



GOVERNMENT OF  
WESTERN AUSTRALIA



# The 2018–19 census of Western Australian local government waste and recycling services



## Disclaimer

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# Executive summary

The *Waste Avoidance and Resource Recovery Strategy 2030* (Waste Strategy 2030), released in February 2019, includes ambitious targets to reduce and recover waste in Western Australia. It specifically includes targets and strategies for municipal solid waste (MSW), alongside those for other waste streams. This report presents the results of the 2018–19 census of local government waste and recycling services (the census) and is focused on domestic waste, which is the major component of MSW.

In 2018–19, 88 per cent of all local governments submitted a census return representing 98.5 per cent of the Western Australian population. All 33 local governments and five regional councils in the Perth and Peel regions participated in the census.

Statewide, local governments collected an estimated 1.5 million tonnes of domestic waste from their residents and reported that 39 per cent of the waste collected was recovered in 2018–19. Average recovery rates were higher in the Perth and Peel regions (42 per cent) compared to elsewhere in the state (29 per cent), with the highest local government recovery rate in the City of Melville (64 per cent), which provided a food organics and garden organics (FOGO) three-bin collection system to its residents.

In 2018–19, FOGO systems were the best performing kerbside systems for waste recovery in Western Australia, with 55 per cent of all kerbside waste recovered from FOGO collection systems. This compares to only 19 per cent kerbside waste recovery from two-bin collection systems in 2018–19. The rollout of FOGO collection systems across the Perth and Peel regions is a headline strategy of the Waste Strategy 2030 and plays a key role in increasing the recovery of domestic waste.

The Waste Strategy 2030 sets a MSW recovery target for major regional centres of 50 per cent for 2020. The domestic waste recovery rate (used as a proxy for the MSW recovery rate) for major regional centres was 29 per cent in 2018–19.

Since 2010–11, annual domestic waste generation per household has varied between an estimated 1.4 and 1.6 tonnes per household, with the lowest generation rate reported in 2018–19. The amount of waste disposed of to landfill has decreased from one tonne per household in 2010–11 to 0.9 tonnes per household in 2018–19, and recovery per household has remained at 0.5 tonnes.

Local governments spent an estimated \$309 million providing waste and recycling services to their residents in 2018–19, equivalent to \$206 per tonne of waste collected.

From April 2019, some of the data reported to the census will be published annually on the [MyCouncil website](#). The publication of this data provides increased transparency around local government waste recovery performance, increased access to waste data and a more timely release of waste data.

Eighty-seven per cent of participants reported they were confident in the general accuracy of the data they reported to the census.

From 2019–20, the census will be replaced by annual reporting requirements under the Waste Avoidance and Resource Recovery Regulations 2008. Further information can be found on the Department of Water and Environmental Regulation's [website](#).



# 1. Introduction

The Department of Water and Environmental Regulation (the department), on behalf of the Waste Authority, conducts an annual census of the waste and recycling services provided to households and commercial premises by local governments and regional councils in Western Australia. The 2018–19 census was conducted between August and December 2019, and collected a variety of data about the waste and recycling services provided by local governments in that financial year.

This report presents information about domestic waste, which is the major component of the municipal solid waste (MSW) stream. As defined here, domestic waste is largely comprised of waste collected by local governments from households through kerbside, vergeside and drop-off services but also includes waste collected from bins in public places and at special events, such as community festivals. Definitions of these service types can be found in the glossary.

The *Waste Avoidance and Resource Recovery Strategy 2030* (Waste Strategy 2030) was released in February 2019. It sets ambitious targets for reducing and recovering waste in Western Australia, including those for the MSW stream. Some of the headline strategies are directed towards local governments, including:

- A consistent three-bin kerbside collection system, which includes separation of food organics and garden organics from other waste categories, to be provided by all local governments in the Perth and Peel regions by 2025 and supported by State Government funding.
- Implement local government waste plans, which align local government waste planning processes with the Waste Strategy 2030.

Data collected and reported through the census is used to develop waste-focused policy and programs. It is also used to monitor progress towards the Waste Strategy 2030 targets for MSW in major regional centres. A separate annual report, *Recycling Activity in Western Australia*, provides measures against other Waste Strategy 2030 targets.

Data collected and reported through the census also includes information required by the National Environmental Protection Council under the National Environment Protection (Used Packaging Materials) Measure 2011.

Some of the data reported to the census is published on the [MyCouncil website](#). Published data includes the disaggregated quantities of waste collected, disposed of to landfill and recovered by each local government for kerbside and vergeside services. It also indicates progress towards meeting Waste Strategy 2030 targets, providing increased transparency around local government waste recovery performance and appropriate recognition of existing or improved performance, and encouraging benchmarking between local governments.

## 2. Census details and approach

The department, on behalf of the Waste Authority, distributed and collected the 2018–19 census forms, and undertook data consolidation and analysis.

The census only collected data about waste and recycling services provided to residents by local government and regional councils (including those services contracted out to third-party service providers). It did not capture services provided to residents by other entities.

Feedback was provided to local governments on the completeness and consistency

of submitted data; however, no data validation was conducted and the accuracy of measurements and estimates provided by local governments cannot be quantified nor guaranteed. Additionally, many local governments obtained waste data from their waste contractors. This third-party data may not have been audited by local government and has not been independently validated.

Local governments that were not equipped to measure the quantity of waste they manage were encouraged to provide estimates based on documented information, such as recent waste composition audits and historical data. Local governments were also provided with examples of methods that could be used to estimate quantities of waste.

Some local governments did not provide complete information on tonnages or other information such as costs and charges. In many instances, this was due to the absence of an established waste and recycling data management system and/or not having staff whose function specifically included monitoring and reporting these services.

Past census reports have consistently shown that, in Western Australia, the majority of domestic waste is collected directly from households. Consequently, waste tonnages and costs are generally presented as tonnes or costs per household. Data on the projected population and number of households was estimated from data from the Western Australian Planning Commission (2019) and the Australian Bureau of Statistics (2016). Local governments were able to revise the WAPC-projected number of households on their census forms. Where provided, these revisions have been incorporated into this report.

Waste resource recovery is referred to throughout the report and is defined as a portion of waste generated that is recovered for the purposes of recycling, re-use or energy recovery. It is calculated as the difference between the quantity of waste collected by a local government and the quantity of waste disposed of to landfill. Waste resource recovery in this report is equivalent to material recovery in the Waste Strategy 2030 because there was no waste-to-energy recovery reported by any local governments in 2019-20.

Consistent with the targets contained in the Waste Strategy 2030, data has been collated and reported against regions defined as statewide, Perth and Peel, and 'other'. This represents a break with past census reports which have included the Peel region in a 'non-metropolitan' category.

Unless otherwise specified, all waste quantities are reported in tonnes. Due to rounding, the totals presented in the report's tables and charts do not always equal the sum of presented data. The quantities reported in the text have also been rounded.

From 2019–20, the census will be replaced by annual reporting requirements under the Waste Avoidance and Resource Recovery Regulations 2008. The amended regulations require 'liable persons' to report waste and recycling data annually to the Chief Executive Officer (CEO) of the department in accordance with approved procedures. Further information can be found on the department's [website](#).

# MSW

reported in *Recycling Activity in Western Australia*

**Domestic  
waste**  
this report

**Local  
government  
waste**

**Other**

## 2.1 Domestic versus municipal waste

Municipal solid waste (MSW) can be broken into two main components:

- domestic waste generated from households
- waste generated from local government activities such as park and road maintenance.

