



---

## **ANNUAL REPORT 2009/ 2010**

---

**Funders: Governments of NSW, VIC, QLD, WA, SA, TAS, ACT, NT  
& National Packaging Covenant Industry Association (NPCIA)**

Prepared for: Keep Australia Beautiful National Association

GPO Box 193, Canberra ACT 2601

M: 00419 016 401, [scottl@kab.org.au](mailto:scottl@kab.org.au)

P: 02 9698 8773, [www.kab.org.au](http://www.kab.org.au)

Based on field surveys conducted in Nov. 2005, May 2006, Nov. 2006, May 2007,  
Nov. 2007, May 2008, Nov 2008, May 2009, Nov 2009 and May 2010.

Project No: 8837

Date: July 2010

# CONTENTS

<b>Section 1</b>	<b>Overview.....</b>	<b>1</b>
	Executive Summary.....	1
	Suggested User Guide .....	3
<b>Section 2</b>	<b>Background and Content .....</b>	<b>4</b>
	Keep Australia Beautiful and the National Litter Index.....	5
	Purpose .....	6
	Limitations .....	6
<b>Section 3</b>	<b>National Litter Index Methodology .....</b>	<b>7</b>
3.1	Scope .....	8
3.2	Material Categorisation .....	8
3.3	Sites .....	9
	Residential .....	9
	Beach .....	9
	Industrial .....	9
	Car Park .....	9
	Shopping Centre.....	10
	Retail Strip/ Shops - Street Precinct .....	10
	Recreational Park.....	10
	Highway .....	10
	Site Type Representation .....	10
3.4	Volumes .....	11
3.5	Timing .....	12
3.6	Litter Counter Training .....	13
3.7	Auditing .....	13
3.8	Reporting.....	14
	Annual Results.....	14
	Litter per 1,000 m <sup>2</sup> .....	14
	Illegal Dumping and Miscellaneous Litter .....	14
<b>Section 4</b>	<b>Results.....</b>	<b>16</b>
4.1	National.....	17
	At a Glance .....	17
	Comparisons by Site Types.....	17
	Comparison by Main Material Types .....	22
	The Dirty Dozen.....	26
4.2	Australian Capital Territory .....	29
	At a Glance .....	29
	Comparisons by Site Types.....	29

	Comparison by Main Material Types .....	34
	The Dirty Dozen.....	39
4.3	New South Wales.....	42
	At a Glance .....	42
	Comparisons by Site Types.....	43
	Comparison by Main Material Types .....	47
	The Dirty Dozen.....	52
4.4	Northern Territory.....	56
	At a Glance .....	56
	Comparisons by Site Types.....	57
	Comparison by Main Material Types .....	61
	The Dirty Dozen.....	66
4.5	Queensland.....	70
	At a Glance .....	70
	Comparisons by Site Types.....	71
	Comparison by Main Material Types .....	75
	The Dirty Dozen.....	80
4.6	South Australia.....	83
	At a Glance .....	83
	Comparisons by Site Types.....	83
	Comparison by Main Material Types .....	88
	The Dirty Dozen.....	93
4.7	Tasmania .....	96
	At a Glance .....	96
	Comparisons by Site Types.....	97
	Comparison by Main Material Types .....	101
	The Dirty Dozen.....	106
4.8	Victoria .....	109
	At a Glance .....	109
	Comparisons by Site Types.....	110
	Comparison by Main Material Types .....	114
	The Dirty Dozen.....	119
4.9	Western Australia.....	122
	At a Glance .....	122
	Comparisons by Site Types.....	123
	Comparison by Main Material Types .....	127
	The Dirty Dozen.....	132
Appendix 1:	Supplementary Information .....	135
	2005/ 2006 - Areas Surveyed - Square Metres .....	136
	2006/ 2007 - Areas Surveyed - Square Metres .....	137
	2007/ 2008 - Areas Surveyed - Square Metres .....	138
	2008/ 2009 - Areas Surveyed - Square Metres .....	139
	2009/ 2010 - Areas Surveyed - Square Metres .....	140

	Litter Sub-Categories.....	141
Appendix 2:	Data Collection Form.....	144
Appendix 3:	McGregor Tan Research Profile.....	148
	Quality Management and Privacy Policy .....	151
	Quality Control.....	151
	Sampling Procedures .....	152
	Privacy Policy .....	152
	Data Analysis.....	153
	Some of our Clients .....	154

For enquiries on this report please contact:

- David O’Dea or Zing Hai Tan at McGregor Tan Research on 08 8433 0200.

Or

- Scott Lyall on 0419 016 401 at Keep Australia Beautiful National Association or your local Keep Australia Beautiful office.

# *Section 1*

## *Overview*

## *Executive Summary*

The Keep Australia Beautiful Network (KAB), consisting of independent State and Territory offices coordinated by a national secretariat, is a national organisation that seeks to lead, challenge and inspire all Australians to strive for a sustainable and litter free environment.

In 2005/2006, KAB, through the support of the Australian Government recommenced its bi-annual litter count and the annual National Litter Index (NLI) report. The report builds on research that has taken place in SA for many years. In 2005/2006 the Tasmanian count was supported by Cadbury Schweppes. In 2006/2007 a majority of States and Territories joined the Australian Government as financial supporters of the research: NSW, NT, QLD, SA, TAS, VIC, WA, and in 2006/2007 NT and ACT were included in the fieldwork for the first time. In 2008/09 the National Packaging Covenant Industry Association (NPCIA) came on board as a financial supporter of the NLI.

In its current reporting format, which commenced in 2005/06, it is expected that the NLI will, by providing reliable base line data on litter across Australia, assist governments, businesses and community organisations in the development of policies and programs that will reduce litter and provide increased pride in communities across Australia.

NLI counts are conducted in November and May each year, and following expansion to the ACT and Northern Territory now cover 983 sites. These sites are divided into eight site types:

- Beaches
- Car Parks
- Highways
- Industrial
- Recreational Parks
- Residential
- Retail
- Shopping Centres

Each count records all items of litter present. From the number of items volumes of litter are estimated using well established conversion factors.

This base data is then collated to provide trend comparisons between items and volumes within material types and across the various site types.

Currently all NLI sites are in urban and near-urban areas. All sites have been selected to be 'typical' for that site category, and are not varied from count to count. Each site has been measured to determine its area.

The 2009/10 National Litter Index has upheld key changes in the report which were initiated in previous years. These include:

- All results are quoted against a 1,000 square metre site area
- Illegal dumping has been split out of 'miscellaneous' litter and quoted separately
- Gutters have been included in all sites

As a result of these changes, benchmarking between individual states and the national data is more reliable.

Littering trends showed an overall decrease when collated across Australia, in comparison to figures from 2009/10, 2008/09, 2007/08, 2006/07 and 2005/06:

	Items per 1,000m <sup>2</sup>					Volume (litres) per 1,000m <sup>2</sup>				
	05/06	06/07	07/08	08/09	09/10	05/06	06/07	07/08	08/09	09/10
<b>NATIONAL</b>	70	74	68	63	66	8.86	9.68	8.59	7.73	7.55
<b>ACT</b>	-	68	56	56	51	-	7.04	6.06	4.77	3.31
<b>NSW</b>	80	71	77	65	75	14.95	14.69	11.90	12.13	13.43
<b>NT</b>	-	64	60	84	70	-	5.32	7.24	6.00	5.09
<b>QLD</b>	89	86	76	59	76	7.66	7.59	7.44	5.60	5.65
<b>SA</b>	60	61	68	57	54	7.23	11.08	9.55	8.02	7.13
<b>TAS</b>	59	70	61	64	86	5.15	6.68	5.90	9.20	9.04
<b>VIC</b>	71	80	48	43	50	7.87	7.74	4.19	2.87	4.91
<b>WA</b>	60	83	85	87	71	8.57	12.19	13.06	11.93	9.44

## Suggested User Guide

To obtain the best results from your review of this new National Litter Index reporting format it is suggested that the reader use the following five steps:

**Step 1: Methodology** - Review the new reporting methodology noting that the count results are all quoted against a base area of 1,000 square metres.

**Step 2: National Baseline** - Review the national year-to-year results from the 983 sites across Australia and note the changes across the site categories, e.g. (Column chart - page 18) the number of items increased at many locations except for car park, highway and industrial sites, leading to an overall increase from 63 to 66 items per 1,000m<sup>2</sup> while (Column chart - page 20) litter volume decreased at all locations other than beach, car park, recreational park and shopping centre sites, leading to an overall decrease of 0.18 litres per 1,000m<sup>2</sup>.

**Step 3: Benchmarking** - Compare your state's results with the national baseline to determine where improvement can be made.

**Step 4: Trend Analysis** - Review your state's year-to-year results and compare category variances to the national trend across the four counts recorded in the report. Highlight negative trends and use the accompanying tabulations to determine which items are increasing.

**Step 5: Setting Priorities** - Review your state's year-to-year composition charts to highlight changes in litter behaviour.

**Step 6: The Dirty Dozen** - Check your state's 'Dirty Dozen' to ensure that you are targeting the main litterers.

**David O'Dea**

*NLI Project Manager*

09/ 10 Report

## *Section 2*

# *Background and Content*

## **Keep Australia Beautiful and the National Litter Index**

Keep Australia Beautiful (KAB) National Association was formed in 1971 as a federation of the autonomous state KAB Councils which have been in existence since 1966 and continue their work today. A major focus of Keep Australia Beautiful's work is the reduction of litter and pollution. KAB encourages people all around Australia to care for their local environment through its awards programs such as the Australian Tidy Towns "Sustainable Communities", Sustainable Cities and the Clean Beaches target litter, recycling, packaging waste and graffiti.

A bi-annual National Litter Index was reinstated in 2005 with funding provided by the Commonwealth and several state governments. This support for a national litter count was prompted by the ratification of a second five-year term for the National Packaging Covenant. Covenant #2 has focused on improving the recovery of packaging products consumed away from home. A number of litter reduction projects have also been funded by the Covenant targeting roadside litter (Victoria) and car park litter (South Australia).

The revised Covenant is expected to be more results-driven than the first version and has a particular focus on improving the recovery of packaging on products consumed away from home.

The National Litter Index was initially developed by KESAB, the KAB Network member in South Australia. The methodology has been refined over many years of continuous surveying in South Australia and more recently from the Australian wide surveys undertaken for the National Litter Index.

## *Purpose*

The purpose of the National Litter Index is to provide insight regarding:

- The presence of litter items at sites within broadly comparable regions.
- Estimated volumes of litter objects within the litter stream, based upon a volume-per-item model.
- The contribution of objects recognized within established main material types to the overall litter stream.
- The most significant contributors to the litter stream - the 'Dirty Dozen'.

It is expected that the information derived from this research will be used by governments and community organisations to develop policies/ programs that will reduce litter and create increased pride in communities across Australia.

## *Limitations*

The National Litter Index is not a study of littering behaviour. It is exclusively intended as an assessment of the presence of litter objects within surveyed regions. As such, no corrections for population densities are carried out. The information derived from the Index provides no indication of whether residents of a particular region litter more or less frequently than those in a different region. It does, however, provide insight regarding (a) the relative presence or absence of litter objects and particular material types within the regions surveyed, and (b) result trends over time. As, such findings are considered to be broadly but tentatively standardised to regions of a similar type.

*Section 3*  
*National Litter Index*  
*Methodology*

### 3.1 Scope

Sites surveyed within the research program were sampled primarily from urban and near-urban areas (i.e. generally within 50km of the urban areas surrounding each state capital). Generalisation of findings to regional locations must therefore be made with caution.

The total area surveyed across all sites nationally was 1,499,791m<sup>2</sup>. This area spanned a total of 983 sites, and the average site size was 1,526m<sup>2</sup>. A complete table of site area information is provided in the Appendices.

### 3.2 Material Categorisation

All litter items counted were incorporated within 7 main material type categories. These main material types were further broken down into object sub-categories, as follows:

<b>MAIN MATERIAL TYPE</b>	<b>Object Sub-Category</b>
<b>CIGARETTE BUTTS</b>	Total
<b>GLASS</b>	Alcoholic beverage container Non-alcoholic beverage container Plain water container Other
<b>ILLEGAL DUMPING</b>	Total
<b>METAL</b>	Alcoholic beverage container Food container or utensil Non-alcoholic beverage container Plain water container Other
<b>MISCELLANEOUS</b>	Total
<b>PAPER/ PAPERBOARD</b>	Cigarette packets Food container or utensil Non-alcoholic beverage container Publication Other
<b>PLASTIC</b>	Alcoholic beverage container Food container or utensil Non-alcoholic beverage container Plain water container Shopping bag Other

These object sub-categories were further broken down into a total of 84 separate item-type distinctions (a full list of these is available in the Appendices). Litter counters were required to record the numbers of items within each of these item types that were present at any given site surveyed.

### **3.3 Sites**

All sites incorporated within the survey were categorised according to 8 different site types. Uniform guidelines were conformed to during site selection. Site specifications vary from 500 square metres (beaches) to 3,000 square metres (highways).

#### **Residential**

A street area approximately 150 metres in length, along both sides of the road from the front of the properties on each side of that road extending to the gutter including litter in the gutter.

#### **Beach**

An area of approximately 50 metres long and 10 metres wide, positioned on one or across both sides of a jetty, boat ramp or main entry access point to beach.

#### **Industrial**

A street area approximately 150 metres long within an industrial area, the count area to be from the fence line or immediate front of the properties to the gutter including litter in the gutter

#### **Car Park**

An area of approximately 30 by 50 metres in an open space public car park at a point distant from the entrance to the car park.

### **Shopping Centre**

An area approximately 50 metres long and 25 metres wide, directly outside of the main shopping centre building and including one or across both sides of a major entrance.

### **Retail Strip/ Shops - Street Precinct**

An area approximately 150 metres long in front of a strip of shops, extending from the front of the shops to the street gutter and including litter in the gutter.

### **Recreational Park**

An area of approximately 40 by 50 metres in a park area which includes a playground but which is not in the immediate vicinity of a shop or kiosk. The areas should be within a frequently used park.

### **Highway**

Highways include open major roadways bounded by a vegetated area that may include an open drain.

The count area commences from the area beginning at the edge of the road, and extending out from the road to the nearest fence/ boundary or up to a distance of 10 meters out from the road side if no such fence/ boundary exists. Two such areas should be collected from, one on each side of the road. Each region should extend for a length of approximately 200 meters along the road.

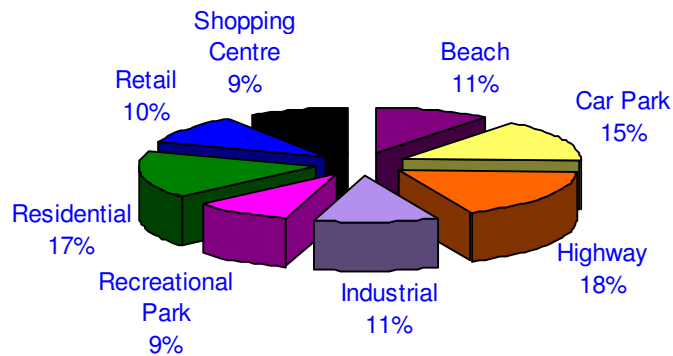
### **Site Type Representation**

The following table outlines the number of sites within each of the 8 distinct site types that were sampled within each of the states participating in the Index.

Please note that the numbers of sites sampled from ACT/ NT/ TAS were all designated to represent half the numbers of sites sampled from all other states.

	ACT/ NT/ TAS	All Other States	Total Sites Surveyed Nationally
Beach	8	16	104
Car Park	11	23	148
Highway	13	27	174
Industrial	9	17	112
Recreational Park	7	13	86
Residential	13	26	169
Retail	8	15	99
Shopping Centre	7	14	91
<b>Total</b>	<b>76</b>	<b>151</b>	<b>983</b>

### Proportion of Total Sites by Site Type



### 3.4

#### Volumes

Litter volumes were estimated from extensive historical litter data recorded within South Australia.

Each litter type incorporated within the study was associated with an individual figure which represented an average volume for each litter item of that type.

In order to reflect a more realistic scenario the final volumes for each litter category item take into account that a certain proportion of all items found would be crushed and weathered.

These volumetric profiles were then extrapolated to calculate estimated volumes of the national data based on the numbers of litter items recorded per category. It should be noted that these volumes represent estimates only, and as such they should be interpreted with caution.

For example, the volume estimates based upon the numbers of items found in the following categories were calculated as follows:

<b>Item Type</b>	<i>Estimated volume of one item of this type in litres</i>	<b>Number of items recorded nationally 06/ 07</b>	<b>Estimated volume in litres</b>
GLASS - Plain water (carbonated or non-carb.), 1 litre+	<i>1.05925</i>	33	34.96
METAL - Aerosols - pressure packs	<i>0.68424</i>	57	39.00
PAPER/ PAPERBOARD - Cigarette packets	<i>0.21787</i>	3,121	679.97
PLASTIC - Flav. milk, <1 litre	<i>0.5327</i>	544	289.79

### **3.5**      **Timing**

The National Litter count was initiated in NSW, QLD, SA, TAS, VIC & WA during November 2005, with a second count conducted in May 2006. These counts were conducted at 76 sites within TAS and across 151 sites within each of the other states. Analysis of the ACT and NT was initiated in November 2006. These counts were commenced at 76 sites within each of these territories.

Calculations of average litter figures within areas have taken into account the reduced overall areas corresponding to the litter counts for these regions. The 2006/07, 2007/08, 2008/09 and 2009/10 National litter counts were conducted during November 2006/07/08/09 and May 2007/08/09/10 respectively.

### **3.6**                    **Litter Counter Training**

The litter categorisations and assumptions used during the counts of designated sites were broadly as follows:

- A standard data collection form, was used when conducting the litter counts. A copy of this form is provided in the Appendices.
- Counters were trained to carefully analyse the litter to ensure that it was properly identified before recording it on the survey form. For example, to determine whether an item is glass and not clear plastic, or to differentiate between fruit juice and fruit drink as these are recorded on different sections of the form.
- Broken bottles were counted as one bottle, a bag of dumped garbage was considered to be one item of “illegal dumping”, and scattered newspaper pages were counted as one newspaper.
- While individual cigarette butts are counted, where there are large volumes of cigarette butts an estimated count is acceptable.
- For the purpose of the Litter Count, all waste located within any count site is litter apart from that properly disposed of in a waste receptacle.
- Organic matter (including food, chewing gum, and dog faeces) was not recorded during the count.

### **3.7**                    **Auditing**

An audit of site counts and recorded counts that have been data entered is planned and conducted and based on the findings an audit report is prepared and provided separately to the KAB Board. The audit is carried out to provide assurance that the reported results are free from material misstatement.

### 3.8 Reporting

#### Annual Results

Litter counts have been conducted bi-annually in November and May across the years of 2005/06, 2006/07, 2007/08, 2008/09 and 2009/10 respectively. Unless stated otherwise, results are thus reported on an annual basis incorporating average figures corresponding to the combined November and May counts across these years.

#### Litter per 1,000 m<sup>2</sup>

Numbers of litter items and volumes are quoted against an average 1,000 square metre area, in order to allow for the detailed analysis of data within an established comparative framework.

This analysis has been applied to all data collected since November 2005, and consequently results are now tracked across 2005/06, 2006/07, 2007/08, 2008/09 and 2009/2010 using a reliable benchmark comparison.

The current litter per area measurement methodology enables meaningful and valid comparisons of the amounts of litter in the litter stream nationally, regionally, and across material types.

#### Illegal Dumping and Miscellaneous Litter

Previous to 2006/07, illegally dumped items were incorporated within the miscellaneous material category. However, the large volumes of these items necessitate the separation of such items into a specific material category.

Furthermore, comparisons between main material types do not incorporate illegal dumping or miscellaneous litter on the basis that the material type of such litter items is not identified.

For the National Litter Index illegal dumping is defined as the unlawful deposit onto land of waste larger than litter, or in other words, waste materials dumped, tipped or otherwise deposited onto private or public land

where no license or approval exists to accept such waste. Illegal dumping varies from small bags of rubbish in an urban environment to larger scale dumping of materials in isolated areas, such as bushland.

In the context of the National Litter Index illegal dumping is any litter that does not fit into the other material categories. See results tables for detailed descriptions of other categories including miscellaneous litter.

# *Section 4*

## *Results*

## 4.1 National

### At a Glance

The overall average number of items per 1,000m<sup>2</sup> across all 983 sites surveyed in the 2009/10 National Litter Index was 66, while the overall average estimated volume per 1,000m<sup>2</sup> was 7.55 litres. These figures represent a marginal increase to the number of items per 1,000m<sup>2</sup> (63 items per 1,000m<sup>2</sup>) and a marginal decrease to the volume of litter per 1,000m<sup>2</sup> (7.73 litres per 1,000m<sup>2</sup>) in comparison to the findings for the year 2008/09. The results are also lower than all other previous litter monitors in years 2007/08 (68 items and 8.59 litres per 1,000m<sup>2</sup>), 2006/07 (74 items and 9.68 litres per 1,000m<sup>2</sup>) and also 2005/06 (70 items and 8.86 litres per 1,000m<sup>2</sup>).

The most littered sites were retail sites which contributed large numbers of litter items per 1,000m<sup>2</sup>, but they were associated with only small volumes of litter per 1,000m<sup>2</sup>. Industrial locations were generally associated with both large numbers of items and litter volume per 1,000m<sup>2</sup>. While highway sites had a relatively low number of litter items per 1,000m<sup>2</sup>, they contributed a significant proportion of the overall volume total.

Cigarette butts were the most frequently identified item, and 32 such objects (up from 30 butts in 2008/09, the same as 2007/08 and down from 35 butts in 2006/07 and 34 butts in 2005/06) per 1,000m<sup>2</sup> were recorded in annual figures for 2009/10. Only a very small proportion of the overall litter volume (0.004 litres per 1,000m<sup>2</sup>) however was associated with cigarette butts.

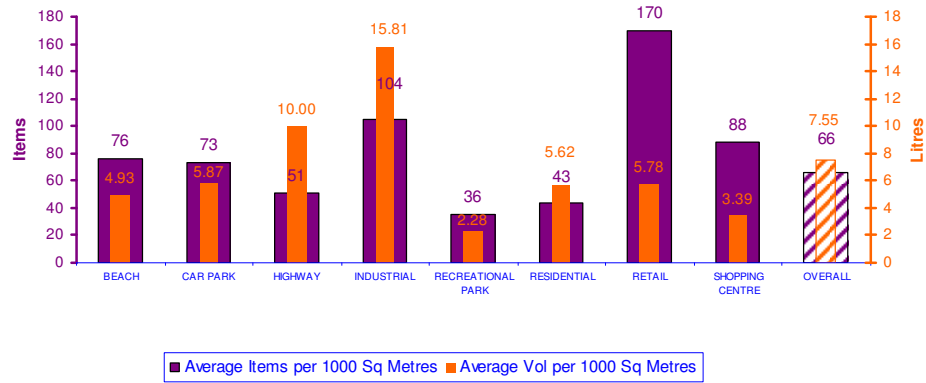
Plastic litter objects contributed the largest amount of volume to the litter stream, and such objects were associated with 2.16 litres (down from 2.39 litres in 2008/09, 2.79 litres in 2007/08, 2.99 litres in 2006/07 and 3.22 litres in 2005/06) of volume per 1,000m<sup>2</sup> across all sites nationally.

### Comparisons by Site Types

The largest numbers of items per 1,000m<sup>2</sup> were located within retail sites (170 items per 1,000m<sup>2</sup>), industrial sites (104 items per 1,000m<sup>2</sup>) and shopping centres (88 items per 1,000m<sup>2</sup>).

The estimated volumes per 1,000m<sup>2</sup> of the litter objects at industrial sites (15.81 litres per 1,000m<sup>2</sup>) and highway sites (10.00 litres per 1,000m<sup>2</sup>) were higher than within any other site types.

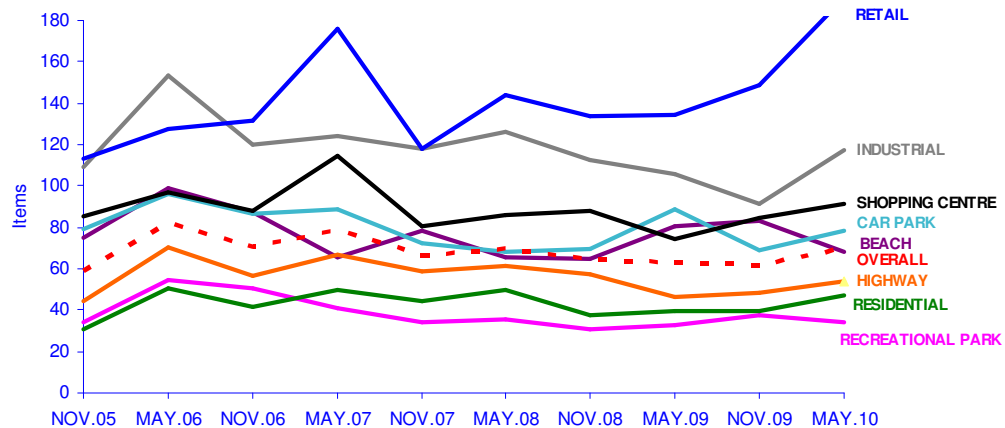
Items and Volume per 1000 Square Metres by Site Type - NATIONAL - 2009/ 2010



Tracked results demonstrate some seasonal fluctuations in the numbers of items per 1,000m<sup>2</sup> within most site results. The seasonal trends are for a peak in the May litter counts and a trough in November litter counts and not surprisingly, the converse generally appears among beach sites where the trend is for higher counts in November and lower counts in May.

Nationally, since the litter monitor commenced, there has been an overall decline in the number of items in the litter stream. The major contributors of litter items however, were retail sites, followed by industrial and shopping centres sites.

Items per 1000 Sq Metres by Site Type - NATIONAL

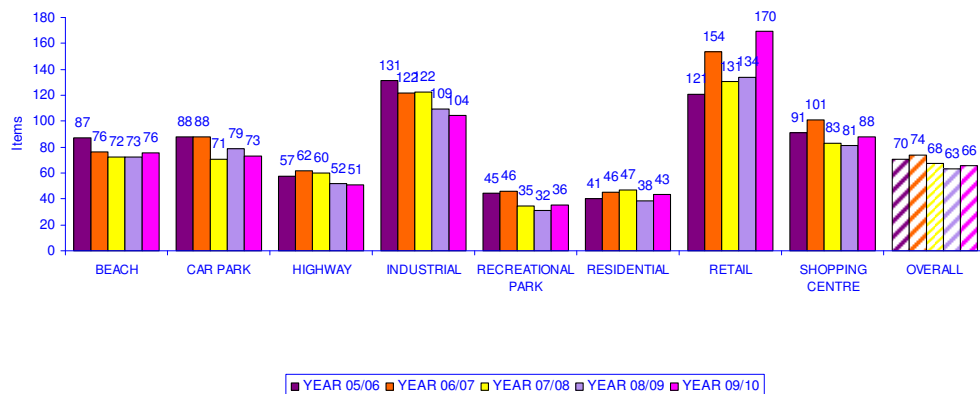


The annual average of items per 1,000m<sup>2</sup> for the year of 2009/10 (66 items per 1,000m<sup>2</sup>) were marginally higher than the figures recorded in 2008/09 (63 items per 1,000m<sup>2</sup>) but lower than the figures recorded for all other previous litter monitors in 2007/08 (68 items per 1,000m<sup>2</sup>), 2006/07 (74 items per 1,000m<sup>2</sup>) and 2005/06 (70 items per 1,000m<sup>2</sup>).

The increase was most evident among retail sites (170 items per 1,000m<sup>2</sup>, up from 134 items in 2008/09, 131 items in 2007/08 and 154 items in 2006/07). There were also small increases at shopping centres (88 items per 1,000m<sup>2</sup>, up from 81 items in 2008/09, 83 items in 2007/08 but down from 101 items in 2006/07), residential sites (43 items per 1,000m<sup>2</sup>, up from 38 items in 2008/09 but down from 47 items in 2007/08 and 46 items in 2006/07), recreational parks (36 items per 1,000m<sup>2</sup>, up from 32 items in 2008/09, 35 items in 2007/08 but down from 46 items in 2006/07) and beaches (76 items per 1,000m<sup>2</sup>, up from 73 items in 2008/09, 72 items in 2007/08 and the same as the 2006/07).

Decreases in the litter count were recorded at car park sites (73 items per 1,000m<sup>2</sup>, down from 79 items in 2008/09, up from 71 items in 2007/08 and down from 88 items in 2006/07), industrial sites (104 items per 1,000m<sup>2</sup>, down from 109 items in 2008/09 and 122 items in both 2007/08 and 2006/07) and highway sites (51 items per 1,000m<sup>2</sup>, down from 52 items in 2008/09, 60 items in 2007/08 and 62 items in 2006/07).

Items per 1000 Sq Metres by Site Type - Annual Averages - NATIONAL

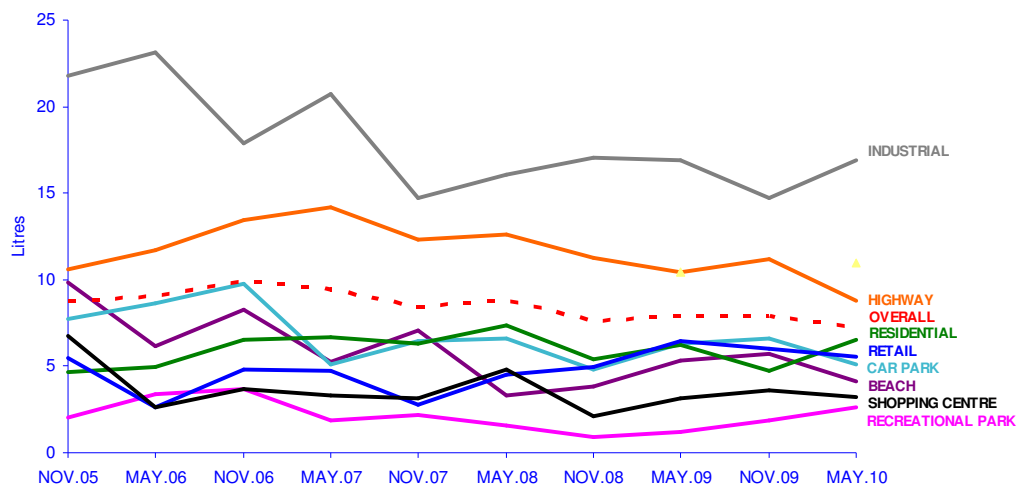


The overall trend in the estimated volumes per 1,000m<sup>2</sup> of litter items at all national sites was the gradual reduction in the volume in the litter stream,

most evident in the findings for industrial sites, highway sites, beaches and car parks.

There were also seasonal trends observed in the results where beach site results demonstrated a peak in the November litter counts and a trough in May litter counts and conversely, there were higher litter counts among residential sites in May compared to lower litter counts in November.

**Volume per 1000 Square Metres by Site Type - NATIONAL**



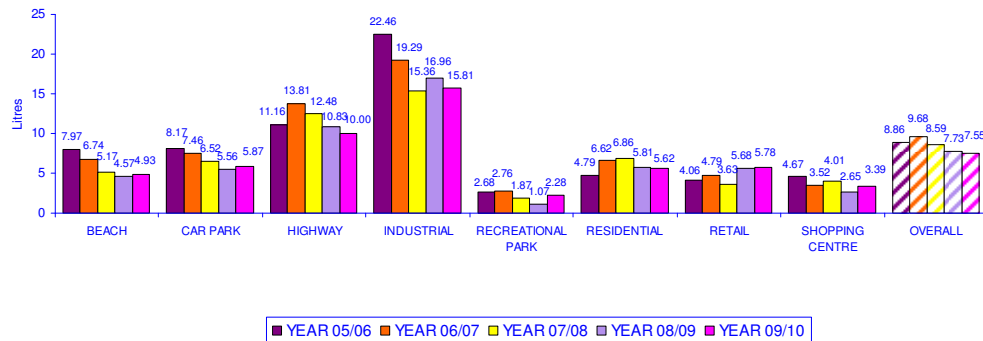
The overall annual average estimated litter volume per 1,000m<sup>2</sup> across all national sites for the year 2009/2010 was 7.55 litres per 1,000m<sup>2</sup>, marginally lower than the estimated litter volume recorded in 2008/09 (7.73 litres per 1,000m<sup>2</sup>) and lower than the volume estimates recorded for all other previous litter monitors in 2007/08 (8.59 litres per 1,000m<sup>2</sup>), 2006/07 (9.68 litres per 1,000m<sup>2</sup>) and 2005/06 (8.86 litres per 1,000m<sup>2</sup>).

The increases in the volume of litter which were most evident at recreational parks (2.28 litres per 1,000m<sup>2</sup>, up from 1.07 litres in 2008/09, 1.87 litres in 2007/08 but down from 2.76 litres in 2006/07) and shopping centres (3.39 litres per 1,000m<sup>2</sup>, up from 2.65 litres in 2008/09 but down from 4.01 litres in 2007/08 and 3.52 litres in 2006/07). There were also small increases apparent in the volumes of litter at beaches (4.93 litres per 1,000m<sup>2</sup>, up from 4.57 litres in 2008/09 but down from 5.17 litres in 2007/08 and 6.74 litres in 2006/07), car parks (5.87 litres per 1,000m<sup>2</sup>, up from 5.56 litres in 2008/09

but down from 6.52 litres in 2007/08 and 7.46 litres in 2006/07) and retail sites (5.78 litres per 1,000m<sup>2</sup>, up from 5.68 litres in 2008/09, 3.63 litres in 2007/08 and 4.79 litres in 2006/07).

Conversely, there were decreases in the litter volume at industrial sites (15.81 litres per 1,000m<sup>2</sup>, down from 16.96 litres in 2008/09, up from 15.36 litres in 2007/08 and down from 19.29 litres in 2006/07), highways (10.00 litres per 1,000m<sup>2</sup>, down from 10.83 litres in 2008/09, 12.48 litres in 2007/08 and 13.81 litres in 2006/07) and residential sites (5.62 litres per 1,000m<sup>2</sup>, down from 5.81 litres in 2008/09, 6.86 litres in 2007/08 and 6.62 litres in 2006/07).

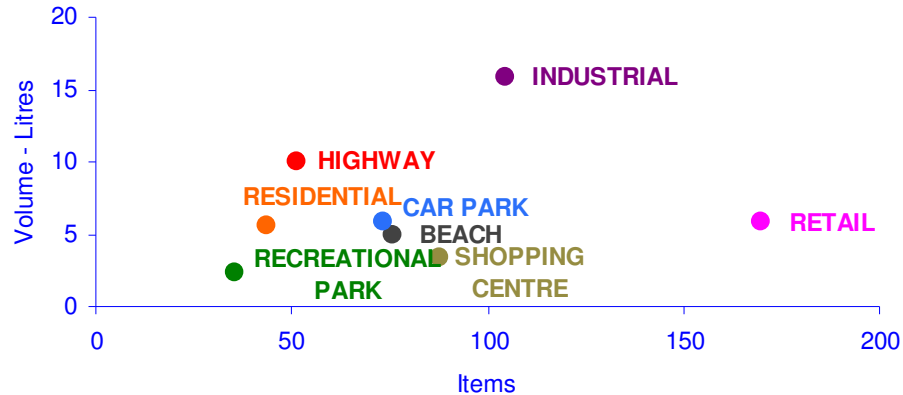
Volume per 1000 Square Metres by Site Type - Annual Averages - NATIONAL



Items and volume estimates per 1,000m<sup>2</sup> nationally identify differential patterns across site types. Site characteristics which are evident are as follows:

- Industrial sites are associated with moderate to large numbers of litter items as well as large litter volume
- Highway sites are associated with both moderate numbers of litter items and moderate litter volume
- Retail sites are associated with large numbers of items but only a small litter volume
- Car parks, beaches and shopping centres are associated with moderate numbers of items but only a small litter volume
- Recreational Parks and residential sites contribute both small numbers of items and a low volume to the overall litter stream

### Items and Volume per 1000 Square Metres by Site Type - NATIONAL - 2009/ 2010

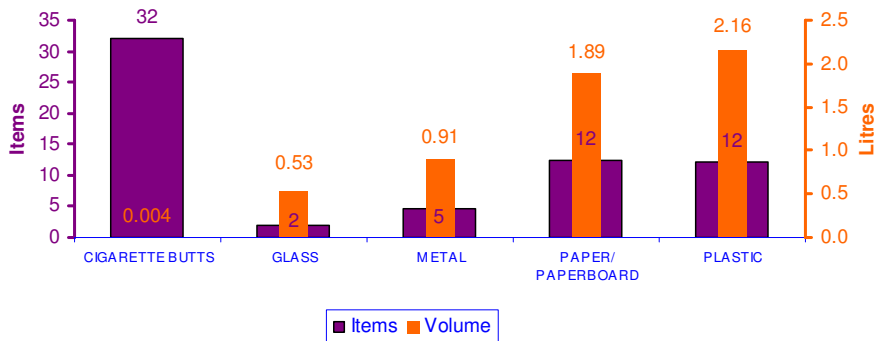


#### Comparison by Main Material Types

Cigarette butts remain the most pervasive litter item nationally, and an average of 32 cigarette butts per 1,000m<sup>2</sup> were identified across all national sites during the year of 2009/10 (up from 30 cigarette butts in 2008/09). However, these items only contributed 0.004 litres per 1,000m<sup>2</sup> in volume to the national litter stream.

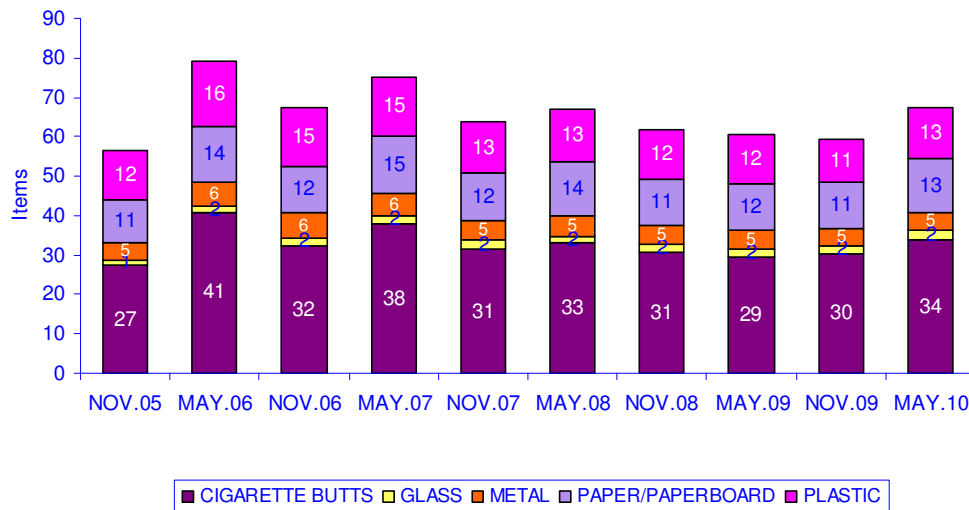
Plastic materials and paper/ paperboard objects also contributed strongly to the litter stream with both categories adding 12 items per 1,000m<sup>2</sup> during the 2009/10 year (unchanged from 2008/09). Plastic items contributed an overall national average of 2.16 litres of litter volume per 1,000m<sup>2</sup> during 2009/10 (down from 2.39 litres in 2008/09) and paper/ paperboard objects were associated with an average of 1.89 litres of litter volume per 1,000m<sup>2</sup> across all sites nationally during 2009/10 (up from 1.77 litres in 2008/09).

**Items and Volume per 1,000 Square Metres by Main Material Type - NATIONAL - 2009/ 2010**



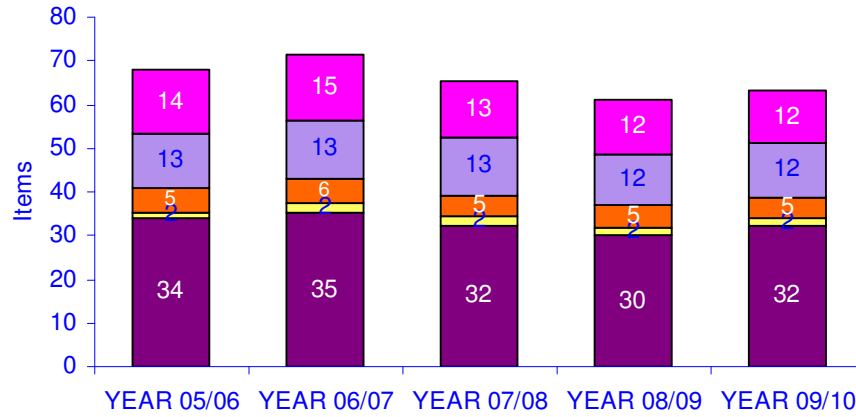
Despite seasonal minor fluctuations in the absolute numbers of items per 1,000m<sup>2</sup> identified within main material type categories, results across bi-annual counts from November 2005 through to the present do not show significant fluctuations in the proportional contributions of items within main material types to the overall litter present in the litter stream.

**Items per 1000 Square Metres by Main Material Type - NATIONAL**



Similarly, the representations of specific main material categories within the litter stream show no significant fluctuations across annual averages for the years 2005/06, 2006/07, 2007/08, 2008/09 and 2009/10 respectively.

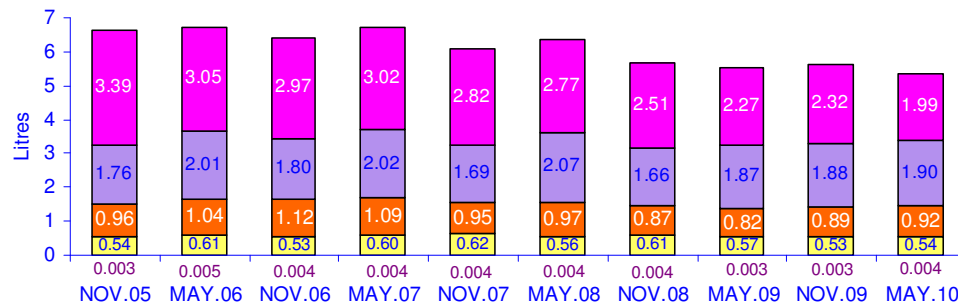
**Items per 1000 Square Metres by Main Material Type - Annual Averages - NATIONAL**



■ CIGARETTE BUTTS ■ GLASS ■ METAL ■ PAPER/PAPERBOARD ■ PLASTIC

Results for litter volume per 1,000m<sup>2</sup> remains generally proportional across material categories across counts from November 2005 through to present results, although, there has been a gradual decline in the volume of plastic in the litter stream.

**Volume per 1000 Square Metres by Main Material Type - NATIONAL**

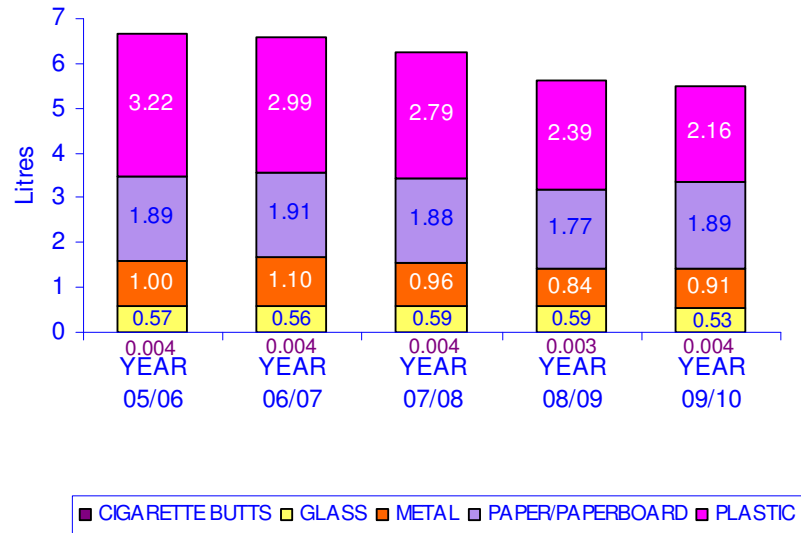


■ CIGARETTE BUTTS ■ GLASS ■ METAL ■ PAPER/PAPERBOARD ■ PLASTIC

The general downward trend of litter volume has been lead by a decline in the volume of plastic items in the litter stream, as represented in the figures

for annual averages from 2005/06 to 2009/10, while the volumes of other material type items have remained at similar levels.

