

Adelaide Metropolitan Area Kerbside Waste Performance Report 2016-17



Government
of South Australia

Green Industries SA

Acknowledgments

The information in this report is entirely dependent on the accuracy of the data provided by Adelaide metropolitan councils and the contractors collecting their kerbside waste. Green Industries SA acknowledges their assistance.



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Executive Summary

This report presents data on kerbside waste and recycling collection services provided by the 19 Adelaide metropolitan councils in the 2016-17 financial year and analyses performance and improvements in waste disposal efficiency and sustainability over the past 14 years.

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

All 19 metropolitan councils have offered a three-bin service for a number of years, although some only provide a green organics bin on an opt-in basis. There are also some differences between councils in terms of protocols.

Performance

In 2016-17:

- Approximately 530,300 tonnes of Municipal Solid Waste (MSW) was collected from kerbsides across the 19 council areas. This equates to about 411 kilograms per person or 974 kilograms per serviced household.
- Of this, 264,800 tonnes were recovered as organics (58.8%) or recyclables (41.2%). This represents a total recovery rate of 49.9%.

Between 2002-03 and 2016-17:

- Total kerbside waste collections increased by 17%
- The amount of waste going to landfill fell by 13% (33,800 tonnes)
- Organics and recyclables collected grew by 57% and 34% respectively
- The overall collection recovery rate increased from 31.6% in 2003-04 to 47.8% in 2013-14 then plateaued somewhat.

The 2016-17 rate of 49.9% is below the *South Australia's Waste Strategy* (GISA 2015) target of 60% waste diversion from high performing bin systems by 2020, making it clear that there is still work to be done¹.

Analysis shows that the top performing councils in 2016-17 – some achieving nearly 60% recovery rates – were those that provide a weekly residual waste collection, fortnightly recyclables collection and fortnightly organics collection that includes food waste.

Some groupings of councils have recovery rates seven to 10 percentage points lower than others due to their use of opt-in system for organics collections.

¹ It should be noted that *South Australia's Waste Strategy 2015-20* has an MSW diversion rate of 70%, which includes kerbside bins, hard waste, resident drop, CDS, etc.

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 food diversion systems will raise waste diversion rates and may narrow the gap between best and least performing councils.

2. Standardised, consistent materials collected in bin-based services across all metropolitan councils

A standard list of materials that can be placed in the recycling and organics bins across all metropolitan councils would reduce confusion for ratepayers about which bin to use, reduce contamination of the recyclables stream and organics stream and aid the consistency of education and awareness efforts.

Time and effort are being wasted in tailoring the message to individual councils' residents to accommodate the different bin services on offer within a council area. To build up a culture of waste minimisation and behaviour change takes time and requires reinforcement of the key messages. Costs can be reduced in the longer term by providing the same message 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 make correct recycling 'automatic' and 'unthinking' behaviour.

Green Industries SA (GISA) provides a number of programs and activities to assist local government. Information can be found in GISA's 2018-19 Business Plan at:

<http://www.greenindustries.sa.gov.au/publications-corporate>

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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 2015-2020* (GISA 2015) 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 councils in the 2016-17 financial year and analyses performance and improvements in waste disposal efficiency and sustainability. It also reports on trends over a 14-year period.

The focus is only on waste collected at kerbside in bins provided specifically for residual waste (garbage), co-mingled recyclables and green organics. 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 Recycling Activity Survey 2016-17*, 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 2016-17, 83.4% of all waste was diverted from landfill for recycling and other purposes (Rawtec 2018).

Residential residual waste accounts for 45% of the total solid waste that goes to landfill. The remainder is commercial and industrial waste (22%) and construction and demolition waste (33%).

1.2 Background

The environmental benefits of a three-bin waste collection system are well established and the 19 metropolitan councils have offered this service for a number of years. There are some differences between councils, however.

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

All councils collect residual waste bins weekly and recyclables fortnightly, but organics collections vary: some are fortnightly, others every four weeks.

Similarly, some councils allow food waste to be placed in the organics bin (and may even provide kitchen caddies with compostable liners) but others do not.

The average landfill recovery rate from the three-bin system across the 19 metropolitan councils was 49.9% in 2016-17. 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.

Councils often contract services to external collection contractors, many of which are private companies. The contractors collect the waste and recyclables and take it to transfer stations or Material Recovery Facilities (MRFs) for sorting and processing. The quantities are weighed at weighbridges and charged back to individual councils².

1.3 Context

Since 2005 Green Industries SA (GISA) – formerly Zero Waste SA – has funded metropolitan and rural 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 20 June 2017, about \$6.8 million had been provided to 60 councils through the Kerbside Performance Incentives Program and the Kerbside Performance Plus (Food Organics) Incentives Program, which focuses on food diversion from residual to organics bins.

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

The SA Local Government Grants Commission (SALGGC) also requests waste data from councils, which is provided on an annual basis. GISA used this data to verify the accuracy of the data collected directly.

In previous kerbside reports, SALGGC data was used for reporting waste quantities for regional councils.

² See comments on weighbridges footnote 3, p10.

1.4 Methodology

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

Councils provide GISA with a monthly breakdown, in tonnes, of residual waste, organics and co-mingled recyclables. Some councils also collect small amounts of commercial and industrial waste which is not counted separately as it is considered negligible. As the waste is weighed on weighbridges [and this is the basis of contractor charging], the accuracy of metropolitan Adelaide data is relatively high. All waste and recycling quantities in this report have been rounded to the nearest one-hundred for consistency and accuracy³.

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 metropolitan 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.

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:

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

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

$$\text{2-Bin Recovery Rate} = \frac{\text{recyclables}}{\text{recyclables + residual}} \times 100\%$$

Demographic data [population and household figures] is based on figures from the Australian Bureau of Statistics [ABS].

The Estimated Resident Population by local government area is used for population data in this report, and 'occupied dwellings' is used for serviced-households figures from 2016 census data.

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

2. Findings

2.1 Metropolitan Adelaide Kerbside Services

In 2016-17, all 19 metropolitan households 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 Council⁴ only covered about two-thirds of households (mostly in townships) for organics.

An estimated 55% 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 2017), with participation increasing since 2011-12. It is estimated that about 90% of metropolitan households now have three bins in use.

Bin System	Metropolitan	
	2003-04	2016-17
Three-bin	15	19
Two-bin	4	0
Single-bin	0	0
Total	19	19

Table 1. Summary of Metropolitan Council Kerbside Bin Systems in 2016-17 and 2003-04

Sources: SALGGC (2016) and SA EPA (2002)

Most metropolitan councils provide a weekly residual service, fortnightly recyclable collections and fortnightly organics collections.

All use yellow lids for recycling bins and most use 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. The other seven use blue lids which, according to the standard, are for cardboard and paper only. [See Appendix 1 for details].

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.

⁴ For the purpose of this report, the Adelaide Hills Council is included in the analysis.

2.2 Metropolitan Adelaide Kerbside Quantities

In 2016-17, residents in the metropolitan area generated 530,300 tonnes of kerbside materials, of which 49.9% was recovered as recyclables or organics, a 1.7% increase on the previous year [Table 2]. This was driven by a 13% increase in organics.

Approximately 411 kg of MSW was collected per person, or 974 kg per household serviced [Table 4].

Overall, metropolitan Adelaide achieved a three-bin recovery rate of 49.9%.

