



**NATIONAL LITTER INDEX
2017 - 2018**

WESTERN AUSTRALIA RESULTS

**KEEP AUSTRALIA BEAUTIFUL NATIONAL ASSOCIATION
September 2018**

www.kab.org.au

Introduction

The 2017/18 survey reports the results of biannual litter counts at the same, undisclosed 151 sites across Western Australia. While over time additional rural highway sites have been added, the heart of the survey remains and the NLI is Australia's only long term, consistent survey of litter. Also unchanged is its aim to build a deeper understanding of what is being littered, and where, and how that is changing over time.

The National Litter count was initiated in during November 2005, with a second count conducted in May 2006. The National KAB reporting commenced in 2006/07, the 2017/18 National litter counts were conducted during November 2017 and May 2018.

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 recognised within established litter categories to the overall litter stream.

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.

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.

Methodology

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 NLI sites in Western Australia was 235,966m². This area spanned a total of 151 sites.

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 metres 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 metres 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 Western Australia.

	All Other States
Beach	16
Car Park	23
Highway	27
Industrial	17
Recreational Park	13
Residential	26
Retail	15
Shopping Centre	14
Total	151

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.

Reporting

Litter counts have been conducted bi-annually in November and May across the years from 2005/06, unless stated otherwise, the 2017/18 results are reported on an annual basis incorporating average figures corresponding to November 2017 and May 2018 counts.

Western Australian Results

Key Messages and Insights

- There was a marginal increase (+2.6%) in litter items counted in the 2017/18 monitor compared to 2016/17, however, the 2017/18 litter counted was 21% lower than the number of litter items recorded in the 2015/16 litter monitor.
- A rise in cigarette litter (+21.9%) was the main contributor to the increase in litter counted, while there were smaller increases associated with other glass (+13.3%) and other plastic (+ 2.5%).
- Higher levels of litter were recorded at retail precincts (+55.6%), beaches (+11.0%), major roads highways (+5.2%) and car parks (+0.8%).
- Lower levels of litter were counted at recreational parks (-46.8%), shopping centres (-17.1%), residential streets (-8.1%) and industrial precincts (-5.3%).
- There was a marginal increase of litter volume of 1.0% which was mainly attributed to the impact of increases of plastic industrial containers and plastic soft drink bottles <1 litre.
- Industrial precincts recorded the highest loads on an item counted basis whereas major roads/highways recorded the highest loads on a volumetric basis.

Survey Specifics

The national litter index surveys 151 sites across Western Australia, with an area surveyed of 235,966 square metres. While city and suburban areas are the primary focus of the survey, a number of regional/rural sites, are also surveyed. The breakdown is shown in the table below.

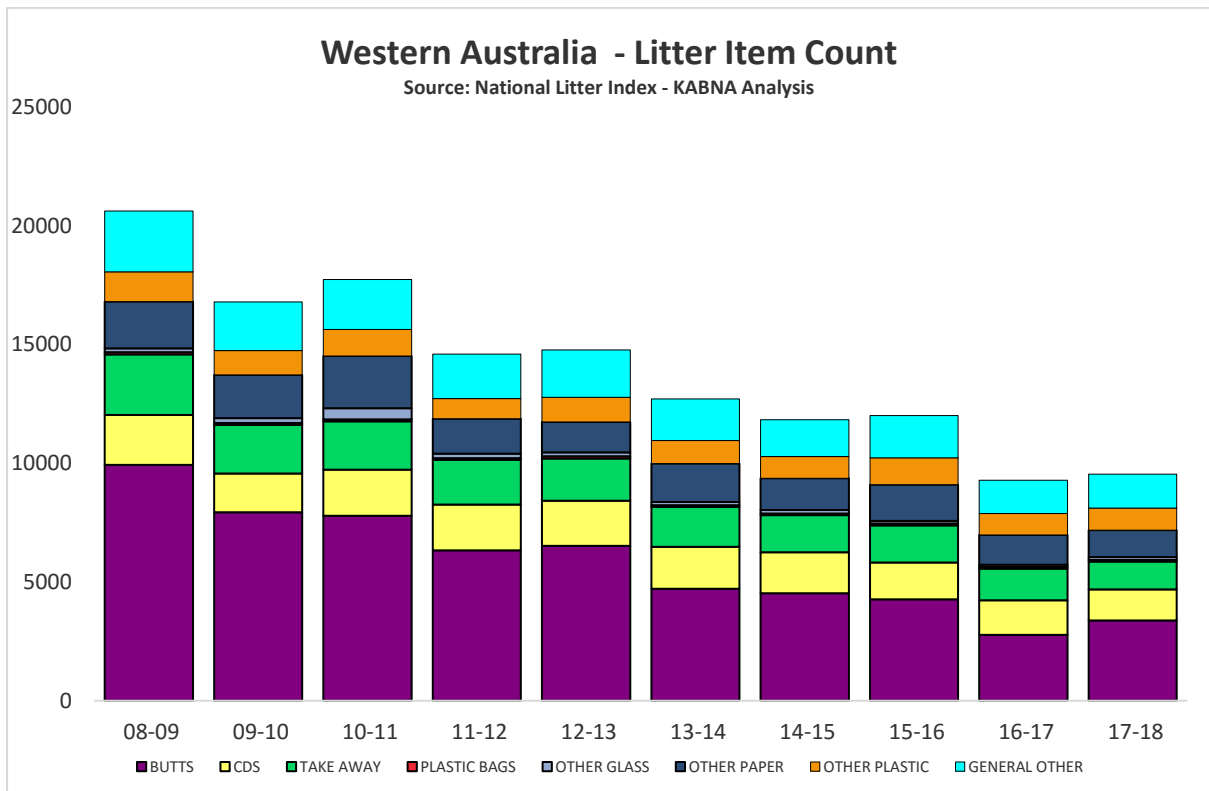
Site Types	Number Surveyed			Area Surveyed (sq m)
	Suburban	Regional	Total	
Recreational Swimming	10	6	16	8,000
Car Parks	19	4	23	34,365
Major Roads/Highways	17	10	27	87,565
Industrial Precincts	13	4	17	14,985
Recreational Parks	7	6	13	26,000
Residential Streets	21	5	26	35,870
Retail Precincts	10	5	15	13,556
Strip Shopping Precincts	12	2	14	15,625
TOTAL	109	42	151	235,966

