

Local Government Data Collection 2002- 2003  
Waste Management Services – August 2004



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## EXECUTIVE SUMMARY

### Total Waste

- Kerbside services collected 1.65 M tonnes in Victoria in the 2002-2003 financial year (7,000 tonnes less than in the 2001-02 financial year)
- The total kerbside collection expenditure by local government was nearly \$179 M

### Kerbside services summary, Victoria 2002-03

	<i>Garbage</i>	<i>Recyclables</i>	<i>Green</i>		<i>Total</i>
			<i>Organics</i>	<i>Hard Waste</i>	
Annual service cost	\$100,053,644	\$54,567,405	\$17,969,593	\$5,920,607	\$178,511,249
Tonnes collected	1,056,690.9	397,141.2	140,044.6	54,515.4	1,648,392.1
Total households serviced	1,956,248	1,881,046	1,504,527	1,414,712	—
Cost per tonne	\$94.69	\$137.40	\$126.79	\$108.60	\$108.29
Cost per household	\$51.15	\$29.01	\$12.17	\$4.19	—
Household yield (kg)	540.2	211.1	96.0	38.5	—

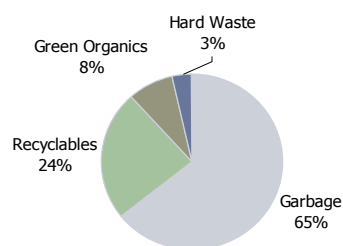
### Regional waste management group diversion rate by tonnes<sup>1</sup>, Victoria 2002-03

<i>Regional Waste Management Group</i>	<i>Diversion rate (%)</i>
Leastwaste	44.6
Barwon	43.1
South Western	39.0
South Eastern	38.4
Northern	38.3
Mornington Peninsula	27.3
Highlands	26.1
Central Murray	26.0
Western	25.3
Desert Fringe	23.7
Gippsland	22.2
North Eastern	21.8
Calder	19.8
Goulburn Valley	18.2
Mildura	17.2
Grampians	11.9
<i>State average</i>	<i>33.7</i>

<sup>1</sup>Includes garbage, recyclables and green organics for all local governments

- The Statewide average recyclables and green organics diversion rate by tonnes was 33.7%, up from 28.0% in 2000-01
- Garbage accounted for 65% or 1.06 M tonnes

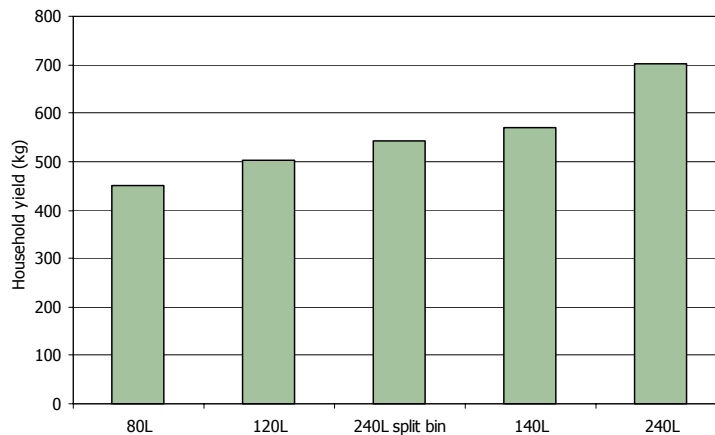
Composition of waste processed through kerbside services, Victoria 2002-03



## Garbage

- Tonnes collected has decreased by 4.8% over the past year
- Average of 540 kg per household per year (580 kg 2001-02), a decrease of 40 kg per household or 6.9%
- Average cost of \$51 per household per year to provide service
- Local governments using smaller garbage bins generated less waste and had greater diversion rates than those using larger bins

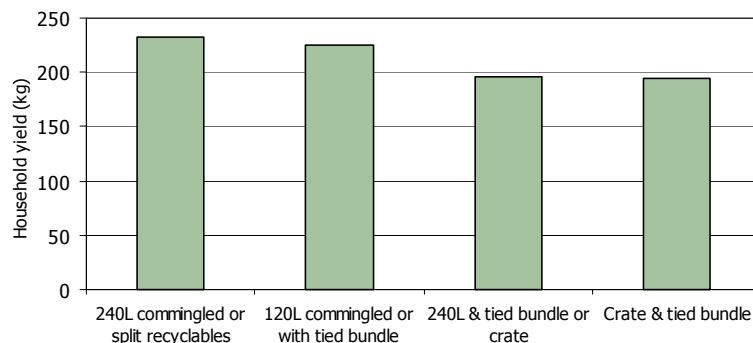
**Garbage, yields by collection system, Victoria 2002-03**



## Recyclables

- 397,000 tonnes of recyclables were collected from kerbside services, up 37,000 tonnes or 10.3% from last year
- Average of 211 kg per household per year (197 kg 2001-02) an increase of 14 kg or 7.5%
- The majority of local governments (38%) used a crate for containers and tied bundle for paper
- 240L commingled or split recyclables mobile bins delivered the greatest yield per household and a higher diversion rate compared to a crate and tied bundle
- Average service cost of \$29 per household per year, up from \$28 in 2001-02
- The average contamination rate for recyclables was 6.3%
- By weight of recyclable material collected (exc. green organics) from kerbside collections, paper/cardboard accounted for 55%, miscellaneous containers (glass/steel and aluminium cans) 31% and plastic containers 8%

**Recyclables, yields by collection system, Victoria 2002-03**



## Green Organics

- 40 out of 79 local governments provided a green organics collection service, of which 23 had fortnightly or monthly collections as their predominant service
- 140,000 tonnes of green organics were collected from kerbside services (8% of total kerbside waste stream)
- On average, 96 kg of green organics collected per household per year, costing \$12 per household
- Fortnightly services were the most common service, yielding 165 kg per household for fortnightly compulsory services, the highest of all collection systems

**Kerbside services provided by number of local governments,  
Victoria 2002-03**

<i>Kerbside service</i>	<i>Metro (no.)</i>	<i>Non-Metro (no.)</i>	<i>Total (no.)</i>	<i>Total as a proportion of local governments (%)</i>
Garbage	31	48	79	100
Recyclables	31	46	77	97
Green Organics	29	11	40	51
Hard Waste	28	12	40	51
Commercial & Industrial Recyclables	3	0	3	4
Street Sweeping	31	42	73	92
Litter Service	31	38	69	87

## Hard Waste

- 40 out of 79 local governments provided a hard waste collection service
- Over 54,500 tonnes collected and 45,000 tonnes disposed to landfill, representing a 17% diversion rate
- On average, 39 kg of hard waste collected per household per year, costing \$4 per household

## Environmental Benefits from Kerbside Services

The environmental savings for kerbside recycling are equivalent to:

- Filling 1,671 Olympic sized swimming pools (8,360 megalitres of water)
- Taking 48,200 cars off the road (290,000 tonnes of greenhouse gases)

The environmental benefits for kerbside green organics were savings of:

- 110 megalitres of water
- 43,240 tonnes of greenhouse gases

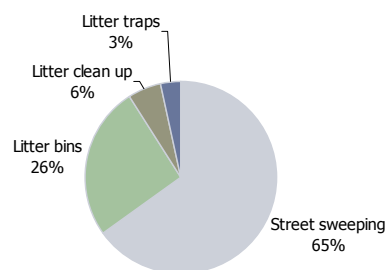
## Commercial and Industrial Kerbside Services

- Only three local governments provided a separate commercial and industrial kerbside recyclables service to 6,400 properties
- A further 69,050 commercial and industrial properties were serviced within the domestic garbage service and 30,250 within the domestic recyclables service

## Street Sweeping and Litter Services

- Littering costs local government nearly \$51 million, covering street sweeping, maintaining litter bins and traps and litter clean up (such as dumped rubbish)
- 705 penalty infringement notices were issued in 2002-03, an increase from 514 in 2001-02

Cost of litter services, Victoria 2002-03



## Landfills and Transfer Stations

- The number of local government owned landfills, both licensed and unlicensed, have decreased while the number of transfer stations have increased since 2001-02
- 151 landfills operated during 2002-03, 52 of which were licensed
- 207 transfer stations operated during the same period, an increase of 13 since 2001-02
- \$48 M was spent on operating the landfills and transfer stations
- 183,500 tonnes of resources recovered at landfills and transfer stations
- Green organics accounted for around 50% of all materials recovered at landfills and transfer stations

### Items recovered by source of recovery, Victoria 2002-03

Item recovered	Source of Item			Total
	Kerbside	Landfill	Transfer Stations	
Plastic	31,277.3	189.9	696.1	32,163.4
Other Containers <sup>1</sup>	123,514.6	1,043.3	4,167.8	128,725.7
Paper	217,360.5	1,119.8	8,642.1	227,122.4
Green Organics	140,044.6	19,862.9	64,356.1	224,263.6
<b>Total</b>	<b>512,197.0</b>	<b>22,215.9</b>	<b>77,862.1</b>	<b>612,275.0</b>

<sup>1</sup>Includes aluminium cans, steel cans and glass bottles

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## **INTRODUCTION**

In October 2003 EcoRecycle Victoria commenced the survey on the waste management and recycling services provided by Victorian local governments over the 2002-2003 financial year, as part of the annual *Local Government Data Collection 2002-2003* program.

This is the third in the series of surveys undertaken for Victoria and builds on previous surveys to enable the performance of local government waste management services to be evaluated.

The data plays a vital role in the formulation of policy directions for waste management services throughout the state as well as providing a measure of Victoria's progress towards the delivery of efficient and sustainable kerbside services.

EcoRecycle gratefully acknowledges the co-operation of Victorian local governments, Regional Waste Management Groups and the Municipal Association of Victoria in achieving a 100% response rate to the survey (79 local governments). Information was also gathered from three Alpine Resorts<sup>1</sup> from the North Eastern Regional Waste Management Group, namely Falls Creek, Mount Hotham and Mount Buller. However, figures relating to the Alpine Resorts only appear in Section 7 of the report (see Appendix A Methodology).

The data collection extended to the following service areas:

- Household garbage collection and disposal
- Household recyclables collection and sorting
- Household green organics collection and processing
- Household hard waste collection, recycling and disposal
- Commercial and industrial sector recyclables collection and sorting
- Street sweeping
- Litter bin and litter trap collection and disposal
- Litter clean up services
- Landfill and transfer station operating details and resource recovery

The data collected has been organised in this report under a number of broad section headings:

### **1. Household Waste Generation**

This section focuses on the total generation of waste by Victorian households that is collected through kerbside services.

### **2. Local Government Household Kerbside Services**

Kerbside services provided through local government for the collection of household garbage, recyclables, green organics and hard waste is covered more specifically in this section.

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<sup>1</sup> For the purpose of waste reporting, EPA legislation considers Alpine Resorts as municipalities.

As well as providing an overview of the services, the section draws on the data collected and analyses the *efficiency* of these services in relation to costs, yields and access as well as to container type and service frequency.

This year, questions in the survey relating to green organics were expanded to detail the type of service provided, particularly in relation to compulsory versus user pays systems. This was done in order to provide a more accurate and useful analysis of these services in Victoria, which is evolving rapidly.

### **3. Environmental Benefits from Kerbside Recycling**

Applying the findings of *The Independent Assessment of Kerbside Recycling in Australia*<sup>2</sup> and the *Life Cycle Assessment for Paper and Packaging Waste Management Scenarios in Victoria*<sup>3</sup> to the collected data, this section looks at the environmental benefits gained from kerbside recycling and green organics in Victoria during 2002-03.

### **4. Commercial and Industrial Kerbside Services**

The focus of this section is the range of kerbside collections provided by local government to commerce and industry.

### **5. Street Sweeping and Litter Services**

The cost of litter and street sweeping services is covered in this section. Litter services include collecting waste from litter bins and litter traps, as well as further detail on litter clean up services. For the first time, the number of public place recycling bins and Waste Wise Events held have been recorded.

### **6. Landfills and Transfer Stations**

This section deals with the number and operating details of local government owned and operated landfills (licensed and unlicensed) and transfer stations. Also included are the type and quantities of items recovered for recycling.

### **7. Alpine Resorts**

Waste services provided by Alpine Resorts are summarised in this section, including: kerbside services, street sweeping, litter services and landfills and transfer stations.

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<sup>2</sup> National Packaging Covenant Council *The Independent Assessment of Kerbside Recycling in Australia*, January 2001

<sup>3</sup> Grant T, James KL, Lundie S, Sonneveld K (2001) *Stage 2 Report for Life Cycle Assessment for Paper and Packaging Waste Management Scenarios in Victoria*, Centre for Design at RMIT, Melbourne.

EcoRecycle has sought to verify information provided in data collection returns through rigorous follow-up with individual local governments. However, EcoRecycle is not in a position to validate underlying data in the report. Findings in this report are therefore subject to the accuracy of data provided by individual local governments.

As more data becomes available through future annual data collections, comparisons of individual local governments and Regional Waste Management Groups' performances over time as well as with other areas of the state will be possible. This will provide an important tool to assist the Victorian Government and Regional Waste Management Groups to assess the impact of waste minimisation and recycling initiatives across the state.

Together the data will play a vital role in the formulation of future policy directions for waste management services throughout the state as well as Victoria's progress towards the delivery of efficient and sustainable waste management services.

## 1. HOUSEHOLD WASTE GENERATION

The focus of this section is on the generation of waste by Victorian households.

Household waste generation is closely linked to Victorian household consumption patterns. It is a clear measure of the state's progress towards the sustainable use of resources.

It is important to note that the *Local Government Data Collection* focuses on measuring wastes collected through kerbside services when analysing household waste generation. It does not include quantities at drop-off facilities or wastes removed by private contractors outside the local government kerbside system. Information relating to drop-off facilities is contained in Section 6 Landfills and Transfer Stations.

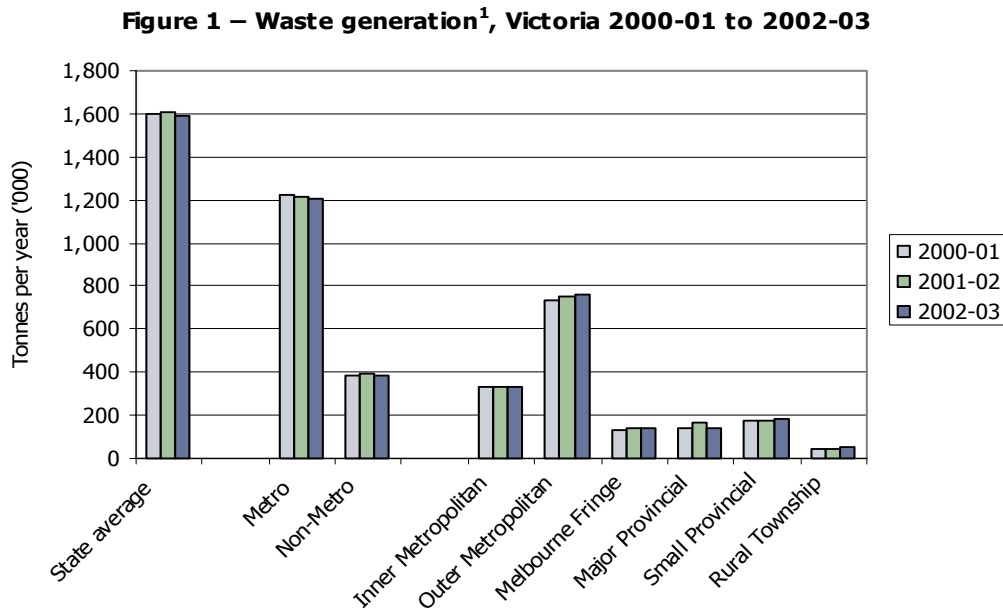
The data collected revealed that Victorians generated 1.65 million tonnes of solid waste through kerbside collection services in 2002-03.

Key findings include:

### Total Waste Generated

Victorians generated 1,648,392 tonnes of solid waste through kerbside collection services in 2002-03. This represents a decrease of 0.4% from the 1,655,415 tonnes generated in 2001-02, but it is still an overall increase of 2.9% since 2000-01. This figure encompasses the garbage, recyclables, green organics and hard waste services.

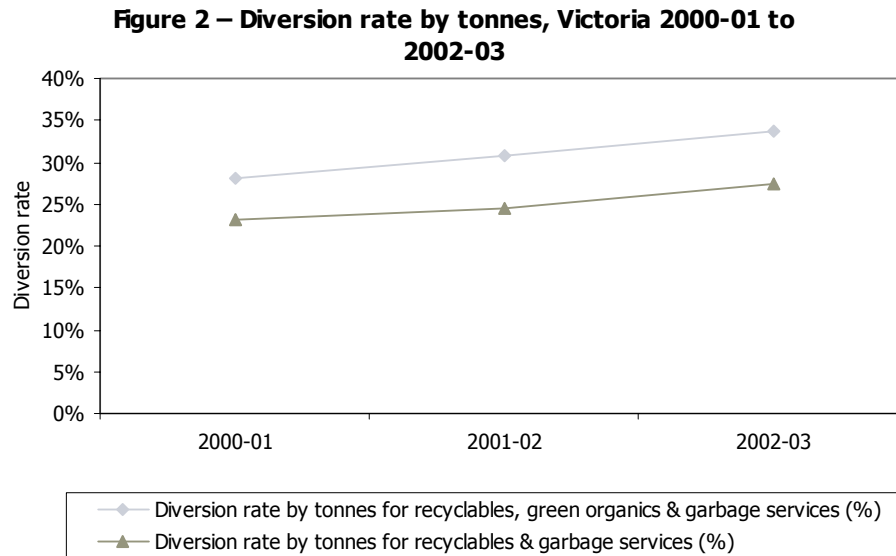
Even with hard waste services excluded, the total waste generated still amounted to 1.6 million tonnes (see Figure 1).



<sup>1</sup>Waste generation includes garbage, recyclables and green organics but excludes hard waste

Definitions of the six service provision categories used in Figure 1 are provided in Appendix B and a list of all local governments, classified by service provision, Regional Waste Management Group and metro/non-metro classification, are located in Appendix C.

The diversion rate by tonnes collected over time can be seen in Figure 2. Diversion rate is calculated by tonnes of recyclables and green organics divided by tonnes of recyclables, green organics and garbage collected OR tonnes of recyclables collected divided by tonnes of recyclables and garbage collected.