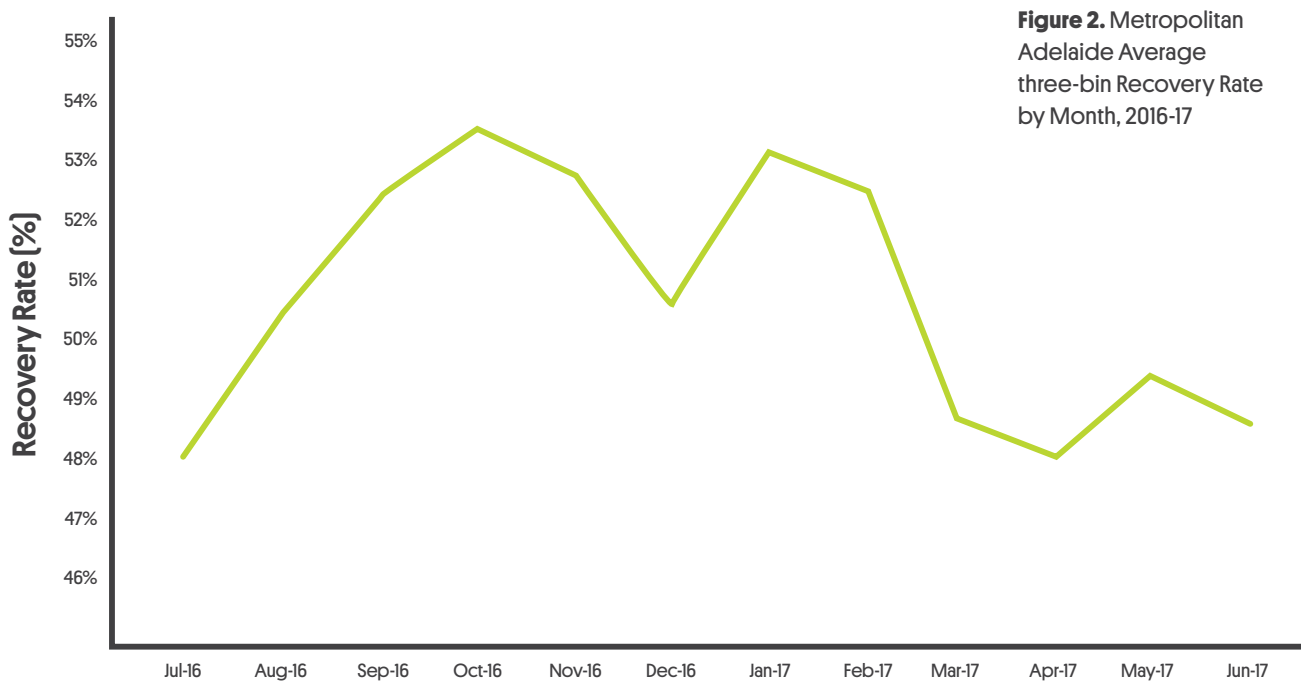
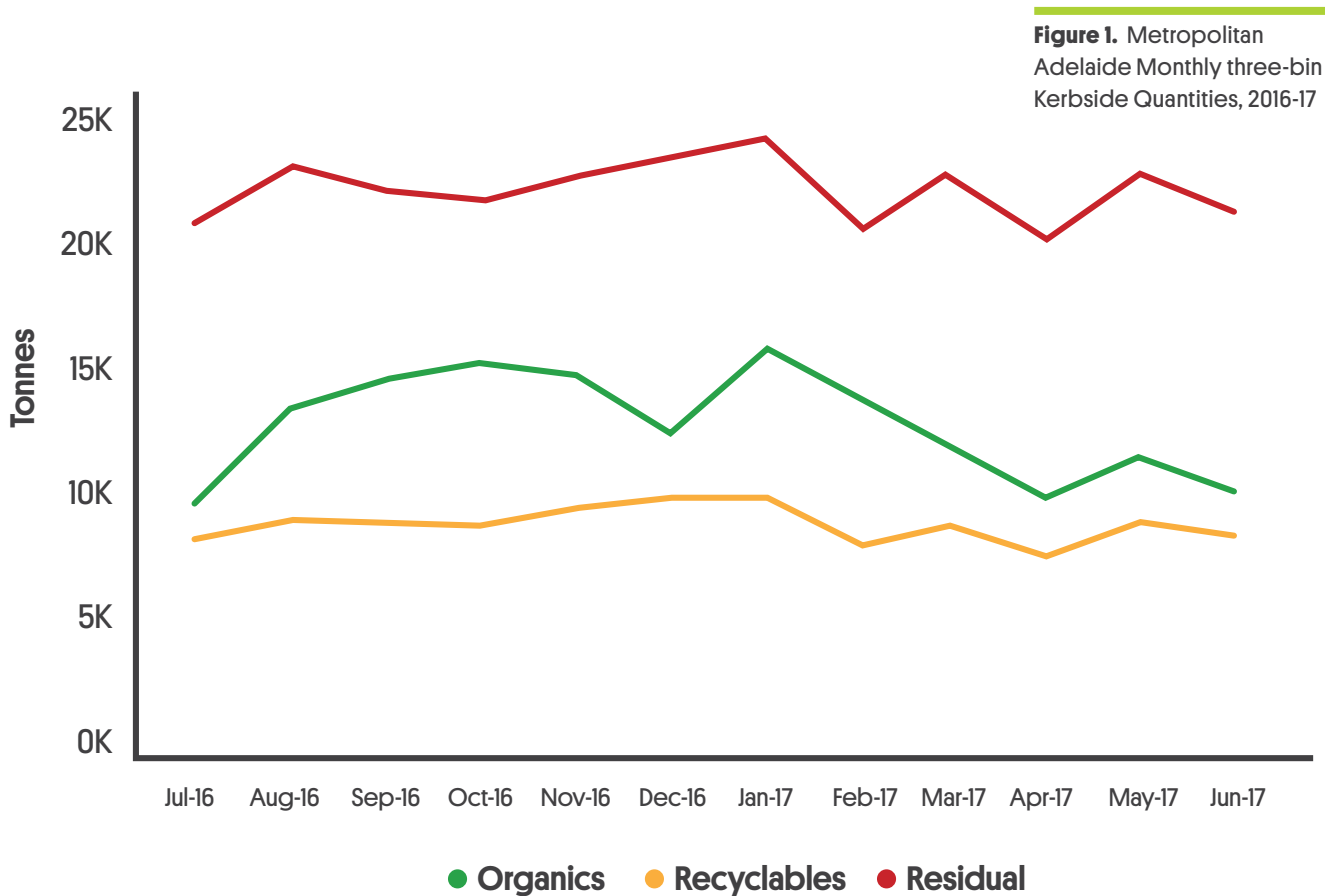
Collection	2015-16 (tonnes)	2016-17 (tonnes)	% Change from 2015-16
Residual Waste	263,700	265,500	1%
Organic	134,900	155,700	13%
Recyclables	110,500	109,100	-1%
Total Metropolitan Materials	509,000	530,300	4%
Recovery Rate	48.2%	49.9%	1.7%

Table 2. Metropolitan Adelaide Councils: 2015-16 and 2016-17 Kerbside Quantities

Source: GISA [2018]

Seasonal fluctuations in monthly collection trends (Figure 1) can affect quantities: for example, garden waste in spring and autumn and general waste around Christmas and Easter. Weather conditions, particularly rainfall, also can affect quantities of garden waste.

Fluctuations in the three-bin recovery rate over 2016-17 are shown in Figure 2. The impact of a dry summer can be seen. The slight pick-up in organics in May is likely due to deciduous trees dropping their leaves.



2.2.1 Metropolitan Adelaide Sub-Regions

To provide some comparisons between councils, sub-regional aggregations have been used (Table 3, Figure 3). Since 2004-05, populations in all metropolitan sub-regions have increased (ABS 2017). This contributes to an increase in total waste generated, so per capita and per household analysis has been undertaken (Table 4).