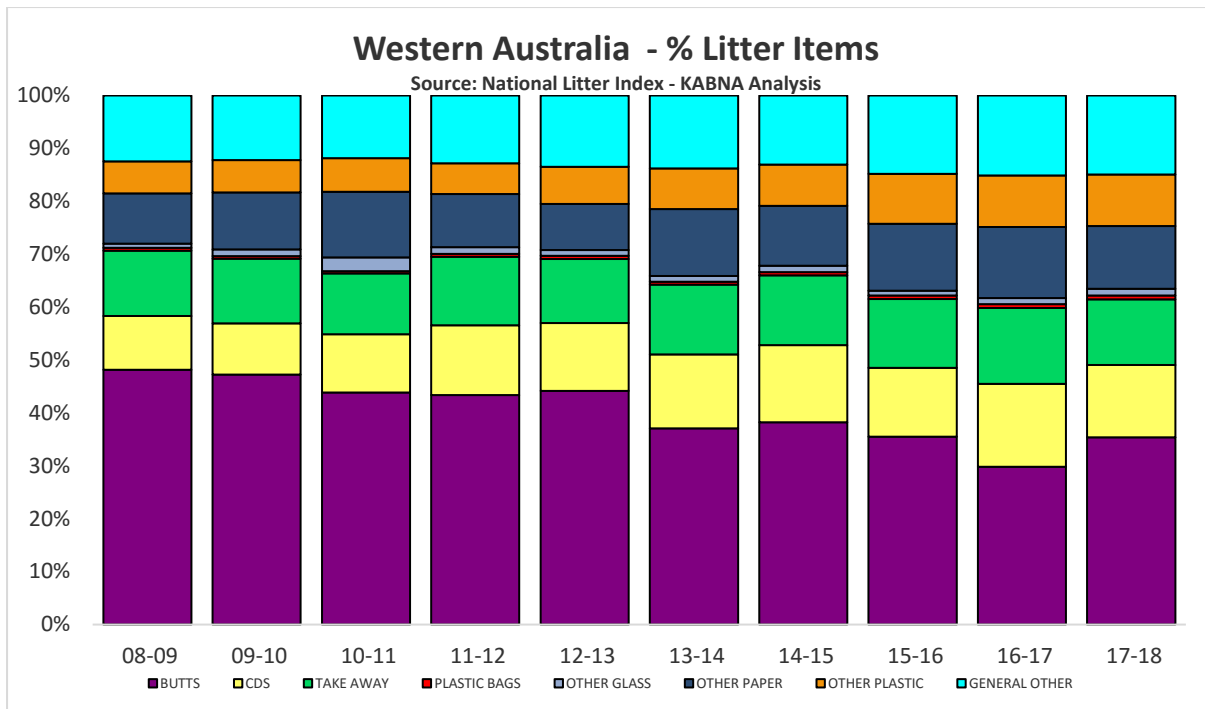
Litter Counts

As shown in the following table, the 2017/18 litter monitor recorded 2.6% more litter than counted in the 2016/17 monitor. A rise in cigarette litter (+21.9%) was the main contributor to the increase in litter counted, while there were smaller increases associated with other glass (+13.3%) and other plastic (+ 2.5%). Litter decreased across all other litter categories, the most notable decreases included takeaway packaging (-11.3%), other paper litter items (-9.3%) and beverage containers (-7.0%).

WA		Items								
		Beach	Car Park	Highway	Industrial	Recreational Park	Residential	Retail	Shopping Centre	Total
WA 2017/18	Butts & Packaging	217	694	644	441	30	148	831	372	3376
	Beverage Containers	8	35	1093	85	6	36	35	12	1308
	Takeaway Food & Beverage	60	159	447	101	67	166	132	52	1183
	Other Glass	2	11	84	9		6	6	3	120
	Other Paper	46	88	556	125	53	120	90	57	1134
	Other Plastic	33	87	406	155	37	121	53	40	929
	General Other	37	92	823	172	31	143	81	47	1425
	Plastic Bags	2	4	37	8	3	10	5	2	69
	Illegal Dumping		1	4	1	1	1	1	1	8
	GRAND TOTAL	403	1168	4093	1096	227	748	1232	583	9550
WA 2016/17	Butts & Packaging	116	618	446	400	73	193	486	439	2770
	Beverage Containers	24	39	1164	86	30	35	21	10	1407
	Takeaway Food & Beverage	86	180	504	149	118	130	96	74	1334
	Other Glass	4	7	63	16		10	6	1	106
	Other Paper	49	103	593	139	84	145	72	68	1250
	Other Plastic	37	96	368	139	55	128	48	38	906
	General Other	43	115	701	220	64	164	58	71	1433
	Plastic Bags	6	2	45	9	4	11	8	4	86
	Illegal Dumping		1	8	2	1	2			13
	GRAND TOTAL	363	1159	3890	1157	427	814	792	703	9304
% REDUCTION	Butts & Packaging	-87.1%	-12.2%	-44.4%	-10.3%	58.6%	23.1%	-71.0%	15.3%	-21.9%
	Beverage Containers	68.8%	10.4%	6.1%	0.6%	80.0%	-2.9%	-68.3%	-21.1%	7.0%
	Takeaway Food & Beverage	29.8%	11.4%	11.2%	32.2%	43.0%	-27.8%	-37.0%	29.3%	11.3%
	Other Glass	42.9%	-57.1%	-34.4%	45.2%		42.1%	-9.1%	-150.0%	-13.3%
	Other Paper	5.2%	14.6%	6.2%	9.7%	36.9%	17.6%	-25.9%	16.3%	9.3%
	Other Plastic	12.2%	9.4%	-10.3%	-11.5%	33.0%	5.5%	-11.6%	-5.3%	-2.5%
	General Other	15.1%	20.1%	-17.3%	21.8%	51.2%	12.8%	-40.9%	34.5%	0.6%
	Plastic Bags	72.7%	-75.0%	16.9%	11.8%	28.6%	4.8%	40.0%	50.0%	20.3%
	Illegal Dumping			50.0%	33.3%		33.3%			38.5%
	Grand Total (excluding illegal dumping)	-11.0%	-0.8%	-5.3%	5.3%	46.9%	8.1%	-55.5%	17.1%	-2.7%
GRAND TOTAL	-11.0%	-0.8%	-5.2%	5.3%	46.8%	8.1%	-55.6%	17.1%	-2.6%	