Other sources of MSW can include small quantities of waste from commercial premises, which are mixed in with household waste.

The focus of this report is domestic waste collected by local governments. Estimates of MSW generation and recycling are reported in another series of annual reports, [\*Recycling Activity in Western Australia\*](#).





## 3. Local government participation

### 3.1 Participation

In 2018–19, eighty eight per cent of local governments and regional councils returned a census, representing 98.5 per cent of the Western Australian population. All local governments and regional councils in the Perth and Peel regions responded to the survey. Table 3.1 shows the number of participating local governments and regional councils. Appendix A provides a breakdown of participating and non-participating local governments.

Local governments	Total	Participating	Participation (%)
<b>Perth and Peel regions</b>			
Local government	33	33	100
Regional councils	5	5	100
<b>Other regions</b>			
Local government	106	89	84
Regional councils	1	0	100
<b>Total</b>	<b>145</b>	<b>127</b>	<b>88</b>

Table 3.1: *Western Australian local governments' participation in the 2018–19 waste and recycling census*

### 3.2 Census feedback

Local governments and regional councils were asked to provide feedback about the accuracy of their census return. Eighty-seven per cent of respondents reported they were confident to extremely confident in the general accuracy of the data they reported. Seven per cent were only somewhat confident or not at all confident in the general accuracy of their reported data.

## 4. Waste generation and recovery as reported by local governments

In 2018–19, participating local governments reported collecting around 1.46 million tonnes of domestic waste (Table 4.1)

Extrapolation across non-participating local governments results in a statewide estimate of 1.49 million tonnes of domestic waste. This is equivalent to each Western Australian household generating 27 kilograms of domestic waste every week.

Perth and Peel local governments collected 74 per cent (1,073,400 tonnes) of the total reported domestic waste.

Of this, 42 per cent, or around 451,100 tonnes, of domestic waste was reported as recovered.

Outside the Perth and Peel regions, local governments reported collecting 386,500 tonnes of domestic waste. Of this, 29 per cent or around 113,500 tonnes of domestic waste was reported as recovered.

Waste collection and disposal per household were greater outside the Perth and Peel regions (Table 4.2). Waste recovery per household was the same statewide. The same regional trends were seen in per capita waste collection, landfill and recovery (Table 4.3).

Region	Collected (t)	Landfill (t)	Recovered (t)	Recovery rate (%)
<b>Perth and Peel regions</b>	1,073,424	622,322	451,102	42
<b>Other regions</b>	386,456	272,986	113,470	29
<b>Statewide</b>	1,459,880	895,308	564,572	39

Table 4.1: Reported total tonnes of domestic waste collected, disposed to landfill and recovered, 2018–19

	Perth and Peel regions	Other regions	Statewide
<b>Households*</b>	837,496	210,571	1,048,066
<b>Domestic waste collection per household (kg)</b>	1,282	1,835	1,393
<b>Landfill per household (kg)</b>	743	1,296	854
<b>Recovered per household (kg)</b>	539	539	539

\* Residing in local governments that returned a census in time.

Table 4.2: Reported domestic waste collection, disposal and recovery as kilograms per household, 2018–19

	Perth and Peel regions	Other regions	Statewide
<b>Persons*</b>	2,120,670	497,409	2,618,079
<b>Domestic waste collection per capita (kg)</b>	506	777	558
<b>Landfill per capita (kg)</b>	293	549	342
<b>Recovered per capita (kg)</b>	213	228	216

\* Residing in local governments that returned a census.

Table 4.3: Reported domestic waste collection, disposal and recovery as kilograms per capita, 2018–19

Since 2010–11, annual domestic waste generation has varied between an estimated 1.4 and 1.6 tonnes per household. Annual waste disposed to landfill has fallen from 1 tonne to 0.9 tonnes per household and recovery per household has varied between an estimated 0.4 and 0.6 tonnes.

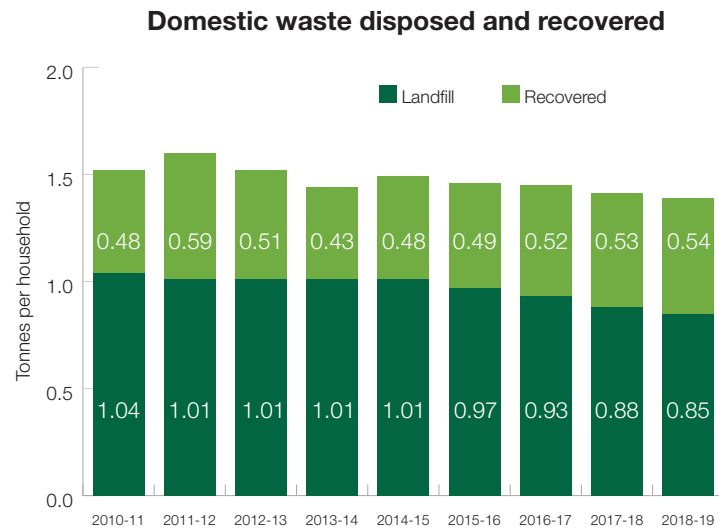


Figure 4.1: Reported total domestic waste generation per household shown as landfill and recovery, from 2010–11 to 2018–19

#### 4.1 Major regional centre performance against Waste Strategy 2030 targets

The Waste Strategy 2030 identifies five local governments outside the Perth and Peel regions with relatively large populations and reasonable access to markets. These major regional centres (MRCs) are the cities of Albany, Busselton, Bunbury, Greater Geraldton and Kalgoorlie–Boulder.

The Waste Strategy 2030’s MSW target of 50 per cent material recovery for MRCs in 2020 applies to waste collected in these cities. The domestic waste recovery rate for MRCs was estimated as 29 per cent in 2018–19.

The MRC of the City of Bunbury reported a recovery rate of 60 per cent, which was the second highest recovery rate reported by local governments in 2018–19. This was achieved through the provision of a three-bin food organics and garden organics (FOGO) kerbside system to its residents.

## 5. Domestic waste and recycling services

In this report, waste collected by local government is differentiated according to the service through which it is collected. Collected waste is further disaggregated by its fate:

- disposal
- material recovery.

### 5.1 Collection of waste

Across the state, most domestic waste was collected through kerbside services (66 per cent) followed by drop-off facilities (24 per cent). In the Perth and Peel regions, 73 per cent of domestic waste was collected through kerbside services. In other regions, 47 per cent of all domestic waste was dropped off at waste collection facilities, with 47 per cent of domestic waste collected through kerbside services (Figure 5.1).