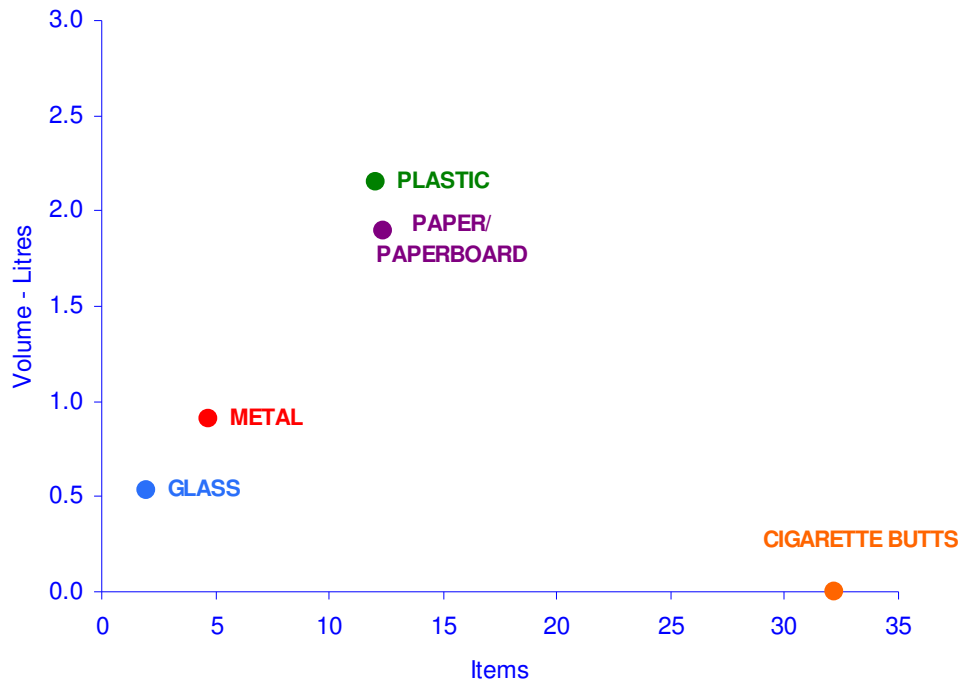
**Volume per 1000 Square Metres by Main Material Type -  
Annual Averages - NATIONAL**



Figures for items and volumes per 1,000m<sup>2</sup> across main material types identify the following characteristics of litter objects:

- Plastic litter and paper/ paperboard items contribute large volumes to the litter stream and are associated with moderate numbers of litter items
- Cigarette butts contribute a large number of items per 1,000m<sup>2</sup> to the litter stream and are frequently identified across all sites, however, they are only associated with a negligible litter volume
- Metal and glass contribute both small numbers of items and low volumes to the overall litter stream

### Items and Volume per 1000 Square Metres by Main Material Type - NATIONAL - 2009/ 2010



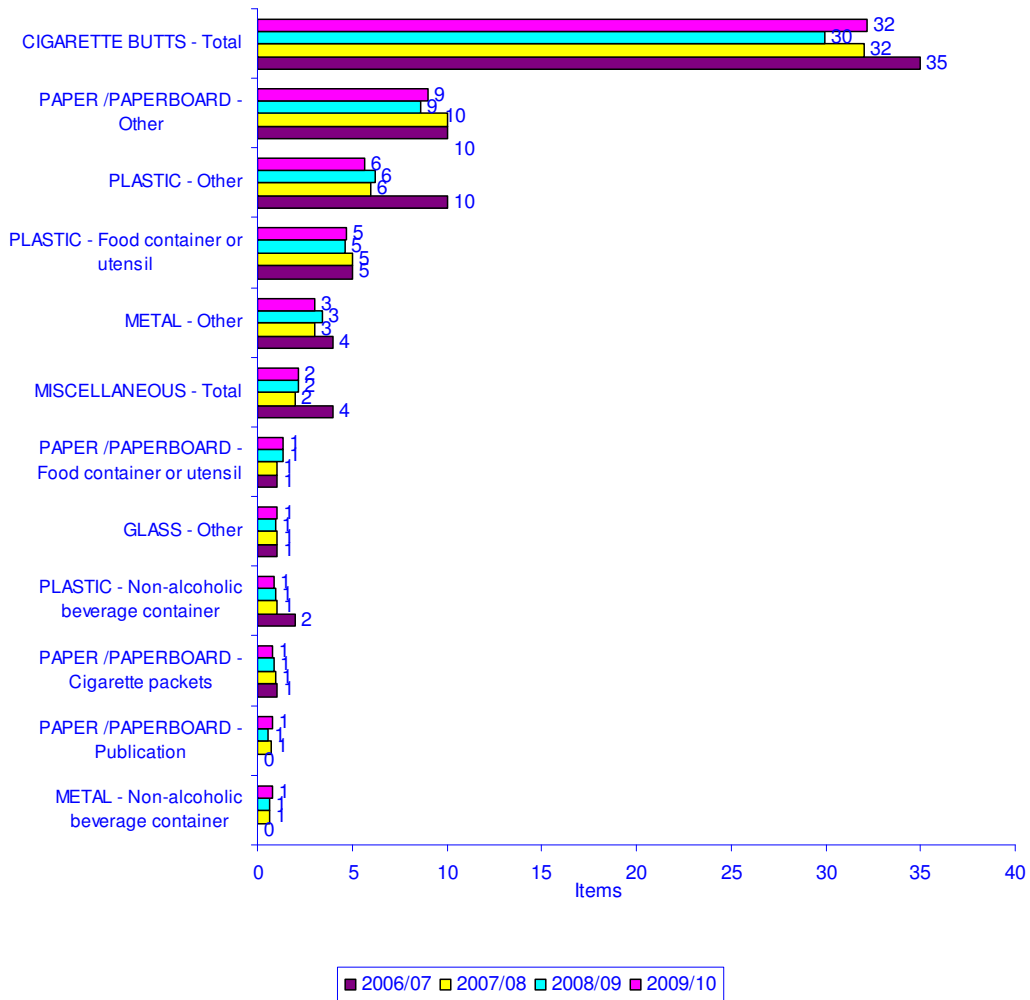
### The Dirty Dozen

When partitioned according to object sub-type distinctions, cigarette butts clearly emerge as the most frequently identified litter item with 32 butts recorded per 1,000m<sup>2</sup> during the 2009/2010 count (up from 30 butts in 2008/09, the same as 32 butts in 2007/08, but down from 35 butts in 2006/07). Other objects frequently identified included:

- Uncategorised paper/ paperboard objects (9 items per 1,000m<sup>2</sup>, unchanged from 2008/09 and down from 10 items in 2007/08 and 11 items in 2006/07)
- Uncategorised plastic objects (6 items per 1,000m<sup>2</sup>, unchanged from 2008/09 and 2007/08 and down from 10 items in 2006/07)
- Plastic food containers and utensils (5 items per 1,000m<sup>2</sup>, unchanged from 2009/10, 2007/08 and 2006/07)

- Uncategorised metal objects (3 items per 1,000m<sup>2</sup>, unchanged from 2008/09 and 2007/08 and down from 4 items in 2006/07)

**Dirty Dozen - Items per 1000 Square Metres - Object Sub-Categories - NATIONAL - 06/07 to 09/10**

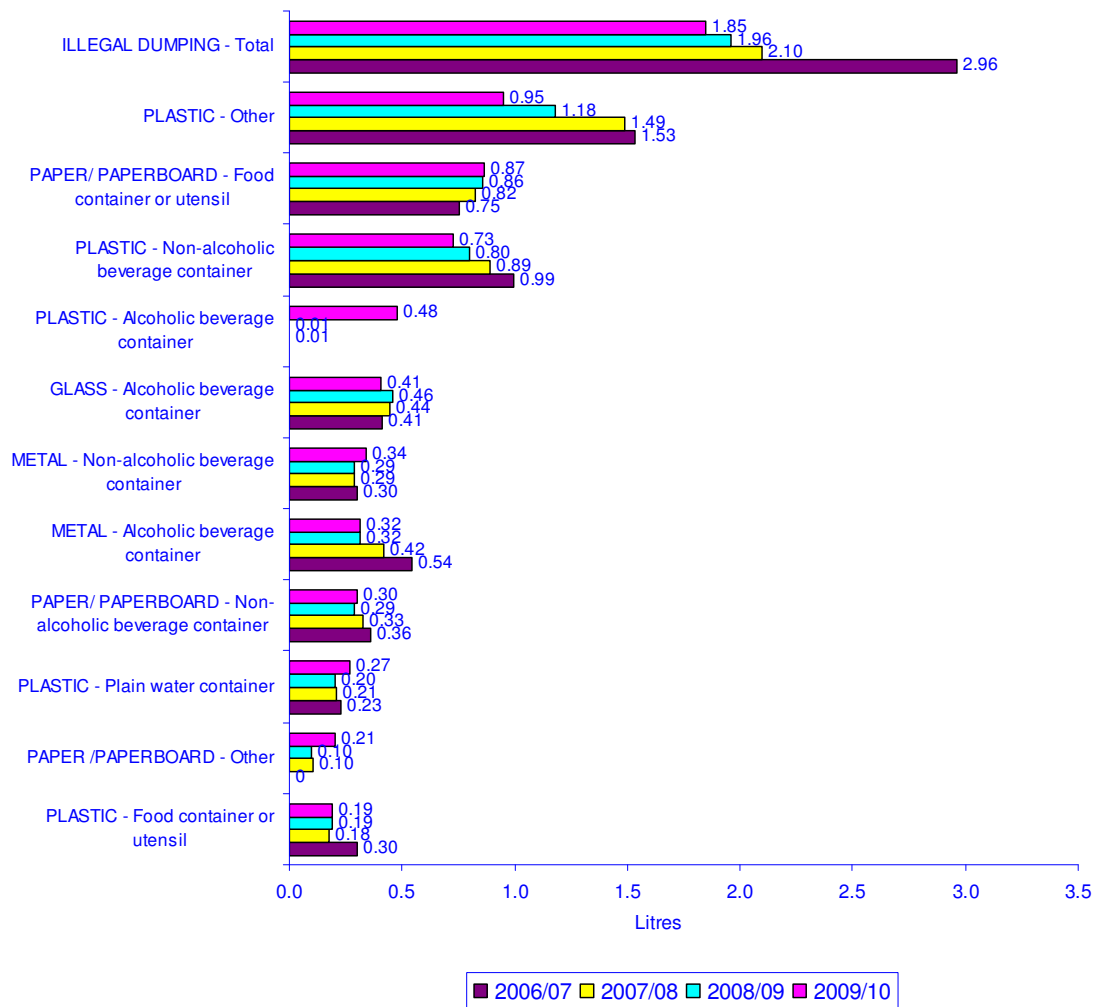


Illegal dumping represented the largest contribution to estimated litter volume (1.85 litres per 1,000m<sup>2</sup>, down from 1.96 litres in 2008/09, 2.11 litres in 2007/08 and 2.96 litres in 2006/07). Other object sub-categories which were associated with substantial estimated volume measurements included:

- Uncategorised plastic objects (0.95 litres per 1,000m<sup>2</sup>, down from 1.18 litres in 2008/09, 1.49 litres in 2007/08 and 1.53 litres in 2006/07)

- Paper/ paperboard - food containers or utensils (0.87 litres per 1,000m<sup>2</sup>, marginally up from 0.86 litres in 2008/09, 0.82 litres in 2007/08 and 0.75 litres in 2006/07)
- Plastic - non-alcoholic beverage containers (0.73 litres per 1,000m<sup>2</sup>, down 0.88 litres in 2008/09, 0.89 litres in 2007/08 and 0.99 litres in 2006/07)

**Dirty Dozen - Volume per 1000 Square Metres - Object Sub-Categories - NATIONAL - 06/07 to 09/10**



The Dirty Dozen analysis shows the findings from November 2006 through until May 2010. Results for 2005/06 are not included.

Prior to the 2006/07 count, specific research for this section of the report was not carried out as part of the National Litter Index project.

## 4.2 Australian Capital Territory

### At a Glance

The overall average number of items per 1,000m<sup>2</sup> across all of the 76 sites surveyed in the ACT during the counts for the year 2009/10 was 51 items, while the overall average estimated volume per 1,000m<sup>2</sup> was 3.31 litres.

The number of items per 1,000m<sup>2</sup> in the litter stream decreased (51 items down from 56 items in 2008/09 and 2007/08 and 68 items in 2006/07). In addition, the current years volume of 3.31 litres per 1,000m<sup>2</sup> was lower than previous years (down from 4.77 litres in 2008/09, 6.06 in 2007/08 and 7.04 litres in 2006/07).

Within the ACT retail sites and shopping centres displayed large numbers of litter items per 1,000m<sup>2</sup>, but these areas were associated with only small volumes of litter per 1,000m<sup>2</sup>. Industrial and highway sites contributed the highest total volume of litter per 1,000m<sup>2</sup> to the overall litter stream, with moderately high volumes of litter per 1,000m<sup>2</sup> also associated with residential and retail sites.

Cigarette butts were the most frequently identified item in the ACT in 2009/2010 with 27 butts per 1,000m<sup>2</sup> recorded (down from 28 butts in 2008/09, 29 butts in 2007/08 and 36 butts in 2006/07). Cigarette butts however, contributed only a small proportion of the overall litter volume (0.003 litres per 1,000m<sup>2</sup>).

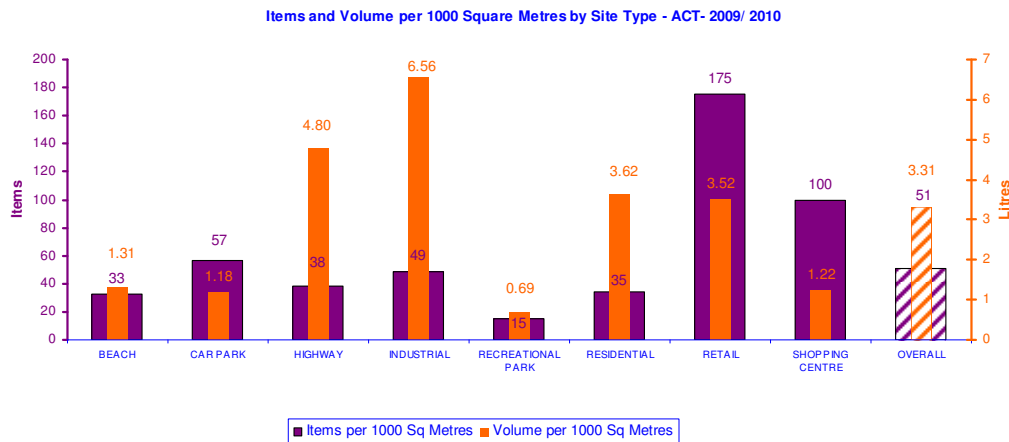
Paper/ paperboard litter objects (1.59 litres per 1,000m<sup>2</sup>, up from 1.27 litres in 2008/09, 1.39 litres in 2007/08 and 1.47 litres in 2006/07) contributed the largest amount of volume to the litter stream, followed by plastic objects (0.84 litres per 1,000m<sup>2</sup>, down from 1.58 litres in 2008/09, 1.31 litres in 2007/08 and 2.86 litres in 2006/07).

### Comparisons by Site Types

The largest numbers of items per 1,000m<sup>2</sup> at the sites surveyed within the ACT during the year of 2009/10 were located within retail sites (175 items per 1,000m<sup>2</sup>, up from 143 items in 2008/09 and 108 items in 2007/08) and

shopping centres (100 items per 1,000m<sup>2</sup>, down from 106 items in 2008/09, but up from 95 items in 2007/08). Retail sites also contributed moderately high volumes of litter (3.52 litres per 1,000m<sup>2</sup>, up from 2.04 litres in 2008/09, but down from 5.64 litres in 2007/08), while shopping centres only contained small volumes of litter (1.22 litres 1,000m<sup>2</sup>, down from 2.75 litres in 2008/09 and 3.49 litres in 2007/08).

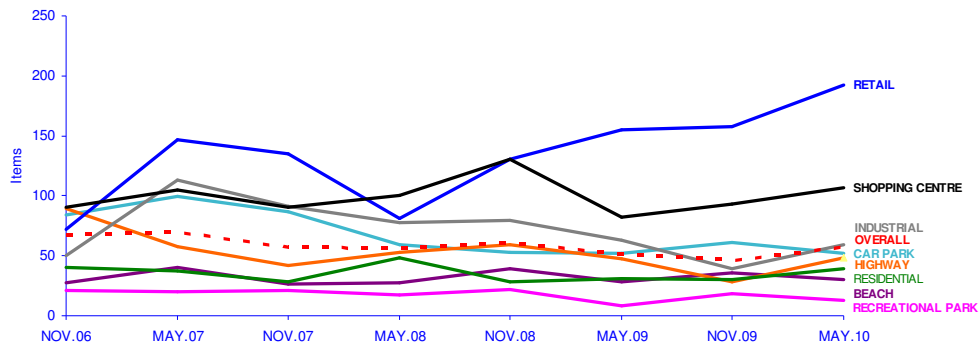
Industrial sites contributed the highest volume totals to the litter stream, with 6.56 litres per 1,000m<sup>2</sup> (down from 15.25 litres in 2008/09, 12.01 in 2007/08 and 18.60 litres in 2006/07) and estimated litter volume at highways (4.80 litres per 1,000m<sup>2</sup>, down from 6.44 litres in 2008/09, 6.25 litres in 2007/08 and 11.82 litres in 2006/07) was also high in comparison to most other site types.



Tracked results demonstrate an overall downward trend of items per 1,000m<sup>2</sup> across most site types, with the exception of retail sites and shopping sites. Retail sites litter count has progressively increased from a low in May 2008.

Emerging trends in the results are demonstrated in season fluctuations among beaches and recreational parks where there is a peak in the November litter counts and a trough in May litter counts. In contrast there are higher litter counts among residential sites in May compared to lower litter counts in November.

Items per 1000 Square Metres by Site Type - ACT

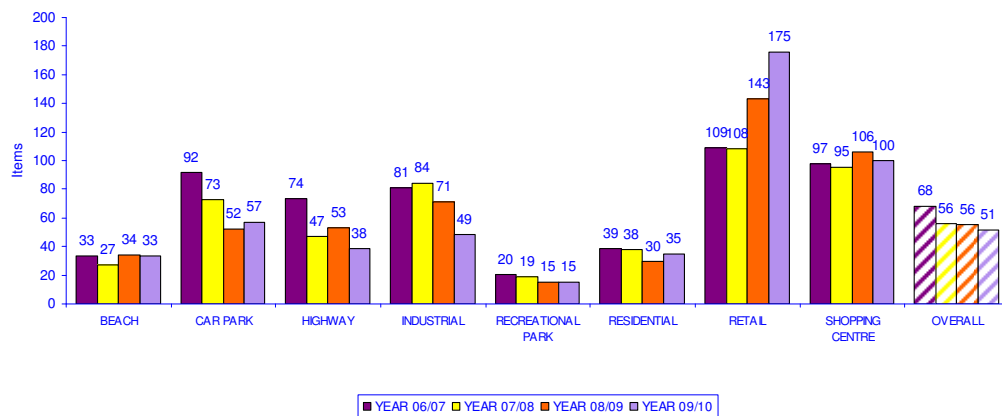


The annual average of items per 1,000m<sup>2</sup> for the year 2009/10 (51 items per 1,000m<sup>2</sup>) is below the 56 items per 1,000m<sup>2</sup> recorded for the years 2008/09 and 2007/08 and well below the 68 items per 1,000m<sup>2</sup> recorded in 2006/07.

Decreases in the litter count were most strongly apparent at industrial sites (with 49 items per 1,000m<sup>2</sup>, compared to 71 in 2008/09), highway sites (with 38 items per 1,000m<sup>2</sup>, compared to 53 in 2008/09) and shopping centre sites (with 100 items per 1,000m<sup>2</sup>, compared to 106 in 2008/09).

These decreases compensated for the increase in litter counts at retail sites (175 items per 1,000m<sup>2</sup>, up from 143 in 2008/09), car parks (57 items per 1,000m<sup>2</sup>, up from 52 in 2008/09) and residential sites (35 items per 1,000m<sup>2</sup>, up from 30 in 2008/09).

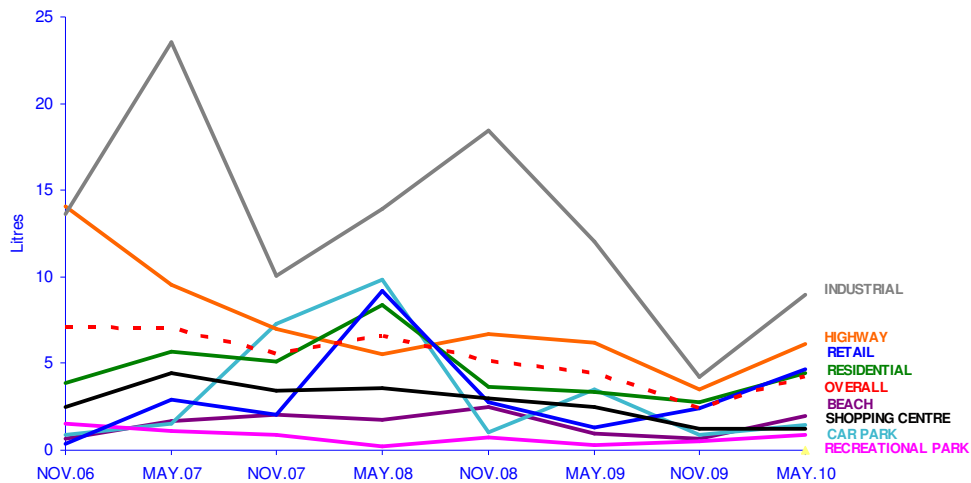
Items per 1000 Square Metres by Site Type - Annual Averages - ACT



Overall there has been a downward trend in the volume of litter across the ACT, with some sites dropping sharply in volume levels compared to previous counts and others displaying a steady downward trend in volume levels.

Emerging trends in volume estimates of litter within site types in the ACT characterise seasonal fluctuations where there were higher litter volumes among residential, shopping centre and car park sites in May compared to lower litter volumes in November. Conversely, there were higher litter volumes among beach sites where there has generally been peaks in the November and a troughs in May.

Volume per 1000 Square Metres by Site Type - ACT



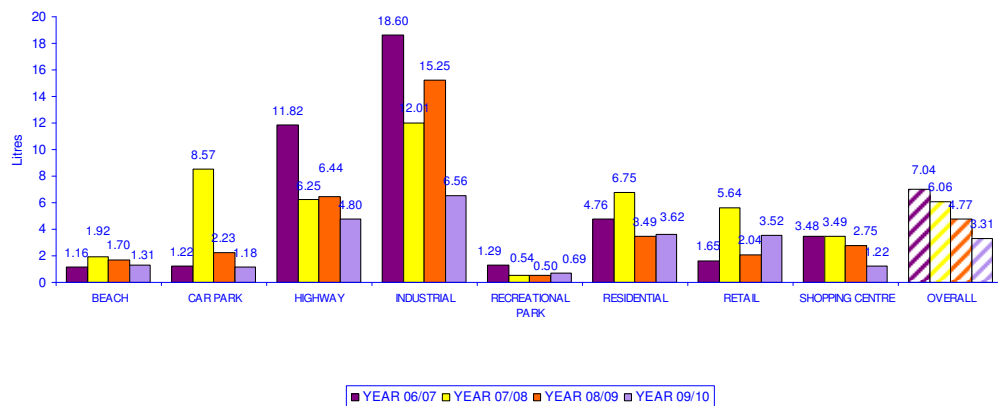
The annual average estimated litter volume per 1,000m<sup>2</sup> across all sites within the ACT for the year 2009/10 is lower than the results for the previous years (3.31 litres per 1,000m<sup>2</sup>, down from 4.77 litres in 2008/09, 6.06 litters in 2007/08 and 7.04 litters in 2006/07).

The decrease in volume of litre was most strongly evident among industrial sites (6.56 litres per 1,000m<sup>2</sup>, down from 15.25 litres in 2008/09 and 12.01 litres in 2007/08), highways (4.80 litres per 1,000m<sup>2</sup>, down from 6.44 litres in 2008/09 and 6.25 litres in 2007/08), shopping centres (1.22 litres per 1,000m<sup>2</sup>, down from 2.75 litres in 2008/09 and 3.49 litres in 2007/08) and

car park sites (1.18 litres per 1,000m<sup>2</sup>, down from 2.23 litres in 2008/09 and 8.57 litres in 2007/08).

There were only marginal increases at a few site types across the ACT, the largest of these was at retail sites (3.52 litres per 1,000m<sup>2</sup>, up from 2.04 litres in 2008/09 but down from 5.64 litres in 2007/08).

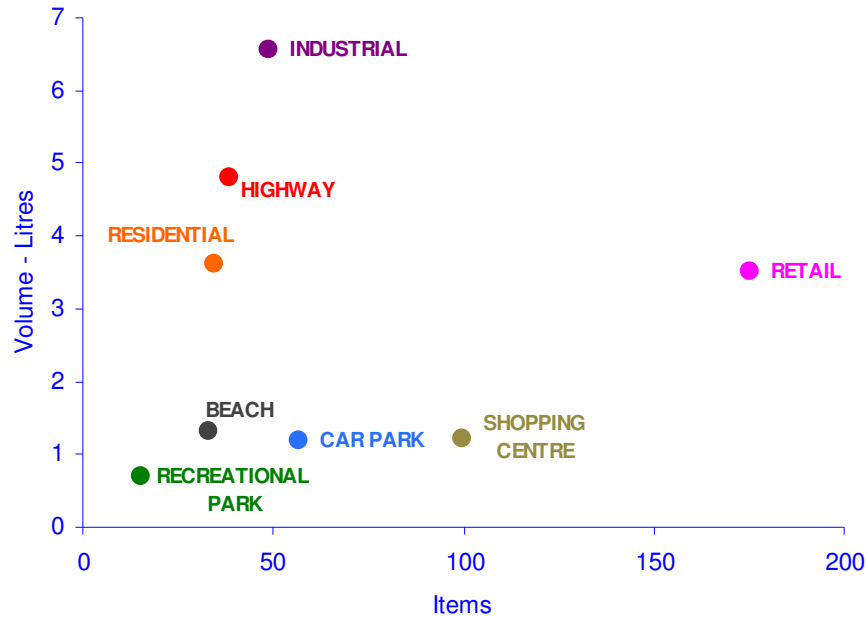
Volume per 1000 Square Metres by Site Type - Annual Averages - ACT



Items and volume estimates per 1,000 m<sup>2</sup> within the ACT identify differential patterns across site types. Site characteristics which are evident are as follows:

- Industrial sites and highway sites are associated with large estimated litter volume but small numbers of litter items
- Residential sites are associated with moderate levels of litter volume but small numbers of litter items
- Residential, beach and car park sites were all associated with small numbers and low volumes of litter items
- Shopping centre sites were associated with moderate numbers of litter items but low levels of litter volume
- Retail sites are associated with large numbers of litter items but only small volumes of litter

**Items and Volume per 1000 Square Metres by Site  
Type - ACT - 2009/ 2010**

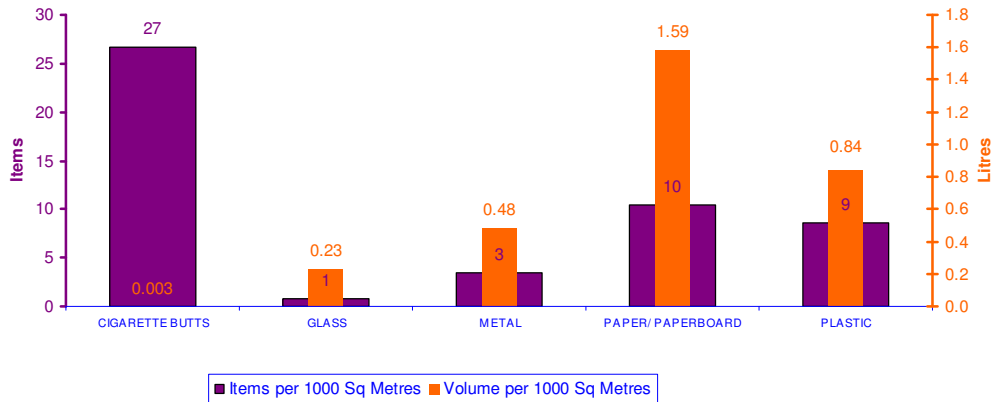


**Comparison by Main Material Types**

An average of 27 cigarette butts per 1,000m<sup>2</sup> were identified across all sites during 2009/10 in the ACT. Cigarette butts however, contributed only a small proportion of the overall litter volume (0.003 litres per 1,000m<sup>2</sup>).

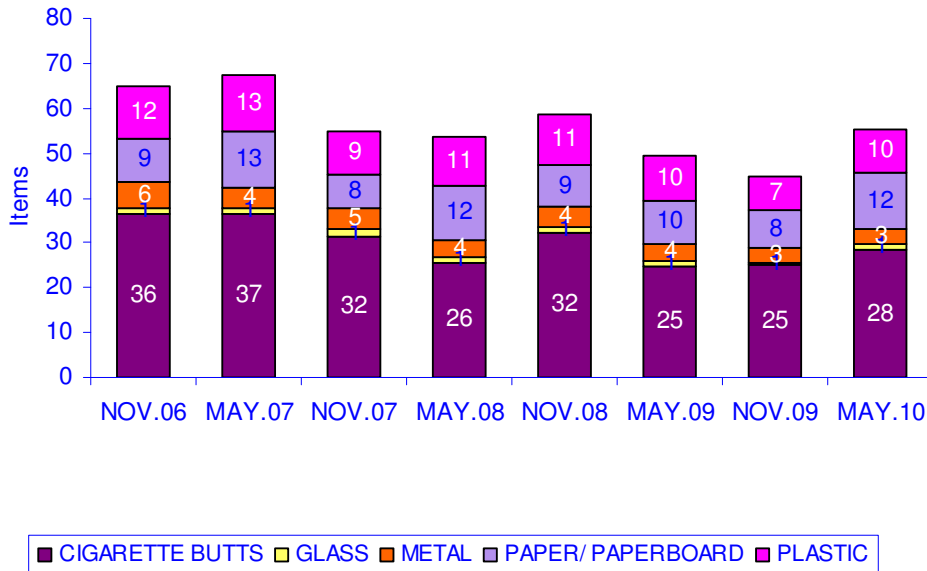
Items which contributed the greatest volumes to the litter stream in the ACT were paper/ paperboard litter objects (1.59 litres per 1,000m<sup>2</sup>), followed by plastic objects (0.84 litres per 1,000m<sup>2</sup>).

Items and Volume per 1000 Square Metres by Main Material Type - ACT - 2009/ 2010



Results from November 2006 through to current findings do not show significant fluctuations in the proportional contributions of items within main material types to the overall litter present in the litter stream in the ACT.

Items per 1000 Square Metres by Main Material Type - ACT

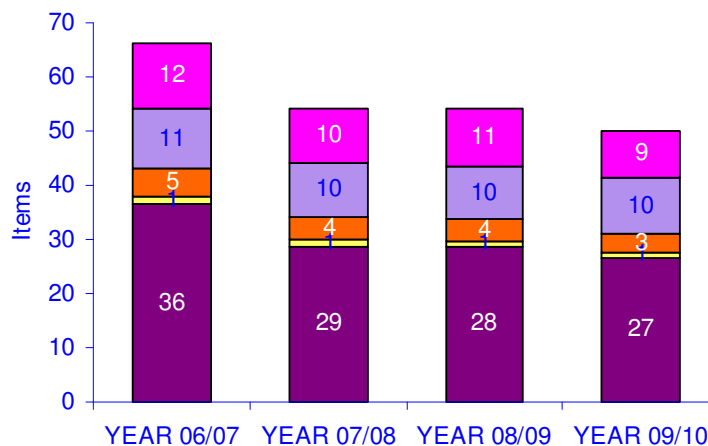


Annual average figures for counts across 2006/07, 2007/08, 2008/09 and 2009/10 in the ACT confirm the cigarette butts continue to contribute the highest number of items to the litter stream and that this remains consistently proportional among the main material type categories.

There has been an overall decline in the number of items by most material type across the litter counts to date, as outlined below:

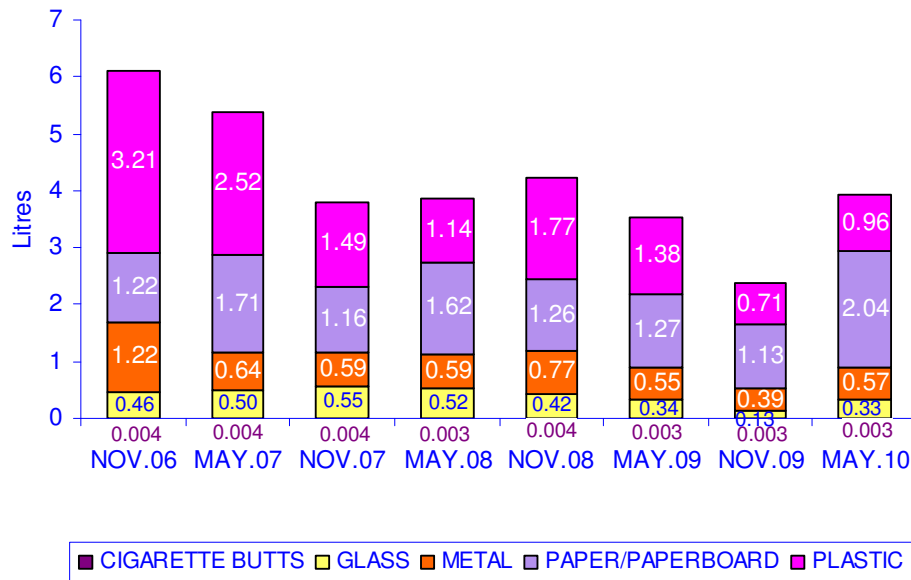
- Cigarette butts (27 butts per 1,000m<sup>2</sup>, down from 28 butts in 2008/09, 29 butts in 2007/08 and 36 butts in 2006/07)
- Paper/ paperboard objects (10 items per 1,000m<sup>2</sup>, unchanged from 2008/09 and 2007/08 and down from 11 items in 2006/07)
- Plastic objects (9 items per 1,000m<sup>2</sup>, down from 11 items in 2008/09, 10 items in 2007/08 and 12 items in 2006/07)
- Metal objects (3 items per 1,000m<sup>2</sup>, down from 4 items in 2008/09 and 2007/08 and 5 items in 2006/07)
- Glass objects (1 items per 1,000m<sup>2</sup>, unchanged from 2008/09, 2007/08 and 2006/07)

**Items per 1000 Square Metres by Main Material Type - Annual Averages - ACT**



Results for November counts and May counts reveal a seasonal trend in the number and estimated volume of paper items in the litter stream, decreasing in numbers and volume in November and increasing in May.

### Volume per 1000 Square Metres by Main Material Type - ACT



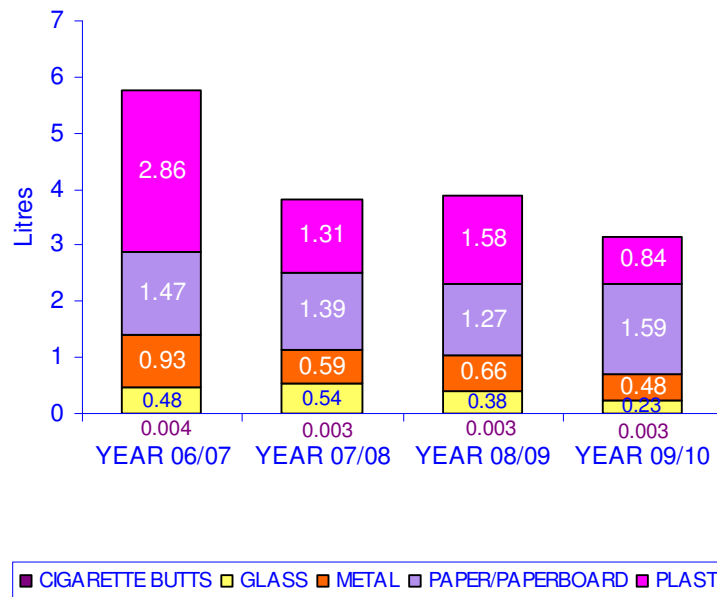
The annual averages for from 2006/07 through to 2009/10 show there has been a decrease in the volume levels of most of the material categories in the ACT litter stream, most significantly among plastic litter items (0.84 litres per 1,000m<sup>2</sup>, down from 1.58 litres in 2008/09, 1.31 litres in 2007/08 and 2.86 litres in 2006/07).

Reductions in volume levels of other material types in the litter stream also included:

- Metal volumes declined to 0.48 litres per 1,000m<sup>2</sup> (down from 0.66 litres in 2008/09, 0.59 litres in 2007/08 and 0.93 litres in 2006/07)
- Glass volumes reduced to 0.23 litres per 1,000m<sup>2</sup> (down from 0.38 litres in 2008/09, 0.54 litres in 2007/08 and 0.48 litres in 2006/07)

There was however, a marginal increase in the volume levels of paper/paperboard to 1.59 litres per 1,000m<sup>2</sup> (up from 1.27 litres in 2008/09, 1.39 litres in 2007/08 and 1.47 litres in 2006/07).

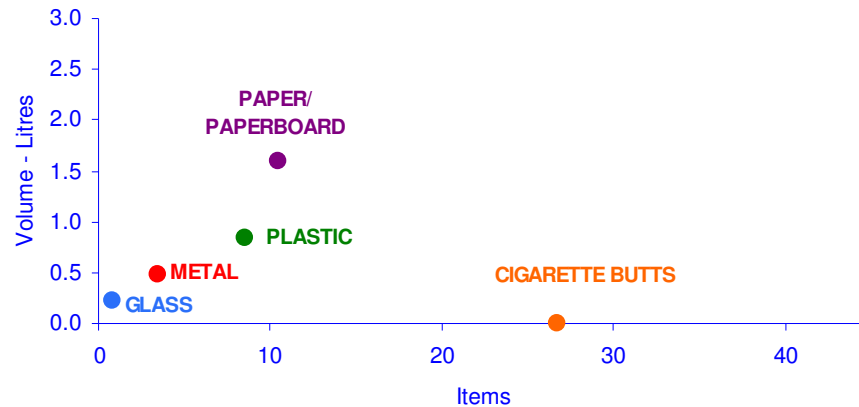
### Volume per 1000 Square Metres by Main Material Type - Annual Averages - ACT



Figures for items and volumes per 1,000m<sup>2</sup> across main material types identify the following characteristics of litter objects within the ACT:

- Paper/ paperboard items contribute large volumes to the litter stream but are associated with only a small to medium number of litter items
- Plastic litter items contribute moderate volumes to the litter stream and are associated with only a small to medium number of litter items
- Metal and glass items contribute both a small number of items and volumes to the litter stream
- Cigarette butts are associated with a large number of litter items but contribute only a negligible volume to the litter stream

## Items and Volume per 1000 Square Metres by Main Material Type - ACT - 2009/ 2010



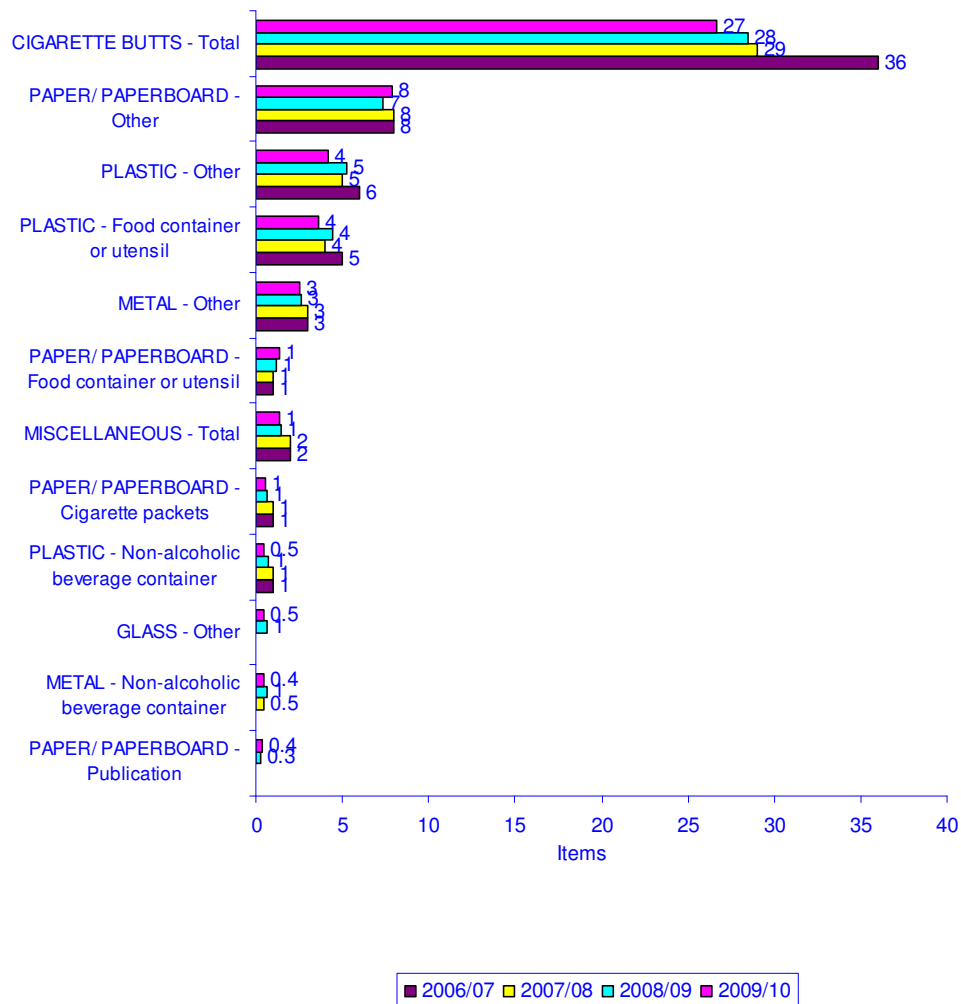
### *The Dirty Dozen*

When partitioned according to object sub-type distinctions, cigarette butts clearly emerge as the most frequently identified litter item with 27 butts recorded per 1,000m<sup>2</sup> within the ACT during the 2009/10 counts (down from 28 butts in 2008/09, 29 butts in 2007/08 and 36 butts in 2006/07).

The other main types of objects frequently identified included:

- Uncategorised paper/ paperboard objects (8 items per 1,000m<sup>2</sup>, up from 7 items in 2008/09, the same as 2007/08 and 2006/07)
- Uncategorised plastic objects (4 items per 1,000m<sup>2</sup>, down from 5 items in 2008/09 and 2007/08 and from 6 items in 2006/07)
- Plastic food containers and utensils (4 items per 1,000m<sup>2</sup>, unchanged from 2008/09 and 2007/08 and down from 5 items in 2006/07)
- Uncategorised metal objects (3 items per 1,000m<sup>2</sup>, unchanged from 2008/09, 2007/08 and 2006/07).

**Dirty Dozen - Items per 1000 Square Metres - Object Sub-Categories -  
ACT - 06/07 to 09/10**



Paper/ paperboard - food containers or utensils contributed the largest proportion to the total estimated litter volume (0.96 litres per 1,000m<sup>2</sup>, up from 0.79 in 2008/09, 0.66 in 2007/08 and 0.58 litres in 2006/07)

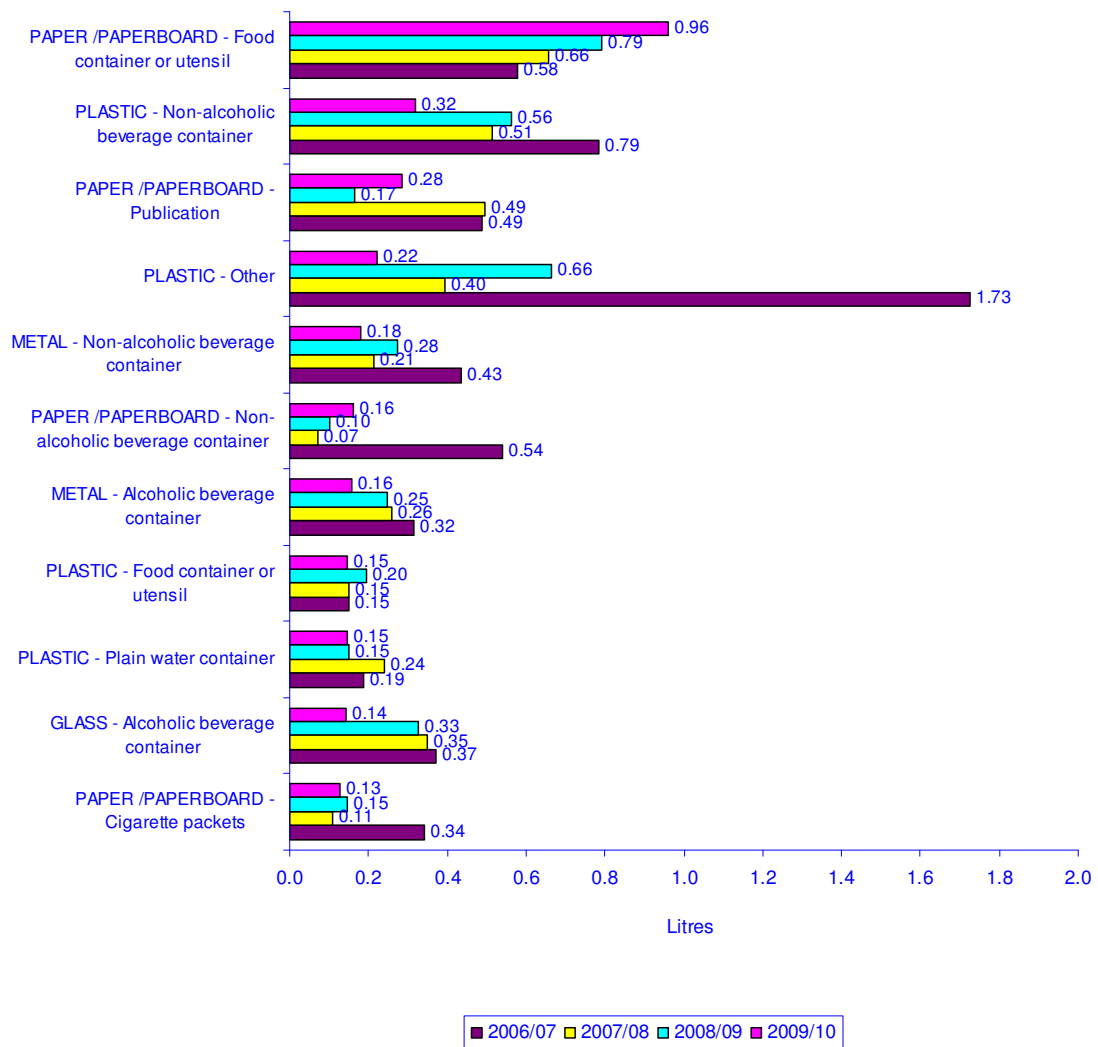
Other object sub-categories with substantial volume estimates included:

- Plastic - non-alcoholic beverage containers (0.32 litres per 1,000m<sup>2</sup>, down from 0.56 litres in 2008/09, 0.51 litres in 2007/08 and 0.79 litres in 2006/07)
- Paper/ paperboard publications (0.28 litres per 1,000m<sup>2</sup>, up from 0.17 litres in 2008/09, down from 0.49 litres in both 2007/08 and 2006/07)

- Uncategorized plastic objects (0.22 litres per 1,000m<sup>2</sup>, down from 0.66 litres in 2008/09, 0.40 litres in 2007/08, 1.73 litres in 2006/07).

The other notable decrease was from illegal dumped items which was absent from the dirty dozen in the ACT in 2009/10, after contributed the largest proportion to the total estimated litter volume in 2008/09 (0.10 litres per 1,000m<sup>2</sup> in 2009/10 down from 0.83 litres in 2008/09).

**Dirty Dozen - Volume per 1000 Square Metres - Object Sub-Categories- ACT - 06/07 to 09/10**



### 4.3 New South Wales

#### At a Glance

The overall average number of items per 1,000m<sup>2</sup> across all of the 151 sites surveyed within NSW during the counts for the year 2009/10 was 75, while the overall average estimated volume per 1,000m<sup>2</sup> was 13.43 litres.

The number of litter items per 1,000m<sup>2</sup> represents an increase from the previous year (up from 65 items in 2008/09, but down from 77 items in 2007/08, up from 71 items in 2006/07 and down from 80 items in 2005/06). The current volume total is also higher than volumes recorded in the previous two years (up from 12.13 litres in 2008/09 and 11.90 litres in 2007/08), however, it remains lower than those recorded in 2006/07 (14.69 litres) and 2005/06 (14.95 litres).

The most littered sites surveyed within NSW remained industrial sites, car parks and highway sites which were associated with large numbers of litter items and litter volume per 1,000m<sup>2</sup>.

Retail sites contributed large numbers of litter items per 1,000m<sup>2</sup>, however, they were associated with lower but still appreciable volumes of litter per 1,000m<sup>2</sup>.

Cigarette butts were the most frequently identified item, with 35 butts per 1,000m<sup>2</sup> (up from 31 butts in 2008/09, but down or similar to 39 butts in 2007/08, 34 butts in 2006/07 and 40 butts in 2005/06) recorded within NSW for the year 2009/10, they were however, associated with only a very small proportion of the overall litter volume (0.004 litres per 1,000m<sup>2</sup>).

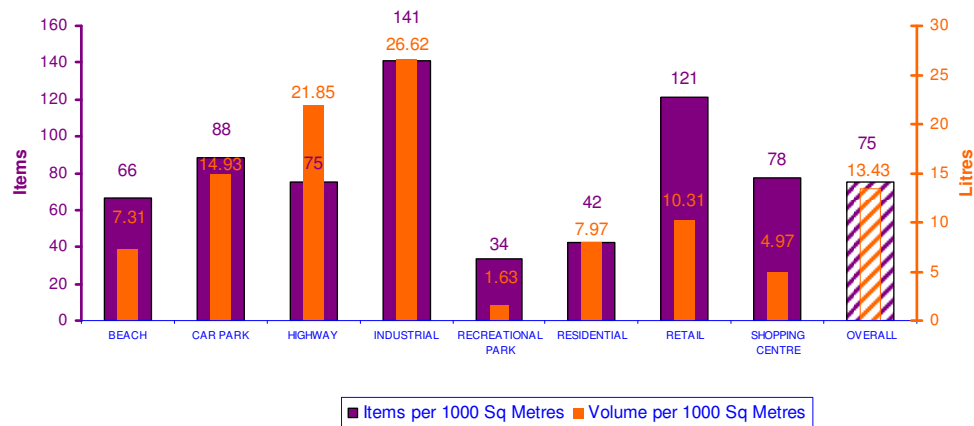
Plastic litter objects continued to contribute the largest amount of volume to the litter stream, adding 3.00 litres of volume per 1,000m<sup>2</sup> (up from 2.67 litres in 2008/09 and 2.95 litres in 2007/08, but down from 3.50 litres in 2006/07 and 4.19 litres in 2005/06). Paper/ paperboard objects contributed the second largest volume to the litter stream, with 2.72 litres of volume per 1,000m<sup>2</sup> (up from 2.24 litres in 2008/09, 2.03 litres in 2007/08, 2.21 litres in 2006/07 and 2.68 litres in 2005/06).

## Comparisons by Site Types

The largest numbers of items per 1,000 m<sup>2</sup> were associated with industrial sites (141 items, up from 122 items in 2008/09 and 2007/08) retail locations (121 items, up from 101 items in 2008/09 and 103 items in 2007/08) and car park sites (88 items, down from 95 items in 2008/09, up from 76 items in 2007/08, but below the 94 items recorded in 2005/06).

Industrial sites (26.62 litres, down from 34.86 litres in 2008/09) also displayed higher volume totals per 1,000 m<sup>2</sup> in comparison to other site types. A considerable estimated volume of litter was also recorded at highway sites (21.85 litres, up from 13.99 litres in 2008/09) and car parks (14.93 litres, down from 14.64 litres in 2008/09).

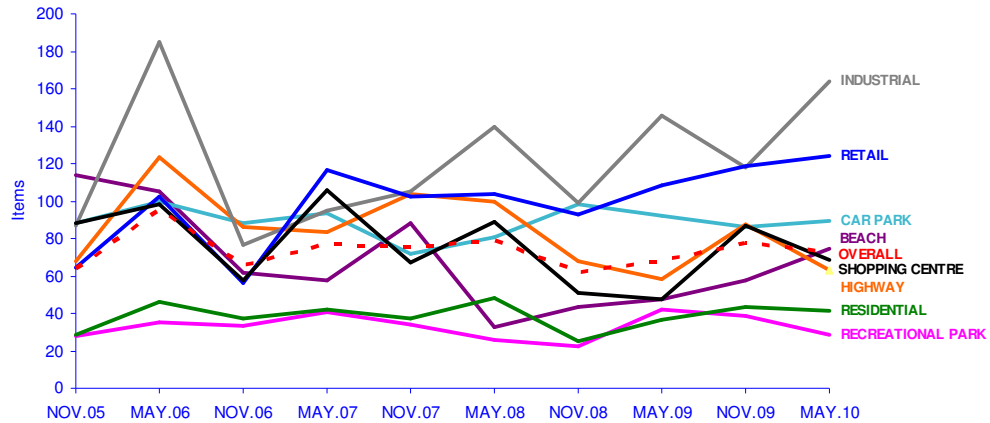
Items and Volume per 1000 Square Metres by Site Type - NSW - 2009/ 2010



Tracked results from November 2005 demonstrate seasonal fluctuations among shopping centres, residential and industrial sites with an increase in the overall numbers of items per 1,000m<sup>2</sup> recorded in the May counts, and lower results in figures for November counts.

Since the inception of the litter monitors there also appears to be a gradual increase in the number of litter items per 1,000m<sup>2</sup> at retail and industrial sites.