Over the longer term, WA has been experiencing steadily declining litter levels, driven primarily by reductions in cigarette litter. In the 2017/18 litter monitor an increase in cigarette litter was the primary reason for the overall increase in litter from the previous year.





Volumetric Impacts

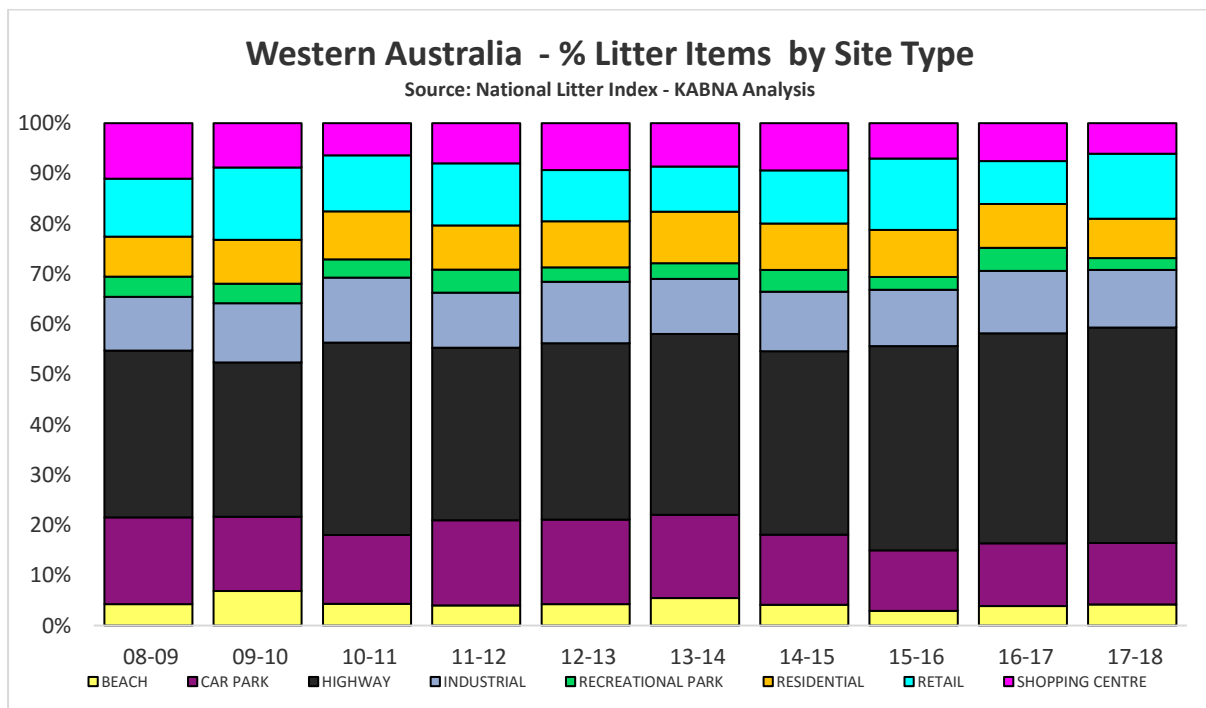
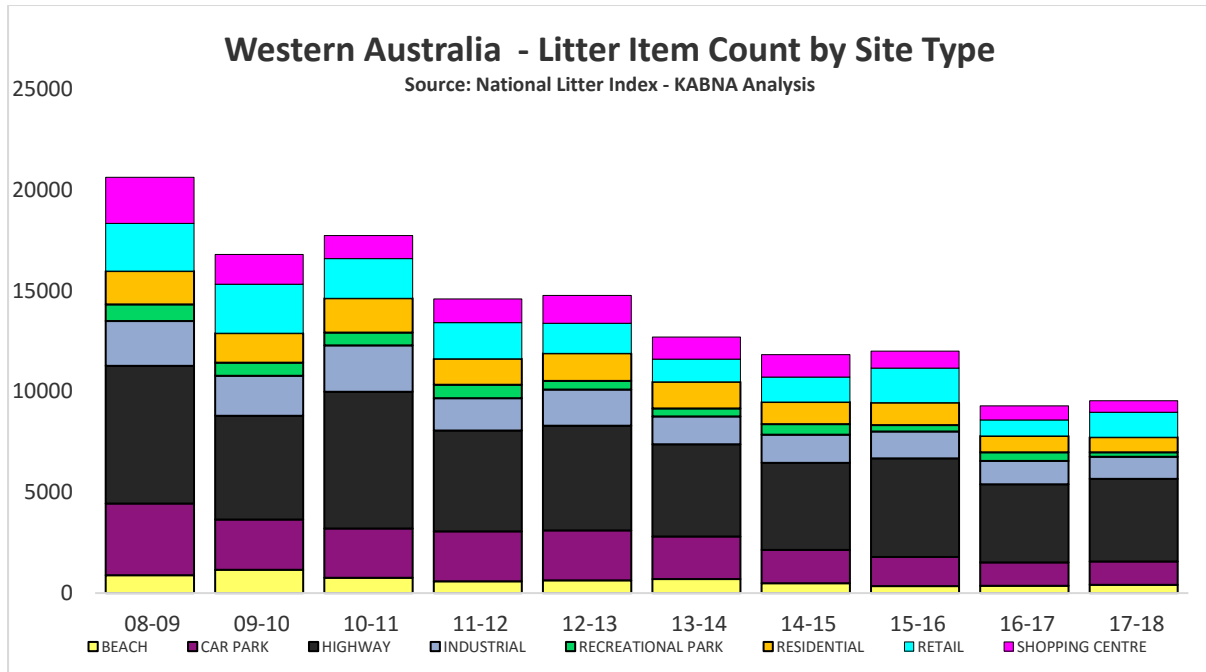
There was a marginal increase of litter volume of 1.0% in 2017/18. The most significant contributors to the increase in litter volume recorded was the impact of plastic industrial containers and plastic soft drink bottles <1 litre.

