Appendix 2: Waste in Western Australia – additional data

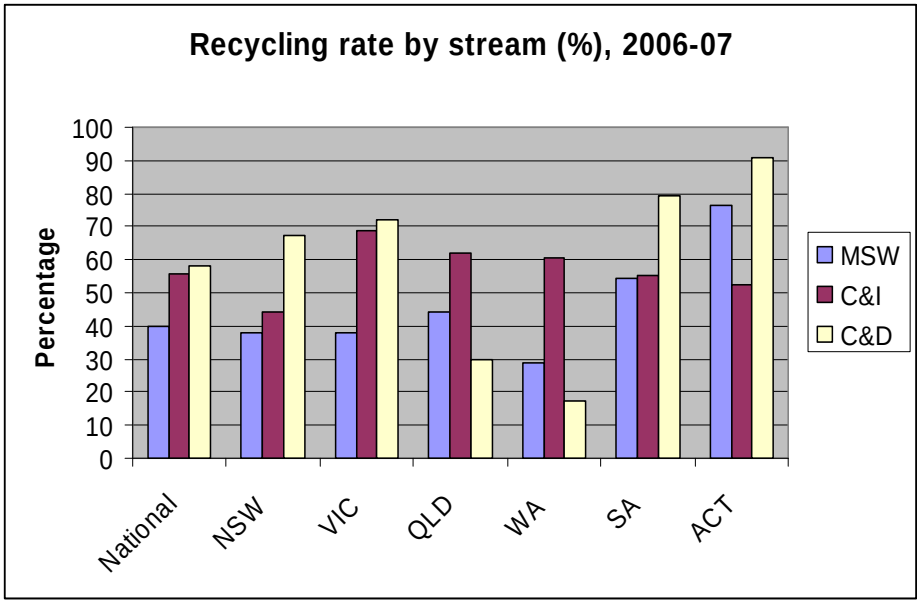
National Overview

The information in this section is taken from the draft *National Waste Report* produced by the Department of Environment, Water, Heritage and the Arts in 2009

Figure1 shows a breakdown of recycling by waste stream and jurisdiction. At the national level, the recycling rates within each stream in 2006–07 were:

- municipal solid waste—40%
- commercial and industrial waste—56%
- construction and demolition waste—58%.

Figure 1: Australia—percentage of each waste stream that is recycled, 2006–07(source draft National Waste Report 2009)



Recycling rates for each stream within individual jurisdictions can differ markedly from each other, and from the national average.

For purposes of comparison, data from 2006/07 has been used.

Generation per person

Figure 2 shows the waste generated per person in NSW, Victoria, Queensland, WA, SA and the ACT for 2006–07, in kilograms. Comparable data for Tasmania and the NT are not available. A breakdown by waste stream is shown at **Figure 3**.

Figure 2: ***Kilograms of waste generated, per person, 2006–07 (source draft National Waste Report 2009)***