Items per 1000 Square Metres by Site Type - NSW

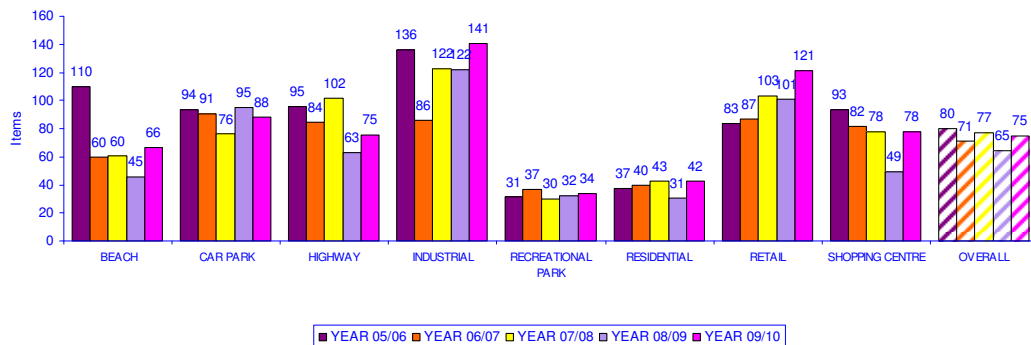


The annual average number of litter items per 1,000m<sup>2</sup> within NSW for the year of 2009/10 (75 items) represented an increase from the figure recorded in 2008/09 (65 items), but remained lower than the number of litter items recorded in 2007/08 (77 items).

Increases in the litter recorded per 1,000m<sup>2</sup> were most strongly evident at shopping centres (78 items, up from 49 items in 2008/09), beaches (66 items, up from 45 items in 2007/08), retail sites (121 items, up from 101 items in 2008/09) and industrial sites (141 items, up from 122 items in 2008/09).

There was however, a decrease in the litter recorded per 1,000m<sup>2</sup> at car park sites (88 items, down from 95 items in 2008/09).

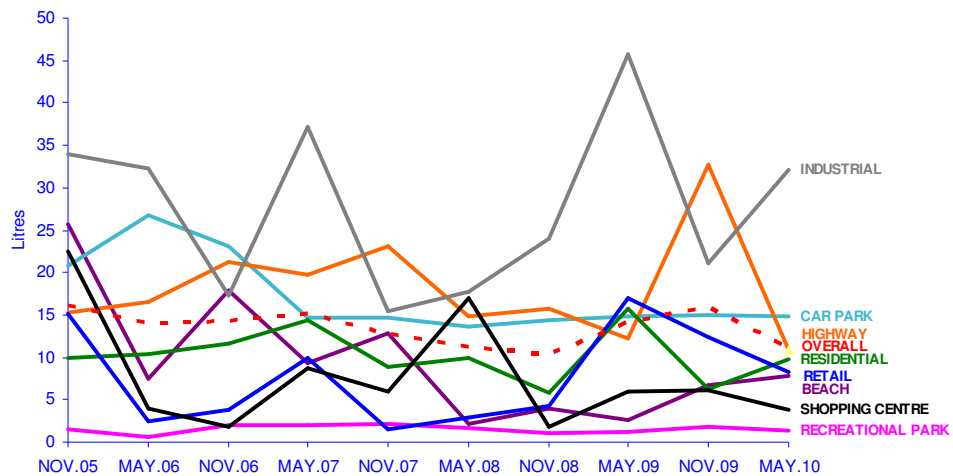
Items per 1000 Square Metres by Site Type - Annual Averages - NSW



There is also some seasonal fluctuation evident in volume estimates of litter within site types in the NSW where there are higher litter volumes among residential and shopping centre sites in May compared to lower litter volumes in November. Conversely, there are higher litter volumes among beach and highway sites in the November and a lower volumes in May.

The volume estimates from the other site types show fluctuations across count results but without evidence of predictable seasonal activity. Fluctuations in litter volumes at industrial and highway sites are mainly due the discarding of high volume materials through illegal dumping.

**Volume per 1000 Square Metres by Site Type - NSW**



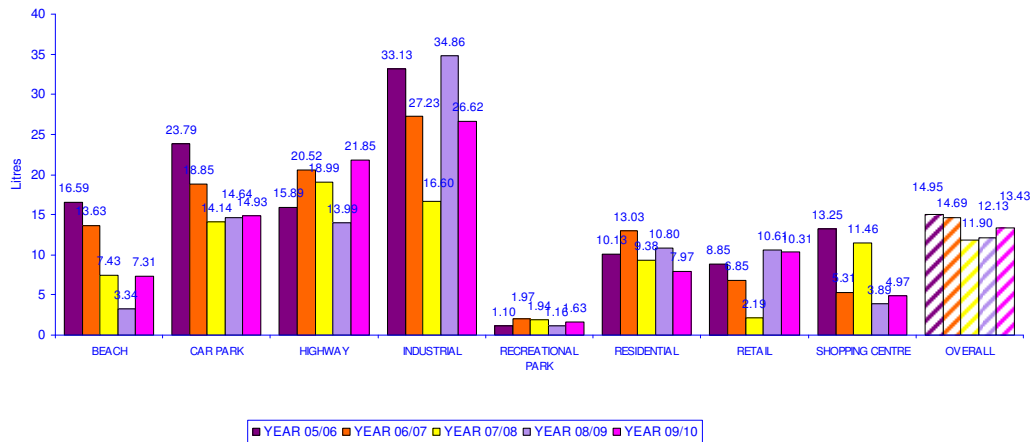
The overall annual average estimated litter volume per 1,000m<sup>2</sup> across all sites within NSW for the year 2009/10 (13.43 litres) was marginally higher than the results recorded in the previous two years (up from 12.13 litres in 2008/09 and 11.90 litres in 2007/08) but still remain lower however, than the results for 2006/07 (14.69 litres) and 2005/06 (14.95 litres).

The increase in litter volume per 1,000m<sup>2</sup> was most strongly reflected within the recorded results from highway sites (21.85 litres, up from 13.99 litres in 2008/09 and 18.99 litres in 2007/08) and beach sites (7.31 litres, up from 3.34 litres in 2008/09, but down from 7.43 litres in 2007/08).

Conversely, decreases in the annual average estimated litter volume per 1,000m<sup>2</sup> were most evident at industrial sites (26.62 litres, down from 34.86

litres in 2008/09) and residential sites (7.97 litres, down from 10.80 litres in 2008/09).

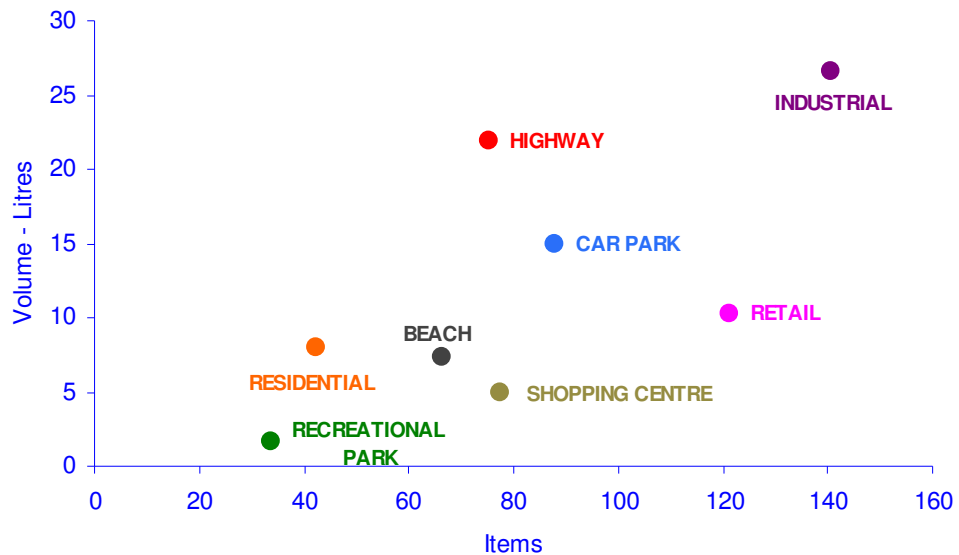
Volume per 1000 Square Metres by Site Type - Annual Averages - NSW



Items and volume estimates per 1,000m<sup>2</sup> within NSW identify the following site characteristics across the respective site types surveyed in 2009/10:

- Industrial sites were associated with both large numbers of litter items as well as high levels of litter volumes
- Retail sites were associated with high numbers of litter items and moderate levels of litter volumes
- Car park sites were associated with both moderate levels of litter items and litter volumes
- Shopping centres were associated with moderate levels of litter items and low levels of litter volumes
- Beaches, recreational parks and residential sites were associated with both lower levels of litter items and litter volumes

**Items and Volume per 1000 Square Metres by Site Type -  
NSW - 2009/ 2010**

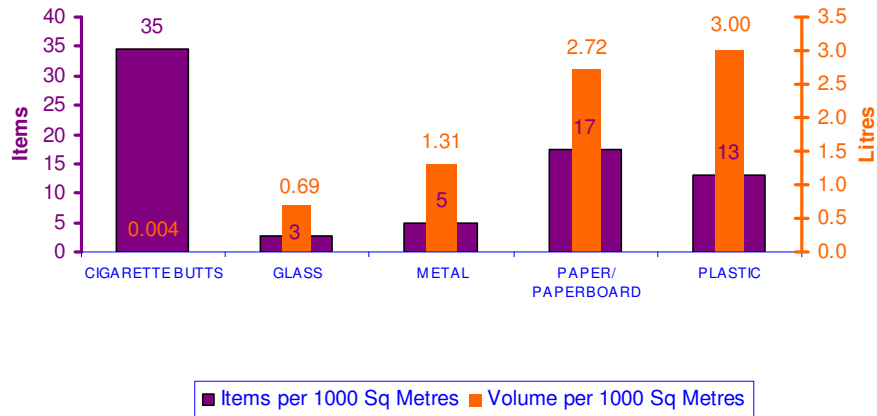


**Comparison by Main Material Types**

An average of 35 cigarette butts per 1,000m<sup>2</sup> were identified across all sites surveyed within NSW during the year of 2009/10. These items however, only contributed 0.004 litres per 1,000m<sup>2</sup> in volume to the litter stream in that state.

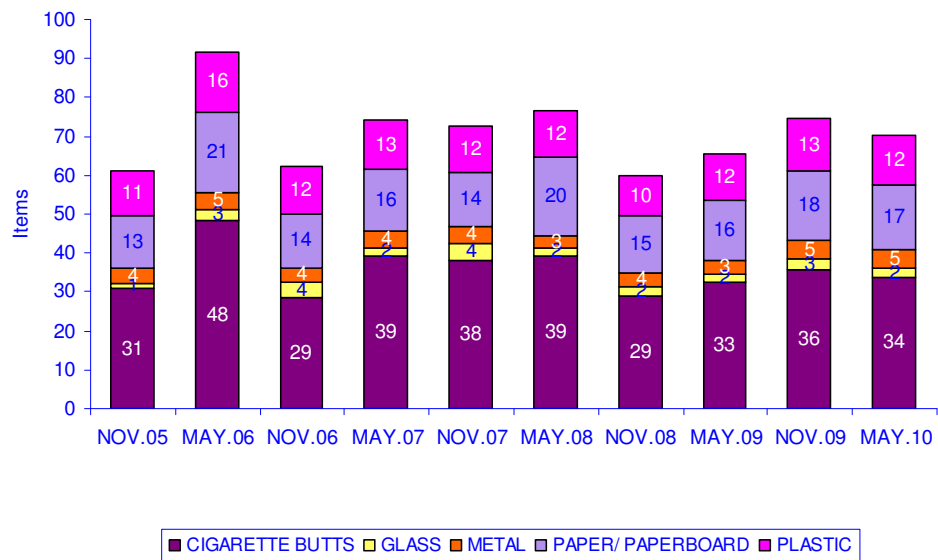
Items which contributed the greatest volumes to the litter stream in NSW in 2009/10 were plastic objects (3.00 litres per 1,000m<sup>2</sup>) and paper/paperboard objects (2.72 litres per 1,000m<sup>2</sup>).

**Items and Volume per 1000 Square Metres by Main Material Type - NSW - 2009/2010**



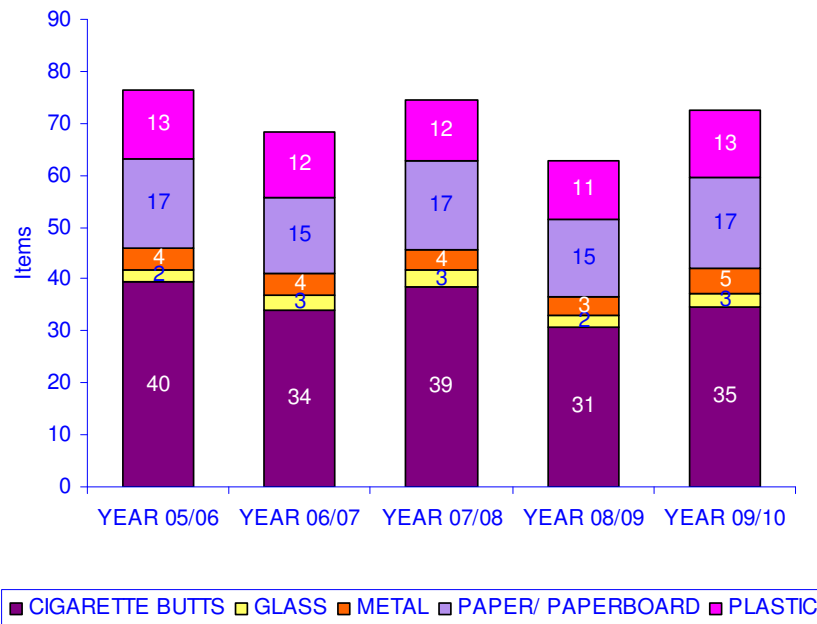
There is no evidence to support the notion of a seasonal pattern among material categories, the contribution of each main material type to the overall litter stream, however, has remained proportionally consistent across each count. The only significant variance remains the cigarette butt litter count recorded in May 2006 which remains well above all other counts.

**Items per 1000 Square Metres by Main Material Type - NSW**



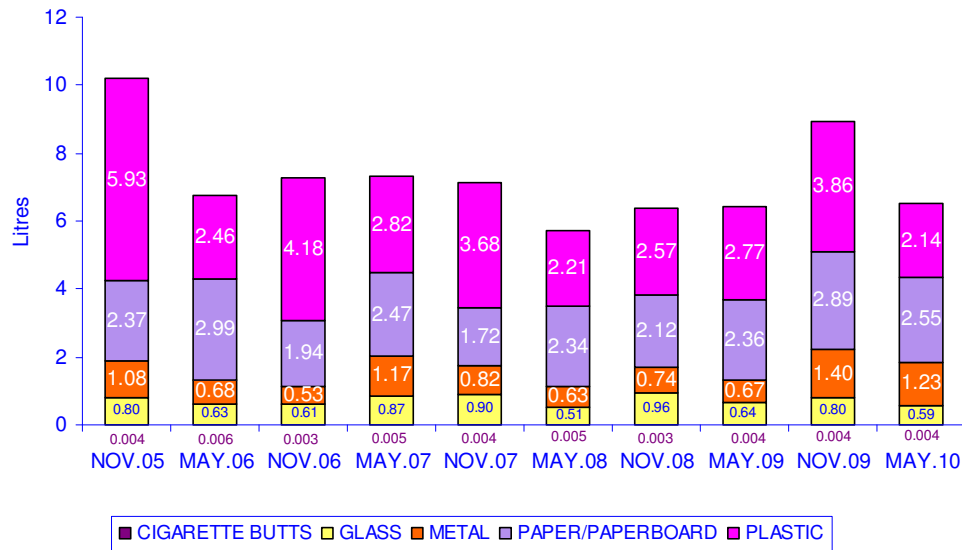
There has been a marginal increase over all material categories in 2009/10 from the results recorded in 2008/09. The contribution of each main material type to the overall litter stream however, has maintained a similar proportional contribution to the overall totals.

### Items per 1000 Square Metres by Main Material Type - Annual Averages - NSW



There is the absence of evidence to support the notion of a seasonal pattern among material categories. Each of the main material types maintained a similar proportional contribution to the overall estimated litter volume across seasonal counts.

### Volume per 1000 Square Metres by Main Material Type - NSW

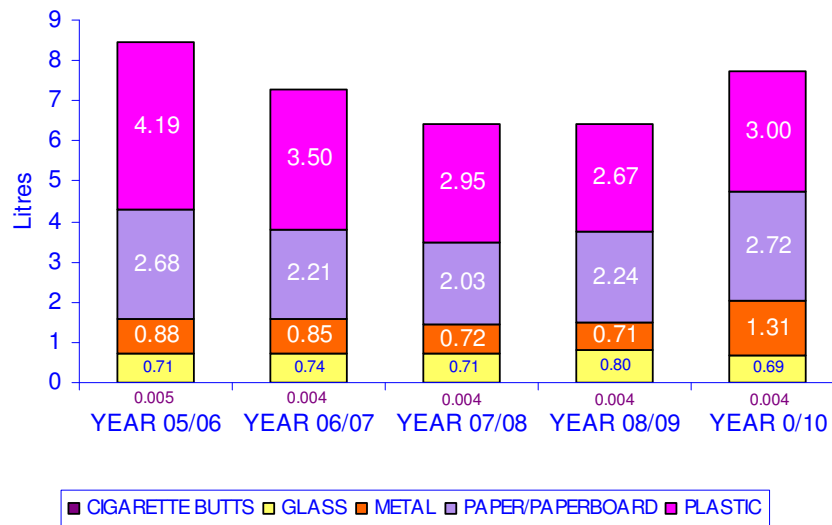


Annual results for the year 2009/10 revealed an overall increase in the volume of litter per 1,000m<sup>2</sup> in NSW across all main material types except glass. Glass declined to the lowest volume recorded during across all litter monitors in 2009/10 (0.69 litres, down from 0.80 litres in 2008/09, 0.71 litres in 2007/08, 0.74 litres in 2006/07 and 0.71 litres in 2005/06).

The largest increase in 2009/2010 among the other main material types was the increase in the volumes per 1,000m<sup>2</sup> of metal litter (1.31 litres, up from 0.71 litres in 2008/09, 0.72 litres in 2007/08, 0.85 litres in 2006/07 and 0.88 litres in 2005/06). Paper/ paperboard and plastic volumes per 1,000m<sup>2</sup> also increased marginally from 2008/09 to 2009/10, as outlined:

- Paper (2.72 litres, up from 2.24 litres in 2008/09, 2.03 litres in 2007/08, 2.21 litres in 2006/07 and 2.68 litres in 2005/06)
- Plastic (3.00 litres, up from 2.67 litres in 2008/09, down from 2.95 litres in 2007/08, but down from 3.50 litres in 2006/07 and 4.19 litres in 2005/06)

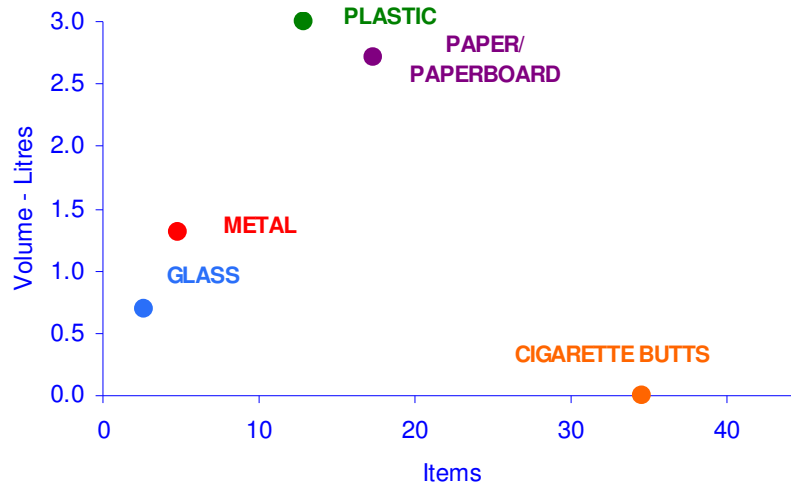
### Volume per 1000 Square Metres by Main Material Type - Annual Averages - NSW



Figures for items and volumes per 1,000m<sup>2</sup> across main material types identify the following characteristics of litter objects recorded within NSW during the year of 2009/2010:

- Plastic and paper/ paperboard items contribute large volumes to the litter stream and were also associated with a moderate number of litter items
- Cigarette butts are associated with large numbers of litter items but they contribute only a negligible volume to the overall litter stream in the state
- Metals items are contributed a lower number of litter items and moderate volumes to the litter stream
- Glass items are associated with a lower number of litter items and lower volumes in the litter stream

## Items and Volume per 1000 Square Metres by Main Material Type - NSW - 2009/ 2010



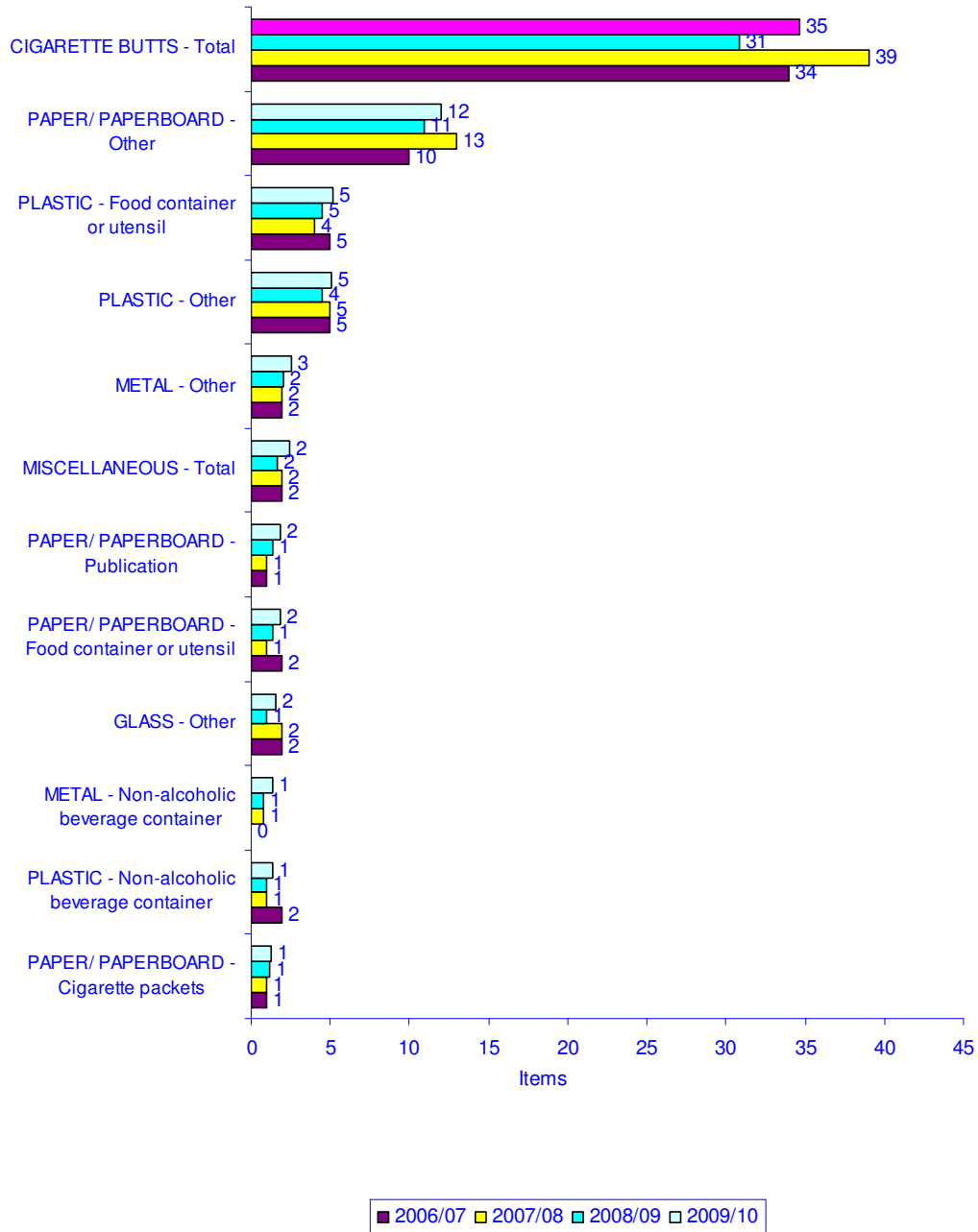
### The Dirty Dozen

Within object type sub-categories, cigarette butts remained the strongest contributor to the presence of litter objects at sites within NSW, with 35 butts per 1,000m<sup>2</sup> were identified on average across the 2009/10 counts (up from 31 butts in 2008/09, down from 39 in 2007/08 and up from 34 butts in 2006/07).

Other object sub-categories associated with large litter counts included:

- Uncategorised paper/ paperboard objects (12 items per 1,000m<sup>2</sup>, up from 11 items in 2008/09, down from 13 items in 2007/08 and up from 10 items in 2006/07)
- Plastic food containers or utensils (5 items per 1,000m<sup>2</sup>, unchanged from 2008/09, up from 4 items in 2007/08 and the same as 2006/07)
- Uncategorised plastic objects (5 items per 1,000m<sup>2</sup>, up from 5 items in 2008/09 and the same as 2007/08 and 2006/07)

**Dirty Dozen - Items per 1000 Square Metres - Object Sub-Categories -  
NSW - 06/07 to 09/10**

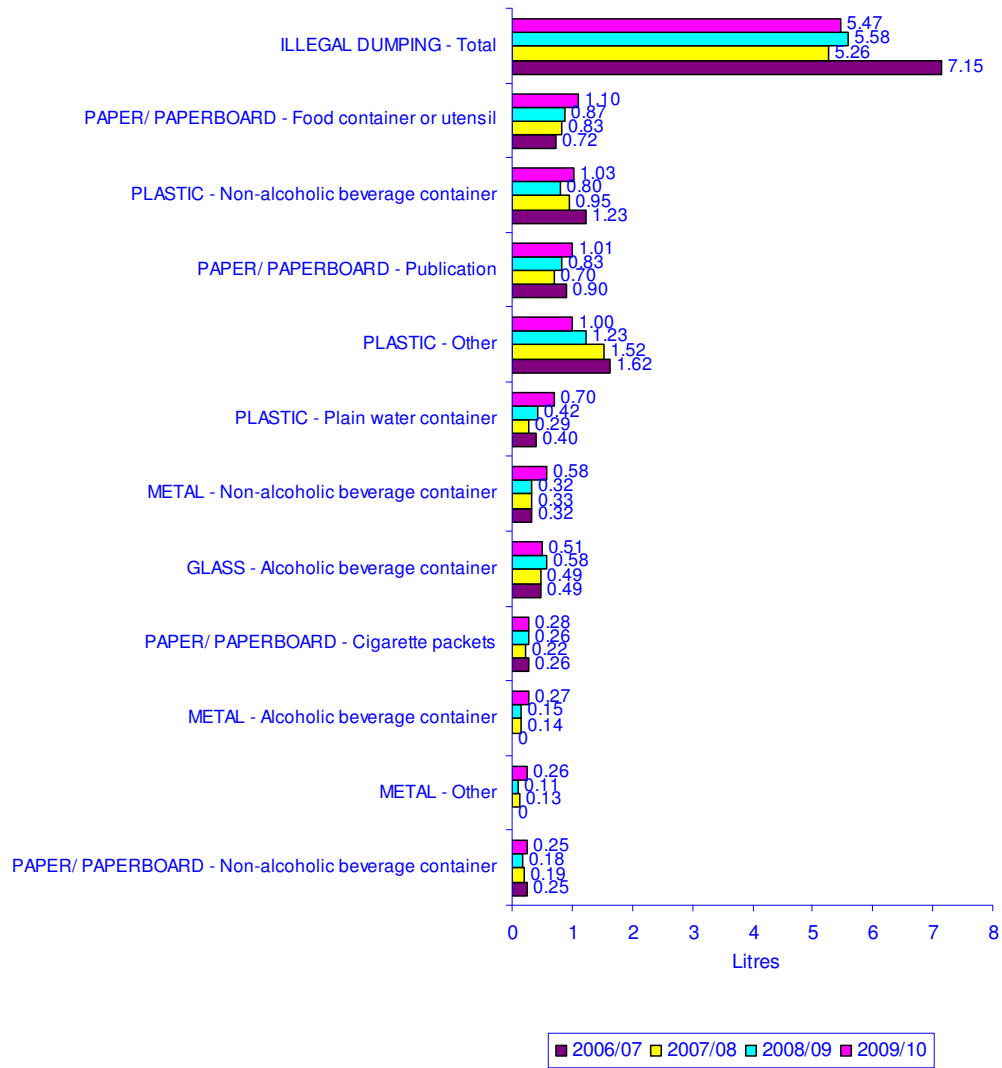


Illegal dumping was strongly associated with litter volume present at sites within NSW and contributed 5.47 litres of litter volume per 1,000m<sup>2</sup> (down from 5.58 litres in 2008/09, up from 5.26 litres in 2007/08 but still down substantially from 7.15 litres in 2006/07).

Other object sub-categories associated with large litter volume estimates included:

- Paper/ paperboard - food containers or utensils (1.10 litres per 1,000m<sup>2</sup>, up from 0.87 litres in 2008/09, 0.83 litres in 2007/08 and 0.72 litres in 2006/07)
- Plastic - non-alcoholic beverage containers (1.03 litres per 1,000m<sup>2</sup>, up from 0.80 litres in 2008/09 and 0.95 litres in 2007/08 and down from 1.23 litres in 2006/07)
- Paper/ paperboard - publications (1.01 litres per 1,000m<sup>2</sup>, down from 0.83 litres in 2008/09, 0.70 litres in 2007/08 and 0.90 litres in 2006/07)
- Uncategorised plastic objects (1.00 litres per 1,000m<sup>2</sup>, down from 1.23 litres in 2008/09, 1.52 litres in 2007/08 and 1.62 litres in 2006/07)

**Dirty Dozen - Volume per 1000 Square Metres - Object Sub-Categories - NSW - 06/07 to 09/10**



#### 4.4

#### Northern Territory

##### At a Glance

Overall, there were 70 items per 1,000m<sup>2</sup> on average recorded across all of the 76 sites surveyed in the Northern Territory during the 2009/10 litter counts, while the overall average estimated volume per 1,000m<sup>2</sup> was 5.09 litres.

The number of items per 1,000m<sup>2</sup> represented a decrease from previous year (down from 84 items in 2008/09 but up from 60 items in 2007/08) and similarly, the current volume of 5.09 per 1,000m<sup>2</sup> also represented a decrease from the previous year (down from 6.00 litres in 2008/09 and 7.24 litres in 2007/09).

Within the Northern Territory, retail sites were associated with the highest number of litter items and also contributed a substantial volume of litter to the estimated total volume. Other sites that also contributed large volumes of litter to the litter stream in the Northern Territory included beaches, residential and car park sites.

Cigarette butts were the most frequently identified item over all sites in the Northern Territory for 2009/10, with an average of 38 butts per 1,000 m<sup>2</sup> (unchanged from 2008/09 but up from 28 butts in 2007/08, they were however, associated with only a very small proportion of the overall litter volume (0.004 litres per 1,000m<sup>2</sup>).

Plastic litter items contributed the highest amount of volume to the litter total, with 1.83 litres per 1,000m<sup>2</sup> (down from 1.87 litres in 2008/09 and 2.28 litres in 2007/08). Paper/ paperboard items (1.14 litres per 1,000m<sup>2</sup>, marginally up from 1.12 litres in 2008/09, but down from 1.27 litres in 2007/08) and metal items (0.82 litres per 1,000m<sup>2</sup>, down from 0.90 litres in 2008/09 and 1.20 litres in 2007/08) also contributed appreciable amounts to the overall total volume in the litter stream.

### *Comparisons by Site Types*

The largest numbers of items per 1,000m<sup>2</sup> at the sites surveyed within the Northern Territory during the year 2009/10 were located within retail sites (364 items per 1,000m<sup>2</sup>, up from 225 items in 2008/09 and 230 items in 2007/08). Retail sites also contributed the third highest volume of litter per 1,000m<sup>2</sup> by site across the Northern Territory (6.57 litres per 1,000m<sup>2</sup>, down from 11.74 litres in 2008/09 and marginally up from 6.34 litres in 2007/08).

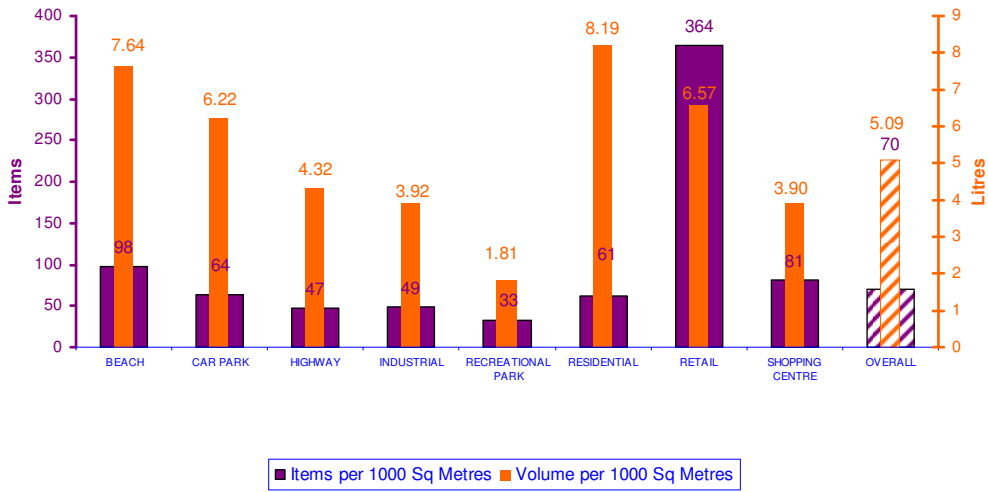
The other sites that contributed the second and third highest, although more moderate, levels of items per 1,000m<sup>2</sup> to the litter stream were beaches (98 items per 1,000m<sup>2</sup>, down from 154 items in 2007/08 and 101 items in 2007/08) and shopping centres (81 items per 1,000m<sup>2</sup>, down from 100 items in 2007/08 and up from 74 items in 2007/08).

The highest level of estimated volume per 1,000m<sup>2</sup> of the litter in the litter stream was recorded at residential sites (8.19 litres, down from 10.42 litres in 2008/09 and up from 7.89 litres in 2007/08), these sites however, were associated with only a smaller number of litter items per 1,000m<sup>2</sup> (61 items, up from 52 items in 2008/09 and 42 items in 2007/08).

High to moderate levels of litter volume per 1,000m<sup>2</sup> were also contributed by beaches (7.64 litres, down from 12.52 litres in 2008/09 and 14.53 litres in 2007/08) and car parks (6.22 litres, down from 8.29 litres in 2008/09 and 14.79 litres in 2007/08).

Both highway and industrial sites contributed small numbers of litter items and moderate volumes of litter, while recreational parks were associated with both low levels of litter items and low volumes of litter.

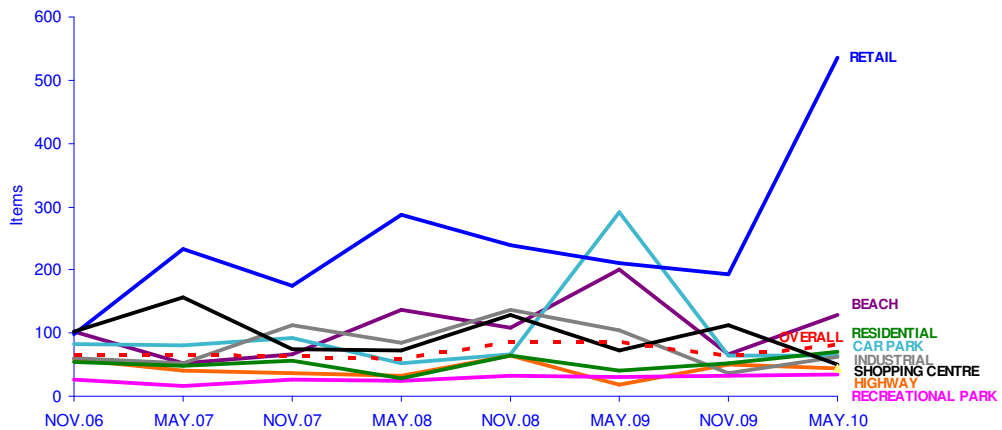
Items and Volume per 1000 Square Metres by Site Type - NT - 2009/ 2010



The tracked results demonstrate that there are some seasonal fluctuations in the number of litter items per 1,000m<sup>2</sup>, particularly within beach and retail sites which display peaks in May and troughs in November.

Litter item counts among most site types have remained relatively steady when tracked from November 2006. The most noticeable differences are the fluctuations at retail sites, due largely to cigarette butts.

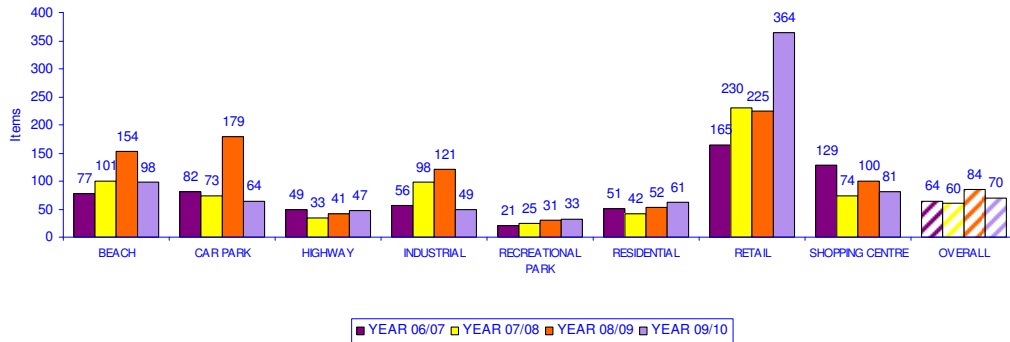
Items per 1000 Square Metres by Site Type - NT



The annual average of items per 1,000m<sup>2</sup> within the Northern Territory for the year 2009/10 totalled 70 items, which is significantly lower than the 84 items recorded for 2008/09.

Decreases in the number of items per 1,000m<sup>2</sup> in the litter stream were most evident at car parks (64 items, down from 179 items in 2008/09), industrial sites (49 items, down from 121 items in 2008/09) and beaches (98 items, down from 154 items in 2008/09). Conversely, the increase in the number of items per 1,000m<sup>2</sup> in the litter stream was most apparent at retail sites (364 items, up from 225 items in 2008/09).

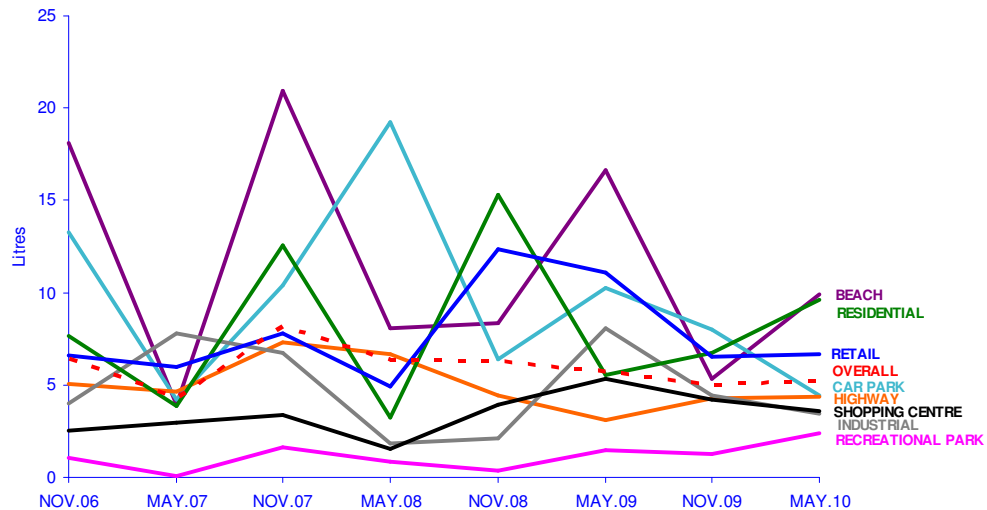
Items per 1000 Square Metres by Site Type - Annual Averages - NT



Overall, there has been a downward trend with regard to total litter volume in the litter stream in the Northern Territory.

Tracked results of total estimated volume shows distinctive seasonal fluctuations particularly among residential sites, with higher litter volumes in November, offset by considerably lower volume levels in May.

Volume per 1000 Square Metres by Site Type - NT

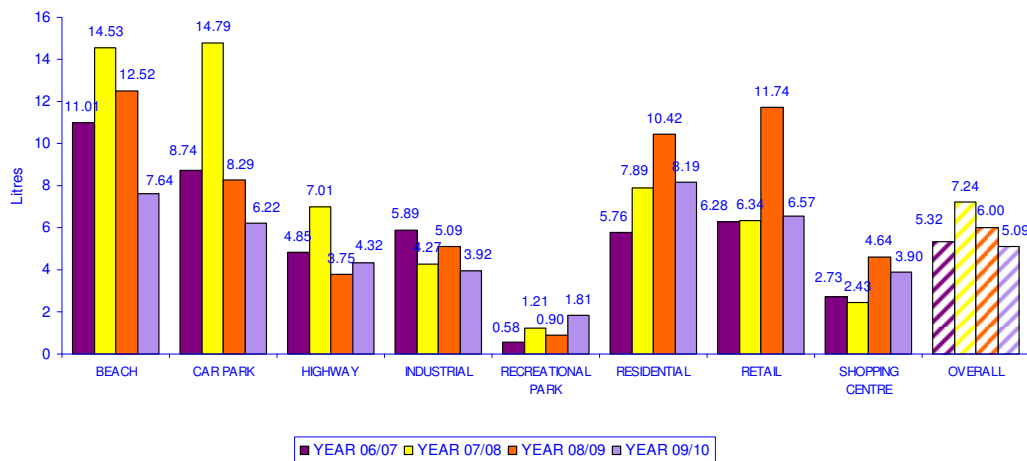


The overall average estimated litter volume per 1,000m<sup>2</sup> across all Northern Territory sites for the year 2009/10 was 5.09 litres, a reduction from the volume recorded in the previous year (6.00 litres in 2008/09).

The decrease in litter volume per 1,000m<sup>2</sup> was most evident at retail sites (6.57 litres, down from 11.74 litres in 2008/09), and beaches (7.64 litres, down from 12.52 litres in 2008/09), residential sites (8.19 litres, down from 10.42 litres in 2008/09) and car parks (6.22 litres, down from 8.29 litres in 2008/09).

Conversely, there were moderate increases in the litter volume per 1,000m<sup>2</sup> at recreational parks (1.81 litres, up from 0.90 litres in 2008/09) and highways sites (4.32 litres, up from 3.75 litres 2008/09).

Volume per 1000 Square Metres by Site Type - Annual Averages - NT

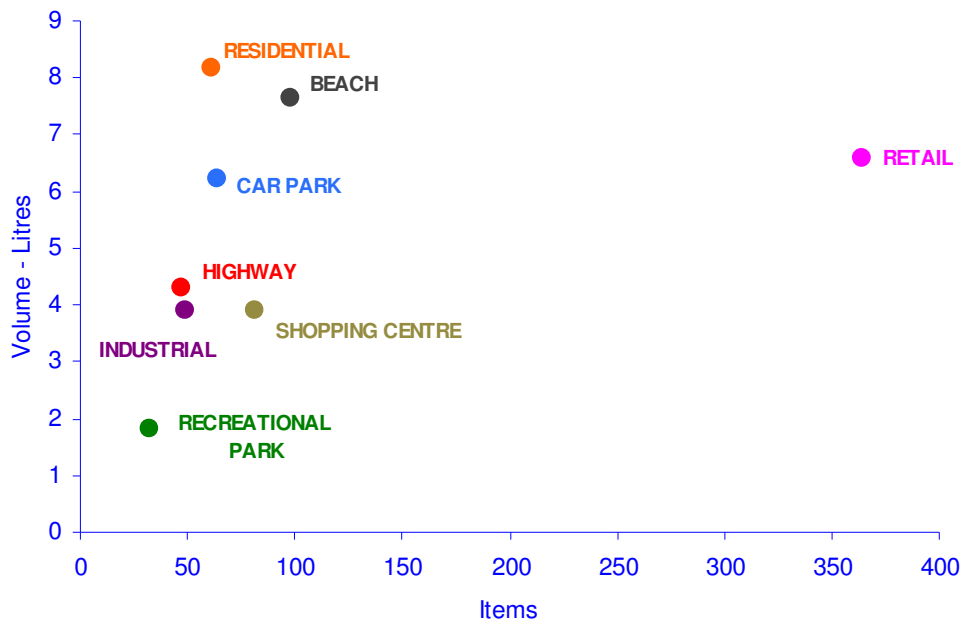


Items and volume estimates per 1,000m<sup>2</sup> within the Northern Territory identify differential patterns across site types. Particular site characteristics which are evident are as follows:

- Retail sites were associated with a large number of litter items and medium to high volumes of litter.
- Residential and beach sites were associated with a small number of litter items and high volumes of litter.
- Car park sites were associated with a small number of litter items and medium to high levels of litter volume.

- Industrial, highways and shopping centre sites were associated with a low number of litter items and low to moderate levels of litter volume
- Recreational parks were associated with both a low number of litter items and a low level of litter volume

### Items and Volume per 1000 Square Metres by Site Type - NT - 2009/ 2010

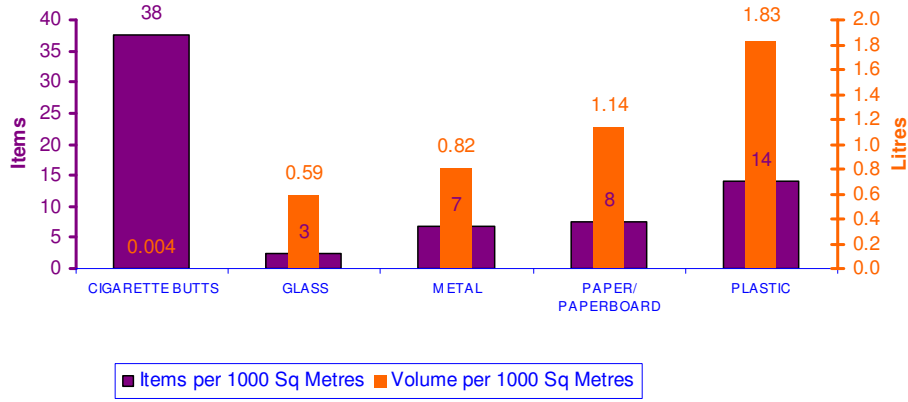


### Comparison by Main Material Types

An average of 38 cigarette butts per 1,000m<sup>2</sup> were identified across all sites within the Northern Territory during the year of 2009/10. Cigarette butts however, only contributed 0.004 litres per 1,000m<sup>2</sup> in volume to the litter stream.

Items which contributed the greatest volumes to the overall litter stream included plastic items (1.83 litres per 1,000m<sup>2</sup>), paper/ paperboard items (1.14 litres per 1,000m<sup>2</sup>) and metal items (0.82 litres per 1,000m<sup>2</sup>).

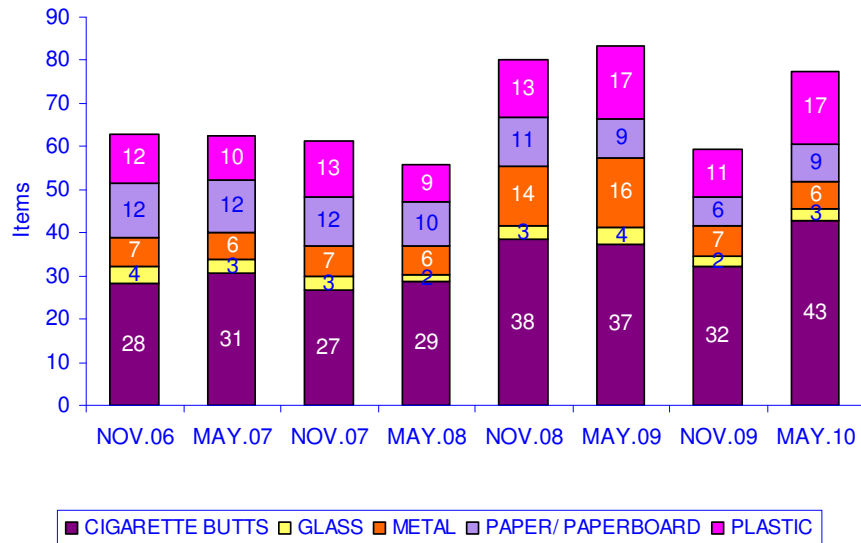
**Items and Volume per 1000 Square Metres by Main Material Type - NT -  
2009/ 2010**



Results from November 2006 through May 2010 do reveal any seasonal fluctuations within main material types when comparing November and May counts.