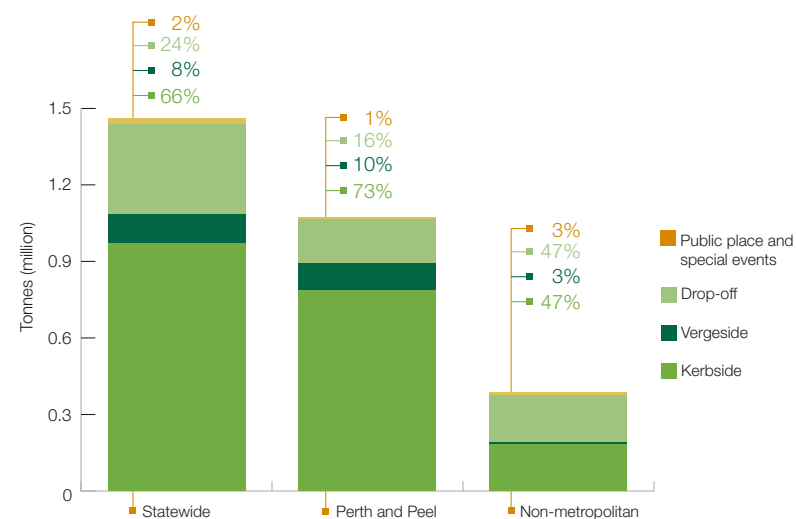


Figure 5.1: Quantity of domestic waste collected by service type by local governments for Perth and Peel regions and other regions, 2018–19



## 5.2 Recycling and disposal

Statewide, 895,300 tonnes of domestic waste collected by local governments was disposed of to landfill in 2018–19. The majority (55 per cent) of domestic waste sent to landfill was collected through general waste kerbside collections, with dropped-off mixed waste (18 per cent) and residual waste (11 per cent) from kerbside alternative waste treatment (AWT) services the next biggest contributors.

Across the state, 564,600 tonnes of domestic waste collected by local governments was recovered. The majority of domestic waste recovered was collected from kerbside services (60 per cent), with smaller quantities recovered from drop-off facilities (29 per cent) and vergeside services (12 per cent) (Figure 5.2).

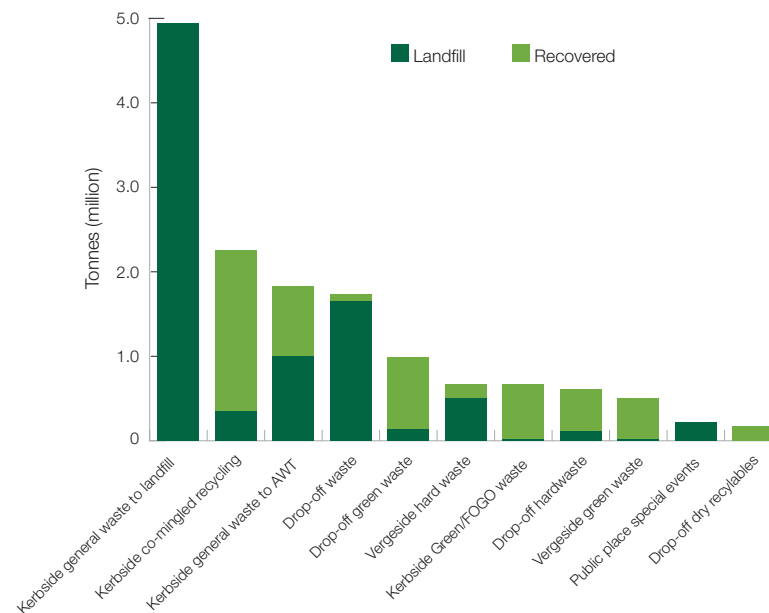


Figure 5.2: Domestic waste recycling and disposal, by collection service, 2018–19



## 5. Domestic waste and recycling services (continued)



In the Perth and Peel regions, most recovered domestic waste was collected from the kerbside (28 per cent of all waste collected), while in other regions most recovered domestic waste was collected at drop-off facilities (18 per cent of all waste collected) (Figures 5.3 and 5.4).

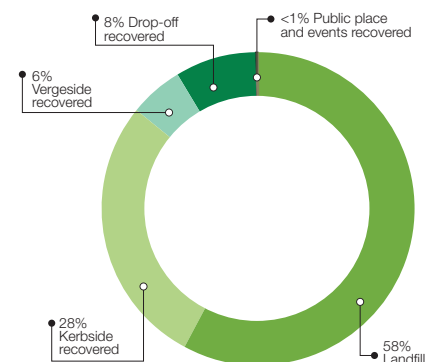


Figure 5.3: Proportion of domestic waste reported as recovered and disposed of by Perth and Peel local governments with recovered materials disaggregated by type of collection service, 2018-19

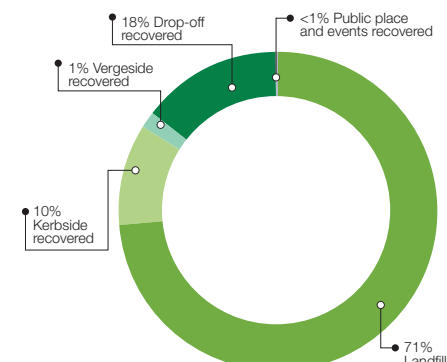


Figure 5.4: Proportion of domestic waste reported as recovered and disposed of by other regions local governments with recovered materials disaggregated by type of collection service, 2018-19

## 6. Kerbside services

### 6.1 Trends in kerbside services

Average service participation rates and delivery methods and the number of households provided with kerbside services in 2018–19 are provided in Appendix B.

Between 2012–13 and 2018–19, the reported total number of households with a kerbside service increased by around nine per cent. Note that a small decrease in the number of households with kerbside services between 2017–18 and 2018–19 may have been a product of changes in population and household estimates and not an actual decrease in the number of houses with these services. Estimated kerbside waste collected per household has decreased by 10 per cent since 2012–13.



Destination	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19
Collected (t)	1,006,491	985,252	987,767	1,013,270	1,004,698	981,112	969,350
Landfilled (t)	698,169	711,408	702,667	707,710	686,167	654,457	632,498
Recovered (t)	308,322	273,843	285,100	305,559	318,532	326,655	336,847
Estimated households with at least 1 kerbside service	954,477	977,997	995,027	998,242	1,013,897	1,037,786	1,025,327
Collected per household (kg)	1,054	1,007	993	1,015	991	945	945
Landfill per household (kg)	731	727	706	709	677	631	617
Recovered per household (kg)	323	280	287	306	314	315	329

Table 6.1: Reported tonnes of waste collected, landfilled and recovered from kerbside services, 2012–13 to 2018–19

## 6. Kerbside services (continued)

### 6.2 Kerbside recovery performance

In 2018–19, the best-performing kerbside systems for waste recovery were those that included a third bin for the collection of FOGO. FOGO systems had an overall kerbside recovery rate of 55 per cent. Two-bin systems where the mixed waste was processed at a composting facility, also known as AWT, were the next best-performing kerbside systems (53 per cent recovery). Three-bin collection systems that included a bin for garden waste only (no food organics) had a recovery performance of 40 per cent, followed by two-bin collection systems with a 19 per cent recovery of waste materials (Figure 6.2).

Local governments reported that in 2018–19, 93 per cent of all households were provided with a kerbside recycling service, 34 per cent of all households had some of their kerbside waste directed to an AWT facility, 29 per cent of all households were provided with a garden organic only third bin service and three per cent of all households were provided with a FOGO three-bin service.

The Waste Strategy 2030 has a headline strategy of a consistent, three-bin kerbside collection system, which includes separation of food organics and garden organics from other waste categories, to be provided by all local governments in the Perth and Peel regions by 2025.