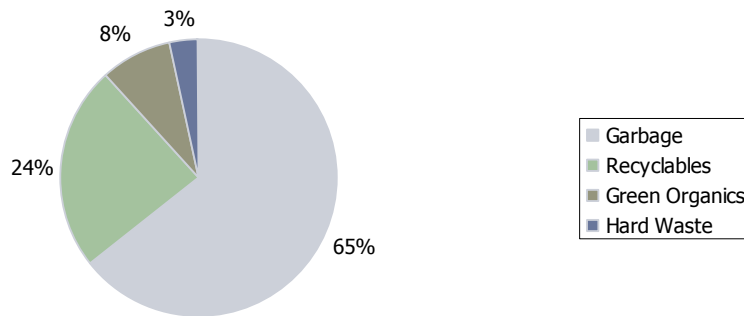


Diversion rates of both scenarios have steadily increased over the last three years. Diversion including green organics has risen from 28.0% in 2000-01, to 33.7% in 2002-03, while diversion including only recyclables and garbage has risen from 23.1% to 27.3% over the same period.

### Composition

Of the total amount of waste generated, garbage accounted for 65% of the total, with recyclables, green organics and hard waste making up the remainder (see Figure 3).

**Figure 3 – Composition of waste processed through kerbside services, Victoria 2002-03**



This is a decrease in the proportion of garbage, down from 70% in 2000-01 and 67% in 2001-02.

**Waste generated per geographic sector: quantity**

In terms of quantity, outer metropolitan local governments generated most of Victoria's total waste stream and accounted for 758,000 tonnes or 48% of the total (Figure 1).

**Waste diversion rates per region**

Table 1 and Figure 4 displays the performance of the Regional Waste Management Groups (RWMG), based on diversion rate by tonnes for recyclables, green organics and garbage. All local governments were included, regardless of how many kerbside services they provided.

Previous regional waste diversion rates were based on a per household formula and did not include green organics.

More detailed information on total waste generation and diversion rate on a per household level for garbage, recyclables *and* green organic collections for each local government is available in Appendix D.

**Table 1 – Regional waste management group diversion rate by tonnes<sup>1</sup>, Victoria 2002-03**

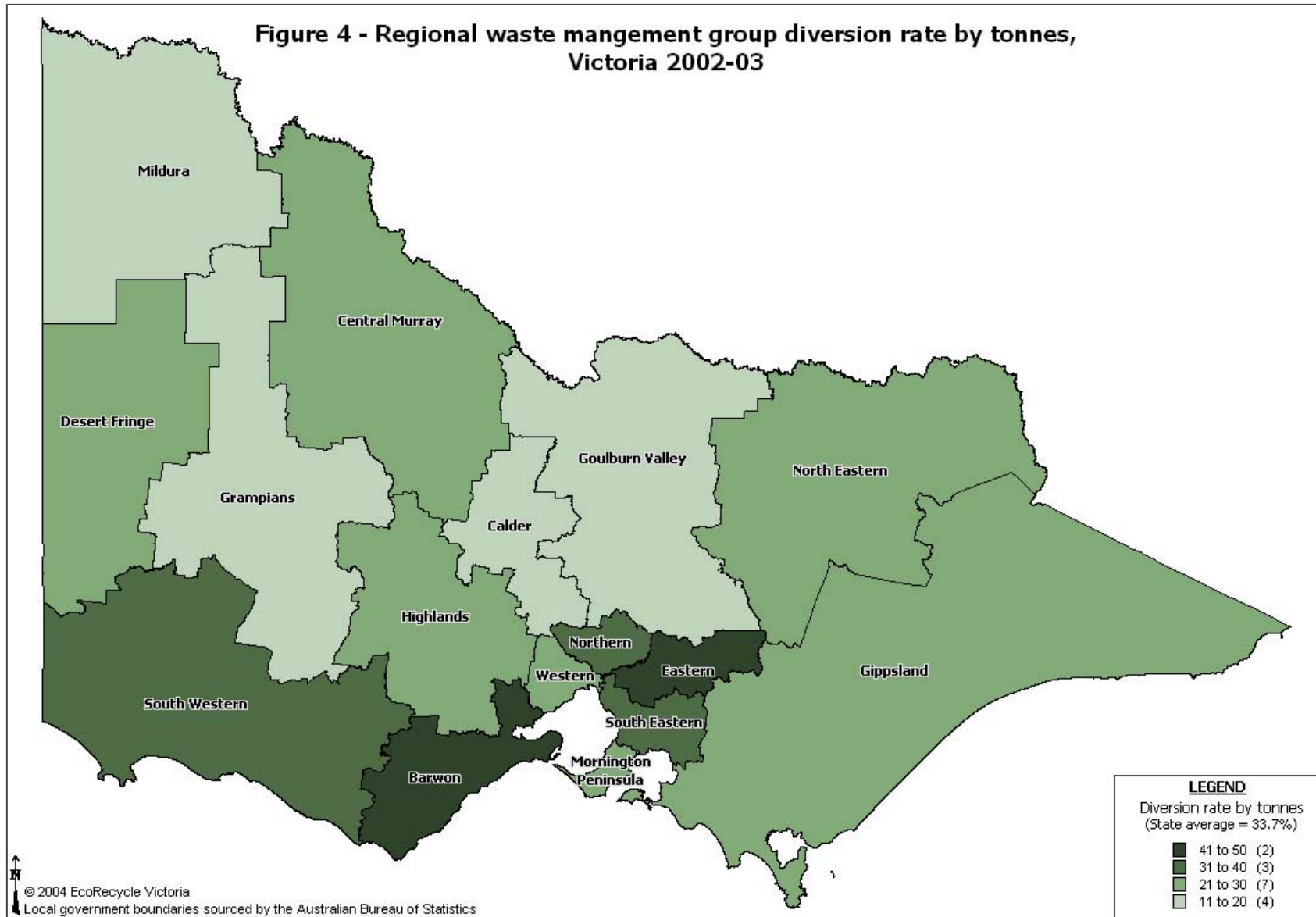
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Gippsland	22.2
North Eastern	21.8
Calder	19.8
Goulburn Valley	18.2
Mildura	17.2
Grampians	11.9
<i>State average</i>	<i>33.7</i>

<sup>1</sup>Includes garbage, recyclables and green organics for all local governments

Leastwaste had the highest diversion rate of all regions at 44.6%, well above the State average of 33.7%. Grampians had the lowest diversion rate at 11.9%.

The following map illustrates the diversion rate for each of the 16 regions (Figure 4).

**Figure 4 - Regional waste management group diversion rate by tonnes, Victoria 2002-03**



## **2. LOCAL GOVERNMENT HOUSEHOLD KERBSIDE SERVICES**

Part two of this report provides an analysis of local government kerbside collection services. It is divided into five sections: a general overview, garbage services, recyclables services, green organic services and hard waste services.

The focus of each section, drawing from the data provided by local government, is on the *efficiency* of these services. The key efficiency considerations are:

- *service costs* expressed both on a per household and per tonne basis
- *yields* or quantities collected
- *access* to kerbside services

### **2.1 Overview**

This section of the report provides an overview of the kerbside collection services provided by Victorian local governments as well as some comparisons with last year's data where appropriate.

It is important to note that the data does not include waste disposed at drop-off facilities or by private contractors outside the local government system.

The amount spent by Victorian local governments on these services is considerable, amounting to over \$178.5 million (see Table 2), and representing 4.4% of total local government expenditure in Victoria in 2002-03<sup>4</sup>, which is a stable proportion of expenditure since 2001-02. This equates to an increase from \$169.8 million in 2001-02.

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<sup>4</sup> Estimates from the Municipal Association of Victoria.

**Table 2 – Kerbside services summary, Victoria 2002-03<sup>1</sup>**

	<i>Garbage</i>	<i>Recyclables</i>	<i>Green Organics</i>	<i>Hard Waste</i>	<i>Total</i>
<b>Metro</b>					
Annual service cost	\$71,198,990	\$38,937,555	\$15,780,904	\$5,487,897	\$131,405,347
Tonnes collected	769,823.9	313,067.8	123,226.6	48,888.8	1,255,007.1
Total households serviced <sup>2</sup>	1,438,268	1,396,635	1,308,212	1,307,277	—
Cost per tonne	\$92.49	\$124.37	\$126.33	\$112.25	\$104.70
Cost per household	\$49.50	\$27.88	\$12.33	\$4.20	—
Household yield (kg)	535.2	224.2	97.6	37.4	—
<b>Non Metro</b>					
Annual service cost	\$28,854,654	\$15,629,850	\$2,188,688	\$432,710	\$47,105,902
Tonnes collected	286,867.0	84,073.5	16,818.0	5,626.6	393,385.0
Total households serviced <sup>2</sup>	517,980	484,411	196,315	107,435	—
Cost per tonne	\$100.59	\$185.91	\$130.14	\$76.90	\$119.75
Cost per household	\$55.71	\$32.27	\$11.15	\$4.03	—
Household yield (kg)	553.8	173.6	85.7	52.4	—
<b>Total</b>					
Annual service cost	\$100,053,644	\$54,567,405	\$17,969,593	\$5,920,607	\$178,511,249
Tonnes collected	1,056,690.9	397,141.2	140,044.6	54,515.4	1,648,392.1
Total households serviced <sup>2</sup>	1,956,248	1,881,046	1,504,527	1,414,712	—
Cost per tonne	\$94.69	\$137.40	\$126.79	\$108.60	\$108.29
Cost per household	\$51.15	\$29.01	\$12.17	\$4.19	—
Household yield (kg)	540.2	211.1	96.0	38.5	—

<sup>1</sup>Averages exclude services where the local government did not provide full figures for tonnage collected or cost of service

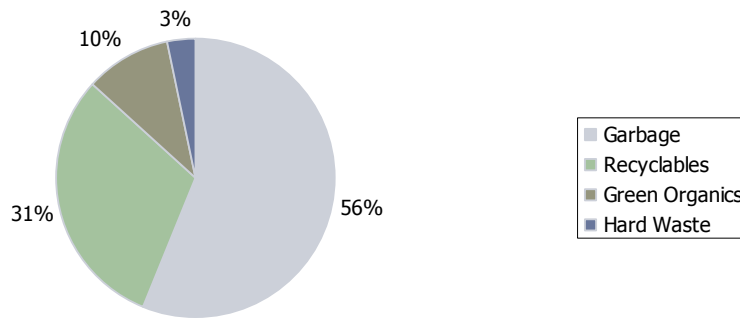
<sup>2</sup>Total households serviced may also include commercial and industrial properties

Key findings include:

### Overall cost of kerbside collection services

Of the \$178.5 million spent by Victorian local governments on kerbside collection services for garbage, recyclables, green organics and hard waste during 2002-03, 87% was for garbage and recyclables services (see Figure 5).

**Figure 5 – Proportion of total kerbside service cost by type of service, Victoria 2002-03**



Expenditure this year increased by \$8.7M from 2001-02, representing a 5% increase.

**Geographic comparison**

The household yield for garbage was 18.6 kg per year higher in non-metro local governments. Conversely, the recyclables yield was 50.6 kg per year higher in metro.

The costs of garbage and recyclables services were respectively higher by \$6.20 and \$4.40 per household in non-metro local governments (see Table 2).

**Overall access to kerbside collection services**

Victorian household access to kerbside collection services is high, with 97% of households having access to kerbside garbage collections and 95% access to recyclables collections (see Table 3<sup>5</sup>).

**Table 3 – Kerbside services by proportion of households receiving service, Victoria 2002-03**

<i>Kerbside service</i>	<i>Metro (%)</i>	<i>Non-Metro (%)</i>	<i>Total (%)</i>
Garbage	99.5	89.9	96.8
Recyclables	98.8	85.1	94.9
Green Organics	93.8	35.4	77.2
Hard Waste	93.7	19.4	72.6

Access to recyclables services has increased by 3% since 2001-02.

While Table 3 shows access to services at the household level, Table 4 presents the *number of local governments* providing each service.

<sup>5</sup> Some anomalies exist in the data due to the variations in the household populations reported in the survey. It is likely that some of the survey data contains commercial premises within the residential household figure.

**Table 4 – Kerbside services provided by number of local governments, Victoria  
2002-03**

<i>Kerbside service</i>	<i>Metro (no.)</i>	<i>Non-Metro (no.)</i>	<i>Total (no.)</i>	<i>Total as a proportion of local governments (%)</i>
Garbage	31	48	79	100
Recyclables	31	46	77	97
Green Organics	29	11	40	51
Hard Waste	28	12	40	51
Commercial & Industrial Recyclables	3	0	3	4
Street Sweeping	31	42	73	92
Litter Service	31	38	69	87

There are now 79 local governments as one local government area was split into two in 2002-03 (both had a garbage and recyclables service).

All Victorian local governments provide a kerbside garbage service, with 98% providing a recyclables service. A further local government also implemented a new kerbside recyclables service in 2002-03. Drop-off facilities are generally established to assist where services are not provided.

Although only half of the local governments provide a green organics or hard waste service, most are concentrated in populated areas (eg metro), so around three quarters of Victorian households have access to such services.

An additional local government reported a separate commercial and industrial recyclables service, taking it to three local governments.

## 2.2 Garbage Services

This section of the report analyses local government kerbside services for the collection of garbage.

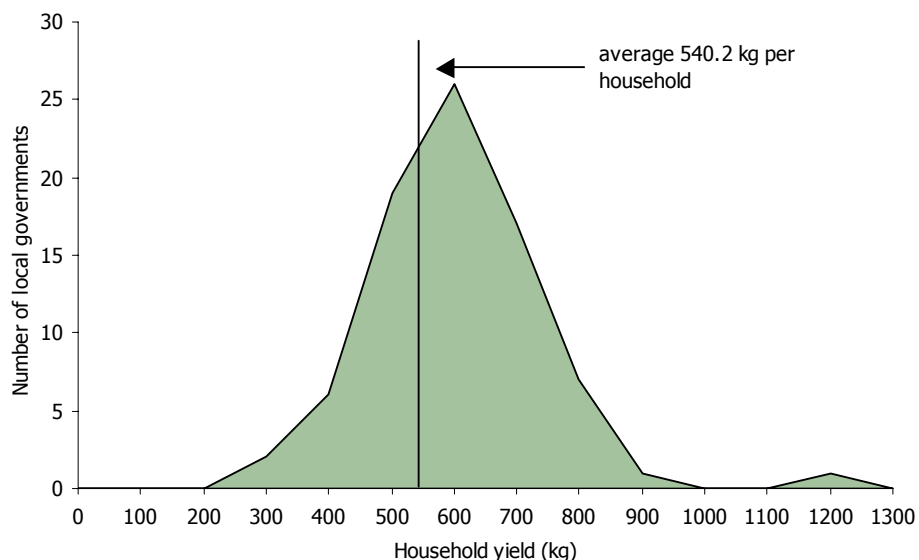
### Access

All 79 local governments have a kerbside garbage collection service, covering 97% of Victorian households (see Tables 3 and 4).

### Yields

Victorians generated an average of 540.2 kg (580.4 kg in 2001-02) of garbage per household per year, but this varied between local governments (see Figure 6).

**Figure 6 – Garbage, household yield across local governments, Victoria 2002-03**



### Geographic comparison

There is a 13% difference between metro and non-metro local governments in average cost per household with non-metro households paying \$6.21 more for the provision of a kerbside garbage service. Non-metro local governments also generated on average about 3% more garbage than metro local governments per household per year (see Table 2).

Costs per tonne and yield per household varied between local government service provision categories (see Table 5).

**Table 5 – Garbage services by service provision category, Victoria 2001-02 to 2002-03**

	<i>Inner Metropolitan</i>	<i>Outer Metropolitan</i>	<i>Melbourne Fringe</i>	<i>Major Provincial</i>	<i>Small Provincial</i>	<i>Rural Township</i>	<i>Total</i>
<b>2002-03</b>							
Annual service cost	\$21,209,223	\$40,494,061	\$10,843,158	\$8,869,993	\$14,807,961	\$3,829,248	\$100,053,644
Tonnes collected	229,474.0	459,809.7	92,041.2	97,719.0	140,612.0	37,035.0	1,056,690.9
Total households serviced <sup>1</sup>	440,580	829,868	187,536	183,965	249,246	65,053	1,956,248
Cost per tonne	\$92.43	\$88.07	\$117.81	\$90.77	\$105.31	\$103.40	\$94.69
Cost per household	\$48.14	\$48.80	\$57.82	\$48.22	\$59.41	\$58.86	\$51.15
Household yield (kg)	520.8	554.1	490.8	531.2	564.1	569.3	540.2
<b>2001-02</b>							
Annual service cost	\$21,212,979	\$40,718,160	\$9,386,455	\$9,835,845	\$12,510,751	\$4,188,737	\$97,852,927
Tonnes collected	236,353	475,605	102,969.0	126,289	136,949.0	31,703	1,109,867.9
Total households serviced <sup>1</sup>	433,748	807,339	183,196	191,245	241,385	55,194	1,912,107
Cost per tonne	\$89.75	\$85.61	\$91.16	\$77.88	\$91.35	\$132.12	\$88.17
Cost per household	\$48.91	\$50.44	\$51.24	\$51.43	\$51.83	\$75.89	\$51.18
Household yield (kg)	544.9	589.1	562.1	660.3	567.3	574.4	580.4
<b>Per cent change (%)</b>							
Annual service cost	0.0%	-0.6%	15.5%	-9.8%	18.4%	-8.6%	2.2%
Tonnes collected	-2.9%	-3.3%	-10.6%	-22.6%	2.7%	16.8%	-4.8%
Total households serviced	1.6%	2.8%	2.4%	-3.8%	3.3%	17.9%	2.3%
Cost per tonne	3.0%	2.9%	29.2%	16.5%	15.3%	-21.7%	7.4%
Cost per household	-1.6%	-3.3%	12.8%	-6.3%	14.6%	-22.4%	-0.1%
Household yield (kg)	-4.4%	-5.9%	-12.7%	-19.6%	-0.6%	-0.9%	-6.9%

<sup>1</sup>Total households serviced may also include commercial and industrial properties

Melbourne fringe recorded the lowest yield of 490.8 kg but also the highest cost per tonne of \$117.81. The overall cost per household has remained constant at \$51, while the yield has decreased 40 kg and the cost per tonne has increased 7% to over \$94.

The cost per household varied by \$11.27 between the highest and lowest values reported. Inner Melbourne had the lowest cost of \$48.14 compared to small provincial, which was paying 23.4% more per household for a garbage service at \$59.41.

### Collection system

The 120L garbage bin was by far the most common collection system, being the predominant bin in 40 (or half) of the local governments (see Table 6). This is an increase from 37 local governments in 2001-02 who had 120L bins.