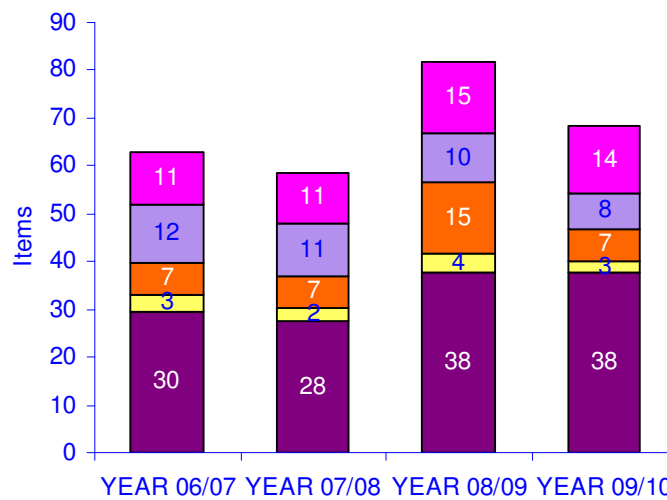
The most notable fluctuations occurred among metal and cigarette butt numbers in the litter stream, with increases in metal items and cigarette butts, and to a lesser extent plastic items, in November 2008 and May 2009 and cigarette butts again in May 2010.

**Items per 1000 Square Metres by Main Material Type - NT**



The most significant fluctuations in annual litter items per 1,000m<sup>2</sup> in the litter stream from 2006/07 to 2009/2010 were the increases the number metal, plastic and cigarette butts in 2008/09. While the number of metal litter items decreased to previous levels in 2009/10, plastic litter items and cigarette butts numbers have remained elevated in comparison to 2006/07 and 2007/08.

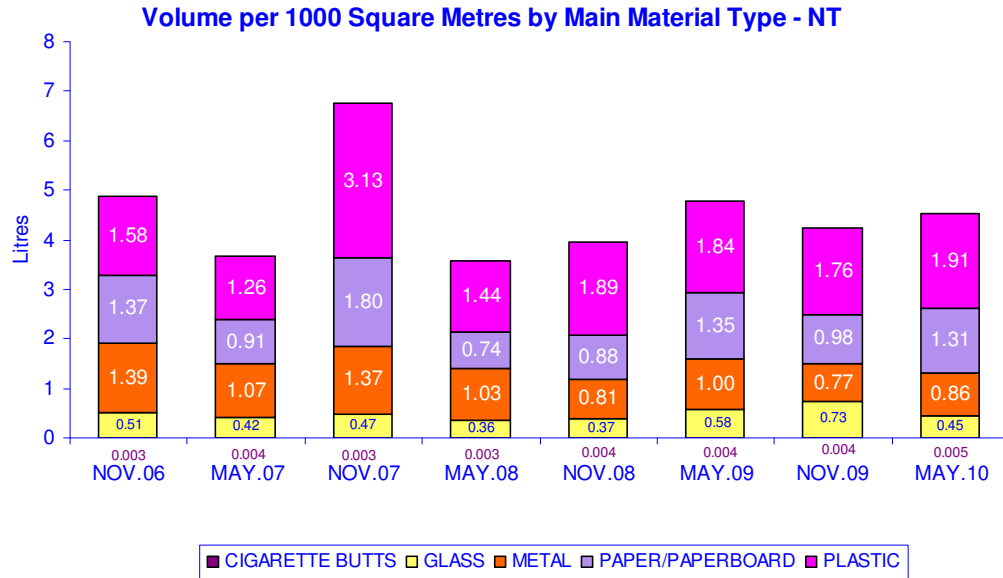
### Items per 1000 Square Metres by Main Material Type - Annual Averages - NT



■ CIGARETTE BUTTS ■ GLASS ■ METAL ■ PAPER/ PAPERBOARD ■ PLASTIC

There does not appear to be seasonal pattern among the material categories, resulting from variances in November and May counts.

The spike in the volume of plastic litter items in November 2007 remains the most significant variance among the overall results, due primarily to a higher overall litter count total, which included a significantly larger amount of high-volume plastic items such as domestic and industrial containers. Volumes in the litter stream of the other material types have remained relatively proportional across the litter counts.

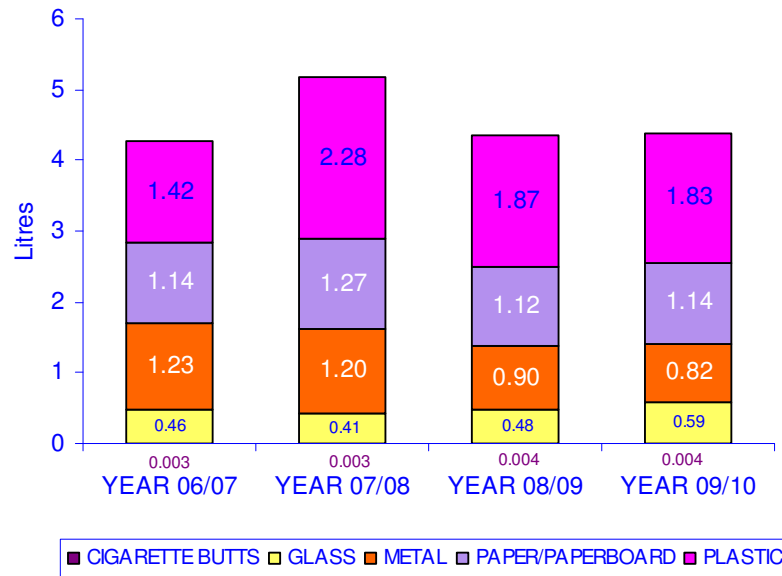


The overall annual average in 2009/10 in the Northern Territory are almost the same as the average in the previous year with only minor changes within the different material categories Glass litter items represented the largest increase in litter volume per 1,000m<sup>2</sup> (0.59 litres, up from 0.48 litres in 2008/09, 0.41 litres in 2007/08 and 0.46 litres in 2006/07

The volume levels of other material types in the litter stream also included:

- Plastic litter volumes reduced to 1.83 litres per 1,000m<sup>2</sup> (down from 1.87 litres in 2008/09, 2.28 litres in 2007/08, but still higher than 1.42 litres in 2006/07)
- Paper/ paperboard volumes reduced to 1.14 litres per 1,000m<sup>2</sup> (up from 1.12 litres in 2008/09, but down from 1.27 litres in 2007/08 and the same as 2006/07)
- Metal volumes declined to 0.82 litres per 1,000m<sup>2</sup> (down from 0.90 litres in 2008/09, 1.20 litres in 2007/08 and 1.23 litres in 2006/07)

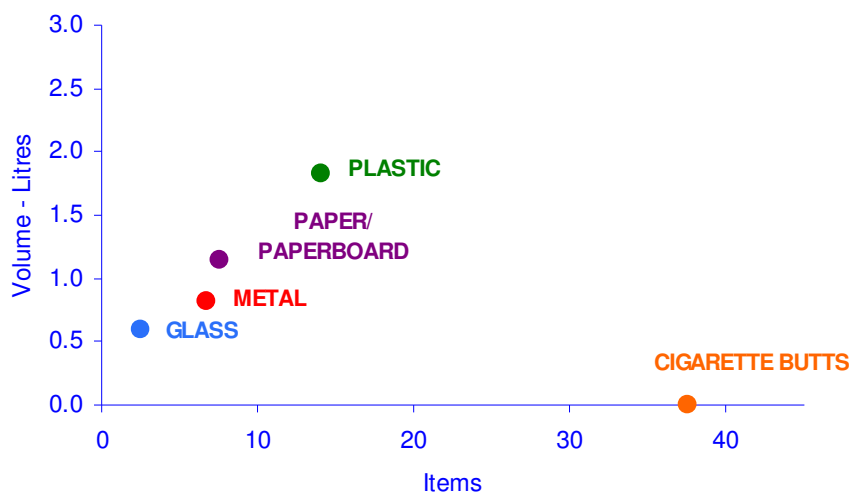
### Volume per 1000 Square Metres by Main Material Type - Annual Averages - NT



Figures for items and volumes per 1,000m<sup>2</sup> across main material types identify the following characteristics of litter objects within the Northern Territory:

- Plastic litter items contribute large volumes to the litter stream but are associated with a moderate number of litter items.
- Paper/ paperboard and metal litter items contribute moderate volumes to the litter stream and are also associated with a low to medium number of litter items.
- Glass contributes low volumes of litter and is also associated with low numbers of litter items.
- Cigarette butts represent a large proportion of the litter items, however, they contribute only a negligible volume to the overall litter stream.

## Items and Volume per 1000 Square Metres by Main Material Type - NT - 2009/ 2010



### *The Dirty Dozen*

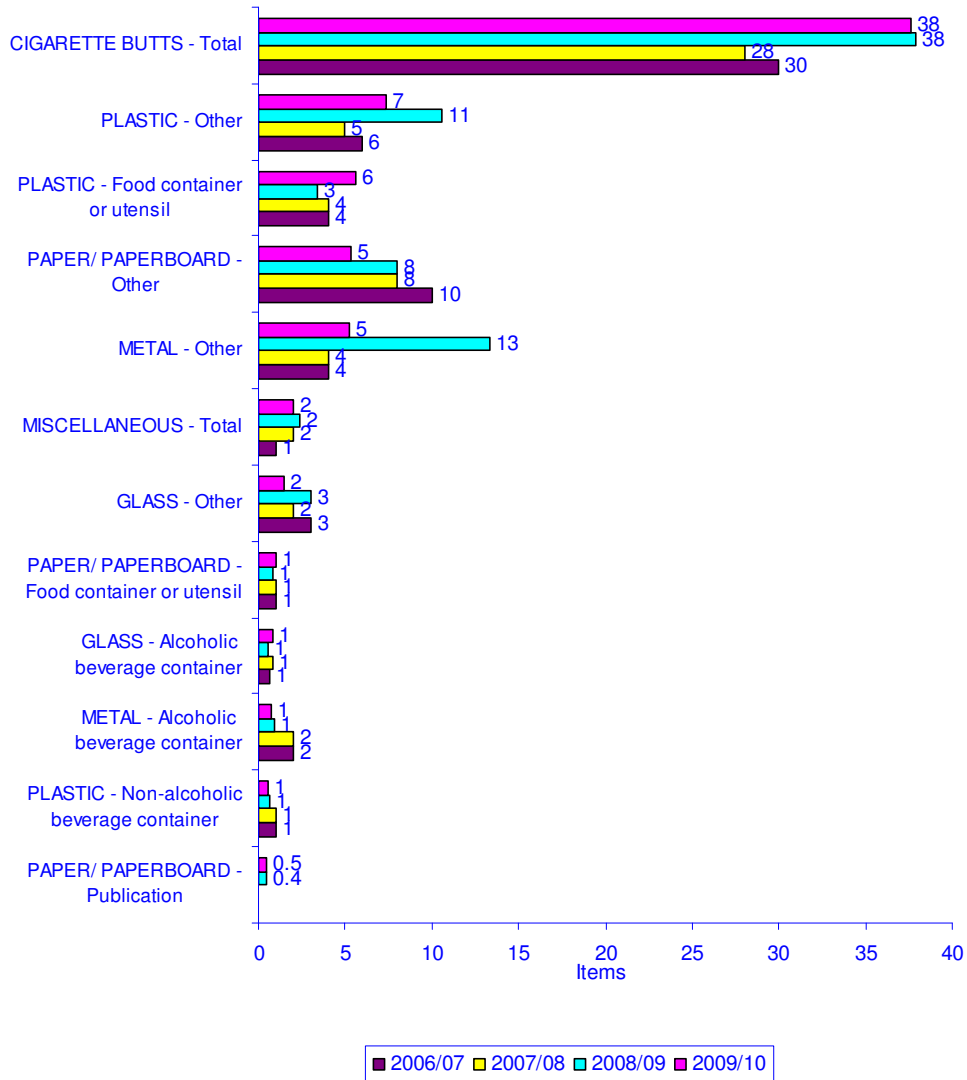
When partitioned according to object sub-type distinctions, cigarette butts were the most frequently identified litter item, with 38 butts recorded per 1,000m<sup>2</sup> (unchanged from 2008/09 and up from 28 butts in 2007/08 and 30 butts in 2006/07) on average across the 2009/10 counts in the Northern Territory.

Other objects frequently identified in that state during the counts included:

- Uncategorised plastic objects (7 items, down from 11 items in 2008/09, up from 5 items in 2007/08 and 6 items in 2006/07)
- Plastic food containers and utensils (6 items, up from 3 items in 2008/09, and 4 items in both 2007/08 and 2006/07)
- Uncategorised paper/ paperboard objects (5 items, down from 8 items in 2008/09, 8 items in and 2007/08 and 10 items in 2006/07)

- Uncategorized metal objects (5 items, down from 13 items in 2008/09 and up from 4 items in both 2007/08 and 2006/07)

**Dirty Dozen - Items per 1000 Square Metres - Object Sub-Categories - NT - 2009/ 2010**

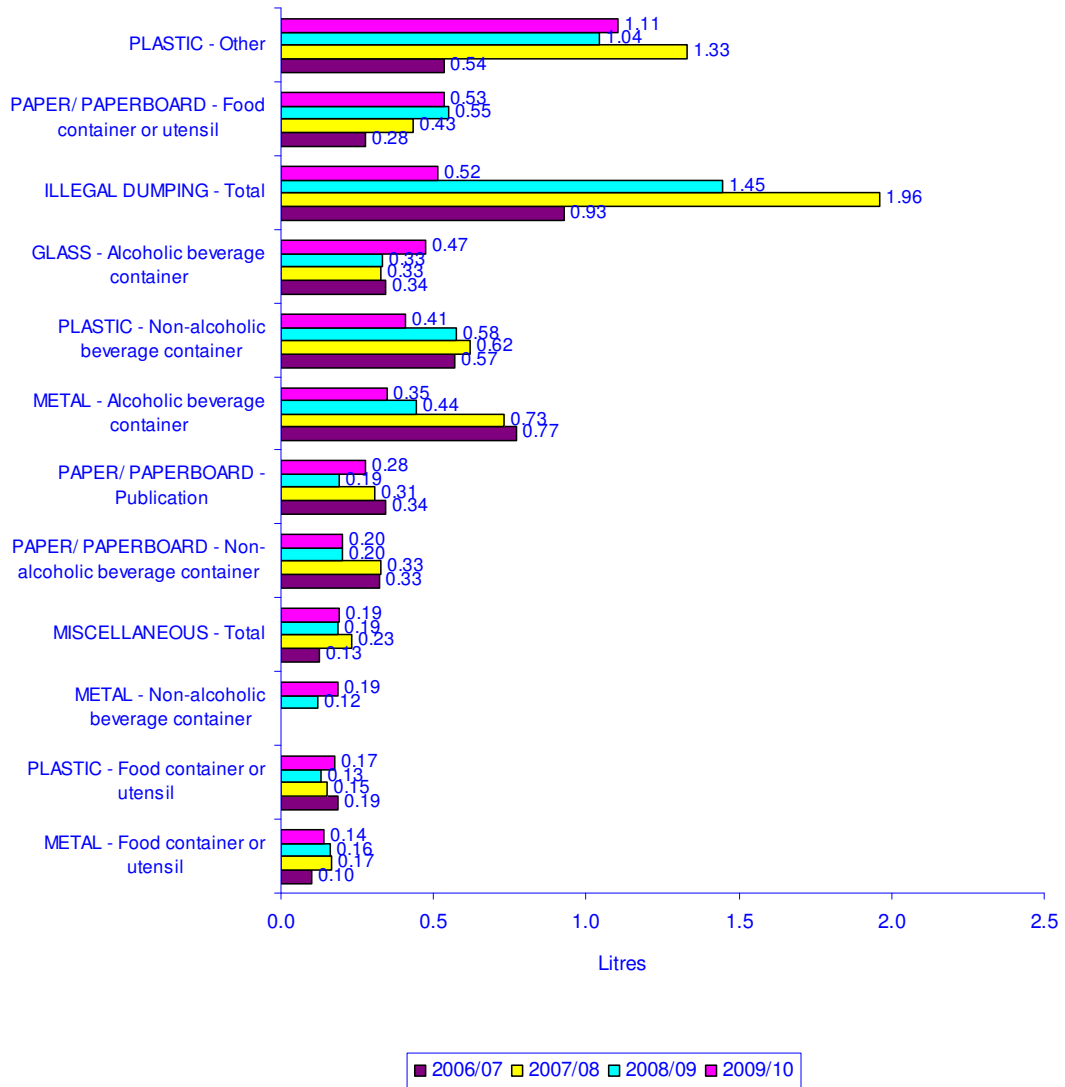


The largest contributor to volume in the litter stream in the Northern Territory was uncategorized plastic objects, with a litter volume of 1.11 litres per 1,000m<sup>2</sup> (up from 1.04 litres in 2008/09, down from 1.33 litres in 2007/08 and up from 0.54 litres in 2006/07).

Other object sub-categories which were associated with substantial estimated volume measurements per 1,000m<sup>2</sup>, included:

- Paper/ paperboard – food container or utensil (0.53 litres, down from 0.55 litres in 2008/09 and up from 0.43 litres in 2007/08 and 0.28 litres in 2006/07)
- Illegal dumping, with an estimated litter volume of 0.52 litres (down from 1.45 litres in 2008/09, 1.96 litres in 2007/08 and 0.93 litres in 2006/07)
- Glass - non-alcoholic beverage containers (0.47 litres, up from 0.33 in 2008/09, 0.33 litres in 2007/08 and 0.34 litres in 2006/07)
- Plastic - non-alcoholic beverage containers (0.41 litres, down from 0.58 litres, 0.62 litres in 2007/08 and 0.57 litres in 2006/07)
- Metal – alcoholic beverage container (0.35 litres, down from 0.44 litres in 2007/08, 0.73 in 2007/08 and 0.77 litres in 2006/07)

**Dirty Dozen - Volume per 1000 Square Metres - Object Sub-Categories -  
NT - 06/07 to 09/10**



## 4.5

## Queensland

### At a Glance

The overall average number of items per 1,000m<sup>2</sup> across all 151 sites surveyed within Queensland during the counts in the year 2009/10 was 76, while the overall average estimated volume per 1,000m<sup>2</sup> was 5.65 litres.

There was an overall increase in the number of litter items per 1,000m<sup>2</sup> for the year 2009/10 (76 items, up from 59 items, the same as 76 items in 2007/08 and down from 86 items in 2006/07). The current volume total per 1,000m<sup>2</sup> however, is very similar to the volume recorded in litter monitor last year and below the volumes recorded in all other previous years (5.65 litres, similar to 5.60 litres in 2008/09 and below 7.44 litres in 2007/08 and 7.59 litres in 2006/07).

In Queensland retail sites and shopping centres both displayed large number of litter items per 1,000m<sup>2</sup>, but were associated with only smaller volumes of litter per 1,000m<sup>2</sup>. Highway and industrial sites contributed the highest total volume of litter per 1,000m<sup>2</sup> to the overall litter stream and were also associated with appreciable numbers of litter items per 1,000m<sup>2</sup>.

Cigarette butts most frequently identified item across all sites in Queensland during the 2009/10 counts, with 38 butts per 1,000m<sup>2</sup> (up from 27 butts in 2008/09, 36 butts in 2007/08 and 43 butts in 2006/07). Only a very small proportion of the overall litter volume (0.004 litres per 1,000m<sup>2</sup>) however, was associated with these items.

Plastic objects (1.89 litres per 1,000m<sup>2</sup>, up from 1.80 litres in 2008/09 and down from 2.57 litres in 2007/08), and paper/ paperboard litter objects (1.75 litres per 1,000m<sup>2</sup>, up from 1.71 litres in 2008/09 and down from 2.14 litres in 2007/08) contributed the largest amount of volume to the litter stream.

### Comparisons by Site Types

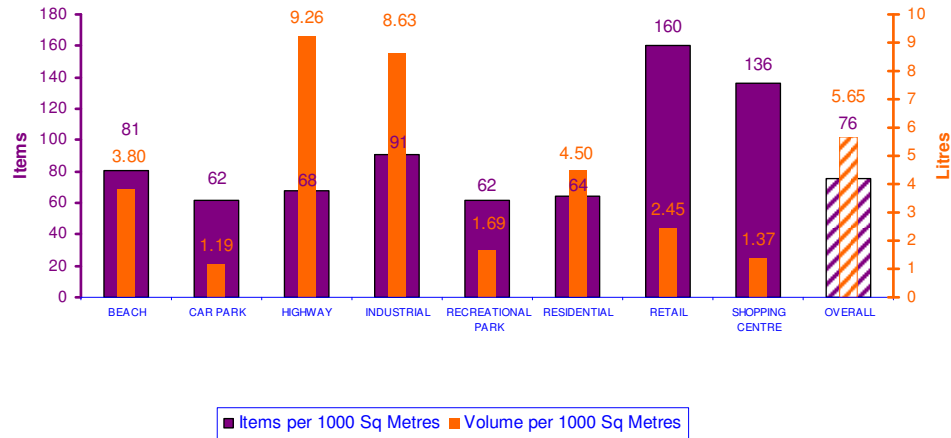
The largest numbers of items per 1,000m<sup>2</sup> at the sites surveyed within the Queensland during the year 2009/10 were located within retail sites (160 items, up from 105 items in 2008/09 and 120 items in 2007/08) and shopping centres (136 items, up from 81 items in 2008/09 and 98 items in 2007/08). Retail sites (2.45 litres, down from 3.43 litres in 2008/09) and shopping centres (1.37 litres, up from 0.39 litres in 2008/09), however, contributed lower volumes of litter per 1,000m<sup>2</sup> by site type across Queensland in comparison to other sites.

Sites that were associated with a moderate level of litter items per 1,000m<sup>2</sup> included industrial sites (91 items, up from 86 items in 2008/09, but down from 100 items in 2007/08) and beach sites (81 items, up from 65 items in 2008/09, but down from 83 items in 2007/08). Residential, recreational parks and car park sites were associated with lower but still appreciable levels of litter.

The estimated volumes per 1,000m<sup>2</sup> of the litter objects at highway sites (9.26 litres, up from 8.68 litres in 2008/09 and 10.21 litres in 2007/08) and industrial sites (8.63 litres, down from 8.97 litres in 2008/09 and 10.80 litres in 2007/08) and were higher than at any other site types.

Sites that were associated with a moderate level of litter volume per 1,000m<sup>2</sup> included residential (4.50 litres, down from 5.80 litres in 2008/09 and 8.58 litres in 2007/08) and beach sites (3.80 litres, up from 1.84 litres in 2008/09 and down from 4.13 litres in 2007/08). Lower volumes of litter were also associated with recreational park and car park sites.

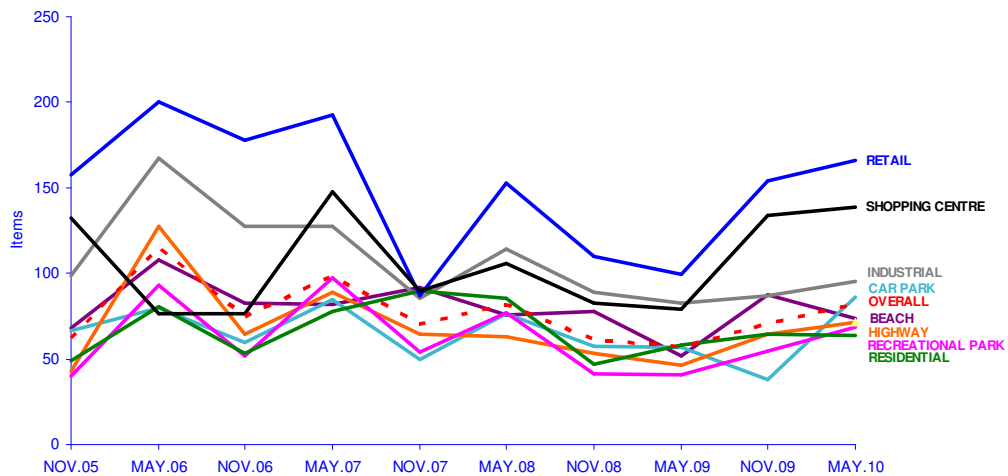
Items and Volume per 1000 Square Metres by Site Type - QLD - 2009/ 2010



Tracked results demonstrate some seasonal fluctuations in the number of litter items per 1,000m<sup>2</sup>, particularly within beach sites which display peaks in November and troughs in May. The converse applies however, to the recorded number of litter items for car parks which peak in the May and decline in November.

Litter item fluctuations at retail and shopping centre sites are due largely to cigarette butts.

Items per 1000 Square Metres by Site Type - QLD

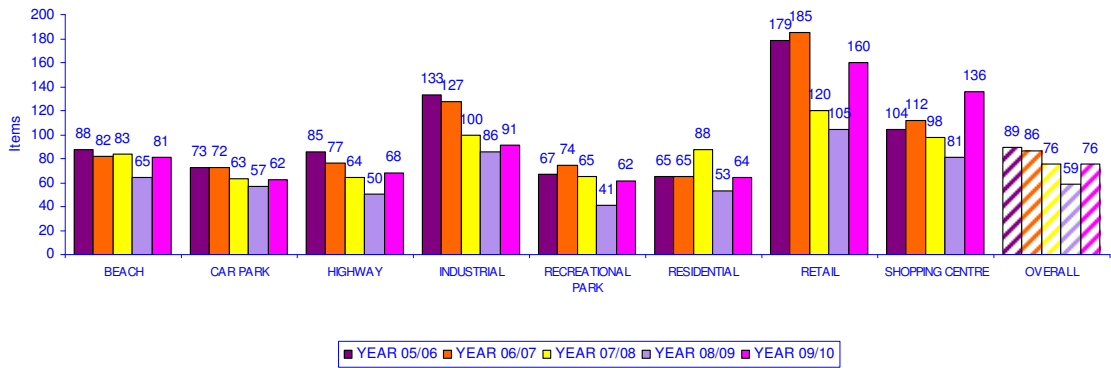


The annual average number of items per 1,000m<sup>2</sup> within Queensland for the year 2009/10 (76 items) is higher than the figures corresponding to 2008/09

(59 items) the same as 2007/08 (76 items) and lower than 2006/07 (86 items).

There was an increase across all site types in 2009/10 and was particularly evident among retail (160 items, up from 105 items in 2008/09 and 120 items in 2007/08) and shopping centre sites (136 items, up from 81 items in 2008/09 and 98 items in 2007/08).

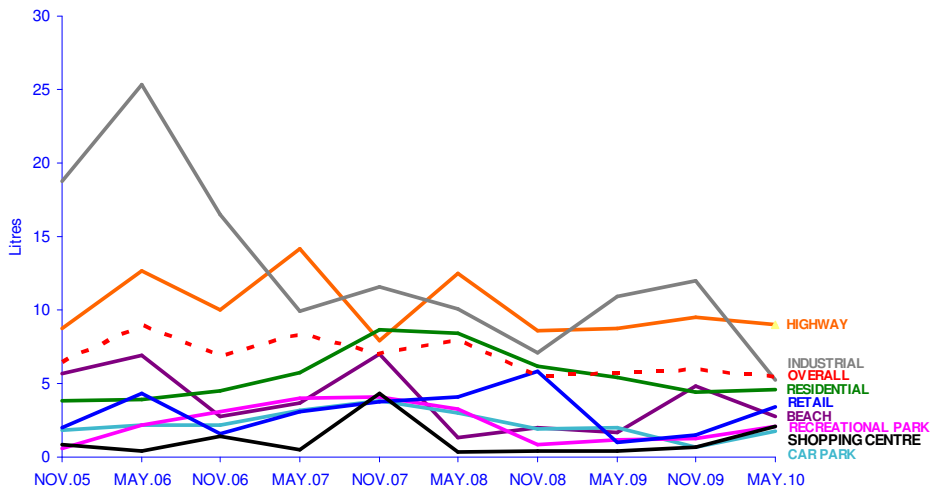
Items per 1000 Square Metres by Site Type - Annual Averages - QLD



The overall trend in Queensland has been a decrease in the litter volume in the litter stream, the decrease in volume has been most apparent at industrial sites.

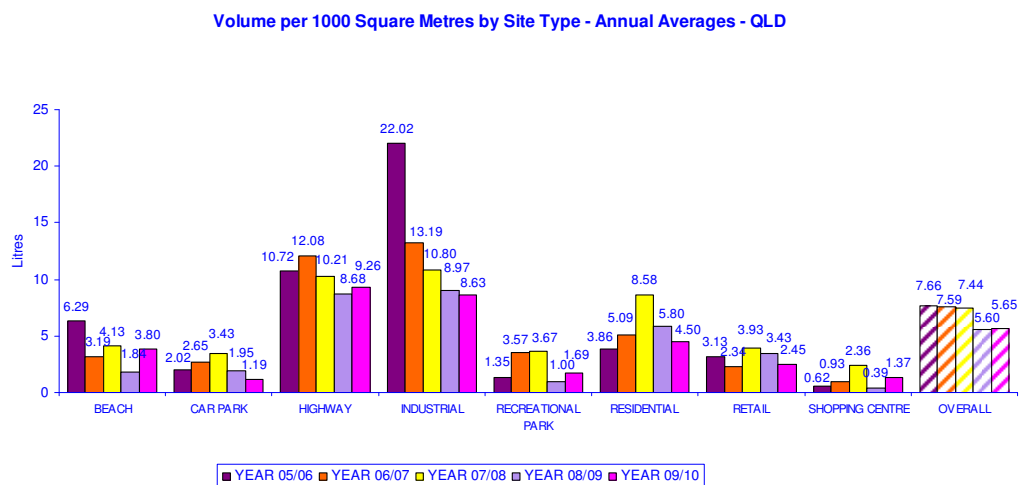
The other apparent trend is the seasonal fluctuation of litter volume per 1,000m<sup>2</sup> at beach sites, with peaks in November and troughs in May.

Volume per 1000 Square Metres by Site Type - QLD



The overall annual average estimated litter volume per 1,000m<sup>2</sup> across all sites within Queensland for the year of 2009/10 is almost the same as the previous year's result (5.65 litres, marginally higher than 5.60 litres in 2008/09 and down from 7.44 litres in 2007/08, 7.59 litres in 2006/07 and 7.66 litres in 2005/06).

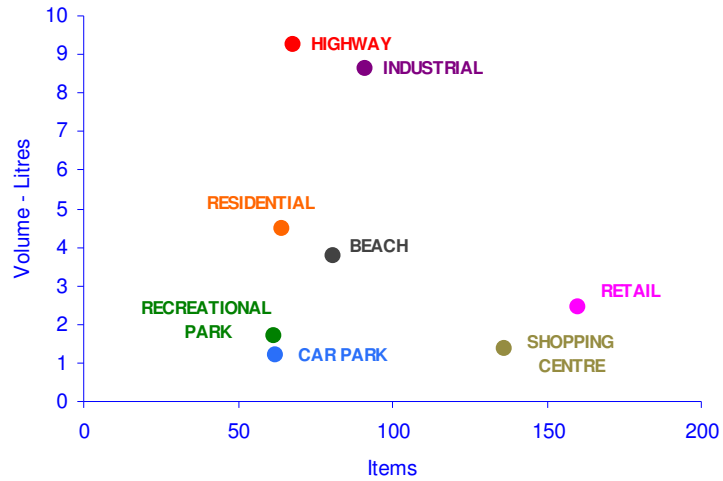
The increase was most evident at beaches (3.80 litres, up from 1.84 litres in 2008/09 and down from 4.13 in 2007/08) and shopping centre sites (1.37 litres, up from 0.39 litres in 2008/09 and down from 2.36 litres in 2007/08). Conversely, the most apparent decrease among the different sites was at residential sites (4.50 litres, down from 5.80 litres in 2008/09 and 8.58 litres in 2007/08).



Items and volume estimates per 1,000m<sup>2</sup> within Queensland identify the following site characteristics across the respective site types surveyed in 2009/ 2010:

- Highway and industrial sites were associated with a moderate number of litter items as well as a large litter volume per 1,000m<sup>2</sup>
- Residential and beach sites were associated with both a moderate number of litter items as well as a moderate litter volume per 1,000m<sup>2</sup>
- Retail sites and shopping centres were associated with large numbers of litter items but only a small volume of litter
- Recreational parks and car parks were associated with both a small number of litter items as well as a small volume of litter

Items and Volume per 1000 Square Metres by Site  
Type - QLD - 2009/2010

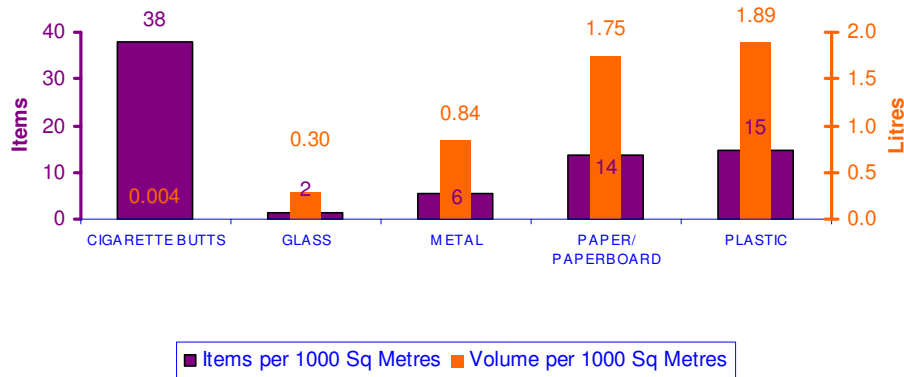


**Comparison by Main Material Types**

An average of 38 cigarette butts per 1,000m<sup>2</sup> were identified across all sites surveyed within Queensland during the year 2009/10, these items however, only contributed 0.004 litres per 1,000m<sup>2</sup> in volume to the litter stream.

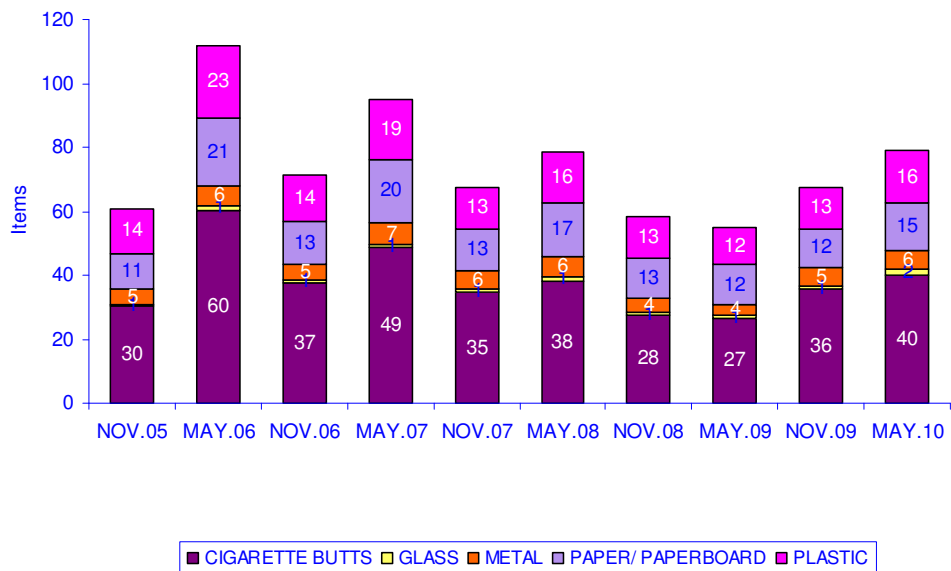
Items which contributed the greatest volumes to the litter stream in Queensland were constructed of plastic materials (1.89 litres per 1,000m<sup>2</sup>) and paper/ paperboard (1.75 litres per 1,000m<sup>2</sup>).

**Items and Volume per 1000 Square Metres by Main Material Type - QLD-  
2009/ 2010**



With the exception of the 2008/09 results, which show little seasonal variation, most main material type categories demonstrated relatively consistent seasonal fluctuations in the numbers of items per 1,000m<sup>2</sup> identified within each category with lows in November 2005, 2006, 2007 and 2009 and peaks in May 2006, 2007, 2008 and 2010.

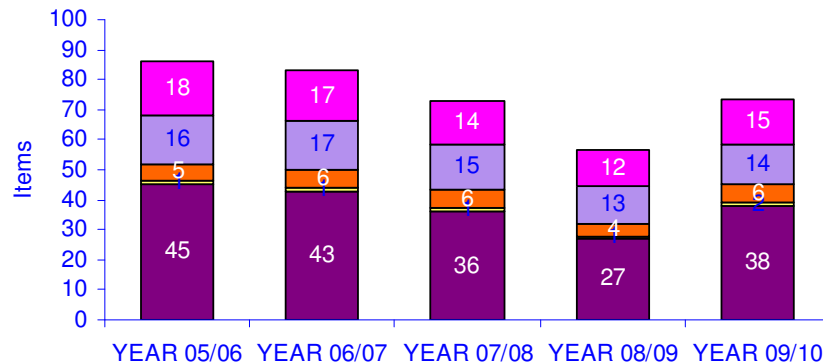
**Items per 1000 Square Metres by Main Material Type - QLD**



Annual averages for Queensland from 2005/06 through to 2009/10 demonstrate relatively consistent proportions of litter objects within the main material types. There was an increase in the number of all material type items per 1,000m<sup>2</sup> in 2009/10, with the largest increase was among cigarette butts (38 butts, up from 27 butts in 2008/09, 36 in 2007/08 and down from 43 in 2006/07). The increase in the number of litter items per 1,000m<sup>2</sup> among other material types included:

- Plastic objects (15 items, up from 12 items in 2008/09, 14 items in 2007/08 and down from 17 items in 2006/07)
- Paper/ paperboard objects (14 items, up from 13 items in 2008/09 and down from 15 items in 2007/08 and 17 items in 2006/07)
- Metal objects (6 items, up from 4 items in 2008/09 and the same as 2007/08 and 2006/07)
- Glass objects (2 items, up from 1 item in 2008/09, 2007/08 and 2006/07)

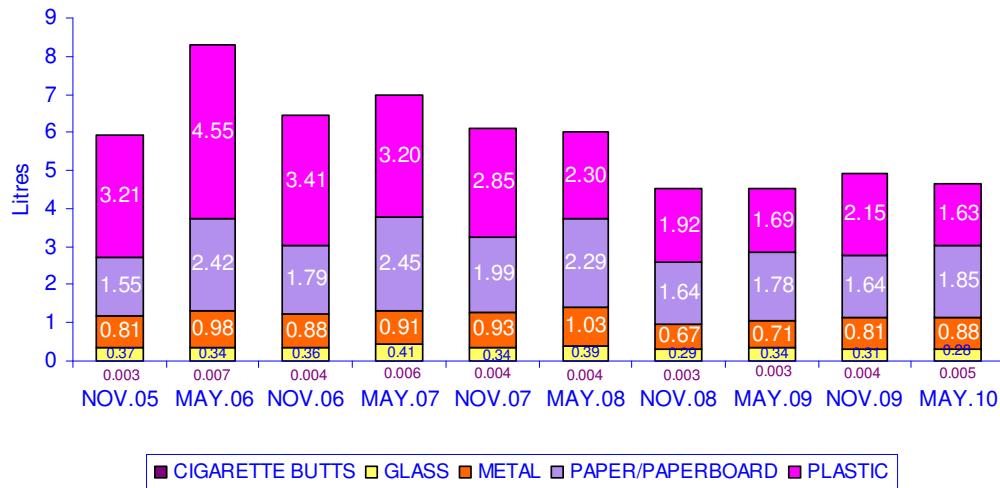
### Items per 1000 Square Metres by Main Material Type - Annual Averages -QLD



■ CIGARETTE BUTTS ■ GLASS ■ METAL ■ PAPER/ PAPERBOARD ■ PLASTIC

There is an overall seasonal trend in the volume of paper/ paperboard and metal in the litter stream in Queensland, with a decrease in volumes November and increase in volumes in May. There is the absence however, of any seasonal pattern for the other material categories.

### Volume per 1000 Square Metres by Main Material Type - QLD



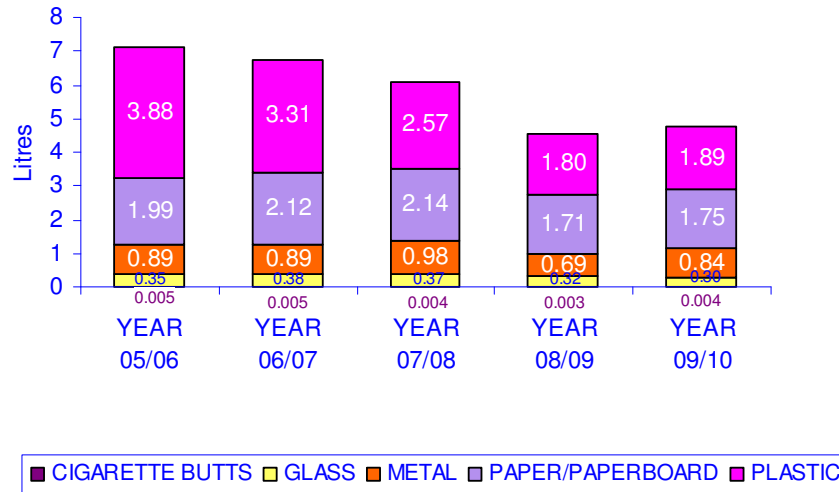
There has been an overall general decline in the litter volume of all material categories per 1,000m<sup>2</sup> in the Queensland litter stream, with plastic litter volume associated with the most significant overall volume reduction.

Glass was the only material category which had a very small decrease in the volume of litter in 2009/10 (0.30 litres, down from 0.32 litres in 2008/09, 0.37 litres in 2007/08, 0.38 litres in 2006/07 and 0.35 litres in 2005/06), all other categories recorded a very marginal increase in litter volumes per 1,000m<sup>2</sup> from 2008/09 to 2009/10, as outlined:

- Plastic volumes increased (1.89 litres, up from 1.80 litres, but down from 2.57 litres in 2007/08, 3.31 litres in 2006/07 and 3.88 litres in 2005/06).
- Paper/ paperboard volumes increased (1.75 litres, up from 1.71 litres in 2008/09, but down from 2.14 litres in 2007/08, 2.12 litres in 2006/07 and 1.99 litres in 2005/06)

- Metal volumes increased (0.84 litres, up from 0.69 litres in 2008/09, but down from 0.98 litres in 2007/08, 0.89 litres in both 2006/07 and 2005/06)

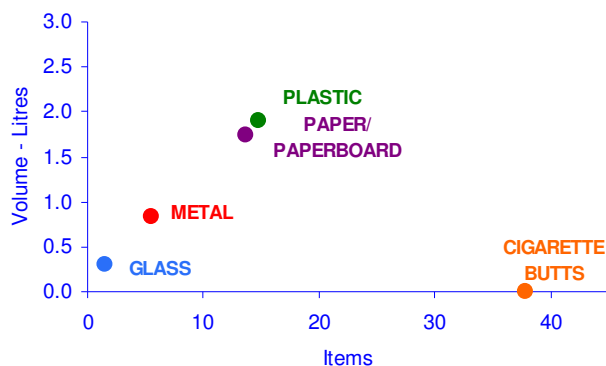
### Volume per 1000 Square Metres by Main Material Type - Annual Averages - QLD



Figures for items and volumes per 1,000m<sup>2</sup> across main material types identify the following characteristics of litter objects recorded within Queensland during the year 2009/10:

- Plastic and paper/ paperboard litter items contribute large volumes to and a moderate number of items to the litter stream
- Metal and glass items contribute both small numbers of items and low volumes to the litter stream
- Cigarette butts were associated with a large number of litter items, but they contributed only a negligible volume to the overall litter stream

**Items and Volume per 1000 Square Metres by Main  
Material Type - QLD - 2009/ 2010**



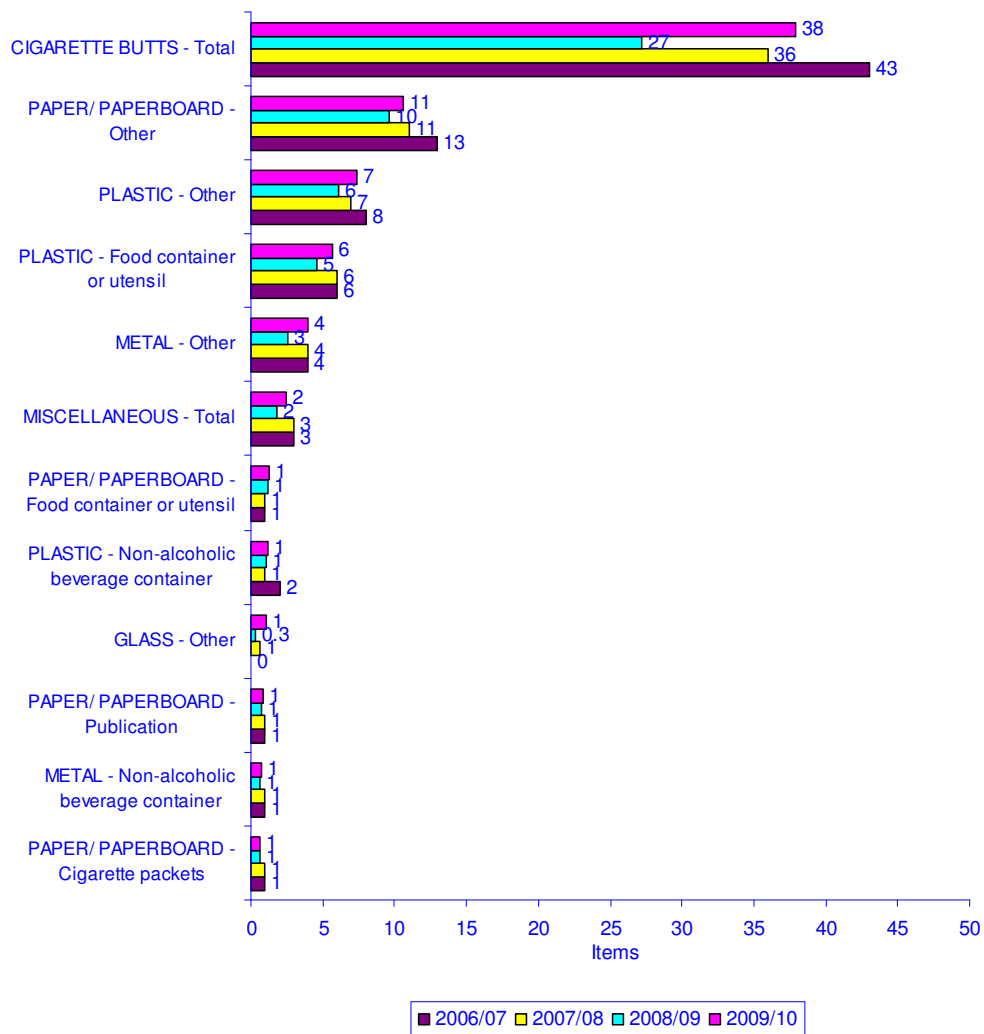
**The Dirty Dozen**

Cigarette butts remained the most frequently identified litter item in Queensland, with 38 butts (up from 27 butts in 2008/09, 36 butts in 2007/08 and down from 43 butts in 2006/07) recorded per 1,000m<sup>2</sup> on average during the 2009/10 counts across the State.

The other most frequently identified objects per 1,000m<sup>2</sup> in Queensland included:

- Uncategorised paper/ paperboard objects (11 items, up from 10 items in 2008/09, the same as 2007/08 and down from 13 items in 2006/07)
- Uncategorised plastic objects (7 items, up from 6 items in 2008/09, the same as 2007/08 and down from 8 items in 2006/07)
- Plastic food containers and utensils (6 items, up from 5 items in 2008/09 and the same as 2007/08 and 2006/07)
- Uncategorised metal objects (4 items, up from 3 items in 2008/09 and the same as 2007/08 and 2006/07)

**Dirty Dozen - Items per 1000 Square Metres - Object Sub-Categories -  
QLD - 06/07 to 09/10**



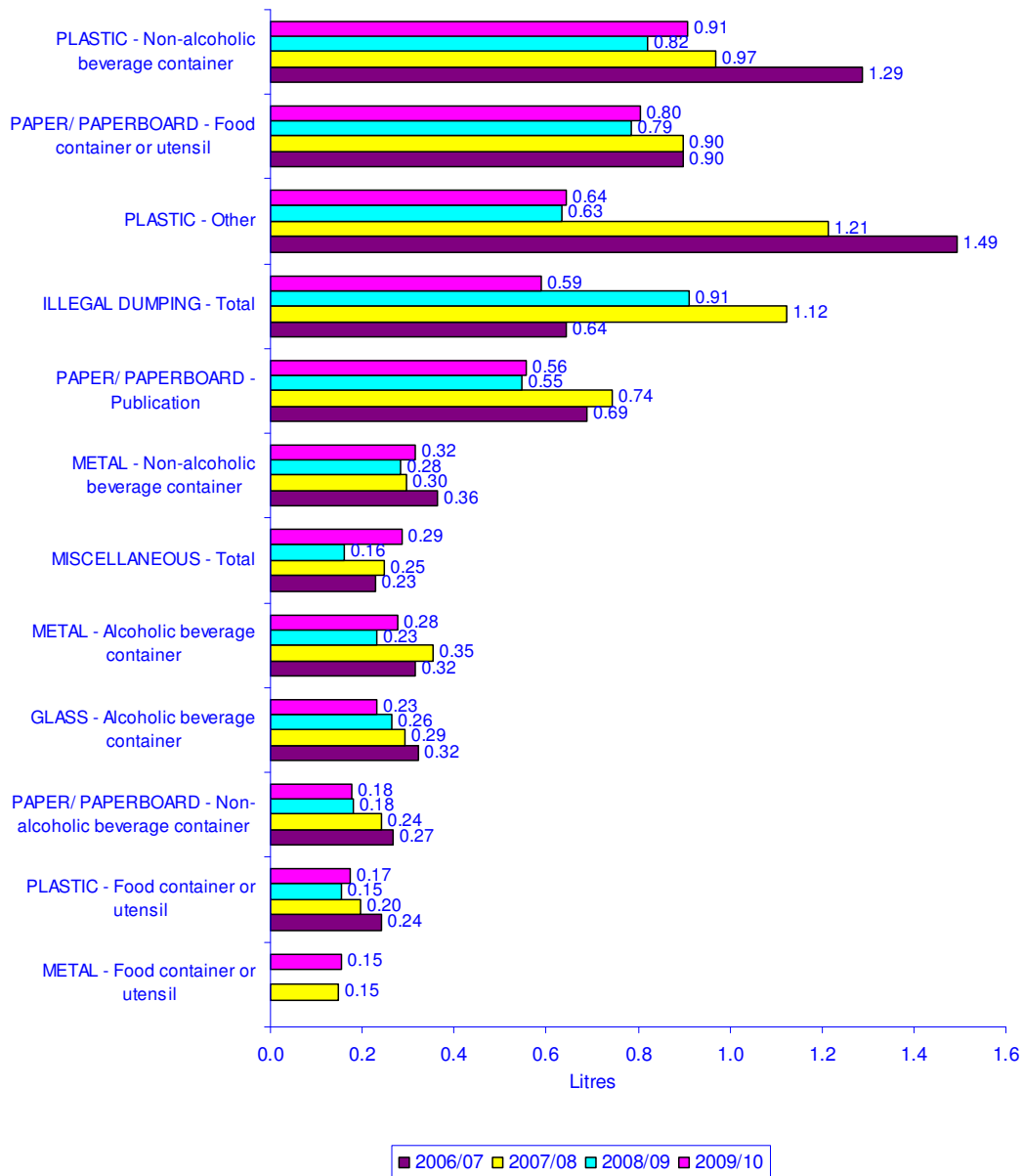
Plastic – non-alcoholic beverage containers represented the largest contribution to estimated litter volume per 1,000m<sup>2</sup> in Queensland in 2009/10 (0.91 litres, up from 0.82 litres, down from 0.97 litres in 2007/08 and 1.29 litres in 2006/07).