WA		Volume - Litres								
		Beach	Car Park	Highway	Industrial	Recreational Park	Residential	Retail	Shopping Centre	Total
WA 2017/18	Butts & Packaging	0.569	1.931	12.268	3.317	0.112	0.888	0.640	0.587	20.313
	Beverage Containers	4.529	19.902	615.739	44.422	4.694	22.617	22.900	6.751	741.554
	Takeaway Food & Beverage	2.552	14.356	108.552	10.034	3.661	12.651	10.472	2.300	164.579
	Other Glass	0.039	0.215	1.650	0.167	0.108	0.118	0.049	0.049	2.347
	Other Paper	0.155	0.295	1.879	0.423	0.179	0.404	0.304	0.191	3.831
	Other Plastic	0.041	0.108	0.507	0.194	0.046	0.151	0.066	0.049	1.161
	General Other	1.717	11.031	446.583	38.811	4.446	22.171	16.839	6.846	548.443
	Plastic Bags	0.051	0.172	1.953	0.416	0.085	0.554	0.206	0.068	3.505
	Illegal Dumping		24.000	96.000	24.000		24.000	12.000	12.000	192.000
	GRAND TOTAL	9.653	72.012	1285.131	121.783	13.223	83.545	63.546	28.842	1677.733
WA 2016/17	Butts & Packaging	0.122	1.378	13.443	2.550	0.444	1.111	0.274	0.922	20.243
	Beverage Containers	15.606	21.189	646.717	48.547	16.995	22.014	12.521	4.763	788.352
	Takeaway Food & Beverage	5.918	19.102	139.777	20.437	9.960	14.522	7.859	6.750	224.325
	Other Glass	0.069	0.137	1.228	0.304	0.020	0.187	0.108	0.020	2.072
	Other Paper	0.164	0.345	2.003	0.468	0.284	0.490	0.242	0.228	4.225
	Other Plastic	0.046	0.119	0.459	0.174	0.068	0.159	0.059	0.047	1.133
	General Other	0.690	9.256	226.144	23.682	5.546	27.972	7.191	4.954	305.436
	Plastic Bags	0.214	0.122	2.268	0.342	0.146	0.437	0.308	0.163	4.019
	Illegal Dumping		24.000	192.000	36.000	24.000	36.000			312.000
	GRAND TOTAL	22.829	75.649	1224.060	132.504	57.463	102.892	28.562	17.846	1661.805
% REDUCTION	Butts & Packaging	-365.8%	-40.1%	8.7%	-30.1%	74.7%	20.1%	-133.9%	36.3%	-0.3%
	Beverage Containers	71.0%	6.1%	4.8%	8.5%	72.4%	-2.7%	-82.9%	-41.7%	5.9%
	Takeaway Food & Beverage	56.9%	24.8%	22.3%	50.9%	63.2%	12.9%	-33.3%	65.9%	26.6%
	Other Glass	42.9%	-57.1%	-34.4%	45.2%	100.0%	42.1%	-9.1%	-150.0%	-13.3%
	Other Paper	5.2%	14.6%	6.2%	9.7%	36.9%	17.6%	-25.9%	16.3%	9.3%
	Other Plastic	12.2%	9.4%	-10.3%	-11.5%	33.0%	5.5%	-11.6%	-5.3%	-2.5%
	General Other	-148.7%	-19.2%	-97.5%	-63.9%	19.8%	20.7%	-134.2%	-38.2%	-79.6%
	Plastic Bags	76.2%	-41.9%	14.6%	-21.4%	41.7%	-26.8%	33.0%	58.3%	12.8%
	Illegal Dumping			50.0%	33.3%	100.0%	33.3%			38.5%
	Grand Total (excluding illegal dumping)	57.7%	7.0%	-15.2%	-1.3%	60.5%	11.0%	-80.5%	5.6%	-10.1%
GRAND TOTAL	57.7%	4.8%	-5.0%	8.1%	77.0%	18.8%	-122.5%	-61.6%	-1.0%	

