LITTERING BEHAVIOUR STUDIES VII

NATIONAL BENCHMARK

2004

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Environment
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Acknowledgements

Once again, we would like to acknowledge the Beverage Industry Environment Council (BIEC) who have funded the Littering Behaviour Studies (LBS) series since 1997, providing the only comprehensive annual benchmarking of Australian disposal behaviour of its kind. Many thanks to the Community Change team who have contributed to the 2004 study, particularly Jo Creswell, Katherine Sampson, Carol Burns, Sylvia Gruber, Ursula Noye, and Catherine Matthews.

Rob Curnow and Karen Spehr, April 2005.

Executive Summary

The Littering Behaviour Studies (LBS) series is a long-term benchmarking project to monitor littering behaviour in a wide variety of locations throughout Australia. LBS projects have now developed to form the world's largest disposal behaviour database, now exceeding 90,000 observations collected from all Australian capital cities and selected regional centres. This 2004 report (LBS7) contains outcomes from the sixth national benchmarking study of Australian disposal behaviour. Regional centre locations (included for the first time in 2003) were able to be assessed again in the 2004 study, providing a basis for comparison with initial outcomes from last year.

On a national basis, 2004 sees disposal behaviour consolidated at 2003 levels, which then showed improvement for the first time since baseline in 1997. On a capital city basis, Sydney and Melbourne led the other capital cities with lower levels of littering and more binning occurring, followed by Darwin, Adelaide, Brisbane and Hobart, cities that reflected the 2004 national average for disposal behaviour. Hobart demonstrated a marked improvement in 2004, as prior DBI levels were all below the national average. Similar to a number of previous national studies Canberra performed at the lowest level compared to other capital cities.

Overall, levels of appropriate disposal behaviour were somewhat lower for regional centres than capital cities, however Wollongong and Alice Springs performed at levels in excess of the national average, both regional centres showing improvement since last year.

LBS7 includes detailed analysis of capital city and regional centre data and the effects of various factors on disposal behaviour – site type, demographic factors, bin distance, consumption activity, and the attitudes of people using public places. It tracks changes in disposal behaviour for the same locations in many sites consistently assessed since 1997.

Outcomes can assist in directing national efforts at litter reduction but can also provide specific information useful at the local level in modifying and assessing the impact of programs designed to improve disposal behaviour.

The LBS Report Series

The Littering Behaviour Studies (LBS) series is a long-term benchmarking project to monitor littering behaviour in a wide variety of locations throughout Australia. Since 1997, on behalf of its member companies, the Beverage Industry Environment Council (BIEC) has commissioned a team of behavioural psychologists, Community Change (CC), to conduct behavioural observation studies of Australians and their disposal behaviour in public places.

The Federal Government's National Packaging Covenant (NPC)[1] has established litter management as an important issue, with government and industry clearly identifying the link between waste reduction and litter prevention. Under the NPC, BIEC's commitments include assisting various stakeholders to reduce the presence of litter in the environment and progress toward effective recovery of resources from public places, using LBS outcomes.

This report, 'LBS7', is the seventh in the series. LBS1 followed a detailed review of international literature on disposal behaviour. The review identified significant knowledge gaps, resulting in the considerable research effort that BIEC then initiated through the Littering Behaviour Studies. Subsequent LBS projects have since developed to form the world's largest disposal behaviour data base, now exceeding 90,000 observations collected from all Australian capital cities. Annual LBS benchmarking has provided the only regular collection of Australian disposal behaviour data in 1997, 2000, 2001, 2002, 2003 and with this volume, 2004.

In addition to providing national comparisons of littering, the LBS series also includes DBI levels for individual locations. Regional centre locations (included for the first time in 2003) were able to be assessed again in the 2004 study, providing a basis for comparison with initial outcomes from last year. Outcomes for individual capital city locations have been provided in Appendix D with outcomes for individual regional centre locations included as Appendix E.

The methodology used in the LBS series – the observational approach (OA) – is a valid and reliable research tool for tracking levels of littering behaviour, providing systematic monitoring of the effectiveness of a range of government and related agencies' anti-littering and pro– environmental initiatives in changing people's behaviour. As well as being used to assess littering behaviour, it also includes indicators of environmentally desirable behaviours such as binning. Behaviour is characterised using the Disposal Behaviour Index (DBI), developed as a numerical representation of both positive and negative behaviour.

Previous LBS studies have discussed at some length, the rationale for examining both positive and negative behaviour. For example, disposal actions of individuals and groups tend to vary with the items people are using and the context in which they are using them. Also, the same item may be littered by the same person in some situations but not others. A more detailed account of the complexity of littering behaviour has been provided in previous LBS reports and has been reproduced in Appendix A, The Complexity of Littering Behaviour.

In recent years, a number of valuable action research initiatives have been developed to provide location specific information to assist in making and tracking improvements to public places in preventing litter. Such strategies have been developed in response to the need for a more basic information gathering method for use at a local level. The observational methodology used in the

[1] The National Packaging Covenant is a co-regulatory agreement between industries in the packaging chain and all spheres of government. It allows packaging suppliers and users to lead the way in packaging waste reduction. Information can be obtained from www.environment.gov.au/epg/covenant.

LBS however, remains the most reliable and valid method of measuring actual behaviour as it happens, using a strict observation behaviour protocol designed to represent the complexity of an individual's behavioural repertoire.

National LBS Benchmarks

The annual LBS benchmarks provide reliable comparisons of disposal behaviour over time where DBI's are calculated for similar sites (core site types) in each capital city. DBI's for each core site type are combined to give an average performance level for each city, enabling detailed comparisons of disposal behaviour in similar site types throughout Australia. A national indicator is comprised of the averages for all capital cities and provides national trends in behaviour over time.

Annual benchmarks also enable comparison of changes according to site type for all cities, eg, parks throughout Australia and site types within cities, eg, shopping malls in Sydney, Melbourne or Perth.

The National Benchmark 2004 report compares levels of disposal behaviour in Australia to baseline measures and outcomes from 2003 by:

- Identifying the national trend in littering behaviour
- Examining trends in disposal behaviour in capital cities
- Comparing trends in disposal behaviour in the same site types
- Identifying attributes of locations associated with particular disposal behaviours

Methodology

Using the Observational Approach to Capture the Complexity of Disposal Behaviour

The LBS series is based on an observational method that accurately reflects the many disposal actions executed by individuals in public places where:

- Any one person may engage in a variety of disposal behaviours (pocketing, littering, binning, recycling and composting) in the one location
- Littering is relatively rare, and most litter is the result of the behaviour of a comparatively small proportion of people in a location

A naturalistic approach to behaviour measurement - the Observational Approach (OA) - is used to gather information by recording details of disposal behaviour in public places as it happens. The overall aim of the OA is to provide a systematic and direct method of measuring behaviour in the actual context in which it occurs. In the LBS series, data collection teams use recording instruments capable of distinguishing hundreds of combinations of variables related to public place disposal behaviour.

The OA method uses teams of two people, one an observer and the other an interviewer. Observers are trained in ethnographic data gathering techniques and the inconspicuous observation of people as they dispose of items in public. After observing a person completing a disposal behaviour - either by littering or using a bin - observers direct an interviewer to that person using a two-way radio. Interviewers are deliberately not informed about the person's disposal behaviour and so do not know whether respondents have littered or used a bin. They are therefore less likely to be influenced by their own preconceptions or biases.

Interviewers administer a standard survey that provides information on people's awareness of their own behaviour, as well as their attitudes about litter, anti-littering measures, and other waste minimisation initiatives designed for public places. Survey responses are linked to behavioural observations of that individual in order to examine the connection between what people said they did and how they actually behaved, thereby controlling some of the social desirability associated with self-report surveys and other judgements about littering behaviour.

The OA is intended to gather information to help understand current attitudes and disposal behaviours without impacting or influencing the characteristics of a site. Observers ensure sampling protocols are followed whereby the areas studied each year are as close as possible to those used in previous national benchmarks.

Using the OA, annual benchmarks of littering behaviour are collected in a consistent and standardised way in a variety of sites within a city. In the LBS series a 'core' grouping of sites is assessed on return visits to provide time series information about disposal behaviour in the same location over time in the national benchmark. Core sites (listed in Table 1) can be identified for most major regional and urban centres and are defined in Appendix C. Combining observational measurements from core sites ensures meaningful comparisons of disposal behaviour can be made between cities and regional centres.

Table 1 National Benchmark Core Sites Studied Using the OA

CORE SITES OBSERVED		
Beaches	Parks	Shopping malls
Malls	Public buildings	Transport terminals
Markets	Shopping strips	Waterfronts

The information obtained from observations is analysed to determine the characteristic disposal behaviours associated with various sites and cities.

Measuring Disposal Behaviour

Collecting observational information in exactly the same manner enables the DBI levels for the same site type to be compared under different conditions. Once sufficient numbers of observations have been made in a site type, information representing the disposal behaviours typical of that site type can be interpreted.

The DBI level for a site is a numerical representation of environmentally undesirable behaviours such as littering *as well as* the positive behaviours such as bin use and recycling that occur in a site. Table 2 summarises the descriptions of disposal behaviours typically found at each of seven levels of the DBI.

Table 2 Levels of DBI

DBI LEVEL		DESCRIPTION OF DISPOSAL BEHAVIOURS IN A SITE FOR EACH LEVEL OF DBI
1	Low	Little use of bins, clear majority of people littering. Area is a litter "hot spot" requiring urgent attention and a priority for clean up.
2	Base	High proportion of people littering with base level of bin use. Prompt action is required to bring litter rates down and to increase binning.
3	High Base	Binning is greater than littering. Action is needed to create opportunities for effective recycling and to reduce littering expected behaviours.
4	Mid Range	Bins used twice as much as people litter but there is potential for improved behaviour as littering can be reduced and bin use improved.
5	High Mid	Sites where people clearly were *Doing the Right Thing* but where littering or inappropriate use of bins remains an issue to be addressed.
6	High	Binning greatly exceeds littering and appropriate bin use occurs most of the time. Minimal action required to recover resources and prevent litter.
7	Peak	Minimal littering with prominent and appropriate bin use and good potential to recover resources. Maintenance required for clean & largely litter free area.

The higher the numeric level recorded for the DBI in a location, the more positive the behaviours - people litter less, use bins more, and place the right items into the correct bins. In contrast, the lower

the DBI, the greater the amount of littering, the lower the level of bin use, and the higher the contamination of bins for that site.

In sites with peak DBI levels, people seem to respond to the cleanliness of the location by taking more care with their disposal actions compared to other areas. In these peak level sites where public place recycling facilities are also provided, people will often spend a few seconds standing at bins sorting their waste to ensure that they help reduce contamination and maximise the recovery of resources.

In contrast, low-level DBI scores are found in sites that are highly littered. Many people who typically do not litter may find themselves doing so in low DBI sites because they seem to get caught up in 'following the herd' or herd behaviour. Low-level DBI sites often become litter hot spots and appear to attract further littering. In these sites, immediate clean up operations are required as a priority action.

DBI scores characterise the behaviours seen in a site and provide a basis for comparing disposal behaviour in different locations, sites, and cities.

Littering Behaviour Studies Data Set

DBI information collected throughout Australia during the national benchmark study and through other LBS projects has provided the world's most comprehensive summary of public place littering, binning and recycling behaviours. Since 1997, information has been collected in public places in every capital city, in some regional areas, at special events and during research evaluation programs. The numbers of observations in the LBS data set to the middle of 2004 have been summarised in Table 3.

In 2004, the increased geographical coverage of the LBS was maintained to continue the exploration of disposal behaviour in regional centres while continuing to ensure the integrity of comparisons between annual measures of disposal behaviour in capital cities compared to baseline, established in 2000[2]. Data for five regional centres were collected in the 2003 and 2004 studies - Launceston (Tas), Ballarat (Vic), Wollongong (NSW), Townsville (Qld) and Alice Springs (NT).

[2] The baseline is a starting point for monitoring environmentally desirable and/or undesirable behaviour change in Australia.