Other object sub-categories which were associated with substantial estimated volume measurements included:

- Paper/ paperboard - food containers or utensils (0.80 litres, up from 0.79 litres in 2008/09, down from 0.90 litres in both 2007/08 and 2006/07).

- Uncategorised plastic objects (0.64 litres, up from 0.63 litres in 2008/09, down from 1.21 litres in 2007/08 and 1.49 litres in 2006/07)
- Illegally dumped items (0.59 litres, down from 0.91 litres in 2008/09, 1.12 litres in 2007/08 and 0.64 litres in 2006/07).
- Paper/ paperboard - publications (0.56 litres, up from 0.55 litres in 2008/09, down from 0.74 in 2007/08 and 0.69 litres in 2006/07)

**Dirty Dozen - Volume per 1000 Square Metres - Object Sub-Categories - QLD - 06/07 to 09/10**



## 4.6

## South Australia

### At a Glance

The overall average number of items per 1,000m<sup>2</sup> across all of the 151 sites surveyed within SA during the counts in the year of 2009/10 was 54, while the overall average estimated volume per 1,000m<sup>2</sup> was 7.13 litres.

The number of litter items per 1,000m<sup>2</sup> represents a decrease from all previous years (down from 57 items in 2008/09, 68 items in 2007/08, 61 items in 2006/07 and 60 items in 2005/06). The current year's volume of 7.13 litres per 1,000m<sup>2</sup> estimate also represents a decrease from all previous years (down from 8.02 litres in 2008/09, 9.55 litres in 2007/08, 11.08 litres in 2006/07 but slightly higher than 7.23 litres in 2005/06).

In South Australia the most littered sites were generally retail sites, industrial locations and shopping centres. Industrial sites were associated with large number of litter and estimated volume per 1,000m<sup>2</sup>, while retail sites and shopping recorded high levels of litter but low estimated litter volumes.

Cigarette butts remained the most frequently identified litter item across all sites in South Australia during the 2009/10 counts, with 21 butts per 1,000m<sup>2</sup> (up from 19 butts in 2008/09, but down from 26 butts in 2007/08, 25 butts in 2006/07 and 24 butts in 2005/06). Cigarette butts however, were associated with only a very small proportion of the overall litter volume (0.002 litres per 1,000m<sup>2</sup>).

Plastic objects (2.05 litres per 1,000m<sup>2</sup>, down from 2.33 litres in 2008/09, 3.29 litres in 2007/08 and 2.94 litres in 2006/07) and paper/ paperboard litter objects (1.42 litres per 1,000m<sup>2</sup>, down from 1.84 litres in 2008/09, 2.24 litres in 2007/08 and 1.53 litres in 2006/07) contributed the largest amount of volume to the litter stream.

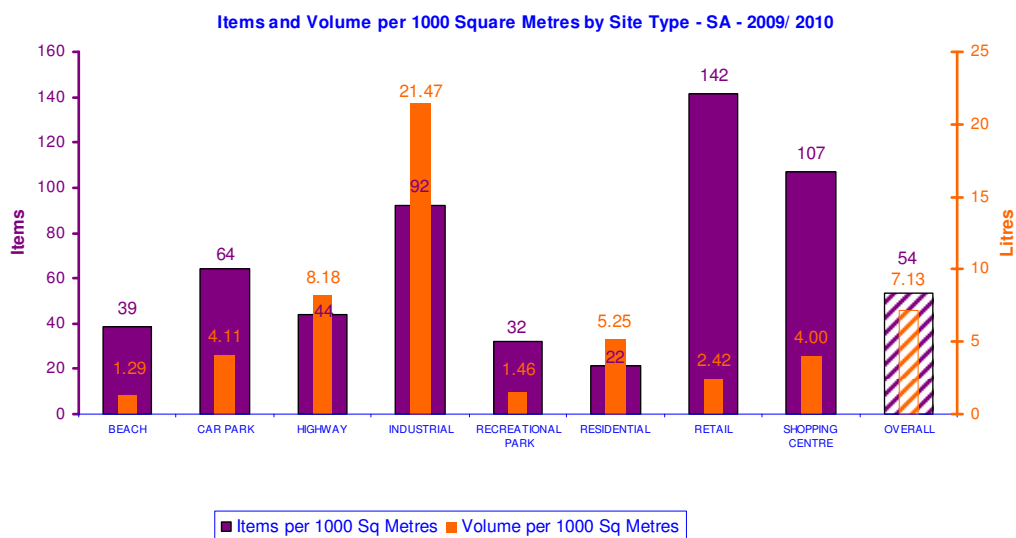
### Comparisons by Site Types

The largest numbers of items per 1,000m<sup>2</sup> were located within retail sites (142 items, down from 153 items in 2008/09 and 191 items in 2007/08), shopping centres (107 items, up from 85 items in 2008/09, but down from

115 items in 2007/08) and industrial sites (92 items, down from 100 items in 2008/09 and 126 items in 2007/08). Industrial sites contributed the largest estimated volumes per 1,000m<sup>2</sup> in South Australia (21.47 litres, up from 20.55 litres in 2008/09 and 20.87 litres in 2007/08) to the litter stream while retail sites (2.42 litres, down from 2.38 litres in 2008/09) and shopping centres (4.00 litres, up from 3.39 litres in 2008/09) contributed only lower volumes of litter per 1,000m<sup>2</sup> by site type.

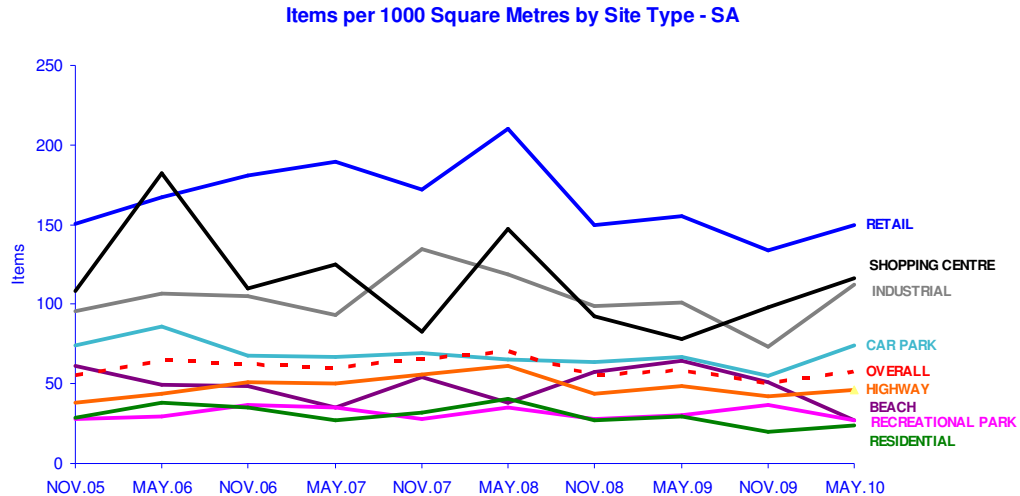
Sites that were associated with a moderate level of litter items per 1,000m<sup>2</sup> included industrial sites (92 items, down from 100 items in 2008/09 and 126 items in 2007/08) and car park sites (64 items, down from 65 items in 2008/09 and 67 items in 2007/08). Highway, beach, residential and recreational parks sites were associated with lower but still appreciable number of litter items.

Highway sights contributed the second largest estimated volumes per 1,000m<sup>2</sup> of the litter objects (8.18 litres per 1,000m<sup>2</sup>, down from 10.51 litres), after industrial sights. Lower volumes of litter were associated with all other site types.



Overall, there has been a downward trend with regard to number of litter items in the litter stream in South Australia.

Tracked results demonstrate some seasonal fluctuations in the number of litter items per 1,000m<sup>2</sup>, particularly within retail and residential sites which generally display peaks in May and troughs in November.

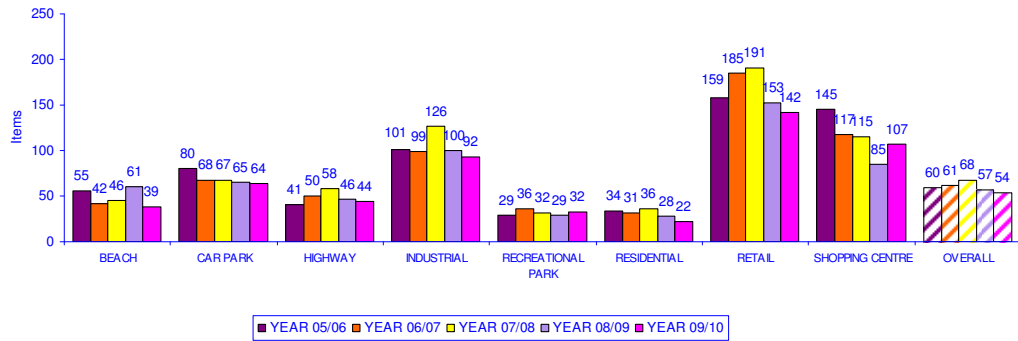


The annual average of items per 1,000m<sup>2</sup> within SA for the year of 2009/10 (54 items) is lower than the figures corresponding to all previous years (down from 57 items in 2008/09, 68 items in 2007/08, 61 items in 2006/07 and 60 items in 2005/06).

The decrease in the number of items per 1,000m<sup>2</sup> in the litter stream was most evident at beaches (39 items, down from 61 items in 2008/09 and 46 items in 2007/08), retail sites (142 items, down from 153 items in 2008/09 and 191 items in 2007/08), industrial sites (92 items, down from 100 items in 2008/09 and 126 items in 2007/08) and residential sites (22 items, down from 28 items in 2008/09 and 36 items in 2007/08). There were also decreases in the litter count, to a lesser extent, at highway and car park sites.

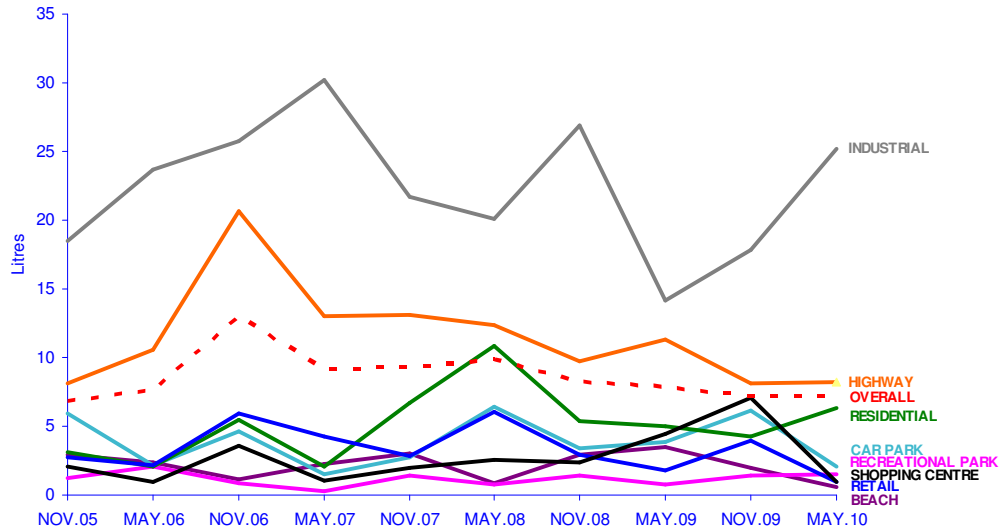
Conversely, there was a notable increase in the of number of items per 1,000m<sup>2</sup> at shopping centres (107 items, up from 85 items in 2008/09 and down from 115 items in 2007/08). There was also a very marginal increase in the litter count at recreational parks.

Items per 1000 Square Metres by Site Type - Annual Averages - SA



The trend overall, with the exception of industrial sites, has been a decline in the estimated volumes per 1,000m<sup>2</sup> of litter items within South Australia. While there are fluctuations in the estimated volumes from November to May across site types they do not demonstrate a consistent seasonal pattern.

Volume per 1000 Square Metres by Site Type - SA

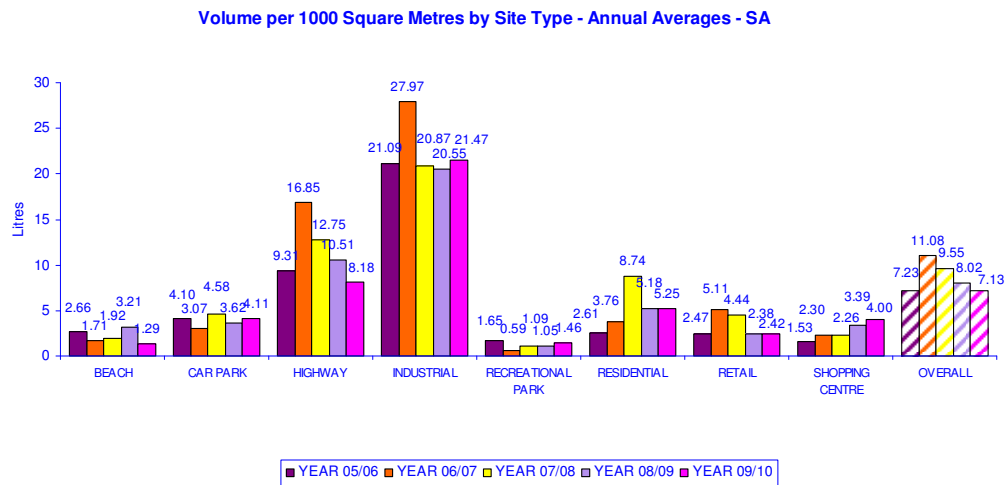


The overall annual average estimated litter volume per 1,000m<sup>2</sup> across all sites within South Australia for the year of 2009/10 is lower than the results for all previous years (7.13 litres, down from 8.02 litres in 2008/09, 9.55 litres in 2007/8, 11.08 litres in 2006/07 and 7.23 litres in 2005/06).

This decrease was most strongly reflected with at highway sites (8.18 litres, down from 10.51 litres in 2008/09 and 12.75 litres in 2007/08) and to a

lesser extent, beaches (1.29 litres, down from 3.21 litres in 2008/09 and 1.92 litres in 2007/08)

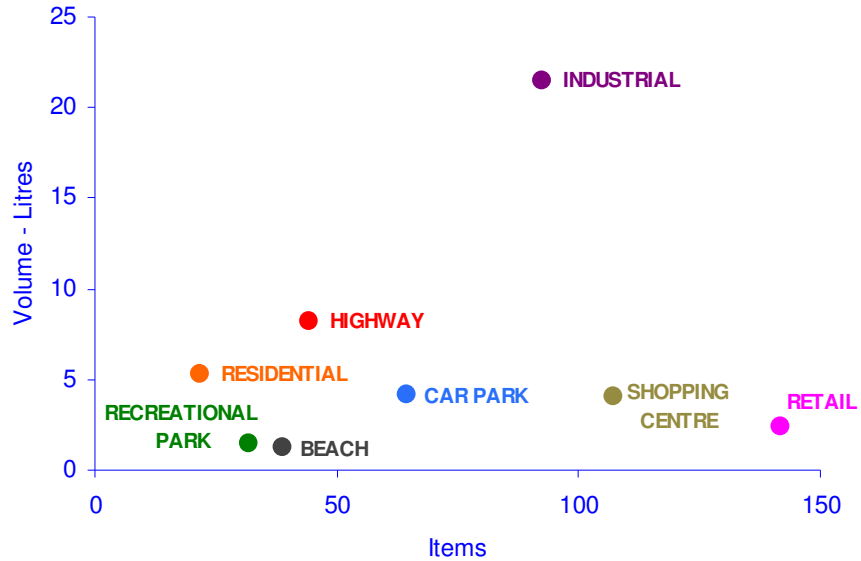
There were very marginal increases in the volumes of litter per 1,000m<sup>2</sup> across all other site types, the largest increase was at industrial sites (21.47 litres, up from 20.55 litres in 2008/09 and 20.87 litres in 2007/08).



Items and volume estimates per 1,000m<sup>2</sup> within South Australia identify the following site characteristics across the respective site types surveyed in 2009/10:

- Industrial sites were associated with a relatively high number of litter items and a large estimated litter volume
- Highway sites were associated with a moderate volume of litter but only a small number of litter items
- Retail sites and shopping centres were associated with large numbers of litter items but only a small volume of litter
- Car park sites were associated with a moderate number of litter items but only a small volume of litter
- Residential, beach and recreational park sites were associated with both a small number of litter items and a small volume of litter

**Items and Volume per 1000 Square Metres by Site Type -  
SA - 2009/ 2010**

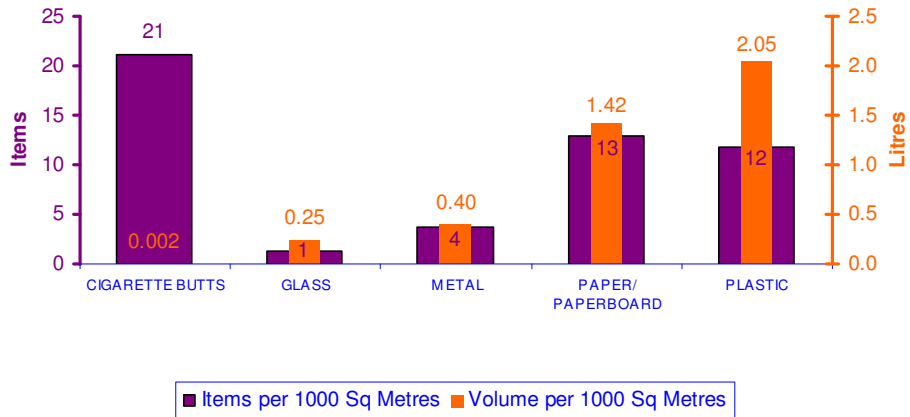


**Comparison by Main Material Types**

An average of 21 cigarette butts per 1,000m<sup>2</sup> were identified across all sites surveyed within SA during the year 2009/10, these items however, only contributed 0.002 litres of volume per 1,000m<sup>2</sup> to the litter stream.

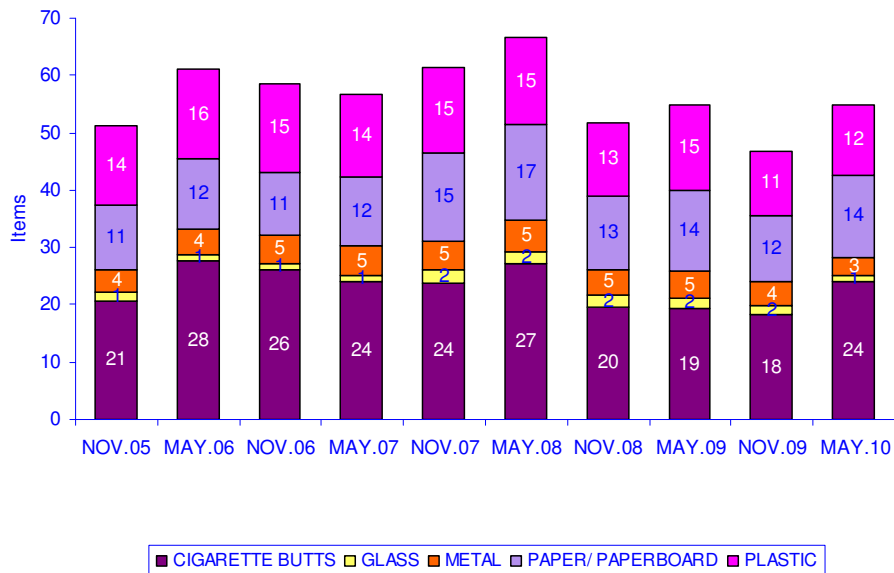
Items which contributed the greatest volumes to the litter stream in SA were constructed of plastic materials (2.05 litres per 1,000m<sup>2</sup>) and paper/paperboard materials (1.42 litres per 1,000m<sup>2</sup>).

**Items and Volume per 1000 Square Metres by Main Material Type - SA-  
2009/ 2010**



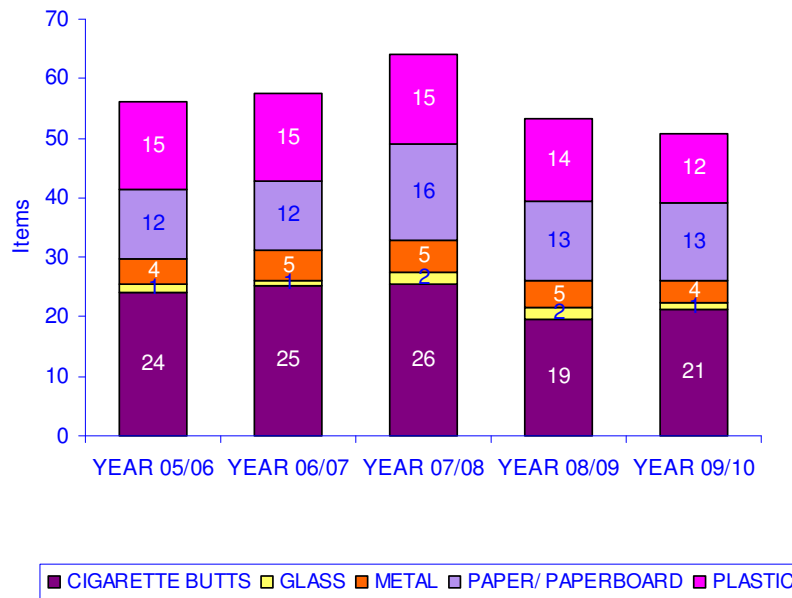
With the exception of the 2006/07 results, there are generally seasonal fluctuations in South Australia across both plastic and paper/ paperboard material type categories in the numbers of items per 1,000m<sup>2</sup>. The seasonal pattern is demonstrated by a lower number of items in November and a higher number of items in May. The proportion of each major litter type to the overall litter stream has also remained fairly steady across all counts from November 2005 to May 2010.

**Items per 1000 Square Metres by Main Material Type - SA**



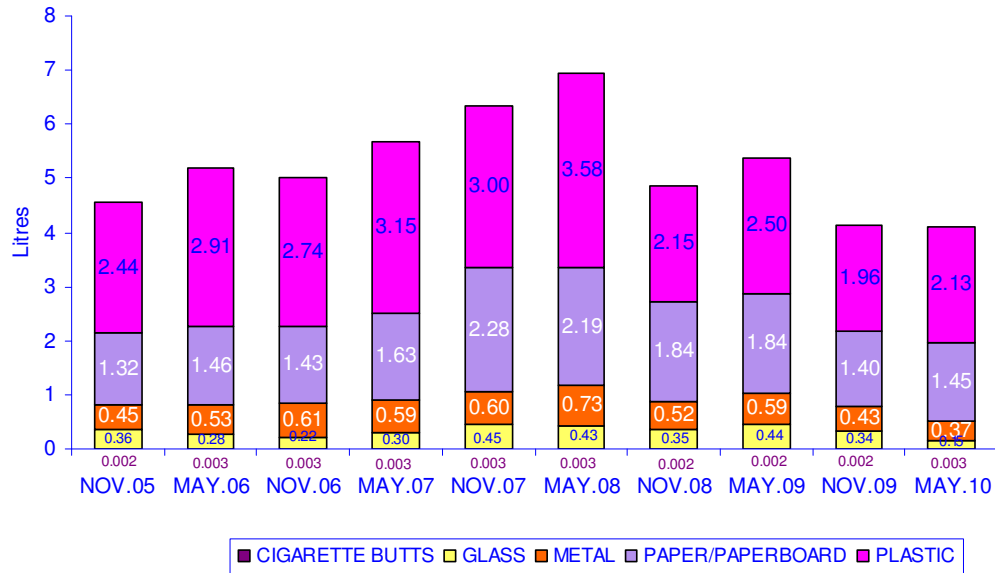
There has been an overall gradual decrease in the number of items per 1,000m<sup>2</sup> across the plastic material type category and cigarette butts, plastic items also displayed the strongest decrease (2 items per 1,000m<sup>2</sup>) from the previous litter monitor in 2008/09.

**Items per 1000 Square Metres by Main Material Type - Annual Averages - SA**



Results for the November and May litter monitors across South Australia reveal a seasonal trend in the volume of plastic litter per 1,000m<sup>2</sup> in the litter stream. The seasonal pattern displays decreasing plastic volumes in November and increasing plastic volumes in May. There does not appear however, to be seasonal patterns for the other material categories.

**Volume per 1000 Square Metres by Main Material Type - SA**

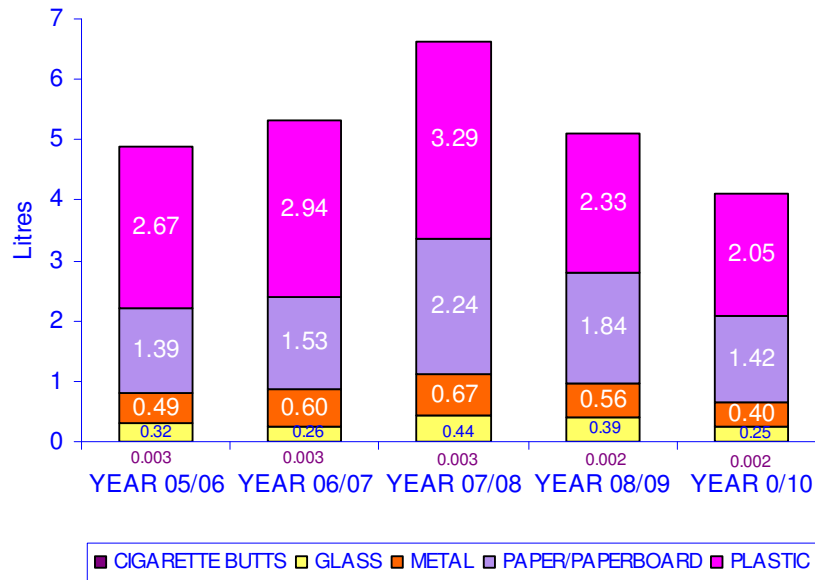


Since the litter monitor research commenced there has been an overall decrease in the volume of litter per 1,000m<sup>2</sup>. The annual averages from 2008/09 to 2009/10 show there has been a decrease in the volume levels of all material categories in the SA litter stream, and most significantly among plastic litter items (2.05 litres, down from 2.33 litres in 2008/09, 3.29 litres in 2007/08, 2.94 litres in 2006/07 and 2.67 litres in 2005/06).

Reductions in volume levels of other material types in the litter stream also included:

- Paper/ paperboard volumes (1.42 litres, down from 1.84 litres in 2008/09, 2.24 litres in 2007/08, 1.53 litres in 2006/07 and slightly up from 1.39 litres in 2005/06)
- Metal volumes (0.40 litres, down from 0.56 litres in 2008/09, 0.67 litres in 2007/08, 0.60 litres in 2006/07 and 0.49 litres in 2005/06)
- Glass volumes (0.25 litres, down from 0.39 litres in 2008/09, 0.44 litres in 2007/08, 0.26 litres in 2006/07 and 0.32 litres in 2005/06)

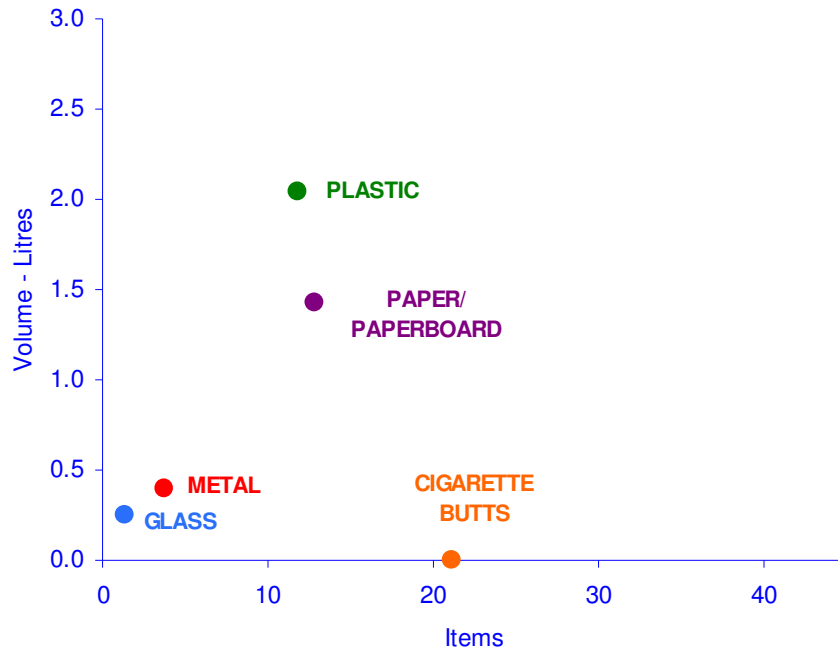
**Volume per 1000 Square Metres by Main Material Type -  
Annual Averages - SA**



Figures for items and volumes per 1,000m<sup>2</sup> across main material types identify the following characteristics of litter objects recorded within SA during the year of 2008/09:

- Plastic litter items contribute large volumes to the litter stream and are associated with a moderate number of litter items
- Paper/ paperboard items contribute both moderate volumes to the litter stream and are associated with a moderate number of litter items
- Metal and glass items contribute both small numbers of items and low volumes to the litter stream
- Cigarette butts were associated with a large number of items, but contributed only a negligible volume to the overall litter stream

## Items and Volume per 1000 Square Metres by Main Material Type - SA - 2009/ 2010



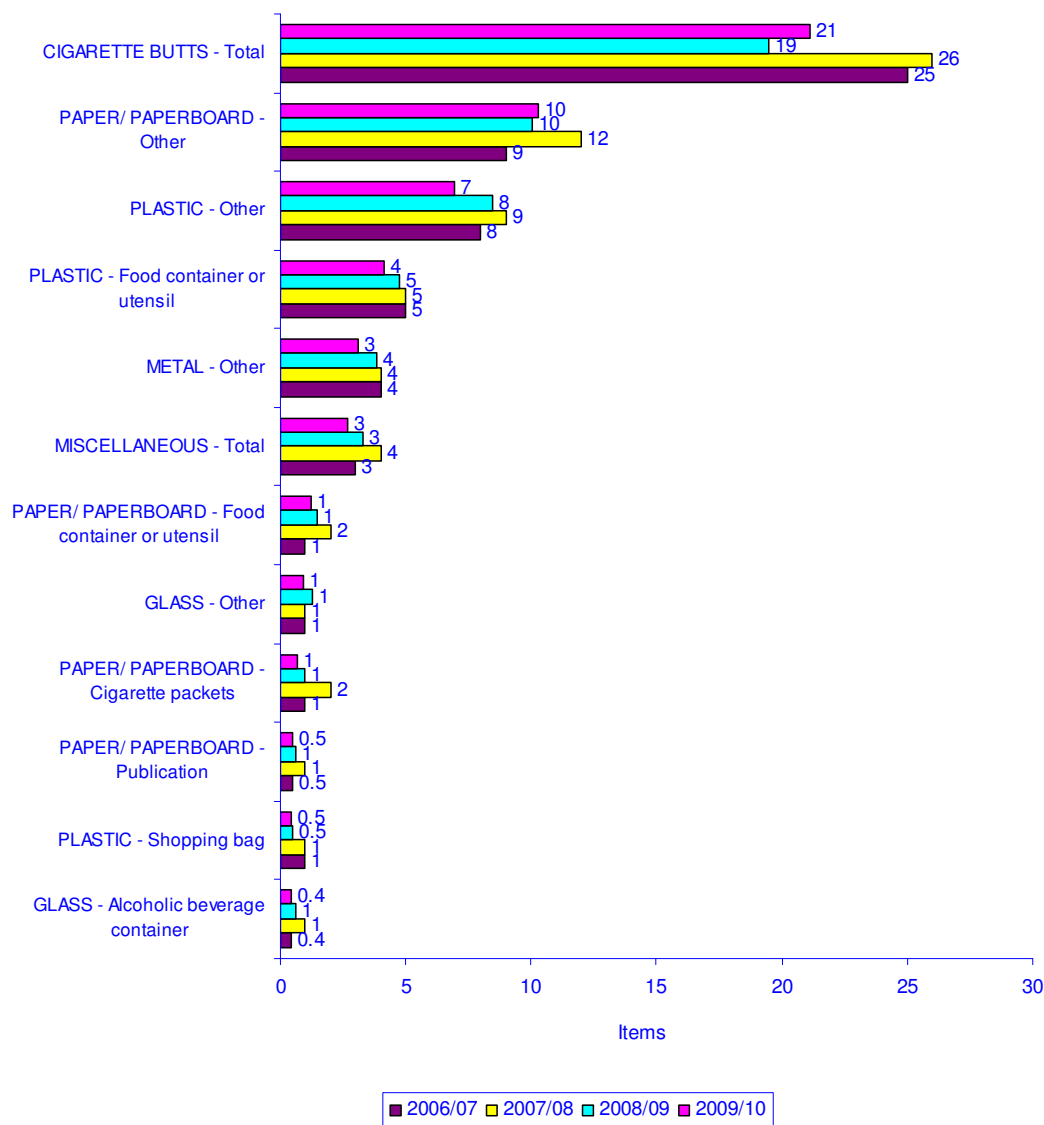
### *The Dirty Dozen*

Cigarette butts were the most frequently identified litter item, with 21 butts were recorded per 1,000m<sup>2</sup> on average during the 2009/10 counts (down from 19 butts in 2008/09, 26 butts in 2007/08 and 25 butts in 2006/07).

Other objects that were frequently identified in the South Australian litter counts included:

- Uncategorised paper/ paperboard objects (10 items per 1,000m<sup>2</sup>, the same as 2008/09, down from 12 items in 2007/08 and up from 9 items in 2006/07)
- Uncategorised plastic objects (7 items per 1,000m<sup>2</sup>, down 8 items in 2008/09, 9 items in 2007/08 and 8 items in 2006/07)
- Plastic food containers and utensils (4 items per 1,000m<sup>2</sup>, down from 5 items in 2008/09, 2007/08 and 2006/07)
- Uncategorised metal objects (3 items per 1,000m<sup>2</sup>, down from 4 items in 2008/09, 2007/08 and 2006/07).

**Dirty Dozen - Items per 1000 Square Metres - Object Sub-Categories -  
SA - 06/07 to 09/10**

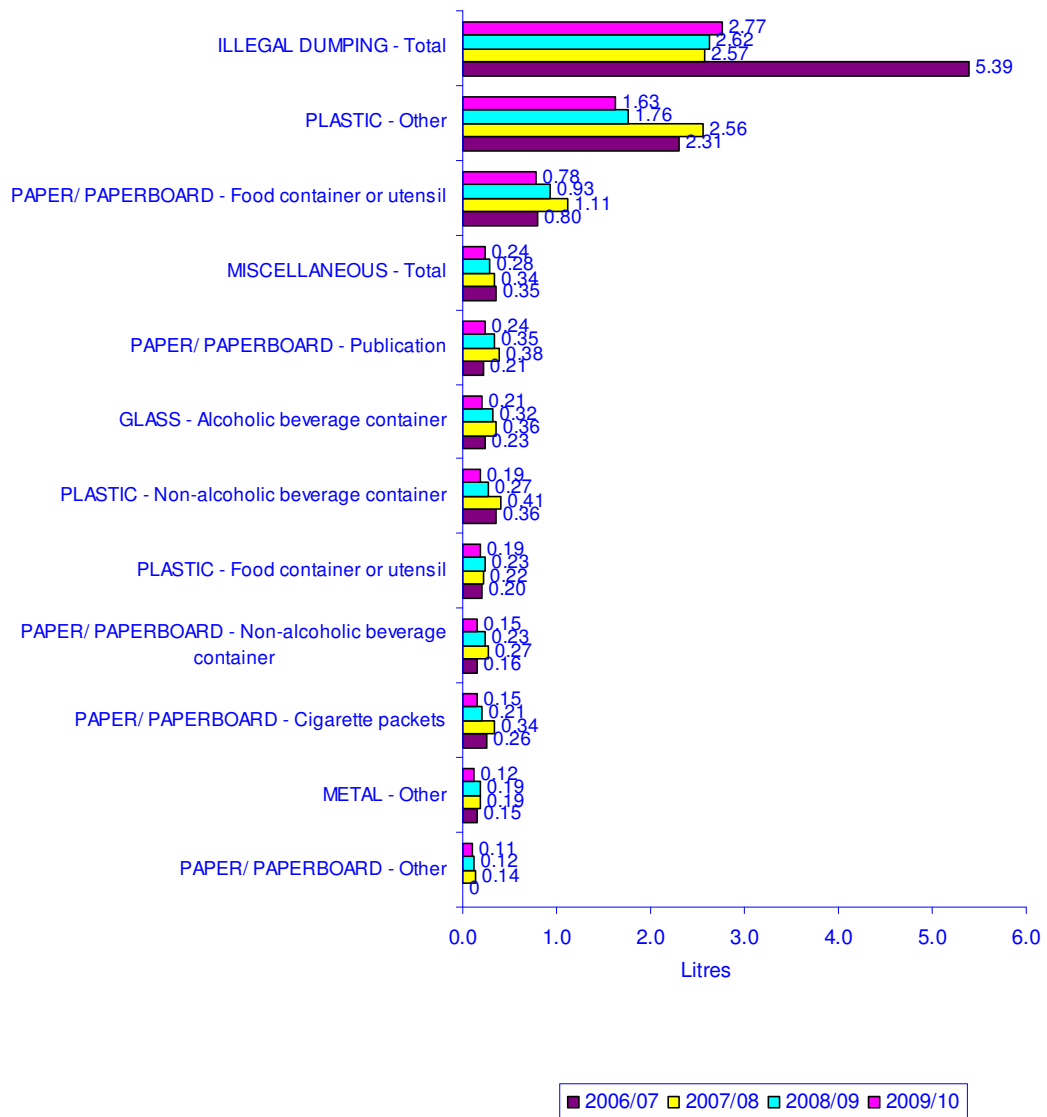


Illegal dumping represented the largest contribution to estimated litter volume per 1,000m<sup>2</sup> in South Australia during 2009/10 (2.77 litres, a marginal increase from 2.62 litres in 2008/09 and 2.57 litres in 2007/08, but still significantly down from 5.39 litres in 2006/07).

Other object sub-categories which were associated with substantial estimated volume measurements per 1,000m<sup>2</sup> in the litter stream included:

- Uncategorised plastic objects (1.63 litters, down from 1.76 litres in 2008/09, 2.56 litres in 2007/08 and 2.31 litres in 2006/07).
- Paper/ paperboard - food containers or utensils (0.78 litres, down from 0.93 litres in 2008/09, 1.11 litres in 2007/08 and up from 0.80 litres in 2006/07)

**Dirty Dozen - Volume per 1000 Square Metres - Object Sub-Categories - SA - 2009/ 2010**



## 4.7

## Tasmania

### At a Glance

The overall average number of items per 1,000m<sup>2</sup> across all of the 76 sites surveyed within Tasmania during the counts in the year 2009/10 was 86, while the overall average estimated litter volume per 1,000m<sup>2</sup> was 9.40 litres.

The number of litter items per 1,000m<sup>2</sup> represents an increase from previous years (up from 64 items in 2008/09, 61 items in 2007/08, 70 items in 2006/07 and 59 items in 2005/06). The current year's volume per 1,000m<sup>2</sup> estimate is also higher than previous years (up from 9.20 litres in 2008/09, 5.90 litres in 2007/08, 6.68 litres in 2006/07 and 5.15 litres in 2005/06).

The most littered sites surveyed within Tasmania were generally industrial locations, which were significantly above all other sites in numbers of litter items and total estimated volume per 1,000m<sup>2</sup>. There were also a greater number of litter items recorded at retail sites, while there were moderate numbers of litter items at car parks, shopping centres, beaches and highway sites. Beaches and highways also had moderate estimated litter volumes per 1,000m<sup>2</sup>, recording the second and third largest volumes by site type after industrial sites.

Cigarette butts were the most frequently identified item across all sites in Tasmania with 56 butts per 1,000m<sup>2</sup> (up from 38 butts in 2008/09, 36 butts in 2007/08, 37 butts in 2006/07 and 27 butts in 2005/06) recorded in annual figures for 2009/10. Cigarette butts however, were associated with a very small proportion of the litter volume (0.006 litres per 1,000m<sup>2</sup>).

Paper/ paperboard objects (2.57 litres, down from 2.66 litres and up from 1.67 litres in 2007/08, 1.23 litres in 2006/07 and 1.35 litres in 2005/06) and plastic objects (2.47 litres, up from 2.07 litres in 2008/09, 2.02 litres in 2007/08, 2.45 litres in 2005/06 and 1.76 litres in 2005/06) both contributed the largest amounts of volume per 1,000m<sup>2</sup> to the litter stream.

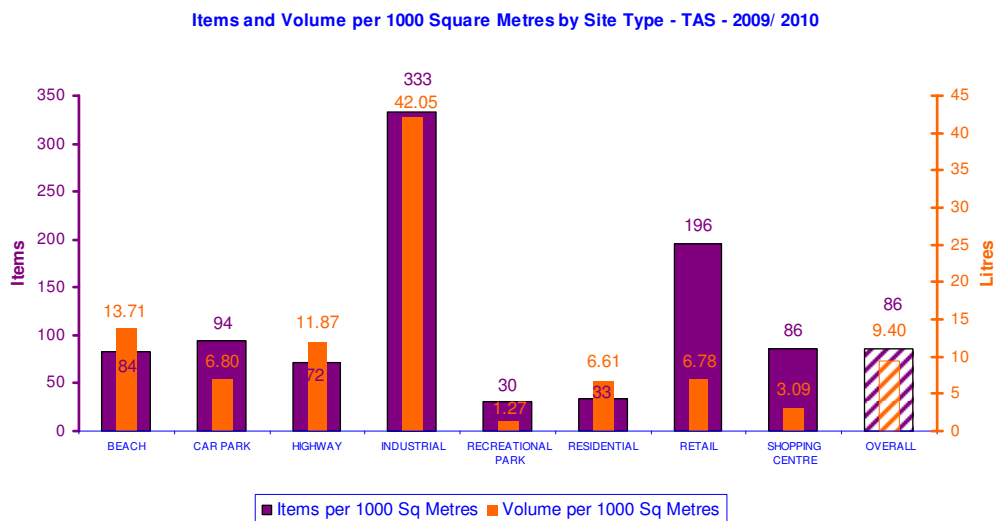
## Comparisons by Site Types

The largest numbers of items per 1,000m<sup>2</sup> were located within industrial sites (333 items, up from 203 items in 2008/09 and 185 items in 2007/08). Industrial sites were also associated with the largest estimated litter volume per 1,000 m<sup>2</sup> across site types (42.05 litres, up from 33.72 litres in 2008/09 and 25.20 litres in 2007/08).

Retail sites (196 items, up from 107 items in 2008/09 and 124 items in 2007/08) were also associated with large numbers of litter items per 1,000m<sup>2</sup>, however, contributed lower volumes of litter per 1,000m<sup>2</sup> by site type across Tasmania in comparison to other sites (6.78 litres, up from 3.96 litres in 2008/09 and 2.41 litres in 2007/08).

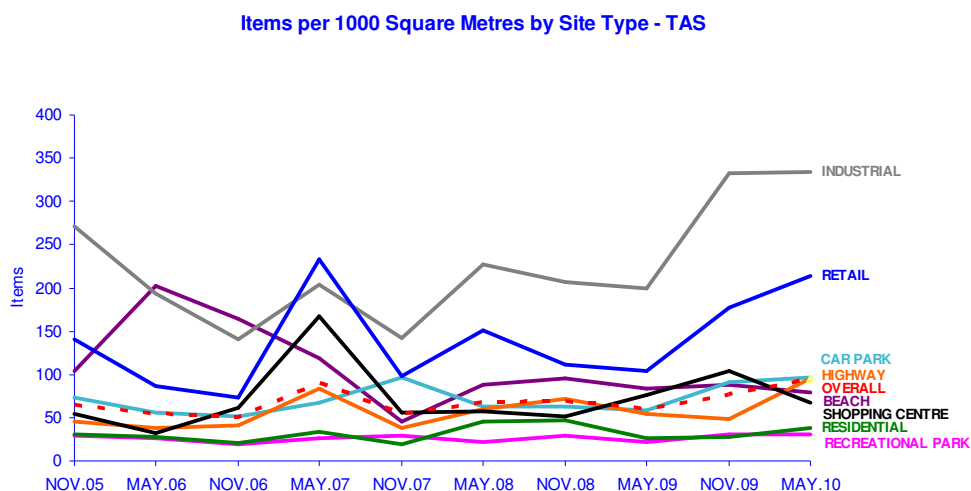
Sites that were associated with a moderate level of litter items per 1,000m<sup>2</sup> included car park sites (94 items, up from 61 items in 2008/09 and 80 items in 2007/08), shopping centres (86 items, up from 64 items in 2008/09 and 54 items in 2007/08) and beaches (84 items, down from 89 items in 2008/09, but up from 66 items in 2007/08).

Sites that were also associated with a moderate level of litter volume per 1,000m<sup>2</sup> included beaches (13.71 litres, down from 18.60 litres in 2008/09 and up from 9.07 litres in 2007/08) and highway sites (11.87 litres, down from 13.57 litres in 2008/09 and up from 8.81 litres in 2007/08).



Overall, there has been an upward trend with regard to number of litter items in the litter stream in Tasmania.

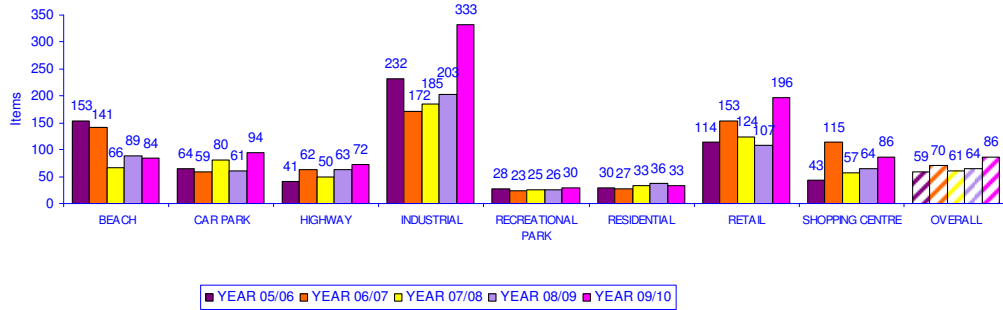
Tracked results demonstrate some seasonal fluctuations in the number of litter items per 1,000m<sup>2</sup> within recreational parks which generally display modest increases in November and modest declines in May.



The annual average of items per 1,000m<sup>2</sup> within Tasmanian for the year of 2009/10 (86 items) was higher than figures corresponding to previous years 2008/09 (64 items), 2007/08 (61 items), 2006/07 (70 items) and 2005/06 (59 items).

This increase in the number of items per 1,000m<sup>2</sup> in the litter stream was particularly evident at industrial sites, (333 items, up from 203 items in 2008/09 and 185 items in 2007/08) and retail sites (196 items, up from 107 items in 2008/09 and 124 items in 2007/08). There were also considerable increases, to a lesser extent, at both car park sites (94 items, up from 61 items in 2008/09 and 80 items in 2007/08) and shopping centres (86 items, up from 64 items in 2008/09 and 57 items in 2007/08).