Littering Location

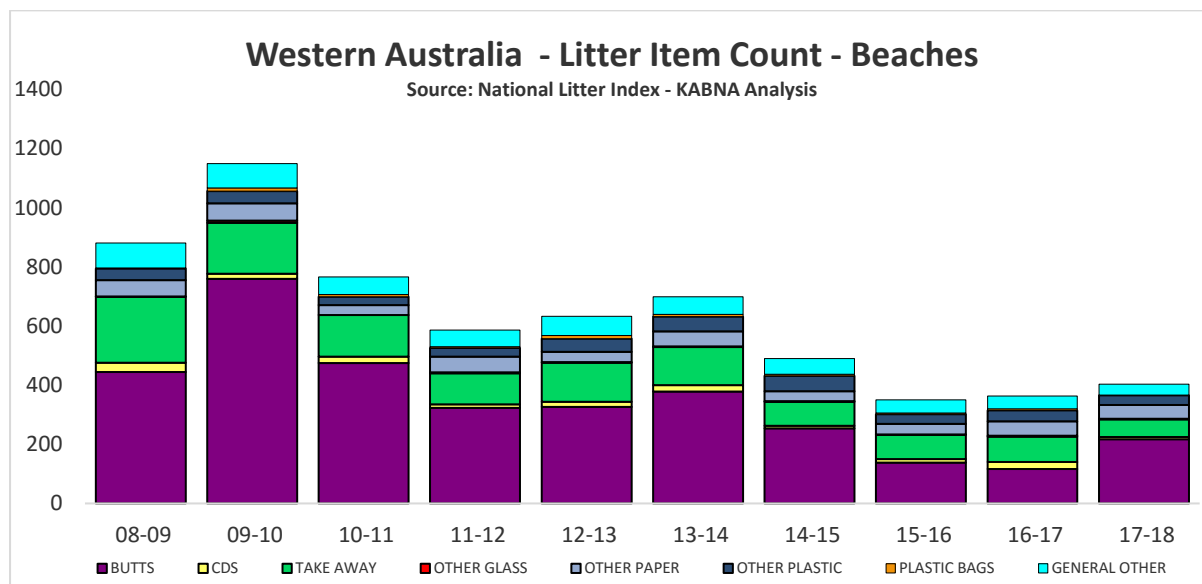
The breakdown of the location of the litter found in Western Australia is contained in the following charts which demonstrate that with the exception of major roads/highways, all sites have seen reduced litter levels over time. As a consequence, major roads/highways are proportionally increasing their share of the WA litter stream.

In 2017/18 monitor higher levels of litter were recorded at retail precincts (+55.6%), beaches (+11.0%), major roads highways (+5.2%) and car parks (+0.8%), these were offset by lower levels counted at recreational parks (-46.8%), shopping centres (-17.1%), residential streets (-8.1%) and industrial precincts (-5.3%).



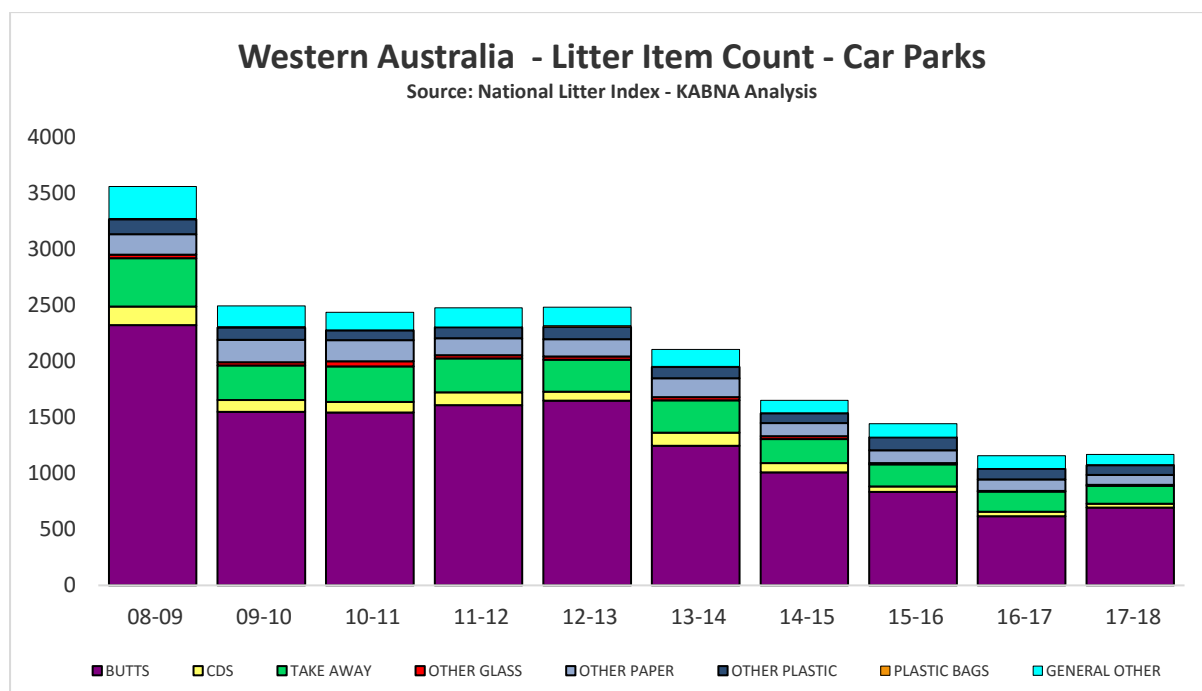
Beaches

Litter levels at beaches in WA rose by 11.0% in 2017/18 driven solely by the impact of increases in cigarette associated litter. Litter levels decreased however across all other litter categories at WA beaches.