Sub-region	Population	Households
Central Eastern – Adelaide, Adelaide Hills, Burnside, Campbelltown, Norwood Payneham and St Peters, Prospect, Unley, Walkerville	265,085	114,925
Northern – Gawler, Playford, Salisbury, Tea Tree Gully	358,835	141,861
Southern – Marion, Mitcham, Onkaparinga	328,783	138,114
Western – Charles Sturt, Holdfast Bay, Port Adelaide Enfield, West Torrens	337,347	149,596
Total	1,290,050	544,496

Table 3. Metropolitan Adelaide Sub-Regions, Population and Households, 2017

Sources: GISA (2018) and ABS (2018)

Sub-Region	Total Materials [tonnes]	Recovery Rate	Materials per Capita (kg/yr)	Materials per Household (kg/yr)
Central Eastern	106,996	53.5%	404	931
Northern	141,603	45.6%	395	998
Southern	136,876	48.8%	416	991
Western	144,859	52.7%	429	968
Total	530,300	49.9%	411	974

Table 4. Metropolitan Adelaide Sub-Regions: Total Materials Collected, Per Capita and Per Household in 2016-17

Sources: GISA (2018) and ABS (2018)

The Central Eastern group had the highest three-bin recovery rate at 53.5% and the Northern group the lowest at 45.6% (Table 4, and Figure 3). Factors affecting the recycling rate are discussed in Section 3.5.

Monthly three-bin recovery rates for the sub-regions show seasonal trends in all areas. There is a steady difference of 7 to 10 percentage points between the sub-regions with the highest recovery rate and the lowest (see Figure 4).

Figure 3. Monthly three-bin Kerbside Recovery Rates by Metropolitan Adelaide Sub-Regions, 2016-17

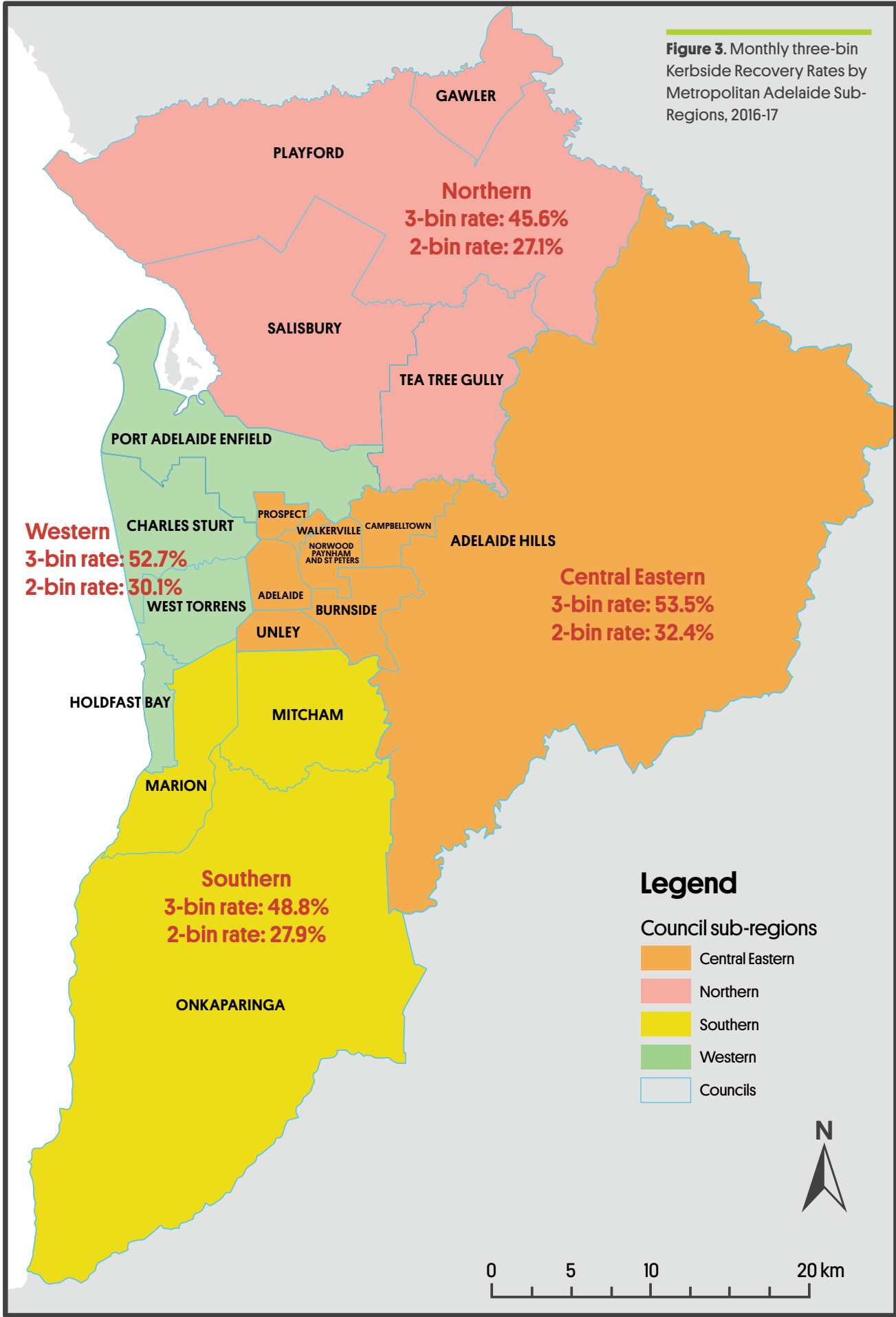
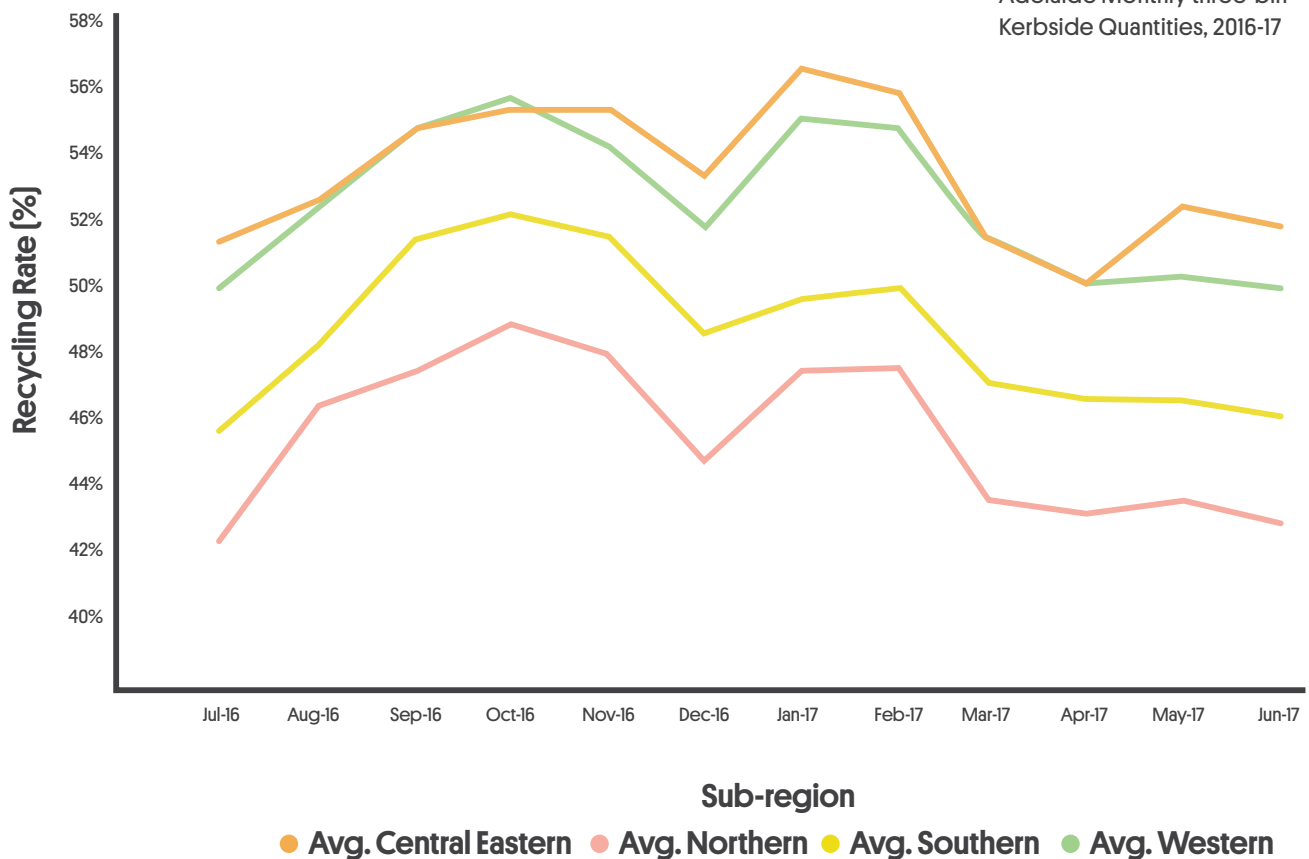


