



# Recycling and waste in Queensland

# 2018



Queensland  
Government



## Minister's foreword

The Recycling and Waste in Queensland 2018 Report provides a snapshot of how waste and recyclables were managed, recovered and disposed of in 2017–18. It summarises Queensland's improvements, and highlights areas where our state can do better.

In 2017–18, Queenslanders increased their recycling effort for household and business wastes by 580,000 tonnes, resulting in close to 5 million tonnes of materials diverted from landfill.

However, the report also shows that Queenslanders recycled less than the amount of waste sent to landfill, and the state still remains a poor performer in recycling in comparison to most other states and territories.

Queensland is a dynamic and growing state, now home to more than 5 million people. As our population continues to increase, so does the amount of waste we produce. Regrettably, our waste is growing faster than our population.

The Queensland Government is committed to developing and implementing a long-term plan to help improve our waste management practices. A new Waste Management and Resource Recovery Strategy will provide the direction for Queensland to become a zero waste society.

To support this transition, the introduction of a waste disposal levy from 1 July 2019 will create incentives to divert waste away from landfill and instead find more resource recovery solutions. An important benefit of the levy will be to provide funding for ongoing investment in infrastructure and technologies that bolster our recycling and resource recovery industries across the state.

To kick-start the process, the Queensland Government is investing \$100 million over the next three years for new and expanded resource recovery facilities in Queensland, to be complemented by a suite of education and support programs.

The Queensland Government has also committed that 70 per cent of levy proceeds will be invested in resource recovery and other environmental programs—a huge catalyst for co-investment by the private sector—and unprecedented in Australia.

2017–18 also marked some historic achievements in reducing waste in Queensland and its impacts on our environment, our communities and our economy.

The ban on the supply of lightweight single-use plastic bags on 1 July 2018 is helping reduce plastic pollution in our environment. Before the ban, nearly 1 billion of these bags were used in Queensland every year—16 million of which ended up as litter in our environment.

In addition, Queensland's container refund scheme, Containers for Change, has had tremendous support since its introduction on 1 November 2018, providing great new community fundraising and local business opportunities, while helping keep these containers, the second most commonly littered item in Queensland, out of the environment.

In 2017-18, the Queensland Government also completed the review and reforms to the framework for waste-related industries and hazardous waste, providing a more robust and risk-based approach to their regulation.

We are gaining much traction on improving waste management in Queensland, and we want to keep building on this momentum.

Everyone has a role to play in Queensland becoming more resourceful and less wasteful—individuals, business, industry and government. We will all need to work together to create a sustainable, resilient and prosperous Queensland, where waste diverted from landfill is used to create the products, jobs and industries of the future, while also protecting our precious environment.

Leeanne Enoch MP

**Minister for Environment and the Great Barrier Reef,  
Minister for Science and Minister for the Arts**

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## Introduction

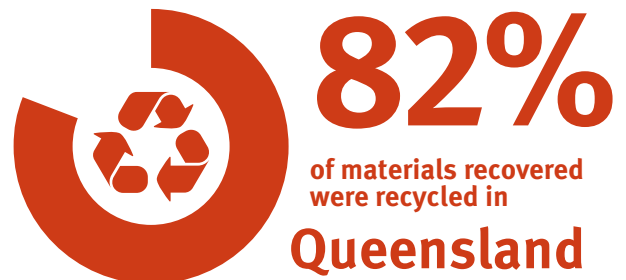
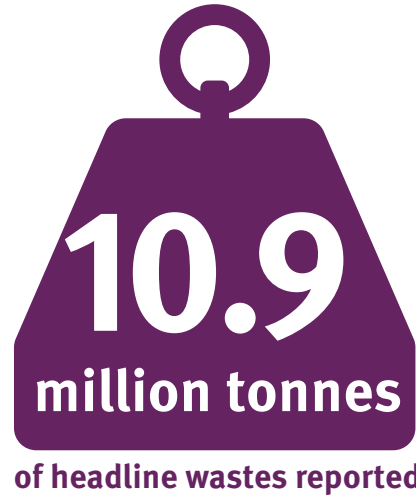
This report presents data on, and trends in, waste recovery and disposal in Queensland during the 2017–18 financial year.

The *Waste Reduction and Recycling Act 2011* places mandatory annual reporting requirements on reporting entities. The data in this report was derived from surveys submitted by 361 reporting entities, including local

governments, private landfill operators, recyclers, organic processors, waste transporters, and operators of transfer stations, incinerators, and industrial and mining monofills.

More information about Queensland's waste management and resource recovery programs, policies and initiatives is available at [www.qld.gov.au/wasterecovery](http://www.qld.gov.au/wasterecovery).

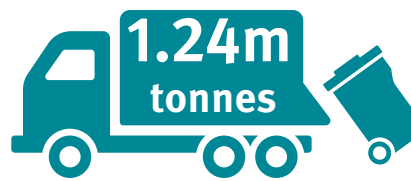
## In 2017–18 ...



Local governments sent 340 000 tonnes



of paper and packaging to recyclers



of mixed domestic waste picked up by weekly council kerbside collection

Organic processors converted 1.4 million tonnes



into products such as soil, potting mixes and mulches

It cost local governments

**\$18.4m**

to deal with 6,000 tonnes



of illegally disposed of waste



## Key findings for 2017–18

### Headline wastes

- A total of 10.9 million tonnes of headline wastes (municipal; commercial and industrial; construction and demolition) were generated— an increase of 1.1 million tonnes (11%) from 2016–17.
- The 11% increase in the generation of headline wastes was greater than Queensland’s population growth of 1.6%<sup>1</sup> and its economic growth (state final demand) of 3.7%<sup>2</sup> during the same period.
- The overall recovery rate increased slightly by 0.9% from 44.5% in 2016–17 to 45.4% in 2017–18.
- Recovery rates for the headline waste streams were:
  - » 32.4% for municipal solid waste
  - » 47.3% for commercial and industrial waste
  - » 50.9% for construction and demolition waste.
- Private sector waste facilities (landfills, monofills and incinerators) handled 60% of the headline wastes sent for disposal—a 3% increase from 2016–17. Of this waste, private sector landfills reported disposing of:
  - » 14% of the municipal solid waste
  - » 53% of the commercial and industrial waste
  - » 95% of the construction and demolition waste.

### Local governments

In 2017–18—

- Weekly red bin lid kerbside services collected 1.24 million tonnes of domestic waste from 1,893,000 households—a 3% decrease per capita from 2016–17 and an 11% decrease per capita since 2009–10.
- Yellow bin lid services collected 347,000 tonnes of paper and packaging—a 0.2% decrease per capita from 2016–17 and a 2.6% increase per capita since 2009–10.
- Green bin lid services collected 61,000 tonnes of garden and food organic wastes—a 15% increase per capita from 2016–17 and a 92% increase per capita since 2012–13.
- Nine councils provided 220,000 Queensland households with a regular green waste (green bin lid) kerbside collection service—an increase of 29,000 households from 2016–17.
- Thirty-two councils provided a regular (yellow bin lid) kerbside collection service for paper and packaging materials to 1,722,000 households—a 3.8% increase from 2016–17.
- Local government diverted 2,842,000 tonnes of waste from disposal, including 1,510,000 tonnes of headline wastes (such as paper and packaging, and green waste) and 1,332,000 tonnes of other wastes (such as biosolids, batteries and clean earthen material).
- 15,100 tonnes of waste were diverted from landfill through the operation of ‘tip shops’.
- 6,000 tonnes of litter and illegally dumped waste were cleaned up at a cost of \$18.4 million.

### Materials recovered

In 2017–18:

- A total of 4,945,000 tonnes of headline wastes were recovered—a 13% increase from 2016–17.
- Close to 661,000 tonnes of segregated green waste was recovered, of which 78% was from domestic sources and the remainder from commercial sources.
- Organic processors converted 1.4 million tonnes of inputs (such as green waste, timber, forestry residuals, biosolids, manure, grease trap waste, abattoir waste, drilling mud and ash) into products such as soil conditioners, manufactured soil, potting mixes and mulches.
- Approximately 1,069,000 tonnes of ash (18.1% of the 5.9 million tonnes reported) was recovered.
- 107,000 tonnes of waste (including green waste, timber, tyres, mineral oil and chemicals) was sent to energy recovery.

### Movement of wastes

- Of the materials recovered in 2017–18:
  - » 82% were processed in Queensland
  - » 5% of diverted materials were sent interstate for further processing
  - » 13% of diverted materials were sent overseas for further processing
  - » Typically the recovered organics and building materials were fully processed in Queensland, while the majority of the paper, cardboard, plastics, batteries, e-waste, ferrous and non-ferrous metals diverted from disposal were exported from Queensland for further processing.
- Close to 1,248,000 tonnes of waste was received from interstate sources by reporting entities in Queensland—a 37% increase from the 912,000 tonnes reported in 2016–17.

1 ABS 3218.0 Regional Population Growth, Australia, 24 April 2018 (<http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3218.02016-17>)

2 ABS State Details, June quarter 2018 (<http://www.qgso.qld.gov.au/products/reports/national-accounts-state-details/national-accounts-state-details-201806.pdf>)

# 1. Summary account of municipal solid waste, commercial and industrial waste and construction and demolition waste generated in 2017–18

This section reports on the headline waste streams: municipal solid waste; commercial and industrial waste; and construction and demolition waste. These are general wastes arising from everyday household and business activities.

Reporting entities handled 10,892,000 tonnes of headline waste during the reporting period (Figure 1.1). This was 1,078,000 tonnes more than the total reported in 2016–17.

A total of 5,947,000 tonnes was disposed of, and 4,945,000 tonnes was sent to recovery. The overall recovery rate for headline waste was 45.4%—an increase of 0.9% from the 44.5% achieved in 2016–17.

## 1.1 Municipal solid waste

In 2017–18, approximately 870,000 tonnes (or 32.4%) of the reported 2.7 million tonnes of municipal solid waste was recovered. This was an increase from the 30.9% recovery rate reported in 2016–17. This improvement is due to a 47,000 tonne decrease in the amount landfilled and a 38,000 tonne increase in the amount recovered.

Local government reported the clean-up and management of 6,000 tonnes of litter and illegally dumped waste at a cost of \$18.4 million—a decrease from the 8,500 tonnes reported in 2016–17. Sixty four councils provided data on the types of litter and illegally dumped waste collected. The most common wastes were tyres (reported by 50% of councils), household litter (42%), large household items including white goods, furniture and mattresses (34%), green waste (27%), construction and demolition waste (23%), asbestos (22%) and cars (11%).

## 1.2 Commercial and industrial waste

Approximately 1.4 million tonnes (or 47.3%) of the 2.9 million tonnes of commercial and industrial waste reported were recovered. This is similar to the 47.8% recovery rate reported in 2016–17.

Scrap metal, paper and packaging materials, and green waste were the main materials recovered (Table 1.1).

## 1.3 Construction and demolition waste

Approximately 2.7 million tonnes (or 50.9%) of the 5.3 million tonnes of construction and demolition waste reported were recovered. This represents a slight increase from the 50.8% reported in 2016–17.

In 2017–18, the total amount of construction and demolition waste reported increased by 900,000 from 2016–17. This included a 430,000 tonne increase in the amount received from interstate sources.

Concrete was the main material recovered (Table 1.2).

