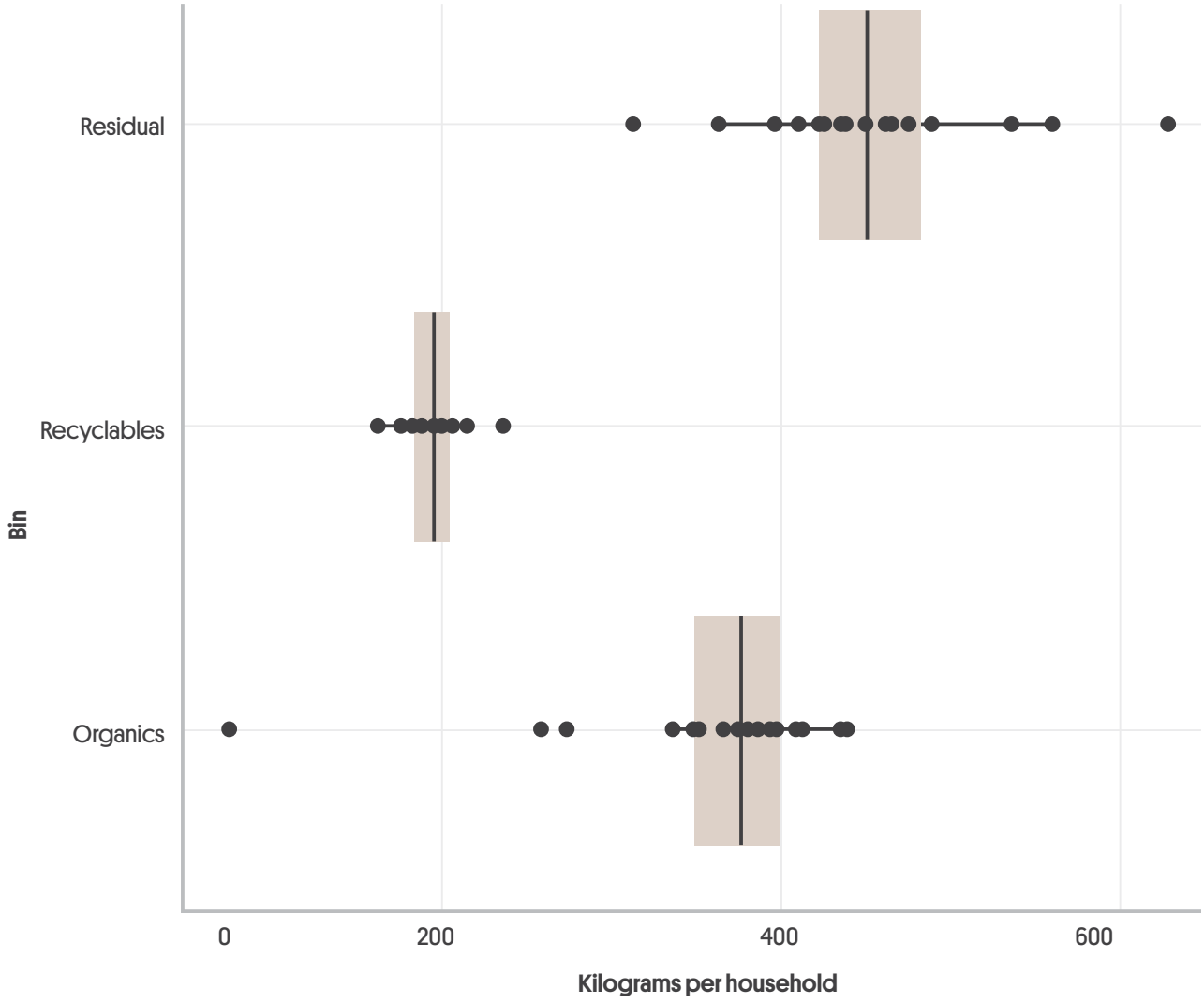
Approximately 385 kg of kerbside waste was collected per person, or 924 kg per household serviced (**Figure 3**).

Figure 3: Summary of Metro Adelaide's Kerbside Waste Performance in 2022-23



As can be seen in **Figure 4** below, very little variation exists between councils in the quantities recovered for the recyclables bin which averages 172 kilograms per household. Greater variation is observed in both the residual and organics where some councils consistently produce more waste per household than others.

Figure 4: Kerbside material collected annually per household (kilograms) by council and bin type in Metropolitan Adelaide, 2022-23



The spread of quantity materials presented at kerbside of all the bins is more varied when broken down into monthly values. These values show that the seasonal trend in the waste collected. This can be seen in **Figure 5** and **Figure 6**.

Figure 5: Monthly average waste presented per household by council for the residual bin