Table 3 LBS Benchmark Data Set

National Benchmark	Year	Observations	Surveys
Littering Behaviour Study – National Benchmark I	1997	8,900	2,700
Littering Behaviour Study – National Benchmark II	2000	18,300	2,850
Littering Behaviour Study – National Benchmark III	2001	6,600	1,150
Littering Behaviour Study – National Benchmark IV	2002	6,550	1,620
Littering Behaviour Study – National Benchmark V	2003	10,574	1,988
Littering Behaviour Study – National Benchmark VI	2004	11,123	2,233
Sub-total National Benchmark[3]		62,047	12,541
Sub-total LBS Research Projects[4]		31,950	6,370
Total DBI Database 1997 - 2004		93,997	18,911

The accumulation of national benchmark information from baseline to 2004 provides a clearer picture of annual trends in littering behaviour in all locations and core sites. In 2004, only a few special sites (events, festivals, tourist spots, and indoor centres) were measured due to the practical constraints of project planning and a focus on core sites for comparison purposes.

[3] Numbers rounded for ease of comparison.

[4] No additional projects using the OA or the DBI were conducted during 2003 or 2004.

Littering Behaviour in 2004

National Benchmark

Summary Statement

In 2004, improvement in disposal behaviour in core sites throughout Australia was maintained at the 2003 level - high-mid DBI level – 5, demonstrating a sustained national improvement in environmentally desirable behaviour in public places.

National Outcomes

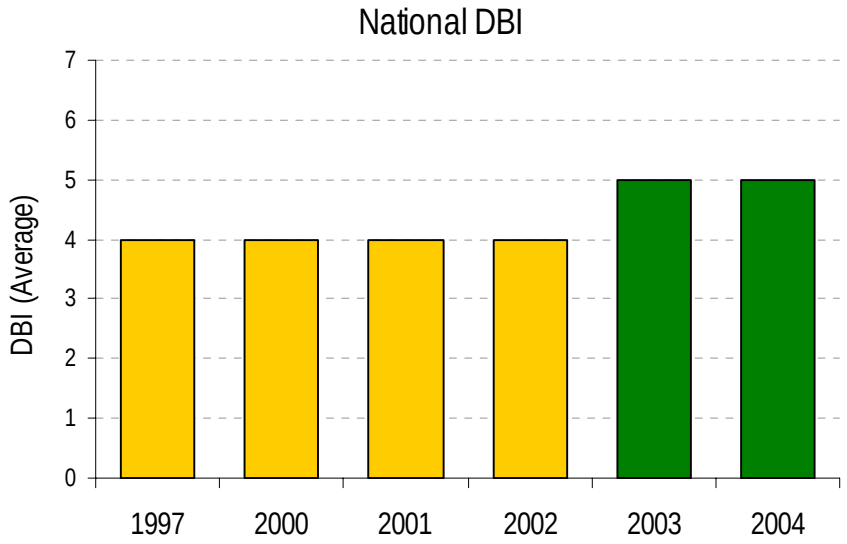

Figure 1 National DBI Averages

Key Findings

1) As evident in previous LBS reports, most Australians visiting public places behave in an environmentally desirable manner most of the time with more than two thirds of people disposing of items appropriately by using general litter and recycling bins rather than littering.
2) A sustained improvement in disposal behaviour in 2003-2004 provides a foundation for additional improvement in community disposal behaviour in the future.
3) There continues to be a need for a national approach to support further increases in environmentally desirable outcomes and reduced littering. A cooperative approach between key industry groups, organisations and government is required if targets and peak DBI levels are to be achieved.

Capital City Benchmarks

Summary Statement

In 2004, improvements in DBI levels were evident for three capital cities – Sydney, Melbourne and Hobart - with levels in Sydney and Melbourne exceeding the national average of a high-mid DBI level - 5. Both Adelaide and Darwin sustained 2003 improvements, demonstrating a DBI level equal to the national average.

Of the remaining cities showing a decline in DBI levels relative to 2003, Brisbane was not able to sustain its 2003 high DBI level – 6, with Perth also unable to consolidate a marked 2003 increase, reverting back to a previous stable mid range DBI level – 4. Canberra was unable to sustain last year's improvement of one DBI level (still below the 2003 national average), with current levels continuing to be well below the national average and below that of all other capital cities.

Capital City Outcomes

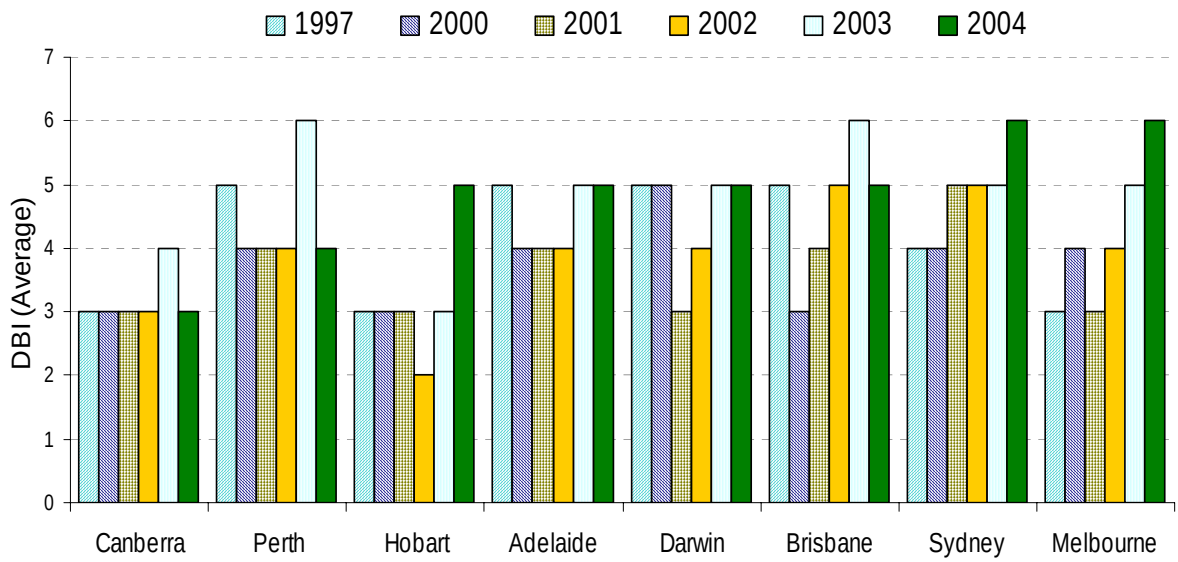

Figure 2 Capital City Disposal Behaviour (DBI Levels)

Key Findings

1) Canberra: Following improvement last year, DBI levels reverted back to a high base DBI level – 3, indicating binning was greater than littering but well below the national average of high mid DBI level – 5. Systematic interventions are required to improve this situation. Changes in cleansing routines, infrastructure and environmental awareness are needed to achieve sustained improvement to bring Canberra into line with the national average.

2) Perth: A marked improvement in disposal behaviour last year was unable to be sustained with DBI levels dropping back to that of the previous three years at mid range DBI level – 4. Current levels indicated that people were twice as likely to use bins as litter but levels were still below the national average.

3) Hobart: Following consistently low DBI levels in previous years, Hobart demonstrated a marked improvement, with DBI levels equal to the national average high mid DBI level – 5. A number of systematic interventions (changes in cleansing routines, infrastructure and environmental awareness) appear to have been implemented in Hobart contributing to this increase.

4) Adelaide: A return last year to national average levels (high mid DBI level – 5) following lower levels during the three previous benchmarking periods, was consolidated in 2004. DBI levels were sustained at the national average, providing a foundation for future improvement.

5) Darwin: After a return to national average levels in 2003 following declines in 2001-2002, Darwin also consolidated last year's improvement. Similar to Adelaide, DBI levels sustained at the national average provide a good foundation for future improvement.

6) Sydney: Sydney's sustained DBI levels during the last three benchmarking periods at high mid DBI level – 5 improved further in 2004 to a high DBI level – 6, exceeding the national average. Binning greatly exceeded littering with minimal additional action required in most places to prevent litter.

7) Brisbane: After exceeding the national average initially at baseline, and demonstrating a significant decrease to high base DBI level – 3 in 2000, Brisbane showed steady improvement in the following three benchmarking periods, culminating in a high DBI level - 6 last year. This was not sustained in 2004 however, with Brisbane's DBI level now at the national average high mid DBI level - 5.

8) Melbourne: Following previous variable DBI levels between high base DBI level – 3 and mid range DBI level – 4, and an improvement to the national average level of high mid DBI level – 5 in 2003, Melbourne demonstrated a further improvement to a high DBI level – 6 in 2004, exceeding the national average. Similar to Sydney, binning greatly exceeded littering with minimal additional action required in most places to prevent litter.

Capital City Site Type Benchmarks

Summary Statement

Parks, markets and public buildings showed the most positive disposal behaviour of all site types at a high DBI level – 6, with parks and markets having done so for two benchmarking periods in a row, a very pleasing outcome. Similar to last year, DBI levels in waterfront areas and malls have remained stable at a high base DBI level – 5, with both site types continuing to demonstrate a strong foundation for further improvement.

Shops and beaches were unable to sustain improvements evident in 2003, although shops continue to demonstrate that more than two thirds of people bin their used items with a high base DBI level - 5. Transport areas still perform at levels well below most other site types, demonstrating a high degree of variability. A high base DBI level – 3 indicates that although binning was greater than littering, systematic interventions are required to achieve sustained improvement for this site type.

Site Type Outcomes

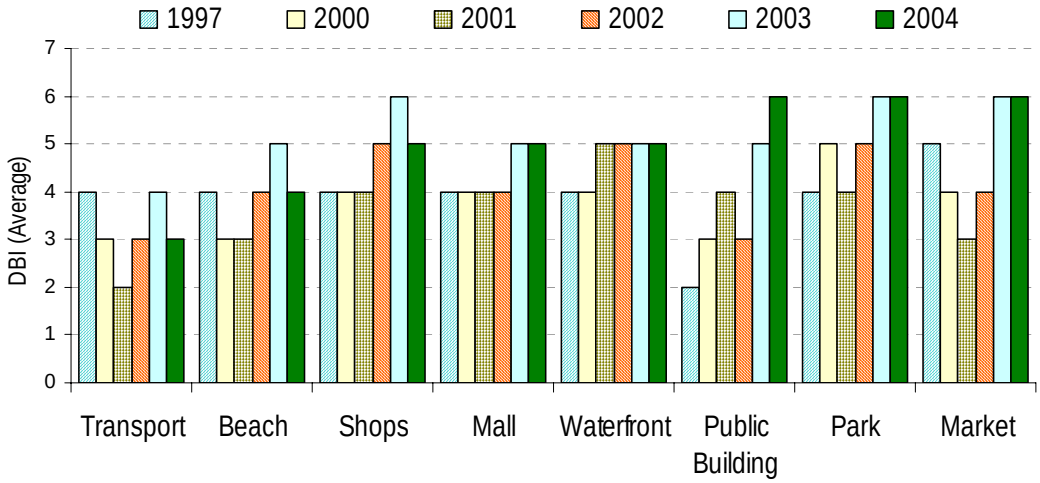

Figure 3 Site Type Disposal Behaviour (DBI Levels)

Key Findings

1) Transport areas: Transport areas continued to demonstrate variable DBI levels, with a trend for improvement in the last three benchmarking periods (from very low levels in 2001) unable to be sustained. The 2004 high base DBI level – 3 indicated binning was greater than littering but that a large potential for improvement exists. Systematic interventions are required to improve this situation, with changes in cleansing routines, infrastructure and environmental awareness needed to achieve sustained improvement to bring transport areas into line with other site types.

2) Public buildings: Originally at low baseline levels, public buildings have shown steady DBI improvement over subsequent benchmarking periods, increasing further in 2004 to a high DBI level – 6, indicating binning greatly exceeded littering with minimal additional action required in most places to prevent litter. Maintaining and developing efforts to improve disposal behaviour outside public buildings should aim at consolidating these pleasing behavioural outcomes.

3) Beaches: Behavioural improvements evident in 2003 (where DBI levels exceeded that of all previous benchmarking periods) were unable to be sustained in 2004, with the DBI level reverting to a mid range DBI – level 4. This level indicates that people were twice as likely to use bins as litter but that sustained effort is required to improve beach sites beyond original baseline levels recorded in 1997.