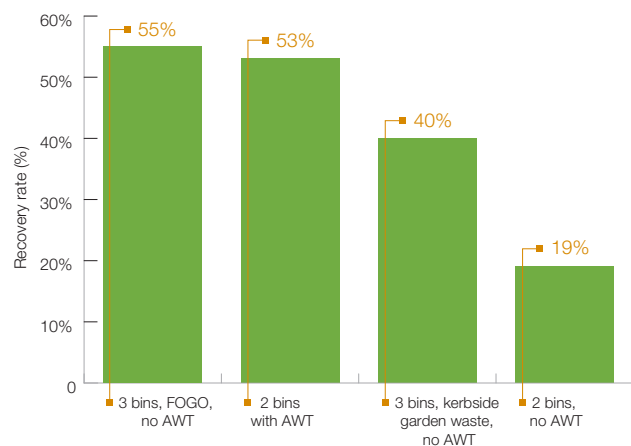


Figure 6.2: Average kerbside recovery rates for local governments with different kerbside service types, 2018-19







### 6.3 Kerbside general waste directly disposed to landfill

Across the state, 115 local governments (27 from the Perth and Peel regions and 88 from other regions) reported providing a kerbside waste collection service where waste was directly disposed of to landfill (Table 6.2). Of the seven local governments that did not provide this service, six were Perth metropolitan local governments that directed all kerbside waste to an AWT facility, and one was a remote local government with no gazetted townsite.

Geographic region	No. local governments	Collected and disposed of to landfill (t)	Collected per household (t)	Recovery rate (%)
Perth and Peel regions	27	357,047	0.59	0
Other regions	88	137,581	0.72	0
Statewide	115	494,628	0.63	0

Table 6.2: Tonnes collected from domestic kerbside waste services for direct disposal to landfill 2018–19

### 6.4 Kerbside general waste processed at an alternative waste treatment facility

There were two AWT facilities in the Perth metropolitan region routinely receiving mixed municipal waste in 2018–19. Both were enclosed waste composting facilities associated with metropolitan regional councils. There were no AWT facilities outside the Perth metropolitan region in 2018–19.

Nine local governments reported providing a kerbside general waste collection service where collected waste was regularly processed at an AWT facility (Table 6.3). Three of these local governments also reported sending some of their waste collected from the kerbside directly to landfill.

Geographic region	No. local governments	Collected (t)	Landfilled (t)	Recovered (t)	Collected per household (t)	Recovery rate (%)
Perth region	9	182,645	100,243	82,402	0.52	45

Table 6.3: Reported tonnes of domestic waste collected, landfilled and recovered by kerbside services and directed to an AWT facility, 2018–19

## 6. Kerbside services (continued)

### 6.5 Kerbside recycling – co-mingled and separated dry recyclables

The majority of local governments (90) reported providing a kerbside recycling service for dry recyclables. As in previous census reports, the most commonly reported service was a fortnightly collection of co-mingled recyclables using a 240-litre mobile garbage bin (Table 6.4). While each local government reported only the most commonly provided service, many commented that they offered a choice of bin sizes to their residents.

All 30 metropolitan and 60 non-metropolitan local governments reported providing kerbside recycling collection services to their residents (Table 6.5). Local governments reported 84 per cent of dry recyclable waste collected from the kerbside was recovered.

Service	Container size*	Collection frequency	No. local governments
<b>Co-mingled service</b>			
	240L	Weekly	3
	240L	Fortnightly	84
	240L	Other	2
	360L	Fortnightly	2
<b>Separated recyclables</b>			
	120L	not reported	1

\* Only the most commonly provided container size was reported by each local government

Table 6.4: Number of local governments providing kerbside recycling services, by container type and size, and frequency of collection service, 2018–19

Geographic region	No. local governments	Collected (t)	Landfilled (t)	Recovered (t)	Collected per household (t)	Recovery rate (%)
<b>Perth and Peel regions</b>	33	193,430	29,125	164,305	0.23	85
<b>Other regions</b>	59	32,243	6,320	25,924	0.23	80
<b>Statewide</b>	92	225,673	35,445	190,229	0.23	84

Table 6.5: Reported tonnes of domestic waste collected and recovered from kerbside co-mingled and separated dry recyclable services, 2018–19



## 6.6 Kerbside garden organics

Twelve local governments (10 Perth metropolitan and two outside the metropolitan region) provided a kerbside garden organics collection service in 2018–19. This collection service does not include food organic waste. Across the state, local governments reported that 96 per cent of the waste collected through a separated kerbside garden organics service was recovered (Table 6.6).

Geographic region	No. local governments	Collected (t)	Landfilled (t)	Recovered (t)	Collected per household (t)	Recovery rate (%)
<b>Perth and Peel regions</b>	10	51,302	1,659	49,643	0.18	97
<b>Other regions</b>	2	2,015	299	1,716	0.12	85
<b>Statewide</b>	12	53,317	1,958	51,359	0.17	96

Table 6.6: Reported tonnes of domestic waste collected and recovered from kerbside garden organics services, 2018–19

## 6.7 Kerbside food organics and garden organics

The delivery of FOGO services across the Perth and Peel regions is a headline strategy in the Waste Strategy 2030. To date, the adoption of FOGO services has been led by local governments outside of the Perth metropolitan region. Four local governments outside the Perth and Peel regions provided their residents with services to collect FOGO in 2018–19. The City of Melville in the Perth metropolitan region trialed a FOGO service during 2017–18 and started rolling it out to residents in 2019. As a consequence, the city reported the highest local government recovery rate in Western Australia of 64 per cent. Across the state, local governments reported that 98 per cent of the waste collected through a FOGO service was recovered (Table 6.6).

Geographic region	No. local governments	Collected (t)	Landfilled (t)	Recovered (t)	Collected per household (t)	Recovery rate (%)
<b>Perth and Peel regions</b>	1	2,935	110	2,825	0.49	96
<b>Other regions</b>	4	10,151	114	10,037	0.34	99
<b>Statewide</b>	5	13,086	224	12,862	0.37	98

Table 6.7: Reported tonnes of domestic waste collected and recovered from kerbside FOGO services, 2018–19

## 7. Vergeside services



### 7.1 Vergeside green waste collection

Table 7.1 lists the number of local governments by frequency of vergeside green waste collections. It shows the majority of local governments collect vergeside green waste either annually or twice a year, with only a smaller proportion offering more frequent collections. Fifty-nine local governments (32 from the Perth and Peel regions and 27 from outside those regions) reported providing a vergeside green waste service in 2018–19. Local governments reported that 98 per cent of the waste collected through vergeside green waste services was recovered (Table 7.2).

Frequency	Perth and Peel regions	Other regions	Statewide
<b>Periodic</b>			
<b>1 per year</b>	6	15	21
<b>2 per year</b>	15	9	24
<b>3 per year</b>	3		3
<b>4 per year</b>	3	1	4
<b>Other</b>	1	2	3
<b>On demand</b>	4		4
<b>Total</b>	<b>32</b>	<b>27</b>	<b>59</b>

Table 7.1: Reported frequency of vergeside green waste services provided to households, 2018–19

Geographic region	No. local governments	Collected (t)	Landfilled (t)	Recovered (t)	Collected per household (t)	Recovery rate (%)
<b>Perth and Peel regions</b>	32	44,741	0	44,741	0.06	100
<b>Other regions</b>	27	5,748	1,212	4,536	0.09	79
<b>Statewide</b>	59	50,489	1,212	49,277	0.06	98

Table 7.2: Reported tonnes of domestic green waste collected, landfilled and recovered from vergeside services, 2018–19

## 7.2 Vergeside hard waste collections

Sixty-seven local governments (32 from the Perth and Peel regions and 35 from outside these regions) reported providing a vergeside hard waste service in 2018–19. The majority of these local governments reported collecting vergeside hard waste either annually or twice a year, with only a small proportion offering more frequent collections (Table 7.3). A small number of local governments (10) provided on-demand hard waste collection services. In addition to providing a mixed hard waste collection service, ten local governments within the Perth and Peel regions provided residents with a verge collection service for specific waste products, generally mattresses and white goods. Local governments reported that 22 per cent of the waste collected through vergeside hard waste services was recovered in 2018–19 (Table 7.4).