**Table 6 – Garbage collection system<sup>1</sup> by service provision categories, Victoria 2002-03**

<i>Service Provision Category</i>	<i>80L</i>	<i>120L</i>	<i>240L split bin<sup>2</sup></i>	<i>140L</i>	<i>240L</i>	<i>Number of local governments</i>
Inner Metropolitan	3	5	—	—	2	10
Outer Metropolitan	1	11	1	3	1	17
Melbourne Fringe	—	3	1	2	—	6
Major Provincial	—	1	—	2	2	5
Small Provincial	3	10	2	4	6	25
Rural Township	—	10	—	4	2	16
<i>Number of local governments</i>	<i>7</i>	<i>40</i>	<i>4</i>	<i>15</i>	<i>13</i>	<i>79</i>

<sup>1</sup>Refers to the predominant bin type used by the local government (see glossary for definition of predominant bin)

<sup>2</sup>The 240L split bin refers to split Garbage & Green Organics or Garbage & Recyclables bins

The 120L bins were the most predominant in all service provision categories except in major provincial areas, where the predominant collection systems were equally 140L and 240L bins. The largest garbage bin (240L) is still used by 13 local governments,

representing 16% of all local governments, which is a decrease from 20 local governments in 2001-02. This illustrates the constant shift to downsizing of bins. Bags are no longer used as the predominant collection system by any Victorian local government.

Table 7 shows how yields and costs are affected by the size of the garbage collection system employed.

**Table 7 – Garbage collection system<sup>1</sup> by costs and yields, Victoria 2002-03**

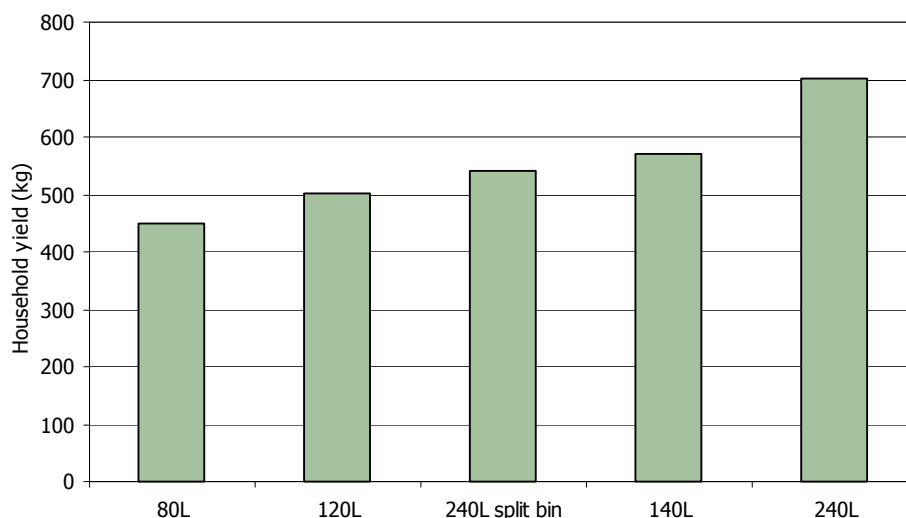
<i>Garbage collection system</i>	<i>Number of local governments</i>	<i>Cost per tonne</i>	<i>Cost per household</i>	<i>Household yield (kg)</i>
80L	7	\$124.25	\$55.94	450.2
120L	40	\$94.07	\$47.27	502.5
240L split bin	4	\$88.44	\$47.88	541.4
140L	15	\$106.58	\$60.70	569.6
240L	13	\$75.71	\$53.08	701.0
<i>State average</i>	<i>79</i>	<i>\$94.69</i>	<i>\$51.15</i>	<i>540.2</i>

<sup>1</sup>Refers to the predominant bin type used by the local government

Smaller bins such as the 80L bin, produced on average 450 kg per household per year compared to the 240L with 701 kg per household. This represents 56% more garbage produced per household per year by using the 240L bin compared to the 80L bin. There is a clear correlation between yield and bin size, with yield consistently increasing, the larger the bin size (See Figure 7).

However, the costs per household and per tonne vary between bin systems.

**Figure 7 – Garbage, yields by collection system<sup>1</sup>, Victoria 2002-03**



<sup>1</sup> Refers to the predominant bin type used by the local government

## 2.3 Recyclables Services

This section of the report analyses local government kerbside services for the collection of containers and paper/cardboard.

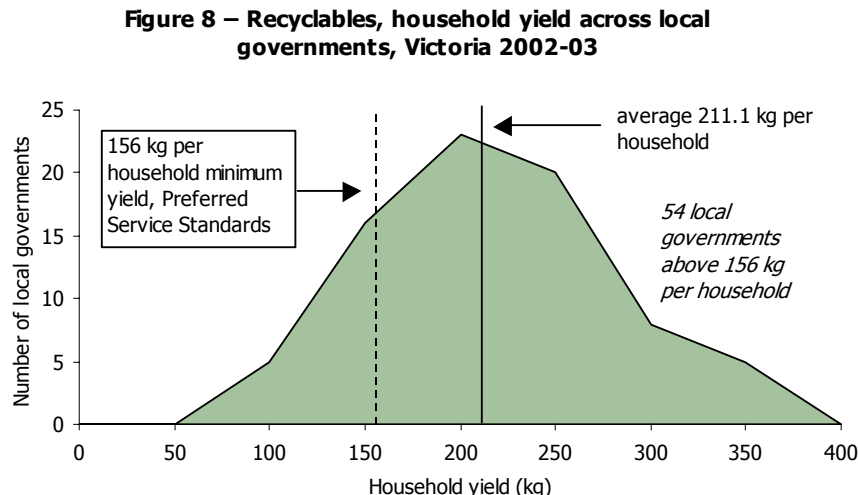
### 2.3.1 Costs, yields, access to services and geographic comparison

#### Access

Seventy-seven local governments run a kerbside recyclables service, providing access to 95% of Victorian households (see Table 3).

#### Yields

An average of 211.1 kg of recyclables were collected per household per year (see Figure 8).



This is higher than the 156 kg average minimum efficiency measure established in the *Guide to Preferred Standards for Kerbside Recycling in Victoria* (2000). This is an increase from the yield in 2001-02, which was 196.5 kg per household.

However, it should be noted that the yield of recyclables varied significantly around this average, from a low of 57 kg to a high of 341 kg per household per year (see Figure 8).

On average, households in non-metro local governments generated 20% less recyclables or 51 kg less per household per year than in metro municipalities (see Table 2).

#### Geographic comparison

The cost per tonne was higher in non-metro areas. It cost \$61.50 more per tonne in the non-metro areas and the average non-metro yields (174 kg per household per year) were 29% lower than those of metro areas (224 kg per household per year). These figures point to the greater challenges of delivering efficient and high-yielding recycling services

in rural areas, given the greater transport distances between households and end-markets.

Patterns also emerged in the analysis of recyclables costs and yields by service provision category (see Table 8).

**Table 8 – Recyclables services by service provision category, Victoria 2001-02 to 2002-03**

	<i>Inner Metropolitan</i>	<i>Outer Metropolitan</i>	<i>Melbourne Fringe</i>	<i>Major Provincial</i>	<i>Small Provincial</i>	<i>Rural Township</i>	<i>Total</i>
<b>2002-03</b>							
Annual service cost	\$11,952,273	\$23,541,748	\$4,260,557	\$4,873,970	\$7,940,106	\$1,998,751	\$54,567,405
Tonnes collected	84,834.9	194,545.1	38,566.1	34,071.0	36,506.2	8,618.0	397,141.2
Total households serviced <sup>1</sup>	433,241	799,928	182,929	177,404	233,813	53,731	1,881,046
Cost per tonne	\$140.89	\$121.01	\$110.47	\$143.05	\$217.50	\$231.93	\$137.40
Cost per household	\$27.59	\$29.43	\$23.29	\$27.47	\$33.96	\$37.20	\$29.01
Household yield (kg)	195.8	243.2	210.8	192.1	156.1	160.4	211.1
<b>2001-02</b>							
Annual service cost	\$10,422,155	\$23,052,205	\$6,286,245	\$3,900,339	\$6,822,014	\$1,481,579	\$51,964,537
Tonnes collected	75,950.2	174,927.5	33,760.3	34,053.9	33,922.0	7,457.6	360,071.5
Total households serviced <sup>1</sup>	424,720	781,885	177,256	180,177	224,642	44,172	1,832,852
Cost per tonne	\$137.22	\$131.78	\$186.20	\$114.53	\$201.11	\$198.67	\$144.32
Cost per household	\$24.54	\$29.48	\$35.46	\$21.65	\$30.37	\$33.54	\$28.35
Household yield (kg)	178.8	223.7	190.5	189.0	145.1	168.8	196.5
<b>Per cent change (%)</b>							
Annual service cost	14.7%	2.1%	-32.2%	25.0%	16.4%	34.9%	5.0%
Tonnes collected	11.7%	11.2%	14.2%	0.1%	7.6%	15.6%	10.3%
Total households serviced	2.0%	2.3%	3.2%	-1.5%	4.1%	21.6%	2.6%
Cost per tonne	2.7%	-8.2%	-40.7%	24.9%	8.2%	16.7%	-4.8%
Cost per household	12.4%	-0.2%	-34.3%	26.9%	11.8%	10.9%	2.3%
Household yield (kg)	9.5%	8.7%	10.7%	1.6%	7.6%	-5.0%	7.5%

<sup>1</sup>Total households serviced may also include commercial and industrial properties

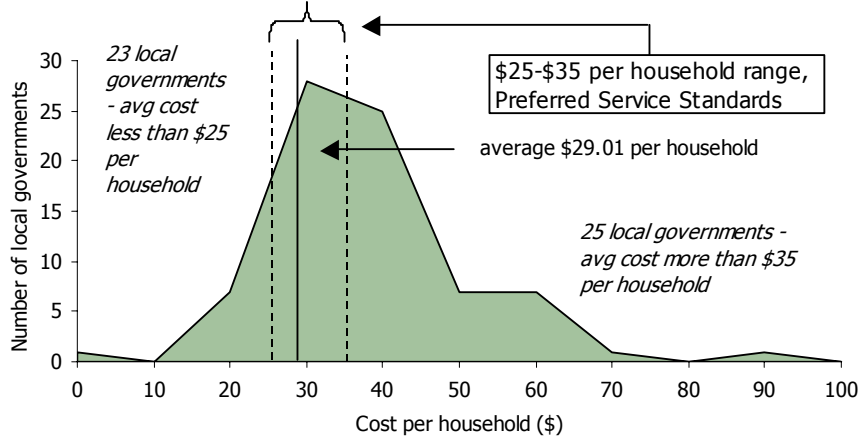
Outer metropolitan local governments delivered the highest average recyclable material yields of all service provision categories with 243 kg per household per year compared against the State average of 211 kg.

As well as geographic factors, costs in non-metro local governments were adversely affected by relatively low yields achieved in some cases. In addition to this, it is also important to acknowledge the lower household coverage of collection services for recycling in small provincial and rural township areas. Despite the relatively low household coverage, it should be noted that there has been expansion of recycling services in some of these areas over the last five years. Between the 2001-02 and 2002-03 surveys, one additional local government began a recycling service. The relative infancy of more recent services may allow scope for further cost efficiencies and yield improvements.

### Costs

Figure 9 displays the average household cost of \$29 per year, which falls within the \$25 - \$35 range established in the *Guide to Preferred Standards for Kerbside Recycling in Victoria* (2000).

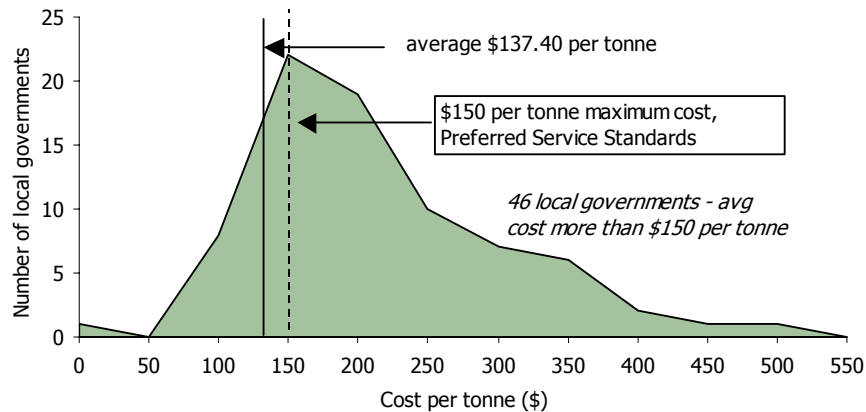
**Figure 9 – Recyclables, cost per household across local governments, Victoria 2002-03**



However, the high number (25) of local governments above this range, point towards the continuing challenge of containing the costs of delivering optimum kerbside recycling services in some areas (mainly in non-metro areas).

The average cost per tonne of \$137.40 is under the maximum \$150 per tonne established in the *Guide to Preferred Standards for Kerbside Recycling in Victoria* (2000) (see Figure 10).

**Figure 10 – Recyclables, cost per tonne across local governments, Victoria 2002-03**



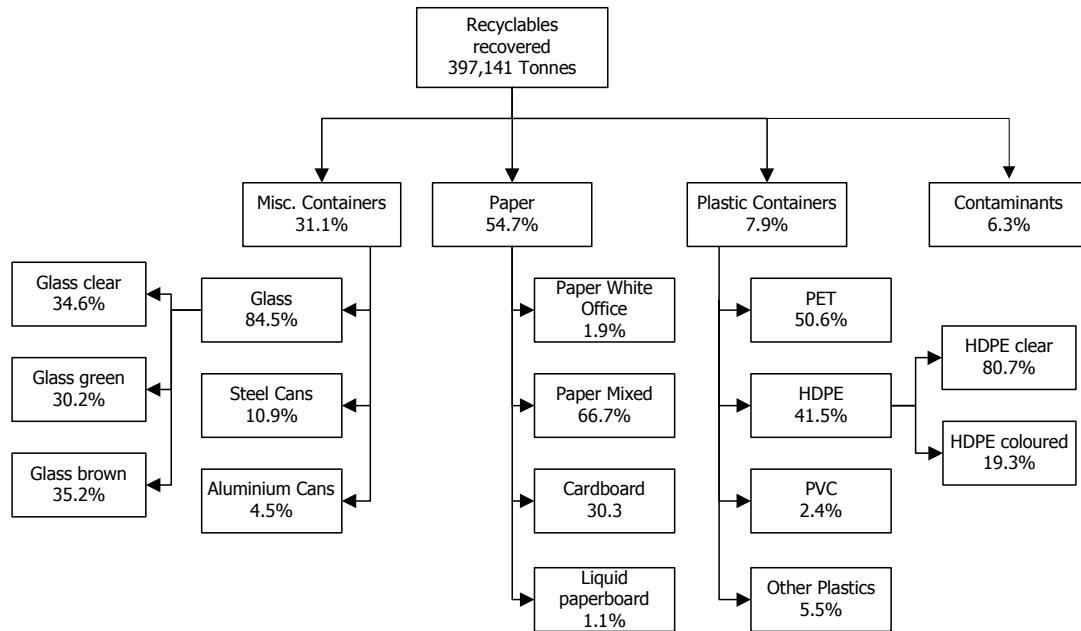
However, 46 local governments were above this average cost, indicating underlying issues relating to the continuing challenge of containing the costs, particularly in the non-metro areas of Victoria.

### 2.3.2 Materials collected and contamination

#### Materials collected

Paper items accounted for nearly 55% by weight of recyclables collected by kerbside services (see Figure 11).

**Figure 11 – Recyclables by type of items collected, Victoria 2002-03<sup>6</sup>**



The second highest category was miscellaneous containers with 31%. Of this category, glass accounted for the vast majority at 85%, which equates to 26% of the entire recyclables stream. Plastic containers, due to their light weight by volume, only made up 8%. In Victoria, most local governments with a recyclable service collected PET and HDPE plastic containers (Code numbers 1 and 2), with 60% collecting PVC (Code number 3) and only a quarter collecting other types of plastic, which was quite often PP (Code number 5). However, the quantity of other plastics collected is double that of PVC.

#### Contamination

Only 52 local governments with a recyclables collection service provided data on contamination rates, with contamination levels averaging 6.3% of quantities collected (contaminants divided by total amount collected). This is a very similar level to 2001-02, when it was 6.5%

Provided below are new figures in relation to contamination rates found for various collection systems (see Table 9). Previously known contamination rates for different collection systems were from a report published in 2000, and there has been a large drop in contamination rates since that time.

<sup>6</sup> Based on returns from local governments comprising 67 detailed responses for plastic containers, 67 for miscellaneous containers, 70 for paper products and 52 for contaminants.

**Table 9 – Recyclables, average contamination rates by collection system<sup>1</sup>, Victoria 2002-03**

<i>Collection system</i>	<i>Average contamination rate</i>
240L & tied bundle or crate	10.1%
240L commingled or split recyclables	10.1%
120L commingled or with tied bundle	8.0%
Other systems <sup>2</sup>	6.9%
2 Crate or commingled crate system	2.2%
Crate & tied bundle	2.2%
<i>State average</i>	<i>6.3%</i>

<sup>1</sup>Refers to the predominant bin type used by the local government

<sup>2</sup>Other systems includes split Garbage & Recyclables bins, monthly collections and bags

Bin based systems recorded contamination rates of between 13% and 22% in the past, while crates and bags had a low rate of 4%. The contamination rates have improved considerably and now sit around 8-10% for bins (regardless of whether they are used in conjunction with a crate or tied bundle for paper) while a crate based system averages a 2% contamination rate.

Community education may have assisted in improving the contamination rates over time, especially for the newer bin based systems.

### 2.3.3 Container type and service frequency

There are 15 different combinations of container systems and service frequencies used by Victorian local governments.

The predominant system was crate and tied bundle, provided weekly or fortnightly by 29 local governments (38%), followed closely by 26 local governments with a 240L commingled or split recyclables system (see Table 10).

**Table 10 – Recyclables, average yields and costs by collection system<sup>1</sup>, Victoria 2002-03**

	<i>Number of local governments</i>	<i>Cost per tonne</i>	<i>Cost per household</i>	<i>Household yield (kg)</i>
240L commingled or split recyclables	26	\$145.69	\$33.84	232.3
120L commingled or with tied bundle	7	\$163.84	\$36.94	225.5
240L & tied bundle or crate	4	\$166.27	\$32.51	195.5
Crate & tied bundle	29	\$137.33	\$26.70	194.5
2 Crate or commingled crate system	4	\$108.04	\$23.56	218.0
Other systems <sup>2</sup>	7	\$60.94	\$11.34	186.1
<i>State average</i>	<i>77</i>	<i>\$137.40</i>	<i>\$29.01</i>	<i>211.1</i>

<sup>1</sup>Refers to the predominant bin type used by the local government

<sup>2</sup>Other systems includes split Garbage & Recyclables bins, monthly collections and bags

### Container type

An analysis of the data revealed that container type has an impact on yields and costs.