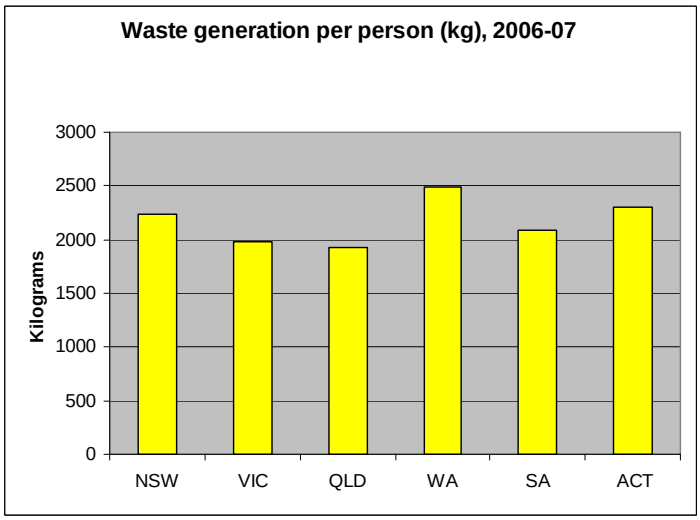
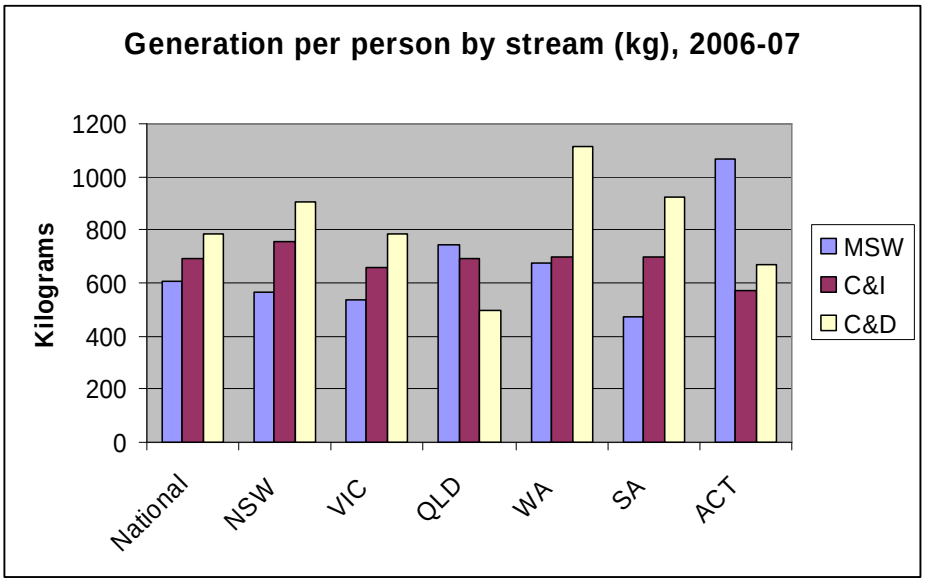


Figure 3: ***Kilograms of waste generated in each waste stream, per person, 2006–07 (source draft National Waste Report 2009)***



For purposes of comparison, data from 2006/07 has been used

Metropolitan

The information in this section is taken from *Assessment of Waste Disposal and Material Recovery Infrastructure for Perth* (2008) produced by Cardno on behalf of the Waste Authority.

Total Perth Metropolitan Region Waste / Recycling Generation

The Perth Metropolitan Region continues to increase the amount of waste it produces (**Table 1**), however this is being offset to a degree by increased recycling activity. The Perth Metropolitan Region generated approximately 5.3 million tonnes of waste in 2006/07. Of this, 3.6 million tonnes was sent to landfill and 1.7 million tonnes was recycled (32% recovery rate). Commercial and Industrial (C&I) and Construction and Demolition (C&D)) have shown increases in waste to landfill and recycling, whilst MSW has varied somewhat over the past three financial years.

Table 1: Summary of total generation of waste (by waste stream) and destination (landfill or recycled) between 2004/05 and 2006/07 in tonnes

	2004/05		2005/06		2006/07	
Waste Stream	Landfill	Recycled	Landfill	Recycled	Landfill	Recycled
MSW	720,220	343,150	698,240	403,520	714,090	388,600
C&I	539,270	800,000	668,430	881,340	830,380	890,560
C&D	1,586,600	300,000	1,709,690	331,610	2,096,960	409,350
Total	**2,846,090**	**1,443,150**	**3,076,360**	**1,616,470**	**3,641.430**	**1,688,510**

Note: Recycling totals are for Western Australia, but >95% can be considered to be from the Perth Region

Approximately 80% of the MSW kerbside waste is recoverable, whilst >90% of C&I and C&D is potentially recoverable if waste mixing / contamination is minimised.

Waste and resource recovery infrastructure

A crucial underpinning of modern waste management is the infrastructure needed for its collection, handling, processing and disposal. Waste infrastructure is expensive and is usually established by municipal authorities, even though private companies generate most of the material inputs. While waste infrastructure is essential, siting is often the subject of 'not in my backyard' disputes. In this section we review the asset base of waste and resource recovery infrastructure in WA.