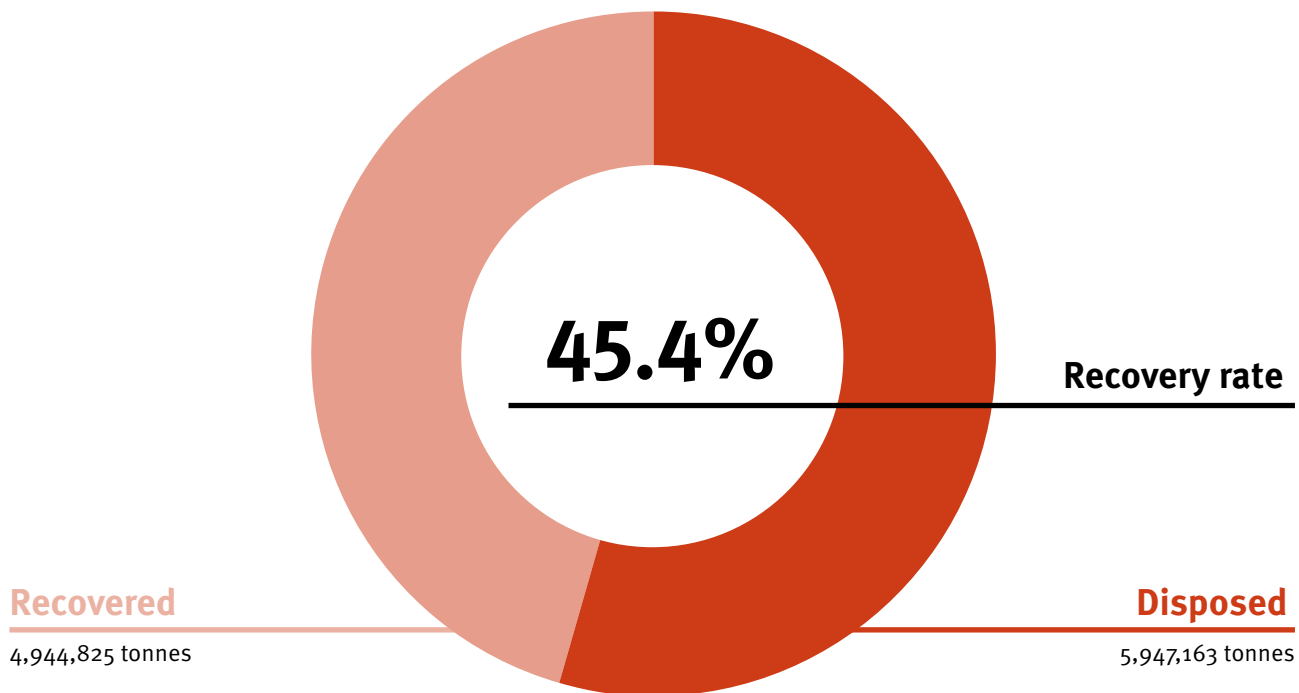
**Table 1.1: Commercial and industrial waste materials recovered during 2017–18**

Material	Amount recovered (tonnes)
Paper and packaging	315,536
Non-packaging glass	7,370
Non-packaging plastic	19,359
Ferrous scrap metal	385,240
Non-ferrous scrap metal	58,989
Timber	164,296
Green waste	192,308
Cotton gin trash	5,680
Food waste	66,045
Drilling mud	99,793
Tyres	66,020
Other mixed waste	3,965

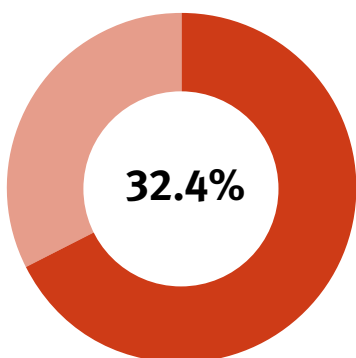
**Table 1.2: Construction and demolition waste materials recovered during 2017–18**

Material	Amount recovered (tonnes)
Concrete	1,851,243
Asphalt	360,146
Bricks and tiles	84,066
Plasterboard	55,124
Timber	30,036
Non-packaging glass	7,370
Non-packaging plastic	2,151
Ferrous scrap metal	283,726
Non-ferrous scrap metal	15,645
Other construction and demolition material	226

Figure 1.1: Headline wastes generated and recovery rates in Queensland during 2017–18

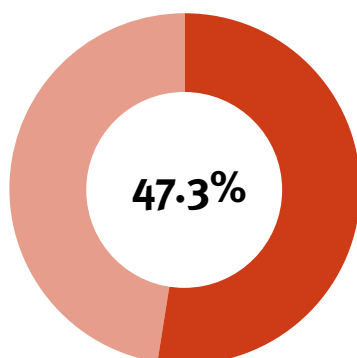


**Municipal solid waste**



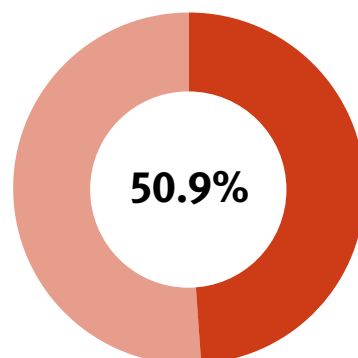
Recovered 870,492 tonnes  
Disposed 1,814,217 tonnes

**Commercial and industrial waste**



Recovered 1,384,600 tonnes  
Disposed 1,540,659 tonnes

**Construction and demolition waste**



Recovered 2,689,733 tonnes  
Disposed 2,592,287 tonnes

## 2. Selected trends for headline waste streams

This section reviews the management of selected headline waste streams using a series of graphs to illustrate multi-year trends.

### 2.1 Kerbside domestic bin services

In 2017–18, local governments provided kerbside bin collection services:

- for domestic waste (red bin lid) to 1,893,000 households
- for recovering paper and packaging materials (yellow bin lid) to 1,722,000 households
- for recovering green waste (green bin lid) to 220,000 households.

In Queensland, 91% of households with a red bin lid service also had a yellow bin lid service, while 11.6% also had a green bin lid service. In 2017–18, 63,000 households had no kerbside bin collection service.

The numbers of waste, and paper and packaging bin services have mostly kept pace with population growth in Queensland during the period 2009–10 to 2017–18, averaging 386 and 335 services per thousand people for red and yellow bin lid services respectively (Figure 2.1).

However, the number of green bin lid services has increased from seven services per thousand people (28,500) in 2008–09 to 45 services per thousand people (220,000) in 2017–18. In addition, Ipswich City Council also collects food waste through its green bin lid service.

A breakdown of local government bin services (by region) is available in Appendix 1.

In 2017–18 (compared with 2016–17), local government bin services recorded:

- a 19,000 tonne (1.5%) decrease in the amount of domestic waste (red bin lid) sent to landfill
- a 400 tonne (0.7%) increase in the amount of domestic waste (red bin lid) sent to an alternative waste treatment facility for recovery
- a 4,800 tonne (1.4%) increase in the amount of paper and packaging collected through the yellow bin lid service
- an 8,800 tonne (16.6%) increase in the amount of green waste collected<sup>3</sup>.

For the year 2017–18, local governments collected:

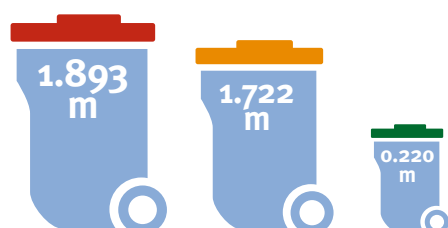
- an average of 685kg of domestic waste per red bin lid service (a decrease from 700kg in 2016–17)
- 200 kg of paper and packaging materials per yellow bin lid service (a decrease from 210kg in 2016–17)
- 280 kg of green waste per green bin lid service (no change from 2016–17).

Figure 2.2 shows the trends in the management of wastes collected by local governments from households. The amounts sent for recovery were greater than the amounts actually recovered due to the generation of recycling residuals in the recovery process.

Between 2009–10 and 2017–18:

- the amount of domestic waste (red bin lid) increased by 1.2% from 1,281,000 tonnes in 2009–10 to 1,296,000 tonnes in 2017–18
- the amount of red bin lid waste collected decreased by 11.1% on a per capita basis
- the amount of yellow and green bin lid material collected increased by 37% from 297,000 tonnes in 2009–10 to 408,000 tonnes in 2017–18
- the combined amount of yellow and green bin lid material collected increased by 20.7% on a per capita basis.

#### Services provided to households in 2018



<sup>3</sup> In the Cairns region, waste from some of the domestic red bin lid services is not sent direct to landfill but is sent to an alternative waste treatment facility for recovery of the organic fraction of the waste. The non-recoverable residuals from this process are sent to landfill.



Figure 2.1: Trends in the provision of kerbside bin services by local governments (2009–18)

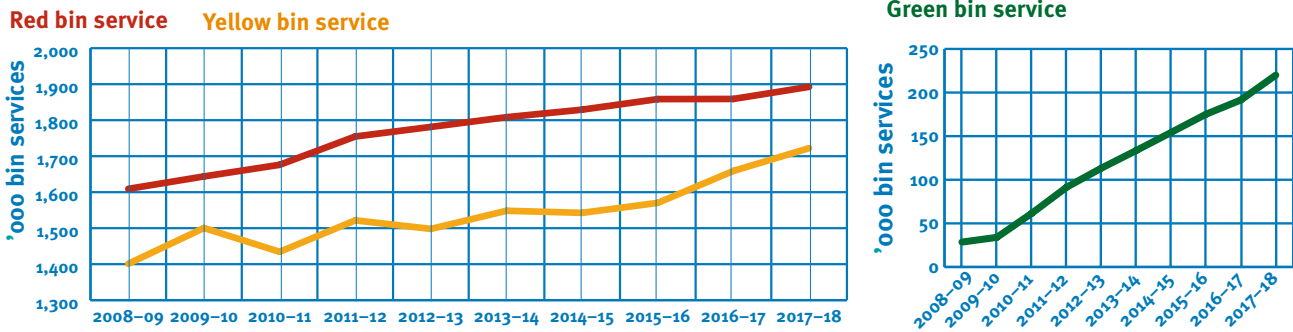
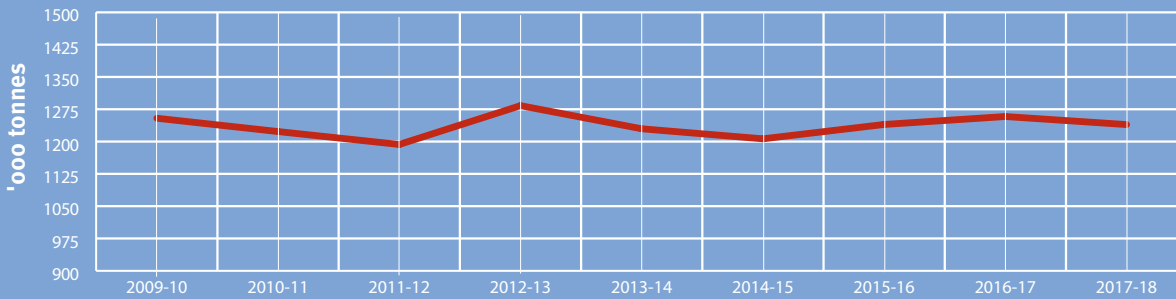


Figure 2.2 Trends in the disposal and recovery of domestic waste picked up by kerbside collections in Queensland (2010–18)