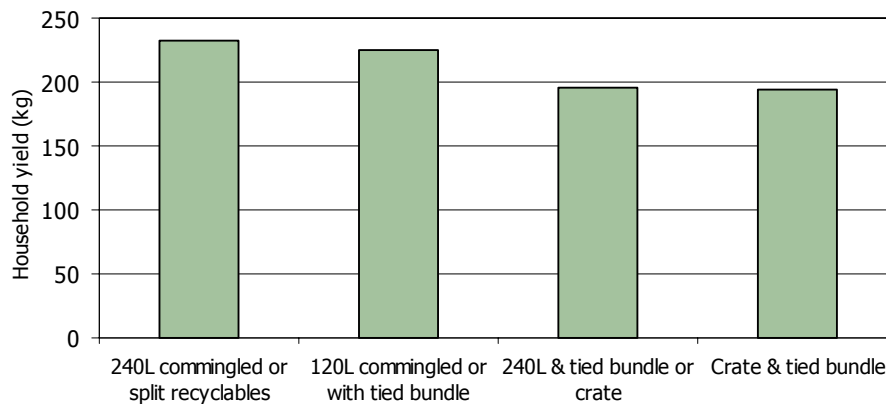
A 240L commingled or split recyclables collection delivered the greatest yield at 232.3 kg per household. The cost of providing the 240L split or commingled system to a household is \$7.14 higher than the crate and tied bundle system. The most common

system used, being the crate and tied bundle serviced mainly on a weekly basis, delivered one of the lowest yields of 194.5 kg per household while the 240L yielded 232.3 kg (19% more) recyclables per household per year. However, the corresponding costs per tonne and household were lower for a crate and tied bundle than that shown for bin based systems.

Yields and costs for collection systems represented by small numbers of local governments should be treated with caution (i.e. those less than seven local governments).

Figure 12 below illustrates yields and costs for the most common system types employed across Victoria.

**Figure 12 – Recyclables, yields by collection system, Victoria 2002-03**



As the above Figure shows, yields are higher for bin based systems, while Table 10 shows that the costs are lower for crate based systems.

EcoRecycle emphasises that other factors such as population density, length of time a system has been employed, education programs and distances to sorting facilities and end markets can have significant impacts on yields and costs, so container systems should not be judged in isolation from the context of other variables.

**Correlation between garbage and recyclables container size and diversion**

The data shows a strong correlation between smaller garbage bin size and higher diversion rates<sup>7</sup> of recyclables (see Table 11).

<sup>7</sup> Diversion is calculated as: quantity recyclables / (quantity recyclables + garbage). It does not factor in green organics diversion due to the irregular pattern of these services across Victorian local governments in 2002-03.

**Table 11 – Correlation between garbage and recyclables collection system<sup>1</sup> and household diversion rate, Victoria 2002-03**

<i>Recyclables collection system</i>	<i>Garbage collection system</i>					<i>Average diversion rate</i>
	<i>80L</i>	<i>120L</i>	<i>240L split bin</i>	<i>140L</i>	<i>240L</i>	
	<i>Diversion rate (%)</i>					
240L commingled or split recyclables	—	33	—	24	25	31
120L commingled or with tied bundle	34	41	—	32	—	35
240L & tied bundle or crate	22	30	23	24	—	27
Crate & tied bundle	30	28	—	24	18	25
2 Crate or commingled crate system	36	31	—	—	23	29
Other systems <sup>2</sup>	—	27	26	26	10	25
<i>Average diversion rate</i>	<i>33</i>	<i>31</i>	<i>26</i>	<i>26</i>	<i>20</i>	<i>28</i>

<sup>1</sup>Refers to the predominant collection system used by the local government

<sup>2</sup>Other systems includes split Garbage & Recyclables bins, monthly collections and bags

Using smaller garbage bins increases the proportion of recyclables in local government collections, resulting in more efficient kerbside resource recovery.

It can be seen that an 80L garbage bin gives the highest average diversion rate compared to other garbage bins, with 33% diversion.

The 120L commingled recyclables or with tied bundle for paper gives the highest average diversion rate of 35%. This may be a consequence of some of these systems being weekly collections. This diversion rate is closely followed by the 240L commingled or split recyclables bin with 31%, the same pattern as in 2001-02.

The most common combination is a 120L garbage bin coupled with a 240L commingled or split recyclables system (see Table 12). Eighteen local governments have this combination, resulting in a 33% diversion rate.

**Table 12 – Garbage and recyclables collection system configurations<sup>1</sup> by number of local governments, Victoria 2002-03**

<i>Recyclables collection system</i>	<i>Garbage collection system</i>					<i>Total</i>
	<i>80L</i>	<i>120L</i>	<i>240L split bin</i>	<i>140L</i>	<i>240L</i>	
	<i>Number of local governments</i>					
240L commingled or split recyclables	—	18	—	5	3	26
120L commingled or with tied bundle	2	4	—	1	—	7
240L & tied bundle or crate	1	1	1	1	—	4
Crate & tied bundle	3	13	—	6	7	29
2 Crate or commingled crate system	1	2	—	—	1	4
Other systems <sup>2</sup>	—	1	3	1	2	7
<i>Number of local governments</i>	<i>7</i>	<i>39</i>	<i>4</i>	<i>14</i>	<i>13</i>	<i>77</i>

<sup>1</sup>Refers to the predominant collection system used by the local government

<sup>2</sup>Other systems includes split Garbage & Recyclables bins, monthly collections and bags

The highest diversion rate of 41%, combining a 120L garbage bin with a 120L commingled or with tied bundle for recyclables, is a system used by four local governments.

Diversion rates for systems utilised by a small number of local governments should be read with caution.

## 2.4 Green Organics Services

This section of the report looks at green organics kerbside collection services provided by Victorian local governments.

To better represent the various green organics services, greater detail was sought during 2002-03 including whether the service was compulsory (provided to all households in serviced areas) or user pays (optional). Information on the number of households with access and how many households participated in the service, was also collected.

### Access

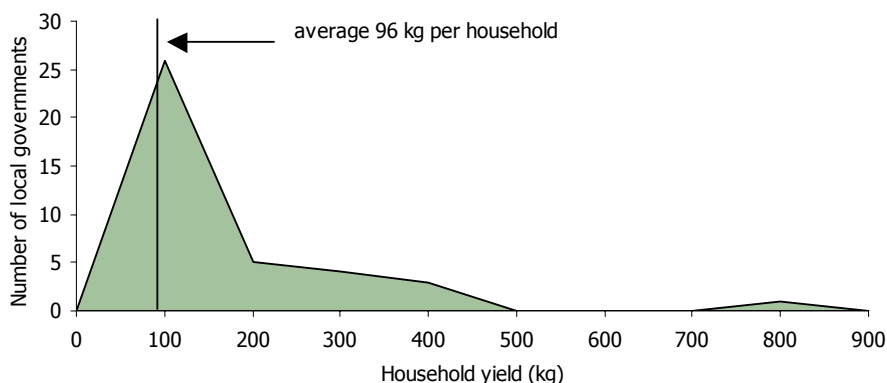
Seventy-seven per cent of Victorian households in 40 municipalities had access to green organics kerbside collection services<sup>8</sup> (see Tables 3 and 4), an increase of two local governments since 2001-02.

As the analysis of *total households serviced* has changed to the number of households with *access*, this variable is not compared between years. Previously, *total households serviced* was sometimes reported as how many households participated or on-call services were made.

### Yields

In 2002-03, the average yield was 96 kg of green organics collected per household per year (see Figure 13).

**Figure 13 – Green organics, household yield across local governments, Victoria 2002-03**



The cost and tonnes collected for the green organics service across service provision areas is summarised in Table 13.

<sup>8</sup> All data on green waste drop-off facilities is contained in Section 6. Landfills and Transfer Stations.

**Table 13 – Green organics by service provision category, Victoria 2001-02 to 2002-03<sup>1</sup>**

	<i>Inner Metropolitan</i>	<i>Outer Metropolitan</i>	<i>Melbourne Fringe</i>	<i>Major Provincial</i>	<i>Small Provincial</i>	<i>Rural Township</i>	<i>Total</i>
<b>2002-03</b>							
Annual service cost	\$3,223,565	\$11,812,425	\$744,914	\$1,241,900	\$796,788	\$150,000	\$17,969,593
Tonnes collected	14,369.6	103,763.0	5,094.0	9,424.0	3,958.0	3,436.0	140,044.6
Total households serviced	424,873	726,040	157,299	127,322	60,637	8,356	1,504,527
Cost per tonne	\$221.37	\$112.19	\$146.23	\$131.78	\$201.31	\$43.66	\$126.79
Cost per household	\$7.49	\$17.10	\$4.74	\$9.75	\$13.14	\$17.95	\$12.17
Household yield (kg)	33.8	152.4	32.4	74.0	65.3	411.2	96.0
<b>2001-02</b>							
Annual service cost	\$2,835,340	\$10,048,841	\$497,131	\$247,280	\$680,260	\$118,450	\$14,427,302
Tonnes collected	19,044	103,641	2,677	2,082	2,601	2,085	132,130
<b>Per cent change (%)</b>							
Annual service cost	13.7%	17.6%	49.8%	402.2%	17.1%	26.6%	24.6%
Tonnes collected	-24.5%	0.1%	90.3%	352.6%	52.2%	64.8%	6.0%

<sup>1</sup>Averages exclude services where the local government did not provide full figures for tonnage collected or cost of service

In 2002-03, 140,045 tonnes of green organics were collected, which equates to a 6% increase in total tonnes since 2001-02 (132,130 tonnes).

### Costs

The cost of providing this service amounts to nearly \$18 million a year, or an average cost of over \$12 per household per year, an increase in overall cost by \$3.5 million since 2001-02. Nearly all figures of cost and tonnes collected by service provision have increased, some markedly, from the 2001-02 figures. These figures should be read with caution, given the significant variability in the data provided by different local governments, as can be seen when comparing service provision categories.

The major increase in figures for major provincial are largely due to the introduction of a compulsory green organics service in a single local government.

### Frequency

Twenty-three local governments provided a fortnightly or monthly green organics collection service as their predominant service (see Table 14).

**Table 14 – Green organics collection by frequency of service, Victoria 2002-03**

<i>Predominant frequency of service<sup>1</sup></i>	<i>Inner Metropolitan</i>	<i>Outer Metropolitan</i>	<i>Melbourne Fringe</i>	<i>Major Provincial</i>	<i>Small Provincial</i>	<i>Rural Township</i>	<i>Total</i>
Annual	1	—	—	—	1	—	2
Bi-annual	3	2	—	—	—	—	5
Monthly	1	—	—	—	1	1	3
Monthly (User Pays)	—	1	—	—	—	—	1
Fortnightly	2	6	1	1	—	1	11
Fortnightly (User Pays)	2	4	—	1	1	—	8
Weekly	—	—	—	—	1	—	1
On Call	1	1	1	—	—	—	3
On Call (User Pays)	—	1	1	1	1	—	4
Other	—	—	1	—	1	—	2
<b>Total</b>	<b>10</b>	<b>15</b>	<b>4</b>	<b>3</b>	<b>6</b>	<b>2</b>	<b>40</b>

<sup>1</sup>Refers to the predominant frequency of service used by the local government

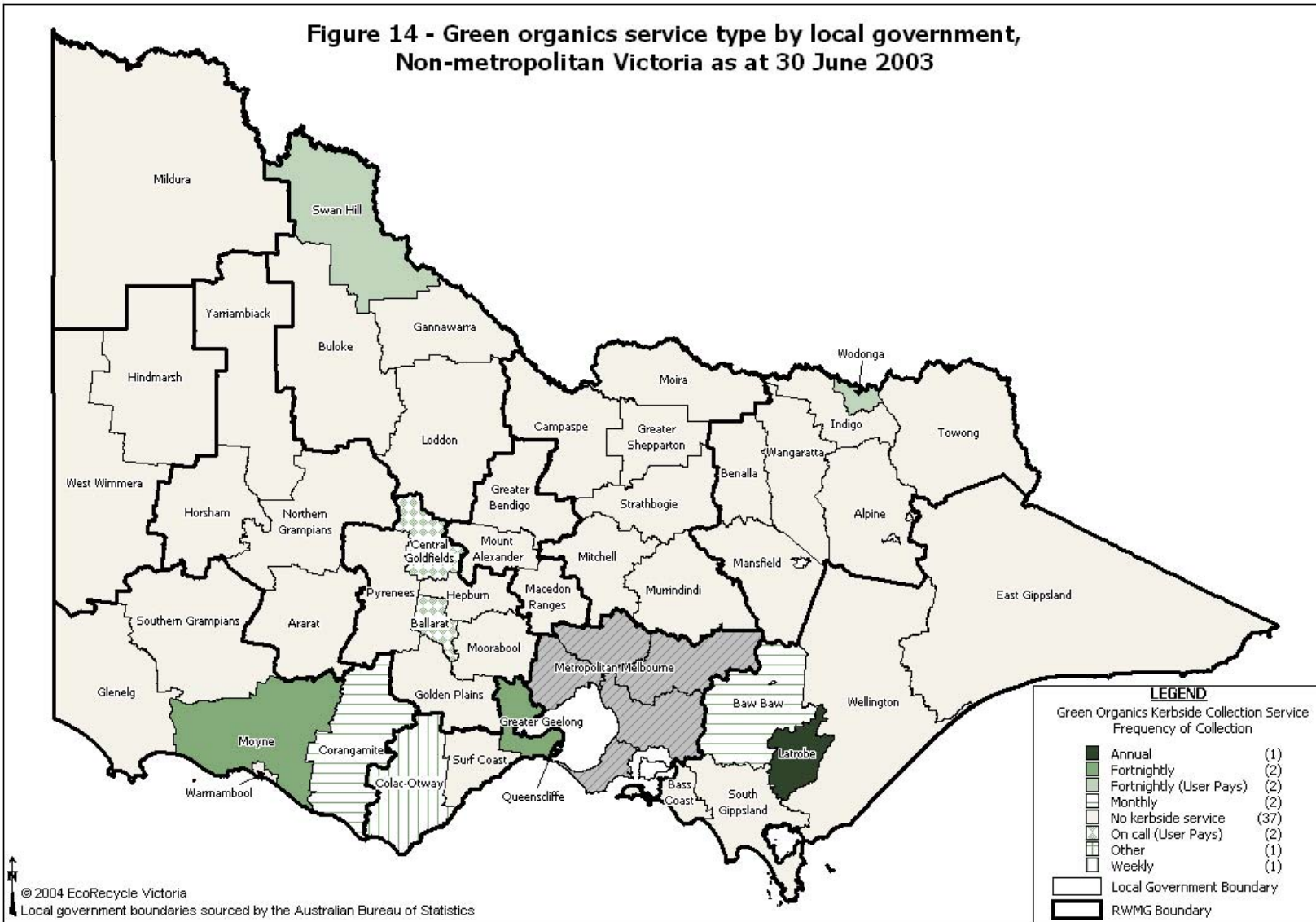
There has been an increase from 19 to 23 local governments that provide a frequent service since 2001-02 (defined as monthly or fortnightly). An additional local

government provided a fortnightly (user pays) service, but it is not their predominant service.

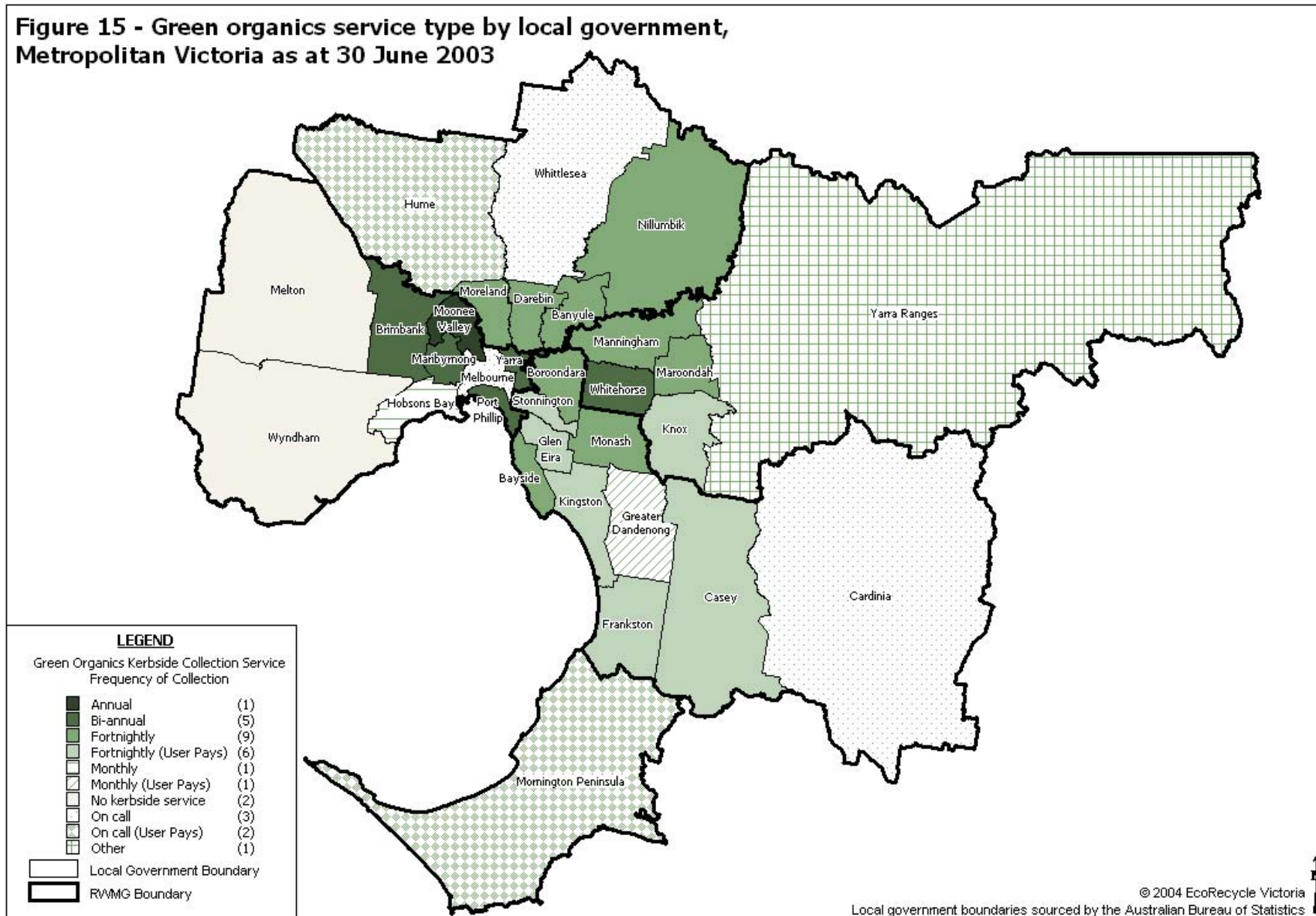
Inner and outer metropolitan service areas (which account for 35% of local governments) provided 63% of the green organic collection services, and mainly used a fortnightly collection frequency.