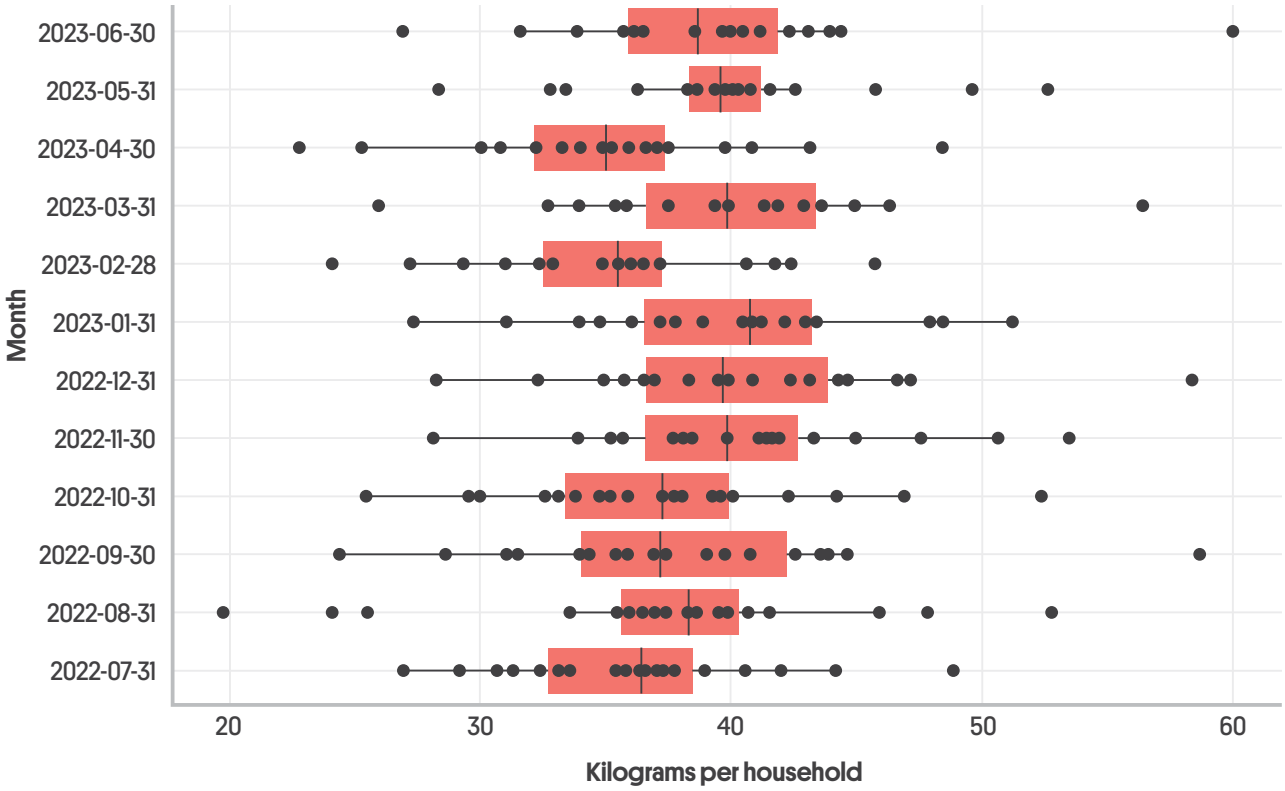
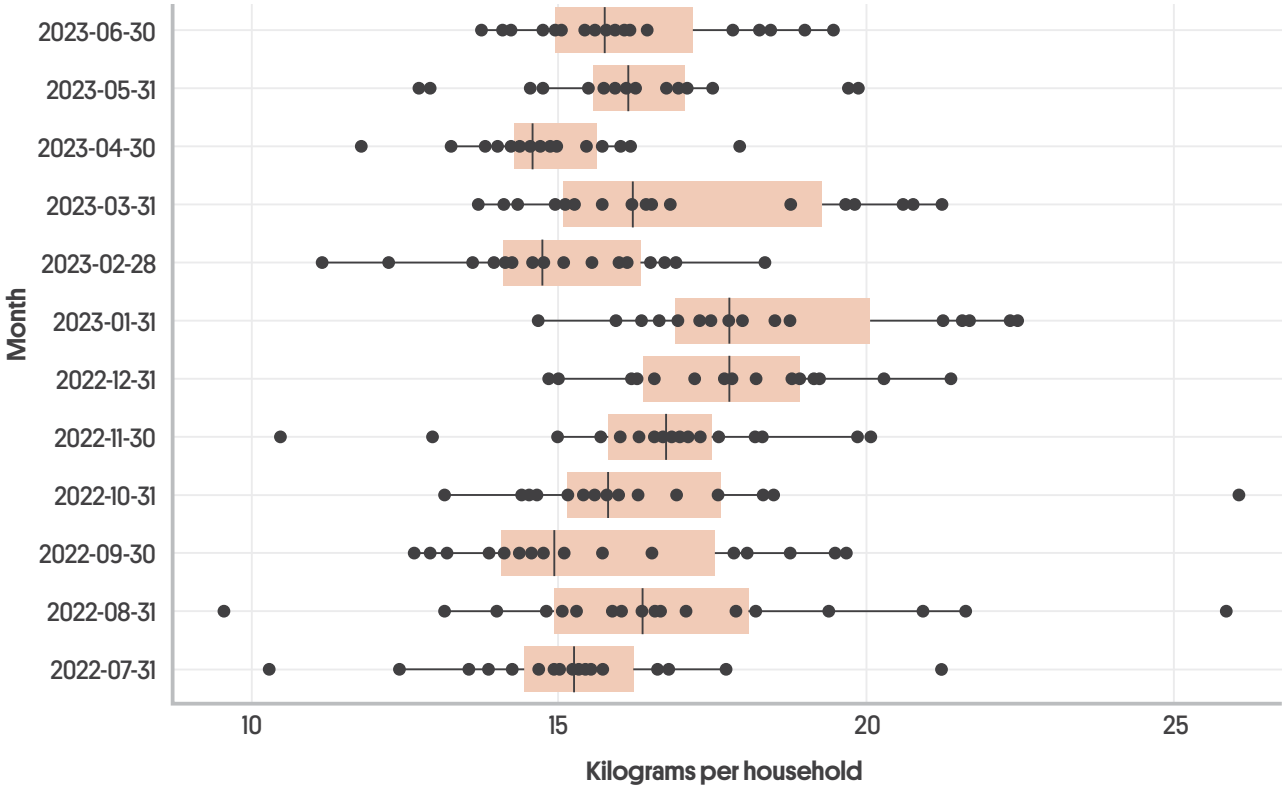
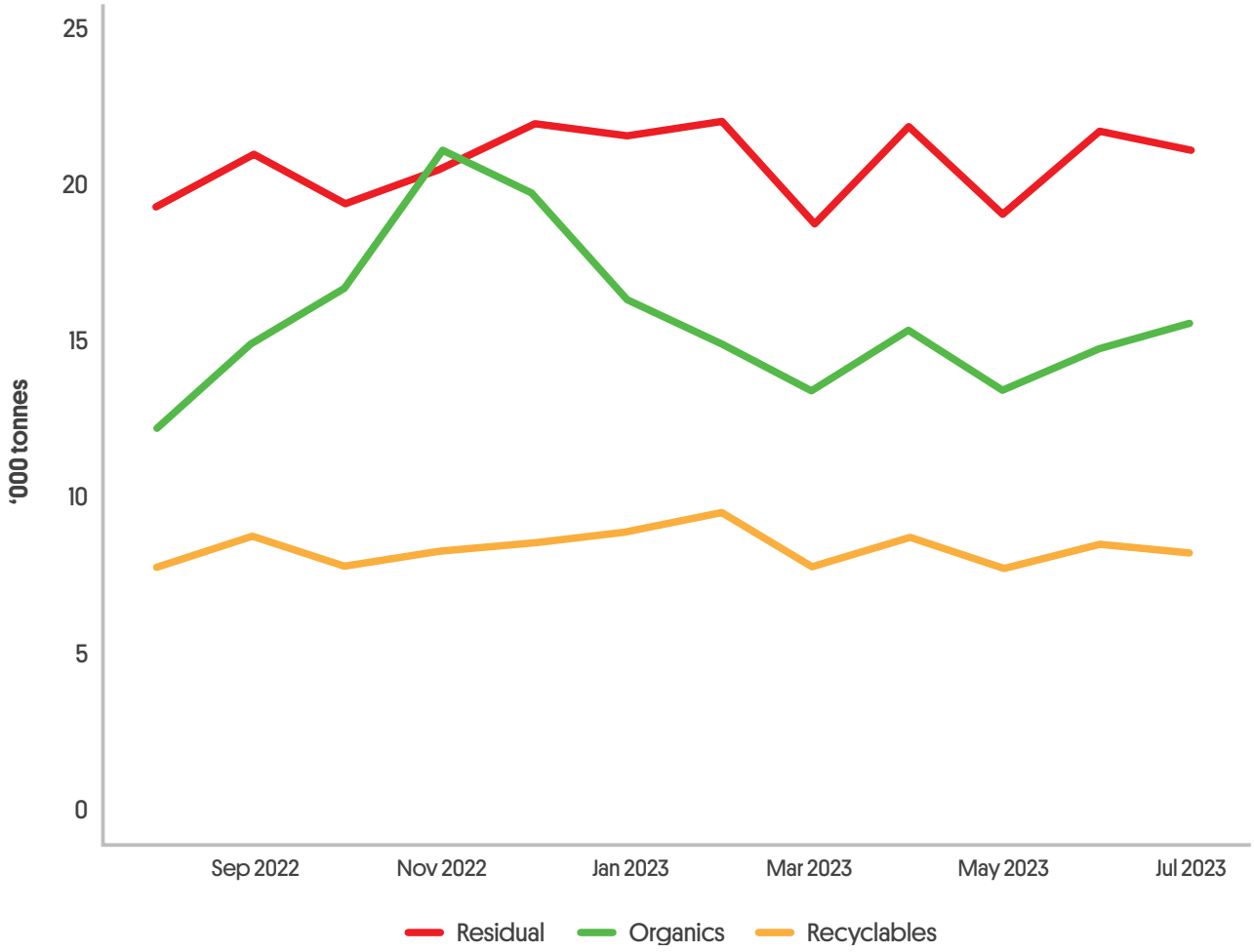


Figure 6: Monthly average waste presented per household by council for the recyclable bin



Weather conditions, particularly rainfall, also can affect quantities of garden waste which increases in spring and autumn. General waste increases around holiday seasons. Rainfall figures show 2022-23 was a relatively wet year (see rainfall figures in **Table 7**).