Frequency	Perth and Peel regions	Other regions	Statewide
<b>Periodic</b>			
<b>1 per year</b>	14	22	36
<b>2 per year</b>	11	5	16
<b>Other</b>	1	4	5
<b>On demand - general hard waste</b>	<b>6</b>	<b>4</b>	10
<b>Total</b>	<b>32</b>	<b>35</b>	<b>67</b>
<b>Additional service - product pick up</b>	10	0	10

Table 7.3: Reported frequency of hard waste vergeside services to households, 2018–19

Geographic region	No. local governments	Collected (t)	Landfilled (t)	Recovered (t)	Collected per household (t)	Recovery rate (%)
<b>Perth and Peel regions</b>	32	60,505	46,805	13,700	0.08	23
<b>Other regions</b>	35	4,516	3,926	590	0.06	13
<b>Statewide</b>	67	65,021	50,731	14,290	0.07	22

Table 7.4: Reported tonnes of domestic hard waste collected, landfilled and recovered from vergeside services, 2018–19



## 8. Drop-off facilities

Only self-hauled domestic waste dropped off at facilities operated (directly or under contract) by local governments is reported below.

Some 351,000 tonnes of domestic waste was reported by local governments as dropped off by residents at local government facilities in 2018–19. Local governments reported recovering 46 per cent of all domestic waste received at these facilities.

The quantity of recyclables may be recorded as loads of recyclables left at a drop-off facility, and these loads may include contamination. This process of record keeping may result in higher than expected recovery rates for recyclable waste types recovered at drop-off facilities (Tables 8.1 to 8.4).

### Mixed waste

Geographic region	No. local governments	Collected (t)	Landfilled (t)	Recovered (t)	Recovery rate (%)
<b>Perth and Peel regions</b>	15	76,007	68,257	7,750	10
<b>Other regions</b>	86	96,905	95,400	1,505	2
<b>Statewide</b>	101	172,912	163,656	9,255	5

Table 8.1: Reported tonnes of domestic mixed waste collected, landfilled and recovered at drop-off facilities, 2018–19

### Dry recyclables

Geographic region	No. local governments	Collected (t)	Landfilled (t)	Recovered (t)	Recovery rate (%)
<b>Perth and Peel regions</b>	16	11,959	53	11,905	100
<b>Other regions</b>	68	4,251	326	3,925	92
<b>Statewide</b>	84	16,210	379	15,830	98

\* Inclusive of regional councils

Table 8.2: Reported tonnes of domestic recyclables collected, landfilled and recovered at drop-off facilities, 2018–19

## Green waste

Geographic region	No. local governments	Collected (t)	Landfilled (t)	Recovered (t)	Recovery rate (%)
<b>Perth and Peel regions</b>	15	45,695	0	45,695	100
<b>Other regions</b>	70	40,331	12,142	28,189	70
<b>Statewide</b>	85	86,026	12,142	73,884	86

Table 8.3: Reported tonnes of domestic garden waste collected, landfilled and recovered at drop-off facilities, 2018–19

## Hard waste

Geographic region	No. local governments	Collected (t)	Landfilled (t)	Recovered (t)	Recovery rate (%)
<b>Perth and Peel regions</b>	18	22,191	7,793	14,398	65
<b>Other regions</b>	65	37,942	3,117	34,826	92
<b>Statewide</b>	83	60,133	10,910	49,224	82

Table 8.4: Reported tonnes of domestic hard waste collected, landfilled and recovered at drop-off facilities, 2018–19



## 8. Drop-off facilities (continued)

### 8.1 Regional council drop-off facilities

Drop-off waste and recycling facilities were provided for residents by five regional councils in 2018–19:

- Eastern Metropolitan Regional Council
- Mandarie Regional Council
- Southern Metropolitan Regional Council
- Western Metropolitan Regional Council
- Bunbury–Harvey Regional Council.

The amounts of waste reported as collected, landfilled and recovered at these drop-off facilities in 2018–19, disaggregated by waste type, are shown in Table 8.5. The quantities below have also been included in Tables 8.2–8.4.

Waste type	No. regional councils	Collected (t)	Landfilled (t)	Recovered (t)	Recovery rate (%)
Mixed waste	4	19,912	16,639	3,273	16
Dry recycling	4	4,733	0	4,733	100
Green waste	5	6,870	0	6,870	100
Hard waste	4	5,631	0	5,631	100
<b>Total</b>	<b>5</b>	<b>37,146</b>	<b>16,639</b>	<b>20,508</b>	<b>50</b>

Table 8.5: Reported tonnes of self-hauled domestic waste collected, landfilled and recovered at regional council drop-off facilities, 2018–19





## 9. Public place and special events services

Local governments collect waste in public places using street litter bins and permanent bins in parks. For special events, such as festivals and similar gatherings, temporary bins are put in place.

Most local governments were unable to provide a direct measure of the quantity of waste and recycling materials collected from public place bins because they were typically collected with household kerbside waste. However, the majority were able to estimate tonnes collected based on the number of bin lifts and an estimation of average bin weight or, alternatively, by attributing to public places and special events a proportion of the domestic bin collection run. Similarly, local governments did not typically measure quantities of waste and recycling materials collected from temporary bins placed at special events. The reported quantity was likely to be a 'best guess' by the local government officer completing the census.

The majority of local governments reported providing public place (98 per cent) and special event (81 per cent) waste and/or recycling services. Around 22,200 tonnes of waste was reported as collected from these services in 2018–19, with a reported recovery of only around 600 tonnes, equivalent to a three per cent recovery rate.



# 10. Recovered materials

Local governments were asked to separately report the total quantity of recovered waste by material type from domestic waste collections.

The quantities of recovered domestic waste do not necessarily equal the quantities previously reported in sections 6–9, due to inconsistent and/or incomplete reporting by some local governments. However, differences were generally small and the data presented in this section still provides a guide to the proportions and quantities of the types of domestic waste recovered by local governments.

## 10.1 Recovered materials statewide

Some 568,800 tonnes of recovered materials were reported in this section of the census. Of this, green waste (usually recovered as compost or mulch) formed the largest proportion of recovered materials (185,100 tonnes). Paper and cardboard was the largest category of recovered dry recyclable materials (111,800 tonnes). Figure 10.1 shows the proportions of the most commonly recovered materials. The quantities of all recovered waste materials are provided in Appendix C.