The following maps display the type of green organics service for each local government (see Figures 14 and 15).

**Figure 14 - Green organics service type by local government,  
Non-metropolitan Victoria as at 30 June 2003**



**Figure 15 - Green organics service type by local government, Metropolitan Victoria as at 30 June 2003**



The maps demonstrate common green organics systems in different areas. For instance, in the metro areas, the fortnightly user pays services are mainly within the South East region, while the compulsory fortnightly services are congregated within the Northern region.

As can be seen in Table 15, costs and yields per household vary with the frequency of service.

**Table 15 – Green organics, average costs and yields by collection system, Victoria 2002-03**

<i>Collection system</i>	<i>Number of local governments<sup>1</sup></i>	<i>Cost per tonne</i>	<i>Cost per household</i>	<i>Household yield (kg)</i>	<i>Cost per optional service</i>	<i>Household yield per optional service (kg)</i>	<i>Cost per on-call service</i>	<i>Yield per on-call service (kg)</i>
Annual	3	\$288.80	\$2.63	9.1	—	—	—	—
Bi-annual	6	\$146.79	\$2.68	18.2	—	—	—	—
Monthly	3	\$348.44	\$11.95	34.3	—	—	—	—
Monthly (User Pays)	1	—	\$3.78	—	\$94.59	—	—	—
Fortnightly	12	\$120.69	\$19.94	165.2	—	—	—	—
Fortnightly (User Pays)	9	\$120.30	\$10.71	89.0	\$33.38	277.5	—	—
On Call	6	\$190.98	\$2.28	11.9	—	—	\$17.83	93.4
On Call (User Pays)	4	\$77.84	\$3.28	42.2	—	—	\$8.58	110.2

<sup>1</sup>Local governments that had more than one frequency of collection are listed here as separate services

For regular collections (i.e. not on-call), the more frequent the service, the higher the household yield. The cost per household tends to rise in the same manner. Annual collections cost \$2.63 and yielded only 9.1 kg per household per year while compulsory fortnightly collections cost \$19.94 and yielded 165.2 kg per household.

On-call service yields and costs per household were similar to the annual and bi-annual collections. The similarity in performance measures between on-call and either annual or bi-annual services is not surprising as the number of on-call services allowed per household is normally limited to one or two per year.

User pays services were only offered on a monthly, fortnightly or on-call basis. A compulsory fortnightly service yielded 165.2 kg per household while a fortnightly user pays service yielded 89.0 kg per household, based on the number of households with access. Of those households that did sign up for a fortnightly user pays service, they averaged 277.5 kg each. Hence, if a compulsory green organics service was implemented in a local government, with increased participation from the current 62%, an average yield could expect to lie between 165.2 and 277.5 kg per household.

The following Tables 16a-16d illustrate the performance of the different collection systems.

**Table 16a – Green organics on-call service summary, Victoria 2002-03**

	<i>Metro</i>	<i>Total</i>
Annual service cost	\$470,666	\$470,666
Tonnes collected	2,241.7	2,241.7
Total households serviced	240,921	240,921
No of on-call services	28,625	28,625
Cost per tonne	\$190.98	\$190.98
Cost per household	\$2.28	\$2.28
Household yield (kg)	11.9	11.9
Cost per on-call service	\$17.83	\$17.83
Yield per on-call service (kg)	93.4	93.4

**Table 16b – Green organics on-call user pays service summary, Victoria 2002-03**

	<i>Metro</i>	<i>Non-Metro</i>	<i>Total</i>
Annual service cost	\$283,846	\$231,070	\$514,916
Tonnes collected	4,475.4	2,140.0	6,615.4
Total households serviced	119,050	37,859	156,909
No. of on-call services	17,545	42,500	60,045
Cost per tonne	\$63.42	\$107.98	\$77.84
Cost per household	\$2.38	\$6.10	\$3.28
Household yield (kg)	37.6	56.5	42.2
Cost per on-call service	\$16.18	\$5.44	\$8.58
Yield per on-call service (kg)	255.1	50.4	110.2

The difference between the total households serviced (which is the number with access) and the number of on-call services made, illustrates the participation rate. The number of on-call services provided per household can be as high as 12 (once per month), but it is more often limited to once or twice per year.

**Table 16c – Green organics regular service summary, Victoria 2002-03**

	<i>Metro</i>	<i>Non-Metro</i>	<i>Total</i>
Annual service cost	\$11,109,960	\$1,829,938	\$12,939,898
Tonnes collected	85,002.5	13,994.0	98,996.5
Total households serviced	837,925	139,681	977,606
Cost per tonne	\$130.70	\$130.77	\$130.71
Cost per household	\$13.26	\$13.10	\$13.24
Household yield (kg)	101.4	100.2	101.3

**Table 16d – Green organics regular user pays service summary, Victoria 2002-03**

	<i>Metro</i>	<i>Non-Metro</i>	<i>Total</i>
Annual service cost	\$3,916,432	\$127,680	\$4,044,112
Tonnes collected	31,507.0	684.0	32,191.0
Total households serviced	388,188	18,775	406,963
No. of optional services	115,972	1,848	117,820
Cost per tonne	\$118.86	\$186.67	\$120.30
Cost per household	\$10.92	\$6.80	\$10.71
Household yield (kg)	91.9	36.4	89.0
Cost per optional service	\$32.81	\$69.09	\$33.38
Household yield per optional service (kg)	276.0	370.1	277.5

While over 400,000 households had access to a regular user pays service, only 120,000 (29%) chose to take up this service in 2002-03. In comparison, compulsory green organics services experience a 62% participation rate.

It was common for local governments to limit the amount of green organics collected for frequent services based on a bin size (Table 17).

**Table 17 – Green organics service binned volume limit by frequency of service, Victoria 2002-03**

<i>Collection system</i>	<i>Weekly</i>	<i>Fortnightly</i>	<i>Monthly</i>	<i>Total</i>
110L	—	2	—	2
240L	—	13	4	17
240L split Garbage & Green Organics	1	—	—	1

Seventeen local governments had a predominant limit of 240L.

## 2.5 Hard Waste Services

This section of the report looks at hard waste kerbside collection services provided by Victorian local governments. Hard waste is household waste not normally accepted into garbage bins e.g. old stoves, mattresses.

As with green organics, the analysis of total households serviced has changed to the number of households with access, regardless of how many households participated or on-call services were made, so the total households are not compared between years.

### Access

Half of the local governments (40 out of 79) reported the provision of a kerbside hard waste collection service (see Table 4). This is a decrease of one local government from 2001-02. Hard waste collection services were provided to a greater proportion of households in metro areas than non-metro areas (94% and 19% respectively) (see Table 3).

### Cost

The service cost to Victorian local governments was \$5.9 million, 84% accounted for by inner and outer metropolitan local governments (see Table 18).

**Table 18 – Hard waste services by service provision category, Victoria 2001-02 to 2002-03**

	<i>Inner Metropolitan</i>	<i>Outer Metropolitan</i>	<i>Melbourne Fringe</i>	<i>Major Provincial</i>	<i>Small Provincial</i>	<i>Rural Township</i>	<i>Total</i>
<b>2002-03</b>							
Annual service cost	\$1,567,976	\$3,419,921	\$500,000	\$100,000	\$269,840	\$62,870	\$5,920,607
Tonnes collected	11,770.8	33,224.4	3,893.6	2,500.0	2,391.6	735.0	54,515.4
Tonnes disposed	10,465.4	27,415.9	3,893.6	1,500.0	1,363.7	485.0	45,123.6
Diversion rate (%)	11.1%	17.5%	0.0%	40.0%	43.0%	34.0%	17.2%
Total households serviced	425,173	739,805	142,299	12,000	82,734	12,701	1,414,712
Cost per tonne	\$133.21	\$102.93	\$128.42	\$40.00	\$112.83	\$85.54	\$108.60
Cost per household	\$3.69	\$4.62	\$3.51	\$8.33	\$3.26	\$4.95	\$4.19
Household yield (kg)	27.7	44.9	27.4	208.3	28.9	57.9	38.5
<b>2001-02</b>							
Annual service cost	\$1,451,095	\$3,002,459	\$611,265	\$80,000	\$165,472	\$23,777	\$5,334,068
Tonnes collected	11,228.4	31,315.7	5,222.6	3,000.0	2,590.3	—	53,357.0
Tonnes disposed	9,813.8	23,741.5	3,828.6	2,500.0	1,274.6	—	41,158.5
Diversion rate (%)	12.6%	24.2%	26.7%	16.7%	50.8%	—	22.9%
<b>Per cent change (%)</b>							
Annual service cost	8.1%	13.9%	-18.2%	25.0%	63.1%	164.4%	11.0%
Tonnes collected	4.8%	6.1%	-25.4%	-16.7%	-7.7%	—	2.2%
Tonnes disposed	6.6%	15.5%	1.7%	-40.0%	7.0%	—	9.6%
Diversion rate (%)	-12.0%	-27.7%	-100.0%	140.0%	-15.4%	—	-24.6%

### Yield

Over 54,500 tonnes were collected, with more than 45,000 tonnes being disposed to landfill, leaving a diversion rate of 17% (23% in 2001-02).

Small provincial local governments reported the highest average diversion rates of materials for recycling at 43%. Nearly all service provision areas have decreased their diversion rates since 2001-02. However, it must be noted that obtaining tonnes collected versus tonnes disposed proved problematic for some respondents. Hence, it is possible

that Melbourne fringe did in reality divert material from landfill despite the data returns indicating 0% diversion.

An average of 38.5 kg of hard waste was collected per household over 2002-03 (see Figure 16).

**Figure 16 – Hard waste, household yield across local governments, Victoria 2002-03**



### Frequency

Sixteen (40%) of local governments with a hard waste service reported the predominant frequency of service as annual, followed by bi-annual and on-call which were provided by 11 local governments each (see Table 19).

**Table 19 – Hard waste collection by frequency of service, Victoria 2002-03**

<i>Frequency of service</i>	<i>Inner Metropolitan</i>	<i>Outer Metropolitan</i>	<i>Melbourne Fringe</i>	<i>Major Provincial</i>	<i>Small Provincial</i>	<i>Rural Township</i>	<i>Total</i>
Annual	2	5	—	1	6	2	16
Bi-annual	4	5	1	—	—	1	11
Quarterly	—	1	—	—	—	—	1
On-call	4	4	2	—	1	—	11
Other	—	—	—	—	1	—	1
<b>Total</b>	<b>10</b>	<b>15</b>	<b>3</b>	<b>1</b>	<b>8</b>	<b>3</b>	<b>40</b>

### 3. ENVIRONMENTAL BENEFITS FROM KERBSIDE RECYCLING

This section looks at the environmental benefits gained from recycling during the financial year 2002-03.

According to the data collected in the *Local Government Data Collection*, a total of 397,141.2 tonnes of recyclables were collected for recycling in Victoria, or 211.1 kg per household.

Allowing for a contamination rate of approximately 6.3% (as indicated by local government) and a small quantity that was collected but not recycled, it is estimated that 370,327.5 tonnes of municipal waste was actually recycled in 2002-03.

The amount of 211.1 kg per household is a positive outcome given that this yield is much higher than the 156 kg per household per year average minimum efficiency measure established in the *Guide to Preferred Standards for Kerbside Recycling in Victoria*.

Applying this data to the findings of the *Life Cycle Assessment for Paper and Packaging Waste Management Scenarios in Victoria*<sup>9</sup> reveals substantial environmental benefits. The benefits for the total amount collected for recycling are estimated to include savings of:

- 8,360 megalitres of water a year – equivalent to filling 1,671 Olympic swimming pools, 38% of Maroondah Reservoir's water storage capacity<sup>10</sup> OR the water consumption of 22,000,000 people for one day<sup>11</sup>
- 290,000 tonnes of greenhouse gases (such as CO<sub>2</sub>) a year – equivalent to the amount of greenhouse gases generated by 19,250 households per year<sup>12</sup> (eg close to the number of households in Greater Shepparton City Council) OR taking 48,150 cars off the road for a year<sup>13</sup>
- Air pollution equivalent to emissions from Victorian motorists travelling over 406 million kilometres a year in average post 1985 passenger cars
- 2,908,500 gigajoules or 808,550 MWh of embodied energy a year
- Solid waste to landfill of up to 325,165 tonnes of residual material

A Life Cycle Assessment was also applied to the green organics processed through kerbside services. Of the 140,045 tonnes collected, 136,356 tonnes were processed. This saved 43,240 tonnes of greenhouse gases and 110 megalitres of water a year.

The environmental benefits can be further quantified by applying the findings of *The Independent Assessment of Kerbside Recycling in Australia*.<sup>14</sup> This report is the most comprehensive study of recycling undertaken in Australia to date. It measures the

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<sup>9</sup> Grant T, James KL, Lundie S, Sonneveld K (2001) *Stage 2 Report for Life Cycle Assessment for Paper and Packaging Waste Management Scenarios in Victoria*, Centre for Design at RMIT, Melbourne.

<sup>10</sup> Conserve Water, 2003, Melbourne Water, Melbourne, viewed at 17 March 2003, <<http://conserwater.melbournewater.com.au>>

<sup>11</sup> Water Smart, Victorian Government, Melbourne, viewed at 17 March 2003, <<http://www.watersmart.vic.gov.au>>

<sup>12</sup> Australian Greenhouse Office, 2003, Australian Greenhouse Office, Canberra, viewed at 17 March 2003, <<http://www.greenhouse.gov.au>>

<sup>13</sup> CSIRO Atmospheric Research, 2000, CSIRO, Melbourne, viewed at 17 March 2003, <<http://www.dar.csiro.au>>

<sup>14</sup> National Packaging Covenant Council, January 2001

financial, environmental and social impacts of recycling, translating the environmental impacts into dollars to compare costs and benefits.

Applying the study to the *Local Government Data Collection* findings, the net overall benefit of kerbside recycling to Victoria is estimated to be \$73,559,000 per year. This is based on average net environmental savings of \$39 per household per year for those households serviced. This results from the benefit from kerbside recycling of \$68 per household per year, less the reported costs to local government of delivering these services at \$29 per household per year.

In addition, again only two of the Victorian local governments reported kerbside recycling costs that exceeded the calculated average environmental savings resulting from kerbside recycling (being \$68 per household per year). While the net benefits tend to be lower in rural areas due to greater transport distances between households and to markets, this remains a convincing validation of the environmental benefits of Victoria's kerbside recycling services.

#### 4. COMMERCIAL AND INDUSTRIAL KERBSIDE SERVICES

The focus of this section is the range of kerbside collections provided by local governments to commerce and industry.<sup>15</sup>

##### Access

Table 20 shows the number of commercial and industrial (C&I) properties receiving kerbside services provided by local government.

**Table 20 – Number of commercial and industrial properties serviced by kerbside collections, Victoria 2001-02 to 2002-03**

<i>Type of Service</i>	<i>Inner Metropolitan</i>	<i>Outer Metropolitan</i>	<i>Melbourne Fringe</i>	<i>Major Provincial</i>	<i>Small Provincial</i>	<i>Rural Township</i>	<i>Total</i>
<b>2002-03</b>							
<i>Separate commercial &amp; industrial kerbside system —</i>							
Recyclables collection	6,400	—	—	—	—	—	6,400
<i>Domestic kerbside system —</i>							
Garbage collection	15,707	27,206	7,753	2,691	13,537	2,137	69,031
Recyclables collection	12,867	2,479	3,219	1,440	7,899	2,352	30,256
<b>2001-02</b>							
<i>Separate commercial &amp; industrial kerbside system —</i>							
Recyclables collection	8,100	—	—	—	—	—	8,100
<i>Domestic kerbside system —</i>							
Garbage collection	34,413	19,395	1,520	2,633	9,336	2,773	70,070
Recyclables collection	13,837	5,631	3,893	1,021	6,273	2,790	33,445

Of those C&I properties serviced through the domestic garbage kerbside system (69,031 properties) half as many also received a recyclables collection service (30,256 properties). It is likely that most of the properties receiving a recyclables service would also be receiving a garbage collection service.

A further 6,400 properties received recyclables collection services through separate C&I kerbside systems. Three inner metropolitan local governments provided this service, only collecting cardboard. However, only two of these were able to provide the number of properties.

The figures for 2002-03 are less than those reported in 2001-02. It must be noted that wherever possible, local governments were requested to exclude all information regarding C&I properties from the domestic kerbside service. Only if the related costs and tonnes could be excluded did this occur (which was not often the case). On the other hand, some local governments could not identify the number of C&I properties within the total properties serviced, so simply listed C&I properties under the number of domestic households serviced.

##### Yields

The separate C&I recyclables service collected 1,781 tonnes of cardboard.

<sup>15</sup> The data collected did not include collection services provided through individual arrangements between businesses and garbage / recycling service contractors.

## 5. STREET SWEEPING AND LITTER SERVICES

This section looks at the operation of street sweeping and litter maintenance services. The figures give an indication only of the services, as some local governments could not provide full details in relation to specific costs and tonnages for the litter service, as separate from other services.

Seventy-three local governments reported a street sweeping service (72 local governments 2001-02), and 69 indicated a litter bin and trap maintenance service (same as in 2001-02) (see Table 4).

The overall cost of street sweeping, litter maintenance and clean up costs was \$50,599,636.

### 5.1 Street Sweeping

#### Cost

Victorian local governments spent \$32.9 million on street sweeping (see Table 21).

**Table 21 – Street sweeping service, Victoria 2001-02 to 2002-03**

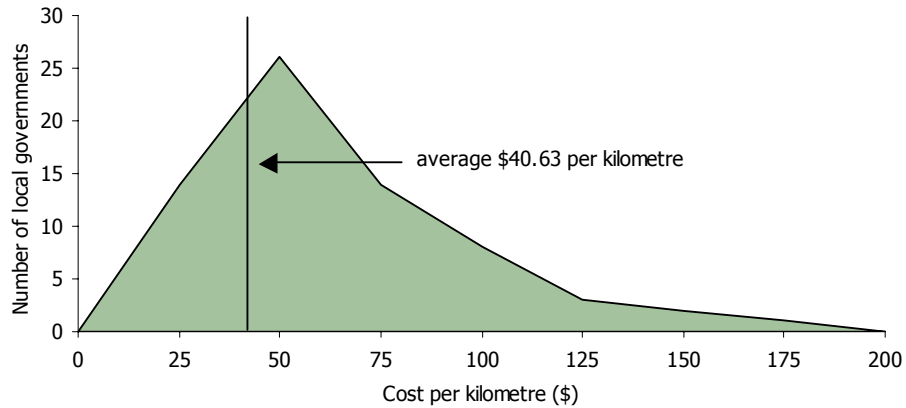
	<i>Metro</i>	<i>Non-Metro</i>	<i>Total</i>
<b>2002-03</b>			
Annual service cost	\$26,127,500	\$6,730,007	\$32,857,507
Annual length of swept kerb & channel (km)	642,948	149,391	792,339
Cost per kilometre <sup>1</sup>	\$40.64	\$40.58	\$40.63
<b>2001-02</b>			
Annual service cost	\$24,195,584	\$6,219,607	\$30,415,191
Annual length of swept kerb & channel (km)	516,843	276,815	793,658
Cost per kilometre <sup>1</sup>	\$46.81	\$17.66	\$36.66

<sup>1</sup>Averages exclude outliers and services where the local government did not provide full figures for cost of service or length swept.