4) Malls: At a mid range DBI level – 4 between baseline and 2002, DBI levels in mall sites increased to a high mid DBI - level 5 in 2003. This level was sustained in 2004, a very pleasing outcome. The expectation for people in malls to show appropriate disposal behaviour is strong, with a firm foundation existing for additional future improvement.

5) Waterfront areas: Waterfront areas have shown sustained positive disposal behaviour at a high mid DBI level – 5 for four benchmarking periods in a row, indicating that more than two thirds of people are binning their used items. With such a strong established expectation for people to Do the Right Thing, further development of systematic approaches to improve disposal behaviour is highly likely to succeed and appears worthy of increased attention.

6) Parks: Although DBI levels for parks had been positive up to the 2002 benchmark, they were not particularly stable. An improvement in 2003 however, to a high DBI – level 6 was evident again in 2004, indicating that binning greatly exceeded littering with minimal additional action required in most locations to prevent litter. Litter prevention efforts in parks appear therefore to have met with great success, creating a sustained community expectation to Do the Right Thing.

7) Shops: With a steady mid range DBI level – 4 for the first three years of benchmarking, shop sites showed a steady improvement to a high DBI level – 6 in 2003. This was unable to be sustained in 2004 however, with the DBI reverting to a high base DBI level - 5. Although more than two thirds of people were binning their used items, efforts to encourage positive disposals need to be maintained and/or further developed to sustain the very high levels evident last year.

8) Markets: Although DBI levels for markets have been highly variable since the original baseline mid range DBI level – 4, 2003 saw a significant improvement to a high DBI level – 6, where binning greatly exceeded littering with minimal additional action required in most locations to prevent litter. Similar to parks, this level was again evident in 2004, indicating litter prevention efforts have been very successful, creating a sustained community expectation to positively dispose of their used items.

Regional and Capital City Benchmarks

Summary Statement

Disposal behaviour in core sites in both regional centres and capital cities remained unchanged between 2003 and 2004. Regional centres demonstrated a mid range DBI level – 4 indicating that two thirds of people were disposing of their items correctly. More than two thirds of those in capital city locations binned their items as shown by a high base DBI level – 5.

Regional and City Outcomes

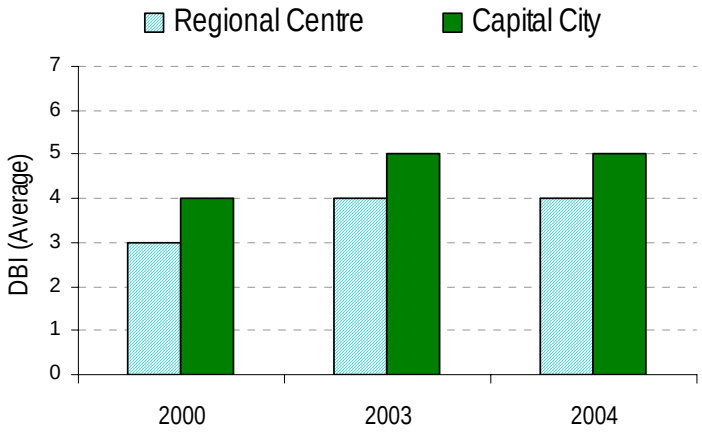

Figure 4 Regional and Capital City DBI Benchmarks Over Time

Key Findings

1) As for 2003, data for the five regional centres showed an average mid range DBI level - 4 indicating most people were using bins rather than littering.
2) Most people visiting public places in regional centres behaved in an environmentally desirable manner most of the time. Around two thirds of people disposing of items in regional centres did so by using general litter and recycling bins rather than littering.
3) As for 2003, DBI levels in regional centres were lower than those in urban centres. Around two thirds of people in regional centres were disposing of used items appropriately whereas more than two thirds of those in urban public places were Doing the Right Thing. Comparatively, increased attention to litter prevention strategies for regional centres appears to be warranted.
4) DBI levels sustained over the two benchmarking periods for both regional and urban centres demonstrated a solid base for further improvement. As result, improved litter prevention efforts are likely to meet with a high degree of success in both areas.

Regional Centre Benchmarks

Summary Statement

Of the five regional centres assessed in 2004, Launceston (Vic), Wollongong (NSW) and Alice Springs (NT) showed an improvement in DBI levels, with Wollongong and Alice Springs demonstrating levels well above the regional average of mid range DBI level - 4. DBI levels were below the regional average in Townsville, unchanged since last year. Following an improvement between 2000 and 2003, disposal behaviour in Ballarat (Vic) had declined markedly with a DBI level below the regional average.

Regional Centre Outcomes

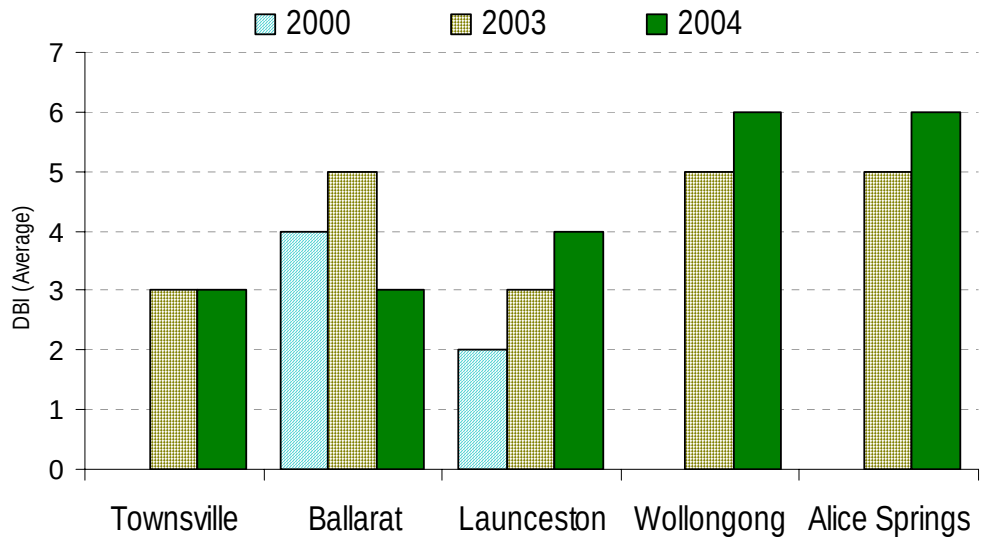

Figure 5 Regional Centre DBI Benchmarks

Key Findings

1) Townsville (Qld): The high base DBI level – 3 evident in 2003 was unchanged in 2004, indicating that binning was greater than littering but below the regional centre average of mid range DBI level – 4. Litter prevention efforts in Townsville continue to require a systematic approach to further improve cleansing routines, maintenance and environmental awareness.

2) Ballarat (Vic): Following an improvement in last year's DBI level (compared to 2000), 2004 levels demonstrated a marked decrease to a high base DBI – level 3, below the regional average. This appeared to mostly a result of littering at shop sites and bus stop areas. Systematic interventions are required to improve this situation, with changes in cleansing routines, infrastructure and environmental awareness needed to achieve sustained improvement.

3) Launceston (Tas): A steady improvement in disposal behaviour from 2000 to 2004 shows a current mid range DBI level – 4 in line with the regional average. Future interventions should aim at developing, or at least sustaining, this positive outcome.

4) Wollongong (NSW): DBI levels in 2003, at a high mid DBI level – 5, showed further improvement in 2004, increasing to a high DBI level – 6 (well above the regional average) indicating that binning greatly exceeded littering with minimal additional action required in most places to prevent litter. Interventions should aim at consolidating this pleasing outcome.

5) Alice Springs (NT): Similar to Wollongong, DBI levels in 2003 were at a high mid DBI level – 5 and increased during 2004 to a high DBI level – 6 (well above the regional average) indicating that binning greatly exceeded littering with minimal additional action required in most places to prevent litter. Similarly, systematic litter prevention efforts should be maintained to consolidate this excellent result.

Site Type Benchmarks – Regional & City Comparisons

Summary Statement

A variety of differences were evident in 2003 for regional centres and capital cities depending on site type. Waterfront areas demonstrated the highest DBI levels for regional centres[5], with parks, shops and markets the best performers for capital cities. Parks, malls and transport areas showed the poorest results for regional centres, with transport areas in need of urgent attention. Transport and mall areas were also lower level performers for capital cities.

[5] Figure 6 shows Public Buildings demonstrated the highest DBI level but only one public building, Alice Springs GPO, was represented in this category with general conclusions therefore unable to be drawn.

Site Type (Regional and City) Outcomes

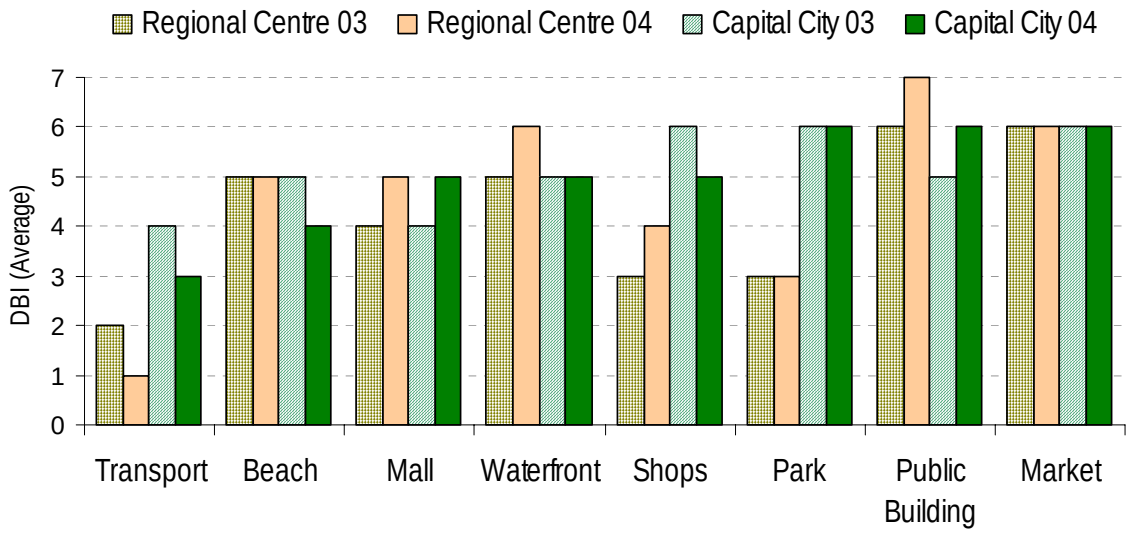

Figure 6 Regional Centre Site Type Benchmarks 2004

Key Findings

1) As in 2003, capital city DBI levels in 2004 were higher than regional centres for transport sites, parks and shops. Regional centre DBI levels were higher for public buildings, although it should be noted that only one public building, Alice Springs GPO, was represented in this category. In contrast to 2003, where regional centre and capital city DBI levels were the same for all remaining site types, regional centre DBI's for beaches and waterfront areas exceeded those of capital cities. DBI levels were the same for malls and markets whether they were in regional centres or capital cities.

2) As in 2003, the largest difference for 2004 was for parks, where capital city DBI's exceeded those of regional centres by three DBI levels. Although a difference of this magnitude was also evident in 2003 for shop sites, this had decreased to a difference of only one level in 2004, due both to an improvement in regional centres and a decline in capital cities.

3) As noted in LBS6 (2003), transport areas in regional centres showed a high proportion of people littering with a base DBI level – 2 evident in 2003. This had further declined in 2004 to a low DBI level – 1, indicating little use of bins with a clear majority of people littering. In 2003, prompt action was recommended to bring littering rates down and to increase binning. In 2004, transport sites in regional areas have become litter 'hot spots' requiring urgent attention and should be considered a priority for clean up.

Trends in Littering Behaviour for Particular Locations

Information about disposal behaviour in capital city core sites has been collected in the same site wherever possible during each benchmark period. Therefore, trends in behaviour for specific locations can be tracked by examining movements in annual DBI measures [6]. Changes in disposal behaviour in a location can be used to help stakeholders refine their litter prevention initiatives and structure educational campaigns.