Figure 7. Metropolitan Adelaide Monthly three-bin Kerbside Quantities, 2022-23



2.4.1 Metropolitan Adelaide Sub-Regions

To provide some further comparisons between councils, sub-regional aggregations based on geographical areas have been utilised in the analysis below (Table 2). Per capita and per household analysis has been undertaken and can be seen in **Figure 8**.

Table 2. Metropolitan Sub-regions, Population and Households, 2022-23

Subregion	Councils	Population	Occupied Private Dwellings
Central Eastern	Adelaide, Adelaide Hills, Campbelltown, Burnside, Norwood Payneham and St Peters, Prospect, Unley, Walkerville	285,145	107,999
Northern	Gawler, Playford, Salisbury, Tea Tree Gully	386,757	136,395
Southern	Marion, Mitcham, Onkaparinga	348,900	131,458
Western	West Torrens, Charles Sturt, Holdfast Bay, Port Adelaide Enfield	369,310	141,510

The Central Eastern group had the highest three-bin recovery rate at 56.5% and the Northern group the lowest at 49.6% (**Figure 8**), with the difference due to higher number of more developed gardens in the Eastern group and rainfall factor (hill face versus plains areas). The map in **Figure 9** shows the performance of the sub-regions in Metropolitan Adelaide with comparisons with the previous financial year.

Figure 8: Summary of kerbside bin performance by Metro Sub-regions, 2022-23

	Residual	Organics	Recyclables	Total Materials (tonnes)	Recovery Rate	Per capita (kg/pp/yr)	Per household (kg/hh/yr)
Central Eastern	46,600	38,400	22,000	**107,000**	56.5%	375	900
Northern	74,700	47,200	26,300	**148,200**	49.6%	383	920
Southern	63,800	53,900	25,400	**143,100**	55.4%	410	984
Western	63,000	47,700	26,100	**136,900**	53.9%	371	889
Total	**248,000**	**187,300**	**99,800**	**535,100**	**53.6%**	**385**	**924**

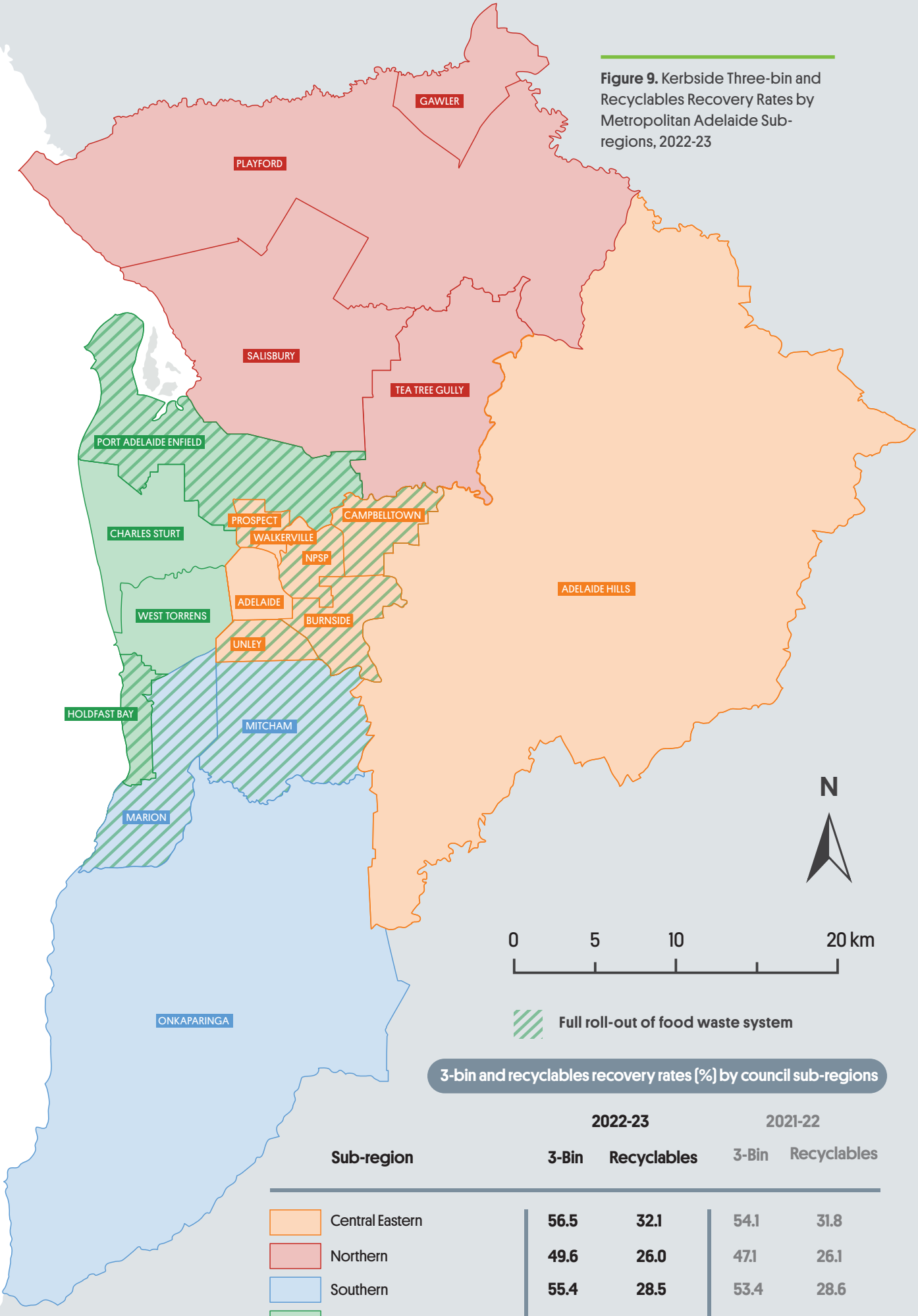


Figure 9. Kerbside Three-bin and Recyclables Recovery Rates by Metropolitan Adelaide Sub-regions, 2022-23

3-bin and recyclables recovery rates (%) by council sub-regions

Sub-region	2022-23 3-Bin	2022-23 Recyclables	2021-22 3-Bin	2021-22 Recyclables
Central Eastern	56.5	32.1	54.1	31.8
Northern	49.6	26.0	47.1	26.1
Southern	55.4	28.5	53.4	28.6
Western	53.9	29.3	52	29.1

2.4.2 Metropolitan Adelaide Recovery Rate Performance

Table 3 shows the three different recovery rates for each of the 19 metropolitan councils with the previous year's figures as a contrast. 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.

Nearly all of these councils have three-bin recovery rates greater than 50%. Eighteen of the nineteen metropolitan Adelaide councils have increased their recovery rates (now achieving 39.5% to 65.6%) and only one has decreased.

The best performing councils have full organics bin coverage, supplemented with a food caddy and are located in an area with higher garden growth. Direct comparisons are difficult due to different underlying factors such as geography, demography, use of food caddies and rainfall.