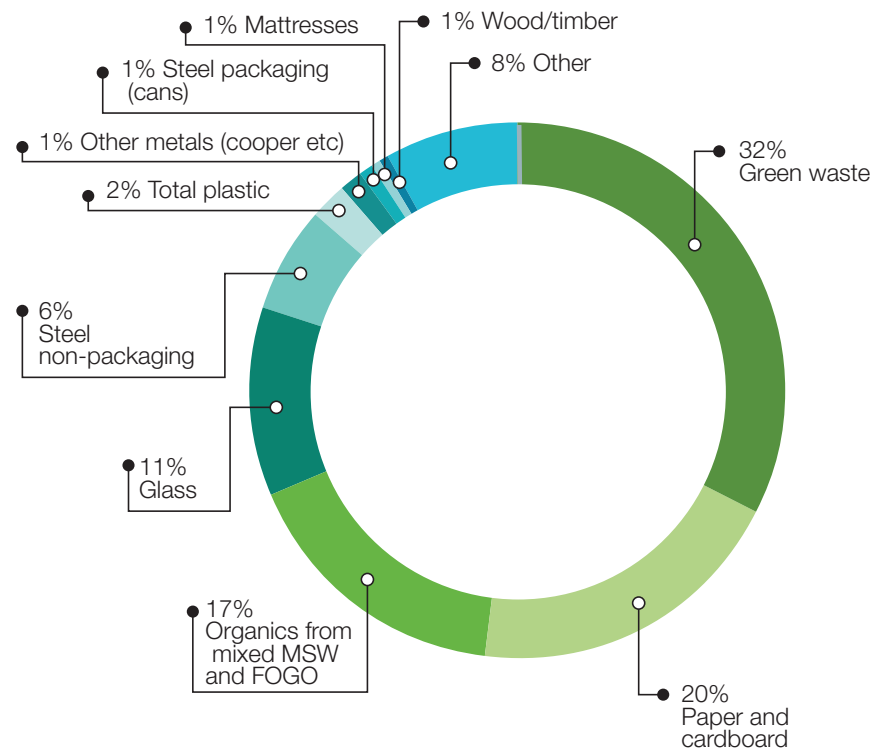


Figure 10.1: Proportions of the most commonly recovered materials types. Tonnes of all recovered material types are provided in Appendix C.

## 10.2 Recovered materials by service collection

The majority (59 per cent) of recovered materials reported in this section of the census were collected through kerbside services (Table 10.1). However, certain material types, such as green waste and steel, were more commonly reported as collected at drop-off facilities. More details about the types of materials recovered, collection services and collection region are provided in Appendix C.

Material type	Kerbside services (t)	Drop-off facilities (t)	Vergeside services (t)	Public place/ special events (t)	Total (t)
Green waste	51,309	87,917	45,892	1	185,118
Paper and cardboard	106,104	5,272	330	134	111,840
Organics from mixed MSW and FOGO	94,592	-	-	-	94,592
Glass	62,956	829	3	30	63,818
Steel non-packaging	1,731	31,023	4,091	20	36,865
Total plastic	12,139	452	11	14	12,616
Other metals (copper, etc)	474	6,606	982	-	8,062
Steel packaging (cans)	4,127	110	-	3	4,240
Mattresses	21	1,798	1,999	-	3,819
Wood / timber	50	2,524	758	-	3,332
Other	2,224	35,657	6,328	314	44,522
<b>Total</b>	<b>335,727</b>	<b>172,187</b>	<b>60,393</b>	<b>516</b>	<b>568,824</b>

Note: Only the top 10 recovered materials are shown here with all other material types shown as 'other'. All recovered material types are provided in Appendix C.

Table 10.1: Quantity (tonnes) of materials recovered by local governments by service type, 2018–19

# 11. Financial data

## 11.1 Cost to local governments

Local governments were asked to report the cost of providing waste and recycling services disaggregated by service and waste type. The reported costs are not directly comparable across all local governments. While the majority of local governments provided disaggregated costs, some only provided a total cost for all their waste and recycling services. In addition, others did not respond to this section of the census. Furthermore, the types of costs and/or services that were included in the reported figures were not verified.

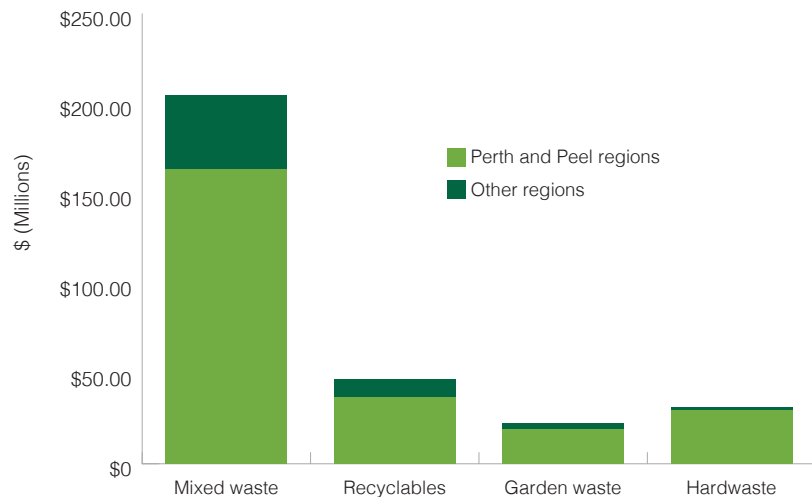


Figure 11.1: Reported total local government expenditure on waste type, 2018-19

Most (97 per cent) local governments reported the total cost of providing waste and recycling services to their residents. These local governments and five regional councils reported spending \$309 million on providing waste and recycling services to their residents in 2018-19. This represents around \$311 million when extrapolated across the entire population of Western Australia, or \$206 per tonne of waste collected by local government.

For local governments that reported, the majority (\$205 million) was spent on general mixed waste with a minority spent on mixed recyclables (\$47 million) and other waste types (Figure 11.1). When broken up by waste service type, the majority (\$223 million) was associated with providing kerbside collection services (Figure 11.2).

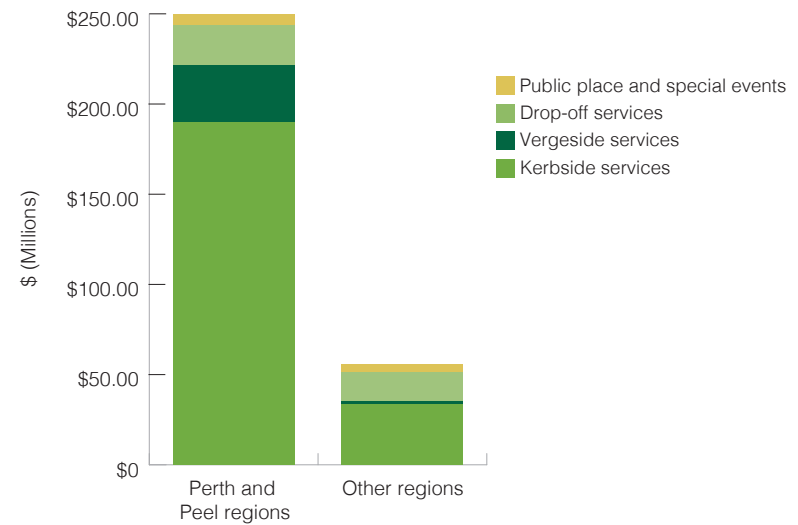


Figure 11.2: Reported total local government expenditure on waste services by service type

The median annual cost to local government per household for the provision of waste and recycling services was \$335 (Table 11.1). While the estimated annual costs to local government per household were highly variable, half of reporting local governments estimated annual costs between \$200 and \$400 per household.

Region	Median cost to local government per household	Number of reporting local governments
<b>Perth and Peel regions</b>	\$291	27
<b>Other</b>	\$410	84
<b>Statewide</b>	\$335	111

Table 11.1: Estimated median costs to local government per household, 2018–19 (based on WAPC population projections), by region

Most local governments reported some breakdown of costs into service or waste types. The range of estimated costs per household were highly variable. The median estimated costs per household for the most commonly reported service types are shown in Table 11.2.