Factors Affecting Location Information

Sometimes during the scheduled national data collection, behavioural observations may not be collected in a location due to extremely low numbers of people using the area. Beach, park and waterfront locations, for example, are particularly susceptible to the effects of inclement weather, rain and wind. Consequently, incomplete comparisons may exist for some locations over the benchmark periods, with some even needing to be replaced because of refurbishment or reconstruction of the original location. In some cases, the original location may no longer exist depending on the size and scale of the redevelopment works.

The effects of weather and physical changes may mean that a particular location was not able to be included in the benchmark study in every year of data collection. Where a particular location was not able to be used again, it was replaced with a similar location that shared as many of the characteristics of the original location and site type as possible.

The complete list of core site types and locations studied has been presented in Appendix D (capital cities) and Appendix E (regional centres). A number of locations have information for all benchmark periods while others have information for only one year; some locations have been added only recently in 2004.

In the sections below, wherever possible, trends in disposal behaviour have been summarised to show patterns evident since 1997. Not all locations included in the 2004 benchmarking study have been included in the trend tables, ie, if DBI levels were not able to be readily categorised they have not been included. As mentioned above though, all individual location results have been included in Appendices D and E.

Locations with Stable DBI's

In some locations, DBI levels have remained relatively unchanged since baseline. Table 4 summarises the locations, site types and cities where DBI levels have remained relatively stable over years of observation.

It should be noted that only one location used in the benchmark studies has shown exactly the same DBI level since 1997 baseline, ie, Adelaide's Glenelg Foreshore. However in other locations, DBI levels have demonstrated a shift of only one DBI level for a single year. There is therefore a relatively stable expectation for disposal behaviour in these locations (either appropriate or inappropriate) persisting over a number of years.

[6] Trends for locations within individual regional centres have been provided using data from 2000, 2003 and 2004 and are shown in Appendix E.

Table 4 Locations with Stable DBI Levels

City	Site	Location	1997	2000	2001	2002	2003	2004
Darwin	Market	Mindil Beach Market					7	7
Darwin	Shops	Parap Market	5	7		7	7	7
Canberra	Market	Gorman House	7	7	6	3	7	7
Adelaide	Park	Glenelg Foreshore		6	6	6	6	6
Adelaide	Park	Hindmarsh Square	5	5	5	4	4	5
Brisbane	Beach	Surfers Paradise	4	4	4	4	5	5
Canberra	Shops	Garema Place	3	3	4	3	3	4
Melbourne	Beach	St Kilda Beach		3	3	3	4	4
Hobart	Mall	Elizabeth St Mall	2	2	3	3	2	2
Hobart	Transport	City Bus Stops	2	2	2	2	3	2
Canberra	Transport	Woden Transit Centre	1	1	1	1	2	2

For example, Canberra's Woden Transit Centre has consistently demonstrated low DBI levels over time, indicating that littering remains a common feature of this site and is probably the expected behaviour in this location, although a small improvement was evident in 2003 and sustained in 2004. Conversely, the expected disposal behaviour for people using Darwin's Parap Market is for almost no littering and correct use of bins.

Locations with a Trend for DBI Improvement

Table 5 summarises the city, site type and location where DBI scores indicate a trend for improvement in 2004 relative to earlier outcomes.

Table 5 Locations with Stable DBI Levels and a Trend for Improved Behaviour

City	Site	Location	1997	2000	2001	2002	2003	2004
Darwin	Market	Nightcliffe Market		5	5	7	7	7
Perth	Park	Central Park		6	5	7	7	7
Hobart	Market	Salamanca Markets	4	4	5	3	6	7
Melbourne	Mall	Bourke St Mall	2	3	4	5	6	6
Melbourne	Shops	Southgate	4	5	5	6	6	6
Sydney	Park	Bondi Beach Park	4	4	4	6	6	
Sydney	Mall	Bondi Junction Mall	3	3	3	4	4	6
Melbourne	Shops	Southgate	4	5	5	6	6	6
Melbourne	Mall	Bourke St Mall	2	3	4	5	6	6
Hobart	Public Building	GPO	2	2	2	1	5	5
Hobart	Shops	Murray St	2	3	3	2	4	4

Although DBI levels have not necessarily been stable for these sites since baseline, a trend for improvement has become evident. For example, between 2000-2001, the behaviours observed in Darwin's Nightcliffe Market indicated very few people littering and consistent use of bins. In 2002, there was a marked improvement in this already positive result with a peak DBI level – 7 being recorded, sustained in 2003 and 2004.

In contrast, between baseline in 1997 and 2001, DBI levels for Sydney's Bondi Junction Mall indicated a high level of littering. An improvement though was evident in 2002 and 2003, with an additional DBI increase in 2004, a very pleasing result.

A further illustration of a location with a reliable trend for DBI improvement is Melbourne's Bourke Street Mall, where DBI increases have been steadily apparent as interventions were systematically introduced and tracked during each benchmarking period. The impact of these changes in infrastructure, including the introduction of new litter bin facilities, recycling bins and then cigarette butt bins, was further reflected in the sustained DBI improvement in this busy location in 2004.

Locations with a Trend for DBI Decline

Following the inclusion of DBI outcomes for 2004, there were no locations considered to show a clear overall trend for decline since 1997. The four locations listed in 2003 as demonstrating a trend for decline all showed improvement in 2004, with three showing DBI increases of two levels: Canberra's Civic Bus Stops (high base DBI – level 3), Hobart's Elizabeth Street Mall (mid range DBI level - 4) and Melbourne's Yarra River Waterfront (peak DBI level – 7).

Although a trend for DBI decline was evident in Melbourne's Yarra River waterfront area previously in 2002 and 2003, the site nevertheless performed at a high mid DBI level – 5 during those two benchmarking periods, with disposal behaviours consistently showing a high level of bin use and low littering. The subsequent 2004 DBI level was the location's best outcome since 1997 baseline.

In its first year of benchmarking, Canberra's Civic Bus Stops demonstrated consistent littering and low levels of bin use evident from a consistent base DBI level - 2. Unfortunately in 2002, and again in 2003, this DBI level fell further to a low DBI level – 1, indicating the was a 'hot spot' in need of urgent and regular clean up prior to a major program of strategic improvement. Although the location still has plenty of room for improvement, a 2004 high base DBI level - 3 indicates an arrest of the earlier decline.

Locations with Variable DBI's but Improvement Since Baseline

In quite a number of locations, DBI levels have shown significant variation over time. Table 6 summarises those sites where DBI levels were variable but where an improvement has become evident since baseline.

Table 6 Locations with Variable DBI's but Improved Since Baseline

City	Site	Location	1997	2000	2001	2002	2003	2004
Melbourne	Waterfront	Yarra River	6	6	6	5	5	7
Hobart	Waterfront	Constitution Dock	3	5	5	3	6	7
Brisbane	Park	PO Square	5	4	2	5	7	7
Adelaide	Shops	Rundle - King William	5	4	6	7	6	6
Perth	Shops	Murray & Barrack Sts	3	4	3	5	6	6
Sydney	Public Building	Town Hall	1	4	3	3	6	6
Canberra	Park	Glebe Park	4	3	5	6	5	6

Although such variation is difficult to account for, it is worth identifying any recent improvements, as local users and managers of these areas may be able to point to changes in site use, features, infrastructure or other initiatives which may benefit from further reinforcement or development.

Locations with Variable DBI's but Decline Since Baseline

Table 7 shows two sites where DBI levels have varied significantly over time but where there has been a decline in disposal behaviour in 2004 compared to earlier studies.

Table 7 Location with Variable DBI's but Decline Since Baseline

City	Site	Location	1997	2000	2001	2002	2003	2004
Sydney	Beach	Bondi Beach	4	3	6	5	5	3
Perth	Beach	Cottesloe Beach	7	3	6	5	4	1
Darwin	Transport	Casuarina Bus Stop			2	1	3	1

As with the improved sites, the reasons for variability and decline need to be further examined at a local level. In the case of Bondi Beach, it is interesting to note that a series of planned interventions to the area appeared to have resulted in behavioural improvements up until 2004, when a compulsory ban on smoking was introduced. Although speculative, one explanation might be that community backlash against this decision has resulted in the behavioural decline evident in 2004, although this would need to be systematically investigated in more detail before accurate conclusions could be drawn.

Locations with High DBI Inconsistency

In some locations, large inconsistencies in disposal behaviour have been evident during the course of the benchmark studies. Table 8 summarises the city, site type and location where DBI scores have demonstrated such variability.

Table 8 Locations with High DBI Inconsistency

City	Site	Location	1997	2000	2001	2002	2003	2004
Hobart	Park	Parliament Square		5	6	4	1	6
Darwin	Park	Tamarind Park	2		3	6	4	5
Hobart	Shops	Liverpool Street	3	5	2	2	6	5
Melbourne	Market	Victoria Market	4	2	3	6	7	5
Brisbane	Waterfront	South Bank Parklands	5	4	3	5	7	5
Adelaide	Beach	Glenelg Beach	5	2	3	6	5	4
Perth	Mall	Murray St Mall	5	3	3	2	5	4
Darwin	Waterfront	Strokes Hill Wharf	1		5	3	2	4
Brisbane	Mall	Queen St Mall	4	3	6	4	5	3
Brisbane	Transport	City Bus Stops		2	2	6	5	3
Brisbane	Transport	City Bus Stops		2	2	6	5	3
Sydney	Beach	Bondi Beach	4	3	6	5	5	3

Such inconsistent levels demonstrate the importance of considering local factors in evaluating sustainable change. It is difficult to account for such high levels of variability which can be due to planned changes in infrastructure, cleansing routines or other initiatives, unintentional changes or lack of maintenance of earlier interventions, or other extraneous factors. In any case, these data may act as a positive catalyst to effect change.

Disposal Behaviour in Special Sites

The main purpose of the national benchmarking studies is to record trends in disposal behaviour in core sites throughout Australian capital cities each year. However progress toward best practice in managing litter in public places and recovering resources through public place recycling is also assessed in special sites at events, festivals, tourist spots and indoor centres.

Special site data is not included as part of a city's DBI score because information is less consistently obtained, data collection depending on the particular events and activities scheduled during the benchmark data gathering period, weather conditions at the time of events and the number of additional LBS projects being conducted in a given year. In 2004, data was collected only for the special site categories of festivals and tourist spots.

Festivals

Outcomes for festivals included in the 2004 benchmark study have been summarised below in Table 9 below.

Table 9 DBI Levels for Festivals

City	Festival	2000	2001	2002	2003	2004
Hobart	Wooden Boat Festival				7	
Hobart	Regatta Day at Centopath Domain				5	7
Melbourne	Mordialloc Food & Wine	6		5	6	7
Melbourne	St Kilda Festival					6
Canberra	Balloon Festival				7	
Canberra	Alive & Navy Day	6	6		6	
Canberra	Sunday By the Lake				5	
Launceston	Festivale				7	7
Ballarat	Begonia Festival				1	

DBI's were at peak levels for three of the four festivals assessed in 2004, an excellent result. A peak DBI level - 7 was evident for Launceston's Festivale (sustained at 2003 levels), Hobart's Regatta Day at Centopath Domain (a marked improvement from a high base DBI – level 5 in 2003) and Melbourne's Mordialloc Food and Wine Festival (improved from a high DBI level – 6 in 2003).

The remaining festival (assessed for the first time in 2004), Melbourne's St Kilda Festival demonstrated a high DBI level – 6, indicating that binning greatly exceeded littering with minimal additional action required in most places to prevent litter.

Tourist Spots

The baseline DBI for tourist spots (identified from a range of sites in the 2000 benchmark) was a mid range DBI level - 4. In 2004, only two tourist spots were studied - Rottnest Island in Western Australia and Port Arthur in Tasmania, as shown in Table 10.

Table 10 Tourist Spots DBI Levels 2004

City	Tourist Spot	1997	2000	2001	2002	2003	2004
Perth	Rottnest Island	6	4	6	6	6	6
Hobart	Port Arthur (overall)	3	3	3	6	3	7
Hobart	Port Arthur Park						5
Hobart	Port Arthur Transport						7
Hobart	Port Arthur Waterfront						7

In 2002, compared to earlier benchmarking studies, DBI levels for Hobart's Port Arthur showed a marked improvement in disposal behaviour, however there were relatively few people using the site at that time due to inclement weather. In 2003, in more typical conditions, the DBI level reverted back to a high base DBI level - 3. In 2004, presumably as a result of systematic intervention, Port Arthur demonstrated a peak DBI level – 7, an outstanding outcome, largely the result of improvements in the transport and waterfront areas as also shown in the table above. Perth's Rottnest Island continued to perform very well with a high DBI level– 6, evident for the fourth year in a row.