Eighty percent of the kerb and channel swept in Victoria were swept by metro local governments, while the cost per kilometre was consistent across metro and non-metro.

The average cost per kilometre was \$40.63, although there is considerable variation around this figure from \$4.82 to \$155.84 (see Figure 17). This is an increase from \$36.66 in 2001-02.

**Figure 17 – Street sweeping, average cost per kilometre across local governments, Victoria 2002-03**



## 5.2 Litter Services

Additional information was gathered in 2002-03, with the cost and tonnes collected split between litter bins and litter traps to obtain a clearer picture of the service provided. Also, the number of public place recycling bins and Waste Wise Events were queried for the first time. Not all Waste Wise Events were accredited, so the number of participating events includes both those that were accredited and non-accredited.

Victorian local governments spent \$14.8 million on the provision of litter services involving litter bins and litter traps, an increase from \$12.4 million in 2001-02. (see Table 22).

**Table 22 – Litter service, Victoria 2001-02 to 2002-03**

	<i>Metro</i>	<i>Non-Metro</i>	<i>Total</i>
<b>2002-03</b>			
No. of litter bins	24,227	14,482	38,709
Annual service cost for bins	\$8,783,235	\$4,329,789	\$13,113,024
Tonnes collected from bins	26,494.0	6,743.0	33,237.0
No. of side entry traps	2,682	212	2,894
No. of in-line litter traps	355	119	474
Annual service cost for traps	\$1,377,685	\$303,284	\$1,680,969
Tonnes collected from traps	3,432.0	262.0	3,694.0
No. of penalty infringement notices issued	586	119	705
Waste Wise Events (no. participating)	36	46	82
Waste Wise Events (no. accredited)	10	17	27
No. of public recycling bins	201	80	281
<b>2001-02</b>			
Annual service cost	\$9,114,221	\$3,261,345	\$12,375,566
Tonnes collected	22,519.2	5,848.6	28,367.8
No. of litter bins	24,657	12,586	37,243
No. of in-line litter traps	217	82	299
No. of side entry traps	2,417	790	3,207
No. of penalty infringement notices issued	382	132	514
<b>Per cent change (%)</b>			
Annual service cost	11.5%	42.1%	19.5%
Tonnes collected	32.9%	19.8%	30.2%
No. of litter bins	-1.7%	15.1%	3.9%
No. of in-line litter traps	-98.6%	-99.1%	-98.7%
No. of side entry traps	11.0%	-73.2%	-9.8%
No. of penalty infringement notices issued	53.4%	-9.8%	37.2%

**Litter Bins and Traps**

A total of 38,709 litter bins and 3,368 traps are installed across 87% of Victorian local governments (see Table 4).

**Yield**

The total tonnes collected of 36,931 was a 30% increase from 28,388 tonnes collected in 2001-02. With the more specific reporting format, it was shown that the tonnes collected from bins were nearly ten times greater than that from litter traps (33,237 compared to 3,694 tonnes).

**Cost**

The majority of costs relate to maintaining litter bins, with a cost of \$13 million, while litter traps cost \$1.7 million. Increases in costs and tonnes collected could relate to the increased ability of local government to report on these areas rather than an actual increase.

**Penalty Infringement Notices**

A total of 705 penalty infringement notices were issued for litter (514 in 2001-02). Metro local governments issued over three quarters of these.

## Public Place Recycling

Fifteen local governments reported a total of 281 public place recycling bins.

## Waste Wise Events

In 2002-03, 82 events participated in the Waste Wise Events program in 31 local governments. Of this, 27 were actual accredited Waste Wise Events operating across 18 local governments.

## Litter Clean Up Services

Forty-nine local governments provided further detail on their litter services, an increase from only 30 in 2001-02 (see Table 23). It is assumed from the increase in the number reporting and the associated increase in figures, that local governments are becoming better equipped to record their litter clean up services, rather than experiencing an increase in real terms.

**Table 23 – Litter clean up services, Victoria 2001-02 to 2002-03**

	<i>Illegally dumped rubbish</i>	<i>Road side litter</i>	<i>Bill poster</i>	<i>Cigarette bins</i>
<b>2002-03</b>				
No. of local governments that list item separately for expense allocation	16	13	8	6
Annual service cost	\$1,567,076	\$700,144	\$256,736	\$84,539
Tonnes collected	9,310.6	4,186.0	n.a.	n.a.
No. of call outs	6,710	n.a.	50	n.a.
No. of penalties issued	252	n.a.	41	n.a.
No. of cigarette bins	n.a.	n.a.	n.a.	586
<b>2001-02</b>				
No. of local governments that list item separately for expense allocation	12	8	4	3
Annual service cost	\$935,424	\$242,060	\$190,500	\$51,372
Tonnes collected	5,423.3	881	n.a.	n.a.
No. of call outs	5,909	n.a.	25	n.a.
No. of penalties issued	93	n.a.	10	n.a.
No. of cigarette bins	n.a.	n.a.	n.a.	399
<b>Per cent change (%)</b>				
No. of local governments that list item separately for expense allocation	33.3%	62.5%	100.0%	100.0%
Annual service cost	67.5%	189.2%	34.8%	64.6%
Tonnes collected	71.7%	375.1%	n.a.	n.a.
No. of call outs	13.6%	n.a.	100.0%	n.a.
No. of penalties issued	171.0%	n.a.	310.0%	n.a.
No. of cigarette bins	n.a.	n.a.	n.a.	46.9%

It was common in some local governments to combine illegally dumped rubbish and roadside litter when reporting costs and tonnes instead of having a separate line item. So in addition to the above figures, five local governments reported a combined cost of \$299,641 and four local governments collected 848.0 tonnes for this section. Therefore in total, the cost of litter clean up services was \$2,908,136 for all four areas, collecting 14,344.6 tonnes of illegally dumped rubbish and roadside litter.

Extrapolations were undertaken of the data provided from responding local governments for the potential cost of illegally dumped rubbish and road-side litter. The

information was stratified by metro/non-metro and the number of residential households by local government. It is estimated that illegally dumped rubbish and roadside litter costs Victorian local governments in excess of \$8 million annually.

For budget allocations, it was more common to separately list the cost of cleaning up illegally dumped rubbish (16 local governments) as a specific service as compared to other litter clean up services. Illegally dumped rubbish appears to be the highest activity that is specifically recorded by local governments in comparison to dealing with roadside litter and bill posters, in terms of cost, tonnes collected, number of call outs and number of penalties issued. Despite not indicating that illegally dumped rubbish and cigarette bins were listed separately as a line item in the budget, slightly more local governments went on to actually provide figures.

The cigarette bins were also a significant service, with 26 local governments reporting a total of 586 cigarette bins. The number of local governments that listed the cigarette bins as a separate item for expense allocation or reported a cost, however, was very low at six and eight local governments respectively.

## 6. LANDFILLS AND TRANSFER STATIONS

This section deals with the number of local government owned landfills (licensed and unlicensed) and transfer stations across the State, including those that are operated by private contractors. The data does not include privately owned sites.

For several years, EPA has run a program in conjunction with local government to identify unlicensed landfills across Victoria. In spite of significant progress, the identification and closure of unlicensed landfills remains a challenge in non-metro areas. The true number of unlicensed landfills may well be higher than the figure below. Indeed, the numbers of sites that have recently closed or opened between the reporting years do not always add up. In 2001-02, Alpine Resorts were included in the landfill and transfer station tally but have now been excluded from all figures below.

The number of local government owned landfills and transfer stations are displayed in Table 24.

**Table 24 – Number of local government owned landfills and transfer stations by service provision category, Victoria 2001-02 to 2002-03**

	<i>Inner Metropolitan</i>	<i>Outer Metropolitan</i>	<i>Melbourne Fringe</i>	<i>Major Provincial</i>	<i>Small Provincial</i>	<i>Rural Township</i>	<i>Total</i>
<b>2002-03</b>							
<b>Operating Landfills –</b>							
No. of licensed landfills	0	5	5	6	29	7	52
No. of unlicensed landfills	0	0	2	2	51	44	99
<i>Total landfills operating</i>	0	5	7	8	80	51	151
<b>Closed Landfills –</b>							
No. of licensed landfills closed during 2002-03	0	0	0	0	0	0	0
No. of unlicensed landfills closed during 2002-03	0	0	0	0	8	1	9
<i>Total landfills closed</i>	0	0	0	0	8	1	9
<b>Transfer Stations –</b>							
No. of transfer stations	5	11	13	15	91	72	207
No. of new transfer stations established during 2002-03	0	1	0	1	5	12	19
<b>2001-02</b>							
<b>Operating Landfills –</b>							
No. of licensed landfills	0	6	5	8	28	10	57
No. of unlicensed landfills	0	0	3	3	66	33	105
<i>Total landfills operating</i>	0	6	8	11	94	43	162
<b>Closed Landfills –</b>							
No. of licensed landfills closed during 2001-02	0	0	2	1	8	0	11
No. of unlicensed landfills closed during 2001-02	0	0	0	1	10	8	19
<i>Total landfills closed</i>	0	0	2	2	18	8	30
<b>Transfer Stations –</b>							
No. of transfer stations	5	10	12	13	102	52	194
No. of new transfer stations established during 2001-02	0	0	1	0	14	18	33

Overall, there has been a decrease in the number of landfills and an increase in transfer stations.

### Licensed landfills

Of the 151 operating landfills reported by local governments, 52 were licensed. It was more likely for metro local governments to have licensed landfills than unlicensed landfills. Inner metropolitan local governments did not own or operate any landfills.

### Unlicensed landfills

Rural townships and small provincial local governments (which have lower population densities) owned 96% of the 99 unlicensed operating landfills reported by local governments.

### Closed landfills

The rate of landfill closure has been slowing over the last three years. Fifty landfills closed in 2000-01, 30 in 2001-02 and now nine have closed in 2002-03. This does, however, illustrate a general trend of landfill closure. The more recent closures were only for unlicensed landfills in small provincial and rural townships.

### Transfer stations

Rural townships and small provincial local governments maintain 163 of Victoria's 207 local government owned transfer stations, reflecting the significant need in rural areas for drop-off facilities to consolidate recyclables and waste. These areas account for all but two of the 19 new transfer stations that have been established during 2002-03.

### Operating details

The operating costs for landfills and transfer stations were over \$48 million (see Table 25). These sites serviced 4.5 million people, which encompasses nearly all of the population of Victoria<sup>16</sup>.

**Table 25 – Operating details of local government owned landfills and transfer stations, Victoria 2002-03**

	<i>Metro</i>	<i>Non-Metro</i>	<i>Total</i>
<b>Landfills –</b>			
Annual operating costs	\$6,315,592	\$19,329,588	\$25,645,180
Population serviced	682,912	1,091,321	1,774,233
No. of weighbridges installed	4	20	24
<b>Transfer stations –</b>			
Annual operating costs	\$13,005,425	\$9,656,567	\$22,661,992
Population serviced	1,994,449	692,272	2,686,721
No. of weighbridges installed	8	3	11

### Weighbridges

A total of 35 weighbridges were installed in these sites, an increase of three from 2001-02.

### Disposal charges

Table 26 displays the varying disposal costs at landfills and transfer stations, which includes the landfill levy for putrescible and inert waste. Details of disposal charges

<sup>16</sup> Australian Bureau of Statistics, Census Data 2001

were given for 63 landfill sites and 112 transfer stations. The use of either cubic metres or tonnes was based on how the local government charged for disposal.

**Table 26 – Disposal charges at landfills and transfer stations, Victoria 2002-03**

<i>Type of waste</i>	<i>Average cost per cubic metre</i>	<i>Average cost per tonne</i>	<i>Sites without a gate fee (%)</i>
<b>Landfills –</b>			
Municipal putrescible	\$13.40	\$38.56	24
Industrial putrescible	\$16.08	\$39.10	23
Municipal inert	\$15.13	\$37.10	24
Industrial inert	\$17.53	\$36.89	23
Separated green organics	\$8.35	\$22.93	30
Separated recyclables	\$8.14	\$20.50	91
<b>Transfer Stations –</b>			
Municipal putrescible	\$14.40	\$43.01	14
Industrial putrescible	\$16.23	\$48.64	9
Municipal inert	\$13.42	\$38.35	8
Industrial inert	\$15.48	\$43.44	9
Separated green organics	\$8.12	\$34.80	13
Separated recyclables	\$1.60	—	99

Industrial waste (both putrescible and inert) generally attracted higher charges than municipal waste, across sites. Green organics were charged at a cost less than for putrescible and inert waste, and at a number of sites no fee was charged. In over 90% of sites recyclables did not attract disposal charges, and if they did it was a small charge. In a small number of cases a gate fee was not charged for waste upon entry, but a flat annual fee was charged. This would normally occur in unattended, unlicensed landfills.

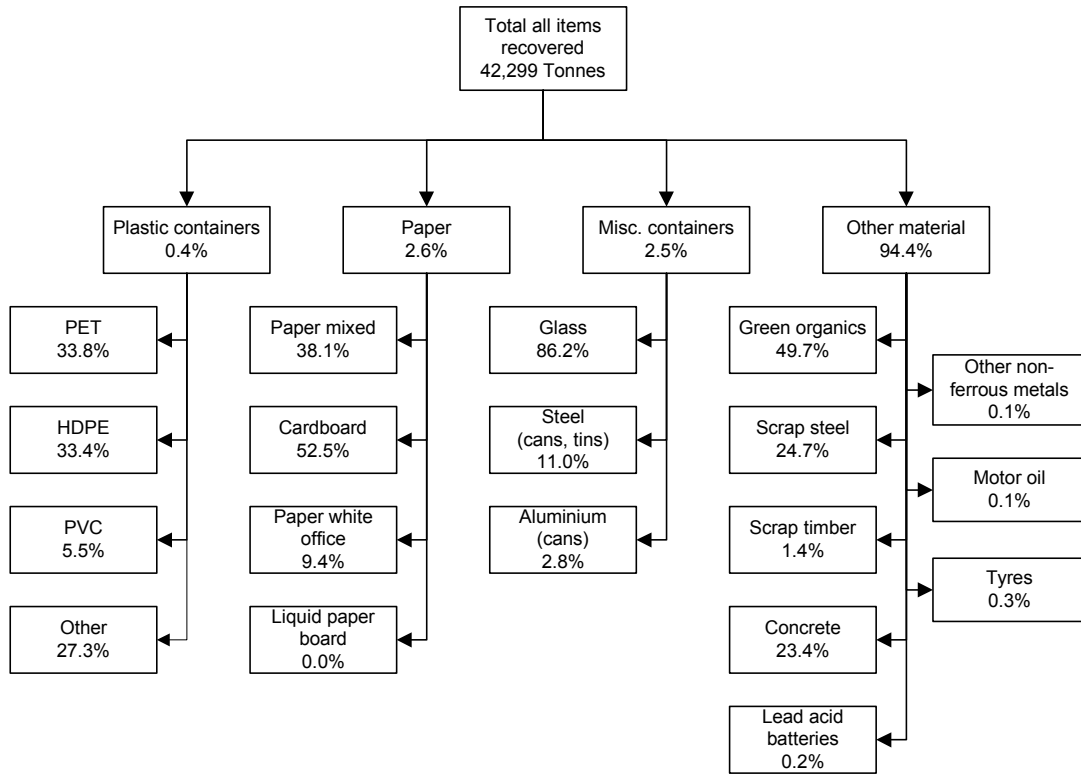
### Resource recovery

Seventy-two landfill sites and 127 transfer stations provided resource recovery facilities. Further detail on items and quantities recovered were given for 46 landfill sites and 78 transfer stations (though sometimes this was an aggregated amount including quantities collected at other sites). A total of 183,446 tonnes were recovered (214,913 tonnes in 2001-02).

### Resource recovery at landfills

Over 42,000 tonnes were recovered from landfill sites in 2002-03 (see Figure 18).

**Figure 18 – Resource recovery by type of items recovered at landfills, Victoria 2002-03**

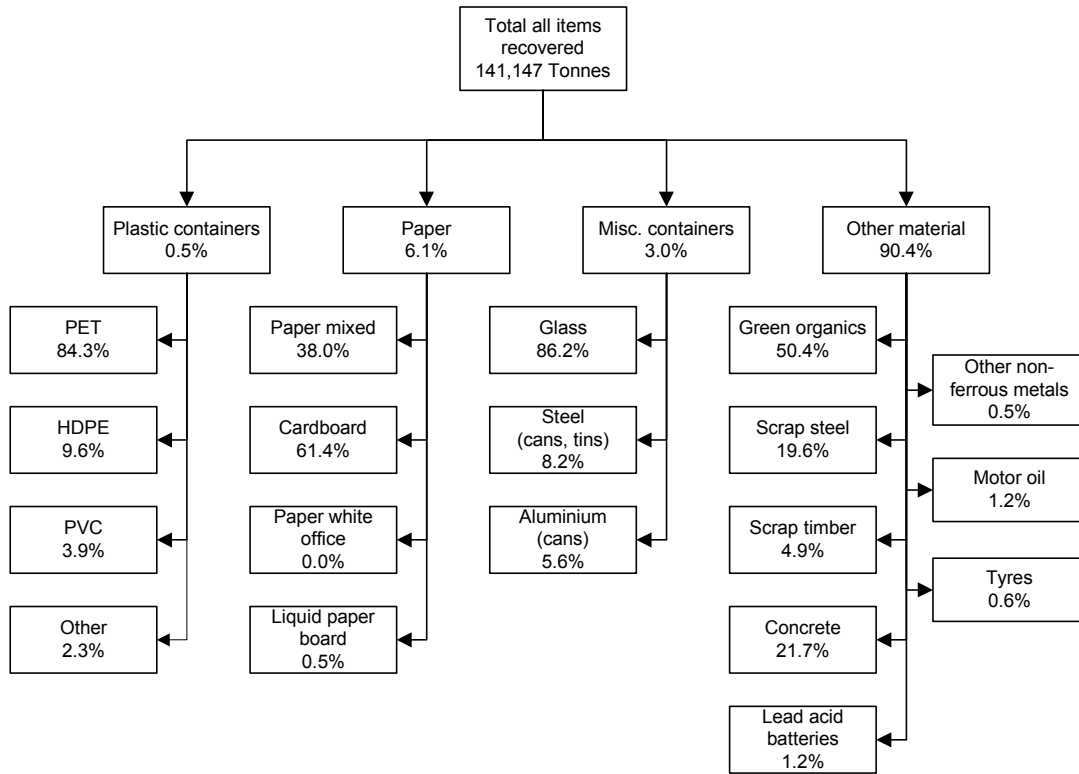


There was a marked decrease in quantity recorded, as 108,088 tonnes were collected in 2001-02. It is difficult to account for this difference. “Other materials”, which included steel, green organics and tyres, accounted for 94% of the total tonnage. The paper and miscellaneous containers were of approximately equal quantity at around 2.5% each. Green organics was by far the greatest proportion of material recovered at landfills, accounting for 47% of the total resources recovered. Green organics, scrap steel and concrete accounted for 92% of the total items recovered at landfills.