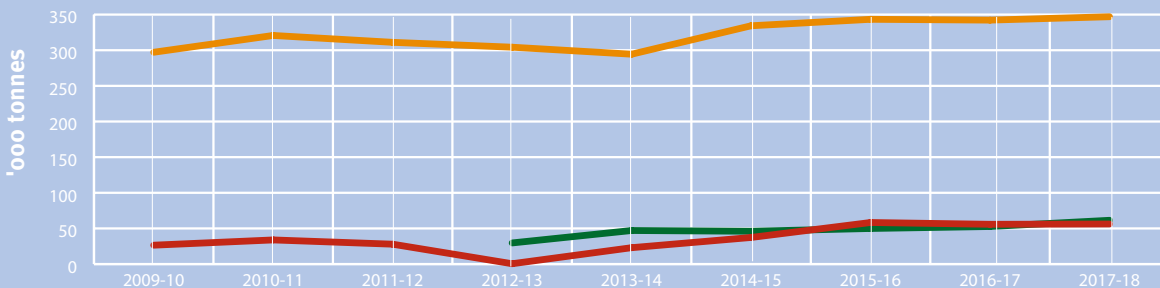
## Sent to landfill

### Red bin service



## Sent to recovery

### Red bin service    Yellow bin service    Green bin service



## 2.2 Segregated green waste and other domestic waste

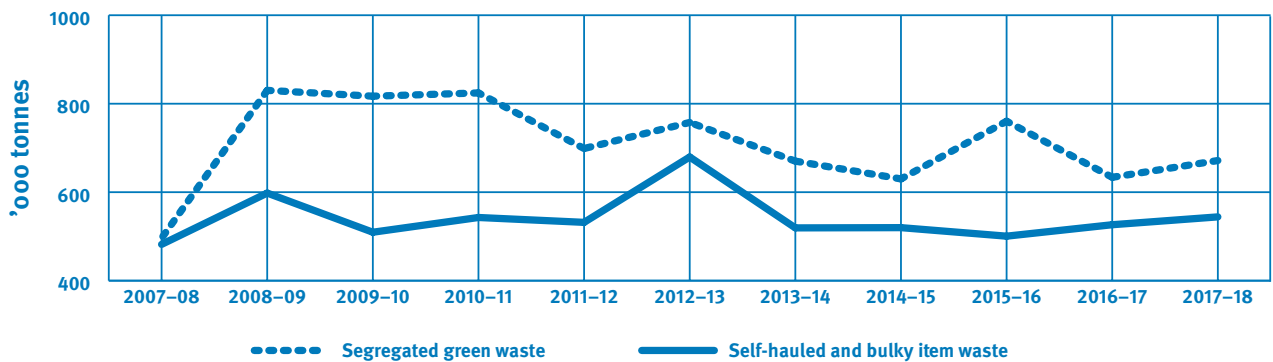
In 2017–18, 672,000 tonnes of segregated green waste was reported. This was an increase of 38,000 tonnes (6%) from 2016–17 (Figure 2.3).

Green waste is generated from both domestic and commercial sources. Of the green waste recovered, 78% was received from domestic sources and is classified as municipal solid waste, with the remainder classified as commercial and industrial waste.

The 544,000 tonnes of domestic waste self-hauled by residents to council facilities or picked up by bulky item kerbside collections was similar to the amounts reported in previous years (Figure 2.3).



**Figure 2.3: Trends in the amounts of segregated and other domestic self-hauled and bulky item waste in Queensland (2008–18)**

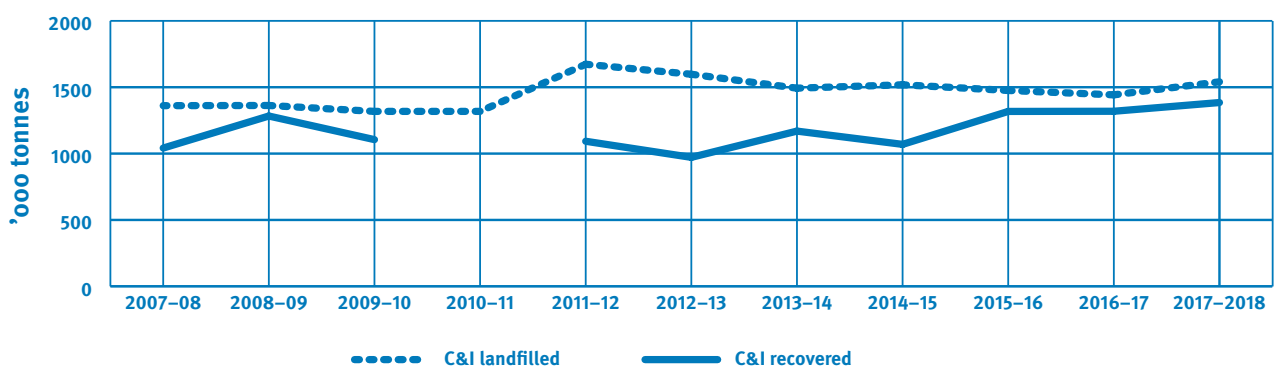


## 2.3 Commercial and industrial waste

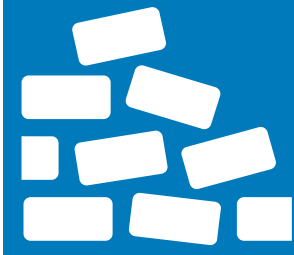
In 2017–18, the total amount of commercial and industrial (C&I) waste sent to disposal was 1,541,000 tonnes. This was a 98,000 tonne (6.6%) increase from 2016–17 and was 101,000 tonnes more than the 2008–17 average of 1,439,000 tonnes (Figure 2.4).

The 1,385,000 tonnes recovered in 2017–18 was a 66,000 tonne (5%) increase from 2016–17 and was 209,000 tonnes more than the 2008–17 average of 1,175,000 tonnes.

**Figure 2.4: Trends in the management of commercial and industrial waste in Queensland (2008–18)**



\*No C&I recovered data available for 2010–11

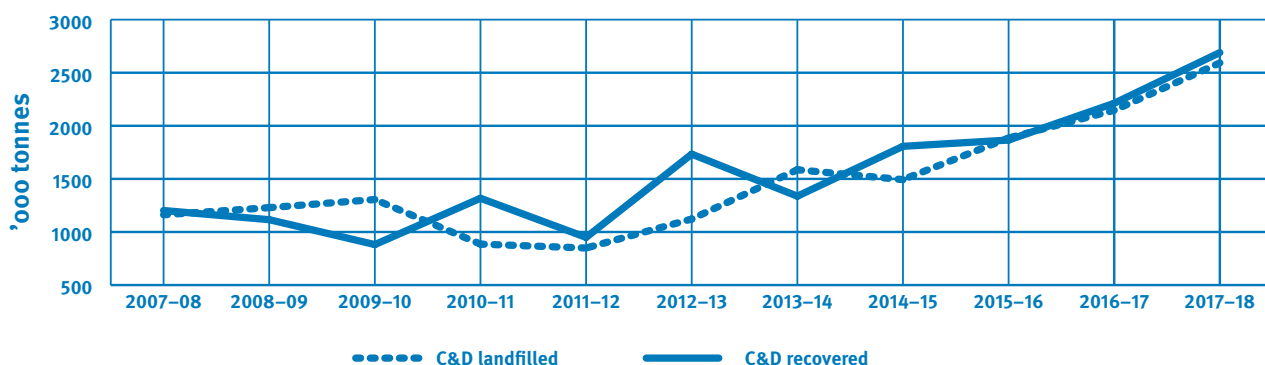


## 2.4 Construction and demolition waste

The trend for increasing amounts of disposal of construction and demolition (C&D) waste continued in 2017–18 (Figure 2.5). The 2,592,000 tonnes landfilled was a 446,000 tonne (24%) increase from 2016–17. A contributing factor was a 394,000 tonne increase in the amount of construction and demolition waste received from interstate, which increased from 640,000 tonnes in 2016–17 to 1,034,000 tonnes in 2017–18.

The 2,690,000 tonnes of construction and demolition waste recovered in 2017–18 was a 477,000 tonne (21%) increase from 2016–17. This included a 375,000 tonne increase in the amount of concrete recovered and a 42,000 tonne increase in the amount of bricks and tiles recovered.

Figure 2.4: Trends in the management of construction and demolition waste in Queensland (2008–18)



### 3. Headline waste disposal by region

This section reports on the disposal of headline waste streams<sup>4</sup> through landfill or incineration in 2017–18 by region. Of the 5,947,000 tonnes of headline wastes disposed of in Queensland, 59.6% went to privately-owned landfills, 40.0% went to local government facilities and the remainder were incinerated, or were disposed of in industrial and mining monofills. Private landfills were responsible for 14% of the municipal solid waste, 53% of the commercial and industrial waste and 95% of the construction and demolition waste disposed of in 2017–18.

In 2017–18, 2,378,000 tonnes of wastes was disposed of in local government landfills, a 54,000 tonne (2.3%) increase from 2016–17, and 3,547,000 tonnes of wastes was disposed of in private sector landfills, a 440,000 tonne (12%) increase from 2016–17. The main changes to the wastes received by private landfill included an 89,000 tonne decrease in the amount of municipal solid waste received, an 82,000 tonne increase in the amount of commercial and industrial waste received, and a 448,000 tonne increase in the amount of construction and demolition waste received. Most of the waste disposed of in private facilities was landfilled in South East Queensland.

Figure 3.1 shows the amounts of the headline waste streams disposed of in each region during 2017–18. The local government areas that make up each region can be found in Appendix 1. Landfills in South East Queensland received 71% of the municipal solid waste, 72% of the commercial and industrial waste and 91% of the construction and demolition waste sent to disposal.