Consumption Activities in Sites - Regional & City Comparisons

Summary Statement

Consumption activity patterns (for eating, drinking and smoking[7]) were observed for core sites throughout Australia, with the results compared for regional centres and capital city locations, according to site type. The patterns of consumption activity for regional centres and capital cities were fairly similar for the different site types.

Consumption Activities (Regional and City) Outcomes

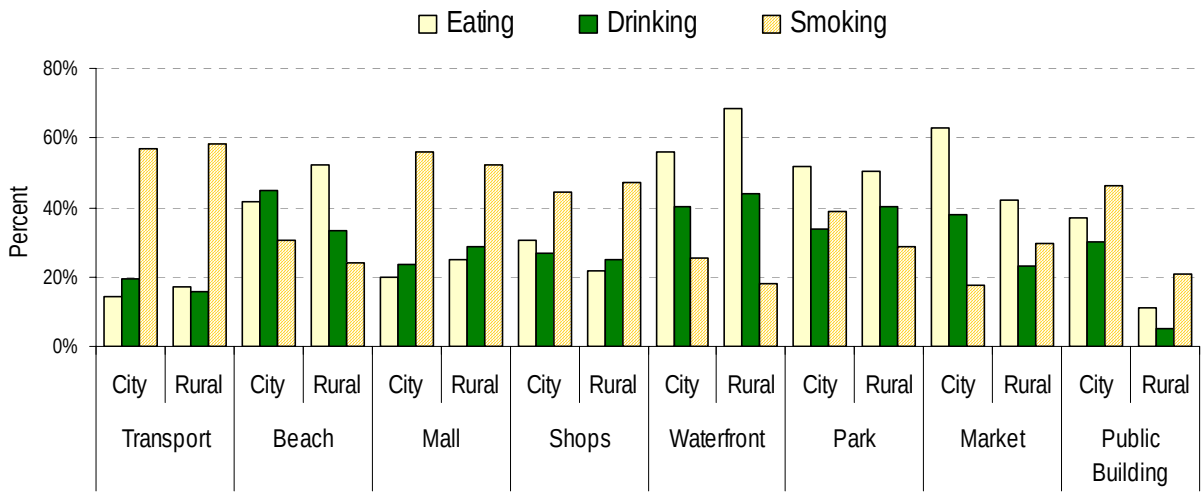

Figure 7 Consumption Activity Patterns in Sites in Regional Centres and Capital Cities

[7] Consumption of chewing gum consistently accounts for less than 1% of disposable items and so has not been included in the 2004 analysis. Clean up of chewing gum, however, is a problematic issue and the prevention of chewing gum litter remains a high priority.

Key Findings [8]

1) With the exception of markets and beaches, the pattern of consumption activity was very similar for regional centres and capital cities across the various site types. That is, for all but two site types, the differences in DBI levels between regional and city sites were not likely to be the result of the type of activities observed.

2) For markets, similar to 2003, people were somewhat more likely to be observed drinking and eating (ie, more likely to be disposing of beverage containers and food related items) in capital cities than in regional centres. This was not particularly noteworthy however, since markets again performed at a high DBI level – 6 for both regional centres and capital cities (see Figure 6).

3) For beaches, in contrast to 2003, people were somewhat more likely to be observed eating and drinking in regional centres than capital cities, however the DBI in regional centre beaches remained unchanged since last year at a high mid DBI level – 5. City consumption patterns were similar to those for 2003 although the DBI dropped from a high base DBI level - 5 to a mid range DBI level - 4 with changes therefore likely to be the result of other factors.

Littered Items – Regional and City Comparisons

Summary Statement

The types of items littered in core sites throughout Australia are shown in Figure 8, with results compared for regional centre and capital city locations. As in 2003, the most frequently littered item in 2004, cigarette butts, was more likely to be littered in regional centres than in capital cities.

[8] Data does not always add to 100% as one person may be engaged in more that one activity. 'Other' activities have not been included as numbers were negligible. For this reason, in the case of the 'public building' category for regional centres, total activities add to less than 100%. This was due to a high proportion of 'other' activities being performed in the only location for this category, Alice Springs GPO. Unusually, compared to other locations, users tended not to be eating, drinking or smoking, but were disposing of mail related material after checking their post boxes.

Littered Items Outcomes

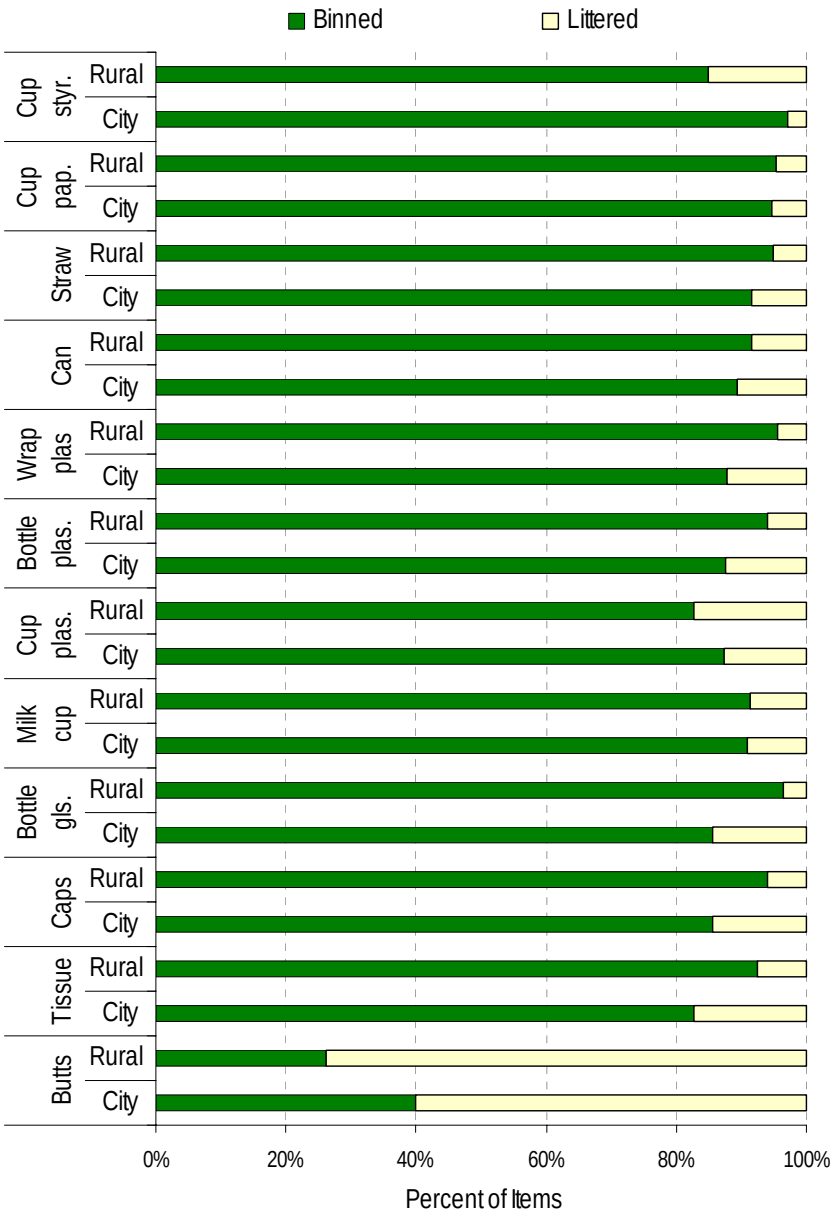

Figure 8 Littering and Binning of Most Frequently Disposed Items for Regional Centres & Capital Cities [9]

Key Findings

1) As in previous studies, cigarette butts were the item most likely to be disposed of in public places comprising one quarter of all observations. In regional centres, almost three quarters (74%) of all littered items were butts, with this rate at 60% for capital city locations.

2) In 2004, cigarette butts in both regional and city locations were again much more likely than other item types to be littered than binned. All other items disposed of were much more likely to be binned than littered.

[9] To promote readability, results for cardboard boxes, confectionery wraps, paper wrapping, paper bags, plastic bags, plastic containers and plastic lids have not been not been included in the chart. Typically, 95% of these item types were binned with no regional/capital city differences.

3) There were small differences in regional centre/capital city littering rates for the remaining item types where styrofoam cups were somewhat more likely to be littered in regional centres, and glass bottles, tissues and bottle caps somewhat more likely to be littered in capital cities. These differences were relatively small however (8-12%) with much smaller numbers of disposals for these items compared to cigarette butts.

Attitudes and Disposal Behaviour

Survey Response Rate

The OA enables objective comparisons between what people *say* they do with their litter in public places and what they *actually* do with it. It also allows comparisons of the extent to which people are aware of their behaviour and the congruence of behaviour with their espoused attitudes.

Summary Statement

Survey responses for 2004 represented the wide range of disposal behaviours found in public places and were not biased towards the views of people who either littered or used bins.

Survey Response Rate Outcomes

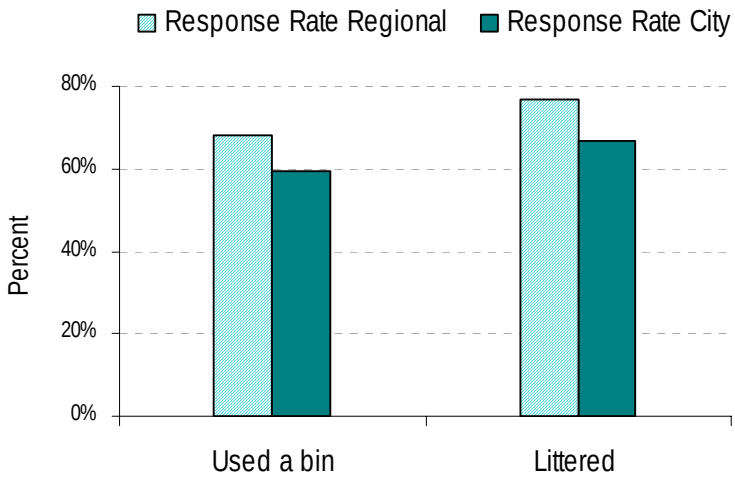

Figure 8 Response Rates to Requests for Interviews Throughout Australia

Key Findings

1) Community willingness to participate in surveys on environmental issues continues to be evident. In 2004, almost two thirds of those observed to have disposed of an item, and asked to complete a survey, agreed to do so. This was somewhat lower than in previous benchmarks though, where almost three quarters of those approached agreed to participate in a survey.

2) There were no differences in the proportion of people agreeing or refusing to do an interview relative to whether they were observed to litter or use a bin. That is, people's willingness to participate in surveys was not associated with their disposal behaviour.

3) As in 2003, slightly more people in regional centres agreed to participate in a survey, whether or not they had littered or binned.

Self-Awareness and Frankness About Littering

Summary Statement

As in previous benchmarks, most people who had littered in public places throughout Australia were unable to remember whether they had littered or were unwilling to admit it.