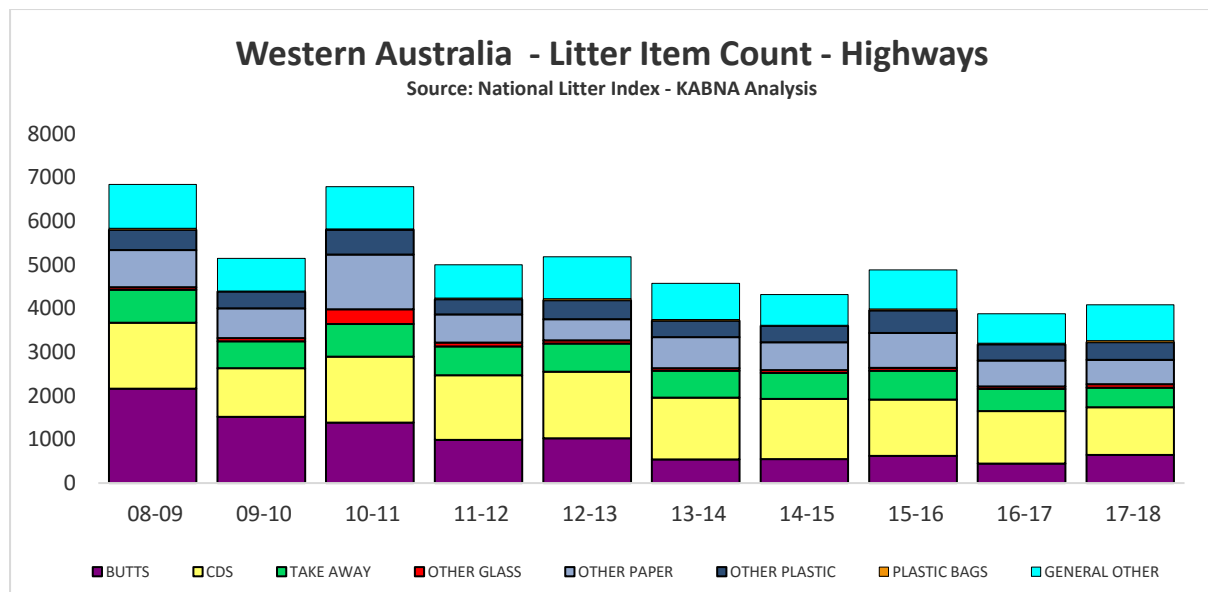
Car Parks

Litter levels increase marginally by 0.8% at WA car parks, also primarily driven by the impact of increases in cigarette associated litter. The increase was offset to some degree by decreases in takeaway packaging (-11.4%), other paper litter (-14.6%) and other general litter (-20.1%).



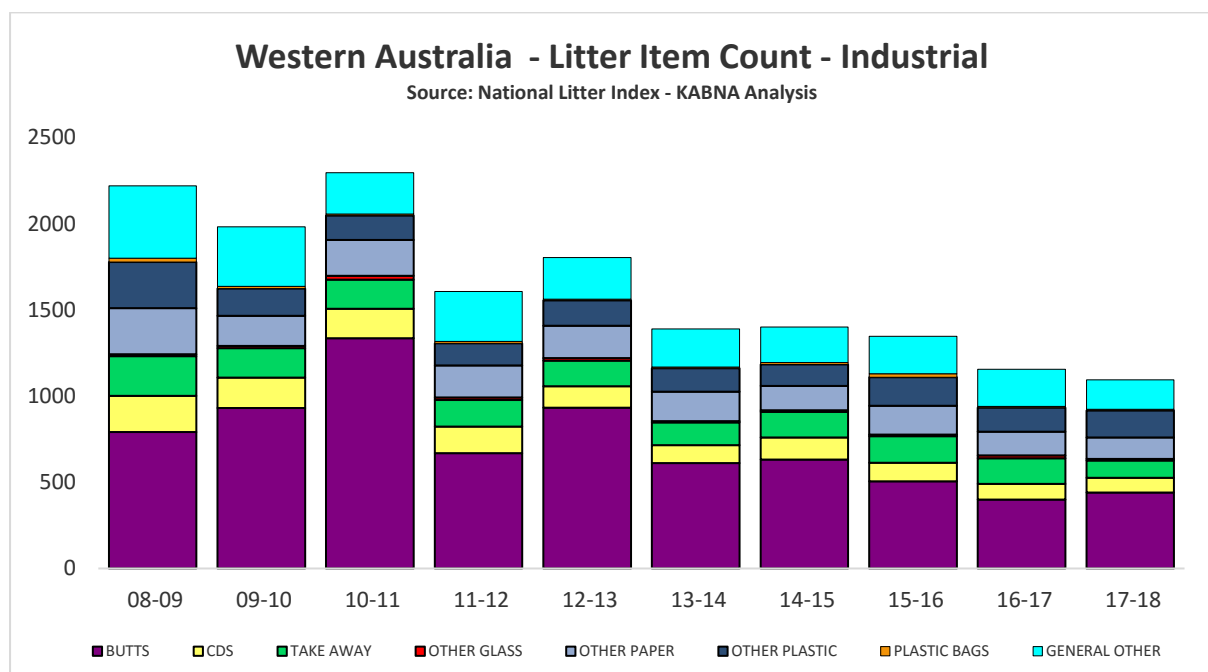
Major Roads/Highways

Litter levels on Western Australia's major roads and highways increased by 5.2% in the 2017/18 litter monitor. All main contributors to the increase were cigarette litter (+44.4%) and general other litter (+17.3%). The increases were offset mainly by decreases in takeaway packaging (-11.2%) and beverage containers (-6.1%).