Figure 4. Metropolitan Adelaide Monthly three-bin Kerbside Quantities, 2016-17



2.3 Metropolitan Adelaide Recovery Rate Performance

Table 5 shows the recovery rate for each of the 19 councils [unnamed] with a description of the organics/food waste service they offer residents. All but three are in the “leafy” category, meaning they have higher rainfall and more residential gardens.

More than half have three-bin recovery rates greater than 50%.

In general, the best performing councils have full organics bin coverage, supplemented with a food caddy. However, direct comparisons are difficult due to different underlying factors such as geography, average weekly household income, use of food caddies and rainfall.

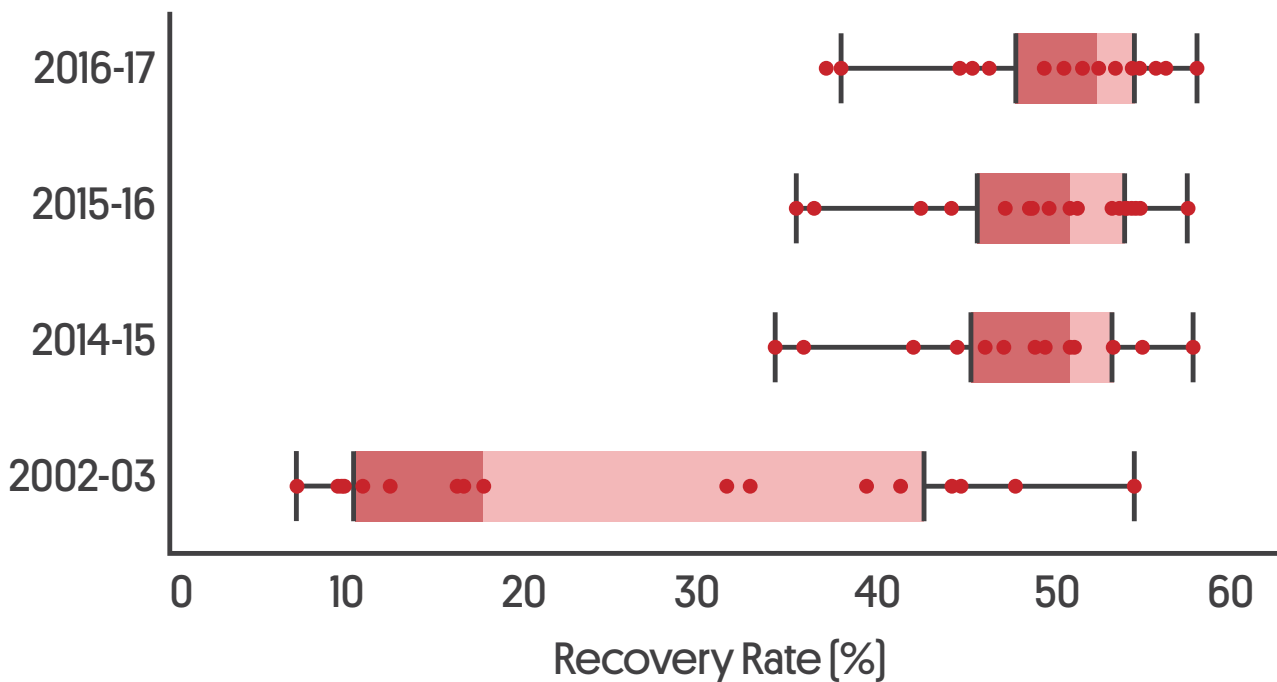
Category	Recovery Rate (all bins)	Recovery Rate without organics	Comments
Leafy	58.0%	33.7%	Full roll out of caddy
	56.3%	32.1%	Full roll out of caddy
	55.7%	35.0%	Full roll out of caddy
Leafy	55.4%	32.3%	Residents can purchase caddies
Leafy	54.7%	33.6%	Opt-in caddy for sale
Leafy	54.5%	33.4%	Full roll out of caddy
	54.4%	31.2%	Residents register and pay for caddy
Leafy	54.3%	29.6%	No caddy at this point
	53.3%	28.6%	Residents can ask for a caddy
	52.3%	29.5%	Opt-in caddy. One off offer
	51.6%	29.8%	Full roll out of caddy
	50.7%	25.7%	Caddy on request
	50.4%	29.4%	No caddy at this point
Leafy	49.4%	32.0%	Caddy, but only for those with greens service
Dry	46.2%	26.3%	Opt-in green service (pay)
Dry	45.4%	27.2%	Opt-in green service (pay), inc. caddy
	44.7%	27.3%	Four weekly green, no food
Dry	38.0%	26.0%	Opt-in green service (pay). No caddy
	37.1%	30.4%	Residents receiving organics collection can pick-up free Kitchen Basket & ongoing supply of compostable bags

Table 5. Recovery Rates Achieved by each Metropolitan Adelaide Council, 2016-17

Source: GISA (2018)

Figure 5 shows the distribution of the three-bin recovery rates by council, comparing 2002-03 with the three years to 2016-17. As previously noted, there was significant improvement over the period, though rates have stabilised recently. The median rate was 52.3% in 2016-17.