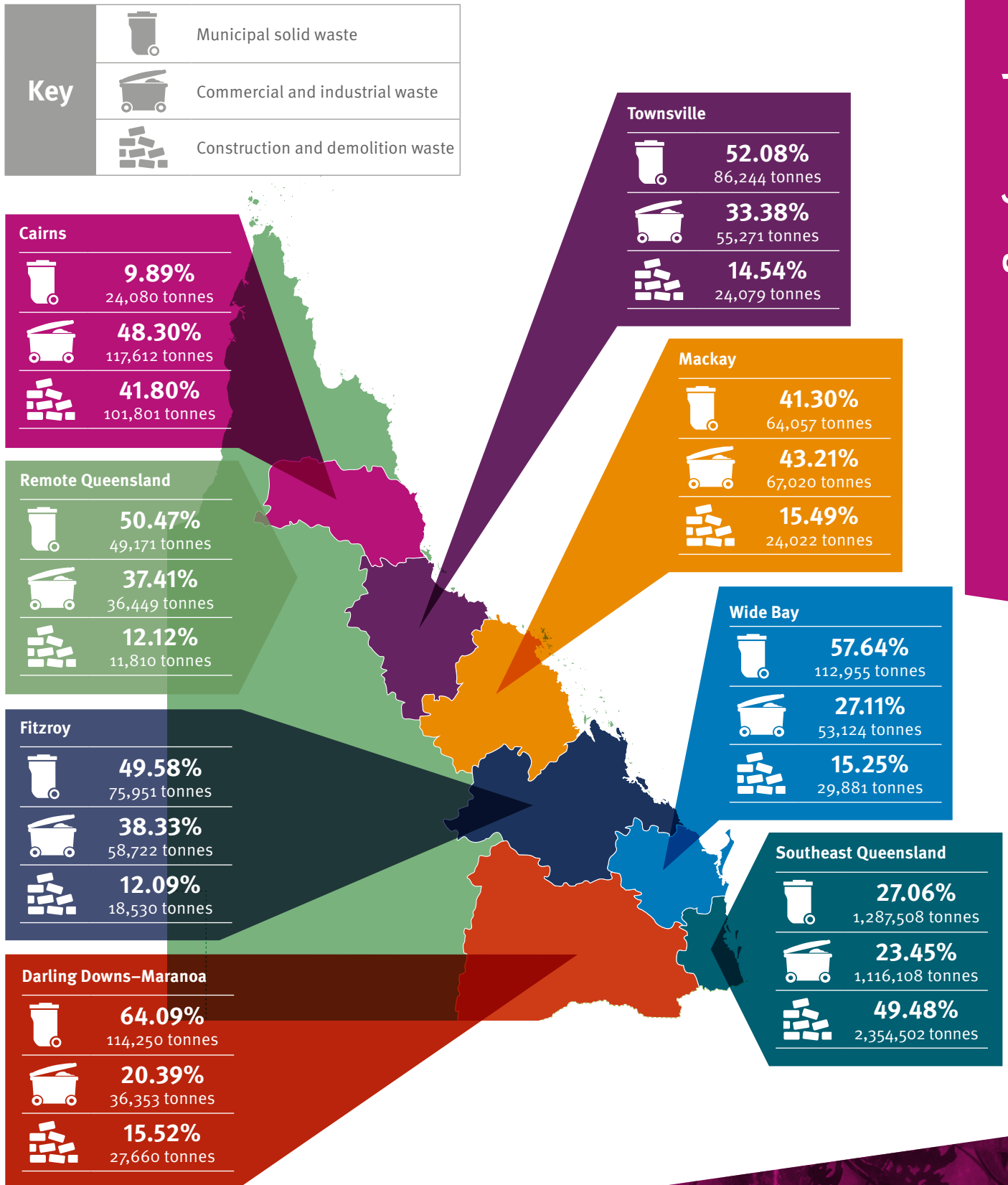
The pattern of disposal in South East Queensland is different to that in the rest of the state (Figure 3.1). For example, while construction and demolition waste was the largest source stream in South East Queensland, it was the generally the smallest stream in the other regions. Municipal solid waste made up 27% of the waste sent to landfill in South East Queensland compared with an average of 44% in non-metropolitan Queensland.

The pattern in the Cairns region was anomalous because a number of councils sent putrescible waste to an alternative waste treatment plant for processing. As a result, municipal solid waste only made up 10% of the waste sent to landfill in that region. As the residual waste from that process was classified as commercial and industrial waste, that source stream made up 48% of the waste sent to landfill in the Cairns region (compared to an average of 26% for the state).

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<sup>4</sup> Headline wastes exclude ash, red mud, primary production wastes, contaminated soil, acid sulfate soil, clean earthen material, biosolids, and other regulated wastes.

Figure 3.1: Amounts of headline waste landfilled or incinerated in Queensland by region in 2017–18



## 4. Waste recovery

This section reports on materials that were diverted from disposal through a variety of means, including recycling, organic processing and energy recovery.

### 4.1 Local government activity

Local government was the main collection point for domestic waste and for wastes generated outside of South East Queensland. In 2017–18, local government diverted 1.5 million tonnes of headline waste (35.3% of the 4.3 million tonnes received) from disposal.

#### 4.1.1 Paper and packaging materials

Local government administers the domestic collection process for paper and packaging through the provision of 1,722,000 yellow bin lid kerbside collection services in urban areas and the provision of 3,663 public place recycling bins/drop-off points across the state.

In total, local government sent 340,000 tonnes of paper and packaging (cardboard and glass, plastic, steel and aluminium containers) for recovery in 2017–18 (up from 335,000 tonnes in 2016–17). Almost all of this material was forwarded to private sector recyclers for processing. The exceptions were small amounts of glass, paper and cardboard recovered and used locally by councils.

The 183,200 tonnes of paper and cardboard sent for recovery was a 1,000 tonne increase (0.6%) compared to the previous year, while the 119,300 tonnes of packaging glass sent for recovery was a 5,300 tonne increase and was the largest amount recorded since reporting commenced in 2004 (Figure 4.1).

The 3,900 tonnes of aluminium containers recovered was an 8.8% increase from 2016–17 and continued a seven-year rising trend. The 27,700 tonnes of packaging plastics recovered was a 1,800 tonne decrease (6.0%) compared to 2016–17, ending an eight-year upward trend. In contrast, the 5,950 tonnes of steel containers recovered remained the same as the 5,970 tonnes recovered from 2016–17.

Population growth has a direct impact on the amount of waste generated. Figure 4.2 provides an indexed comparison of the changes in collections for individual paper and packaging materials with that of the domestic waste (red bin lid) collection on a per capita basis.

In summary:

- The 263 kg per capita of domestic (red bin lid) waste collected in 2017–18 was a decrease of 3% from 2016–17 and an 11.2% decrease from 2009–10.
- The 37.2 kg per capita of paper and cardboard sent for recovery was a decrease of 1.1% from 2016–17, and an 8.2% decrease from 2009–10.
- The 24.2 kg per capita of packaging glass sent for recovery was an increase of 3% from 2016–17 and an increase of 6.4% from 2009–10.
- The 5.6 kg per capita of packaging plastic sent for recovery was a decrease of 7.5% from 2016–17 and an increase of 62% from 2009–10.
- The 1.21 kg per capita of steel cans sent for recovery was a decrease of 1.9% from 2016–17 and a decrease of 4.6% from 2009–10.
- The 0.79 kg per capita of aluminium cans sent for recovery was an increase of 7.0% from 2016–17 and an increase of 16% since 2009–10.

Local governments in South East Queensland cover 70.2% of the state's population and generated 73.7% of the paper and packaging sent for recycling by the sector in 2017–18 (Table 4.1). This region had disproportionately large shares of the packaging glass (77.7%) and packaging plastics (78.7%) segments. In contrast, Cairns and Remote Queensland had disproportionately large shares of aluminium cans sent for recovery, due in some part to transport costs.

Figure 4.1: Trends in the amounts of paper and packaging sent for recycling by local governments from 2004 to 2018 (tonnes)

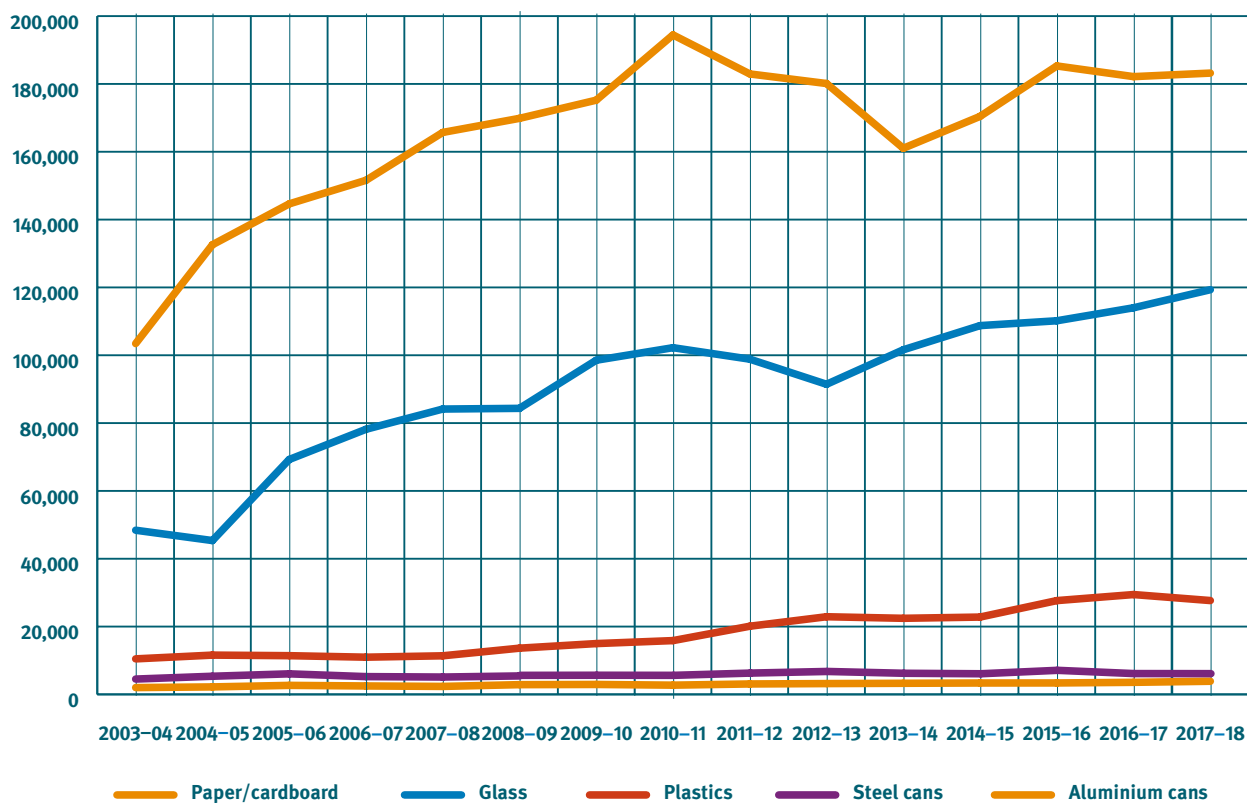
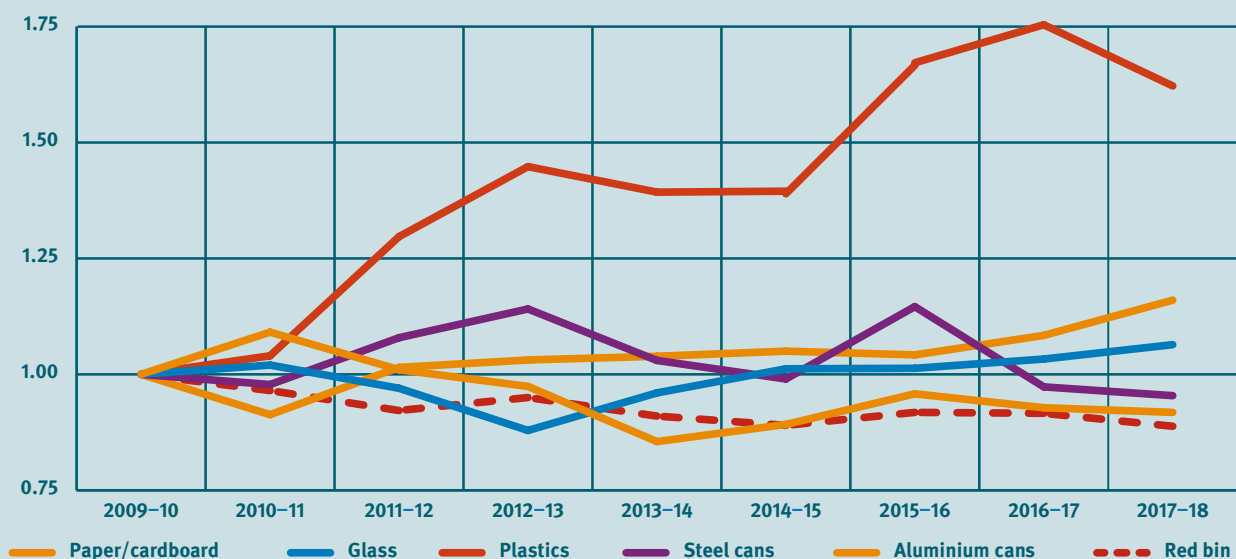








Figure 4.2: Indexed per capita rates for paper and packaging sent for recovery versus domestic kerbside waste collected by local governments (2009-10 = 1.00)



**Table 4.1: Paper and packaging collected by local governments and sent for recovery in 2017–18 by region (tonnes)**

 Region	 Paper and cardboard	 Packaging glass	 Packaging plastics	 Steel cans	 Aluminum cans	Regional total
Southeast Queensland	129,454	92,761	21,765	4,239	2,495	250,714
Darling Downs–Maranoa	5,430	7,133	1,433	299	239	14,534
Wide Bay	16,537	2,152	1,408	466	284	20,847
Fitzroy	7,512	4,340	948	245	144	13,189
Mackay	10,639	6,335	369	171	230	17,745
Townsville	6,489	4,058	869	427	204	12,047
Cairns	7,083	2,512	861	101	270	10,827
Remote Queensland	50	30	20	0	7	107
<b>Subtotal</b>	<b>183,194</b>	<b>119,321</b>	<b>27,673</b>	<b>5,948</b>	<b>3,873</b>	<b>340,010</b>



### 4.1.2 Other materials

Other wastes sent for recovery by local governments in 2017–18 included:

- 597,500 tonnes of green waste
- 11,400 tonnes of timber
- 3,100 tonnes of e-waste
- 95,300 tonnes of other ferrous metal
- 6,400 tonnes of other non-ferrous metal
- 241,800 tonnes of concrete
- 156,000 tonnes of asphalt
- 1,800 tonnes of mineral oil
- 15,100 tonnes of tip shop items.