Service type	Median cost to local governments per household	Number of reporting local governments
<b>Kerbside</b>		
Mixed waste	\$226	116
Mixed dry recyclables	\$61	95
<b>Vergeside</b>		
Garden organics	\$20	51
Hard waste	\$28	55

Table 11.2: Estimated median costs to local government per household, 2018–19 (based on WAPC population projections), by detailed service types

## 11.2 Local government charges

One hundred and eleven local governments responded to a question about charges for the provision of waste and recycling collection services. The median annual charge for the provision of waste and recycling services was \$329 per household.

Thirty-seven local governments reported a separate recycling charge. The median reported annual charge for a recycling service was \$112 per household.

## 12. Waste and recycling services to commercial premises

Local governments were asked to provide data about the waste and recycling services they provided to commercial premises. One hundred and eight local governments (28 from the Perth and Peel regions and 80 from other regions) indicated they provided waste and/or recycling services to commercial premises.

Most local governments were unable to provide a direct measure of the quantity of waste and recycling materials collected from commercial premises. This was because bins provided to commercial premises were typically collected with domestic kerbside waste. Seventy-three local governments reported that at least some of the waste collected from commercial premises had been combined with and reported as domestic waste in the census.

Fifty-five local governments were able to estimate at least some of the tonnes of waste collected from commercial premises. They reported collecting around 70,200 tonnes from commercial premises in 2018–19. Of this amount, around 10,600 tonnes (15 per cent) were reported as recovered.

Local governments were asked to report the total cost of providing waste and recycling services to commercial premises in 2018–19. Fifty-nine local governments reported a total cost of around \$11 million to collect and dispose of mixed waste. Thirty-two local governments reported a total cost of around \$1.5 million dollars to collect and recycle recyclable waste materials.

The average annual charge for a single 240 L weekly waste service to a commercial premises was reported as \$373 (by 65 local governments, including those that only reported a charge for a single service to commercial premises). The average annual charge for a single 240 L fortnightly recycling service to a commercial premises was reported as \$162 (by 45 local governments).



## 13. Local government initiatives

### Waste and recycling infrastructure

Fourteen local governments reported new waste and recycling infrastructure and/or initiatives in 2018–19. These included new or upgrades to existing transfer stations in the shires of Coolgardie, Carnarvon, Mingenew and Cuballing; upgrades to disposal facilities in the City of Mandurah and the shires of Carnarvon, Gnowangerup and Wagin; a new landfill site in the Shire of Jerramungup; a new public recycling station in the Town of Claremont; new recycling facilities in the City of Kwinana and Shire of Yilgarn; a new polystyrene compactor in the City of Armadale; a new waste recycling facility the City of Kwinana; and a new green waste decontamination plant at Henderson Waste Recovery Park in the City of Cockburn.

### Recycling construction and demolition waste and green waste

Thirty-six local governments reported recycling their own construction and demolition waste and 66 local governments reported recycling green waste from their own operations.

### Sustainable purchasing or green purchasing policies

Forty two local governments and regional councils reported having a sustainable purchasing policy or green purchasing policy.

### Waste and recycling education programs

Fifty seven local governments and regional councils reported spending a total of approximately \$3.3 million in waste and recycling education programs in 2018–19.

### Waste composition audits

Twenty-six local governments and regional councils reported conducting waste composition audits in 2018–19.



## 14. Glossary

Term	Explanation
<b>Alternative waste treatment (AWT)</b>	These are plants for processing mixed putrescible (liable to decay) waste for resource recovery. They are sometimes called resource recovery facilities.
<b>Co-mingled dry recyclables</b>	Common recyclables, mostly packaging, such as glass, plastics, aluminium and steel cans, cardboard, paper, liquid paperboard (milk cartons). Dry recyclables excludes organic material.
<b>Garden waste</b>	Plant-based waste that is typically generated from gardens and parks (for example, grass clippings and vegetation prunings).
<b>General waste</b>	Waste material that is intended for disposal to landfill or alternative waste treatment. Where waste undergoes source separation, general waste is the component that remains after recyclables have been separated out. It may also be referred to as 'mixed' or 'residual' waste.
<b>Contamination</b>	That component of recyclable waste that cannot be recovered and is usually sent to landfill for disposal (contaminated recyclables may also be referred to as 'residual waste').
<b>Household</b>	A dwelling (whether a house, flat, unit or farm) with its own street address (or lot number for some rural dwellings).
<b>Drop-off facility</b>	Facility where residents can bring their waste or recyclables for disposal. They are often located at the local landfill or transfer station.

Term	Explanation
<b>Kerbside collection</b>	A regular (typically weekly or fortnightly), containerised (for example, wheelie bin) collection service that collects waste from a resident's kerbside. It can apply to recycling, general waste, green waste and organic waste.
<b>Landfill</b>	Facility where waste material is disposed of by burial in the ground.
<b>Landfilled</b>	The amount of waste collected via a service, which is disposed to a landfill.
<b>Mixed recyclables</b>	Sometimes referred to as co-mingled recyclables, it can include bottles, cans, jars, cardboard and paper that are mixed and collected together for recycling.
<b>Municipal solid waste (MSW)</b>	Solid waste generated primarily from domestic (household) premises and local government. It includes domestic waste collected directly from households, domestic waste dropped off at waste facilities and waste collected from public place bins that have been provided by local governments.
<b>Organic waste</b>	Separated food and/or garden waste.
<b>Participation rate</b>	The percentage of households that are provided with a collection service that typically put their bin out on collection day. This can also be referred to as the presentation rate.
<b>Public place services</b>	Refers to the provision of waste and recycling bins for public use that are permanently located in public areas, such as parks and on the street.
<b>Recovered</b>	The amount of collected waste that is diverted from landfill through re-use, recycling or energy production.



Term	Explanation
<b>Recovery</b>	The process of extracting materials or energy from waste through re-use, recycling or energy production.
<b>Recovery rate</b>	The percentage of waste collected that is recovered. It is calculated as $(\text{recovered} \times 100) \div \text{collected}$ .
<b>Recyclable</b>	Waste that is able to be recycled. A product's recyclability depends on the available infrastructure and services for collection, transport, sorting and processing and can, therefore, be location dependent.
<b>Recycling</b>	A set of processes (including biological) that converts solid waste into useful materials or products, net of contaminants and/or residuals disposed.
<b>Solid waste</b>	Waste products and materials that are spadeable (that is, can be picked up with a spade).
<b>Special event</b>	An event held by the local government that will require additional bins to be provided on a one-off or ad hoc basis (for example, concerts, fireworks displays and other public gatherings).
<b>Vergeside service</b>	Bulk waste services that are infrequent (every 4–6 months or on demand) and where material is collected from residential vergesides. Can be non-containerised or via a skip bin provided by the local government.
<b>Waste</b>	Any discarded, rejected, unwanted, surplus or abandoned matter including matter intended for (1) recycling, reprocessing, recovery, re-use or purification by a separate operation from that which produced the matter; or (2) sale, whether of any value or not.

Term	Explanation
<b>Waste composition</b>	The proportion of different materials and/or products present in a waste stream.
<b>Waste generation</b>	The sum of waste recovered and waste disposed of to landfill.