Self Awareness About Littering in Australian Cities – Outcomes

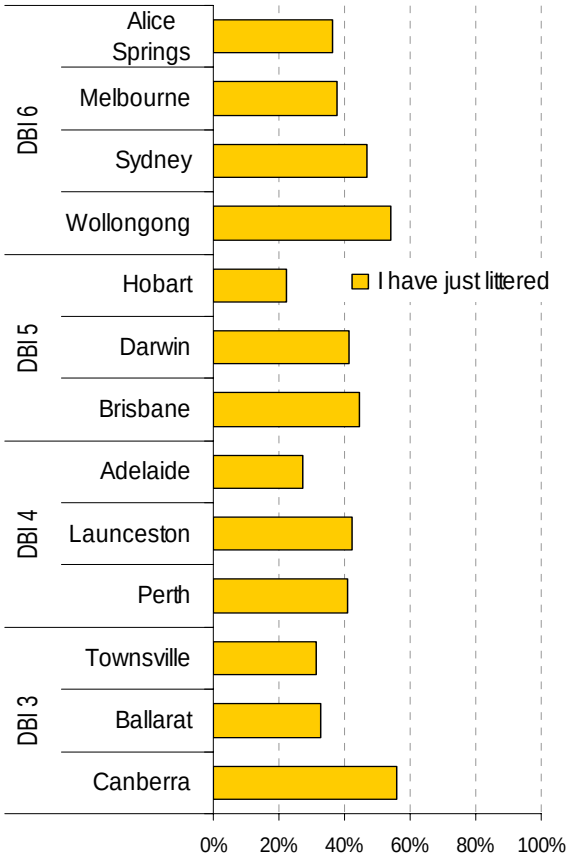

Figure 9 Litterer's Awareness of Littering

Key Findings

1) In 2004, similar to 2003, 61% of the people who had littered in public places around Australia were unable to remember whether they had littered or were unwilling to admit it. This was comprised of 15% who said 'they never littered' and 46% who said they had littered at some time in their life but not in the last 24 hours or that they 'didn't know' when they last littered (but it was not recent).
2) Of those people observed littering immediately prior to agreeing to do an interview, 39% were aware of littering or admitted that they had just littered.
3) As in earlier LBS benchmarks, there were large variations between cities in the way people who had just littered responded to being asked about their littering behaviour. These variations did not show a consistent relationship to DBI outcome for each city. Furthermore, in 2004, there were no differences in the accuracy of recall between regional centre and capital city survey respondents.

4) As noted in previous LBS benchmarks, regardless of disposal behaviour levels across Australia, many people either cannot recall their own behaviour or deliberately misrepresent it. A primary target for intervention efforts is therefore not only to facilitate greater awareness of littering activities but to create a positive social expectation that littering behaviour is unacceptable.

5) Relying on self-report as a sole indicator of behaviour is problematic. Simply talking to people about their views on environmental issues and asking about their actions is not the most valid approach in accurate representation of behaviour.

Attitudes to the Environment and Littering

Summary Statement

As in previous LBS benchmarks, litter prevention and public place recycling were important to the overwhelming majority of people using public places. Despite these espoused views many people continued to admit to littering.

Attitudes to the Environment - Outcomes & Key Findings

1) The level of support for recovering resources through public place recycling and litter prevention continued to be extremely high and congruent with previous benchmark studies, with this support consistent for all capital cities. In 2004, as previously, almost all survey respondents (95%) reported that litter was a 'very important' issue.

2) Despite most people believing litter prevention and anti-littering activities to be extremely important, 85% of all respondents admitted that they had littered at some point in their lives (an increase from the 2003 rate of 74%). Although people knew they should not litter, they continued to behave in a manner incongruent with their espoused attitudes.

'How Bad It Is to litter This Item' – Outcomes & Key Findings

Respondents were asked to rate 'how bad it was' to litter various types of items commonly consumed in public places. Figure 10 summarises the support from respondents for it being 'very bad' to litter various items.

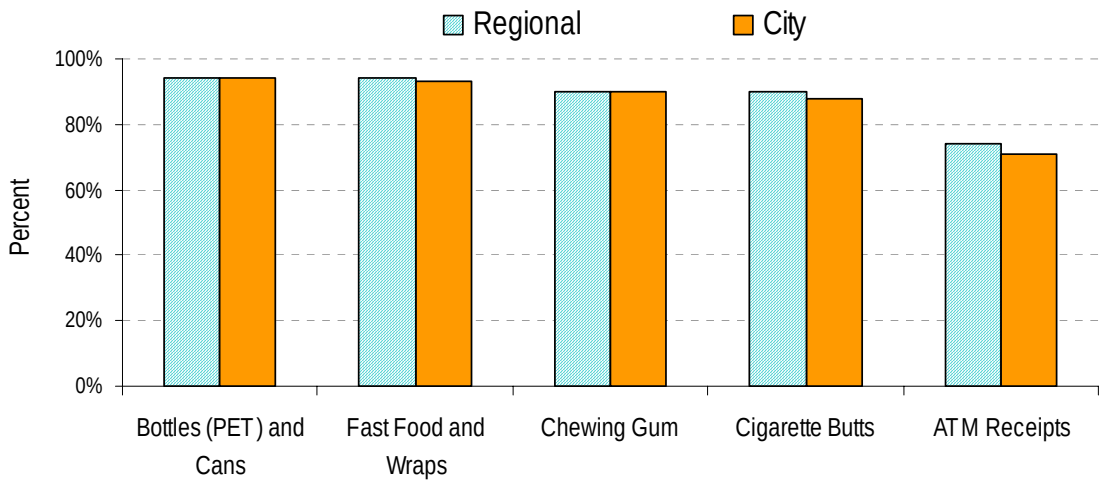

Figure 10 Rating of 'How Bad it is to Litter This Item'

1) Overall there were no differences in 'how bad it was' to litter the various item types compared to 2003 [10].
2) As in 2003, there were no differences in responses according to whether respondents were in regional centres or capital cities.
3) As previously, respondents were somewhat less likely to report that it was bad to litter ATM receipts compared to other item types.

Support for Public Place Recycling – Outcomes & Key Findings

Respondents were asked about their level of support for public place recycling (PPR) with respect to the area in which they were being interviewed, as well as at events generally. They were also asked about the importance of recycling to them and whether they thought all packaging should be recyclable.

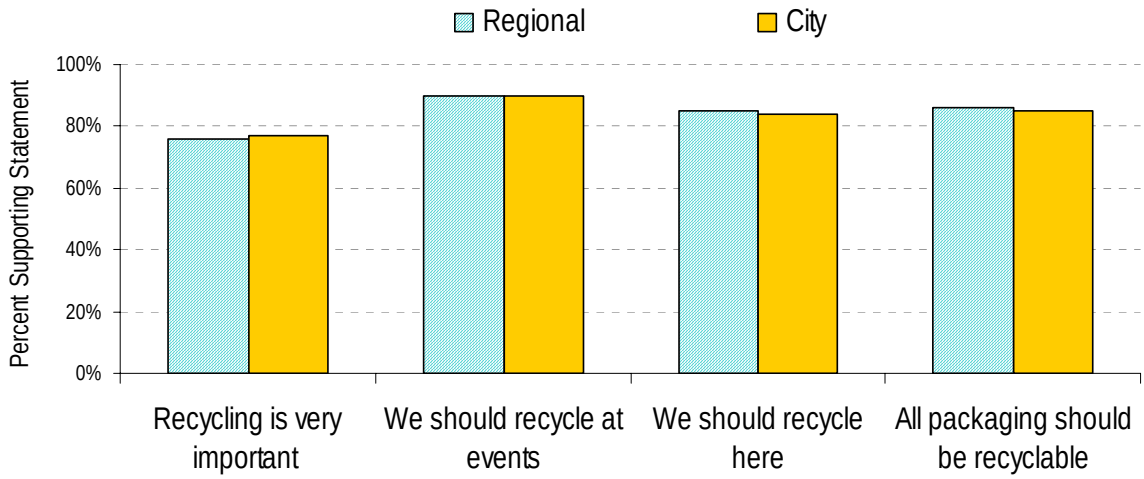

Figure 11 Support for Public Place Recycling to Recover Resources

1) As in previous studies, the level of support for public place recycling facilities did not appear to be associated with variations in disposal behaviour across capital cities or regional centres. That is, for the majority of respondents, strong support was evident across the board for public place recycling [11].
2) Also as in previous studies, there were no differences between regional centres and capital cities in respondent's high level of support for PPR, both in the place they were being interviewed, as well as at events generally. There were also similar levels of support for the importance of recycling and for all packaging to be recyclable.

[10] Not shown in figure above.

[11] Not shown in figure above.

Demographic Features & Disposal Behaviour

The profile of those using public places in the 2004 national benchmark study was reviewed to determine if disposal behaviour was associated with particular demographic characteristics.

Gender & Disposal Behaviour

Summary Statement

There was no clear relationship between the gender of those using public places and disposal behaviour.

Gender & Disposal Behaviour – Outcomes & Key Findings

1) In 2004, men were slightly more likely to be represented in observations of public places throughout Australia (54% in capital cities and 49% in regional centres) in line with previous studies.
2) Overall, similar to previous benchmarking studies, there did not appear to be any major association between gender and disposal behaviour. Men and women were equally likely to be seen using a bin or littering. For example, in capital cities, 33% of men were observed to litter compared to 34% of women; in regional centres 36% of both men and women were observed to litter.

Age & Disposal Behaviour

Age has often been thought to be associated with littering behaviour with young people often identified as major litterers. This perception has, in part, probably been influenced by the prominence of young people using public places. The relationship between age and disposal behaviour is shown in Figure 12.

Summary Statement

All age groups were much more likely to bin than litter, both in capital cities and regional centres.

Age & Disposal Behaviour - Outcomes

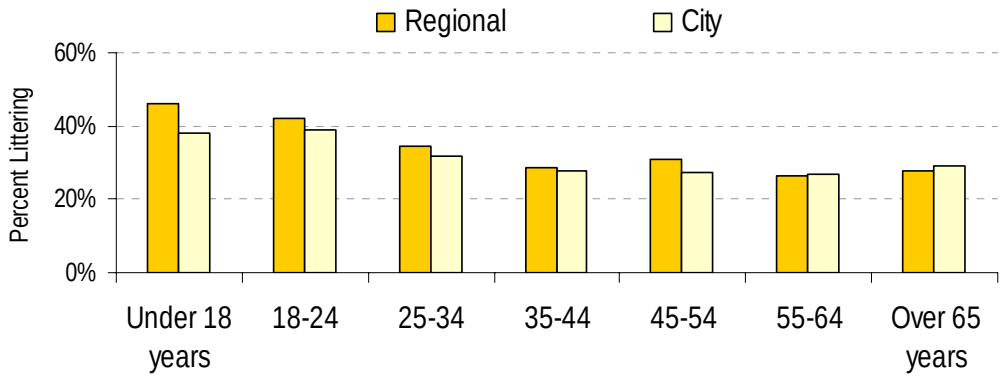

Figure 12 Age and Disposal Behaviour

Key Findings

1) As in previous studies, younger people were found to comprise a relatively high proportion of those people in public places. One third of people observed in public places were under 25 years old, increasing to just over half (56%) for those under 35 years.
2) In capital cities, the pattern of age distribution in public places was similar except for Darwin, which had the lowest proportion of young people with less than one quarter below 25 years. Hobart, Melbourne and Brisbane had the highest proportions of those under 25 years (38%).
3) In regional centres, the pattern of age distribution was also similar, except for Alice Springs, which had the lowest proportion of young people with less than one quarter below 25 years. Launceston had the highest proportion of those under 25 years (54%).
4) All age groups were more likely to bin than to litter. In 2004 (in contrast to 2003), those under 18 years of age in regional centres were also more likely to bin their disposable items (54%) than to litter them.
5) Across age groups, littering rates were very similar between regional centres and capital cities. The greatest difference in littering rates was for those aged under 18 years (46% for regional centres and 38% for capital cities). In any case, as mentioned above, for the first time those under 18 years in regional centres were now more likely to be binning their items than littering them.

Age, Group Size & Disposal Behaviour

A more detailed examination of the relationship between age and disposal behaviour demonstrates some of the complexity involved in understanding this relationship. Figure 13 shows littering rates for people in different sized groups according to age.

Summary Statement

In capital cities, people were more likely to litter as the size of their group increased, no matter what their age. Prior to 2003, this finding was only evident for young people. In regional centres, there was also a general tendency for those under 55 years to litter as group size increased, although it was not as great as that for capital cities.