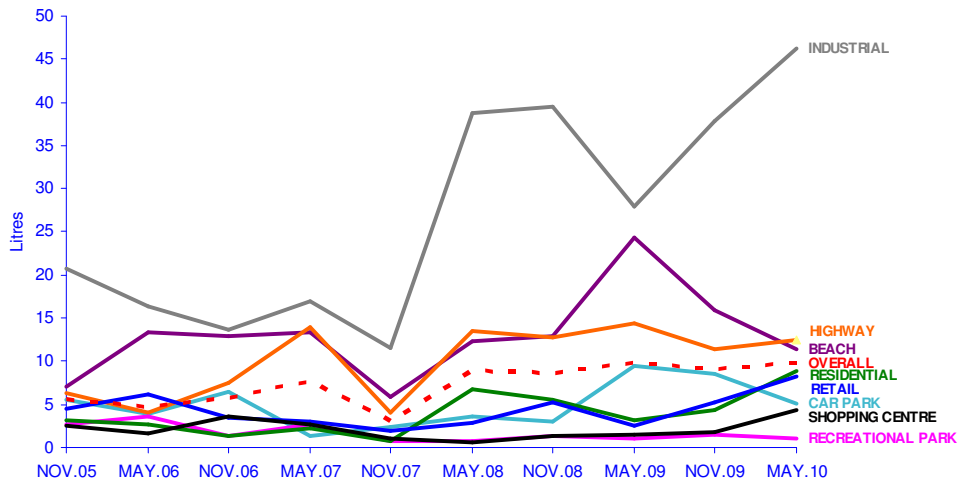
Items per 1000 Square Metres by Site Type - Annual Averages - TAS



There has been an overall upward trend with regard to volume of litter in the litter stream in Tasmania, primarily influenced by increases in litter volume at industrial sites.

There is also some seasonal fluctuation evident in volume estimates of litter among highway sites, where there are higher litter volumes in May compared to lower litter volumes in November. Conversely, to a lesser extent, there are generally higher litter volumes among recreational parks in November compared to lower litter volumes in May.

Volume per 1000 Square Metres by Site Type - TAS

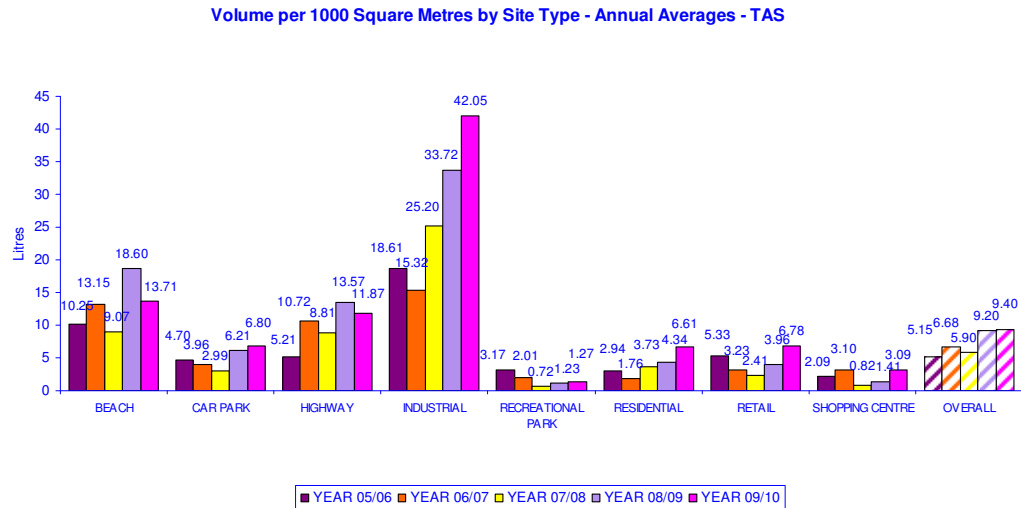


The overall annual average estimated litter volume per 1,000m<sup>2</sup> across all sites within Tasmania for the year of 2009/10 is similar to the results for the

previous years (9.40 litres, up from 9.20 litres in 2008/09, up from 5.90 litres in 2007/08, 6.68 litres in 2006/07 and 5.15 litres in 2005/06).

The recent increase was most strongly evident at industrial sites with the current findings higher than for the previous year (42.05 litres, up from 33.72 litres in 2008/09, 25.20 litres in 2007/08, 15.32 in 2006/07 and 18.61 in 2005/06).

The overall area of industrial sites is significantly smaller in proportion to other site locations within Tasmania.

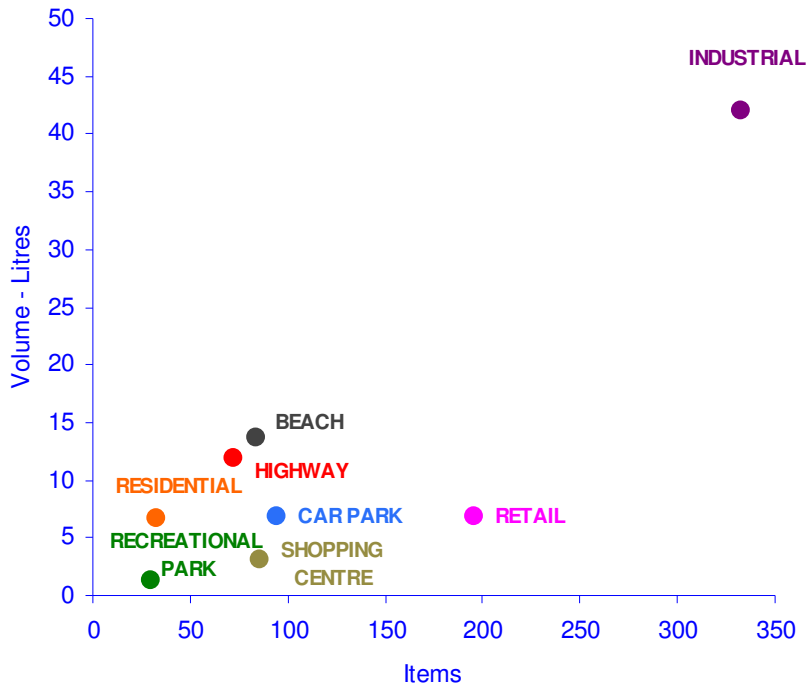


Items and volume estimates per 1,000m<sup>2</sup> within Tasmania identify the following site characteristics across the respective site types surveyed in 2009/10:

- Industrial sites contribute a high number of litter items and a large estimated litter volume, compared to all other sites
- Retail sites were associated with large numbers of litter items but only a small volume of litter
- Beaches and highways were associated with both a moderate numbers of litter items and moderate litter volumes
- Shopping centres and car park sites contributed a moderate number of litter items but were associated with low litter volumes

- Recreational parks and residential sites were associated with lower levels of litter items and lower litter volume

### Items and Volume per 1000 Square Metres by Site Type - TAS - 2009/ 2010

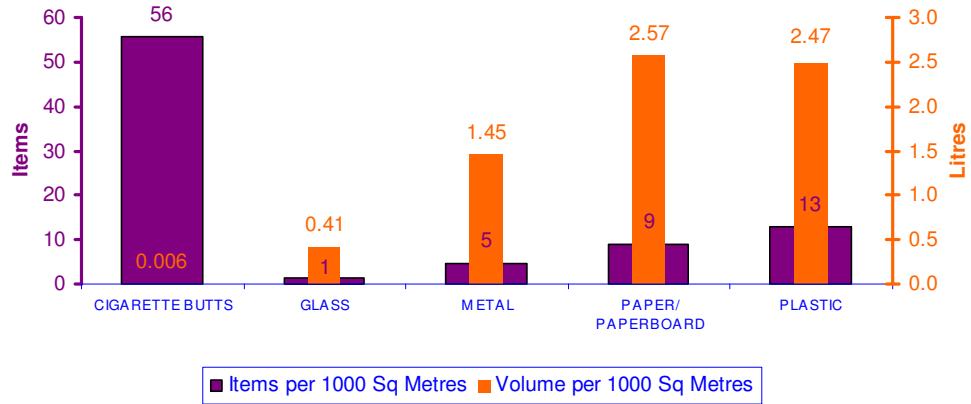


### Comparison by Main Material Types

An average of 56 cigarette butts per 1,000m<sup>2</sup> were identified across all sites surveyed within Tasmania during the year of 2009/10, these items however, only contributed 0.006 litres of volume per 1,000m<sup>2</sup> to the litter stream.

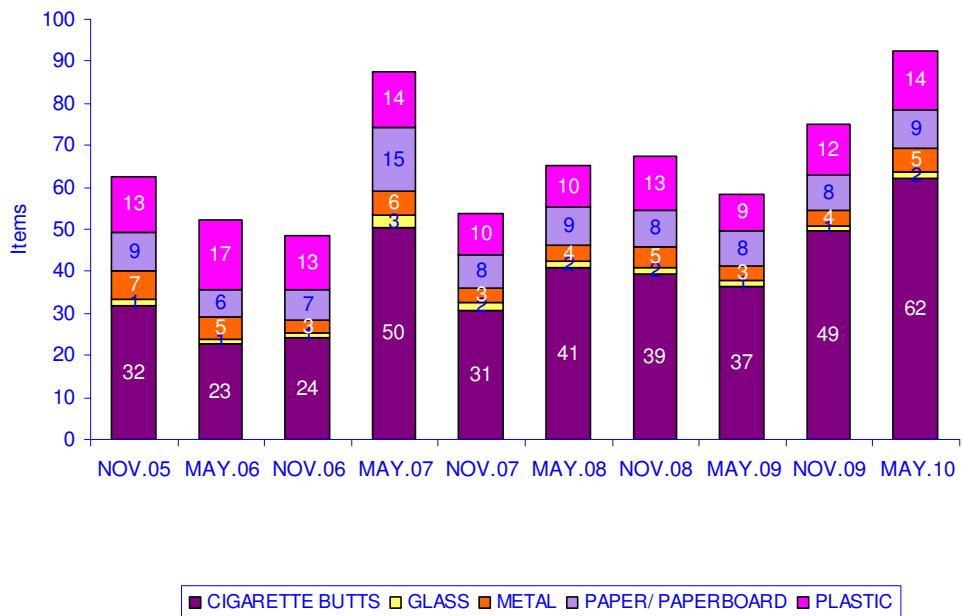
Items which contributed the greatest volumes to the litter stream in Tasmania were constructed of paper/ paperboard materials (2.57 litres per 1,000m<sup>2</sup>) and plastic materials (2.47 litres per 1,000m<sup>2</sup>).

### Items and Volume per 1000 Square Metres by Main Material Type - TAS - 2009/ 2010



The most apparent fluctuations in Tasmania in the numbers of items per 1,000m<sup>2</sup> by material type across the different counts were among cigarette butts. There is no seasonal pattern apparent however, among cigarette butt litter item results. The findings from November 2005 through to 2009/10 also do not provide evidence to support the notion of seasonal trends of any of the other material type litter counts.

### Items per 1000 Square Metres by Main Material Type - TAS



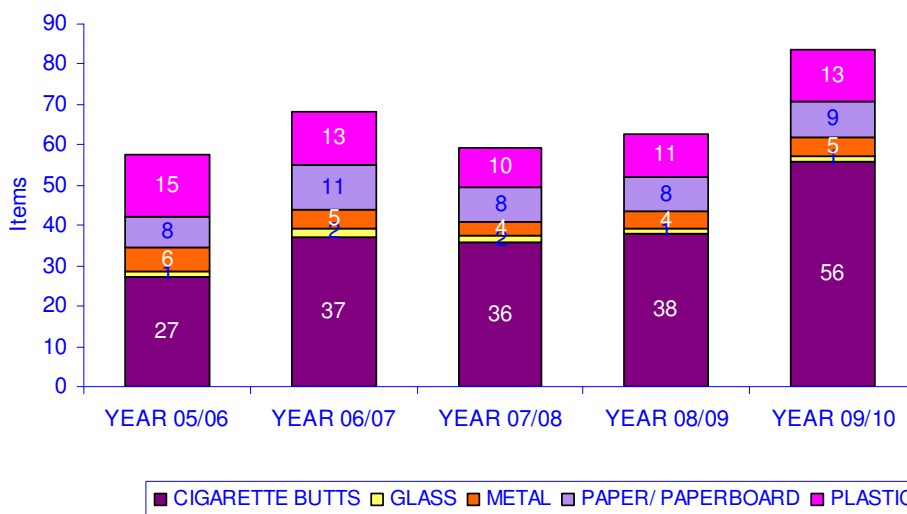
Annual average figures for counts from 2005/06 to 2009/10 in the Tasmania confirm that there have been some fluctuations in the number of cigarette butts per 1,000m<sup>2</sup>, while the contribution of litter items per 1,000m<sup>2</sup> generally remained proportional in the litter stream among the other main material type categories.

Overall, cigarette butts per 1,000m<sup>2</sup> have increased in the litter stream from 2005/06 to 2009/2010 (56 butts, up from 38 butts in 2008/09, 36 butts in 2007/08, 37 in 2006/07 and 27 butts in 2005/06).

There has also been a modest increase in the number of litter items per 1,000m<sup>2</sup> among most other material types since the previous year, as outlined below:

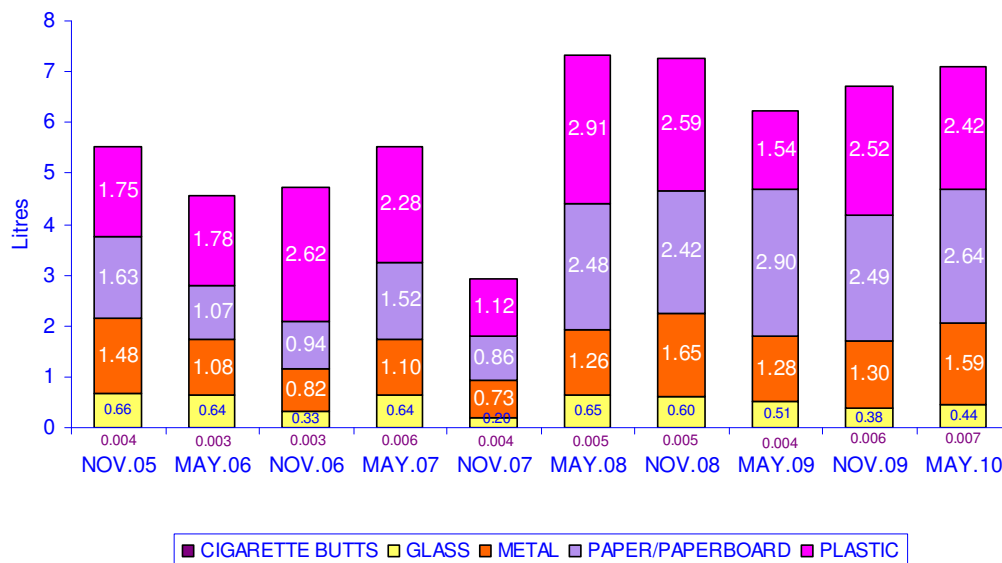
- Plastic objects (13 items, up from 11 items in 2008/09, 10 items in 2007/08, the same as 2006/07 and down from 15 items in 2005/06)
- Paper/ paperboard objects (9 items, up from 8 items in 2008/09 and 2007/08, down from 11 items in 2006/07 and up from 8 items in 2005/06)
- Metal objects (5 items, up from 4 items in 2008/09 and 2007/08, the same as 2006/07 and down from 6 items in 2005/06)
- Glass objects (1 item, the same as 2008/09, down from 2 items in 2007/08 and 2006/07 and the same as 2005/06)

### Items per 1000 Square Metres by Main Material Type - Annual Averages - TAS



Recent results for the November counts and May counts in Tasmania demonstrate a modest seasonal trend in the number of paper/ paperboard items per 1,000m<sup>2</sup> in the litter stream, with the number of items decreasing in November and increasing in May. There does not appear however, to be seasonal patterns for the other material categories.

### Volume per 1000 Square Metres by Main Material Type - TAS

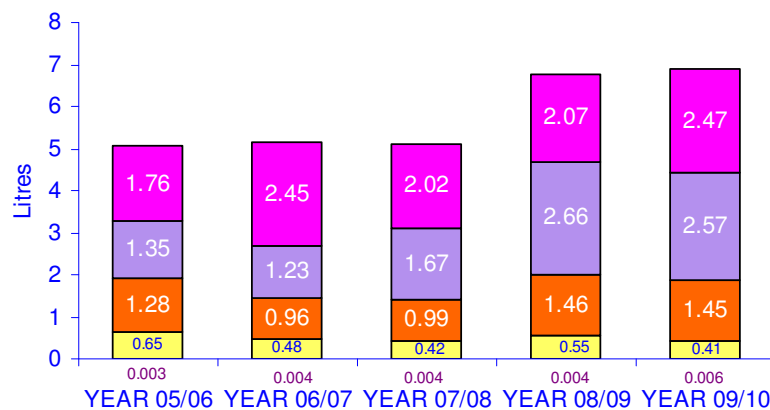


There has been an overall general increase in the litter volume of all material categories per 1,000m<sup>2</sup> in the Tasmanian litter stream since the start of the litter monitor in 2005/06. Annual results for 2009/10 revealed an increase in the volume per 1,000m<sup>2</sup> in the litter stream association with plastic litter volume (2.47 litres, up from 2.07 litres in 2008/09, 2.02 litres in 2007/08, 2.45 litres in 2006/07 and 1.76 litres in 2005/06).

There was however, a decrease in the litter volume of most other material categories per 1,000m<sup>2</sup> in the Tasmanian litter stream, as outlined:

- Paper/ paperboard litter objects (2.57 litres, down from 2.66 litres in 2008/09, 1.67 litres in 2007/08, 1.23 litres in 2006/07 and 1.35 litres in 2005/06)
- Metal objects (1.45 litres, down from 1.46 litres in 2008/09, up from 0.99 litres in 2007/08, 0.96 litres in 2006/07 and 1.28 litres in 2005/06)
- Glass objects (0.41 litres, down from 0.55 litres in 2008/09, 0.42 litres in 2007/08, 0.48 litres in 2006/07 and 0.65 litres in 2005/06)

**Volume per 1000 Square Metres by Main Material Type - Annual Averages - TAS**



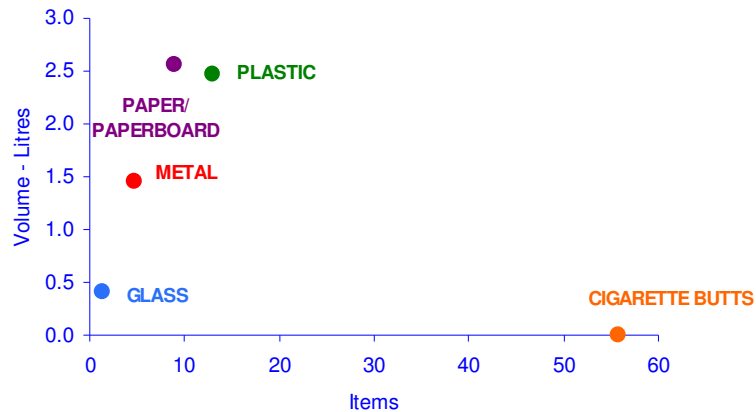
■ CIGARETTE BUTTS ■ GLASS ■ METAL ■ PAPER/PAPERBOARD ■ PLASTIC

Figures for items and volumes per 1,000m<sup>2</sup> across main material types identify the following characteristics of litter objects recorded within TAS during the year of 2009/10:

- Paper/ paperboard and plastic litter items contribute large volumes to the litter stream but are associated with a small number of litter items

- Cigarette butts contributed a large number of litter items, but associated with only a negligible volume in the litter stream
- Metal items contributed moderate volumes to the litter stream but were associated with only a small number of litter items
- Glass items contribute both a small number of litter items and volume to the litter stream

**Items and Volume per 1000 Square Metres by Main Material  
Type - TAS - 2009/ 2010**



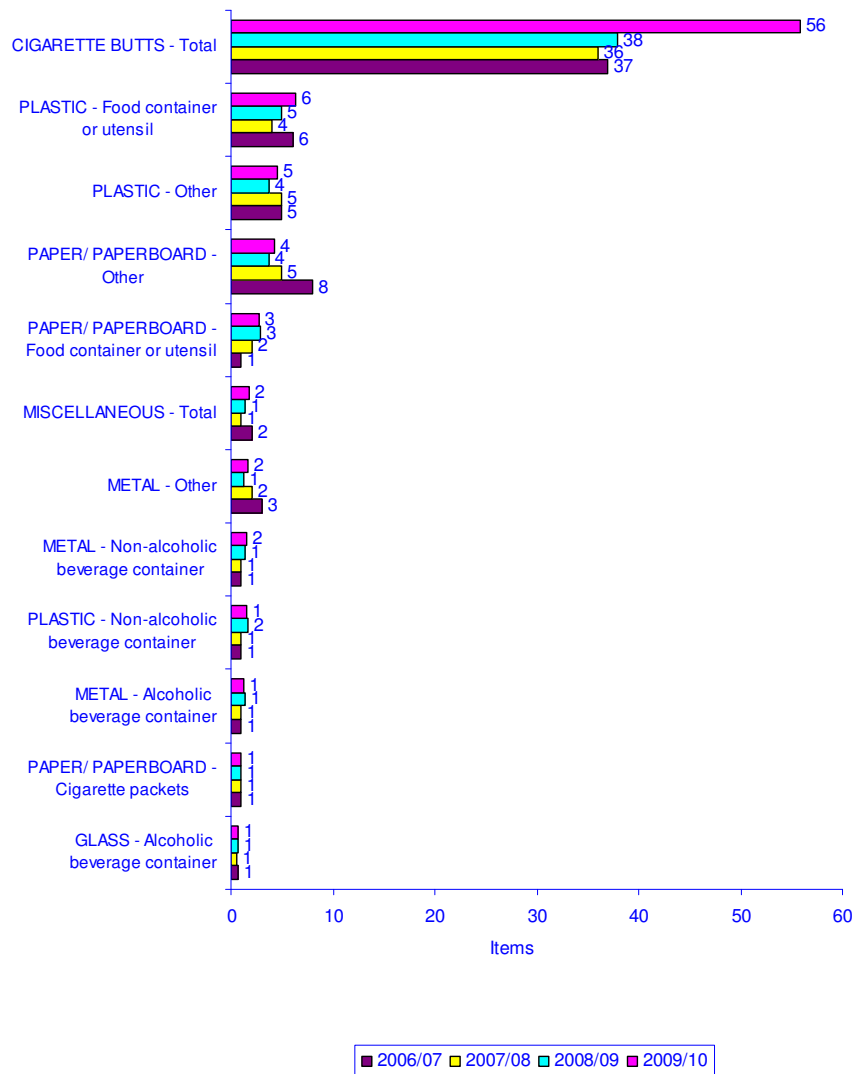
**The Dirty Dozen**

Cigarette butts remains the most frequently identified litter item in Tasmania, with 56 butts on average per 1,000m<sup>2</sup> (up from 38 butts in 2008/09, 36 butts in 2007/08 and 37 butts in 2006/07) during the 2009/10 counts.

Other objects that were frequently identified in the litter counts included:

- Plastic food containers and utensils (6 items per 1,000m<sup>2</sup>, up from 5 items in 2008/09, 4 items in 2007/08 and the same as 2006/07)
- Uncategorised plastic objects (5 items per 1,000m<sup>2</sup>, up from 4 items in 2008/09 and the same as 2007/08 and 2006/07)
- Uncategorised paper/ paperboard objects (4 items per 1,000m<sup>2</sup>, the same as 2008/09, down from 5 items in 2007/08 and 8 items in 2006/07)

**Dirty Dozen - Items per 1000 Square Metres - Object Sub-Categories -  
TAS - 06/07 to 09/10**



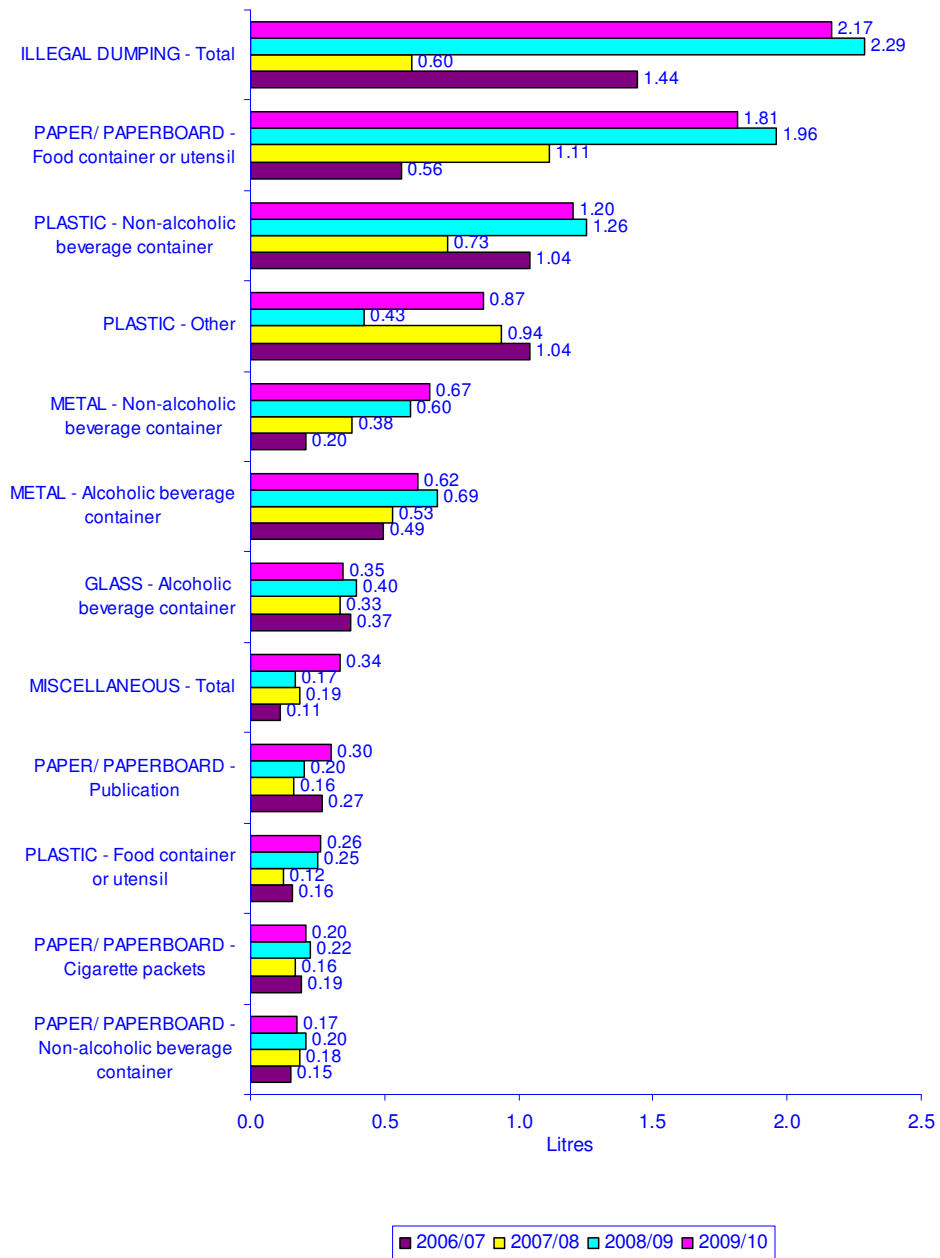
Illegal dumping contributed the largest estimated litter volume in Tasmania, with 2.17 litres per 1,000m<sup>2</sup> (down from 2.29 litres in 2008/09, and up from 0.60 litres in 2007/08 and 1.44 litres in 2006/07).

Other strong contributors to the estimated litter volume included:

- Paper/ paperboard – food containers or utensils (1.81 litres per 1,000m<sup>2</sup>, down from 1.96 litres in 2008/09, 1.11 litres in 2007/08 and 0.56 litres in 2006/07)
- Plastic – non-alcoholic beverage containers (1.20 litres per 1,000m<sup>2</sup>, down from 1.26 litres in 2008/09, up from 0.73 litres in 2007/08 and 1.04 litres in 2006/07)

- Plastic – other (0.87 litres per 1,000m<sup>2</sup>, up from 0.43 litres in 2008/09, 0.94 litres in 2007/08 and down from 1.04 litres in 2006/07)
- Metal – non-alcoholic beverage container (0.67 litres per 1,000m<sup>2</sup>, up from 0.60 in 2008/09, 0.38 litres in 2007/08 and 0.20 litres in 2006/07)
- Metal – alcoholic beverage container (0.62 litres per 1,000m<sup>2</sup>, down from 0.69 in 2008/09, up from 0.53 litres in 2007/08 and 0.49 litres in 2006/07)

**Dirty Dozen - Volume per 1000 Square Metres - Object Sub-Categories - TAS - 06/07 to 09/10**



At a Glance

The overall average number of items per 1,000m<sup>2</sup> across all of the 151 sites surveyed within Victoria during the counts in the year of 2009/10 was 50, while the overall average estimated volume per 1,000m<sup>2</sup> was 4.91 litres.

The number of litter items identified per 1,000m<sup>2</sup> is higher than the last two counts (up from 43 items in 2008/09 and 48 items in 2007/08) but below the other previous monitors (80 items in 2006/07 and 71 items in 2005/06). The current year's volume per 1,000m<sup>2</sup> also increased in line with the higher count (up from 2.87 litres in 2008/09 and 4.19 litres in 2007/08) but below other previous monitors (7.74 litres in 2006/07 and 7.87 litres in 2005/06).

The most littered sites surveyed within Victoria per 1,000m<sup>2</sup> were generally retail sites, industrial sites, beaches and car parks. Retail sites contributed large numbers of litter and moderate volumes of litter items, while industrial sites, beaches and car parks were associated with moderate to large volumes of litter and moderate numbers of litter items.

Cigarette butts were the most frequently identified item across all sites in VIC, with 25 butts per 1,000m<sup>2</sup> recorded in annual figures for 2009/10 (unchanged from 2008/09 and down from 28 butts in 2007/08, 41 butts in 2006/07 and 36 butts in 2005/06), these were however, associated with only a very small proportion of the overall litter volume (0.003 litres per 1,000m<sup>2</sup>).

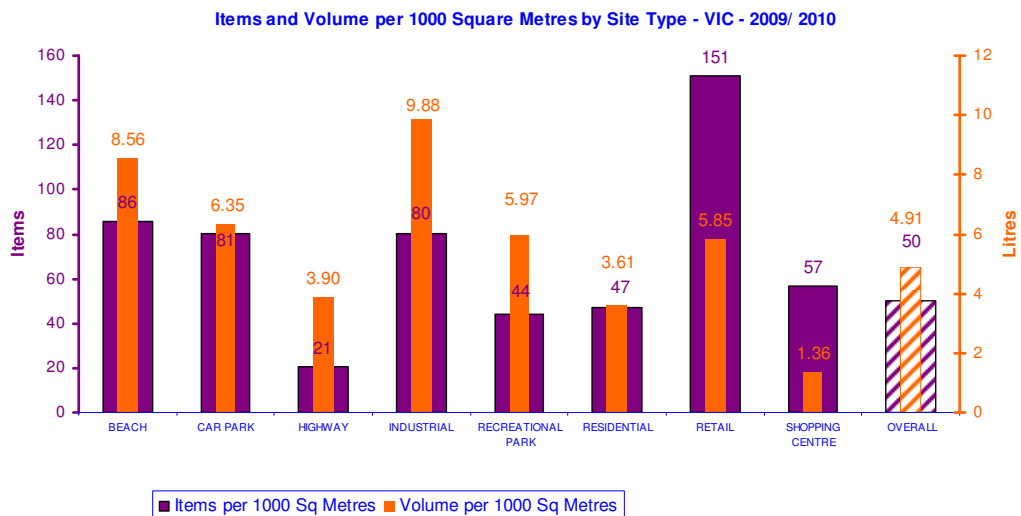
Paper/ paperboard objects contributed the largest volume to the litter stream, with 1.57 litres of volume per 1,000m<sup>2</sup> (up from 0.73 litres in 2008/09, 0.95 litres in 2007/08, but down from 1.82 litres in 2006/07 and 1.66 litres in 2005/06). Plastic litter objects contributed the second largest amount of volume to the litter stream, and were associated with 1.18 litres of volume per 1,000m<sup>2</sup> (0.77 litres in 2008/09, but down from 1.37 litres in 2007/08, 1.73 litres in 2006/07 and 2.54 litres in 2005/06).

## Comparisons by Site Types

The largest numbers of items per 1,000m<sup>2</sup> in Victoria were located within retail sites (151 items, up from 106 items in 2008/09 and 83 items in 2007/08). Retail sites (5.85 litres, up from 4.62 litres in 2008/09 and 2.01 litres in 2007/08) were also associated with moderate volumes of litter per 1,000m<sup>2</sup> compared to other site types.

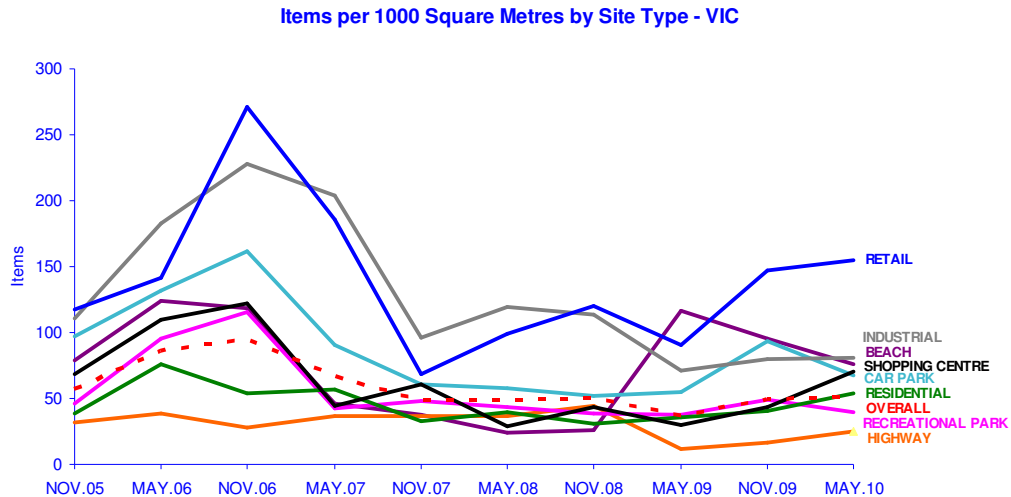
Industrial sites (9.88 litres, up from 5.68 litres in 2008/09 and down from 11.13 litres in 2007/08) were associated with higher volumes of litter per 1,000m<sup>2</sup> compared to other site types. Industrial sites (80 items, down from 92 items in 2008/09 and 107 items in 2007/08) contributed a moderate numbers of litter items per 1,000m<sup>2</sup>, compared to other site types.

Other sites that were also associated with moderate numbers of litter items per 1,000m<sup>2</sup> were beaches (86 items, up from 71 items in 2008/09 and 31 items in 2007/08), and car parks (81 items, up from 53 items in 2008/09 and 59 items in 2007/08). Both beaches (8.56 litres, up from 4.10 litres in 2008/09 and 1.69 litres in 2007/08) and car park sites (6.35 litres, up from 2.74 litres in 2008/09 and 2.73 litres in 2007/08) contributed moderate to large volumes per 1,000m<sup>2</sup> to the litter stream, compared to other site types.



Overall, with the exception of retail sites, there has been a downward trend with the number of litter items in the litter stream in Victoria.

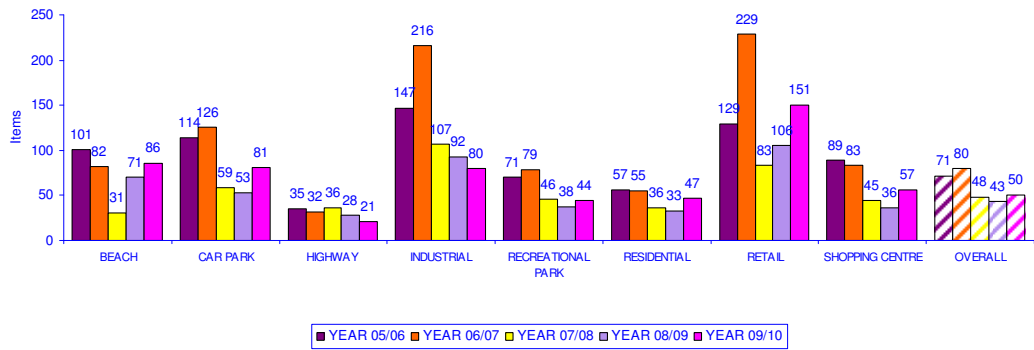
Across all the results there appears to be a seasonal pattern of the numbers of items per 1,000m<sup>2</sup> in the litter stream at shopping centres and residential sites. Shopping centre results generally demonstrate an increase in the numbers of items in the November and a decrease in May, while residential sites recorded an increase in the number of litter items in the May and lower results in the November.



The annual average items per 1,000m<sup>2</sup> within Victoria for the year of 2009/10 (50 items) was up from the figures recorded in 2008/09 (43 items) and 2007/08 (48 items) but still significantly lower than the counts recorded for the year 2006/07 (80 items).

The increase in the litter was apparent across most sites except highway and industrial sites. Increases in the litter items per 1,000m<sup>2</sup> were demonstrated most strongly at retail sites (151 items, up from 106 items in 2008/09 and 83 items in 2007/08, but down from 229 items in 2006/07 and up from 129 items in 2005/06) and shopping centres (57 items, up from 36 items in 2008/09, 45 items in 2007/08, but down from 83 items in 2007/07 and 89 items in 2005/06).

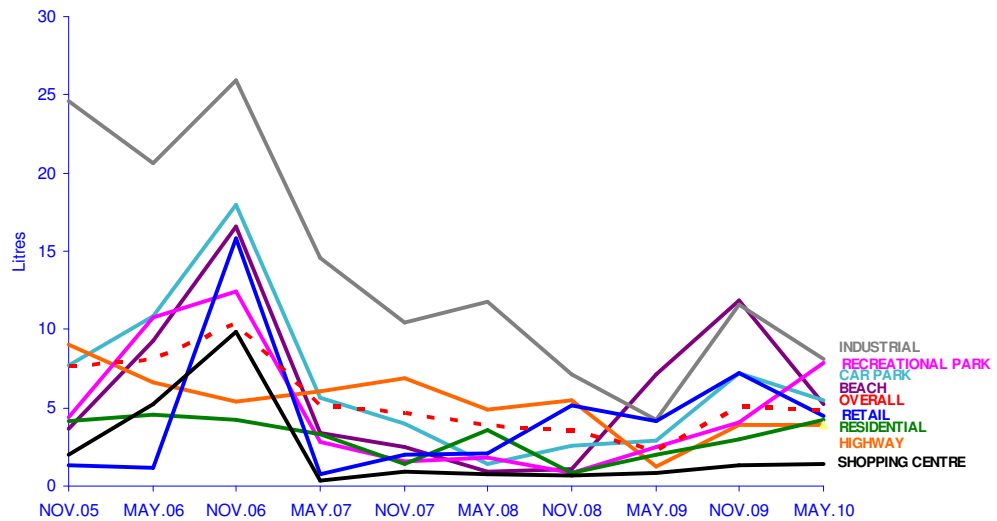
Items per 1000 Square Metres by Site Type - Annual Averages - VIC



Overall, there has been a downward trend in the total estimated litter volume per 1,000m<sup>2</sup> in the litter stream in Victoria.

The tracked results of estimated volumes of litter reveal seasonal fluctuations among retail sites, with higher litter volumes in November and lower litter volumes in May. While there are fluctuations among other site types they do not generally support the notion of seasonal patterns.

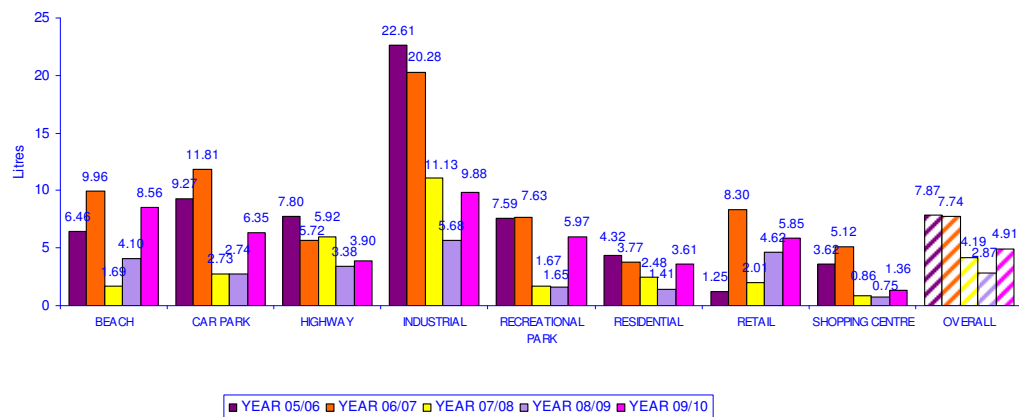
Volume per 1000 Square Metres by Site Type -VIC



The overall annual average estimated litter volume per 1,000m<sup>2</sup> across all sites within Victoria for 2009/10 was 4.91 litres per 1,000m<sup>2</sup> (up from 2.87 litres in 2008/09 and 4.19 litres in 2007/08, but down from 7.74 litres in 2006/07 and 7.87 litres in 2005/06).

The increase in volume per 1,000m<sup>2</sup> was most clearly reflected among beaches (8.56 litres, up from 4.10 litres in 2008/09 and 1.69 litres in 2007/08, and down from 9.96 litres in 2006/07 and up from 6.44 litres in 2005/06 ), recreational parks (5.97 litres, up from 1.65 litres in 2008/09, 1.65 litres in 2007/08 and down from 7.63 litres in 2006/07 and 7.59 litres in 2005/06), industrial sites (9.88 litres, up from 5.68 litres in 2008/09, but down from 11.13 litres in 2007/08, 20.28 litres in 2006/07 and 22.61 litres in 2005/06) and car park sites 6.35 litres, up from 2.74 litres in 2008/09, 2.73 litres in 2007/08, but down from 11.81 litres in 2006/07 and 9.27 litres in 2005/06).

Volume per 1000 Square Metres by Site Type - Annual Averages - VIC

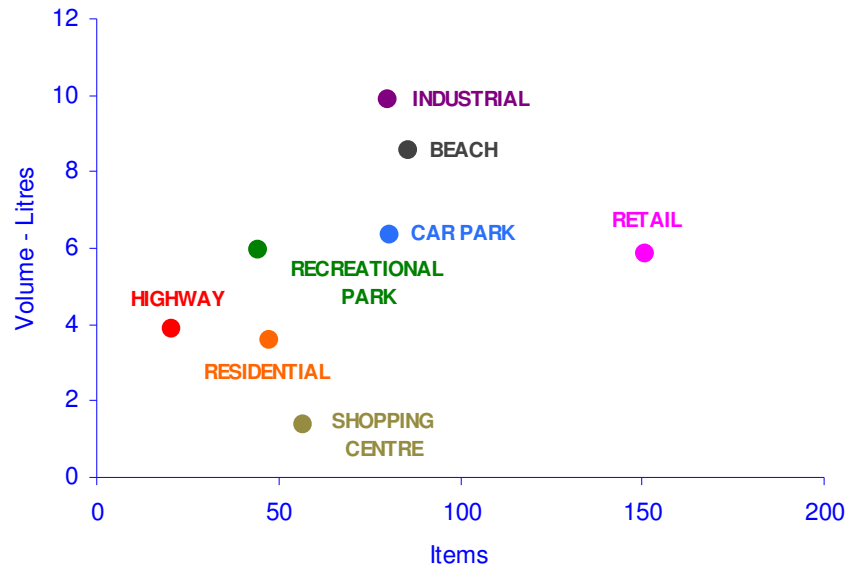


Items and volume estimates per 1,000m<sup>2</sup> within VIC identify the following site characteristics across the respective site types surveyed in 2009/10:

- Industrial sites and beaches were associated with a large estimated litter volume per 1,000m<sup>2</sup> and a moderate number of items per 1,000m<sup>2</sup>
- Retail sites were associated with a large number of items per 1,000m<sup>2</sup> and a moderate estimated litter volume per 1,000m<sup>2</sup>
- Car parks were associated with a moderate number of items per 1,000m<sup>2</sup> and moderate estimated litter volumes per 1,000m<sup>2</sup>
- Recreational parks, highways and residential sites were generally associated with a low number of items per 1,000m<sup>2</sup> and moderate estimated litter volumes per 1,000m<sup>2</sup>

- Shopping centres were associated with both low numbers of items per 1,000m<sup>2</sup> and low estimated volumes of litter per 1,000m<sup>2</sup>

### Items and Volume per 1000 Square Metres by Site Type - VIC - 2009/ 2010

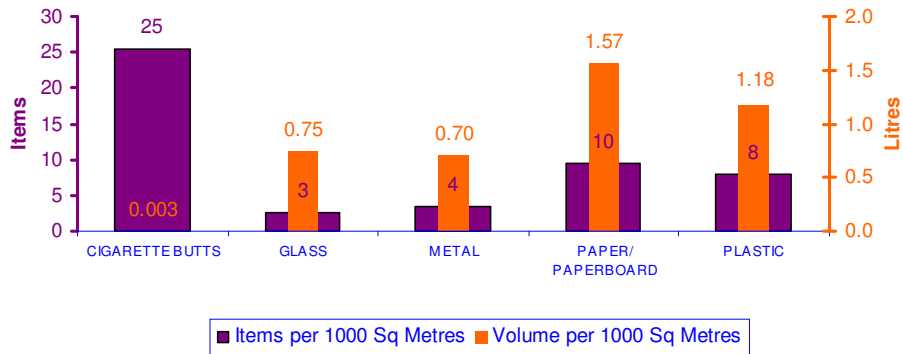


### Comparison by Main Material Types

An average of 25 cigarette butts per 1,000m<sup>2</sup> was identified across all sites surveyed within VIC during the year of 2009/10. However, such items only contributed 0.003 litres of volume per 1,000m<sup>2</sup> to the litter stream.

Items which contributed the greatest volumes to the litter stream in Victoria were constructed of paper/ paperboard materials (1.57 litres per 1,000m<sup>2</sup>) and plastic materials (1.18 litres per 1,000m<sup>2</sup>).

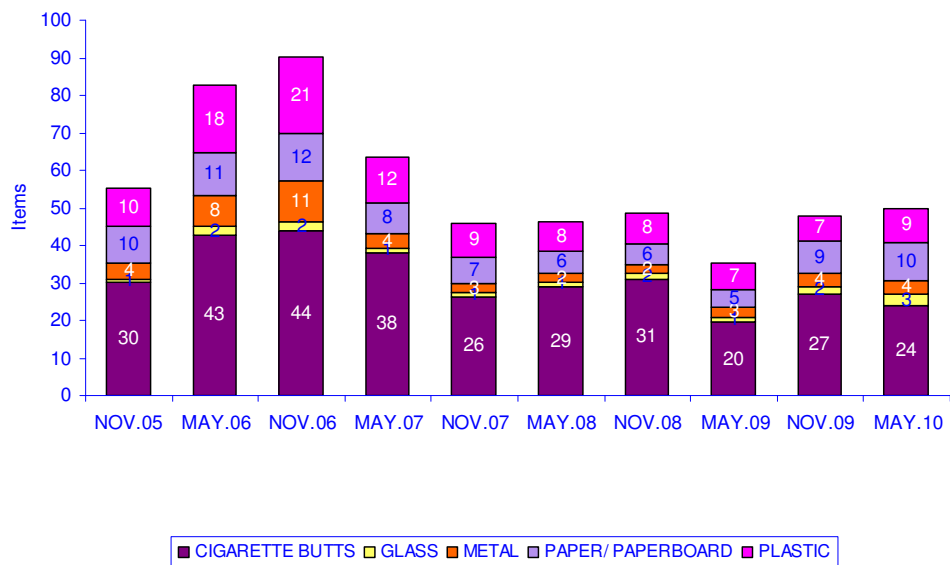
**Items and Volume per 1000 Square Metres by Main Material Type - VIC - 2009/ 2010**



There is no evidence in results of the number of items of litter per 1,000m<sup>2</sup> to suggest that demonstrate the presence of seasonal fluctuations in the main material type categories in Victoria.

The proportion of each major material types in the overall litter stream has remained fairly constant across the litter counts from November 2005 to May 2010.