Figure 10 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 10. Metropolitan Adelaide Kerbside three-bin Recovery Rates, 2022-23

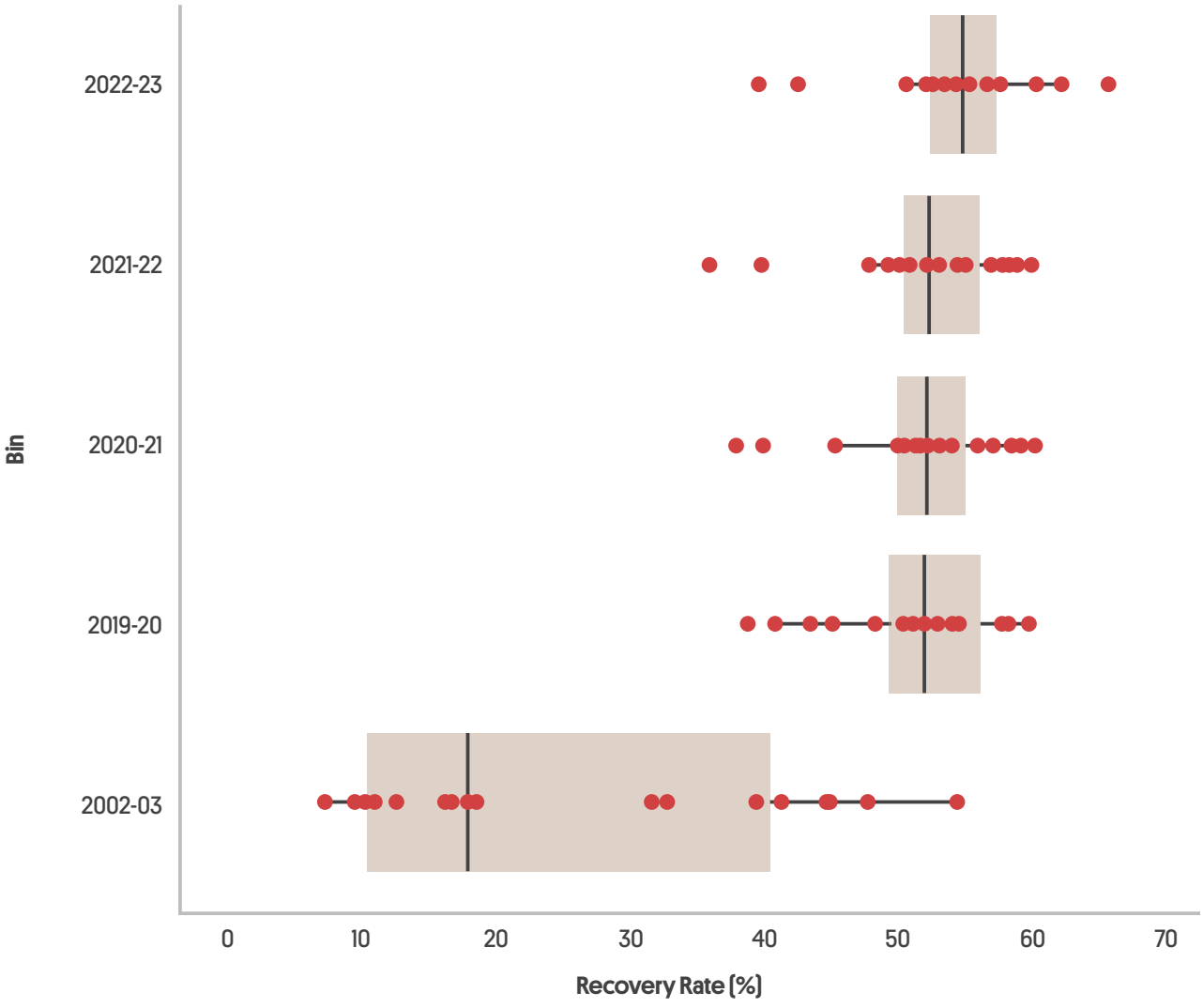


Table 3. Recovery Rates Achieved by each Metropolitan Adelaide Council, 2022-23.

		2022-23			2021-22			Food Waste System
Subregion	3 bin RR diff	3-bin RR	Org. RR	Recyc. RR	3-bin RR	Org. RR	Recyc. RR	
Western	▲	65.6	56.0	38.9	57	44.8	33.9	Area-wide
Central Eastern	▲	62.1	52.3	35.2	58.7	47.2	34.7	Area-wide
Central Eastern	▲	60.3	49.9	34.4	59.9	48.5	35.5	Area-wide
Southern	▲	60.2	50.9	32.2	58.2	47.7	32.6	Area-wide
Southern	▲	57.6	48.6	29.3	55	44.5	29.7	Area-wide
Central Eastern	▲	56.7	46.7	30.4	54.9	44.1	30	Area-wide
Central Eastern	▼	56.6	45.8	31.4	57.7	46.3	33.5	Opt-in
Central Eastern	▲	56.5	45.2	32	54.4	41.5	32.6	Area-wide
Central Eastern	▲	55.2	42.8	32.6	52.3	38.7	31.7	Opt-in
Central Eastern	▲	54.8	44.6	28.8	52	40.5	28.7	Area-wide
Northern	▲	54.4	44	28.9	52.1	40.4	29.0	Opt-in
Western	▲	53.7	43.1	28.6	52.3	41.2	28.3	Opt-in
Western	▲	53.6	43.5	27.7	53.1	41.7	29.5	Opt-in
Southern	▲	52.6	42.6	26.9	50.8	40.1	26.7	Opt-in
Northern	▲	52.1	41.4	27.5	50.2	38.4	27.6	Opt-in
Western	▲	50.7	38.5	28.7	49.3	37	27.7	Area-wide
Northern	▲	50.5	40.8	24.9	47.8	36.8	25.1	Opt-in
Northern	▲	42.6	29.2	24.7	39.8	25.3	24.4	Opt-in
Central Eastern	▲	39.5	17.2	30.9	36	15.5	27.5	Opt-in

2.4.3 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 perceived as "contamination" but it represents a lost opportunity. In addition to lowering the effective recovery rate, 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.

An effective Metropolitan Adelaide diversion rate can be calculated using the previous audit results which are applied to the current kerbside collection. The results of this analyses are presented in **Table 4** below.

Table 4: Comparing presentation and effective recovery rates at kerbside

	Residual	Organics	Recyclables	Total	Recovery Rate
Presented (tonnes)	248,000	187,000	99,700	535,000	53.6
Effective (tonnes)	269,000	184,000	86,700	535,000	49.8

Several kerbside waste audits were undertaken by both metropolitan and regional councils in recent years to determine the behaviour of residents in using the waste 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 correctly 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.

2.5 Regional Kerbside Waste and recycling Services

In 2022-23, of the 49 regional councils, 27 councils offered a 3-bin service compared with 1 council in 2003-04, and 16 had 2-bin systems, up from 14 in 2003-04 – the first year a complete dataset is available. The number of councils with a 1-bin system decreased several years ago to 6 from 33 in 2003-04 (**Figure 1**). Some councils also provide residents with drop off waste directly to transfer stations which would affect the reported recovery rate.

Collection services for individual regional councils can be found in **Appendix 1**.

Since 2004, GISA has contributed 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.

2.5.1 Regional Kerbside Quantities

In 2022-23, residents in regional SA areas generated 163,400 tonnes of kerbside materials, of which 69,700 tonnes was recovered as recyclables or organics, a 3.2% increase on the previous year (**Figure 11**). This was driven by a 5.1% increase in organics and a 0.9% increase in recyclables.

Approximately 358 kg of kerbside waste was collected per person, or 859 kg per household serviced in regional areas (**Figure 11**).

Figure 11. Summary of Regional Kerbside Waste Performance in 2022-23

	Residual	Organics	Recyclables	Total Materials	Recovery Rate
2022-23 quantity (tonne) and change since 2021-22	93,800 ▼ 0.4%	38,600 ▲ 5.1%	31,000 ▲ 0.9%	163,400 ▲ 1.1%	42.6% ▲ 0.8%
Per capita (kg/pp/yr)	205	85	68	358	
Per household (kg/hh/yr)	493	203	163	859	

2.5.2 Regional South Australia Sub-Regions

To provide some comparisons between councils, sub-regional aggregations (**Table 5**) 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 **Figure 12**. The location of the sub-regions can be seen in **Figure 13**.