#### Resource recovery at transfer stations

Transfer stations recovered nearly 100,000 tonnes more than landfills, with 141,147 tonnes in 2002-03 (see Figure 19). This is an increase from 106,825 tonnes in 2001-02.

**Figure 19 – Resource recovery by type of items recovered at transfer stations, Victoria 2002-03**



“Other material” was still the dominant source of items recovered, at 90% of the total, with the paper category accounting for 6%. Green organics again accounted for the highest proportion at 50% of all “other material”, along with scrap steel and concrete at 20% and 22% respectively. These items accounted for 83% of the total of all items recovered at transfer stations.

#### Resource recovery by source

Some of the main items recovered through municipal kerbside collections and drop-off facilities are displayed in Table 27.

**Table 27 – Items recovered by source of recovery, Victoria 2002-03**

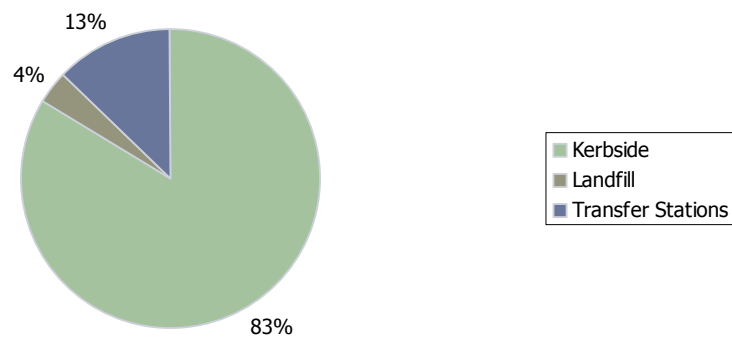
Item recovered	Source of Item			Total
	Kerbside	Landfill	Transfer Stations	
Plastic	31,277.3	189.9	696.1	32,163.4
Other Containers <sup>1</sup>	123,514.6	1,043.3	4,167.8	128,725.7
Paper	217,360.5	1,119.8	8,642.1	227,122.4
Green Organics	140,044.6	19,862.9	64,356.1	224,263.6
<b>Total</b>	<b>512,197.0</b>	<b>22,215.9</b>	<b>77,862.1</b>	<b>612,275.0</b>

<sup>1</sup>Includes aluminium cans, steel cans and glass bottles

Landfills and transfer stations diverted over 100,000 tonnes of household recyclables and green organics from landfill in 2002-03. In 2001-02, the quantity of green organics collected was equally represented through both kerbside collections and drop-off facilities, but this is not the case in 2002-03, with more collected through the kerbside service. It is unclear why this is the case. It may be because of new, frequent kerbside services for organics or an improvement in reporting quality to avoid double counting kerbside and drop off quantities. Conversely, drought conditions may have reduced the quantity of drop-off.

The proportion of items recovered by their source of recovery, is displayed in Figure 20.

**Figure 20 – Proportion of items recovered by source of recovery<sup>1</sup>, Victoria 2002-03**



<sup>1</sup>Includes plastic and other containers, paper and green organics

The vast majority of paper, plastic, containers and green organics are collected through kerbside services (83%) with transfer stations playing a greater role than landfills in resource recovery for these items.

## 7. ALPINE RESORTS

The survey was sent to all six Alpine Resorts that are considered municipalities for the purpose of EPA legislation (Environment Protection Act 1970). Three Alpine Resorts completed the survey – the same three Alpine Resorts from the North Eastern RWMG who completed the survey in 2001-02. All Alpine Resorts were included to gauge whether they provided services analysed in the data collection. From the response, or lack thereof, it can be assumed that the remaining Alpine Resorts are of a different make up. Again, limited information was available from the Resorts that did respond, and with such a small survey size, generalisations from the data should be made with caution.

The Alpine Resorts generally consist of large buildings with multiple rooms. The rooms are often let on a nightly basis to visitors, most of whom visit in winter. The number of bed spaces were used instead of the number of households, as they were more representative of the nature of area as there are no “houses” as such.

### 7.1 Kerbside Services

Alpine Resorts provided up to three kerbside services: garbage, recyclables and hard waste (see Table 28).

**Table 28 – Kerbside services summary for Alpine Resorts, Victoria 2002-03<sup>1</sup>**

	<i>Garbage</i>	<i>Recyclables</i>	<i>Hard Waste</i>	<i>Total</i>
Annual service cost	\$277,459.21	\$96,881	\$7,660	\$381,999.98
Tonnes collected	1,764.2	727.2	223.5	2,714.9
Alpine bed spaces	12,714	12,714	8,714	—
Cost per tonne	\$157.28	\$133.22	\$34.27	\$140.71
Cost per bed space	\$31.84	\$11.12	\$0.88	—
Yield per beds space (kg)	202.5	83.5	25.6	—
No. of Alpine Resorts providing service	3	3	2	—

<sup>1</sup>Averages exclude services where the Alpine Resort did not provide full figures for tonnage collected or cost of service

#### Garbage service

All three Alpine Resorts have a kerbside garbage service.

Bags were used for garbage collection with a daily collection in winter. The variable frequency is reflective of the attraction to the areas for winter activity, creating a fluctuation in the population.

Each bed space generated an average of 202.5 kg per year of garbage. The cost of garbage (at \$157.28 per tonne) is higher than in 2001-02, when it was \$116.94 per tonne. The cost to provide this service averaged at \$31.84 per bed space.

#### Recycling service

The three Alpine Resorts also provided kerbside recycling.

The recyclables were collected in bags at the same frequency as garbage, which was daily in winter.

Each bed space generated 83.5 kg per year of recyclables on average, with a diversion rate of 29.2% (an increase from 14.3% in 2001-02). The cost per tonne was \$133.22, while the cost per bed space was \$11.12.

### Hard waste service

Two Alpine Resorts reported a hard waste collection. Over 223 tonnes were collected, of which at least three tonnes (1.3%) were diverted from landfill. However, only one of the two Alpine Resorts indicated that material was diverted, which may reflect the lack of recording system at both points rather than a lack of diversion.

## 7.2 Street Sweeping and Litter Services

The provision of litter and street sweeping by the Alpine Resorts is covered in this section.

One Alpine Resorts reported the provision of street sweeping, while two reported a litter service (see Table 29). However, due to confidentiality the annual service cost for street sweeping is not published.

**Table 29 – Litter services across Alpine Resorts, Victoria 2002-03**

	<i>Alpine Resorts</i>
No. of litter bins	46
Annual service cost for bins	\$19,500
Tonnes collected from bins	0
No. of side entry traps	0
No. of in-line litter traps	0
Annual service cost for traps	0
Tonnes collected from traps	0
No. of penalty infringement notices issued	0
Waste Wise Events (no. participating)	0
Waste Wise Events (no. accredited)	0
No. of Alpine Resorts providing service	2

The litter service revolved around servicing 46 litter bins, as no litter traps were reported.

## **APPENDIX A METHODOLOGY**

### **Coverage**

The target population of the survey was all 79 local governments and six Alpine Resorts within Victoria. A hard copy of the survey was sent to all the local governments and Alpine Resorts by mail.

The data collection is completely enumerated; that is the data collection included all 79 Victorian local governments, representing a 100% response rate. All local governments have a weighting of one, which means that the numerical findings in this report are entirely derived from the data provided by the 79 participating local governments.

There are six Alpine Resorts that for the purpose of the Environment Protection Act (1970) are deemed to be municipalities. Three Alpine Resorts (all from the North Eastern Regional Waste Management Group) completed the survey, representing 50% of Alpine Resorts. The numerical findings are derived from the data given by the three participating Alpine Resorts, and no estimates were made for the non-participating units.

### **Data collected**

The data collection extended to the following service areas:

- Household Garbage collection and disposal
- Household Recyclables (i.e. containers and paper/cardboard) collection and sorting
- Commercial & Industrial Sector Recyclables (i.e. containers and paper/cardboard) collection and sorting (if separate service provided)
- Household Green Organics collection and processing
- Household Hard Waste collection and disposal/recycling
- Litter bin and litter trap collection and disposal
- Litter clean up services
- Street Sweeping
- Landfill and Transfer Station operating details and resource recovery

The data collected on local government owned drop-off facilities was contained within the landfill and transfer station section and therefore excluded drop-off from the other kerbside services.

### **Diversion rate**

The diversion rate is either calculated by tonnes or by kg per household, which will be indicated in the table or figure.

Diversion rate by tonnes (for example the state-wide diversion rate) is calculated either by including or excluding green organics. The diversion including green organics is calculated by tonnes of recyclables + green organics divided by tonnes of recyclables + green organics + garbage.

Diversion rate by household (such as by the collection system type or by local government) is calculated by kilograms of recyclables per household divided by kilograms of recyclables + garbage per household. One list in Appendix D also includes kilograms of green organics in the calculation.

### **Presentation of data**

The data has been provided in full to Regional Waste Management Groups and their respective member local governments.

In the report, the data is presented in aggregated form. This reduces the impact of statistical anomalies on the findings. The data collection findings are therefore more representative of costs, yields and other features being analysed.

In various parts of the report, the data is grouped by:

- Service Provision Categories - established in the *Guide to Preferred Service Standards for Kerbside Recycling in Victoria* (EcoRecycle Victoria, November 2000)
- Metropolitan/Non-Metropolitan classifications
- Regional Waste Management Group (for waste generation)
- Collection system type (for garbage, recyclables and green organics)
- Collection frequency

The category of each local government by service provision category was revised in 2003 due to the split of Delatite Shire Council into Benalla Rural City Council and Mansfield Shire Council and the recategorisation of Loddon Shire Council from small provincial to rural township, which was an oversight.

### **Survey limitations**

EcoRecycle has sought to verify information provided in data collection returns by local governments through rigorous follow-up with individual local governments by telephone, fax and email, to validate data entries. In addition, EcoRecycle circulated extracts containing individual local government returns to Regional Waste Management Group Executive Officers and Regional Education Officers to verify data. Through these steps and extensive data analysis, EcoRecycle has identified and corrected a significant number of anomalies.

However, EcoRecycle is not in a position to validate underlying data in the report. Findings in this report are therefore subject to the accuracy of data provided by individual local governments.

## **APPENDIX B GLOSSARY**

### **Alpine Resort Management Boards**

All six Alpine Resort Management Boards of Mount Hotham, Mount Buller, Falls Creek, Mount Stirling, Lake Mountain and Mount Baw Baw were included in 2002-03. They were included as under the Alpine Resort Management Act (1994), they are considered municipalities for the purpose of EPA legislation (Environment Protection Act 1970). As the concepts and counting methodology for the Alpine Resorts were difficult to integrate into the main body of data, all information relating to them were contained in a separate section. The number of residential premises serviced was inappropriate to report for these units, so the number of bed spaces per year were reported for use in the derived data (e.g. average cost per bed space), as they were more representative indicators of the type of activity undertaken at the Resorts.

### **Annual service cost**

Refers to the collection, sorting and disposal contract costs of providing a waste service. In-house contracts should allocate costs for providing labour services and associated sorting and disposal fees even if they are usually only accounted for internally. Capital equipment used to provide the kerbside service such as bins, trucks and other specialised equipment should be depreciated as per normal accounting practices, with the annual depreciation figure included as a cost. Lease or hire purchase costs should also be reported. Excludes all capital expenditure costs associated with the construction and commissioning of infrastructure. Only the annual operating expenses of providing a kerbside service are required.

### **Cigarette bins**

Cigarette bins are containers mounted on walls or poles, dedicated to the disposal of cigarette butts. They can be purchased or rented through (and even sometimes cleaned by) the manufacturer

### **In-line and side entry traps**

Traps act as filters in the stormwater to capture litter before it enters the waterways. They are cleaned regularly, either manually or with a vacuum, to dispose of the litter to landfill. In-line entry traps operate within the drainage system and act as a filter to capture pollutants flowing through the stormwater. Side entry traps act at the drainage entrance to capture pollutants.

### **Items recovered for recycling**

Most local governments provided a total quantity recovered or at least the sub-totals for paper, miscellaneous (non-plastic) containers, and plastic containers. Of the 77 local governments that provided this service, detailed breakdowns were provided from 67 local governments for the totals of non-plastic containers (i.e. glass, steel and aluminium), 67 for plastic containers, 70 for paper and 52 for contaminants. Significantly fewer local governments reported on individual items (eg. the quantity of PET within the plastic container category).

In previous years, liquid paperboard was listed under miscellaneous containers but in this report it was included under the paper category.

### Landfill & Transfer Station details

This section deals with the number of local government owned or operated landfills (licensed and unlicensed) and transfer stations across the state. The data does not include privately owned sites. EPA policy states that any landfill servicing a population of over 5,000 requires a license. Any landfill servicing under 5,000 is able to operate unlicensed but with a works approval.

### Length of swept kerb and channel

This item refers to the *annual* length of kerb and channel swept in kilometres (km). The length of swept kerb and channel is calculated using the frequency of the service multiplied by the length swept for that period. For instance, if a local government provides a weekly service where 12 km of kerb and channel are swept, then the length of swept kerb and channel is 12 km multiplied by 52 weeks, which equates to 624 km. If other parts of the municipality are provided with a service other than on a weekly basis, then that length swept is multiplied by the frequency per year. For example, multiplied by 52 for a weekly service, 12 for monthly, 1 for annual, etc. Then all the calculated totals are summed to arrive at an annual length swept.

### On-call services





Many local governments provide an *on-call* service for a green organics or hard waste collection. The most common number of allowed services per household was once or twice per year.

### Penalty Infringement Notices

Litter enforcement officers, who are employees of public authorities, issue penalty infringement notices. Notices are issued for littering, which could lead to fines or court appearances under the Environment Protection Act.

### Plastic Coding System

The Plastic Coding System is a series of symbols that identify the most common plastic material used in the manufacture of a product or packaging. The symbols are usually embossed on the bottom of plastic containers and bottles. Their purpose is to assist collectors with sorting the collected plastics by material type. They do not necessarily indicate that the product can be recycled or is made from recycled content. Each symbol in the Plastics Coding System consists of a number from 1 to 7 inside a chasing arrows triangle. The most common plastic containers that are collected in Victoria are:

-  PETE PET (Plastic Identification Code 1 used for soft drink bottles),
-  HDPE HDPE (Plastic Identification Code 2 used for milk and juice bottles)
-  PVC (Plastic Identification Code 3 used for juice and cordial bottles)
-  PP (Plastic Identification Code 5 used for ice-cream containers)

### **Predominant bin type**

This refers to the bin type used by most residential properties within the municipality for garbage and recyclables. For instance, if a local government has a 120L bin for 30% of the municipality and a 240L bin for 70% of the municipality then the predominant bin type is the 240L bin.

### **Predominant frequency of service**

This refers to the frequency of service that is most common within the municipality for green organics and hard waste. The defining criterion is the number of households serviced. For example, if a local government has a fortnightly service for 1,000 households and an annual service for 10,000 households, the predominant frequency of service is an annual service as more households receive this service.

### **Putrescible & Inert Waste**

Putrescible waste is organic material that decomposes, such as food scraps. Inert waste does not decompose or rot, such as concrete and white goods, and has no potentially hazardous content once landfilled.

### **Recyclable collection systems**

For this publication, the following definitions of bin types have been used:

- *2 crate or commingled crate system* - refers to a crate for the collection of containers and a crate for the collection of paper or one crate that is used to collect containers and paper mixed together;
- *Crate and tied bundle* - refers to a crate for the collection of containers and a tied bundle (or a loose stack) for the collection of paper;
- *Commingled bin* - refers to one collection system used to accept containers and paper mixed together.
- *Split bin* - refers to the collection of containers and paper in one collection system but is segmented to accept both recyclables streams;
- *Split Garbage & Recyclables* - refers to the collection of recyclables (commingled containers and paper) together with garbage in one collection system but is segmented to accept the two different waste streams;

### **Regional Waste Management Groups (RWMG)**

There are 16 Regional Waste Management Groups, which cover all 79 Victorian local governments, divided into metro and non-metro areas. They vary in the number of local governments they include from one local government to ten local governments. Each RWMG is responsible for coordinating the waste management activities for its member local governments.

### **Resource Recovery**

Where items are collected so as to avoid waste going to landfill. Items recovered range from those collected through kerbside recycling (e.g. glass bottles), to scrap steel, green organics and motor oil

### **Service provision categories**

The six kerbside recycling service provision categories established in the *Guide to Preferred Service Standards for Kerbside Recycling in Victoria* have been applied in this report to the range of waste management services provided by local government. Each

local government area has been coded to a service provision category (see Appendix C) according to the following guidelines:

- *Inner Metropolitan:* Covering the more densely populated inner area of Melbourne. Characterised by high levels of multi-tenanted dwellings, narrower streets making accessibility for collection purposes difficult, and generally short distances to a landfill/transfer station, sorting facilities and end markets for recyclables. For example, Yarra and Port Phillip City Councils.
- *Outer Metropolitan:* A geographically more dispersed part of Melbourne, which is generally based on average population density, average block sizes and generally short distances to a landfill/transfer station, sorting facilities and end markets for recyclables. For example, Whitehorse, Monash and Hume City Councils.
- *Melbourne Fringe:* Areas on the outskirts of Melbourne often with a blend of urban and rural areas. Likely to have slightly larger block size and moderate collection transport costs and freight costs to a landfill/transfer station, sorting facilities and end markets for recyclables. Includes metro and non-metro local governments. For example, Nillumbik, Cardinia and Macedon Ranges Shire Councils.
- *Major Provincial Centres:* Characterised by significant population totals and average population density. Likelihood of regional sorting facility within the city and reasonable transport route to Melbourne or other market destinations. Relatively short distances to a landfill/transfer station for waste disposal. For example, Wodonga City Council, Greater Bendigo and Ballarat City Councils.
- *Small Provincial Centres:* Population centres of moderate size and density with some surrounding semi-rural properties. Reasonable likelihood of transportation to a major centre for sorting and additional transportation of recyclables to reprocessing markets. Moderate distances to a landfill/transfer station for waste disposal. For example, Ararat Rural City Council, Baw Baw and Campaspe Shire Councils.
- *Rural Townships/Remote:* Small population centres with significant distances to sorting and reprocessing facilities. Rural areas with sparse populations and lower level road infrastructure, greater distances to a landfill/transfer station for waste disposal. For example, Buloke, Corangamite and Moira Shire Councils.