Age, Group Size & Disposal Behaviour Outcomes

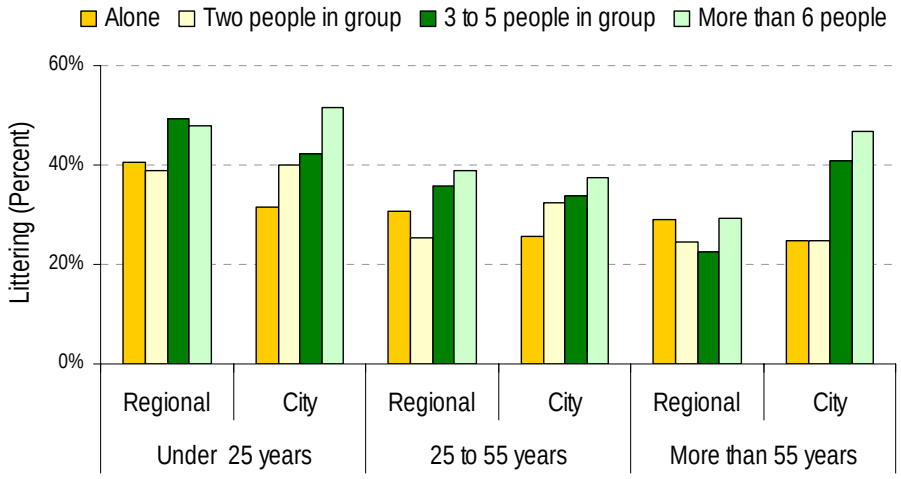

Figure 13 Proportion of People Littering in Various Group Sizes According to Age

Key Findings

1) Prior to 2003, LBS data showed that, in capital cities, young people were more likely to litter as the number of people in their group increased. In 2003, for the first time, this trend was evident for other age groups as well. This outcome was confirmed in 2004 for all three age groups, with littering far more likely as group size increased, highlighting the importance of peer pressure as an influence on behaviour for all those in public places, not just young people.

2) In 2003, when regional data was collected for the first time, the increased likelihood for people in regional centres to litter as the number of people in their group increased was not consistently evident for people in any age group. In 2004 though, there was a general tendency for those under 55 years to litter as group size increased, although when people were in groups of two, they appeared to be least likely to litter. Group size did not seem to influence the littering rates for those over 55 years in regional centres.

Employment and Disposal Behaviour

Summary Statement

For the first time in 2004, homemakers were the employment group most likely to litter. Those working and retired people were the groups most likely to bin items, both in regional centres and capital cities. In contrast to 2003, there was a similar pattern for littering between capital city and regional centres in relation to employment status.

Employment & Disposal Behaviour Outcomes

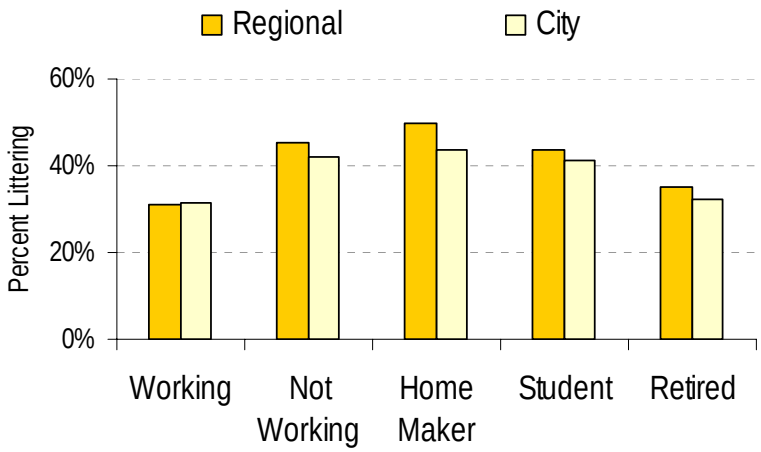

Figure 14 Employment Status and Disposal Behaviour

Key Findings

1) In previous benchmarks, those not currently in paid work were more likely to litter than those in other employment categories. For the first time in 2004, homemakers were the employment group most likely to litter, with this group in regional centres almost equally likely to use a bin as to litter. This was a puzzling result in view of the fact that homemakers were previously the group least likely to litter. Anecdotally, many homemakers were observed to be smoking, with the littering of butts possibly making a major contribution to this outcome. Those working and retired people were the group most likely to bin items, both in regional centres and capital cities.

2) In regional centres in 2003, those in all employment categories were somewhat more likely to litter than their counterparts in capital cities. In 2004, with the exception of homemakers, the extent of this difference was reduced though, with littering rates for those currently working actually the same for capital cities and regional centres.

Education and Disposal Behaviour

Summary Statement

In terms of education level, three of the four groups were more likely to use a bin than to litter, with secondary educated respondents in capital cities equally as likely to bin as to litter. Regional centre/capital city differences in 2004 were not congruent with outcomes for the previous benchmark period in 2003.

Education & Disposal Behaviour Outcomes

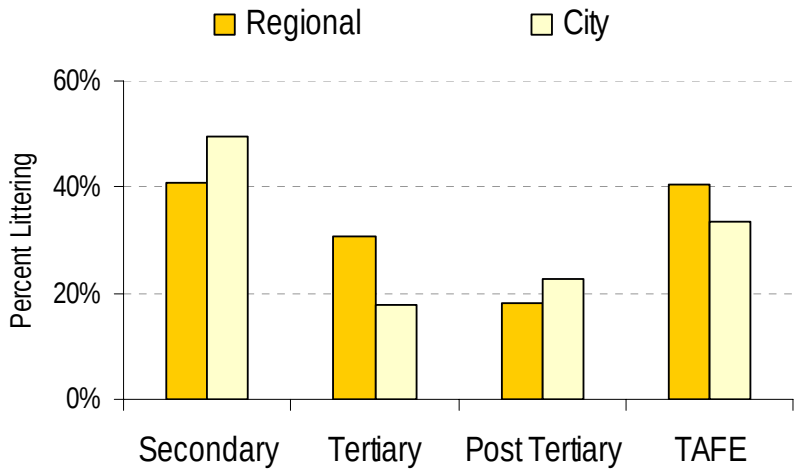

Figure 15 Education and Disposal Behaviour

Key Findings

1) For capital cities, similar to previous benchmark studies, those in three of the four education categories were more likely to bin than to litter. Secondary educated respondents in capital cities were equally as likely to bin as to litter, in contrast to 2003 when they were more likely to bin. Those with a secondary school or TAFE education were more likely to be observed littering than tertiary/post tertiary educated respondents.
2) In regional centres, those in all education categories were more likely to bin than to litter. Similar to capital city respondents, those in regional centres with a secondary or TAFE education were more likely to be observed littering than tertiary educated respondents. Post tertiary educated respondents in regional centres comprised only 4% of the total sample (n=22) with limited conclusions able to be drawn for this group.
3) In 2004, secondary educated people in regional centres were less likely to be observed littering than their city counterparts. In contrast, tertiary and TAFE educated respondents in regional centres were more likely to litter than those in capital cities. These outcomes were not congruent with those for 2003, indicating a high degree of variability in relation to education level and disposal behaviour in relation to capital city/regional centre differences.

Place of Residence & Disposal Behaviour

Summary Statement

There was no clear relationship between place of residence and littering behaviour, although those from interstate appeared least likely to litter in both regional centres and capital cities. Those in all 'place of residence' categories however, were more likely to bin than to litter.

Place of Residence & Disposal Behaviour Outcomes

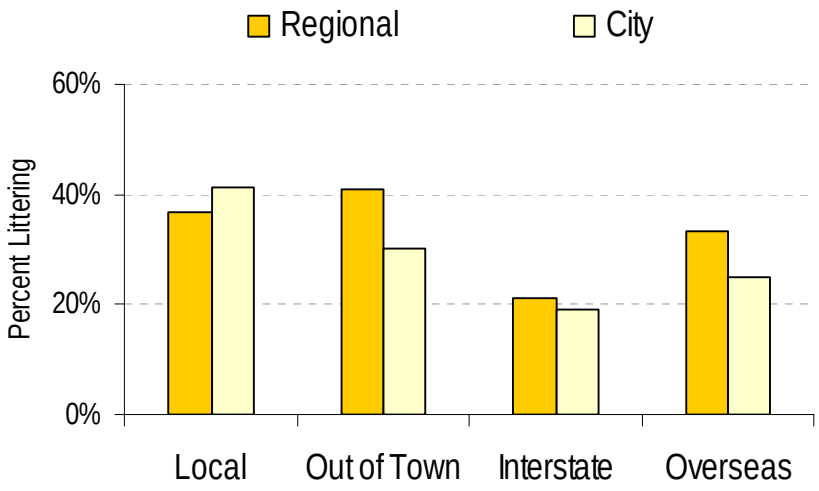

Figure 16 Place of Residence and Littering

Key Findings

1) Just under two thirds (61%) of all those surveyed throughout Australia described themselves as local residents of the place where surveys were conducted, a somewhat lower rate than in 2003 (72%).Slightly more locals were represented in the regional centre city sample (66%) than in capital cities (59%), with a greater proportion of overseas visitors evident for the capital city sample than in 2003.

2) As in previous benchmark studies, respondents from all 'place of residence' groups were more likely to bin than to litter.

3) For capital cities, locals were more likely to be observed littering than other groups, whereas those from out of town were the group most likely to litter in regional centres. Those from interstate were the group least likely to litter in both regional centres and capital cities. As was the case with education level, regional centre/capital city differences were not particularly congruent with those evident in 2003.

Reasons People Give for Littering

When asked why they littered, people gave a variety of responses as shown in Figure 17.

Summary Statement

Congruent with previous benchmarking studies, the most common explanations offered for people on why they littered were that there were 'no bins or ashtrays nearby' or that they were 'too lazy'. Some deliberate decision making appeared to be involved for most littering behaviour.

Reasons People Give for Littering – Outcomes

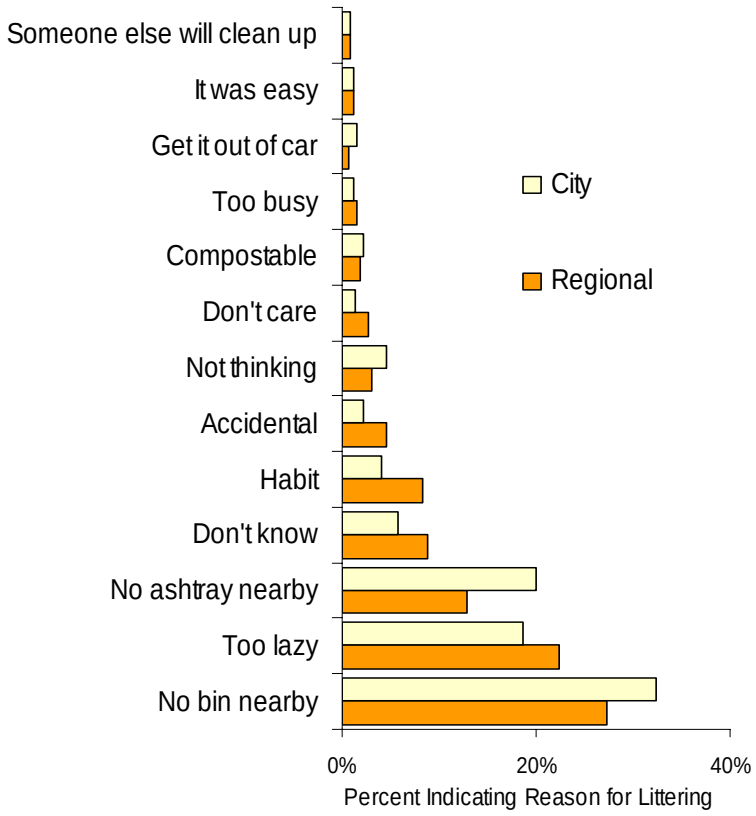

Figure 17 Reasons People Gave for Littering

Key Findings

1) The pattern of responses was again similar to previous benchmark studies, with only a relatively small number of explanations offered by people for why they had littered. Also, as previously, by far the most frequently given responses were that 'there was no litter bin or ashtray nearby' or 'too lazy'.

2) Again similar to previous benchmarking studies, few people indicated that they littered as a habit, or that they did it without thinking, indicating some deliberate decision-making was involved for most litterers.

3) In terms of the three most frequently given responses, there were only small differences between capital cities and regional centres. Differences consistent with 2003 results were a slightly greater tendency for city respondents to give 'no bin nearby' as a reason for littering, with regional respondents slightly more likely to report 'too lazy' as a reason.