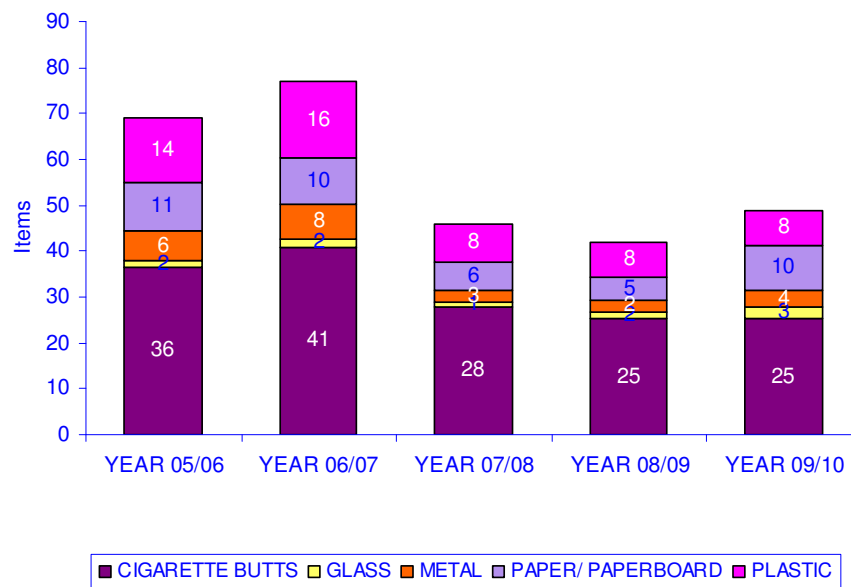
**Items per 1000 Square Metres by Main Material Type - VIC**



There has been an overall decline in the number of litter items per 1,000m<sup>2</sup> among the main material types in Victoria from 2005/06 to 2009/10. While the number of cigarette butts and plastic items remained unchanged from the previous count in 2008/09, there was an increase in the number of paper/ paperboard, metal and glass items, as outlined:

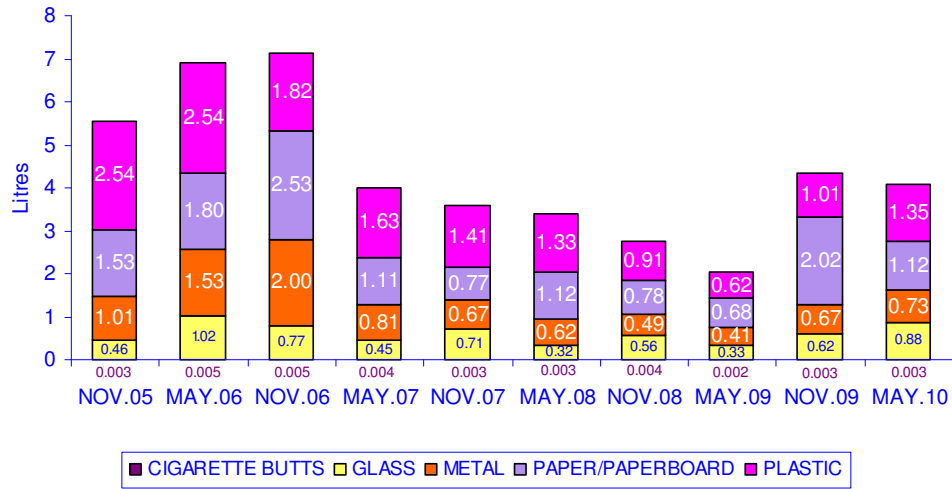
- Cigarette butts – 25 items (unchanged from 2008/09, down from 28 items in 2007/08, 41 items in 2006/07 and 36 items in 2005/06)
- Paper/ paperboard – 10 items (down from 5 items in 2008/09, 6 items in 2008/09, the same as 2006/07 and down from 11 items in 2005/06)
- Plastic items – 8 items (unchanged from 2008/09 and 2007/08, but down from down from 16 items in 2006/07 and 14 items in 2005/06)
- Metal items – 3 items (up from 2 items in 2008/09, the same as 2007/08, down from 8 items in 2006/07 and 6 items in 2005/06).

**Items per 1000 Square Metres by Main Material Type - Annual Averages - VIC**



Overall, there are apparent seasonal fluctuations across the total estimated volumes in Victoria, with larger total estimated volumes in November and lower total estimated volumes in May. There does not appear however, to be any seasonal patterns among the volumes of individual material categories.

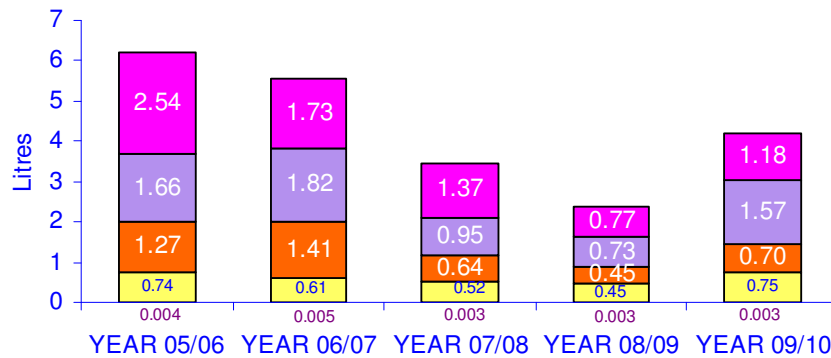
### Volume per 1000 Square Metres by Main Material Type - VIC



Annual results for the contribution of objects within the main material types to volume in the litter stream during the year 2009/10 demonstrate an increase across most main material types:

- Paper/ paperboard objects – 1.57 litres per 1,000m<sup>2</sup> (up from 0.73 litres in 2008/09 and 0.95 litres in 2007/08, down from 1.82 litres 2006/07 and 1.66 litres in 2005/06)
- Plastic litter objects – 1.18 litres per 1,000m<sup>2</sup> (up from 0.77 litres in 2008/09, down from 1.37 litres in 2007/08, 1.73 litres in 2006/07 and 2.54 litres in 2005/06)
- Glass objects – 0.75 litres per 1,000m<sup>2</sup> (up from 0.45 litres in 2008/09 and 0.52 litres in 2007/08, 1.61 litres in 2006/07 and 0.74 litres in 2005/06)
- Metal objects – 0.70 litres per 1,000m<sup>2</sup> (up from 0.45 litres in 2008/09, 0.64 litres in 2007/08, down from 1.41 litres in 2006/07 and 1.27 litres in 2005/06)

### Volume per 1000 Square Metres by Main Material Type - Annual Averages - VIC

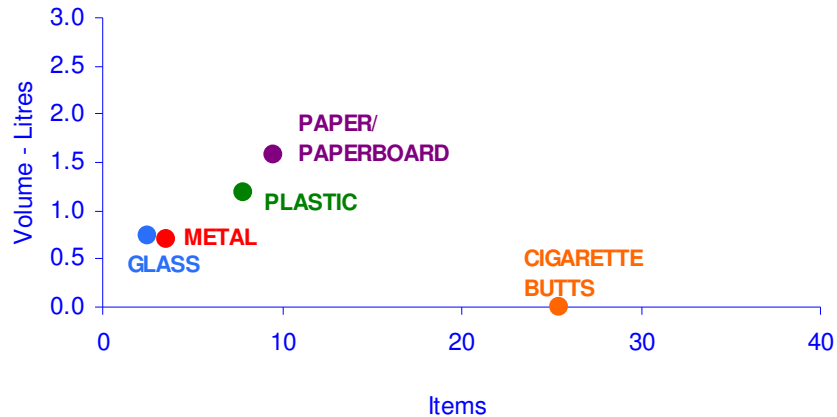


■ CIGARETTE BUTTS 
 ■ GLASS 
 ■ METAL 
 ■ PAPER/PAPERBOARD 
 ■ PLASTIC

Figures for items and volumes per 1,000m<sup>2</sup> across main material types identify the following characteristics of litter objects recorded within Victoria during the year of 2009/10:

- Plastic and paper/ paperboard items contribute large volumes to the litter stream but are associated with only small to moderate numbers of litter items
- Cigarette butts were recorded in large numbers, but such items contribute only a negligible estimated volume to the overall litter stream
- Metal and glass items contribute only small volumes to the litter stream and are associated with only small numbers of litter items

## Items and Volume per 1000 Square Metres by Main Material Type - VIC - 2009/ 2010



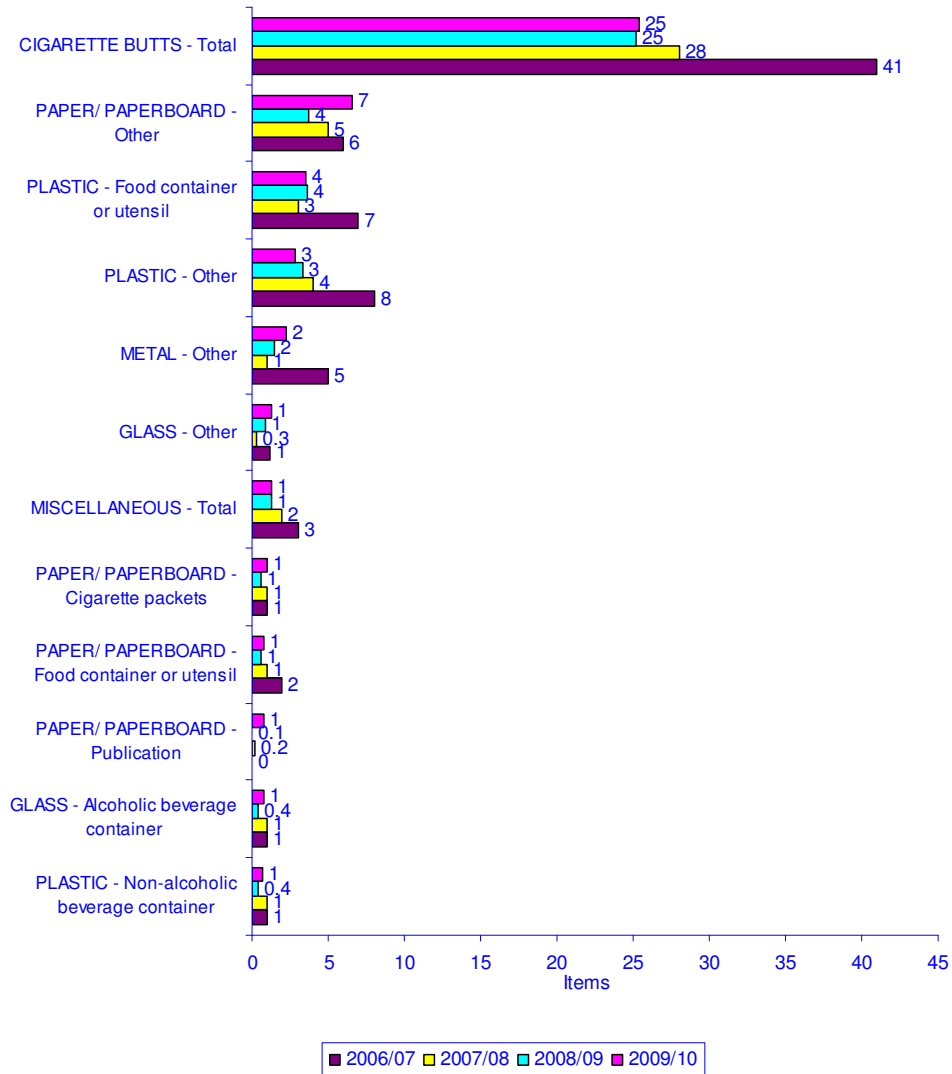
### The Dirty Dozen

Cigarette butts remained the most frequently identified litter item in Victoria, with 25 butts were recorded on average per 1,000m<sup>2</sup> during the 2009/10 counts (the same as 2008/09 and down from 28 butts in 2007/08 and 41 butts in 2006/07).

Other objects frequently identified during the Victorian counts included:

- Uncategorised paper/ paperboard objects (7 items per 1,000m<sup>2</sup>, up from 4 items in 2008/09, 5 items in 2007/08 and 6 items in 2006/07)
- Plastic - food containers and utensils (4 items per 1,000m<sup>2</sup>, unchanged from 2008/09 and up from 3 items 2007/08 and down from 7 items in 2006/07)
- Uncategorised plastic objects (3 items per 1,000m<sup>2</sup>, unchanged from 2008/09 and down from 4 items in 2007/08 and 8 items in 2006/07)

**Dirty Dozen - Items per 1000 Square Metres - Object Sub-Categories -  
VIC - 06/07 to 09/10**



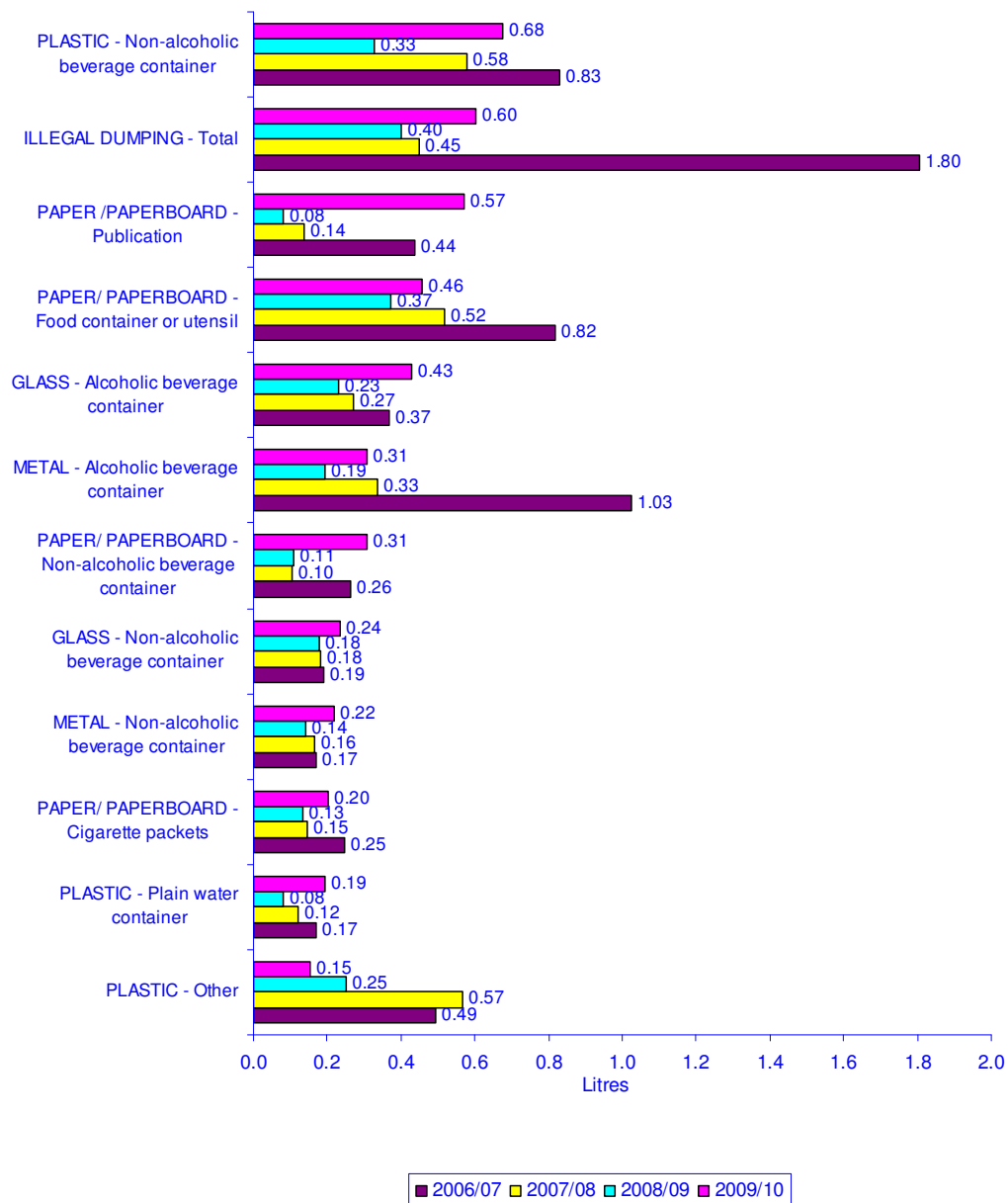
Plastic – non-alcoholic beverage containers (0.68 litres per 1,000m<sup>2</sup>, up from 0.33 litres in 2008/09, 0.58 litres in 2007/08 and down from 0.83 litres in 2006/07) contributed the largest estimated litter volume in Victoria during 2009/10.

Other object sub-categories which were associated with substantial estimated volume measurements included:

- Illegal dumping items (0.60 litres 1,000m<sup>2</sup>, up from 0.40 litres in 2008/09, 0.45 litres in 2007/08 and down from 1.80 litres in 2006/07)

- Paper/ paperboard - publications (0.57 litres per 1,000m<sup>2</sup>, up from 0.08 litres in 2008/09, 0.14 litres in 2007/08 and 0.44 litres in 2006/07)
- Paper/ paperboard - food containers or utensils (0.46 litres per 1,000m<sup>2</sup>, up from 0.37 litres in 2008/09, down from 0.52 litres and 0.82 litres in 2006/07)
- Glass alcoholic beverage container (0.43 litres per 1,000m<sup>2</sup>, up from 0.23 litres in 2008/09, 0.27 litres in 2007/08 and 0.37 litres in 2006/07)

**Dirty Dozen - Volume per 1000 Square Metres - Object Sub-Categories - VIC - 2009/ 2010**



## 4.9 Western Australia

### At a Glance

The overall average number of items per 1,000m<sup>2</sup> across all of the 151 sites surveyed within Western Australia during the counts in the year of 2009/10 was 71, while the overall average estimated volume per 1,000m<sup>2</sup> was 9.44 litres.

The number of litter items per 1,000m<sup>2</sup> identified was lower than most previous years (87 items in 2008/09, 85 items in 2007/08, 83 items in 2006/07) but higher than in 2005/06 (60 items). The current year's volume per 1,000 m<sup>2</sup> estimate however, is lower than the results from the previous two years (11.93 litres in 2008/09, 13.06 litres in 2007/08 and 12.19 litres in 2006/07) but slightly higher than in 2005/ 2006 (8.57 litres per 1,000 m<sup>2</sup>).

The most littered sites surveyed within Western Australia were generally industrial sites, highways, retail sites and beaches. Industrial sites were associated with both large volumes of litter and large numbers of litter items, while highway sites contributed large volumes of litter but a small number of litter items. Retail sites and beaches were both associated with large numbers of litter items but only small volumes of litter.

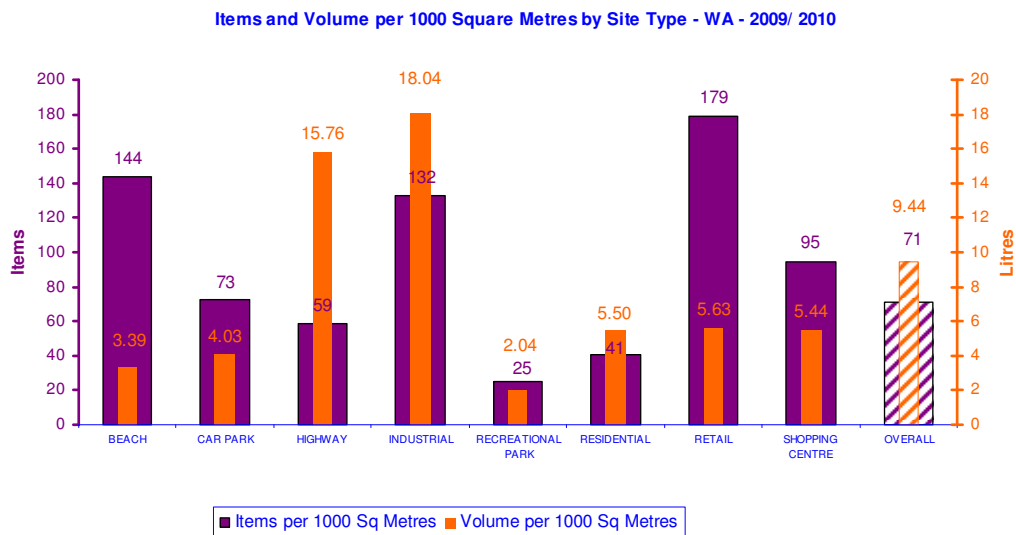
Cigarette butts were the most frequently identified item across all sites in Western Australia, with 33 butts per 1,000m<sup>2</sup> recorded in annual figures for 2009/10 (down from 41 butts in 2008/09, 36 butts in 2007/08, 35 butts in 2006/07 and up slightly from 29 butts in 2005/06). Only a very small proportion of the overall litter volume (0.004 litres per 1,000m<sup>2</sup>) however, was associated with these items.

Plastic litter objects contributed the largest amount of volume to the litter stream in Western Australia, with 3.39 litres of volume per 1,000m<sup>2</sup> (down from 5.21 litres in 2008/09, 5.09 litres in 2007/08, 4.62 litres in 2006/07 and 3.54 litres in 2005/06). Paper/ paperboard contributed the second highest amount of litter with 2.30 litres of volume per 1,000m<sup>2</sup> (down from 2.56 litres in 2008/09, 2.72 litres in 2007/08 and 2.79 litres in 2006/07).

### Comparisons by Site Types

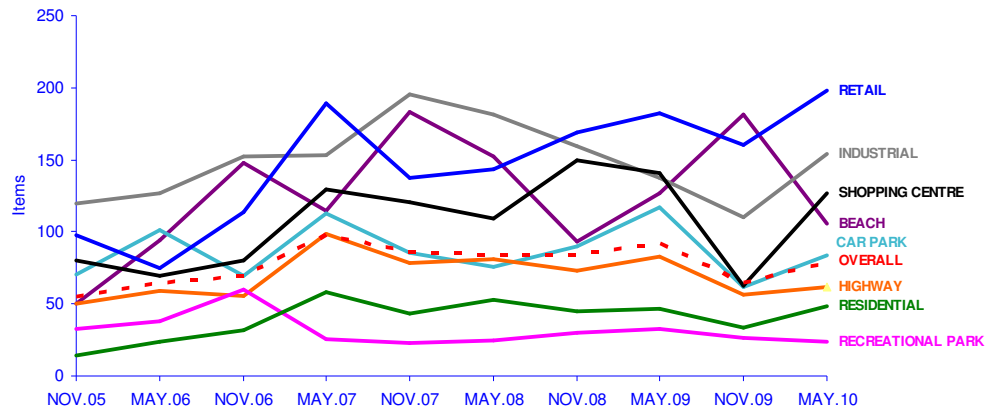
The largest numbers of items per 1,000m<sup>2</sup> were located at retail sites (179 items, up from 175 items in 2008/09), beaches (144 items, up from 110 items in 2008/09) and industrial areas (132 items, down from 148 items in 2008/09).

The largest estimated volumes of litter per 1,000m<sup>2</sup> however, were associated with industrial sites (18.04 litres, down from 18.65 litres in 2008/09) and highways (15.76 litres, down from 23.49 litres in 2008/09).



The tracked results of the number of items per 1,000m<sup>2</sup> across the site types in Western Australia revealed that there are some seasonal fluctuations, particularly among residential and highway sites which displayed a lower number of litter items in November and a higher number of litter items in May. There is little evidence however, to suggest that there are any seasonal patterns among the other site types.

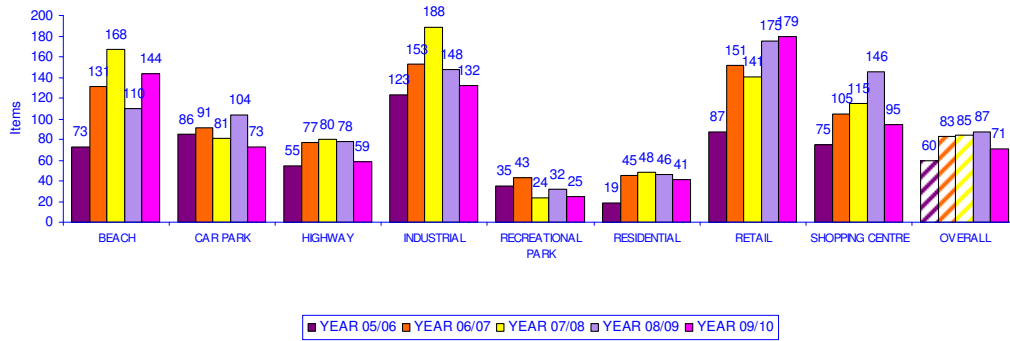
Items per 1000 Square Metres by Site Type - WA



The annual average of items per 1,000m<sup>2</sup> within Western Australia for 2009/10 (71 items per 1,000m<sup>2</sup>) is lower than the figure corresponding to the previous three years results (87 items in 2008/09, 85 items in 2007/08 and 83 items in 2006/07) and higher than the findings for the year 2005/06 (60 items per 1,000m<sup>2</sup>).

The decrease in the number of items per 1,000m<sup>2</sup>, was most strongly evident at shopping centres (95 items, down from 146 items in 2008/09, 115 in 2008/07, 105 in 2006/07 and up from 75 in 2005/06), car parks (73 items, down from 104 items in 2008/09, 81 in 2008/07, 91 in 2006/07 and 86 in 2005/06), highways (59 items, down from 78 items in 2008/09, 80 items in 2007/08, 77 items in 2006/07 and above 55 items in 2005/06) and industrial sites (132 items, down from 148 items in 2008/09, 188 items in 2007/08, 153 items in 2006/07 and up from 123 items in 2005/06). Conversely, the largest increase in the number of items per 1,000m<sup>2</sup> was apparent at beaches (144 items, up from 110 items in 2008/09, down from 168 items in 2007/08 and above 131 items in 2006/07 and 73 items in 2005/06).

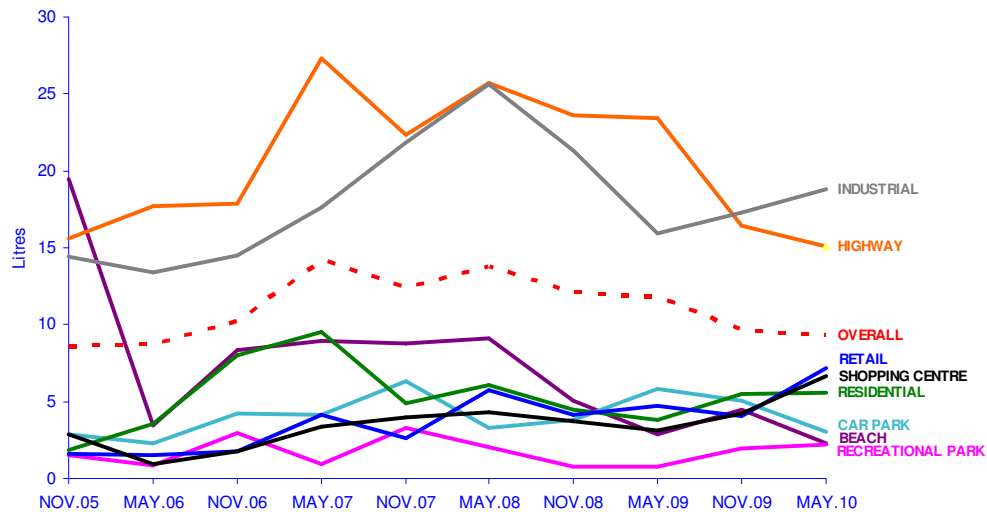
Items per 1000 Square Metres by Site Type - Annual Averages - WA



The tracked results of estimated volumes per 1,000m<sup>2</sup> of litter reveal seasonal fluctuations among retail sites and highway sites, with lower litter volumes in November and higher litter volumes in May. While there are fluctuations among other site types they do not generally support the notion of seasonal patterns.

There are higher volumes of litter per 1,000m<sup>2</sup> evident at highway and industrial sites, compared to other site types.

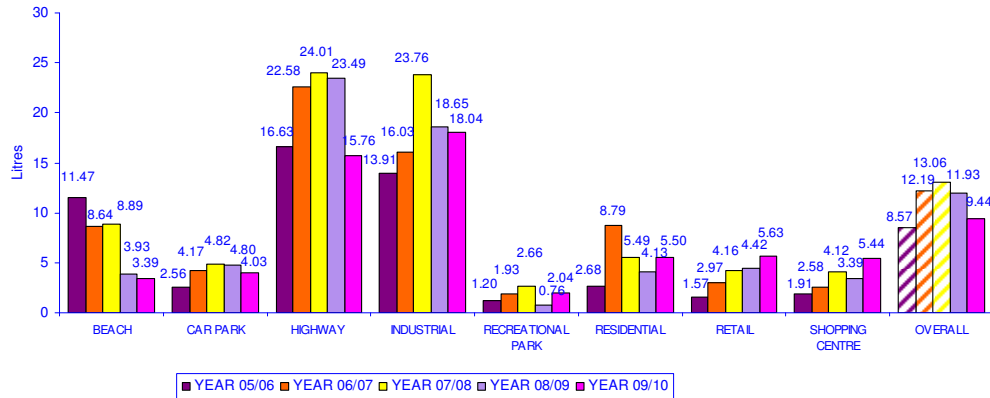
Volume per 1000 Square Metres by Site Type - WA



The overall annual average estimated litter volume per 1,000m<sup>2</sup> across all sites within Western Australia for 2009/2010 (9.44 litres) was lower in volume than 2008/09 (11.93 litres), 2007/08 (13.06 litres), 2006/07 (12.19 litres), but higher than the findings for 2005/06 (8.57 litres).

This decrease was most strongly demonstrated at highway sites (15.76 litres per 1,000m<sup>2</sup>, down from 23.49 litres in 2008/09 24.01 litres in 2007/08, 22.58 litres in 2006/07 and 16.63 litres in 2005/06).

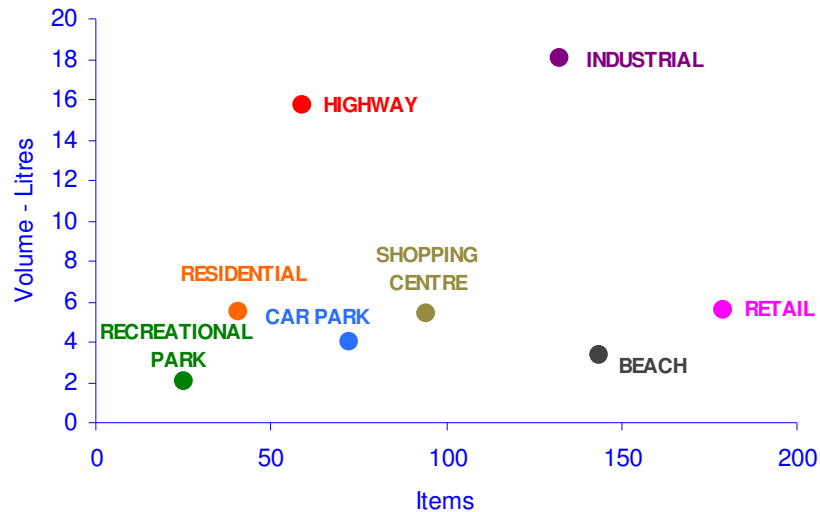
Volume per 1000 Square Metres by Site Type - Annual Averages - WA



The items and volume estimates per 1,000m<sup>2</sup> within WA identified the following site characteristics across the respective site types surveyed in 2009/10:

- Industrial sites were associated with large numbers of litter items and large estimated litter volumes
- Highway sites were associated with a moderate number of litter items and large estimated litter volumes
- Retail sites and beaches were associated with large numbers of litter items but only small estimated litter volumes
- Car parks and shopping centres were associated with moderate numbers of litter items but only small estimated litter volumes
- Recreational parks and residential areas were associated with low numbers of litter items and only a small estimated litter volumes

### Items and Volume per 1000 Square Metres by Site Type - WA - 2009/ 2010

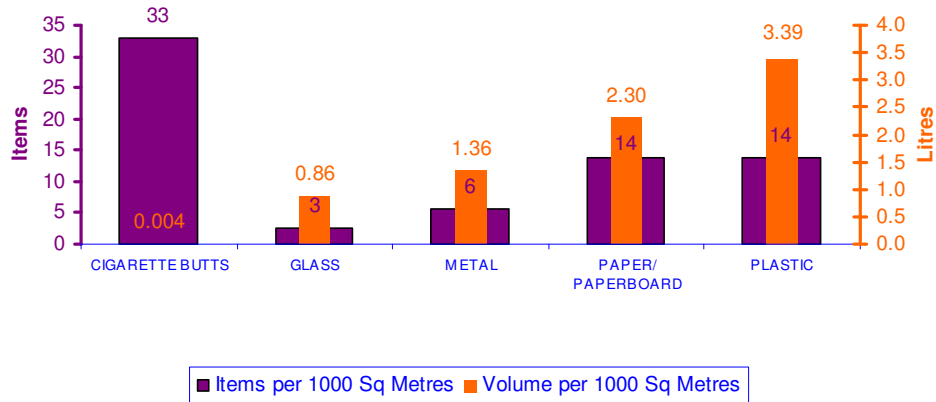


#### Comparison by Main Material Types

An average of 33 cigarette butts per 1,000m<sup>2</sup> was identified across all sites surveyed within Western Australia during the year of 2009/10. However, such items only contributed 0.004 litres of volume per 1,000m<sup>2</sup> to the litter stream.

Items which contributed the greatest volumes to the litter stream in Western Australia were constructed of plastic materials (3.39 litres per 1,000m<sup>2</sup>) and paper/ paperboard materials (2.30 litres per 1,000m<sup>2</sup>).

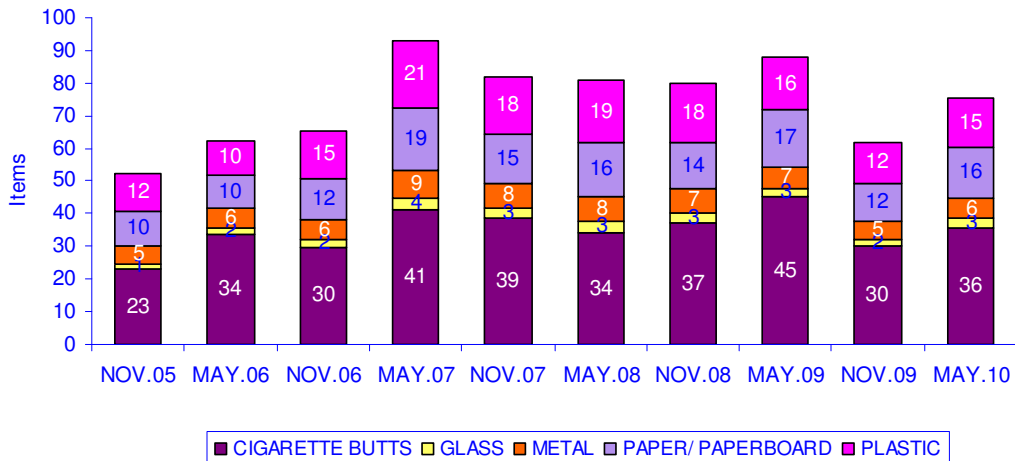
**Items and Volume per 1000 Square Metres by Main Material Type - WA - 2009/ 2010**



Results for November counts and May counts reveal a seasonal trend in the number of plastic and paper/ paperboard items per 1000m<sup>2</sup> in the litter stream, where there are a lower number of these items in November and a higher number of items in May. There does not appear however, to be seasonal pattern for the other material categories.

Apart from some random fluctuations in the number of cigarette butts, the contributions of items within main material types are generally proportional to each other in the litter stream in Western Australia.

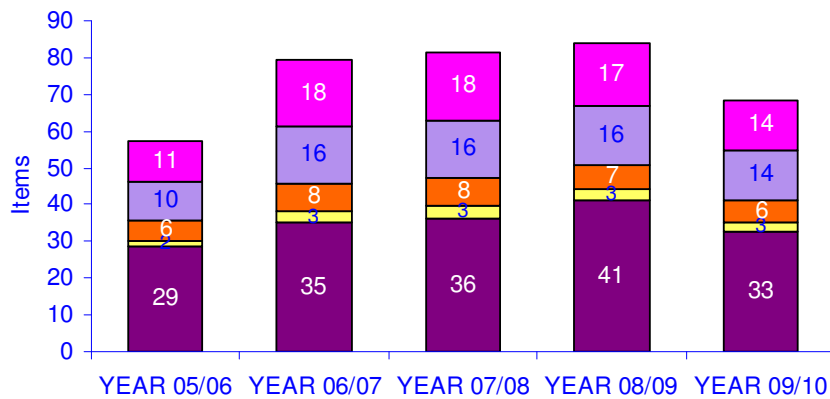
**Items per 1000 Square Metres by Main Material Type - WA**



The annual averages of the number of items per 1000m<sup>2</sup> that were in the litter stream in Western Australia for the years of 2008/09 and 2009/10 were similar in terms of overall figures and proportions of the main material types. The most noticeable change was the decrease of cigarette butts to 33 butts (down from 41 in 2008/09), the overall changes to the main material types included:

- Cigarette butts – 33 items (down from 41 items in 2008/09, 36 items in 2007/08, 35 items in 2006/07 and up from 29 items in 2005/06)
- Plastic items – 14 items (down from 17 items in 2008/09 and 18 items 2007/08 and 2006/07, but up from 11 items in 2005/06)
- Paper/ paperboard – 14 items (down from 16 items in 2008/09, 2007/08, 2006/07 and up from 10 items in 2005/06)
- Metal items – 6 items (down from 7 items in 2008/09, 8 items in 2007/08 and 2006/07 and the same as 2005/06).

**Items per 1000 Square Metres by Main Material Type - Annual Averages - WA**

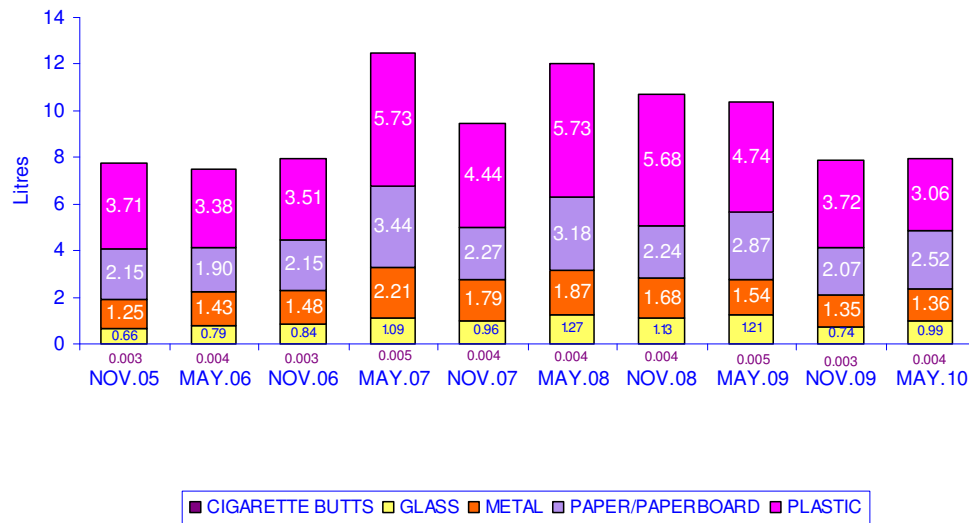


■ CIGARETTE BUTTS ■ GLASS ■ METAL ■ PAPER/ PAPERBOARD ■ PLASTIC

Results for November counts and May counts reveal a seasonal trend in the volume of paper/ paperboard and glass per 1000m<sup>2</sup> in the litter stream with lower volumes in November and higher volumes in May. There does not appear however, to be seasonal pattern for the other material categories.

The overall proportions of total litter volume contributed by objects within the main material types have remained relatively consistent.

### Volume per 1000 Square Metres by Main Material Type - WA

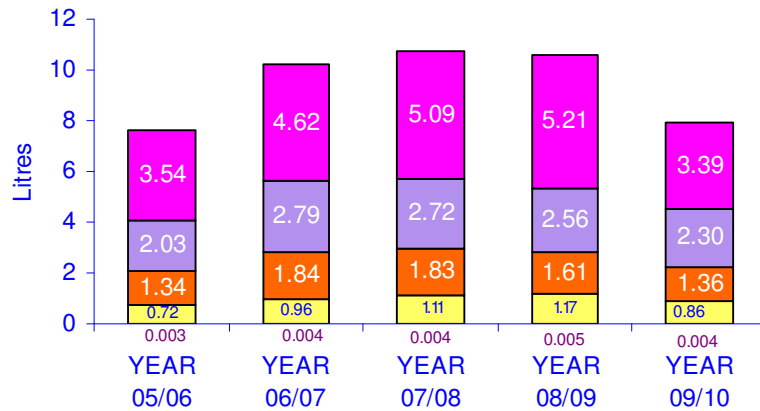


The annual results for 2009/10 for the contribution of objects within the main material types to volume in the litter stream per 1,000m<sup>2</sup> are similar to the 2005/06 results, where volumes and the proportion of material types in the litter stream are almost the same.

The annual results for 2009/10 for the volume of the main material types per 1,000m<sup>2</sup> in the litter stream demonstrate a decrease across all main material types from the previous year:

- Plastic material decreased to 3.39 litres per 1,000m<sup>2</sup> (down from 5.21 litres in 2008/09, 5.09 litres in 2007/08, 4.62 litres in 2006/07 and 3.54 litres in 2005/06)
- Paper/ paperboard objects decreased to 2.30 litres per 1,000m<sup>2</sup> (down from 2.56 litres in 2008/09, 2.72 litres in 2007/08 and 2.79 litres 2006/07 and up from 2.03 litres in 2005/06)
- Metal objects decreased to 1.36 litres per 1,000m<sup>2</sup> (down from 1.61 litres in 2008/09, 1.83 litres in 2007/08 and 1.84 litres in 2006/07 and up from 1.34 litres in 2005/06)
- Glass decreased to 0.86 litres per 1,000m<sup>2</sup> (down from 1.17 litres in 2008/09, 1.11 litres in 2007/08 and 0.96 litres in 2006/07 and up 0.72 litres in 2005/06)

### Volume per 1000 Square Metres by Main Material Type - Annual Averages - WA

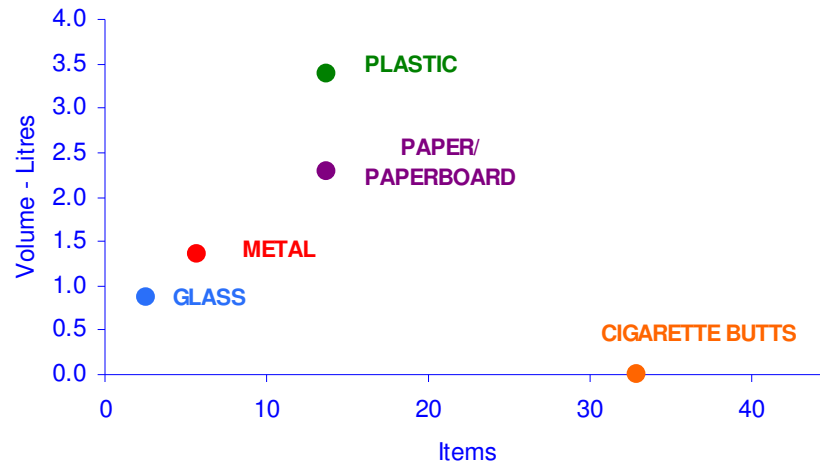


■ CIGARETTE BUTTS ■ GLASS ■ METAL ■ PAPER/PAPERBOARD ■ PLASTIC

Figures for items and volumes per 1,000m<sup>2</sup> across main material types identify the following characteristics of litter objects recorded within WA during the year of 2009/ 2010:

- Plastic litter items contribute large volumes to the litter stream but are associated with only moderate numbers of litter items
- Cigarette butts contribute large numbers, but such items contribute only a negligible estimated volume to the overall litter stream
- Paper/ paperboard objects contribute both a moderate number of litter items and volumes to the litter stream
- Metal and glass items contribute both small numbers of litter items and low volumes to the litter stream

## Items and Volume per 1000 Square Metres by Main Material Type - WA - 2009/ 2010



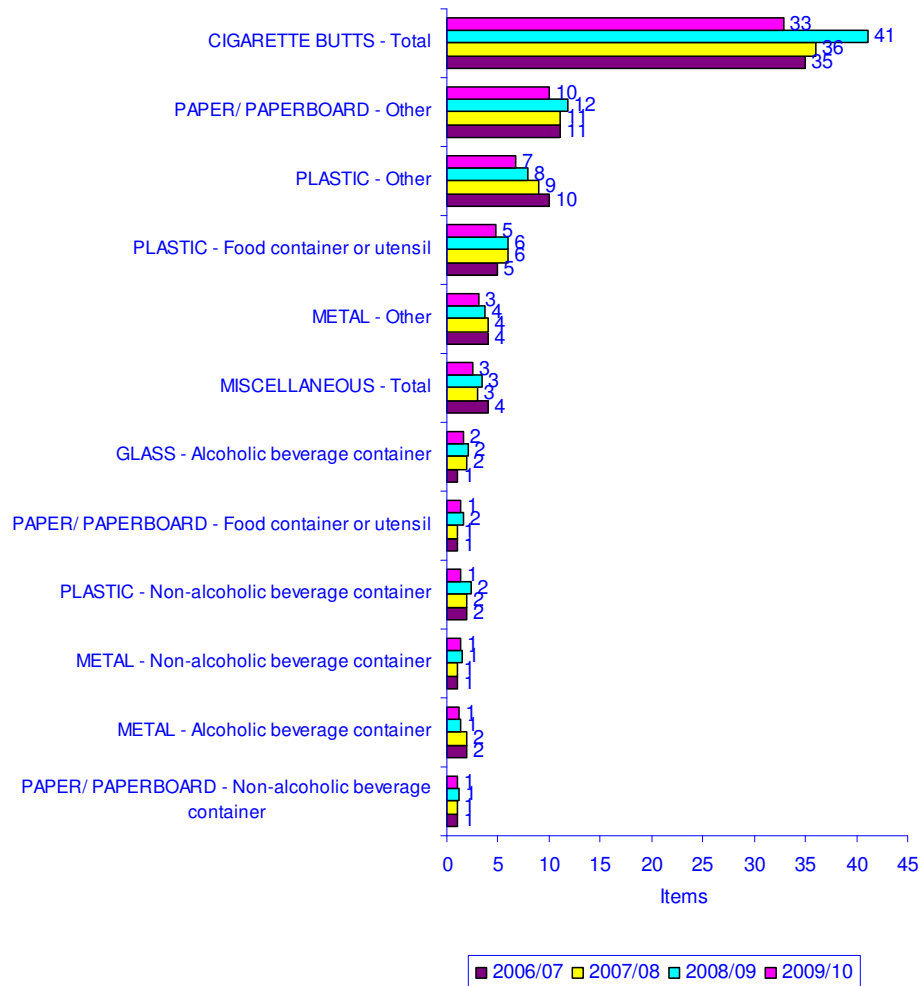
### *The Dirty Dozen*

Cigarette butts was the most frequently identified litter item in Western Australia during the 2009/10 counts, with 33 butts were recorded on average per 1,000m<sup>2</sup> (down from 41 butts in 2008/09, 36 butts in 2007/08 and 35 butts in 2006/07).

Other objects frequently identified during the Western Australia counts included:

- Uncategorised paper/ paperboard objects (10 items per 1,000m<sup>2</sup>, down from 12 items in 2008/09 and 11 items in both 2007/08 and 2006/07)
- Uncategorised plastic objects (7 items per 1,000m<sup>2</sup>, down from 8 items in 2008/09, 9 items in 2007/08 and 10 items in 2006/07)
- Plastic food containers and utensils (5 items per 1,000m<sup>2</sup>, down from 6 items in 2008/09 and 2007/08 and the same as 2006/07)

### Dirty Dozen - Items per 1000 Square Metres - Object Sub-Categories - WA - 06/07 to 09/10



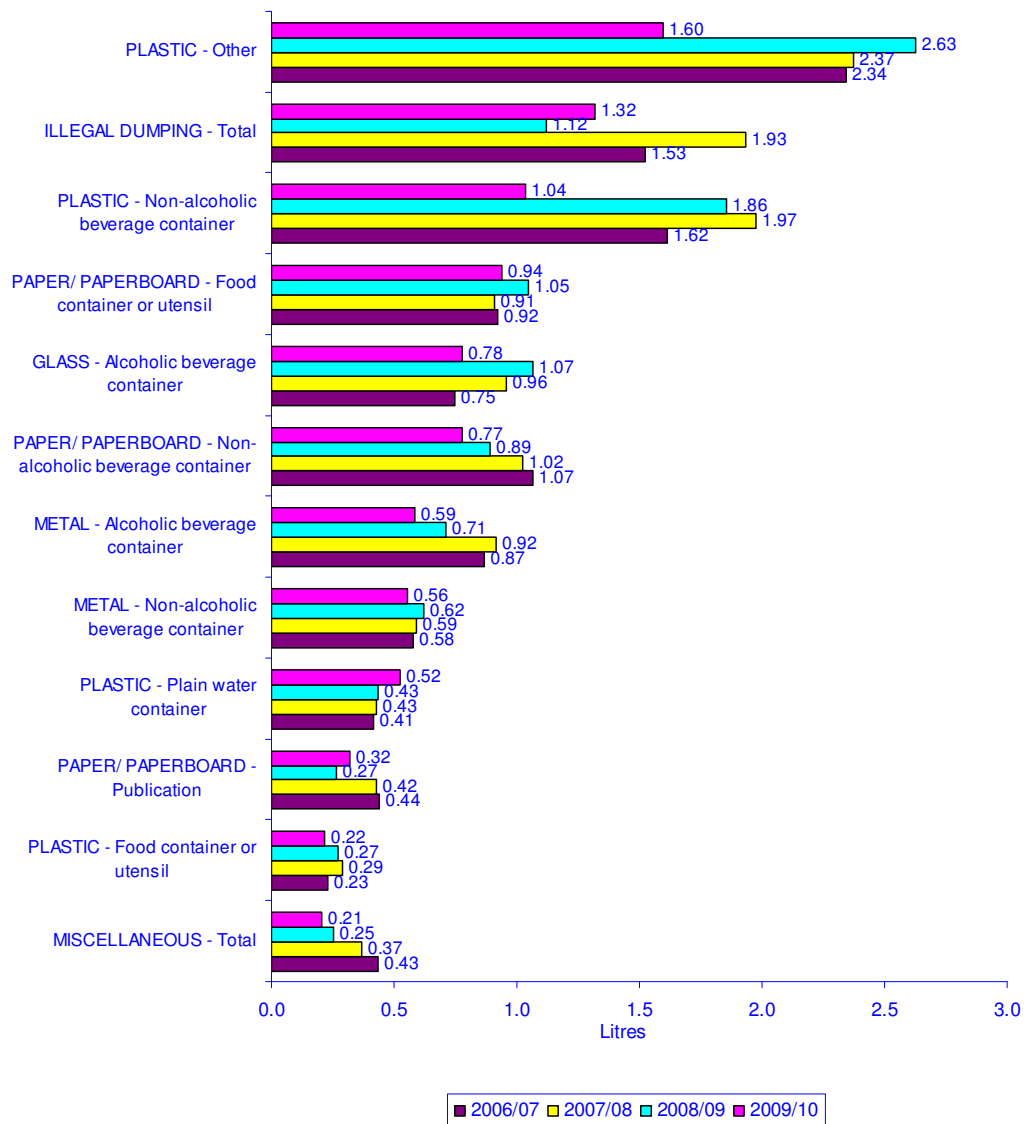
Uncategorised plastic litter objects remained the strongest contributor to estimated litter volume in Western Australia during 2009/10 (1.60 litres per 1,000m<sup>2</sup>, down from 2.63 litres in 2008/09, 2.37 litres in 2007/08 and 2.34 litres in 2006/07).