Figure 5. Metropolitan Adelaide Monthly three-bin Kerbside Quantities, 2016-17



Source: GISA (2018)

2.4 Factors Affecting Recovery Rates

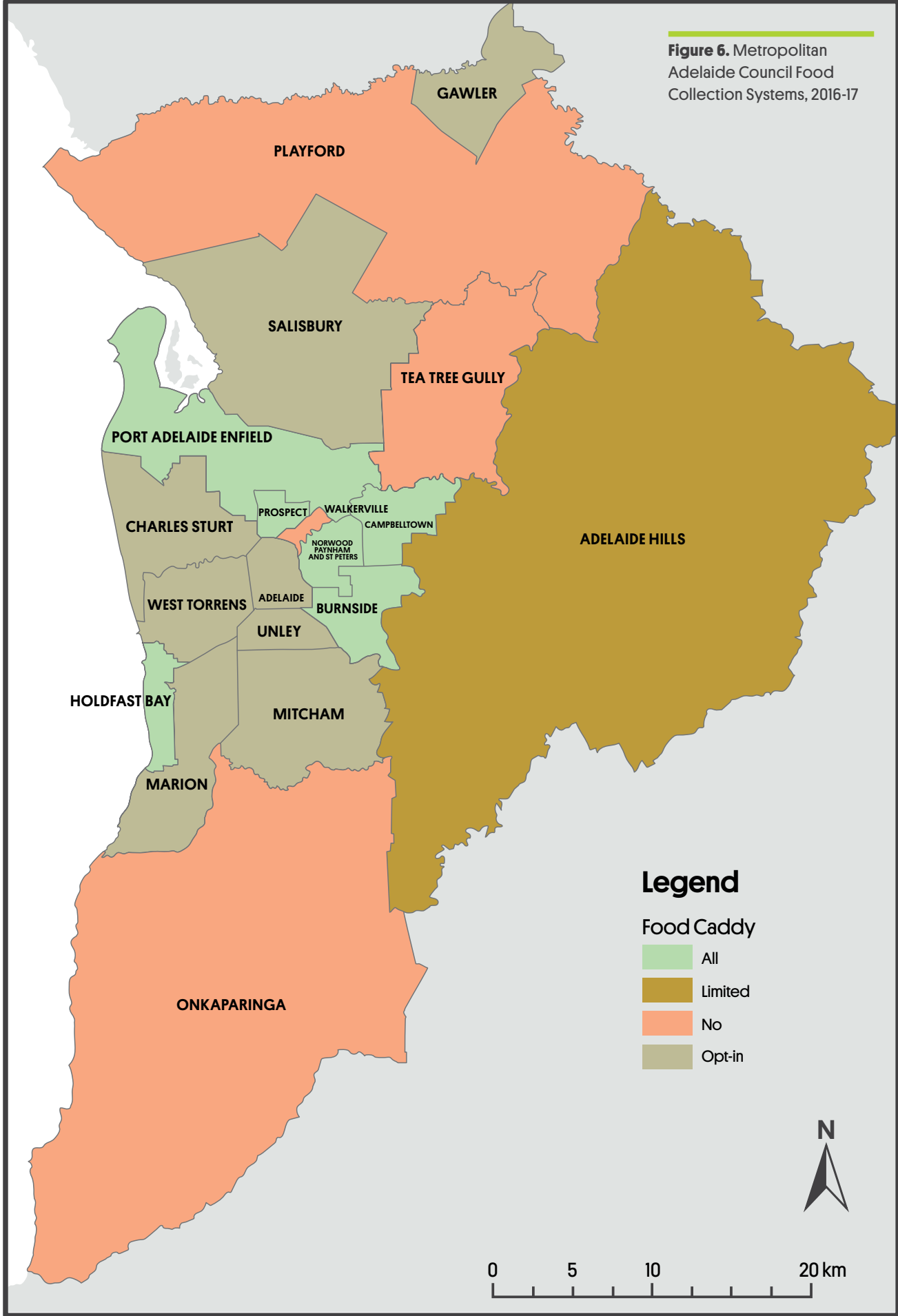
2.4.1 Food Waste Collection Systems

Table 5 and Figure 6 indicate where food caddy systems have been deployed and how effective these have been. Currently 13 councils offer free caddies [although in eight councils this is on a voluntary rather than council-wide basis] and three councils offer these for sale. Some councils did not make the availability of food caddy systems easy for householders to find on their websites, but these may have been promoted in other ways.

A full organic collection rollout across Adelaide would be expected to lift the recovery rate significantly. Councils with opt-in organics collections need to 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.

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.

Figure 6. Metropolitan Adelaide Council Food Collection Systems, 2016-17



2.4.2 Vegetation / gardens

High levels of garden organics tend to boost overall recovery rates [Table 5]. 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 high in 2016-17 relative to previous years [Table 6], contributing to a 13% increase in organics collected compared with 2013-14 [an average rainfall year].

Year	2010	2011	2012	2013	2014	2015	2016	2017
Rainfall	511.2	637.8	608.6	412.6	646.6	376.8	523.4	716.0

Table 6. Total Rainfall (mm) Recorded at Kent Town for Financial Years (periods Ending June 30)

Source: BOM [2018]

Figure 7 shows annual rainfall and total organics recovered at kerbside for the years 2009-10 to 2016-17. Volumes of organics collected drop in dry years, although this is offset by watering of gardens and rainfall patterns across the year.

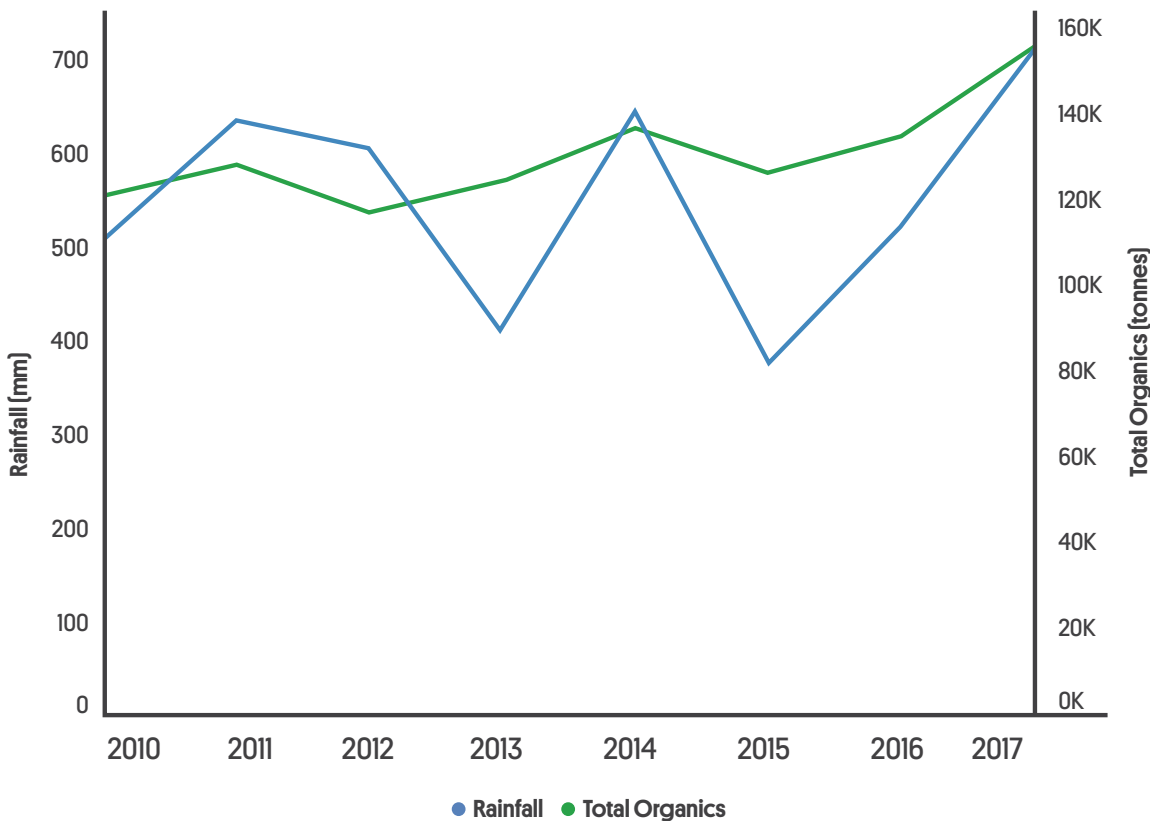


Figure 7. Metropolitan Adelaide Monthly three-bin Kerbside Quantities, 2016-17

2.4.3 Recyclables

In recent years there has been a trend to replace glass and steel packaging with lighter plastics, and consumers are buying fewer newspapers and magazines (newspaper sales fell 40% between 2002 and mid 2017) as consumers receive more information electronically.