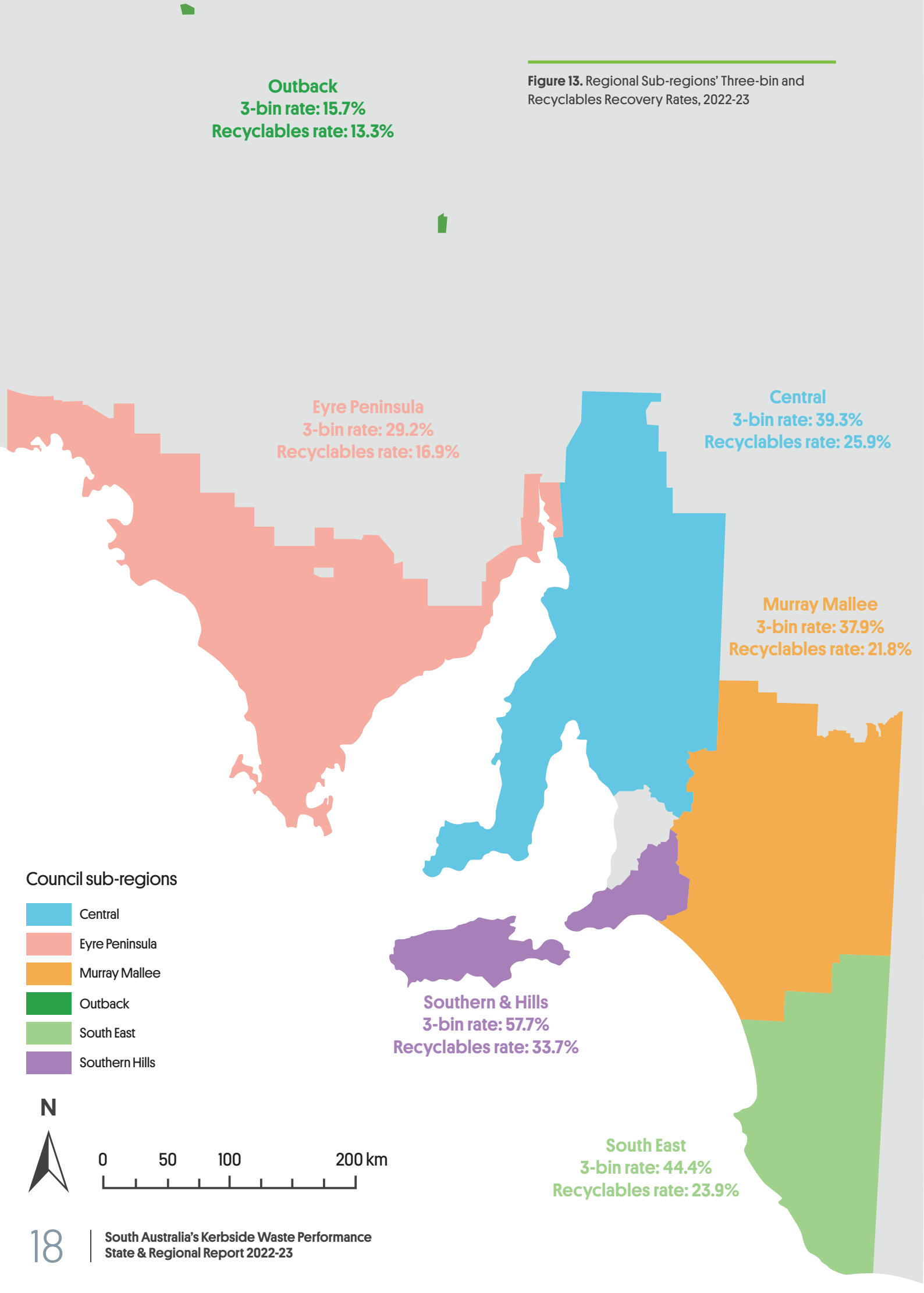
Table 5. Local Government regions: populations and households

Sub-region	Population (2023)	Occupied Private Dwellings (2021)
Central	134,393	50,862
Eyre Peninsula	72,745	27,607
Murray Mallee	73,771	28,391
Outback	5,663	1,869
South East	69,137	25,903
Southern & Hills	100,714	37,800

Figure 12. Summary of Regional Kerbside Waste Performance by Local Government Regions in 2022-23

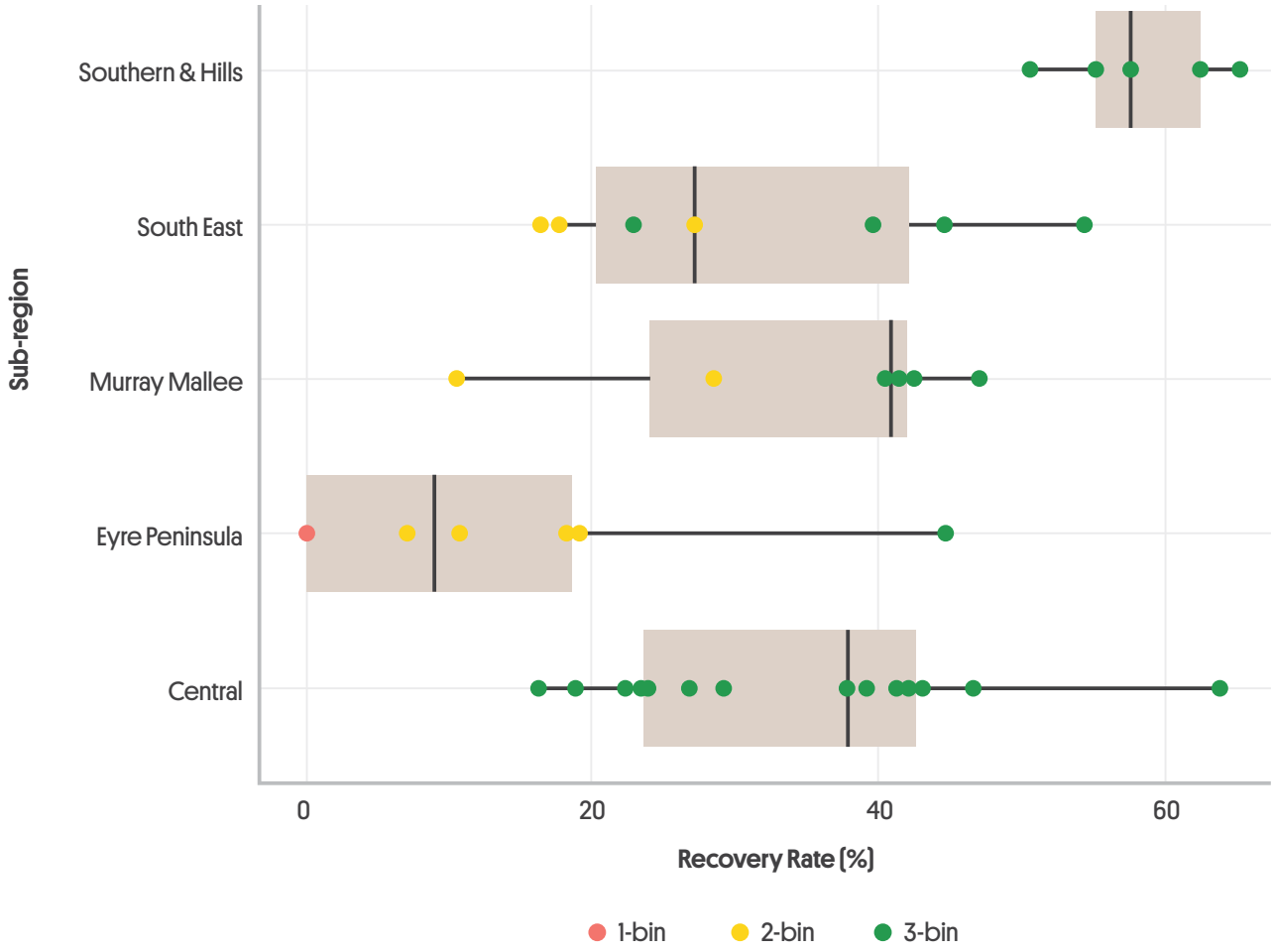
	Residual	Organics	Recyclables	Total Materials (tonnes)	Recovery Rate	Per capita (kg/pp/yr)	Per household (kg/hh/yr)
Central	27,900	8,400	9,800	46,100	39.3%	343	823
Eyre Peninsula	18,400	3,800	3,700	26,000	29.2%	357	856
Murray Mallee	14,600	4,800	4,000	23,500	37.9%	318	764
Outback	1,500	50	230	1,800	15.7%	315	756
South East	14,000	6,800	4,400	25,200	44.4%	364	874
Southern & Hills	17,300	14,800	8,800	40,900	57.7%	406	975
Total	**93,800**	**38,600**	**31,000**	**163,000**	**42.6%**	**358**	**859**