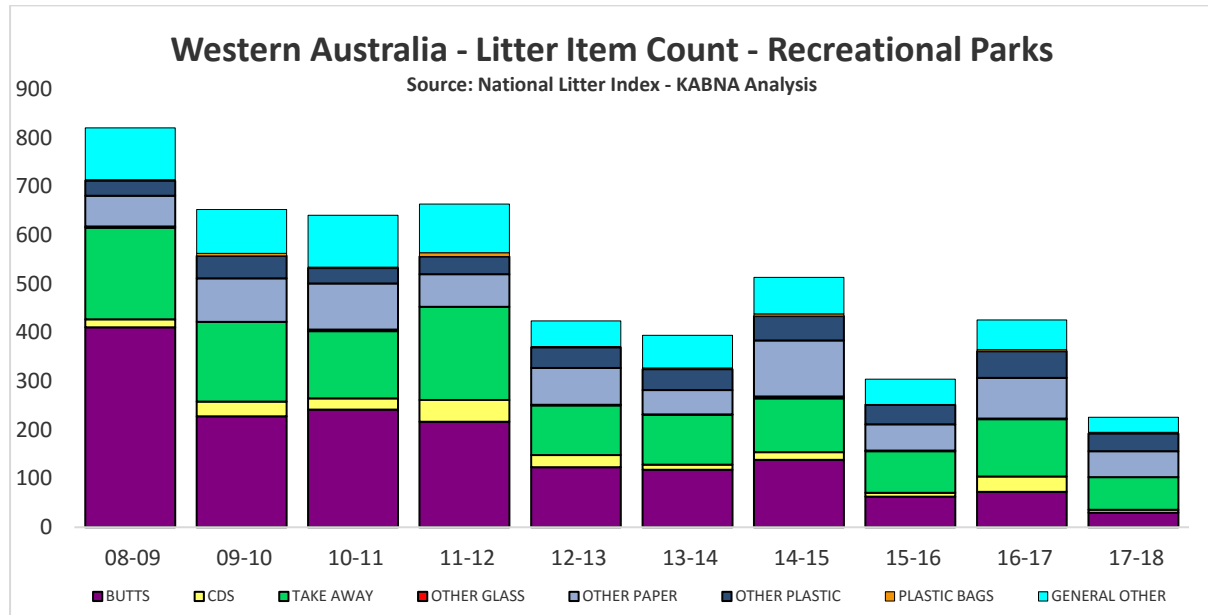
Industrial

The 2017/18 NLI recorded a 5.3% decline in the litter counted around WA industrial precincts and as demonstrated in the chart below reflects a relatively stable, yet declining longer-term litter stream. The main categories experiencing a decrease were takeaway packaging (-32.2%) and other general litter (-21.8), while the main increase was amongst cigarette butts (+10.3%).



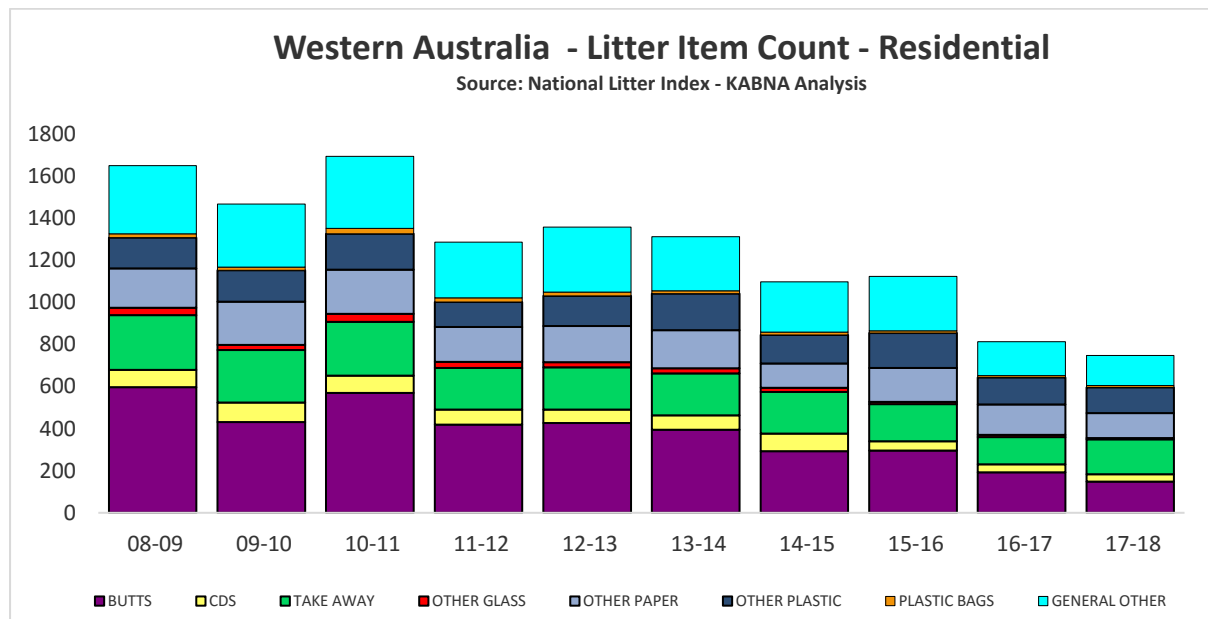
Recreational Parks

Litter counts in Western Australia’s recreational parks decreased after an increase in 2017/18 monitor. In 2017/18 decrease were most notable amongst cigarette butts (-58.6%), takeaway packaging (-43.0%) and beverage containers (-80.0%).



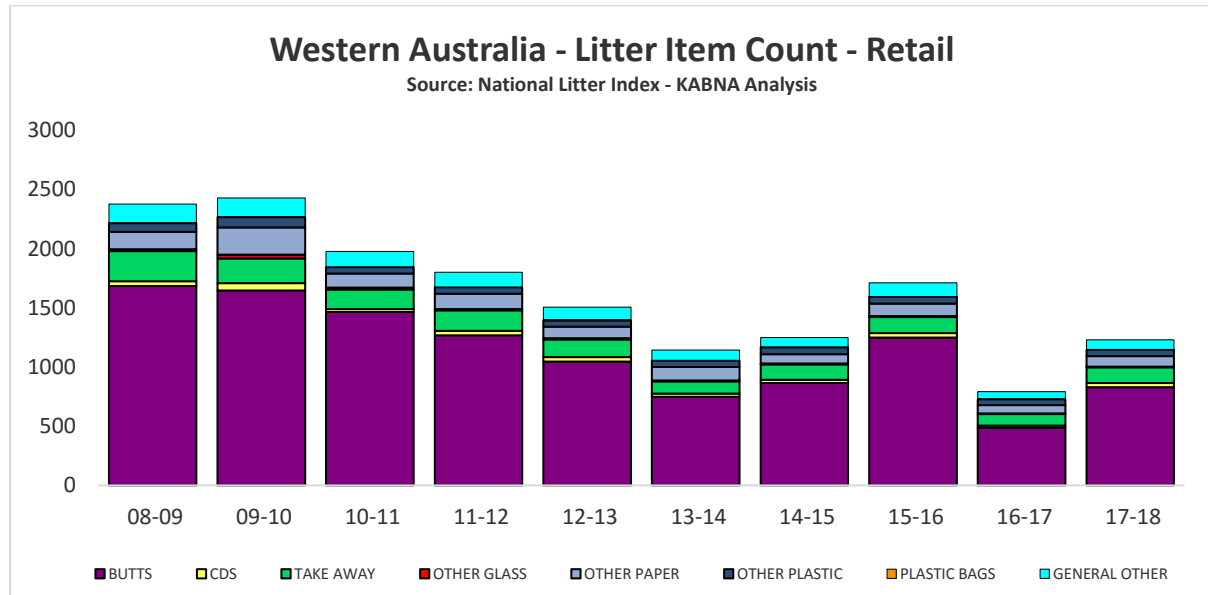
Residential Streets

The 2017/18 monitor recorded 8.1% less litter on Western Australia’s residential streets. All categories experienced falls in litter levels with the exception of takeaway packaging. The most notable reduction was in cigarette butts (-23.1%). The chart below demonstrates continued reductions in levels of cigarette litter, and total litter in residential streets in WA.