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 extent in the future by increased amounts of cardboard as the trend towards online shopping increases.

Less waste means lower recovery rates. To compensate for this drop, less material must be presented in residual bins and changes to householder behaviour such as food diversion are essential.

2.4.4 Economics / households / populations

Economic and demographic factors influence the amount of kerbside waste and recovery rates. As shown in Figure 10, residual waste per person has remained steady in recent years, but total kerbside waste has increased with population increases. Each council has a mix of residents – from young families to older couples – which affects the profile of waste presented.

It is supposed that households with larger incomes can spend more on consumer goods (more packaging and other waste), particularly food. This would generate more waste overall as well as more recyclables. Additionally, more organics can be produced from gardens being watered in dry years.

ABS analysis from the 2016 census shows that some councils have slowing population growth (e.g. Prospect), while others are attracting young families and are expanding (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).

Figure 8 shows the relationship between recovery rate and median household weekly income [ABS]. When the graph is first plotted, it seems to show a near linear relationship, but further examination reveals a different situation. When viewed as two distinct groups, the upper group (shown in blue) is generally characterised by councils with:

- leafy suburbs [6]
- full fortnightly organics service [5] – one has two-thirds of its area so covered
- food caddies deployed to all residents [5]
- higher median weekly household income.

The line of best fit shows virtually no linear trend and is not significant.

The lower group of councils (shown in red) appears to have a linear relationship between recovery rate and weekly household income but again this is misleading. Underlying factors such as:

- partial, voluntary coverage of households with a three-bin system
- two-weekly versus four-weekly collection of organics
- voluntary adoption of food caddies for food waste diversion

are present, with the bin systems of the better performers in this group starting to match those of the upper group.

It appears reasonable to summarise this data by concluding that 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.

This effect is also evident when contrasting the two-bin system recovery rate against weekly household income (not shown). There appears to be near linear improvements as these refinements are added before the rate begins to taper off. Many other factors underlie this situation – such as awareness programs and education levels of households – but a report of this nature cannot examine them in detail. As such, the foregoing discussion does not discredit the notion that higher average household earnings tends to produce higher quantities of kerbside waste.

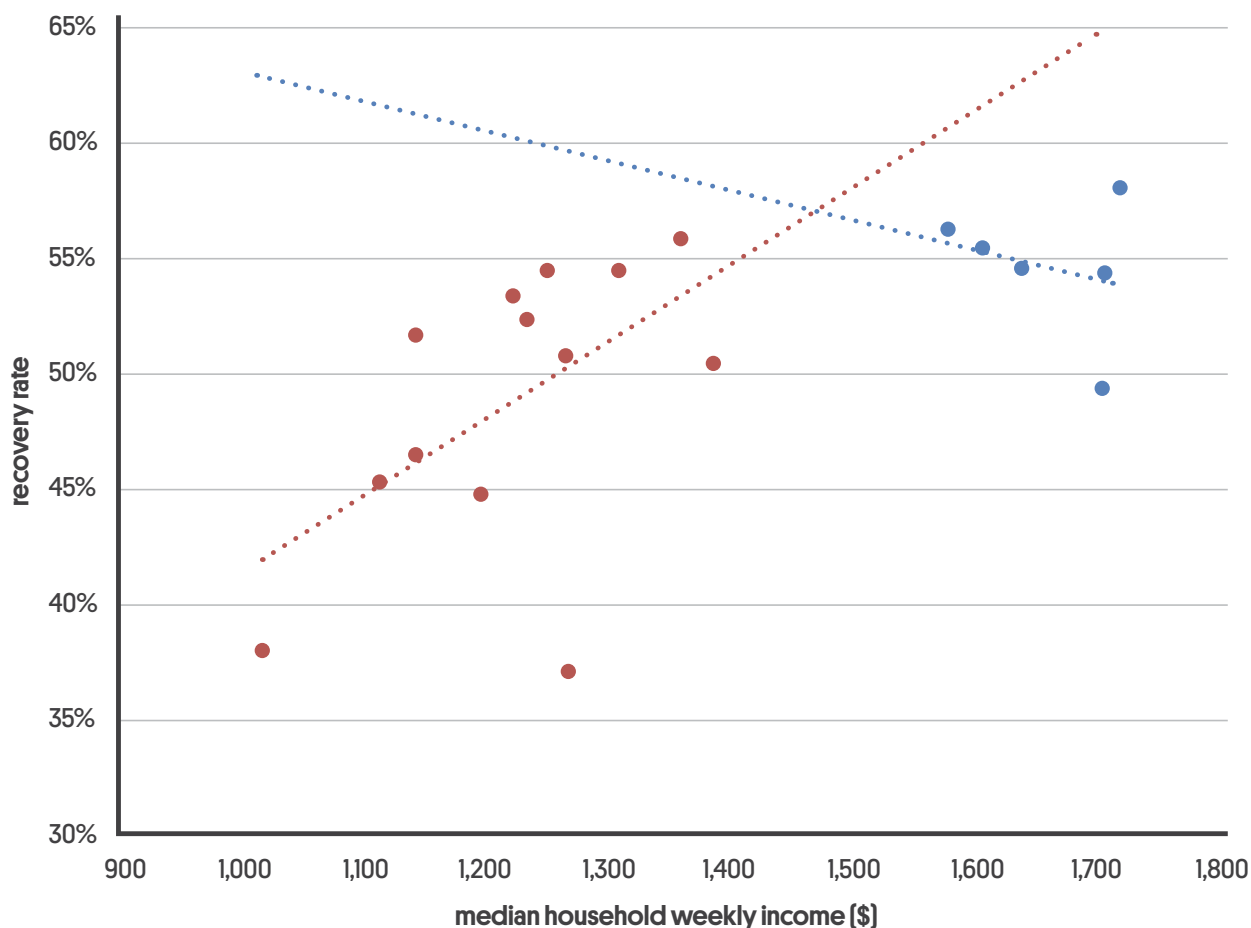


Figure 8. Three-bin Recovery Rates by Median Weekly Household Income Contrasting the Groups with High and Low Median Weekly Income.

2.4.5 Contamination Rates

A number of kerbside waste audits were undertaken between 2011 and 2014. 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 around the mark 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.

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 this material was placed in the green organics bin. Others [FRWA 2015] also point out the significant improvements still to be gained in recovery rates by diverting recyclables from the residual bin, which can contain as much as 69% recyclable material.

2.5 Metropolitan Adelaide Long Term Trends

Over the 14 years to 2016-17 (Figure 9), the major changes include:

- A 17% [92,600 tonne] increase in total metropolitan kerbside waste
- a 13% [33,800 tonne] fall in the quantity of landfill
- a 57% [89,500 tonne] increase in organics diversion
- a 34% [36,900 tonne] increase in recyclables recovered.