Figure 13. Regional Sub-regions' Three-bin and Recyclables Recovery Rates, 2022-23



The box plot in **Figure 14** illustrates the range of kerbside waste recovery performance within each subregion. 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.

Figure 14. Range of recovery rates of councils within each sub-region



2.5.3 Regional SA Councils' Recovery Rate Performance

Table 6 shows the three different recovery rates for each of the 49 regional SA councils with the previous year's figures as a contrast. 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.

Table 6 and **Figure 14** also show that a 3-bin system has performance ranges between 22.5%-65.2%, compared to 2-bin performance ranges of 7.1%-28.5%. Where councils have a higher population located in the township area, the tendency to have all households covered by a 3-bin service is more complete and the recovery rates are higher. The 2-bin system tends to be prevalent in councils with a more dispersed population and does not recover all possible materials, especially organics. Most regional councils are unique mixes of the two systems.

Table 6. Recovery Rates Achieved by each SA Regional Council, 2022-23.

		2022-23			2021-22		
Subregion		3-bin RR	Org. RR	Recyc. RR	3-bin RR	Org. RR	Recyc. RR
Southern & Hills	▲	65.17	55.34	38.73	60.71	48.84	37.14
Southern & Hills	▲	62.49	51.75	37.23	59.64	47.32	36.69
Southern & Hills	▲	57.58	45.24	34.7	55.37	41.46	34.75
Southern & Hills	▲	55.22	38.17	38.12	50.6	30.63	36.82
South East	▲	54.39	45.23	26.83	49.5	39.19	25.13
Southern & Hills	▲	50.53	38.33	28.57	44.99	29.95	28.07
Murray Mallee	▼	46.99	35.59	25.04	47.44	34.98	26.7
Central	◆	46.68	33.67	26.89	46.68	33.68	26.88
Central	▲	46.55	34.5	25.61	45.05	32.4	25.41
Eyre Peninsula	▲	44.65	32.57	24.45	42.88	30.81	23.39
Central	▲	46.4	27.7	32.6	37.67	20.7	25.56
Eyre Peninsula	▼	44.57	33.37	23.27	48.23	37.68	24.65
South East	▲	44.48	33.68	22.67	43.28	31.86	22.81
Central	▲	43.05	29.75	24.94	41.79	26.25	26.59
Murray Mallee	▲	42.36	29.47	24.08	41.96	31.97	20.19
Central	▼	41.95	16.35	34.52	60.74	48.53	37.67
Murray Mallee	▲	41.72	28.58	23.99	36.02	21.99	21.94
Central	▼	41.34	23.9	28.09	49.57	36.14	29.42
Murray Mallee	▲	41.23	26.82	25.1	40.03	24.66	25.39
Murray Mallee	▲	40.48	25.58	25.18	38.42	21.87	25.59
South East	▲	39.56	28.2	20.74	38.82	27.17	20.73
Central	▲	39.23	25.88	22.86	34.11	19	22.07
Central	▲	37.83	18.35	27.73	37.36	17.38	27.85
Central	▼	29.21	19.44	14.63	31.44	23.93	12.59
Murray Mallee	▲	28.52	0	28.52	6.12	0	6.12
South East	▲	27.17	0	27.17	26.84	0	26.84
Central	▼	26.87	0	26.87	28.79	0	28.79
Outback	▼	26.02	6.09	22.29	26.67	9.49	20.56
Central	▼	23.78	0	23.78	27.16	0	27.16
Central	▲	23.41	0	23.41	17.04	0	17.04
South East	▼	22.86	0	22.86	44.9	32.44	25.08
Central	▲	22.51	9.68	15.49	16.11	0	16.11
Eyre Peninsula	◆	19.03	0	19.03	19.03	0	19.03
Central	▲	18.85	0	18.85	17.2	0	17.2
Eyre Peninsula	▲	18.33	0	18.33	18.02	0	18.02
South East	▼	17.67	0	17.67	20.25	0	20.25
South East	▲	16.42	0	16.42	15.47	0	15.47
Central	▼	16.36	0	16.36	17.78	0	17.78
Eyre Peninsula	▼	10.89	0	10.89	17.37	0	17.37
Eyre Peninsula	▲	10.72	0	10.72	9.33	0	9.33
Murray Mallee	▼	10.66	0	10.66	12.46	0	12.46
Murray Mallee	▲	10.54	0	10.54	10.17	0	10.17
Eyre Peninsula	▼	7.14	0	7.14	14.29	0	14.29
Eyre Peninsula	◆	0	0	0	0	0	0
Outback	◆	0	0	0	0	0	0
Eyre Peninsula	◆	0	0	0	0	0	0
Eyre Peninsula	◆	0	0	0	0	0	0
Eyre Peninsula	◆	0	0	0	0	0	0
Eyre Peninsula	◆	0	0	0	0	0	0