Perth

A 2008 assessment[1] found that overall, Perth has adequate waste infrastructure for its needs towards 2020. However, potential strains on waste infrastructure will become apparent in certain geographic areas over the next 10 years unless there is planning or efforts to boost the recycling rate.

The network of transfer stations is adequate and well distributed, and demand for landfill can be met through current and planned future sites on the urban fringe. Standards of management and engineering at metropolitan landfills are generally good. The facilities for sorting and managing recyclables are limited, however, contributing to unnecessarily high levels of recyclable material being sent to landfill. There are plans for additional materials recovery facilities, but the recent fall in commodity prices could undermine the financial viability of these plans. Companies that accept recycled materials typically have the capacity to receive greater volumes of materials, but some recycling infrastructure has closed in Perth due to limited market scale. This problem has undermined paper, cardboard, plastic and glass recycling.

In recent years, several alternative waste treatment facilities have been established in Perth to pre-treat municipal solid waste and recover materials prior to disposal to landfill. These facilities have contributed to improved recycling, improved diversion from landfill, and improved management of greenhouse gases. As with all waste management facilities there is a potential issue of interaction between the facilities and neighbours which requires careful planning and careful management.

Recent temporary closures of some waste management infrastructure in Perth resulted in a number of incidents where recyclable materials were landfilled. The risk of this recurring in future will be reduced by the adoption of contingency arrangements and by plans for additional materials recovery facilities.

Waste Infrastructure Summary

The information in this section is taken from Assessment of Waste Disposal and Material Recovery Infrastructure for Perth (2008) produced by Cardno on behalf of the Waste Authority.

The Perth Metropolitan Region has a number of geographically distributed waste infrastructure facilities that have a specific purpose depending on the waste stream that requires disposal or recycling. Facilities currently include Class I (inert) landfills, Class II / III (putrescible) landfills, a Class IV (hazardous) landfill, inert and putrescible transfer stations, Material Recovery Facilities (MRFs), Resource Recovery Facilities (RRFs) and green waste processors. Other recyclable reprocessors are also located in the Perth Metropolitan Region, but are not concentrated on in the Cardno study.

[1] Cardno (WA) Pty Ltd (2008) *Assessment of waste disposal and material recovery infrastructure for Perth - Towards 2020*, prepared for the Waste Authority

Waste Infrastructure currently available or under construction is outlined in Table 2.

Table 2: Waste Infrastructure currently in place that service the Perth Metropolitan Region

Type of Facility	Number
Class I (inert) landfills	12
Class II / III (putrescible) landfills	7
Class IV (hazardous) landfills	1
Inert "recyclers"	2
Inert "transfer / recycling" stations	3
Inert "transfer" stations	3
Putrescible transfer stations	9
Municipal MRFs	7
Major commercial MRFs	2
Municipal RRFs	2 (2 under construction)
Green waste processors	15

The summary of current throughput, maximum throughput, slack capacity, landfill airspace remaining and predicted life expectancy (based on current throughputs) for waste infrastructure in the Perth Metropolitan Region is presented in **Table 3.**

Table 3: Summary of Waste Infrastructure (actual / maximum) throughput, slack capacity, airspace remaining and estimated facility type lifespan within each Regional Council