Financial Year	Metropolitan %
2003-04	31.6%
2004-05	36.0%
2005-06	44.7%
2006-07	45.4%
2007-08	47.4%
2008-09	48.0%
2009-10	48.0%
2010-11	49.0%
2011-12	48.3%
2012-13	48.7%
2013-14	49.4%
2014-15	47.8%
2015-16	48.2%
2016-17	49.9%

Table 7. Metropolitan Adelaide's 14 Years of Kerbside Recovery Rates

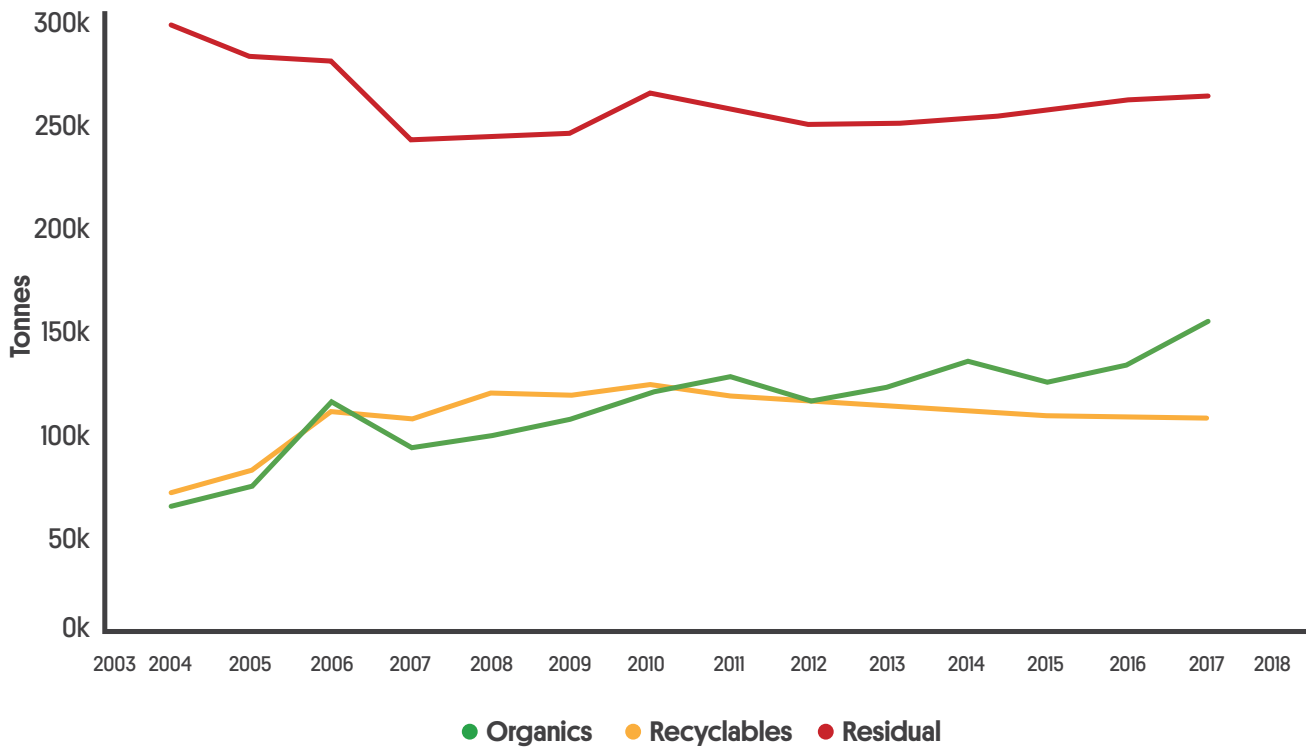
Source: GISA [2018]

The metropolitan recovery rate increased from 31.6% in 2003-04 to 49.9%⁵ in 2016-17, but stabilised in the last three of these years. The recovery rate rose from 48.2% in 2015-16 to 49.9% in 2016-17, probably due to increased numbers of householders taking up an organics bin where the opt-in system is in place, and a higher rainfall year affecting organics yields presented for collection.

In 2016-17, the overall three-bin recovery rate was below the *South Australia's Waste Strategy* (GISA 2015) metropolitan municipal waste diversion target of 60% from high performing bin systems by 2020, showing that there is still a considerable challenge in order to achieve the target.

⁵ The recovery rates quoted in this report should not be confused with the 59.1% Metropolitan MSW recovery rate quoted in the *South Australia's Recycling Activity Survey 2016-17 Financial Year Report* [Rawtec 2018] as this current report examines only kerbside collections and omits, hard waste, e-waste and other aspects of MSW. The *Recycling Activity Survey* covers all aspects of MSW data, not just kerbside collections.

Figure 9. Metropolitan Adelaide 14 Year Trend of Kerbside Collection Quantities



During the last six years, residual municipal waste per capita has remained steady (see Figure 10). There has been a slight decrease in recyclables, likely due to previously mentioned move towards lightweight packaging and decreases in printed newspaper and magazine sales.

Since 2012-13, more households in relevant council areas have taken up the optional organics bin and this has resulted in increased yields of recovered organics (NAWMA 2015). Overall, organics have experienced slight increases and drops across the same period, which is attributed to rainfall variation.

Figure 11 shows these trends more obviously, with total monthly waste per person by waste bin, across Adelaide over the last five years of available data. The trend in residual waste per person has stayed reasonably constant, with the greatest changes occurring in the increased quantities of recovered organics waste, and decreasing recyclables tonnages for reasons explained above.

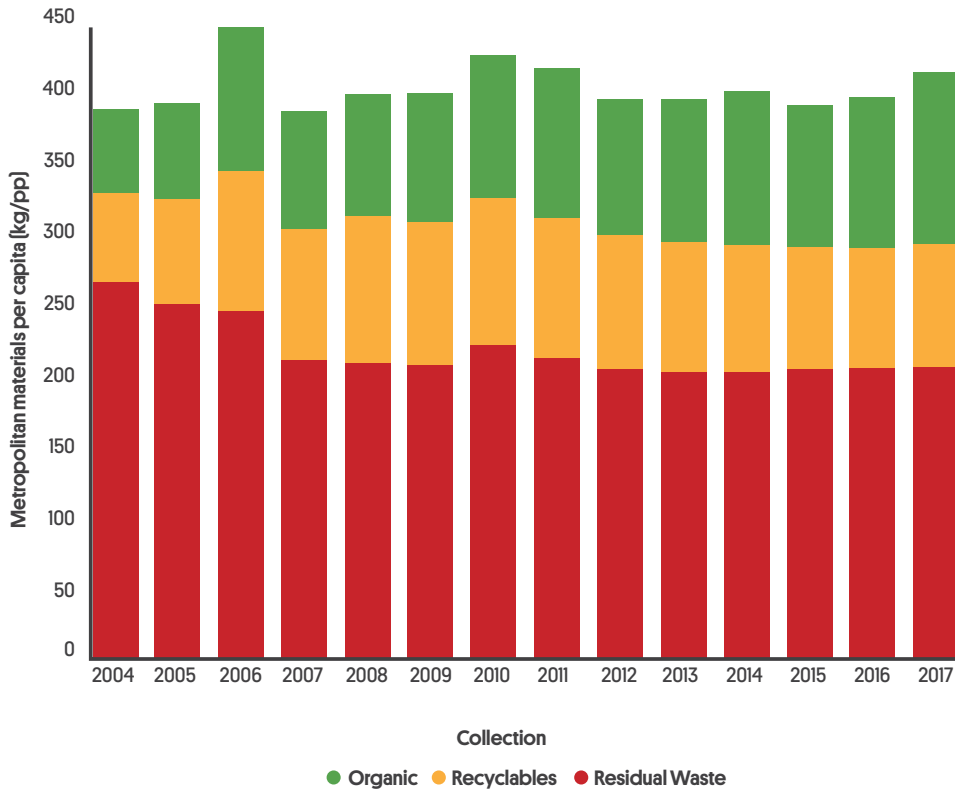


Figure 10. Metropolitan Adelaide 14 Year Trend for Per Capita Kerbside Materials [kilograms per person]