Other object sub-categories which were associated with substantial estimated volume measurements included:

- Illegal dumping (1.32 litres per 1,000m<sup>2</sup>, up from 1.12 litres in 2008/09, down from 1.93 litres in 2007/08 and 1.53 litres in 2006/07)
- Plastic - non-alcoholic beverage containers (1.04 litres per 1,000m<sup>2</sup>, down from 1.86 litres in 2008/09, 1.97 litres in 2007/08 and 1.62 litres in 2006/07)

- Paper/ paperboard - food containers or utensils (0.94 litres per 1,000m<sup>2</sup>, down from 1.05 litres in 2008/09, up from 0.91 litres in 2007/08 and 0.92 litres in 2006/07)
- Glass - alcoholic beverage containers (0.78 litres per 1,000m<sup>2</sup>, down from 1.07 litres in 2008/09 and 0.96 litres in 2007/08 and up from 0.75 litres in 2006/07)
- Paper/ paperboard - non-alcoholic beverage containers (0.77 litres per 1,000m<sup>2</sup>, down from 0.89 litres in 2008/09, 1.02 litres in 2007/08 and 1.07 litres in 2006/07)

**Dirty Dozen - Volume per 1000 Square Metres - Object Sub-Categories - WA - 06/07 to 09/10**



# *Appendix 1: Supplementary Information*

***2005/ 2006 - Areas Surveyed - Square Metres***

		ACT	NSW	NT	QLD	SA	TAS	VIC	WA	NATIONAL
<b>BEACH</b>	Average site area		563		842	939	506	500	500	654
	Number of sites surveyed		16		16	16	8	16	16	88
	<b>Total area</b>		<b>9000</b>		<b>13464</b>	<b>15017</b>	<b>4050</b>	<b>8000</b>	<b>8000</b>	<b>57531</b>
<b>CAR PARK</b>	Average site area		1528		1490	1379	1489	1594	1494	1496
	Number of sites surveyed		23		23	23	11	23	23	126
	<b>Total area</b>		<b>35148</b>		<b>34271</b>	<b>31717</b>	<b>16378</b>	<b>36657</b>	<b>34365</b>	<b>188536</b>
<b>HIGHWAY</b>	Average site area		2209		3114	3889	2785	3480	3243	3152
	Number of sites surveyed		27		27	27	13	27	27	148
	<b>Total area</b>		<b>59636</b>		<b>84076</b>	<b>105002</b>	<b>36200</b>	<b>93950</b>	<b>87565</b>	<b>466429</b>
<b>INDUSTRIAL</b>	Average site area		1017		1266	1340	504	914	881	1028
	Number of sites surveyed		17		17	17	9	17	17	94
	<b>Total area</b>		<b>17288</b>		<b>21520</b>	<b>22786</b>	<b>4540</b>	<b>15545</b>	<b>14985</b>	<b>96664</b>
<b>RECREATIONAL PARK</b>	Average site area		2061		1690	1539	2000	1951	2000	1863
	Number of sites surveyed		13		13	13	7	13	13	72
	<b>Total area</b>		<b>26790</b>		<b>21972</b>	<b>20003</b>	<b>14000</b>	<b>25360</b>	<b>26000</b>	<b>134125</b>
<b>RESIDENTIAL</b>	Average site area		1509		1161	1233	819	1272	1380	1266
	Number of sites surveyed		26		26	26	13	26	26	143
	<b>Total area</b>		<b>39237</b>		<b>30191</b>	<b>32047</b>	<b>10650</b>	<b>33075</b>	<b>35870</b>	<b>181070</b>
<b>RETAIL</b>	Average site area		1163		767	663	647	687	904	819
	Number of sites surveyed		15		15	15	8	15	15	83
	<b>Total area</b>		<b>17450</b>		<b>11502</b>	<b>9946</b>	<b>5172</b>	<b>10311</b>	<b>13556</b>	<b>67937</b>
<b>SHOPPING CENTRE</b>	Average site area		1211		501	752	1250	1179	1116	979
	Number of sites surveyed		14		14	14	7	14	14	77
	<b>Total area</b>		<b>16950</b>		<b>7008</b>	<b>10534</b>	<b>8750</b>	<b>16505</b>	<b>15625</b>	<b>75372</b>
Average area across all sites			1467		1483	1636	1312	1585	1563	1525
Total number of sites			151		151	151	76	151	151	831
<b>Total area surveyed</b>			<b>221499</b>		<b>224004</b>	<b>247052</b>	<b>99740</b>	<b>239403</b>	<b>235966</b>	<b>1267664</b>

Please note that ACT and NT were not incorporated within litter counts prior to November 2006, and litter within area computations for November 2005/ May 2006 in the report have been based upon reduced area measurements accordingly.

**2006/ 2007 - Areas Surveyed - Square Metres**

		ACT	NSW	NT	QLD	SA	TAS	VIC	WA	NATIONAL
<b>BEACH</b>	Average site area	500	563	500	842	939	506	500	500	630
	Number of sites surveyed	8	16	8	16	16	8	16	16	104
	<b>Total area</b>	<b>4000</b>	<b>9000</b>	<b>4000</b>	<b>13464</b>	<b>15017</b>	<b>4050</b>	<b>8000</b>	<b>8000</b>	<b>65531</b>
<b>CAR PARK</b>	Average site area	1500	1528	1335	1490	1379	1489	1594	1494	1485
	Number of sites surveyed	11	23	11	23	23	11	23	23	148
	<b>Total area</b>	<b>16500</b>	<b>35148</b>	<b>14680</b>	<b>34271</b>	<b>31717</b>	<b>16378</b>	<b>36657</b>	<b>34365</b>	<b>219716</b>
<b>HIGHWAY</b>	Average site area	3046	2209	3358	3114	3889	2785	3480	3243	3159
	Number of sites surveyed	13	27	13	27	27	13	27	27	174
	<b>Total area</b>	<b>39600</b>	<b>59636</b>	<b>43660</b>	<b>84076</b>	<b>105002</b>	<b>36200</b>	<b>93950</b>	<b>87565</b>	<b>549689</b>
<b>INDUSTRIAL</b>	Average site area	1117	1017	1200	1266	1340	504	914	881	1049
	Number of sites surveyed	9	17	9	17	17	9	17	17	112
	<b>Total area</b>	<b>10050</b>	<b>17288</b>	<b>10800</b>	<b>21520</b>	<b>22786</b>	<b>4540</b>	<b>15545</b>	<b>14985</b>	<b>117514</b>
<b>RECREATIONAL PARK</b>	Average site area	2000	2061	1507	1690	1539	2000	1951	2000	1845
	Number of sites surveyed	7	13	7	13	13	7	13	13	86
	<b>Total area</b>	<b>14000</b>	<b>26790</b>	<b>10550</b>	<b>21972</b>	<b>20003</b>	<b>14000</b>	<b>25360</b>	<b>26000</b>	<b>158675</b>
<b>RESIDENTIAL</b>	Average site area	1235	1509	1395	1161	1233	819	1272	1380	1274
	Number of sites surveyed	13	26	13	26	26	13	26	26	169
	<b>Total area</b>	<b>16050</b>	<b>39237</b>	<b>18141</b>	<b>30191</b>	<b>32047</b>	<b>10650</b>	<b>33075</b>	<b>35870</b>	<b>215261</b>
<b>RETAIL</b>	Average site area	876	1163	724	767	663	647	687	904	815
	Number of sites surveyed	8	15	8	15	15	8	15	15	99
	<b>Total area</b>	<b>7005</b>	<b>17450</b>	<b>5791</b>	<b>11502</b>	<b>9946</b>	<b>5172</b>	<b>10311</b>	<b>13556</b>	<b>80733</b>
<b>SHOPPING CENTRE</b>	Average site area	1250	1211	1221	501	752	1250	1179	1116	1018
	Number of sites surveyed	7	14	7	14	14	7	14	14	91
	<b>Total area</b>	<b>8750</b>	<b>16950</b>	<b>8550</b>	<b>7008</b>	<b>10534</b>	<b>8750</b>	<b>16505</b>	<b>15625</b>	<b>92672</b>
Average area across all sites		1526	1467	1529	1483	1636	1312	1585	1563	1526
Total number of sites		76	151	76	151	151	76	151	151	983
<b>Total area surveyed</b>		<b>115955</b>	<b>221499</b>	<b>116172</b>	<b>224004</b>	<b>247052</b>	<b>99740</b>	<b>239403</b>	<b>235966</b>	<b>1499791</b>

**2007/ 2008 - Areas Surveyed - Square Metres**

		ACT	NSW	NT	QLD	SA	TAS	VIC	WA	NATIONAL
<b>BEACH</b>	Average site area	500	563	500	842	939	506	500	500	630
	Number of sites surveyed	8	16	8	16	16	8	16	16	104
	<b>Total area</b>	<b>4000</b>	<b>9000</b>	<b>4000</b>	<b>13464</b>	<b>15017</b>	<b>4050</b>	<b>8000</b>	<b>8000</b>	<b>65531</b>
<b>CAR PARK</b>	Average site area	1500	1528	1335	1490	1379	1489	1594	1494	1485
	Number of sites surveyed	11	23	11	23	23	11	23	23	148
	<b>Total area</b>	<b>16500</b>	<b>35148</b>	<b>14680</b>	<b>34271</b>	<b>31717</b>	<b>16378</b>	<b>36657</b>	<b>34365</b>	<b>219716</b>
<b>HIGHWAY</b>	Average site area	3046	2209	3358	3114	3889	2785	3480	3243	3159
	Number of sites surveyed	13	27	13	27	27	13	27	27	174
	<b>Total area</b>	<b>39600</b>	<b>59636</b>	<b>43660</b>	<b>84076</b>	<b>105002</b>	<b>36200</b>	<b>93950</b>	<b>87565</b>	<b>549689</b>
<b>INDUSTRIAL</b>	Average site area	1117	1017	1200	1266	1340	504	914	881	1049
	Number of sites surveyed	9	17	9	17	17	9	17	17	112
	<b>Total area</b>	<b>10050</b>	<b>17288</b>	<b>10800</b>	<b>21520</b>	<b>22786</b>	<b>4540</b>	<b>15545</b>	<b>14985</b>	<b>117514</b>
<b>RECREATIONAL PARK</b>	Average site area	2000	2061	1507	1690	1539	2000	1951	2000	1845
	Number of sites surveyed	7	13	7	13	13	7	13	13	86
	<b>Total area</b>	<b>14000</b>	<b>26790</b>	<b>10550</b>	<b>21972</b>	<b>20003</b>	<b>14000</b>	<b>25360</b>	<b>26000</b>	<b>158675</b>
<b>RESIDENTIAL</b>	Average site area	1235	1509	1395	1161	1233	819	1272	1380	1274
	Number of sites surveyed	13	26	13	26	26	13	26	26	169
	<b>Total area</b>	<b>16050</b>	<b>39237</b>	<b>18141</b>	<b>30191</b>	<b>32047</b>	<b>10650</b>	<b>33075</b>	<b>35870</b>	<b>215261</b>
<b>RETAIL</b>	Average site area	876	1163	724	767	663	647	687	904	815
	Number of sites surveyed	8	15	8	15	15	8	15	15	99
	<b>Total area</b>	<b>7005</b>	<b>17450</b>	<b>5791</b>	<b>11502</b>	<b>9946</b>	<b>5172</b>	<b>10311</b>	<b>13556</b>	<b>80733</b>
<b>SHOPPING CENTRE</b>	Average site area	1250	1211	1221	501	752	1250	1179	1116	1018
	Number of sites surveyed	7	14	7	14	14	7	14	14	91
	<b>Total area</b>	<b>8750</b>	<b>16950</b>	<b>8550</b>	<b>7008</b>	<b>10534</b>	<b>8750</b>	<b>16505</b>	<b>15625</b>	<b>92672</b>
Average area across all sites		1526	1467	1529	1483	1636	1312	1585	1563	1526
Total number of sites		76	151	76	151	151	76	151	151	983
<b>Total area surveyed</b>		<b>115955</b>	<b>221499</b>	<b>116172</b>	<b>224004</b>	<b>247052</b>	<b>99740</b>	<b>239403</b>	<b>235966</b>	<b>1499791</b>

**2008/ 2009 - Areas Surveyed - Square Metres**

		ACT	NSW	NT	QLD	SA	TAS	VIC	WA	NATIONAL
<b>BEACH</b>	Average site area	500	563	500	842	939	506	500	500	630
	Number of sites surveyed	8	16	8	16	16	8	16	16	104
	<b>Total area</b>	<b>4000</b>	<b>9000</b>	<b>4000</b>	<b>13464</b>	<b>15017</b>	<b>4050</b>	<b>8000</b>	<b>8000</b>	<b>65531</b>
<b>CAR PARK</b>	Average site area	1500	1528	1335	1490	1379	1489	1594	1494	1485
	Number of sites surveyed	11	23	11	23	23	11	23	23	148
	<b>Total area</b>	<b>16500</b>	<b>35148</b>	<b>14680</b>	<b>34271</b>	<b>31717</b>	<b>16378</b>	<b>36657</b>	<b>34365</b>	<b>219716</b>
<b>HIGHWAY</b>	Average site area	3046	2209	3358	3114	3889	2785	3480	3243	3159
	Number of sites surveyed	13	27	13	27	27	13	27	27	174
	<b>Total area</b>	<b>39600</b>	<b>59636</b>	<b>43660</b>	<b>84076</b>	<b>105002</b>	<b>36200</b>	<b>93950</b>	<b>87565</b>	<b>549689</b>
<b>INDUSTRIAL</b>	Average site area	1117	1017	1200	1266	1340	504	914	881	1049
	Number of sites surveyed	9	17	9	17	17	9	17	17	112
	<b>Total area</b>	<b>10050</b>	<b>17288</b>	<b>10800</b>	<b>21520</b>	<b>22786</b>	<b>4540</b>	<b>15545</b>	<b>14985</b>	<b>117514</b>
<b>RECREATIONAL PARK</b>	Average site area	2000	2061	1507	1690	1539	2000	1951	2000	1845
	Number of sites surveyed	7	13	7	13	13	7	13	13	86
	<b>Total area</b>	<b>14000</b>	<b>26790</b>	<b>10550</b>	<b>21972</b>	<b>20003</b>	<b>14000</b>	<b>25360</b>	<b>26000</b>	<b>158675</b>
<b>RESIDENTIAL</b>	Average site area	1235	1509	1395	1161	1233	819	1272	1380	1274
	Number of sites surveyed	13	26	13	26	26	13	26	26	169
	<b>Total area</b>	<b>16050</b>	<b>39237</b>	<b>18141</b>	<b>30191</b>	<b>32047</b>	<b>10650</b>	<b>33075</b>	<b>35870</b>	<b>215261</b>
<b>RETAIL</b>	Average site area	876	1163	724	767	663	647	687	904	815
	Number of sites surveyed	8	15	8	15	15	8	15	15	99
	<b>Total area</b>	<b>7005</b>	<b>17450</b>	<b>5791</b>	<b>11502</b>	<b>9946</b>	<b>5172</b>	<b>10311</b>	<b>13556</b>	<b>80733</b>
<b>SHOPPING CENTRE</b>	Average site area	1250	1211	1221	501	752	1250	1179	1116	1018
	Number of sites surveyed	7	14	7	14	14	7	14	14	91
	<b>Total area</b>	<b>8750</b>	<b>16950</b>	<b>8550</b>	<b>7008</b>	<b>10534</b>	<b>8750</b>	<b>16505</b>	<b>15625</b>	<b>92672</b>
Average area across all sites		1526	1467	1529	1483	1636	1312	1585	1563	1526
Total number of sites		76	151	76	151	151	76	151	151	983
<b>Total area surveyed</b>		<b>115955</b>	<b>221499</b>	<b>116172</b>	<b>224004</b>	<b>247052</b>	<b>99740</b>	<b>239403</b>	<b>235966</b>	<b>1499791</b>

**2009/ 2010 - Areas Surveyed - Square Metres**

		ACT	NSW	NT	QLD	SA	TAS	VIC	WA	NATIONAL
<b>BEACH</b>	Average site area	500	563	500	842	939	506	500	500	630
	Number of sites surveyed	8	16	8	16	16	8	16	16	104
	<b>Total area</b>	<b>4000</b>	<b>9000</b>	<b>4000</b>	<b>13464</b>	<b>15017</b>	<b>4050</b>	<b>8000</b>	<b>8000</b>	<b>65531</b>
<b>CAR PARK</b>	Average site area	1500	1528	1335	1490	1379	1489	1594	1494	1485
	Number of sites surveyed	11	23	11	23	23	11	23	23	148
	<b>Total area</b>	<b>16500</b>	<b>35148</b>	<b>14680</b>	<b>34271</b>	<b>31717</b>	<b>16378</b>	<b>36657</b>	<b>34365</b>	<b>219716</b>
<b>HIGHWAY</b>	Average site area	3046	2209	3358	3114	3889	2785	3480	3243	3159
	Number of sites surveyed	13	27	13	27	27	13	27	27	174
	<b>Total area</b>	<b>39600</b>	<b>59636</b>	<b>43660</b>	<b>84076</b>	<b>105002</b>	<b>36200</b>	<b>93950</b>	<b>87565</b>	<b>549689</b>
<b>INDUSTRIAL</b>	Average site area	1117	1017	1200	1266	1340	504	914	881	1049
	Number of sites surveyed	9	17	9	17	17	9	17	17	112
	<b>Total area</b>	<b>10050</b>	<b>17288</b>	<b>10800</b>	<b>21520</b>	<b>22786</b>	<b>4540</b>	<b>15545</b>	<b>14985</b>	<b>117514</b>
<b>RECREATIONAL PARK</b>	Average site area	2000	2061	1507	1690	1539	2000	1951	2000	1845
	Number of sites surveyed	7	13	7	13	13	7	13	13	86
	<b>Total area</b>	<b>14000</b>	<b>26790</b>	<b>10550</b>	<b>21972</b>	<b>20003</b>	<b>14000</b>	<b>25360</b>	<b>26000</b>	<b>158675</b>
<b>RESIDENTIAL</b>	Average site area	1235	1509	1395	1161	1233	819	1272	1380	1274
	Number of sites surveyed	13	26	13	26	26	13	26	26	169
	<b>Total area</b>	<b>16050</b>	<b>39237</b>	<b>18141</b>	<b>30191</b>	<b>32047</b>	<b>10650</b>	<b>33075</b>	<b>35870</b>	<b>215261</b>
<b>RETAIL</b>	Average site area	876	1163	724	767	663	647	687	904	815
	Number of sites surveyed	8	15	8	15	15	8	15	15	99
	<b>Total area</b>	<b>7005</b>	<b>17450</b>	<b>5791</b>	<b>11502</b>	<b>9946</b>	<b>5172</b>	<b>10311</b>	<b>13556</b>	<b>80733</b>
<b>SHOPPING CENTRE</b>	Average site area	1250	1211	1221	501	752	1250	1179	1116	1018
	Number of sites surveyed	7	14	7	14	14	7	14	14	91
	<b>Total area</b>	<b>8750</b>	<b>16950</b>	<b>8550</b>	<b>7008</b>	<b>10534</b>	<b>8750</b>	<b>16505</b>	<b>15625</b>	<b>92672</b>
Average area across all sites		1526	1467	1529	1483	1636	1312	1585	1563	1526
Total number of sites		76	151	76	151	151	76	151	151	983
<b>Total area surveyed</b>		<b>115955</b>	<b>221499</b>	<b>116172</b>	<b>224004</b>	<b>247052</b>	<b>99740</b>	<b>239403</b>	<b>235966</b>	<b>1499791</b>

### Litter Sub-Categories

		Sub-category	2009/ 2010 Average - Items	2009/ 2010 Average - Volume - Litres	2009/ 2010 Items per 1,000 Sq. Metres	2009/ 2010 Vol. per 1,000 Sq. Metres - Litres
<b>CIGARETTE BUTTS</b>			<b>48232</b>	<b>5.5466</b>	<b>32.16</b>	<b>0.0037</b>
<b>GLASS</b>	Alcoholic sodas / spirit-based mixers, all sizes	Alcoholic beverage container	113	42.2959	0.08	0.0282
	Beer, < 750ml, all colours of glass	Alcoholic beverage container	755	362.0225	0.50	0.2414
	Beer, 750ml or more, all colours of glass	Alcoholic beverage container	200	161.6549	0.13	0.1078
	Cider/fruit based etc.	Alcoholic beverage container	14	6.1331	0.01	0.0041
	Flav. water/soft drink (carbonated) <1 litre	Non-alcoholic beverage container	37	29.9811	0.02	0.0200
	Flav. water/soft drink (carbonated) 1 litre+	Non-alcoholic beverage container	16	25.6370	0.01	0.0171
	Flav.wtr/fruit j. dr/sprts dr, (non-carb), <1 litre	Non-alcoholic beverage container	107	32.0672	0.07	0.0214
	Flav.wtr/fruit j. dr/sprts dr, (non-carb), 1 litre+	Non-alcoholic beverage container	20	32.2530	0.01	0.0215
	Fruit juice, < 1 litre	Non-alcoholic beverage container	28	8.5840	0.02	0.0057
	Fruit juice, 1 litre or more	Non-alcoholic beverage container	5	7.8500	0.00	0.0052
	Other glass	Other	1608	31.5713	1.07	0.0211
	Plain water (carbonated or non-carb.), <1 litre	Plain water container	37	15.1402	0.02	0.0101
	Plain water (carbonated or non-carb.), 1 litre+	Plain water container	9	9.5333	0.01	0.0064
	Wine & spirit, all sizes	Alcoholic beverage container	38	33.4275	0.03	0.0223
	Wine cooler, all sizes	Alcoholic beverage container	7	2.6201	0.00	0.0017
<b>GLASS - Total</b>			<b>2990</b>	<b>800.7709</b>	<b>1.99</b>	<b>0.5339</b>
<b>ILLEGAL DUMPING</b>			<b>116</b>	<b>2772.0000</b>	<b>0.08</b>	<b>1.8483</b>
<b>METAL</b>	Aerosols - pressure packs	Other	48	32.8435	0.03	0.0219
	Alcoholic sodas & spirit-based mixers	Alcoholic beverage container	487	273.6453	0.32	0.1825
	Beer, aluminium, all types, all sizes	Alcoholic beverage container	464	200.1696	0.31	0.1335
	Cider/fruit based etc.	Alcoholic beverage container	6	2.3727	0.00	0.0016
	Flav. water/soft drink, (carbonated), all sizes	Non-alcoholic beverage container	1194	515.0916	0.80	0.3434
	Flav. water/soft drink, (non-carb), all sizes	Plain water container	64	24.4224	0.04	0.0163
	Foil take away	Food container or utensil	259	119.7564	0.17	0.0798
	Food cans (including pet food)	Food container or utensil	92	42.6696	0.06	0.0285
	Industrial cans - all types	Other	29	130.2461	0.02	0.0868
	Metal bottle tops and can pull rings	Other	2323	9.2920	1.55	0.0062
	Metal pieces	Other	749	7.9394	0.50	0.0053
	Other foil	Other	1368	2.1341	0.91	0.0014
	<b>METAL - Total</b>			<b>7082</b>	<b>1360.5828</b>	<b>4.72</b>

		Sub-category	2009/ 2010 Average - Items	2009/ 2010 Average - Volume - Litres	2009/ 2010 Items per 1,000 Sq. Metres	2009/ 2010 Vol. per 1,000 Sq. Metres - Litres
MISCELLANEOUS	Clothing & materials	Other	853	13.0509	0.57	0.0087
	Condoms	Other	27	0.0086	0.02	0.0000
	Construction materials	Other	527	189.5400	0.35	0.1264
	Disposable nappies	Other	40	44.4375	0.03	0.0296
	Ice cream sticks	Other	413	0.3800	0.28	0.0003
	Other miscellaneous	Other	515	6.6758	0.34	0.0045
	Rubber pieces (not tyres)	Other	605	0.3666	0.40	0.0002
	Syringes	Other	7	0.0254	0.00	0.0000
	Tyres & pieces	Other	244	54.7875	0.16	0.0365
	<b>MISCELLANEOUS - Total</b>			<b>3229</b>	<b>309.2723</b>	<b>2.15</b>
PAPER/PAPERBOARD	Cartons, flavoured milk < 1 litre	Non-alcoholic beverage container	381	285.6357	0.25	0.1905
	Cartons, flavoured milk 1 litre+	Non-alcoholic beverage container	20	19.7469	0.01	0.0132
	Cartons, fruit juice, < 1 litre	Non-alcoholic beverage container	93	58.1018	0.06	0.0387
	Cartons, fruit juice, 1 litre+	Non-alcoholic beverage container	5	9.3150	0.00	0.0062
	Cartons, milk, plain (white) all sizes	Non-alcoholic beverage container	38	38.4811	0.03	0.0257
	Cigarette packets	Cigarette packets	1216	264.9299	0.81	0.1766
	Cups/take away containers	Food container or utensil	1784	1300.0823	1.19	0.8668
	Flav. water/fruit j. drink/sports drink, non-carb, <1 litre	Non-alcoholic beverage container	36	10.4706	0.02	0.0070
	Flav. water / fruit j. drink/ sports drink, (non-carb), 1 litre+	Non-alcoholic beverage container	13	25.8750	0.01	0.0173
	Ice cream wrappers	Food container or utensil	297	0.7128	0.20	0.0005
	Junk mail / free circulars	Publication	700	121.7130	0.47	0.0812
	Newspapers & magazines	Publication	503	592.9500	0.34	0.3954
	Other paper	Other	10011	33.8372	6.67	0.0226
	Packages & boxes	Other	782	62.5600	0.52	0.0417
	Paper bags	Other	858	9.0776	0.57	0.0061
	Shopper docket & related shopping paper (eg, lists)	Other	1033	2.0960	0.69	0.0014
	Tickets, e.g. bus, ATM, vending machine etc.	Other	814	0.7163	0.54	0.0005
<b>PAPER/ PAPERBOARD - Total</b>			<b>18581</b>	<b>2836.3012</b>	<b>12.39</b>	<b>1.8911</b>

		Sub-category	2009/ 2010 Average - Items	2009/ 2010 Average - Volume - Litres	2009/ 2010 Items per 1,000 Sq. Metres	2009/ 2010 Vol. per 1,000 Sq. Metres - Litres
<b>PLASTIC</b>	6 ring can holders	Other	68	0.1020	0.05	0.0001
	Bags - heavier glossy typically branded carry bags	Shopping bag	85	7.4022	0.06	0.0049
	Bags - supermarket type light weight carry bags	Shopping bag	605	20.5337	0.40	0.0137
	Bread bag tags	Other	233	0.0536	0.16	0.0000
	Containers, domestic type	Other	106	878.1820	0.07	0.5855
	Containers, industrial e.g. oil	Other	23	505.3050	0.02	0.3369
	Drink pouches	Non-alcoholic beverage container	40	3.4069	0.03	0.0023
	Flav. milk, <1 litre	Non-alcoholic beverage container	233	123.8528	0.16	0.0826
	Flav. milk, 1 litre+	Non-alcoholic beverage container	24	50.2122	0.02	0.0335
	Flav.wtr/fruit j. dr, sprts dr etc.(non-carb) <1 litre	Non-alcoholic beverage container	138	76.7432	0.09	0.0512
	Flav. wtr/fruit j. dr, sprts dr etc.(non-carb) 1 litre+	Non-alcoholic beverage container	73	121.3641	0.05	0.0809
	Flav. water/soft drink (carbonated) <1 litre	Non-alcoholic beverage container	575	357.9181	0.38	0.2386
	Flav. water/soft drink (carbonated) 1 litre+	Non-alcoholic beverage container	106	173.9364	0.07	0.1160
	Fruit juice <1 litre	Non-alcoholic beverage container	89	47.1440	0.06	0.0314
	Fruit juice, 1 litre+	Non-alcoholic beverage container	23	48.0755	0.02	0.0321
	Lollipop sticks	Food container or utensil	709	0.3783	0.47	0.0003
	Other plastic	Other	4917	6.1439	3.28	0.0041
	Packing tape & straps	Other	788	0.2125	0.53	0.0001
	Plain water (carbonated or non-carb) <1 litre	Plain water container	347	273.0074	0.23	0.1820
	Plain water (carbonated or non-carb) 1 litre+	Plain water container	86	132.5950	0.06	0.0884
	Plastic bottle tops	Other	1511	12.0757	1.01	0.0081
	Sacks - sheeting - other bags	Other	356	0.2059	0.24	0.0001
	Snack bags & confectionary wrappers	Food container or utensil	2925	22.8145	1.95	0.0152
	Spoons/ cutlery	Food container or utensil	479	4.5902	0.32	0.0031
	Straws	Food container or utensil	1776	7.3178	1.18	0.0049
	Styrene foam boxes, sheets, etc	Other	523	19.9230	0.35	0.0133
	Take away & cups	Food container or utensil	1207	249.4591	0.80	0.1663
	White milk, all sizes	Non-alcoholic beverage container	40	85.4676	0.03	0.0570
	Wine cask bladders	Alcoholic beverage container	10	4.6000	0.01	0.0031
	<b>PLASTIC - Total</b>			<b>18088</b>	<b>3233.0224</b>	<b>12.06</b>
<b>GRAND TOTAL</b>			<b>98317</b>	<b>11317.4961</b>	<b>65.55</b>	<b>7.5460</b>

# *Appendix 2: Data Collection Form*

# KAB - LITTER COUNT COVER SHEET

(REF: 6584)

SITE CODE:

PLEASE ENSURE THAT A COPY OF THIS COVER SHEET IS FILLED OUT AND ATTACHED TO THE COMPLETED LITTER COUNT FORM FOR EVERY SITE.

Date of count: \_\_\_/\_\_\_/\_\_\_

Site description: \_\_\_\_\_

Site responsible person: \_\_\_\_\_

Wet? (Y/N)

Windy? (Y/N)

Temp? °C

## Conditions: (Circle appropriate numbers)

1. Area appeared to be cleaned before count
2. Deliberate dumping of rubbish
3. Area was mowed before count causing proliferation
4. Very recent storm/flood damage litter build-up
5. Very recent or current high winds causing build-up
6. Recent public event held in area – **specify:**
7. Uncovered load spilled in area causing litter

## Please record number and type of bins in site area

No. of litter bins:

No. of butt bins:

No. and type of other bins: \_\_\_\_\_

SITE CODE:		SITE RESPONSIBLE PERSON:			DATE:						
Item Type		Brand	Work Area	Total	Item Type		Brand	Work Area	Total		
GLASS	Ga	Plain water (carbonated or non-carb.), 1 litre-	NONE		METAL	Ma	Beer, aluminium, all types, all sizes	NONE			
	Gb	Plain water (carbonated or non-carb.), <1 litre	NONE			Mb	Alcoholic sodas & spirit-based mixers	NONE			
	Gc	Flavoured water/soft drink (carbonated) 1 litre-	NONE			Mc	Cider/fruit based etc.	NONE			
	Gd	Flavoured water/soft drink (carbonated) <1 litre	NONE			Md	Water, carbonated & flavoured/soft drink	NONE			
	Ge	Flav. water / fruit juice drink/ sports drink, (non carb), 1 litre-	NONE			Me	Water, non-carbonated & flavoured, all sizes	NONE			
	Gf	Flav. water / fruit juice drink/ sports drink, (non carb), <1 litre	NONE			Mf	Food cans (including pet food)	NONE			
	Gg	Fruit juice, 1 litre or more	NONE			Mg	Industrial cans - all types	NONE			
	Gh	Fruit juice, <1 litre	NONE			Mh	Aerosols - pressure packs	NONE			
	Gi	Wine cooler, all sizes	NONE			Mi	Metal bottle tops and can pull rings	NONE			
	Gj	Alcoholic sodas / spirit-based mixers, all sizes	NONE			Mj	Metal pieces	NONE			
	Gk	Cider/fruit based etc.	NONE			Mk	Foil take away	NONE			
	Gl	Wine & spirit, all sizes	NONE			Ml	Other foil	NONE			
	Gm	Beer, 750ml or more, all colours of glass	NONE			Xa	Tyres & pieces	NONE			
	Gn	Beer, < 750ml, all colours of glass	NONE			Xb	Clothing & materials	NONE			
	Go	Other glass	NONE			Xc	Illegal dumping	NONE			
	<b>CIGARETTE BUTTS</b>						MISCELLANEOUS	Xd	Syringes - Do Not Touch	NONE	
								Xe	Ice cream sticks	NONE	
								Xf	Rubber pieces (not tyres)	NONE	
								Xg	Condoms	NONE	
								Xh	Construction materials	NONE	
					Xi	Disposable nappies		NONE			
					OTHER MISC. (Please specify item types and brands below)						
					Xj						



*Appendix 3:  
McGregor Tan Research  
Profile*

McGregor Tan Research has been successful in recruiting some of the most highly qualified, experienced and competent professionals from across a wide range of disciplines in order to build the consultancy team.

In particular the executive project team have been users and buyers of research at some point in their careers, and our aim is to produce quality work that is actionable strategically and tactically.

Our working philosophy is to have several sets of eyes on the one project. We have deliberately built a degree of redundancy into the project team, allowing us to be able to deliver on time in the event unforeseen circumstances such as staff illness and movements. An added benefit is that a multi disciplinary collaborative team approach often leads to fresh insights and solutions, based on collective learnings and experiences.

### **Executive Project Direction**

**Peter Hine** – General Manager. Peter has considerable experience in statistically complex quantitative and innovative qualitative research methodologies. He has a degree in Mathematics, from the University of Adelaide, and post graduate qualifications in Marketing and Management. Peter has over 20 years of research experience both as supplier and a client. He was Divisional Marketing Manager at Mitsubishi before McGregor Tan Research. His broad experience covers the tourism, the arts, sport and major events, environment, water and energy, education, health, finance, ICT, mining, housing and construction, industrial, local, state and federal government, retail and commercial sectors.

**Zing Hai Tan** - Managing Director is a Qualified Practising Market Researcher (QPMR) and has over 25 years of market research experience at a senior level in a wide range of industries including transport, local government, banking and management. Zing Hai's skills are in assisting clients to use market research to its full capacity tactically and strategically. He has a Masters Degree in Planning from the University of Adelaide and is a former Tennyson Medallist. He is a member of the Australian Market and Social Research Society.

### **Project Management and Analysis**

**David O'Dea** - Senior Manager. David has a background in marketing and strategic planning as well as operational management within the Government and non-Government business sectors in Australia and South East Asia. David's knowledge and experience includes industrial marketing, product and organisational branding, website development and computer software engineering. He has a Bachelor of Computer Science and a Bachelor of Commerce (Accounting) from the University of Adelaide and he is a recipient the Rational Prize for Software Engineering from the University.

**Sarah Tyson** - Project Manager graduated with a Bachelor of Science degree from the University of Adelaide in 1988 and brings to the team broad experience in quantitative as well as qualitative research having worked as a consultant for KPMG for 4 years and 8 years as project manager at the Royal Australasian College of Surgeons, and initially at CSIRO (Human Nutrition Division). She also has a strong interest in the health care and disability sectors at both private, state and commonwealth government levels and understands cross cultural research issues well having worked on projects with Aboriginal and Torres Strait Islands Communities.

**Vincent Burke** - Senior Consultant is a specialist in qualitative and diagnostic research and a highly qualified and experienced executive interviewer. He has a degree in education from the University of London. Prior to joining the consultancy in 1993, Vincent worked in arts, education and tourism. He was previously Marketing Manager of the Adelaide Festival Centre.

**Sheila Hume** – Project Researcher has a Bachelor of Media from Adelaide University and provides logistics and analytical support across the full range of the firm’s qualitative and quantitative projects.

### **Project Operations and Data Management**

**Susan Mattner** – Manager – Project and Data Operations, is responsible for data processing, and data collection management, production of statistical tables, graphing, and preparation of base data reports for analysis. Susan has been with the firm since 1985.

**Jodie Egan** – Manager – Research Operations, works closely with Susan and is likewise responsible for data processing, and data collection management, production of statistical tables, graphing, and preparation of base data reports for analysis. Jodie has been with the firm since 2003.

**Chris Inglis** and **Karen McCulloch** are the Data and Administration Support staff who provide specialist coding, administration and research support services.

### **Fieldwork and Qualitative Recruitment Team**

**Barbara Mead** - Supervisor, has over 20 years of field experience is the main coordinator organising and scheduling face-to-face and telephone fieldwork, and has access to team leaders and a team of up to 30 specialist computer assisted telephone interviewing (CATI) staff a national team of over 100 casual field staff.

*Toni Horberry, Terri Diglio and Anna Zoina* are the dedicated recruiting team who recruit the participants for focus group discussions, screening them to ensure they meet the specifications for the task at hand.

### **Finance and ISO9001 Quality Standard**

*Christina Chen* is the firm's Administration and Finance Manager. Her scope of responsibilities include invoicing, and financial reporting, and maintenance of the quality control systems for the ISO 9001 accreditation.

*Sue Hannon* – Executive Director provides high level direction and management of all strategic company activities, and has overseen the company's consistent growth over the last 10 years. Sue has an Arts degree from the University of Adelaide, and has a strong interest in social research including studies of the education sector and the needs of culturally and linguistically diverse groups.

### **Quality Management and Privacy Policy**

#### **Quality Control**

McGregor Tan is the first Australian owned company in Australia to achieve the double management system quality accreditation to the highest standards (ISO 9001:2008, formerly ISO9001:2000) and (ISO 20252:2007, formerly AS4752:2004) for the full scope of research and strategy services including customized research for consumer, social and commercial studies, as recognised by the Australian Market and Social Research Society.



In qualitative research and conducting quantitative surveys, McGregor Tan Research prides itself on our commitment to quality staff, processes, and continuous service improvement and technical innovation. Our executive team of consultants are experienced in all facets of qualitative and quantitative research – group moderation, on line surveys, questionnaire and sampling design, survey methodology development, data analysis and report writing. Our interviewers are fully trained in-house and we have specialist teams of telephone, door-to-door, central location and executive interviewers

### **Sampling Procedures**

Whether the sample required is truly random or stratified (i.e. quotas of different types of respondent are set), sampling procedures are devised and rigorously enforced to ensure that the most representative sample is obtained.

Interviewers keep records of every telephone call made and every address on a door - to - door call sheet. These records are used in our validation (quality control) procedures and they are also used to ensure systematic call backs are made.

In general public surveys, interviewing times are restricted to evenings and weekends so that working people are properly represented.

### **Privacy Policy**

The McGregor Tan Research Policy is based on the Australian Market Research Society of Australia's guidelines on privacy and data collection.

The AMSRS has a rigorous Code of Professional Behaviour which protects the privacy of individuals. Our guidelines to protect the privacy of individuals are the following:

Respondents' identities shall not be revealed without their consent to anyone not directly involved in the market research project (including the client who commissioned the work) or used for any non-research purpose.

Nobody shall be adversely affected or harmed as a direct result of participating in a market research study. Respondents are able to check without difficulty the identity and bona fides of researchers.

Respondents' co-operation in a market research project is entirely voluntary at all stages. No child under 14 years shall be interviewed without parent's/ guardian's/responsible adults' consent.

In the process of quantitative survey research, names and phone numbers are routinely collected and recorded on questionnaires for quality assurance validation. In a door to door survey addresses may be recorded. The respondent is asked for this information and is given the opportunity to refuse. This information is kept for a short period of time (generally no more than 10 days) for quality control purposes.

All information of the identity of respondents is physically separated from the records of the survey information they have provided as soon as possible after the completion of any necessary fieldwork quality checks.

Access to such material is restricted to authorised research personnel within the researcher's own organisation for specific research purposes (e.g. field administration, data processors, or for panel or longitudinal studies or other forms of research involving recall interviews).

The anonymity of respondents is protected by ensuring that any information provided by or about them which could in practice identify them (e.g.: their company and job title) as well as names, addresses and phone numbers is safeguarded.

### **Data Analysis**

All our quantitative survey data are processed and analysed on our in-house computer system utilising the industry-approved *Survey System* software package.

The data are subject to quality control verification, both at the input and pre-analysis stages to eliminate keying in errors and, prior to analysis, is subject to a thorough check for logic errors and other discrepancies.

All open-ended questions are collated in full for the subsequent interpretation by our qualified quantitative report writers. It is at their discretion to post-code responses for inclusion into existing categories or to create new categories where appropriate. Remaining *verbatim* answers are provided in full.

A typical quantitative report includes our assessment of the data on a question-by-question basis, supported by summary statistics tables, principal findings, recommendations and full computer tabulations. Reports and data can also be supplied on disk if this is appropriate.

### Some of our Clients

**ABB Grain Ltd**, Australian Hotels Association, **Australian Red Cross**, Active Australia, **Active Radio Network**, Adelaide Art Directors Club, **Adelaide Bank**, **Adelaide City Council**, Adelaide City Marketing, **Adelaide Entertainment Centre**, Adelaide Festival Centre Trust, **Adelaide Produce Markets Ltd**, Adelaide University, **Advantage SA**, Advertiser Newspaper Ltd, **Andrew Robertson**, Angas Park, **Anglicare**, Annesley College, **Applecorn Research**, Art Gallery of SA, **Asthma Foundation**, Attorney General's Department, **Australian Central Credit Union**, Australia Post, **Ball Public Relations**, Banrock Station, **Beech Environmental Services**, Betts and Betts, **Blue Moon**, Booze Brothers, **Bottomline**, Boylen Publishing, **Bread and Butter Research and Planning**, Burnside City Council, **Business Centre**, Business SA, **Capital City Committee Adelaide**, Castle Plaza Shopping Centre, **Cement and Concrete Association**, Central Field Market Research, **Centre for Innovation**, **Business & Manufacturing**, Chariot Stokes, **Charles Darwin University**, Charterhouse Advertising, **Child & Youth Health Services**, Children's Health Development Fund, **City of Campbelltown**, City of Charles Sturt, **City of Darwin**, City of Marion, **City of Mitcham**, City of Onkaparinga, **City of Prospect**, City of Salisbury, **City of Unley**, City of West Torrens, **Clelands Lawyers**, Clemenger BDDO, **Clipsal 500**, Coastal and Marine Branch, **Colmar Brunton**, Construction Industry Training Board, **Continuity Group**, Coopers Brewery, **CPS Credit Union**, Cranio-Facial Foundation, **Credit Union Pageant Company**, Crompton Corporation, **CSIRO**, Curtin Business School, **CUSCAL**, Delfin Ltd, **Deloitte Touche Tohmatsu**, Department of Education Training and Employment, **Department for Education and Children's Services**, Department for Environment and Heritage, **Department of Administration and Information Services**, Department of Human Services, **Department of Trade and Economic Development**, Department for Transport Urban Planning and the Arts, **Department for Premier and Cabinet**, Elliott & Shanahan Research, **Emphasis**, Energy SA, **Environmental Protection Authority**, Essential Services Commission of SA, **ETSA Telecoms**, ETSA Utilities, **Eye Corp**, Festival Centre, **Finlaysons**, First National Real Estate, **Flinders University**, Franklins Supermarkets, **G Tech**, Geoffrey Reed Communications, **Gillespie Economics**, Government Communications Office, **Great Southern Railways**, Green Phone Inc, **Grundfos Pumps**, Guerilla Advertising, **Hamilton Heading Advertising**, Harris Scarfe, **Health Promotion SA**, Home Australia, **HomeStart Finance**, Homestead, **Horticulture Australia**, Icewerx, **Imparja TV**, Independent Gaming Authority, **Interaction**, Ipsos Australia, **Jarvis Marketing**, Jebb Holland Demasi, **Jetty Road Glenelg Mainstreet Board**, John Edwards Advertising, **Judi White Research**, Keep Australia Beautiful, **Kambitsis Group**, Kemalex Plastics, **KESAB**, Killey Withy Punshon, **Klein Craig and Associates**, Korvest Ltd, **Leisure Co**, Lendlease, **Leo Burnett Robinson (Institute of Engineers)**, Lifeplan, **Living with Alcohol Program**, Local Government Association of South Australia, **Local Government and Shires Association of NSW**, Macquarie University – NSW, **Mark Makrid and Associates**, Masonic Homes Inc, **Maunsell**, Mawson Lakes, **McIntyre Robertson**, Mercer Cullen Egan Dell, **Michels Warren**, Millward Brown, **mNet**, Mt Lofty Ranges Catchment Program, **MTU Detroit**, Multiplex, **Munno Para Shopping Centre**, Museum and Art Gallery of the Northern Territory, **Music Society**, National Centre for Vocational Education Research, **National Parks & Wildlife**, National Pharmacies, **New Start Homes**, New Tel, **NFS Marketing**, North Western Adelaide Health Service, **Northern Adelaide & Barossa Catchment Water Management Board**, Northern Territory Government, **Northern Territory Tourist Commission**, NT Department of Community Development, **Office for Recreation and Sport**, One to One, **Optima Energy**, Orima Research, **Partnerships 21**, Passenger Transport Board, **Paul Centenera**, Peregrine Corporation, **Phillips Group**, Phyllis Mitchell & Associates, **Piper Alderman**, Planning SA, **Playford Centre**, Police Credit Union, **Porter Novelli**, Power & Water Authority – NT, **Power Advertising**, Prescott Consultants, **Preston Motors**, **Prices' Bakery**, Primary Industries and Resources SA, **Public Trustee**, Q&A Market Research, **Q2 Strategic**

**Marketing Research**, Quantum Research, **Queensland Association of Secondary School Principals**, RAA, **RAA Insurance**, Radio Rentals, **Repromed**, Right Marketing, **River Murray Catchment Water Management Board**, Robern Menz, **Rossdale Homes**, Rundle Mall Management, **SA Community Housing Authority**, SA Cricket Association, **SA Government Radio Network**, SA Housing Trust, **SA Lotteries**, SA Tourism Commission, **SA Water**, SA Waste Management Committee, **Sandvik Tamrock Pty Ltd**, Savings & Loans Credit Union, **School Principal's Association**, Seeley International, **Serco**, Sexton Marketing Group, **Shahin Group of Companies**, Silver Chef, **Sims Metal**, Sky City Adelaide, **Smithers Oasis**, Smoke Free Project, **South Australian Primary Principals Association**, South East Catchment Water Management Board, **Southern Equity Holdings**, Speakman & Associates, **Special Broadcasting Services (SBS)**, Spintus, **SSABSA**, Starcom, **State Electoral Office**, State Theatre Company, **Statewide Superannuation Trust**, Stokes Advertising, **Style Catering**, Survey Talk, **Sustainable Energy Development Authority**, Sydney Harbour Foreshore Authority, **TAB**, Taylor Nelson Sofres, **Tea Tree Gully Council**, Territory Insurance Organisation, **The Advertiser**, The Business Centre, **The Research Forum**, THEM Advertising, **Thomson Playford**, Thoroughbred Racing SA, **Tivoli Gardenstone**, TNR Meat, **Toro Australia**, Toshiba Australia, **Trafalgar Corporate**, Transitions Optical, **Transport SA**, Transworld Enterprises, **Tregloans**, UMR, **University of Adelaide**, University of SA, **United Water**, Unley Shopping Centre Management, **Urbis Keys Young**, Watermark Patent Attorneys (Victoria), **Watershed Protection Office**, Western Australian Primary Principals Association, **West Lakes Mall**, Westfield Shopping Centre Management, **Wilkins Research**, Wilson Everard, **Wirthlin Worldwide**, Women's and Children's Hospital, **Woodlands School**, Woods Bagot, **WorkCover Corporation**, WorkCover Employee Advocate Unit, **Worthington Dimarzio**