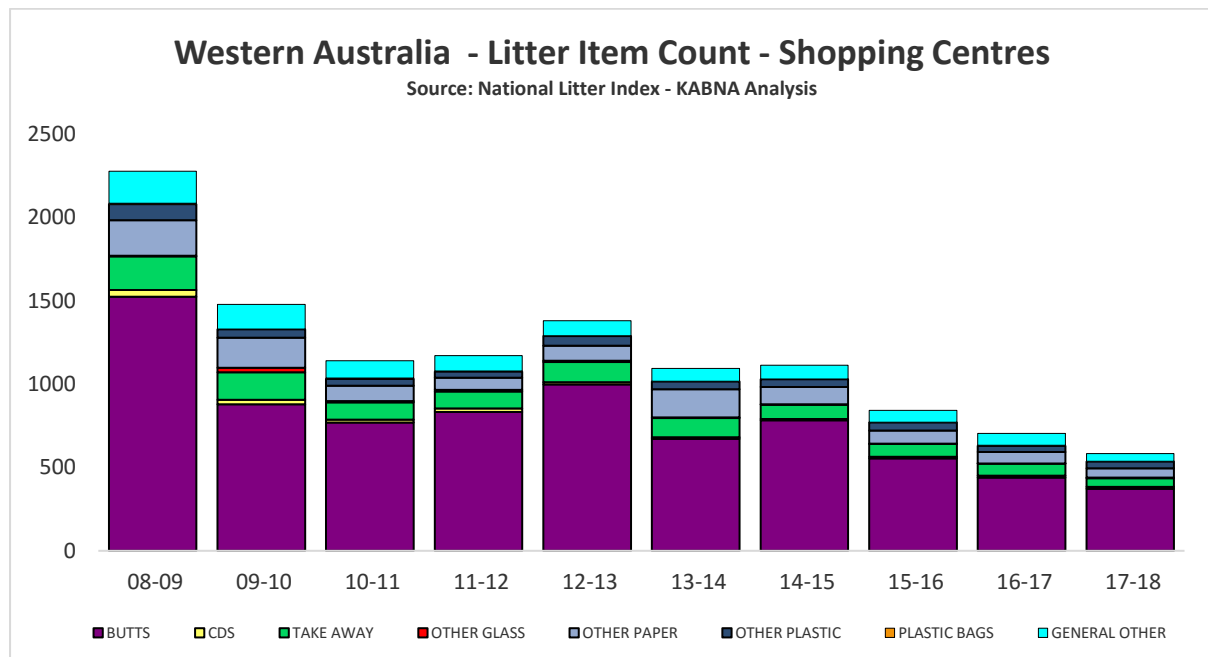
Retail Precincts

Western Australia's retail shopping strips experienced a significant increase in litter in the 2017/18 monitor. The 55.6% increase was still below previous counts from 08/09 to 15/16. The main contributor was an increased in cigarette butts (+71.0%).



Shopping Centres

After a period of relative stability, there has been three consecutive falls in the litter levels observed at shopping centres, with the 2017/18 monitor recording a 17.1% decrease in litter counted at these sites in Western Australia. Most notable declines were in takeaway packaging (-29.3%) and cigarette butts (-15.3%).



Normalisation for Area Surveyed

As demonstrated in the tables below, when the area monitored is taken into account, the 2017/18 litter monitor recorded, on average, 40 items per 1000m², an increase from 39 items per 1000m² recorded in the 2016/17 monitor. Industrial precincts have the highest litter loads in Western Australia with 73 litter items per 1000m².

WA		Items								
		Beach	Car Park	Highway	Industrial	Recreational Park	Residential	Retail	Shopping Centre	Total
WA 2017/18	Areas Surveyed	8000	34365	87565	14985	26000	35870	13556	15625	235966
	Items counted (excl illegal dumping)	403	1167	4089	1095	227	747	1232	583	9542
	Per 1,000 sq m	50	34	47	73	9	21	91	37	40
WA 2016/17	Areas Surveyed	8000	34365	87565	14985	26000	35870	13556	15625	235966
	Items counted (excl illegal dumping)	363	1158	3882	1156	426	813	792	703	9291
	Per 1,000 sq m	45	34	44	77	16	23	58	45	39

A similar picture emerges in volumetric term as 2016/17, which indicates that the volumetric litter loads are the highest on major roads / highways (13.58 litres per 1000m²). As outlined earlier, the volumetric load across the state increased in volume (6.30 litres per 1000m², up from per 5.72 litres 1000m² in 2016/17).

WA		Volume - Litres								
		Beach	Car Park	Highway	Industrial	Recreational Park	Residential	Retail	Shopping Centre	Total
WA 2017/18	Areas Surveyed	8000	34365	87565	14985	26000	35870	13556	15625	235966
	Volume (excl illegal dumping)	9 653	48 012	1189 131	97 783	13 223	59 545	51 546	16 842	1485 733
	Per 1,000 sq m	1.21	1.40	13.58	6.53	0.51	1.66	3.80	1.08	6.30
WA 2016/17	Areas Surveyed	8000	34365	87565	14985	26000	35870	13556	15625	235966
	Volume (excl illegal dumping)	22 829	51 649	1032 060	96 504	33 463	66 892	28 562	17 846	1349 805
	Per 1,000 sq m	2.85	1.50	11.79	6.44	1.29	1.86	2.11	1.14	5.72