Regional Council	Infrastructure	Actual throughput (T)	Maximum throughput (T)	Slack Capacity (T)	Remaining Airspace (m3)	Facility Lifespan (2006/07 throughput) (years)
MRC	Landfills (Putrescible)	356,300	N/A	N/A	4,500,000	10
	Landfills (Inert)	1,065,275	N/A	N/A	3,720,000	5
	Material Recovery Facility (MRF)	22,000	32,000	10,000	N/A	Unknown
	Resource Recovery Facility (RRF)	66,000	66,000	-	N/A	Unknown
	Inert Recycler	No Inert Recyclers				
	Transfer Station (Putrescible)	80,500	90,000	9,500	N/A	Unknown
	Transfer Station (Inert)	No Inert Transfer Station				
	Greenwaste	20,000	70,000	80,000	N/A	Unknown
EMRC	Landfills (Putrescible)	356,225	N/A	N/A	13,200,000	30
	Landfill (Hazardous)	25,000	N/A	N/A	290,000	14
	Landfills (Inert)	114,560	N/A	N/A	70,000	1
	Material Recovery Facility (MRF)	40,000	45,000	5,000	N/A	Unknown
	Resource Recovery Facility (RRF)	No RRF at present				
	Inert Recycler	235,000	1,390,000	1,165,000	N/A	Unknown
	Transfer Station (Putrescible)	29,750	35,000	5,250	N/A	Unknown
	Transfer Station (Inert)	130,000	-	-	N/A	Unknown
	Greenwaste	31,000	56,000	15,000	N/A	Unknown
RRC	Landfills (Putrescible)	244,754	N/A	N/A	3,250,000	11
	Landfills (Inert)	90,000	N/A	N/A	200,000	3
	Material Recovery Facility (MRF)	19,500	19,500	-	N/A	Unknown
	Resource Recovery Facility (RRF)	No RRF at present				
	Inert Recycler	130,000	175,000	45,000	N/A	Unknown
	Transfer Station (Putrescible)	14,500	15,000	500	N/A	Unknown
	Transfer Station (Inert)	-	-	-	N/A	-
	Greenwaste	35,000	81,250	46,250	N/A	Unknown
SMRC	Landfills (Putrescible)	521,816	N/A	N/A	9,200,000	14
	Landfills (Inert)	962,151	N/A	N/A	9,500,000	15
	Material Recovery Facility (MRF)	150,500	212,400	61,900	N/A	Unknown
	Resource Recovery Facility (RRF)	100,000	115,000	15,000	N/A	Unknown
	Inert Recycler	155,000	279,000	124,000	N/A	Unknown
	Transfer Station (Putrescible)	121,000	281,000	59,000	N/A	Unknown
	Transfer Station (Inert)	-	-	-	N/A	Unknown
	Greenwaste	74,600	98,000	23,400	N/A	Unknown
WMRC	Landfills (Putrescible)	No Putresible Landfill				
	Landfills (Inert)	No Inert Landfill				
	Material Recovery Facility (MRF)	No MRF				
	Resource Recovery Facility (RRF)	No RRF (Operational 2009)				
	Inert Recycler	No Inert Recycler				
	Transfer Station (Putrescible)	35,000	50,000	15,000	N/A	Unknown
	Transfer Station (Inert)	No Inert Transfer Station				
	Greenwaste	6,000	6,500	500	N/A	Unknown
Total	Landfills (Putrescible)	1,479,095	N/A	N/A	30,150,000	16
	Landfills (Hazardous)	25,000	N/A	N/A	290,000	14
	Landfills (Inert)	2,231,987	N/A	N/A	13,490,000	9
	Material Recovery Facility (MRF)	249,000	333,900	84,900	N/A	Unknown
	Resource Recovery Facility (RRF)	166,000	181,000	15,000	N/A	Unknown
	Inert Recycler	390,000	1,669,000	1,289,000	N/A	Unknown
	Transfer Station (Putrescible)	280,750	471,000	89,250	N/A	Unknown
	Transfer Station (Inert)	130,000	N/A	N/A	N/A	Unknown
	Greenwaste	166,600	311,750	165,150	N/A	Unknown

Note: - Life expectancy based on 2006/07 throughputs
- MRFs include municipal and commercial operations
- Total includes Greens Recycling (Bunbury)
- Reported MRF maximum throughput and slack capacity is based on a single eight hour shift

- It can be assumed that a double shift (16 hours) would double the current, maximum and slack capacity of MRFs
- 91% coverage (**Appendix A** presents responses)

The MRC and the SMRC are areas that accept the most waste in the Perth Metropolitan Area with approximately 1.45 million tonnes each. This can be attributed to the amount of waste infrastructure currently present in the areas, especially in regards to inert landfills. The MRC accepts significant amounts of MSW to Tamala Park due to its population size and SMRC accepts high amount of C&I waste due to its high commercial base.