### **Tonnes collected**

Conversion factors have been used to convert quantities reported in cubic metres to tonnes. No compaction factors have been taken into account unless otherwise stated on the survey forms.

The conversion factors as used by EcoRecycle Victoria are:

1 cubic metre is equal to:

Paper/cardboard .....	0.10 tonne
Household garbage/Garden/vegetation/.....	0.15
Wood/timber .....	0.30
Glass .....	0.347
Plastics .....	0.013
Steel cans .....	0.052
Aluminium cans .....	0.026
Commingled recyclables, i.e. plastic/glass/steel/aluminium .....	0.063

### **Total households serviced**

Refers to both residential households *and* commercial and industrial premises serviced. Many local governments cannot provide a split of the number of commercial and industrial premises serviced or do not have a separate charge for this service. For

practical reasons, the derived figures calculated in this publication which rely upon the *Total households serviced* such as *Cost per household*, refer to the total residential *and* commercial and industrial premises serviced.

### **Transfer Stations**

For the purpose of this survey, transfer stations are defined as any facility that collects and consolidates waste before being transferred to a disposal site, i.e. landfill. The size of the collection systems may vary in size, including small mobile garbage bins, mini-skips and push-pits (a pit from which the waste is pushed into a large bin).

A transfer station is further defined as any location or site designated by a local government as a transfer station regardless of its physical appearance or size. Where resource recovery is undertaken at a landfill site then strictly speaking it is not considered a transfer station as it has reached its final destination (i.e. the landfill) unless a local government considers this location to be a transfer station.

## APPENDIX C TABLE OF LOCAL GOVERNMENTS IN ALPHABETICAL ORDER

Local governments in alphabetical order (by region, service provision category and metro/non-metro classification), Victoria 2002-03

<i>Council name</i>	<i>Regional Waste Management Group</i>	<i>Service Provision Category</i>	<i>Metro/Non-metro classification</i>
Alpine Shire Council	North Eastern RWMG	Small Provincial	Non-Metro
Ararat Rural City Council	Grampians RWMG	Small Provincial	Non-Metro
Ballarat City Council	Highlands RWMG	Major Provincial	Non-Metro
Banyule City Council	Northern RWMG	Outer Metropolitan	Metro
Bass Coast Shire Council	Gippsland RWMG	Small Provincial	Non-Metro
Baw Baw Shire Council	Gippsland RWMG	Small Provincial	Non-Metro
Bayside City Council	South Eastern RWMG	Outer Metropolitan	Metro
Benalla Rural City Council	North Eastern RWMG	Small Provincial	Non-Metro
Boroondara City Council	South Eastern RWMG	Outer Metropolitan	Metro
Brimbank City Council	Western RWMG	Outer Metropolitan	Metro
Buloke Shire Council	Central Murray RWMG	Rural Township	Non-Metro
Campaspe Shire Council	Goulburn Valley RWMG	Small Provincial	Non-Metro
Cardinia Shire Council	South Eastern RWMG	Melbourne Fringe	Metro
Casey City Council	South Eastern RWMG	Outer Metropolitan	Metro
Central Goldfields Shire Council	Highlands RWMG	Small Provincial	Non-Metro
Colac Otway Shire Council	Barwon RWMG	Small Provincial	Non-Metro
Corangamite Shire Council	South Western RWMG	Rural Township	Non-Metro
Darebin City Council	Northern RWMG	Inner Metropolitan	Metro
East Gippsland Shire Council	Gippsland RWMG	Small Provincial	Non-Metro
Frankston City Council	South Eastern RWMG	Outer Metropolitan	Metro
Gannawarra Shire Council	Central Murray RWMG	Rural Township	Non-Metro
Glen Eira City Council	South Eastern RWMG	Inner Metropolitan	Metro
Glenside Shire Council	South Western RWMG	Rural Township	Non-Metro
Golden Plains Shire Council	Highlands RWMG	Rural Township	Non-Metro
Greater Bendigo City Council	Calder RWMG	Major Provincial	Non-Metro
Greater Dandenong City Council	South Eastern RWMG	Outer Metropolitan	Metro
Greater Geelong City Council	Barwon RWMG	Major Provincial	Non-Metro
Greater Shepparton City Council	Goulburn Valley RWMG	Major Provincial	Non-Metro
Hepburn Shire Council	Highlands RWMG	Small Provincial	Non-Metro
Hindmarsh Shire Council	Desert Fringe RWMG	Rural Township	Non-Metro
Hobsons Bay City Council	Western RWMG	Inner Metropolitan	Metro
Horsham Rural City Council	Grampians RWMG	Small Provincial	Non-Metro
Hume City Council	Northern RWMG	Outer Metropolitan	Metro
Indigo Shire Council	North Eastern RWMG	Small Provincial	Non-Metro
Kingston City Council	South Eastern RWMG	Outer Metropolitan	Metro
Knox City Council	Leastwaste RWMG	Outer Metropolitan	Metro
Latrobe City Council	Gippsland RWMG	Small Provincial	Non-Metro
Loddon Shire Council	Central Murray RWMG	Rural Township	Non-Metro

<i>Council name</i>	<i>Regional Waste Management Group</i>	<i>Service Provision Category</i>	<i>Metro/Non-metro classification</i>
Macedon Ranges Shire Council	Calder RWMG	Melbourne Fringe	Non-Metro
Manningham City Council	Leastwaste RWMG	Outer Metropolitan	Metro
Mansfield Shire Council	North Eastern RWMG	Rural Township	Non-Metro
Maribyrnong City Council	Western RWMG	Inner Metropolitan	Metro
Maroondah City Council	Leastwaste RWMG	Outer Metropolitan	Metro
Melbourne City Council	Western RWMG	Inner Metropolitan	Metro
Melton Shire Council	Western RWMG	Outer Metropolitan	Metro
Mildura Rural City Council	Mildura RWMG	Small Provincial	Non-Metro
Mitchell Shire Council	Goulburn Valley RWMG	Small Provincial	Non-Metro
Moirra Shire Council	Goulburn Valley RWMG	Rural Township	Non-Metro
Monash City Council	South Eastern RWMG	Outer Metropolitan	Metro
Moonee Valley City Council	Western RWMG	Inner Metropolitan	Metro
Moorabool Shire Council	Highlands RWMG	Melbourne Fringe	Non-Metro
Moreland City Council	Northern RWMG	Inner Metropolitan	Metro
Mornington Peninsula Shire Council	Mornington Peninsula RWMG	Melbourne Fringe	Metro
Mount Alexander Shire Council	Calder RWMG	Small Provincial	Non-Metro
Moyne Shire Council	South Western RWMG	Rural Township	Non-Metro
Murrindindi Shire Council	Goulburn Valley RWMG	Rural Township	Non-Metro
Nillumbik Shire Council	Northern RWMG	Melbourne Fringe	Metro
Northern Grampians Shire Council	Grampians RWMG	Small Provincial	Non-Metro
Port Phillip City Council	Western RWMG	Inner Metropolitan	Metro
Pyrenees Shire Council	Highlands RWMG	Rural Township	Non-Metro
Queenscliffe Borough Council	Barwon RWMG	Small Provincial	Non-Metro
South Gippsland Shire Council	Gippsland RWMG	Small Provincial	Non-Metro
Southern Grampians Shire Council	South Western RWMG	Small Provincial	Non-Metro
Stonnington City Council	South Eastern RWMG	Inner Metropolitan	Metro
Strathbogie Shire Council	Goulburn Valley RWMG	Rural Township	Non-Metro
Surf Coast Shire Council	Barwon RWMG	Small Provincial	Non-Metro
Swan Hill Rural City Council	Central Murray RWMG	Small Provincial	Non-Metro
Towong Shire Council	North Eastern RWMG	Rural Township	Non-Metro
Wangaratta Rural City Council	North Eastern RWMG	Small Provincial	Non-Metro
Warrnambool City Council	South Western RWMG	Small Provincial	Non-Metro
Wellington Shire Council	Gippsland RWMG	Small Provincial	Non-Metro
West Wimmera Shire Council	Desert Fringe RWMG	Rural Township	Non-Metro
Whitehorse City Council	Leastwaste RWMG	Outer Metropolitan	Metro
Whittlesea City Council	Northern RWMG	Outer Metropolitan	Metro
Wodonga Rural City Council	North Eastern RWMG	Major Provincial	Non-Metro
Wyndham City Council	Western RWMG	Outer Metropolitan	Metro
Yarra City Council	Western RWMG	Inner Metropolitan	Metro
Yarra Ranges Shire Council	Leastwaste RWMG	Melbourne Fringe	Metro
Yarriambiack Shire Council	Grampians RWMG	Rural Township	Non-Metro

## APPENDIX D WASTE GENERATION AND DIVERSION RATE PER HOUSEHOLD BY LOCAL GOVERNMENT

All local governments with three kerbside services (garbage, recyclables and green organics) are listed below, ranked by diversion rate per household.

### Diversion rate and total waste generation per household for those local governments with garbage, recyclables and green organics services, Victoria 2002-03

<i>Local Government</i>	<i>Garbage household yield (kg)</i>	<i>Recyclables household yield (kg)</i>	<i>Green organics household yield (kg)</i>	<i>Total waste generation (kg)</i>	<i>Diversion rate (%)</i>
1 Moyne Shire Council <sup>1</sup>	637.7	194.1	749.9	1,581.7	59.7
2 Maroondah City Council	436.6	258.4	284.1	979.2	55.4
3 Manningham City Council	516.8	313.7	321.6	1,152.0	55.1
4 Nillumbik Shire Council	462.3	340.5	220.0	1,022.8	54.8
5 Colac Otway Shire Council	372.7	108.6	336.3	817.6	54.4
6 Monash City Council	523.7	247.7	299.0	1,070.4	51.1
7 Bayside City Council	537.7	217.6	304.5	1,059.8	49.3
8 Knox City Council	546.4	269.1	227.7	1,043.2	47.6
9 Kingston City Council	481.9	241.1	186.7	909.6	47.0
10 Banyule City Council	410.5	241.6	117.1	769.2	46.6
11 Greater Geelong City Council	365.0	217.0	81.5	663.5	45.0
12 Frankston City Council	425.0	231.7	73.3	730.0	41.8
13 Casey City Council	520.3	242.5	101.6	864.4	39.8
14 Swan Hill Rural City Council	525.7	338.5	5.9	870.2	39.6
15 Moreland City Council	469.6	214.0	92.2	775.9	39.5
16 Boroondara City Council	638.1	255.2	154.1	1,047.3	39.1
17 Darebin City Council	493.2	214.4	83.4	791.0	37.6
18 Corangamite Shire Council	475.5	134.5	148.0	758.1	37.3
19 Yarra City Council	402.9	226.5	6.9	636.3	36.7
20 Stonnington City Council	419.4	213.0	26.7	659.0	36.4
21 Whitehorse City Council	503.8	237.4	40.0	781.2	35.5
22 Yarra Ranges Shire Council	397.3	190.2	27.0	614.5	35.3
23 Whittlesea City Council	581.9	253.2	48.8	883.9	34.2
24 Port Phillip City Council	390.9	186.8	2.4	580.0	32.6
25 Hume City Council	659.1	224.1	91.5	974.7	32.4
26 Ballarat City Council	513.1	161.7	62.8	737.6	30.4
27 Queenscliffe Borough Council	488.9	175.4	33.8	698.1	30.0
28 Hobsons Bay City Council	535.5	193.7	14.0	743.2	27.9
29 Maribyrnong City Council	637.6	219.7	20.6	877.9	27.4
30 Mornington Peninsula Shire Council	517.3	189.3	4.8	711.4	27.3
31 Greater Dandenong City Council <sup>2</sup>	685.7	253.0	—	938.7	27.0
32 Glen Eira City Council	625.1	188.7	34.1	847.8	26.3
33 Central Goldfields Shire Council	449.6	126.9	12.7	589.2	23.7
34 Wodonga Rural City Council	741.5	174.4	53.7	969.6	23.5
35 Brimbank City Council	718.2	186.9	27.6	932.7	23.0
36 Baw Baw Shire Council	544.0	109.8	51.4	705.3	22.9
37 Cardinia Shire Council	615.1	178.8	2.9	796.9	22.8
38 Moonee Valley City Council	735.8	173.6	4.7	914.2	19.5
39 Melbourne City Council	512.2	111.7	0.8	624.6	18.0
40 Latrobe City Council	723.6	101.4	22.2	847.2	14.6

<sup>1</sup>These figures should be read with caution (particularly green organic yields) which in comparison with other local government's, appear overstated

<sup>2</sup>Greater Dandenong was unable to provide tonnes for green organics

The table below ranks the household yield of recyclables by all local governments. Those who had received funding for Best Practice for Kerbside Recycling by 30 June 2003, are also indicated.

**Recyclables household yield by local government, Victoria 2002-03**

<i>Local Government</i>	<i>Recyclables household yield (kg)</i>	<i>Recyclables collection system</i>	<i>Best Practice</i>
1 Nillumbik Shire Council	340.5	120L & tied bundle	
2 Swan Hill Rural City Council	338.5	240L commingled	
3 Macedon Ranges Shire Council	332.4	240L commingled	
4 Manningham City Council	313.7	240L split Recyclables	Best Practice
5 Benalla Rural City Council	307.3	Crate & tied bundle	
6 Mansfield Shire Council	284.3	Crate & tied bundle	
7 Knox City Council	269.1	240L split Recyclables	Best Practice
8 Gannawarra Shire Council	264.2	240L commingled	
9 Melton Shire Council	262.9	240L split Recyclables & Garbage	
10 Maroondah City Council	258.4	240L split Recyclables	Best Practice
11 Boroondara City Council	255.2	Crate & tied bundle	
12 Whittlesea City Council	253.2	240L & tied bundle	
13 Greater Dandenong City Council	253.0	240L commingled	Best Practice
14 Monash City Council	247.7	2 Crate system	
15 Greater Shepparton City Council	246.0	240L commingled	
16 Casey City Council	242.5	240L commingled	Best Practice
17 Banyule City Council	241.6	120L & tied bundle	
18 Strathbogie Shire Council	241.6	Crate & tied bundle	
19 Kingston City Council	241.1	240L split Recyclables	Best Practice
20 Whitehorse City Council	237.4	Crate & tied bundle	
21 Frankston City Council	231.7	240L commingled	
22 Yarra City Council	226.5	2 Crate system	Best Practice
23 Hume City Council	224.1	Crate & tied bundle	
24 Maribyrnong City Council	219.7	Crate & tied bundle	
25 Bayside City Council	217.6	Crate & tied bundle	
26 Greater Geelong City Council	217.0	240L commingled	Best Practice
27 Wyndham City Council	214.4	Crate & tied bundle	
28 Darebin City Council	214.4	Crate & tied bundle	
29 Moreland City Council	214.0	120L commingled	
30 Stonnington City Council	213.0	Crate & tied bundle	
31 East Gippsland Shire Council	211.7	240L commingled	
32 Southern Grampians Shire Council	204.0	120L & tied bundle	
33 Mount Alexander Shire Council	200.3	240L commingled monthly	
34 Moyne Shire Council	194.1	240L commingled	Best Practice
35 Hobsons Bay City Council	193.7	Crate & tied bundle	
36 Warrnambool City Council	193.7	Crate & tied bundle	
37 Yarra Ranges Shire Council	190.2	120L & tied bundle	
38 Mornington Peninsula Shire Council	189.3	240L split Recyclables & Garbage & tied bundle	
39 Glen Eira City Council	188.7	2 Crate system	Best Practice
40 Northern Grampians Shire Council	187.8	Crate & tied bundle	

<i>Local Government</i>	<i>Recyclables household yield (kg)</i>	<i>Recyclables collection system</i>	<i>Best Practice</i>
41 Brimbank City Council	186.9	Crate & tied bundle	
42 Port Phillip City Council	186.8	Crate & tied bundle	
43 Mildura Rural City Council	185.6	Crate & tied bundle	
44 Moira Shire Council	183.4	240L commingled	
45 Surf Coast Shire Council	179.0	240L commingled	
46 Cardinia Shire Council	178.8	240L commingled	Best Practice
47 Queenscliffe Borough Council	175.4	120L commingled	
48 Wodonga Rural City Council	174.4	240L commingled	
49 Moonee Valley City Council	173.6	Crate & tied bundle	
50 Hindmarsh Shire Council	166.7	Bag	
51 Wellington Shire Council	162.5	240L commingled	
52 Hepburn Shire Council	162.0	240L commingled	
53 Ballarat City Council	161.7	240L & tied bundle	
54 Towong Shire Council	159.5	240L commingled	
55 Ararat Rural City Council	155.8	Crate & tied bundle	
56 Alpine Shire Council	152.4	Crate & tied bundle	
57 Mitchell Shire Council	147.3	240L commingled	
58 South Gippsland Shire Council	146.6	Crate & tied bundle	
59 Indigo Shire Council	144.3	240L commingled	
60 Moorabool Shire Council	138.0	Crate & tied bundle	
61 Wangaratta Rural City Council	137.7	240L commingled	Best Practice
62 Corangamite Shire Council	134.5	Crate & tied bundle	
63 Bass Coast Shire Council	134.4	240L commingled	
64 Glenelg Shire Council	130.8	Crate	
65 Pyrenees Shire Council	130.4	120L & tied bundle	
66 Greater Bendigo City Council	127.1	Crate & tied bundle	
67 Central Goldfields Shire Council	126.9	240L & crate	
68 Golden Plains Shire Council	116.0	240L commingled	
69 Melbourne City Council	111.7	Crate & tied bundle	
70 Baw Baw Shire Council	109.8	240L split Recyclables & Garbage	
71 Colac Otway Shire Council	108.6	240L & tied bundle	
72 Latrobe City Council	101.4	Crate & tied bundle	
73 Murrindindi Shire Council	89.9	Crate & tied bundle	
74 Campaspe Shire Council	89.1	Crate & tied bundle	
75 Horsham Rural City Council	85.2	Bag & tied bundle	
76 West Wimmera Shire Council	77.9	Crate & tied bundle	
77 Buloke Shire Council	57.4	Bag & tied bundle	
78 Loddon Shire Council <sup>1</sup>	0.0	No kerbside recyclables service	
79 Yarriambiack Shire Council <sup>1</sup>	0.0	No kerbside recyclables service	
<i>State average</i>	<i>211.1</i>		

<sup>1</sup>Loddon and Yarriambiack Shire Councils do not have a kerbside recyclables service, but do provide drop-off facilities at landfills and transfer stations