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## Appendix A – Census returns

### Local governments returning a census 2018–19

Regional councils	Perth and Peel regions	Other regions		
Bunbury Harvey Regional Council	City of Armadale	City of Albany	Shire of Denmark	Shire of Murchison
Eastern Metropolitan Regional Council	City of Bayswater	City of Bunbury	Shire of Derby-West Kimberley	Shire of Nannup
Southern Metropolitan Regional Council	City of Belmont	City of Busselton	Shire of Donnybrook-Balingup	Shire of Narembeen
Western Metropolitan Regional Council	City of Canning	City of Greater Geraldton	Shire of Dowerin	Shire of Ngaanyatjaraku
Mindarie Regional Council	City of Cockburn	City of Kalgoorlie-Boulder	Shire of East Pilbara	Shire of Northam
	City of Fremantle	City of Karratha	Shire of Esperance	Shire of Northampton
	City of Gosnells	Shire of Augusta-Margaret River	Shire of Exmouth	Shire of Nungarin
	City of Joondalup	Shire of Beverley	Shire of Gingin	Shire of Pingelly
	City of Kalamunda	Shire of Boddington	Shire of Gnowangerup	Shire of Plantagenet
	City of Kwinana	Shire of Boyup Brook	Shire of Halls Creek	Shire of Quairading
	City of Mandurah	Shire of Bridgetown-Greenbushes	Shire of Harvey	Shire of Ravensthorpe
	City of Melville	Shire of Brookton	Shire of Irwin	Shire of Sandstone
	City of Nedlands	Shire of Broome	Shire of Jerramungup	Shire of Shark Bay
	City of Perth	Shire of Broomehill-Tambellup	Shire of Kellerberrin	Shire of Tammin
	City of Rockingham	Shire of Bruce Rock	Shire of Kent	Shire of Trayning
	City of South Perth	Shire of Capel	Shire of Kondinin	Shire of Victoria Plains
	City of Stirling	Shire of Carnarvon	Shire of Koorda	Shire of Wagin
	City of Subiaco	Shire of Chapman Valley	Shire of Kulin	Shire of Wandering
	City of Swan	Shire of Chittering	Shire of Lake Grace	Shire of Wickepin
	City of Vincent	Shire of Cocos (Keeling) Islands	Shire of Laverton	Shire of Williams
	City of Wanneroo	Shire of Collie	Shire of Leonora	Shire of Wiluna
	Shire of Mundaring	Shire of Coolgardie	Shire of Manjimup	Shire of Wongan-Ballidu
	Shire of Murray	Shire of Corrigin	Shire of Meekatharra	Shire of Woodanilling

## Appendix A – Census returns (continued)

### Local governments returning a census 2018–19

Regional councils	Perth and Peel regions	Other regions		
	Shire of Peppermint Grove	Shire of Cranbrook	Shire of Menzies	Shire of Wyalkatchem
	Shire of Serpentine Jarrahdale	Shire of Cuballing	Shire of Merredin	Shire of Wyndham-East Kimberley
	Shire of Waroona	Shire of Cue	Shire of Mingenew	Shire of Yalgoo
	Town of Bassendean	Shire of Cunderdin	Shire of Morawa	Shire of Yilgarn
	Town of Cambridge	Shire of Dalwallinu	Shire of Mount Magnet	Shire of York
	Town of Claremont	Shire of Dandaragan	Shire of Mount Marshall	Town of Port Hedland
	Town of Cottesloe	Shire of Dardanup	Shire of Mukinbudin	
	Town of East Fremantle			
	Town of Mosman Park			
	Town of Victoria Park			

### Local governments not returning a census 2018–19

Regional councils	Other regions		
Rivers Regional Council	Shire of Ashburton	Shire of Goomalling	Shire of Toodyay
	Shire of Carnamah	Shire of Katanning	Shire of Upper Gascoyne
	Shire of Christmas Island	Shire of Kojonup	Shire of West Arthur
	Shire of Coorow	Shire of Moora	Shire of Westonia
	Shire of Dumbleyung	Shire of Perenjori	Shire of York
	Shire of Dundas	Shire of Three Springs	Town of Port Hedland

## Appendix B – Kerbside and vergeside services: delivery and participation

	No. households with service	Average participation rate (%)	Provided in-house	Outsourced
<b>Kerbside</b>				
<b>General waste for disposal to landfill</b>				
Perth and Peel regions	600,782	95	10	16
Other	190,051	92	15	74
Statewide	790,833	93	27	90
<b>General waste processed at an alternative waste treatment facility</b>				
Perth and Peel regions	352,523	96	6	3
Other				
Statewide	352,523	96	6	3
<b>Co-mingled and separated dry recyclable</b>				
Perth and Peel regions	835,212	93	6	27
Other	138,100	84	2	58
Statewide	973,311	87	8	85
<b>FOGO</b>				
Perth and Peel regions	6,021	100	1	0
Other	29,807	83	1	3
Statewide	35,828	90	2	3
Perth and Peel regions	292,539	62	3	7
Other	16,130	100	0	2
Statewide	308,669	68	3	9
<b>Vergeside</b>				
<b>Green organics</b>				
Perth and Peel regions	785,073		9	23
Other	64,180		17	10
Statewide	849,253		26	33
<b>Hard waste</b>				
Perth and Peel regions	791,518		6	24
Non-metropolitan	79,007		24	11
Statewide	870,525		30	35

## Appendix C – Recovered materials (tonnes) reported to Section C of the census

Material category	Perth and Peel regions				Other regions				Statewide
	Kerbside	Drop off	Vergeside	PP&SE*	Kerbside	Drop off	Vergeside	PP&SE	All
Green waste	51,309	46,031	41,069	-	1	41,886	4,822	1	185,119
Paper and cardboard	91,583	3,031	330	14	14,520	2,241	-	120	111,840
Organics from mixed MSW and FOGO	84,555	-	-	-	10,037	-	-	-	94,592
Glass	55,417	335	-	7	7,540	494	3	23	63,818
Other - please specify	288	9,954	6,184	-	12	19,062	-	2	35,502
Steel non-packing	1,600	13,447	3,599	20	131	17,576	492	-	36,865
Total plastic	8,791	281	11	4	3,348	171	0	10	12,616
Other metals (copper, etc)	173	1,233	932	-	302	5,372	50	-	8,062
Steel packaging (cans)	3,619	3	-	2	507	107	-	1	4,240
Mattresses	21	1,092	1,969	-	-	706	30	-	3,819
Wood / timber	-	576	551	-	50	1,948	207	-	3,332
E-waste	-	1,303	110	-	-	743	1	-	2,156
Aluminium packaging (cans)	1,436	5	-	99	430	164	-	8	2,141
Batteries	5	644	3	-	-	561	2	-	1,214
Waste oil	12	461	1	-	9	627	-	-	1,111
Household Hazardous Waste	-	884	8	-	-	175	-	-	1,067
Tyres / rubber	-	333	2	20	-	260	10	-	625
Aluminium non-packaging	29	27	-	-	3	298	-	1	359
Textiles	-	147	9	184	-	8	-	-	348
<b>Total</b>	<b>298,838</b>	<b>79,788</b>	<b>54,777</b>	<b>350</b>	<b>36,890</b>	<b>92,400</b>	<b>5,616</b>	<b>166</b>	<b>568,825</b>

\*Public places and special events





GOVERNMENT OF  
WESTERN AUSTRALIA



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