Inert and putrescible landfills in 2006/07 accepted the highest quantity of waste in the Metropolitan Area with 2.2 million (inert C&I, C&D) and 1.5 million tonnes of waste (MSW, C&I and C&D) respectively. Life expectancy of putrescible landfills in each Regional Council ranges from 10 years (MRC) to 30 years (EMRC). Life expectancy of inert landfills in each Regional Council ranges from one year (EMRC) to 15 years (SMRC).

Regional WA

Almost every small town in rural Western Australia has its own landfill, mostly operated by the local council. Many of these are unlined, so that leachate can leak into the environment. Methane, a powerful greenhouse gas that arises from decaying organic wastes, is not collected and so vents into the atmosphere. In smaller settlements, landfills are often unattended, leading to increased risk of fires and dumping of inappropriate materials. In mining settlements general waste is sometimes managed in conjunction with spoil. In some remote aboriginal settlements there is no organised waste management at all.

A 2005 study examined recycling infrastructure in regional WA[2]. It found that over half of the 110 local governments in regional WA recover traditional recyclable materials, mostly via drop-off recycling facilities. Kerbside recycling is well established in the south-west of the State where higher population densities and proximity to markets in Perth improve commercial viability. Sorting infrastructure in regional WA is sparse. There are materials recovery facilities in Albany, Bunbury and Mandurah and small-scale sorting at Broome, Esperance, Newman and Wickepin. Rural sorting often relies on volunteer manual labour. Low-cost baling machines are often used for compacting aluminium, paper, cardboard and plastics in order to improve transport efficiencies.

There is an issue relating to effective waste management in remote communities, especially remote indigenous communities, where waste management is at a very basic level, litter is a significant problem and the impacts of these on both the environment and public health are of concern.

[2] BSD / Meinhardt (2005) *Kerbside recycling: exploring regional transport economics.* Prepared for the Department of Environment, Perth.

Waste management responsibilities

A network of organisations and groups share responsibility for the management of waste. Their roles are summarised below.

- *The Waste Authority*

  "The Waste Authority is established by the *Waste Avoidance and Resource Recovery Act 2007* with various non-regulatory functions and powers including:

  - strategic policy and planning for the transition towards zero waste to landfill in Western Australia;
  - the implementation of policies, plans and programs to achieve that transition;
  - the administration of allocated funds raised through the collection of the landfill levy."[3]

- *Department of Environment and Conservation*

  The Department of Environment and Conservation is responsible for regulatory, compliance and enforcement functions in relation to waste.

- *Environmental Protection Authority (EPA)*

  The EPA's functions include development of environmental protection policies and considering proposals for waste treatment facilities with the potential to have a significant environmental effect.

- *Local government*

  Local governments have a primary role in managing municipal waste and informing residents and ratepayers about waste management and recycling. Councils also develop and operate much of waste infrastructure.

- *Regional Councils*

  Regional Councils are formal groups of local governments that aim to provide services, including sustainable waste management, for member councils' communities. The groups are established under the *Local Government Act 1995*. Across Western Australia, there are seven Regional Councils established to deal with waste, five of which cover metropolitan Perth.

[3] Explanatory Memoranda for the Waste Avoidance and Resource Recovery Bill 2007, available online http://www.austlii.edu.au/au/legis/wa/bill_em/waarrb2007374/waarrb2007374.html, accessed 25/02/2009.

- *Municipal Waste Advisory Council*

  The Municipal Waste Advisory Council is a standing committee of the Western Australian Local Government Association which is actively involved in advocacy and program delivery for local government in the area of waste management.

- *Waste and resource recovery industry*

  The waste and resource recovery industry provides privately funded collection, sorting, reprocessing and disposal services.

- *Waste generators*

  Waste generators, including businesses and householders, are responsible for proper management of waste through their use of recycling and disposal systems.