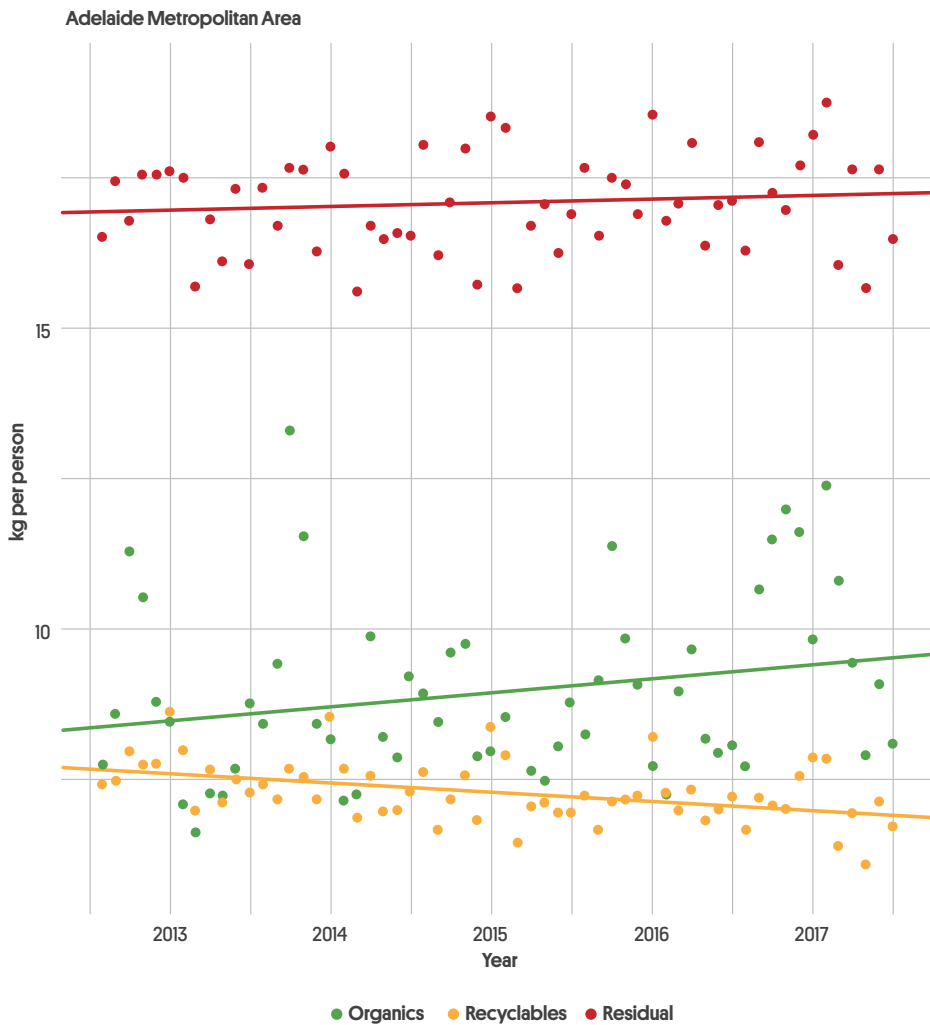


Figure 11. Metropolitan Adelaide Average Kilograms of Kerbside Materials by Bin Per Person Per Month [green = organics, red = residual, yellow = recyclables].

3. Conclusions

This report examines the effectiveness of the kerbside bin systems in Adelaide's metropolitan councils, using the recovery rate as an indicator.

The most effective system of those in use is the three-bin system, which has achieved up to 60% recovery rate at certain times of the year.

All metropolitan councils have a three-bin system but some are opt-in only for the organics service. More residents have opted for an organics service in 2014-15. The councils that have the best recovery rates were generally those in which all households have a three-bin system with food waste system.

The consumption of resources by South Australian households has remained relatively stable over the 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 two-bin recovery rates have been discussed and the latter allows comparison of waste without seasonal effects. Various factors influence the 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 replaced by lighter plastics
- 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, some groupings of councils have recovery rates seven to 10 percentage points lower than others due to their use of opt-in system for organics collections
- Education programs and systems deployed by councils and variations of recycling messages across councils
- Deploying a uniform three-bin system with food caddies will lead to greater recovery rates
- Economic / social, such as household income and spending

In addition to the recovery rate over time, 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.

Appendix 1:

Kerbside bin lid colours

Council	Residual	Organics	Recycling
Adelaide	Red	Lime green	Yellow
Adelaide Hills	Blue	Green	Yellow
Burnside	Red	Green	Yellow
Campbelltown	Blue	Green	Yellow
Charles Sturt	Blue	Green	Yellow
Gawler	Red	Green	Yellow
Holdfast Bay	Red	Green	Yellow
Marion	Red	Green	Yellow
Mitcham	Blue	Green	Yellow
Norwood PSP	Red	Green	Yellow
Onkaparinga	Red	Green	Yellow
Playford	Red	Green	Yellow
Port Adelaide Enfield	Blue	Green	Yellow
Prospect	Red	Green	Yellow
Salisbury	Red	Green	Yellow
Tea Tree Gully	Red	Green	Yellow
Unley	Blue	Green or Grey	Yellow
Walkerville	Blue	Green	Yellow
West Torrens	Red	Green	Yellow

Table A: Lid Colours for Kerbside Bin Types by Local Government Council

Glossary⁶

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.

Food organics

Organic waste derived from food preparation and/or surplus food.

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.

⁶Glossary definitions sourced from:

1. Rawtec (2018), *South Australia's Recycling Activity Survey 2016-17 Financial Year Report*

2. Sustainability Victoria (2013), *Victorian Local Government Annual Survey* available from:

<http://www.sustainability.vic.gov.au/publications-and-research/research/council-waste-and-recycling-data>

3. NSW EPA (2013), *NSW Local Government Waste and Resource Recovery Data Report 2011-12 as reported by councils* available from:

<http://www.epa.nsw.gov.au/warr/datareport.htm>

4. GISA (Green Industries SA 2015), *South Australia's Waste Strategy 2015-2020*, available from: <http://www.greenindustries.sa.gov.au/publications>

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 include waste dropped off at recycling centres, transfer stations and construction waste from owner/occupier renovations.

For the purpose of this report, MSW is waste collected by municipal **kerbside bin collection services (specifically residual waste (garbage), recycling and green organics)**, and excludes hard waste quantities, street sweepings, waste collected at drop-off facilities, and commercial services.

Recyclables

Household recyclables (co-mingled) collected from kerbside mainly comprises of mixed paper, newspaper, magazines, cardboards, plastic films and bottles, steel and aluminium cans, and glass containers (bottles).

Recovered material

Material that would have otherwise been disposed of as waste, but has instead been collected and reclaimed as a material input, in lieu of a new primary material, for a recycling or manufacturing process.

Recovery rate (or diversion rate)

The three-bin resource recovery rate is calculated by dividing the tonnes of recyclables and green organics recycled, by the tonnes of recyclables, green organics and residual waste collected from the kerbside.

The two-bin resource recovery rate is calculated by dividing the tonnes of recyclables by the tonnes of recyclables and residual waste collected from the kerbside.

Residual Waste (garbage)

Waste material that is collected from kerbside, which is material that cannot be recycled through the household co-mingled recyclables or organics bins. Typical items placed in the residual waste bin include disposable nappies, foam/polystyrene, sanitary products, broken glass and crockery and soft plastics.

Source separation of materials

Sorting different waste materials (e.g. cardboard, metals, paper, organic material) where the waste is generated, to facilitate reuse, recycling or processing which reduces contamination.

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