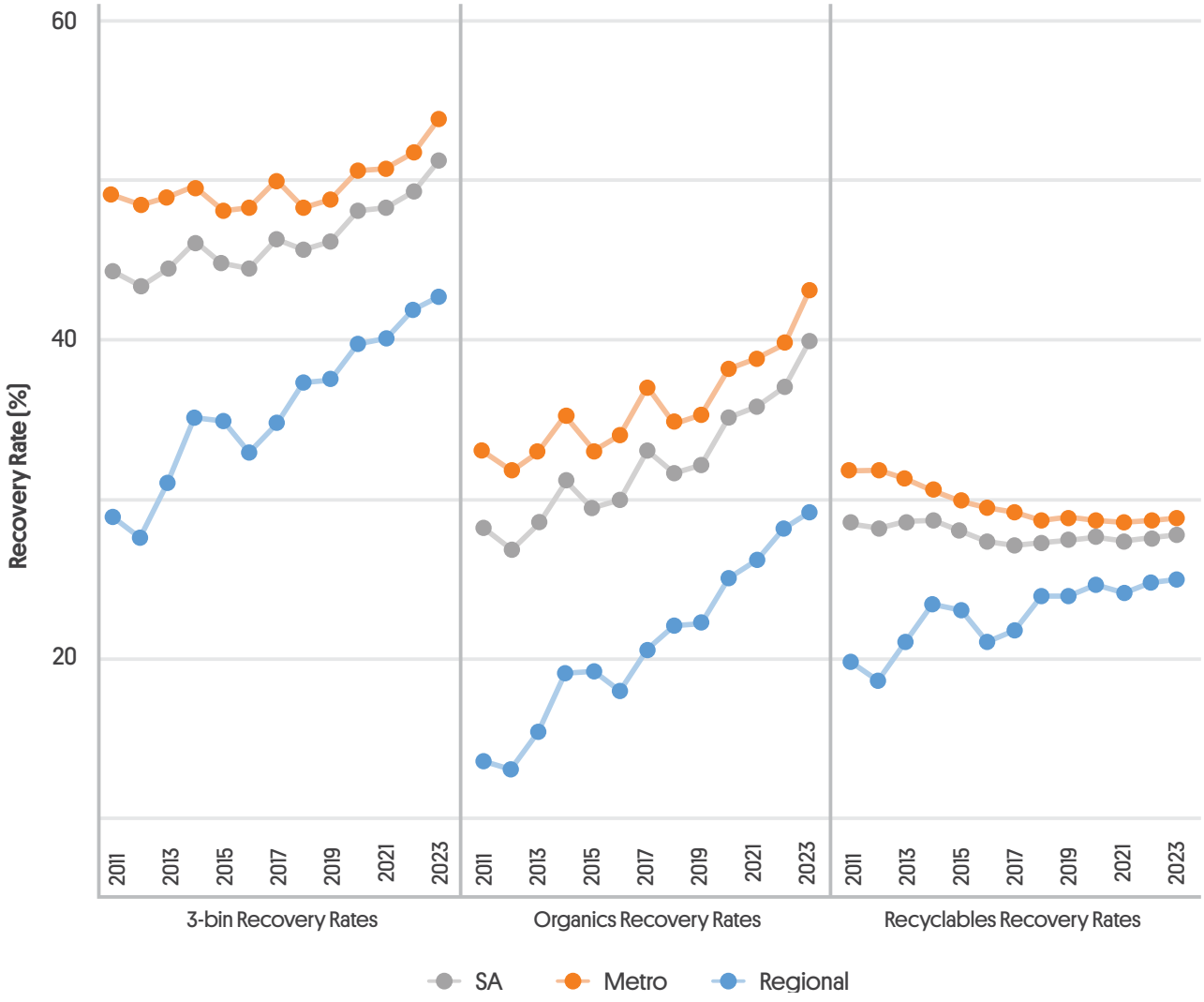
NB: Differences from the previous year are likely due to overestimation in performance or incorrect reporting of quantity of waste in that year. Some quantities of reported wastes may not be related to kerbside only. Efforts have been made to verify and correct the numbers where possible.

2.6 Long term trends

The long-term recovery trends for metropolitan Adelaide versus Regional SA are represented graphically in **Figure 15**. The recovery rate has improved 2.1% over the previous year for the metropolitan Adelaide area compared with 4.6% improvement against 2010-11 performance.

However, in the regional areas, there was a 0.8% improvement from the previous year compared with 13.8% 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 15. Comparison of three-bin recovery rates for Metro Adelaide and Regional areas from 2010-11 to 2022-23



3 Factors Affecting Recovery Rates

3.1 Food Waste Collection Systems

Table 3 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.

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 FOGO collections should complete the organics bins rollout to all households before more food caddies are deployed. These councils will continue to achieve low recovery rates at kerbside until they do so.

In regional areas, councils with more frequent organics service collection often offer an opt-in food waste collection at least in townships. A few councils, such as Alexandrina Council and Mount Gambier City Council, also encourage home composting 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 tends to have a better three-bin recovery rate, but when organics (the third bin) are discounted, it may perform worse than councils with less leafy suburbs. Councils with opt-in FOGO 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.

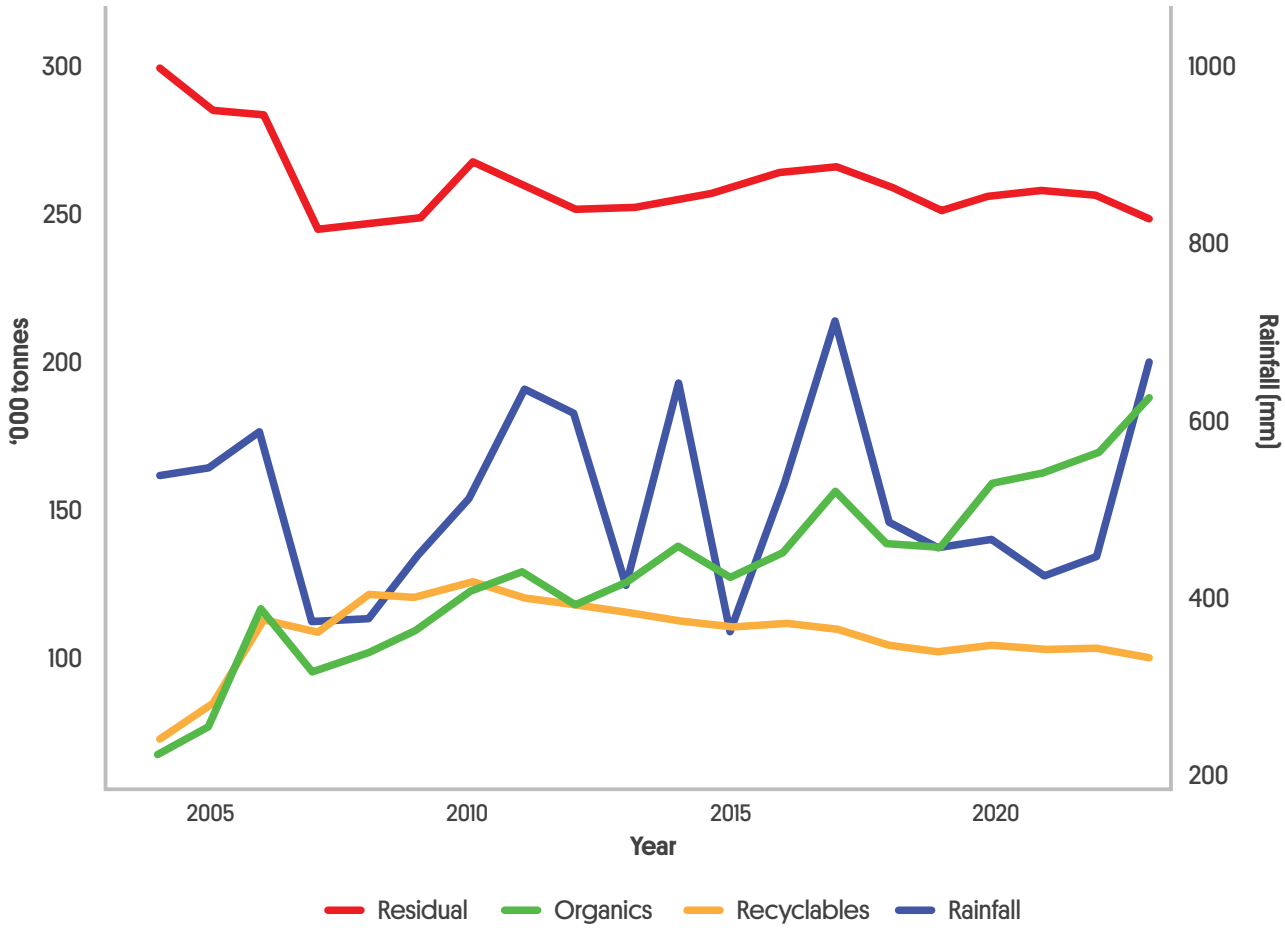
Adelaide's rainfall in 2022-23 was an increase of 49.7% relative to the previous three years (**Table 7**), contributing to an increase of 10.9% in organics collected compared with 2021-22.