Local government played an important role in the collection and management of green waste, handling 90% of the total reported in 2017–18.

While local governments sent all of the mineral oil and e-waste to recyclers for processing, they typically processed all the concrete and asphalt received.

Table 4.2 provides a regional breakdown of selected wastes sent for recovery by local governments. South East Queensland recovered the largest amounts, particularly for e-waste and asphalt, with 80% and 91% of the state totals collected.

Green waste was the largest material by weight recovered by councils in all regions except Remote Queensland, where ferrous metal was the largest. Concrete was typically the second or third largest material recovered in all regions, with the exceptions of Cairns and Remote Queensland where ferrous metal and non-ferrous metal respectively were larger.

**Table 4.2: Amounts of other selected wastes sent for recovery by local governments in 2017–18 by region (tonnes)**

Region	Green waste	Timber	Concrete	Asphalt	Ferrous metal	Non-ferrous metal	E-waste	Tip shop sales
South East Queensland	354,817	3,500	179,784	142,343	56,520	1,920	2,483	9,551
Darling Downs–Maranoa	53,232	4,119	18,379	246	9,208	1,128	59	1,304
Wide Bay	73,758	3,656	12,418	1,392	6,059	968	43	843
Fitzroy	34,643	63	8,824	6,492	4,443	959	137	134
Mackay	15,828	0	4,960	1,699	3,458	433	45	2,012
Townsville	27,589	22	14,885	3,860	2,943	15	117	590
Cairns	36,514	31	2,222	0	9,859	431	225	687
Remote Queensland	1,117	1	304	1	2,810	508	7	2
<b>Subtotal</b>	<b>597,498</b>	<b>11,392</b>	<b>241,776</b>	<b>156,033</b>	<b>95,300</b>	<b>6,362</b>	<b>3,116</b>	<b>15,123</b>

## 4.2 Organic processors

The 59 entities responding to the 2017–18 organic processing survey collectively processed:

- 298,200 tonnes of green waste
- 188,300 tonnes of forestry residuals
- 48,000 tonnes of agricultural residuals
- 99,000 tonnes of drilling mud
- 137,200 tonnes of timber, wood and sawdust
- 5,700 tonnes of cotton gin trash
- 46,200 tonnes of abattoir waste
- 188,100 tonnes of manure
- 81,000 tonnes of biosolids (dry solids equivalent (DSE))
- 104,200 tonnes of grease trap waste and other organic sludges
- 25,000 tonnes of food waste
- 30,700 tonnes of food processing waste
- 20,400 tonnes of ash.

These organic processors collectively produced:

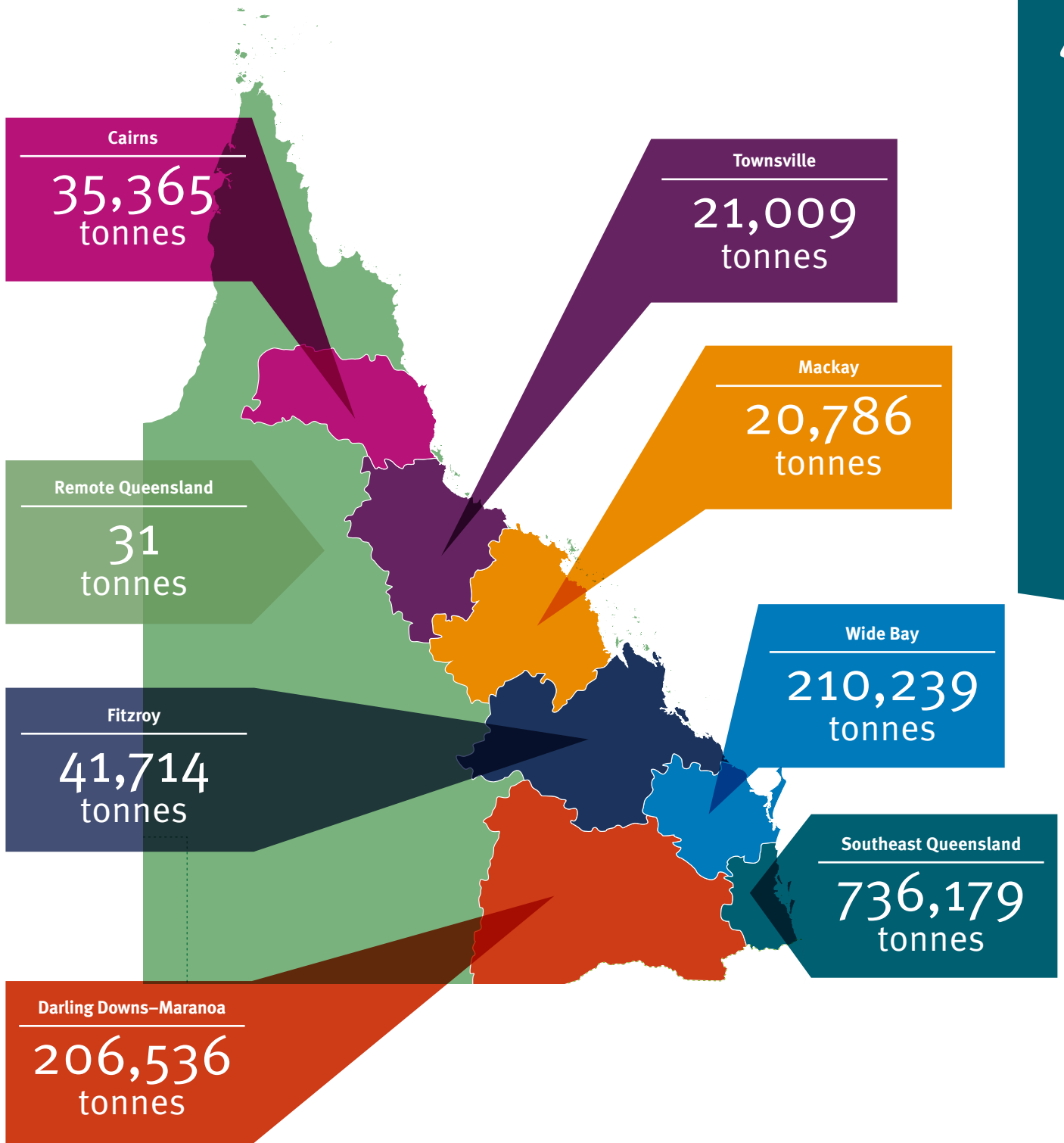
- 586,500 tonnes of manufactured soil
- 331,000 tonnes of soil conditioner
- 137,200 tonnes of potting mix
- 28,700 tonnes of organic fertiliser
- 331,100 tonnes of mulch
- 78,500 tonnes of direct land application
- 65,500 tonnes of composted manure
- 12,700 tonnes of playground surfacing
- 5,900 tonnes of other products.

Organic wastes were typically processed locally, in the region where they were produced (Table 4.3). South East Queensland processed the largest amounts of green waste, forestry residuals, biosolids, grease trap waste and other organic sludges, abattoir waste, waste food, food processing waste and ash. Darling Downs–Maranoa processed the most manure and drilling mud, Fitzroy processed the most cotton gin trash, and Wide Bay processed the most timber and agricultural residuals.

**Table 4.3: Selected wastes processed by organic processors in 2017–18 by region (tonnes)**

Waste material	Region							
	South East Queensland	Darling Downs–Maranoa	Wide Bay	Fitzroy	Mackay	Townsville	Cairns	Remote Qld
Timber, wood and sawdust	54,362	4,575	73,855	72	467	3,500	327	0
Green waste	234,785	3,070	11,232	3,314	17,359	12,500	15,955	0
Forestry residuals	126,593	1,743	59,997	0	0	0	0	0
Agricultural residuals	40	0	40,500	3,478	0	900	3,089	0
Manure	42,886	119,315	19,113	13	0	1,350	5,416	0
Abattoir waste	16,316	13,003	3,754	11,987	1,144	0	0	0
Cotton gin trash	0	0	0	5,680	0	0	0	0
Waste food	24,771	0	0	0	0	190	0	0
Food processing waste	29,630	20	1,000	7	0	0	0	0
Biosolids (DSE)	67,788	2,392	523	575	1,324	19	8,387	31
Grease trap & other organic sludges	84,089	3,392	0	11,996	0	2,500	2,191	0
Ash	14,919	619	265	4,031	492	50	0	0
Drilling mud	40,000	58,407	0	561	0	0	0	0

Figure 4.3: Regional subtotals of selected wastes handled by organic processors during 2016–17



### 4.3 Overall recovery of materials

Many of the waste materials diverted from disposal are transferred between agents within the waste and recycling sector. For example, skip bin operators may deposit materials at council transfer stations; councils may forward material to recyclers and organic processors; and recyclers may forward materials to other recyclers for further processing (in Australia or overseas). Table 4.4 provides an overall summary of materials recovered in 2017–18, distinguishing between material and energy recovery, as well as the last reported destination of the materials (Queensland, interstate or overseas).

Of the 6,835,600 tonnes of materials documented in Table 4.4, 82% were either fully recovered in Queensland or sent to another entity in Queensland; 5% were sent interstate; and 13% were sent overseas. Typically, building materials and organic wastes were recovered in Queensland, while the majority of ferrous and nonferrous metals, lead acid batteries, e-waste, paper, cardboard and plastics were sent either interstate or overseas for recovery.

Close to 107,000 tonnes of the tracked materials were sent to energy recovery in Queensland, interstate and overseas, including 7% of the timber, 6% of the green waste, 29% of the mineral oil, 34% of the tyres, and 90% of the paint, solvents and chemicals reported.

Compared with the previous reporting period:

- the amount of concrete recovered increased by 375,000 tonnes (25%) to 1,851,000 tonnes
- the amount of asphalt recovered increased by 11,000 tonnes (3%) to 360,000 tonnes
- the amount of ferrous metal (excluding steel cans) recovered increased by 12,000 tonnes (2%) to 709,000 tonnes
- the amount of non-ferrous metal (excluding aluminium cans) recovered decreased by 2,200 tonnes (3%) to 78,200 tonnes
- the amount of packaging glass recovered decreased by 2,100 tonnes (2%) to 88,500 tonnes
- the amount of cardboard recovered decreased by 37,000 tonnes (12%) to 265,000 tonnes
- the amount of green waste recovered increased by 36,000 tonnes (6%) to 661,000 tonnes.
- the amount of fly ash recovered increased by 90,000 tonnes (10%) to 945,000 tonnes.

**Table 4.4: Recovery methods and destinations for selected materials recovered by reporting entities in Queensland during 2017–18 (tonnes)**

Material	Quantity recovered or sent for recovery in Queensland*	Quantity combusted for energy recovery in Queensland	Quantity sent interstate for further processing	Quantity sent interstate for energy recovery	Quantity sent overseas for further processing	Quantity sent overseas for energy recovery	Total reported in 2017–18	Change from 2016–17 to 2017–18
Packaging glass	87,783	-	747	-	-	-	88,530	-2.29%
Non-packaging glass	14,739	-	-	-	-	-	14,739	-11.27%
Paper	96,865	-	35,917	-	111,495	-	244,277	-5.30%
Cardboard	105,313	-	86,086	-	73,903	-	265,302	-12.20%
Packaging plastics	5,584	-	1,573	-	19,279	-	26,436	-14.11%
Non-packaging plastics	13,975	-	-	-	7,535	-	21,510	102.85%
Steel cans	-	-	2,136	-	2,302	-	4,437	-22.72%
Other ferrous metals	7,788	-	167,032	-	534,495	-	709,315	1.66%
Aluminium cans	445	-	120	-	5,549	-	6,114	0.79%
Other non-ferrous metals	5	-	2,812	-	75,409	-	78,225	-2.73%
Lead acid batteries	11,287	-	20,026	-	-	-	31,313	-11.72%
Other batteries	68	-	156	-	-	-	224	-20.22%
E-waste (not elsewhere reported)**	569	-	790	-	727	-	2,085	21.60%

Material	Quantity recovered or sent for recovery in Queensland*	Quantity combusted for energy recovery in Queensland	Quantity sent interstate for further processing	Quantity sent interstate for energy recovery	Quantity sent overseas for further processing	Quantity sent overseas for energy recovery	Total reported in 2017–18	Change from 2016–17 to 2017–18
Catalysts	57	-	31	-	-	-	88	-47.49%
Concrete	1,851,243	-	-	-	-	-	1,851,243	25.36%
Asphalt	360,146	-	-	-	-	-	360,146	3.29%
Bricks and tiles	83,823	-	243	-	-	-	84,066	100.60%
Plasterboard/fibro	55,124	-	-	-	-	-	55,124	189.47%
Timber, sawdust	180,307	14,025	-	-	-	-	194,332	63.41%
Green waste	620,294	40,929	-	-	-	-	661,223	5.64%
Forestry residuals	188,333	-	-	-	-	-	188,333	0.82%
Agricultural residuals	48,007	-	-	-	-	-	48,007	289.70%
Manure	188,092	-	-	-	-	-	188,092	-30.87%
Abattoir waste	46,205	-	-	-	-	-	46,205	-27.84%
Cotton gin trash	5,680	-	-	-	-	-	5,680	9.55%
Vegetable Oil	17,640	-	1,856	-	4,876	-	24,372	0.74%
Waste food	66,045	-	-	-	-	-	66,045	-3.77%
Food processing waste	30,657	-	-	-	-	-	30,657	-23.56%
Mineral oil	45,419	3,609	15,428	-	-	21,549	86,005	9.08%
Biosolids (DSE)	81,039	-	-	-	-	-	81,039	4.71%
Grease trap waste and sludges	104,169	-	-	-	-	-	104,169	-11.18%
Oily water	13,588	-	-	-	-	-	13,588	12.01%
Fly ash	944,602	-	-	-	-	-	944,602	10.48%
Bottom/other ash	123,974	-	-	-	-	-	123,974	5.94%
Drilling mud	99,793	-	-	-	-	-	99,793	55.30%
Tyres	41,478	42	-	-	2,416	22,048	66,020	104.74%
Paint, solvents and chemicals	244	3,602	281	1,056	-	-	5,184	42.10%
Tip shop	15,123	-	-	-	-	-	15,123	-19.01%
<b>Destination subtotal</b>	<b>5,555,504</b>	<b>62,208</b>	<b>335,234</b>	<b>1,056</b>	<b>837,984</b>	<b>43,633</b>	<b>6,835,620</b>	<b>9.92%</b>

\* Recovered in Queensland means the material was either fully recovered by the reporting entity or was sent to another (non-reporting) operator in Queensland for further processing. It is possible that materials last tracked to a Queensland site were subsequently sent interstate or overseas.

\*\* Residual amount not reported elsewhere (such as ferrous metal, non-ferrous metal, non-packaging glass, non-packaging plastic).

## 4.4 Recycling residuals

Recycling residuals are materials passing through a recovery process that are sent to disposal (typically landfill). Reasons for the non-recovery of materials include contamination, process breakdowns, technical issues, lack of demand for the recovered materials and financial (cost) issues.

For example, contamination is a significant problem for local government kerbside recycling programs. The contamination rates reported by councils for yellow bin lid collections in 2017–18 ranged from 5% to 48% (average 16%). The contamination rates for the much smaller green bin lid collections (which are predominantly opt-in rather than compulsory) were much lower, ranging from 0% to 5% (average 2%).

Entities completing the recycling and organic processing data collections were surveyed about recycling residuals. As some entities did not provide data, the reported figure of 727,000 tonnes is an undercount. Some liquid residuals, such as oily water, were disposed to sewer as trade waste and not included in the landfill data.

Recyclers processing construction and demolition waste reported 343,000 tonnes of residuals; metal recyclers reported 114,000 tonnes; organic processors reported 82,000 tonnes; paper and packaging recyclers reported 36,000 tonnes; and tyre recyclers reported 13,000 tonnes. If not further recovered, these residuals were sent for disposal.

## 5. Other data and trends

This section reports on data and trends from other waste streams and cross border movements as well as mandatory government planning for waste minimisation.

### 5.1 Other waste streams

Data on other (non-headline) wastes generated during 2017–18 are shown in Figure 5.1. Some of these streams (such as asbestos) had zero recovery, while others (such as biosolids) had very high rates of recovery.

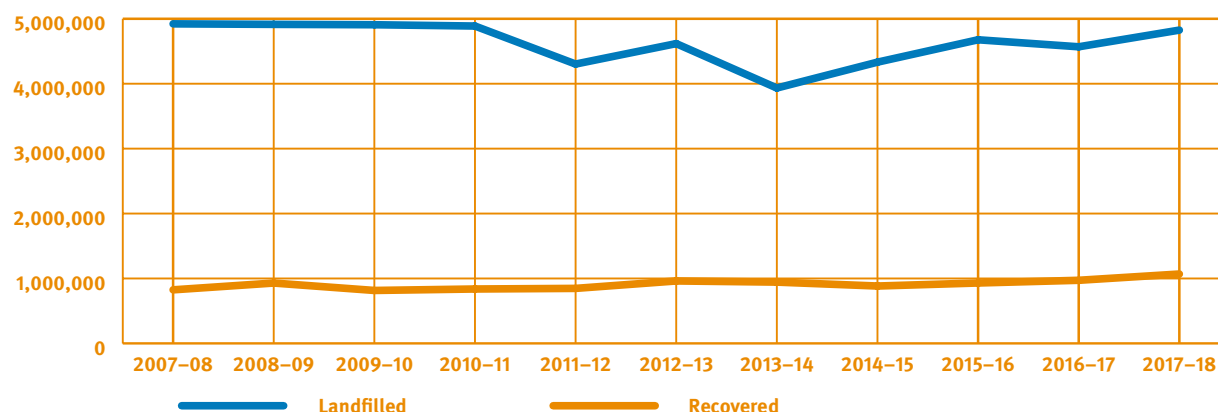
**Table 5.1: Other (non-headline) wastes generated in Queensland during 2017–18**

Waste stream	Amount generated (tonnes)	Amount disposed of (tonnes)	Amount recovered (tonnes)	Recovery rate
Asbestos	85,920	85,920	0	0.00%
Biosolids (dry solids equivalent)	96,365	12,842	83,523	86.67%
Contaminated soil	1,011,641	995,217	16,424	1.62%
Potential/acid sulphate soil	101,365	20,851	80,514	79.43%
Fly ash	5,162,438	4,217,836	944,602	18.30%
Bottom/other ash	731,733	607,759	123,974	16.94%
Red mud	6,821,081	6,821,081	0	0.00%

The 5,894,000 tonnes of ash generated in 2017–18 was a 353,000 tonne (6.4%) increase from 2016–17 and was approximately 400,000 tonnes more than the 10-year average of 5,501,000 tonnes (Figure 5.1).

The 1,069,000 tonnes of ash recovered in 2017–18 was above the 10-year average of 895,000 tonnes, and the recovery rate of 18.1% was also above the 10-year average of 16.3%, although it was lower than the peak recovery rate of 19.4% achieved in 2013–14.

**Figure 5.1: Amounts of ash landfilled and recovered in Queensland during 2008–18 (tonnes)**



## 5.2 Cross-border movements of waste

During 2017–18, wastes moved both into Queensland, and from Queensland into other states or overseas.

Table 4.4 shows that 336,000 tonnes of the materials was sent interstate for recovery, while 882,000 tonnes was sent overseas.

The development of China’s ‘National Sword’ policy in 2017 and its replacement ‘Blue Sky Policy’ in March 2018 set stringent quality and contamination standards on the importation of 24 categories of solid recyclable material, including plastics and mixed paper. The implementation of these policies affected the global and Australian recycling industry with the impacts starting to take effect in Queensland during the 2017–18 reporting period. While the recovery of metals for overseas markets remained largely unaffected, the most significant impact has been seen in the declining trend for the amount of paper and cardboard sent overseas.

Table 5.2 lists the amounts of selected materials sent overseas for recovery from Queensland from 2016 to 2018.

Domestically, the 1,248,000 tonnes of waste received from interstate sources in 2017–18 was a 394,000 tonne (36.9%) increase from 912,000 tonnes in 2016–17. (Following a comment in the Lyon’s review<sup>5</sup>, the recycling sector was queried on interstate waste in the 2017–18 waste data survey, approximately 230,000 tonnes, or a little over half the increase, was reported by entities queried for the first time in 2018).

The waste coming from interstate included:

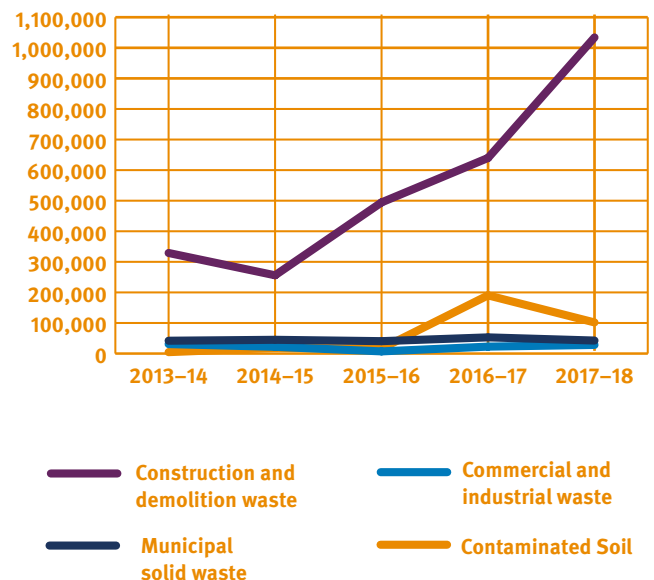
- 43,000 tonnes of municipal solid waste
- 28,000 tonnes of commercial and industrial waste
- 1,034,000 tonnes of construction and demolition waste
- 102,000 tonnes of contaminated soil
- 200 tonnes of acid sulfate soil
- 42,000 tonnes of regulated waste.