Table 7. Total Rainfall (mm) Recorded at Kent Town/ West Terrace for Financial Years (periods ending June 30)

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Rainfall	647	362	524	716	487	456	465	425	446	667

Figure 16 shows annual rainfall and total of each of bins collected at kerbside for the years 2003-04 to 2022-23. Volumes of organics collected drop in dry years, although this is offset by watering of gardens and rainfall patterns across the year.

Figure 16. Trends of kerbside waste tonnages by bin for Metro Adelaide from 2003-04 to 2022-23



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)].

This has led to a decrease in the volume and, in particular, the weight of material being recycled – though this may have been offset to some extent by increased online shopping purchases which are resulting in more cardboard packaging as waste.

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 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.

3.5 Contamination Rates

A number of kerbside waste audits were undertaken in previous years to determine the behaviour of residents in using the waste bins. Audits have been carried out by both metropolitan and regional councils.

Combined, they indicate that contamination was around 13% by weight (post collection) in recyclables bins and 2% in green organics bins. 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.

In addition to lowering the effective recovery rate, contamination interferes with sorting through materials recovery facilities (MRFs) and commercial composting facilities. This wastes resources that may otherwise be recycled or devalues its worth in potential markets.

The audits also show that 30-40% of the contents of the residual bins is food waste. Significant improvements in the recovery rate would be achieved if food waste was correctly placed in the green organics bin. Some audits over different financial years have shown that the residual bin can contain as much as 69% recyclable and organic material.

4 Conclusions

This report examines the effectiveness of the kerbside bin systems in South Australia both in metropolitan Adelaide and regional councils in the 2022-23 financial year, 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 19 metropolitan Adelaide councils have a three-bin system but 5 councils have some form of opt-in for FOGO service. Increasingly, regional councils are offering a FOGO 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 in excess of 60% recovery rate at certain times of the year.

The generation of kerbside waste materials 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, for example:

- 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. The replacement of plastic packaging with cardboard partially offsets this trend.
- 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 7 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. Uniformity in the waste management message to residents across the whole SA community reduces confusion and increases good waste management practices and recovery rates.
- 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 trends in this report show that there are still potential opportunities for greater diversion of recyclable material from the residual bins.

Appendix 1

Regional kerbside bin collection frequency 2022-23

Council	Number of bin	Waste	Recycling	Organics collection
Adelaide Plains Council	Towns 3-bin, Rural 2-bin	Fortnightly	Fortnightly	Fortnightly
Alexandrina Council	Towns 3-bin	Fortnightly	Fortnightly	Fortnightly
The Barossa Council	Towns 3-bin, Rural 2-bin	Weekly	Fortnightly	Fortnightly
Barunga West Council	3-bin	Fortnightly	Fortnightly	Fortnightly
Berri Barmera Council	3-bin	Weekly	Fortnightly	Fortnightly
District Council of Ceduna	1-bin	Weekly	-	-
Clare and Gilbert Valleys Council	3-bin	Fortnightly	Fortnightly	Fortnightly
District Council of Cleve	2-bin	Weekly	Fortnightly	-
District Council of Coober Pedy	1-bin	Weekly	-	-
Coorong District Council	3-bin	Weekly	Fortnightly	Fortnightly
Copper Coast Council	3-bin	Fortnightly	Fortnightly	Fortnightly
District Council of Elliston	2-bin	Weekly	Fortnightly	-
The Flinders Ranges Council	2-bin	Weekly	Fortnightly	-
District Council of Franklin Harbour	1-bin	Weekly	-	-
Regional Council of Goyder	2-bin	Weekly	Fortnightly	-
District Council of Grant	2-bin	Fortnightly	Fortnightly	-
Kangaroo Island Council	Towns 3-bin	Fortnightly	Fortnightly	Fortnightly
District Council of Karoonda East Murray	2-bin	Weekly	Monthly	-
District Council of Kimba	2-bin	Weekly	Fortnightly	-
Kingston District Council	2-bin	Weekly	Fortnightly	-
Light Regional Council	Towns 3-bin, Rural 2-bin	Weekly	Fortnightly	Fortnightly
District Council of Lower Eyre Peninsula	1-bin	Weekly	Fortnightly	-
District Council of Loxton Waikerie	Towns 3-bin, Rural 2-bin	Weekly	Fortnightly	Fortnightly
Mid Murray Council	2-bin	Weekly	Fortnightly	-
Mount Barker District Council	Towns 3-bin, Rural 2-bin	Weekly	Fortnightly	Fortnightly
City of Mount Gambier	3-bin	Weekly	Fortnightly	Fortnightly
District Council of Mount Remarkable	3-bin	Weekly	Fortnightly	Fortnightly
Rural City of Murray Bridge	Towns 3-bin, Rural 2-bin	Weekly	Fortnightly	Fortnightly
Naracoorte Lucindale Council	3-bin	Weekly	Fortnightly	Fortnightly
Northern Areas Council	2-bin	Weekly	Fortnightly	-

Council	Number of bin	Waste	Recycling	Organics collection
District Council of Orroroo Carrieton	2-bin	Weekly	Fortnightly	-
District Council of Peterborough	2-bin	Weekly	Fortnightly	-
Port Augusta City Council	3-bin	Weekly	Fortnightly	Fortnightly
City of Port Lincoln	2-bin	Weekly	Fortnightly	-
Port Pirie Regional Council	3-bin	Weekly	Fortnightly	Fortnightly
Renmark Paringa Council	3-bin	Weekly	Fortnightly	Fortnightly
District Council of Robe	2-bin	Weekly	Fortnightly	-
Municipal Council of Roxby Downs	3-bin	Weekly	Fortnightly	Monthly
Southern Mallee District Council	2-bin	Weekly	Monthly	-
District Council of Streaky Bay	1-bin	Weekly	-	-
Tatiara District Council	Towns 3-bin, Rural 2-bin	Weekly	Fortnightly	Fortnightly
District Council of Tumby Bay	1-bin	Weekly	-	-
City of Victor Harbor	Towns 3-bin	Fortnightly	Fortnightly	Fortnightly
Wakefield Regional Council	3-bin	Weekly	Fortnightly	4-Weekly
Wattle Range Council	3-bin	Weekly	Fortnightly	Fortnightly
City of Whyalla	3-bin	Weekly	Fortnightly	Fortnightly
Wudinna District Council	1-bin	Weekly	-	-
District Council of Yankalilla	3-bin	Fortnightly	Fortnightly	Fortnightly
Yorke Peninsula Council	3-bin	Weekly	Fortnightly	Monthly

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.
East Waste	East Waste Management Authority is a regional subsidiary of local councils formed under the Local Government Act 1999 to provide effective waste collection services for its member councils: Adelaide Hill Council, City of Prospect, City of Unley, City of Burnside, Campbelltown City Council, City of Norwood Payneham & St Peters, City of Mitcham, and the Corporation of the Town of Walkerville.
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 organics bin that collect both household food organics and garden organics.
Food Organics	Organic waste derived from food preparation and/or surplus food. It includes compostable items such as paper straws and contaminated pizza boxes in South Australia.
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 general waste, recyclable materials (separated or co-mingled), and organic waste via a bin system that are left at the kerbside for collection by local council collection service.
Municipal solid waste	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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