Compared with 2016–17, the amount of municipal solid waste decreased by 10,000 tonnes (20%); the amount of commercial and industrial waste increased by 6,000 tonnes (25%); the amount of construction and demolition waste increased by 394,000 tonnes (62%); the amount of contaminated soil decreased by 89,000 tonnes (47%); the amount of acid sulfate soil decreased by 800 tonnes (80%); and the amount of regulated waste increased by 37,000 tonnes (71%) (Figure 5.3).

**Table 5.2: Three-year trends in the amounts of materials sent overseas for recovery**

Material	2015–16	2016–17	2017–18
Paper	143,894	138,565	111,495
Cardboard	136,501	88,332	73,903
Packaging plastics	22,032	15,109	19,279
Non-packaging plastics	6,884	6,213	7,535
Steel cans	6,145	3,201	2,302
Other ferrous metal	403,283	550,892	534,495
Aluminium cans	3,745	5,144	5,549
Other non-ferrous metal	57,109	77,606	75,409
Vegetable oil	2,077	5,970	4,876
Mineral oil	9,219	3,623	21,549
Tyres	9,853	19,713	24,500

**Figure 5.3: Five-year trend in wastes received by Queensland waste operators from interstate sources**



5 P. Lyons (2017) ‘Investigation into the Transport of Waste into Queensland’ Final Report 17 November 2017—[https://www.qld.gov.au/\\_\\_data/assets/pdf\\_file/0029/68915/transport-of-waste-into-qld-final-report.pdf](https://www.qld.gov.au/__data/assets/pdf_file/0029/68915/transport-of-waste-into-qld-final-report.pdf) [last accessed 27 November, 2018]



### 5.3 Waste reduction and recycling plans

Chapter 6 of the *Waste Reduction and Recycling Act 2011* requires Queensland Government departments and local governments to develop and implement waste reduction and recycling plans. These plans are required to include waste reduction and recycling targets, actions to be taken to improve waste reduction and recycling and performance monitoring measures. Councils also have the option to develop regional plans.

In summary, for 2017–18:

- 46 of 77 local governments had waste plans accessible on the internet (see Appendix 1).
- Three regional local government plans were in place, covering the North Queensland, South West Queensland and the Wide Bay Burnett regions.
- 21 of 22 Queensland Government departments and agencies had waste plans in place, with one agency's plan under development following machinery-of-government changes at the end of 2017 (Table 5.3).

**Table 5.3: Queensland Government department waste plans in place as at 23 November 2018**

Department	Plan duration	Availability
Department of Environment and Science	2018–2024	<a href="https://des.qld.gov.au/our-department/documents/des-waste-reduction-recycling-plan-2018-24.pdf">des.qld.gov.au/our-department/documents/des-waste-reduction-recycling-plan-2018-24.pdf</a>
Department of Aboriginal and Torres Strait Islander Partnerships	2017–2020	<a href="https://datsip.qld.gov.au/resources/datsima/publications/corporate/waste-reduction-and-recycling-plan.pdf">datsip.qld.gov.au/resources/datsima/publications/corporate/waste-reduction-and-recycling-plan.pdf</a>
Department of Agriculture and Fisheries	2018–2021	<a href="https://daf.qld.gov.au/__data/assets/pdf_file/0011/1272485/daf-waste-reduction-recycling-plan-2018-21.pdf">daf.qld.gov.au/__data/assets/pdf_file/0011/1272485/daf-waste-reduction-recycling-plan-2018-21.pdf</a>
Department of Child Safety Youth and Women	2018–2021	<a href="https://communities.qld.gov.au/resources/dcsyw/about-us/right-to-information/waste-reduction-and-recycling-plan.pdf">communities.qld.gov.au/resources/dcsyw/about-us/right-to-information/waste-reduction-and-recycling-plan.pdf</a>
Department of Communities, Disability Services and Seniors	2018–2021	<a href="https://communities.qld.gov.au/resources/dcdss/about-us/organisation/publications/waste-reduction-recycling-plan.pdf">communities.qld.gov.au/resources/dcdss/about-us/organisation/publications/waste-reduction-recycling-plan.pdf</a>
Department of Education	2018–2021	<a href="https://qed.qld.gov.au/det-publications/strategiesandplans/Documents/waste-reduction-recycling-plan.pdf">qed.qld.gov.au/det-publications/strategiesandplans/Documents/waste-reduction-recycling-plan.pdf</a>
Department of Employment, Small Business and Training	2018–2024	Link not available at time of publication. Plan available direct from department.
Department of Health	2018–2020	<a href="https://health.qld.gov.au/__data/assets/pdf_file/0027/728181/waste-mgmt-plan.pdf">health.qld.gov.au/__data/assets/pdf_file/0027/728181/waste-mgmt-plan.pdf</a>
Department of Housing and Public Works	2017–2020	<a href="https://hpw.qld.gov.au/SiteCollectionDocuments/HPWWasteReductionAndRecyclingPlan2017-20.pdf">hpw.qld.gov.au/SiteCollectionDocuments/HPWWasteReductionAndRecyclingPlan2017-20.pdf</a>
Department of Innovation, Tourism Industry Development and the Commonwealth Games	2018–2021	<a href="https://ditid.qld.gov.au/__data/assets/pdf_file/0010/1272916/ditid-waste-reduction-recycling-plan-2018-21.pdf">ditid.qld.gov.au/__data/assets/pdf_file/0010/1272916/ditid-waste-reduction-recycling-plan-2018-21.pdf</a>
Department of Justice and Attorney-General	2017–2020	<a href="https://justice.qld.gov.au/__data/assets/pdf_file/0003/539022/waste-reduction-and-recycling-plan-2017-2020.pdf">justice.qld.gov.au/__data/assets/pdf_file/0003/539022/waste-reduction-and-recycling-plan-2017-2020.pdf</a>
Department of Local Government, Racing and Multicultural Affairs	2018–2021	<a href="https://dlgrma.qld.gov.au/resources/publication/strat-plan/waste-reduction-and-recycling-plan-2018-2021.pdf">dlgrma.qld.gov.au/resources/publication/strat-plan/waste-reduction-and-recycling-plan-2018-2021.pdf</a>
Department of Natural Resources, Mines and Energy	2018–2021	<a href="https://dnrme.qld.gov.au/__data/assets/pdf_file/0004/1407784/waste-reduction-plan-18-21.pdf">dnrme.qld.gov.au/__data/assets/pdf_file/0004/1407784/waste-reduction-plan-18-21.pdf</a>
Department of State Development, Manufacturing, Infrastructure, and Planning	2019–2021	<a href="https://statedevelopment.qld.gov.au/resources/publication/waste-reduction-and-recycling-plan-2019-2021.pdf">statedevelopment.qld.gov.au/resources/publication/waste-reduction-and-recycling-plan-2019-2021.pdf</a>
Department of the Premier and Cabinet	2018–2021	<a href="https://premiers.qld.gov.au/publications/categories/plans/assets/waste-reduction-recycling-plan.pdf?">premiers.qld.gov.au/publications/categories/plans/assets/waste-reduction-recycling-plan.pdf?</a>
Department of Transport and Main Roads	2016–2021	<a href="https://tmr.qld.gov.au/Community-and-environment/Environmental-management/Land/Waste-management">tmr.qld.gov.au/Community-and-environment/Environmental-management/Land/Waste-management</a>
Public Safety Business Agency, Queensland Police Service, Queensland Fire and Emergency Services	Not stated	<a href="https://www.psba.qld.gov.au/publications/Documents/WasteReductionRecyclingPlan.pdf">https://www.psba.qld.gov.au/publications/Documents/WasteReductionRecyclingPlan.pdf</a>
Public Service Commission	2018–2021	<a href="https://www.qld.gov.au/__data/assets/pdf_file/0020/56360/PSC-Waste-Reduction-and-Recycling-Plan-2018-2021.pdf">https://www.qld.gov.au/__data/assets/pdf_file/0020/56360/PSC-Waste-Reduction-and-Recycling-Plan-2018-2021.pdf</a>
Queensland Corrective Services	New plan pending	
Queensland Treasury	2018–2021	<a href="https://s3.treasury.qld.gov.au/files/QT-strategic-waste-management-plan-2018-2021.pdf">https://s3.treasury.qld.gov.au/files/QT-strategic-waste-management-plan-2018-2021.pdf</a>



## 6. How this report was compiled

Local government and private sector waste and recycling entities are required by the *Waste Reduction and Recycling Act 2011* to report to the Department of Environment and Science (DES) by 31 August each year on the wastes they have managed during the preceding financial year.

DES collects the data using surveys administered through the Queensland Waste Data System.

DES validates the data as it is submitted, checking to ensure it is correctly formatted and comparable to amounts reported in previous years. Where potential issues are identified (e.g. data entered as kilograms rather than tonnes), DES contacts the respondent, and if warranted, amends the data in the system.

When the validation process has been completed, the data is compiled for analysis. Wastes are counted at the final point of disposal or recovery in the reporting chain (to avoid double-counting for wastes that are transferred between respondents).

Wastes sent to disposal are aggregated by source stream (municipal solid waste, commercial and industrial waste, construction and demolition waste) and waste type (such as clean earthen material, contaminated soil, acid sulfate soil, asbestos, ash, red mud, other regulated waste).

Wastes sent to recovery are aggregated by material type (such as asphalt, concrete, paper, packaging glass, non-packaging plastics, ferrous metal, green waste, mineral oil, or tyres).

Recovered materials are assigned to source streams for the purpose of calculating recovery rates:

- Green waste, paper and packaging materials, and scrap metal collected by local government from households are deemed to be municipal solid waste, as are items sold via council tip shops and domestic waste recovered by alternative waste treatment.
- Concrete, asphalt, plasterboard, bricks and tiles, as well as building-related ferrous metal, non-ferrous non-packaging metal, timber, non-packaging glass and non-packaging plastic are deemed to be construction and demolition waste.
- Food waste, cotton gin trash, tyres, other rubber, drilling mud, the remaining paper and packaging materials, green waste, timber, non-packaging plastic, and non-packaging glass are deemed to be commercial and industrial waste.

The regions used in this report are broadly aligned with the Australian Bureau of Statistics SA4 regions. However, because local government areas are the fundamental building blocks for the reporting regions, this report uses local government boundaries for its regions rather than the ABS framework (where the SA4 boundaries cut through local government areas). As a result, Toowoomba Regional Council is included in the Darling Downs–Maranoa region; and Mareeba Shire Council is included in the Cairns region.

The other difference to the ABS regions is that this report uses a combined South East Queensland region. This combines elements of 12 ABS SA4 regions and largely matches the area covered by the Council of Mayors, South East Queensland (excluding Toowoomba).

## Glossary

**Alternative waste treatment** includes a range of processes that convert unsorted waste streams that would otherwise be landfilled into useful products such as compost, fuel or biogas.

**Ash** is a residue resulting from the combustion of coal and other materials. It contains silica and lime, and can be used in concrete production, organic processing and waste fixation, etc. Fly ash is collected from exhaust gases while bottom ash is collected from the bottom of boilers, etc.

**Biosolids** are organic solids derived from biological wastewater treatment processes that are in a state where they can be used as nutrients and soil conditioning agents, as a source of energy or for some other use. Sewage treatment plants are the main source of biosolids in Queensland.

**Commercial and industrial waste (C&I)** is produced by business and commerce, and includes waste from schools, restaurants, offices, retail and wholesale businesses, and manufacturing industries. In this report, it includes green waste arising from commercial activities and is a *headline waste stream*.

**Construction and demolition waste (C&D)** is non-putrescible waste arising from construction or demolition activity. It may include materials such as concrete, asphalt, bricks, treated timber and steel. It is a *headline waste stream*.

**Disposal** is the process of getting rid of wastes by landfilling or incineration without energy recovery and is the least acceptable option under the waste management and resource recovery hierarchy.

**Domestic waste** or household waste is waste resulting from the ordinary domestic use or occupation of a house, flat, apartment, unit, boarding house, hostel or guesthouse. It does not include waste discharged to a sewer. Domestic waste includes the material that householders place in their kerbside red, yellow and green bins, the waste they self-deliver to landfills and transfer stations, and council bulky item collections.

**Drilling mud** is a viscous fluid mixture used by the drilling industry to protect drill bits and to transport rock cuttings to the surface.

**E-waste** comprises waste electrical and electronic products, such as end-of-life computers, televisions, and kitchen appliances etc.

**Energy recovery** involves the conversion of waste materials into usable heat, electricity or fuel through processes such as combustion, gasification, pyrolysis and anaerobic digestion.

**Green waste** includes grass clippings, tree, bush and shrub trimmings, branches and other similar material resulting from domestic or commercial gardening, landscaping or maintenance activities. For the purposes of this report, the green waste data referred to relate to separated material delivered directly to local government facilities and organic processors, and does not include garden waste mixed with other materials in household red lid waste bins.

**Headline or general waste streams** (municipal solid waste, commercial and industrial waste, and construction and demolition waste) are wastes generated from everyday household and business activities. These wastes form the basis of state and federal waste targets and reporting. This category does not include hazardous or regulated wastes.

**Illegal dumping** is the unlawful disposal of large volumes (greater than 200 litres) of waste.

**Litter** is made up of scattered items of rubbish (less than 200 litres), such as cigarette butts, discarded food wrappers and beverage containers.

**Monofills** are landfills or long-term storage facilities that receive only one type of solid waste (such as tyres, sewage sludge or fly ash) or receive waste from a single source (such as a power station, refinery or mining operation).

**Municipal solid waste (MSW)** is a combination of domestic waste and other wastes arising from council activities (such as the management of parks and gardens, and the collection of litter and illegally dumped waste). It is a *headline waste stream*.

**Organic processing** involves the recovery of putrescible wastes through activities such as anaerobic digestion, mulching, composting or vermiculture.

**Packaging material** includes paper, cardboard, glass containers, plastic containers, aluminium containers and steel containers.

**Recycling** is the process of extracting materials found in waste and converting them into useful products. For example, concrete may be extracted from the construction and demolition waste stream and converted into recycled aggregate suitable for use in road base as a virgin material substitute.

**Recycling residuals** are the left-over materials from recovery and recycling processes that are sent to disposal.

**Recovered material** is waste that has been diverted from landfill. It includes material that has been recycled, reprocessed or stockpiled for future use.

**Recovery rate** is the proportion of a waste stream that is recovered.

**Red mud** is a caustic residual from the refining of bauxite into alumina.

**Regulated waste** includes hazardous wastes listed in Schedule 7 of the Environmental Protection Regulation 2008. This category includes asbestos, pesticides, a range of waste chemicals and chemical compounds, and other industrial wastes.

**Reprocessing** is the activity of using recovered materials from a waste stream as a substitute for raw material inputs. For example, end-of-life tyres may be used as a fuel feedstock to replace a fossil fuel.

**Tip shops** are sales outlets at waste facilities (such as local government transfer stations) for items that have been salvaged prior to landfill.

## Appendix 1: Local government waste services in 2017–18

Council	Population*	Number of red bin services	Number of yellow bin services	Number of public place recycling bins	Number of non-residential services	Number of green bin services	Number of tip shops	Waste plan published on web
<b>South-east Queensland</b>								
Brisbane City Council	1,206,607	464,767	464,767	877	1,117	90,841	2	yes
Gold Coast City Council	592,330	240,110	181,918	128	2,901	27,415	2	yes
Ipswich City Council	206,467	74,577	74,577	10	200	16,538	0	yes
Lockyer Valley Regional Council	40,189	14,951	14,951	8	604	0	8	yes
Logan City Council	319,652	111,278	109,125	40	539	0	1	yes
Moreton Bay Regional Council	448,118	153,449	153,449	245	3,195	0	2	yes
Noosa Shire Council	54,736	30,773	26,087	110	85	15,363	1	yes
Redland City Council	154,312	59,843	59,843	102	2,142	11,518	1	yes
Scenic Rim Regional Council	41,735	13,857	13,857	228	414	0	0	yes
Somerset Regional Council	25,545	9,091	1,740	6	38	0	4	yes
Sunshine Coast Regional Council	311,551	120,949	114,445	244	3,932	26,786	4	yes
<b>Darling Downs–Maranoa</b>								
Balonne Shire Council	4,391	2,110	2,110	10	100	0	0	yes
Goondiwindi Regional Council	10,785	5,205	0	0	0	0	1	yes
Maranoa Regional Council	12,843	3,825	0	0	0	0	0	shared regional
Southern Downs Regional Council	35,542	11,074	11,069	158	0	0	9	pending
Toowoomba Regional Council	166,409	59,204	59,204	422	1,649	26,410	1	yes
Western Downs Regional Council	34,575	10,553	10,553	31	1,231	0	3	no
<b>Wide Bay</b>								
Bundaberg Regional Council	94,858	39,743	39,743	52	3,491	0	10	yes
Cherbourg Aboriginal Shire Council	1,314	280	280	2	16	0	0	no
Fraser Coast Regional Council	103,998	43,061	42,926	68	2,228	0	11	pending
Gympie Regional Council	51,013	21,037	21,037	43	818	0	4	yes
North Burnett Regional Council	10,632	3,152	0	6	0	0	6	no
South Burnett Regional Council	32,707	13,751	0	1	0	0	1	yes

Council	Population*	Number of red bin services	Number of yellow bin services	Number of public place recycling bins	Number of non-residential services	Number of green bin services	Number of tip shops	Waste plan published on web
<b>Fitzroy</b>								
Banana Shire Council	14,521	4,109	0	2	0	0	1	yes
Central Highlands Regional Council	28,684	9,752	9,727	39	1,630	0	1	yes
Gladstone Regional Council	63,052	25,173	25,173	304	1,510	0	2	no
Livingstone Shire Council	37,393	12,511	12,455	52	432	0	1	yes
Rockhampton Regional Council	81,446	30,179	30,179	45	2,254	0	3	yes
Woorabinda Aboriginal Shire Council	994	350	0	0	0	0	0	no
<b>Mackay</b>								
Isaac Regional Council	21,199	7,895	7,900	32	462	0	9	yes
Mackay Regional Council	117,064	49,965	49,965	105	880	0	1	yes
Whitsunday Regional Council	34,831	13,189	11,037	4	0	0	0	yes
<b>Townsville</b>								
Burdekin Shire Council	17,215	7,097	7,097	67	402	4,903	3	yes
Charters Towers Regional Council	11,949	4,059	0	0	0	0	0	yes
Hinchinbrook Shire Council	10,900	5,581	5,581	40	0	0	1	yes
Palm Island Aboriginal Shire Council	2,634	506	0	0	0	0	0	no
Townsville City Council	193,601	80,073	78,015	124	668	0	2	yes
<b>Cairns</b>								
Cairns Regional Council	164,536	71,754	63,515	9	160	0	1	yes
Cassowary Coast Regional Council	29,680	13,059	0	0	0	0	5	yes
Douglas Shire Council	12,186	7,401	7,401	30	543	0	3	yes
Mareeba Shire Council	22,311	6,769	0	0	0	0	0	yes
Tablelands Regional Council	25,425	12,500	12,500	8	140	0	1	no
Yarrabah Aboriginal Shire Council	2,801	460	0	0	0	0	0	no

Council	Population*	Number of red bin services	Number of yellow bin services	Number of public place recycling bins	Number of non-residential services	Number of green bin services	Number of tip shops	Waste plan published on web
<b>Remote Queensland</b>								
Aurukun Shire Council	1,343	350	0	0	0	0	0	no
Barcaldine Regional Council	2,853	1,269	0	0	0	0	0	no
Barcoo Shire Council	272	130	0	0	0	0	0	no
Blackall-Tambo Regional Council	1,889	640	0	0	0	0	0	no
Boulia Shire Council	431	151	0	0	0	0	0	yes
Bulloo Shire Council	350	100	0	0	0	0	0	shared regional plan
Burke Shire Council	347	120	0	0	0	0	0	yes
Carpentaria Shire Council	2,004	769	0	0	0	0	0	no
Cloncurry Shire Council	3,123	1,064	0	0	0	0	0	no
Cook Shire Council	4,461	1,199	0	10	0	0	0	pending
Croydon Shire Council	294	89	0	0	0	0	0	no
Diamantina Shire Council	288	122	0	0	0	0	2	no
Doomadgee Aboriginal Shire Council	1,492	288	0	0	0	0	0	no
Etheridge Shire Council	821	145	0	0	0	0	0	no
Flinders Shire Council	1,521	534	0	0	0	0	1	yes
Hope Vale Aboriginal Shire Council	990	273	0	0	0	0	0	no
Kowanyama Aboriginal Shire Council	984	280	0	0	0	0	0	no
Lockhart River Aboriginal Shire Council	769	180	0	0	0	180	0	no
Longreach Regional Council	3,598	1,400	0	0	0	0	0	no



Council	Population*	Number of red bin services	Number of yellow bin services	Number of public place recycling bins	Number of non-residential services	Number of green bin services	Number of tip shops	Waste plan published on web
Mapoon Aboriginal Shire Council	326	110	0	0	0	0	0	no
McKinlay Shire Council	790	287	0	0	0	0	0	no
Mornington Shire Council	1,203	550	0	0	0	0	0	no
Mount Isa City Council	18,899	6,598	0	0	0	0	0	yes
Murweh Shire Council	4,309	1,809	0	0	0	0	0	shared regional plan
Napranum Aboriginal Shire Council	1,028	300	0	0	0	0	0	no
Northern Peninsula Area Regional Council	3,008	970	0	0	0	0	0	no
Paroo Shire Council	1,665	545	0	0	0	0	0	shared regional plan
Pompuraaw Aboriginal Shire Council	807	225	0	1	0	0	0	no
Quilpie Shire Council	821	386	0	0	0	0	0	shared regional plan
Richmond Shire Council	794	309	0	0	0	0	0	yes
Torres Shire Council	3,798	679	0	0	0	0	0	no
Torres Strait Island Regional Council	4,871	1,193	0	0	0	0	0	no
Winton Shire Council	1,144	435	0	0	0	0	0	yes
Wujal Wujal Aboriginal Shire Council	300	103	0	0	0	0	0	

\* ABS 3218.0 Regional Population Growth, Australia (24 April 2018), Table 3. Estimated Resident Population, Local Government Areas, Queensland