Bin Distance and Disposal Behaviour

Bin Distances in Regional & City Site Types

Summary Statement

In seven of the eight core site types, people in regional centres had to walk further to use a bin than their capital city counterparts, although for malls, shops, markets and transport sites, these differences were negligible or non existent.

Bin Distance in Regional & City Site Types - Outcomes

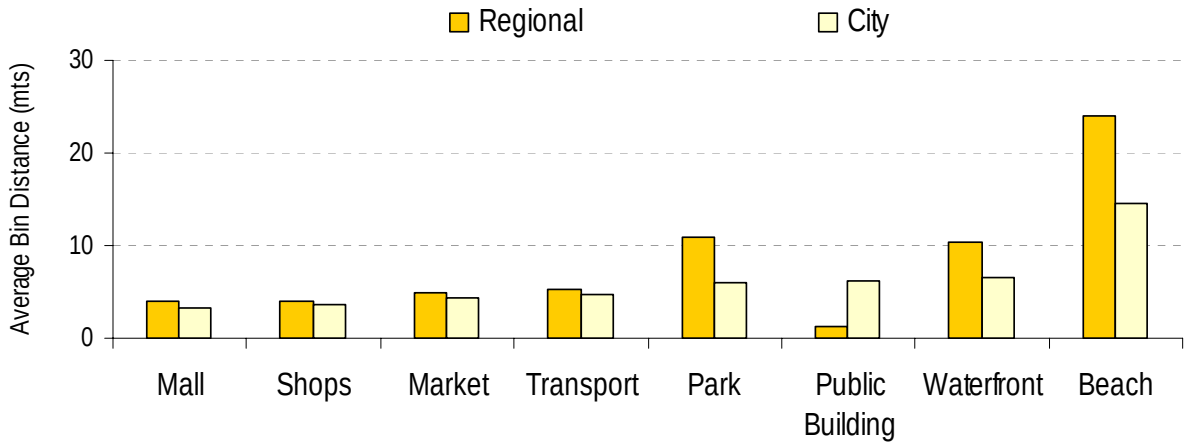

Figure 18 Bin Distance and Core Site Types

Key Findings

1) As in 2003, differences existed between core site types in regional centres and capital cities in terms of the distance people had to walk to use a bin.

2) Bin distance was greater for regional areas than for capital cities in all but one site type. This difference was greatest for beaches (15 metres for capital cities and 24 metres for regional centres) and smallest for malls (3 metres for capital cities and 4 metres for regional centres). Similarly, shops, market and transport sites demonstrated similar differences of a relatively negligible size, or no difference at all, in line with 2003 outcomes. Although bin distance appeared smaller for public buildings in regional areas, this was due to the fact that only one public building was assessed, Alice Springs GPO. For the remaining categories, bin distance was 6 metres for parks in capital cities and 11 metres for regional centres, and for waterfront sites, 7 metres for cities and 10.5 metres for regional areas.

Effects of Bin Distance on Disposal Behaviour

Summary Statement

In 2003, as in previous studies, patterns of binning and littering according to bin distance revealed that overall, the distance a person was from a bin was associated with their disposal behaviour. Although greater bin distances were associated with an increased tendency to litter, the actual distance itself was closely associated with site type. However, there appeared to be no simple bin distance 'formula' applicable to all site types.

Effects of Bin Distance on Disposal Behaviour - Outcomes

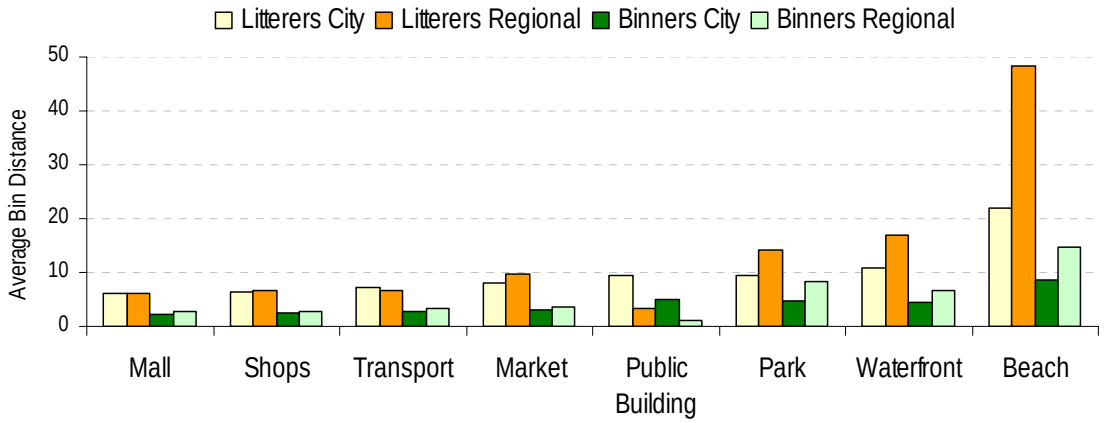

Figure 19 Bin Distance and Patterns of Disposal Behaviour for Regional Centres & Capital Cities

Key Findings

1) In 2004, as in previous benchmark studies, patterns of binning and littering according to bin distance revealed that the distance a person was from a bin was indeed associated with their disposal behaviour.

2) Although greater bin distances were associated with an increased tendency to litter, the actual distance itself was closely associated with site type. As shown in previous studies, in different sites, people were more likely to bin or to litter depending on the physical distance to a bin that was characteristic for that site (as shown in Figure 19). For example, in capital cities, people at beaches walked three times as far to use a bin (9 metres) than those in transport areas (3 metres). At regional centre beaches, people walked five times as far (15 metres for beaches and 3 metres for transport areas).

3) For capital cities, the distance litterers and bin users were from a bin varied greatly for each site type but did not show a clear relationship to DBI levels. For example in 2004, as for 2003, distance to a bin was similar for transport and market site types, yet DBI levels were high for markets (high DBI level – 6) and lower for transport areas (high base DBI level - 3), with this phenomenon similar for both capital cities and regional centres. There appeared to be no simple bin distance 'formula' applicable to all site types, with people appearing to have different expectations of particular sites in relation to bin distance.

Community Assessments of Disposal Facilities

Bin Effectiveness

In addition to examining disposal behaviour according to bin distance, LBS surveys in core sites assessed community opinion on how littered they thought the site was, bin effectiveness, the need for more bins and whether bins could stand out more.

Summary Statement

In 2004, people in regional centres were more likely than those in capital cities to report the need for more bins and for bins to stand out more, with both these levels somewhat higher than in 2003. Respondents in capital cities were more likely than those in regional centres to report bins as effective.

Bin Effectiveness – Community Assessment Outcomes

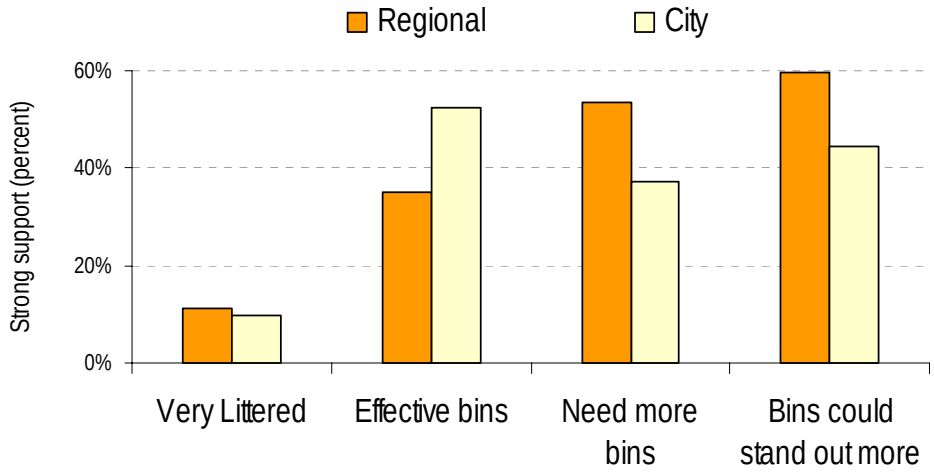

Figure 20 Bin Effectiveness Assessments for Regional Centres & Capital Cities

Key Findings

1) Similar to 2003, when asked about bins in the location in which they were being interviewed, over half of capital city respondents reported bins as effective. Those in regional centres however, were less likely to report this to be the case.
2) Most capital city respondents reported that numbers of bins were adequate. Just over half the respondents in regional centres however, reported the need for more bins; this was an increase of approximately 10% compared to 2003.
3) Nearly 60% of those in regional centres reported that bins should stand out more (an increase of 10% compared to 2003), with capital city respondents somewhat less likely to report that bins should be more prominent.
4) Relatively small proportions of people perceived the site in which they were being interviewed as very littered, with respondents in capital cities equally as likely as those in regional centres to report this to be the case.

Bin Effectiveness (Community Assessments) and Disposal Behaviour – Capital Cities

Previous LBS outcomes for capital cities have shown a broad association between how littered a site appeared to the public and the DBI levels for those sites. Generally, the lower the DBI, the more likely the public was to view those sites as 'very littered'.

In previous studies, with respect to adequacy of bins, respondents from the lowest DBI capital cities were most likely to report the need for more bins and least likely to report bins as being effective. Conversely, respondents in the highest DBI capital cities were least likely to report the need for more bins and most likely to report bins as being effective. Apart from these extremes at either end of the DBI scale though, there was no reliable association between the need for more bins and bin effectiveness. There was also no consistent relationship in relation to making bins stand out more. These relationships were examined for capital cities in the 2004 benchmark study.

Summary Statement

In contrast to earlier capital city benchmarks, no consistent relationship was found between the DBI level and community assessments of bin effectiveness.

Bin Effectiveness (Community Assessments) & Disposal Behaviour Outcomes for Capital Cities

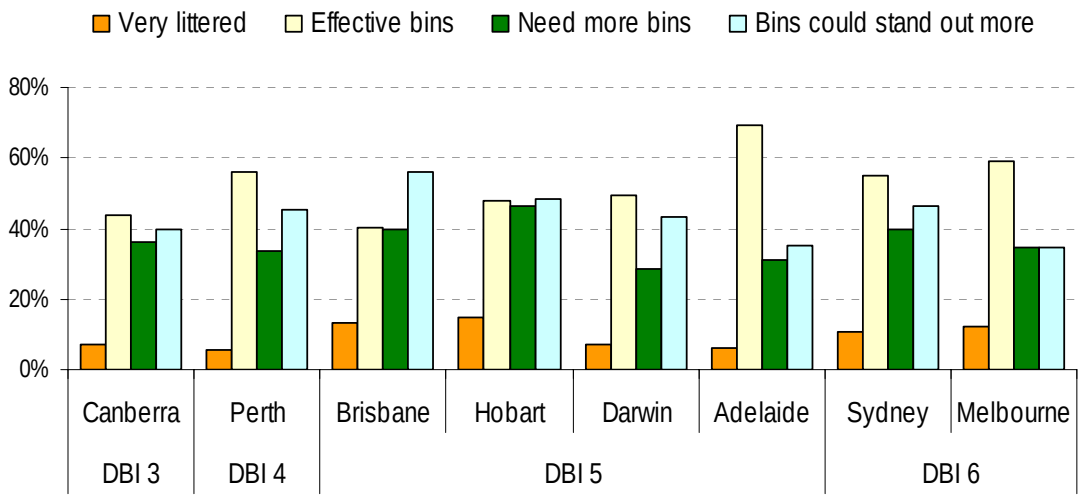

Figure 21 Bin Effectiveness Assessments for Capital Cities

Key Findings

1) For capital cities in 2004, no consistent relationship was found between the DBI level and any of the bin effectiveness factors – how littered a site was; whether bins were effective, whether more bins were needed; or whether bins could stand out more.

2) Some outcomes on community assessments of bin effectiveness lay contrary to expectation. For example, respondents in Perth were least likely to report the site as very littered (mid range DBI level – 4) whereas respondents in Melbourne (high DBI level – 6) were more likely to report the site as very littered.

Bin Effectiveness (Community Assessments) and Disposal Behaviour – Regional Centres

Summary Statement

Similar to 2003, no consistent relationship was found between the DBI level and community assessments of bin effectiveness in regional centres.

Bin Effectiveness (Community Assessments) & Disposal Behaviour Outcomes for Regional Centres

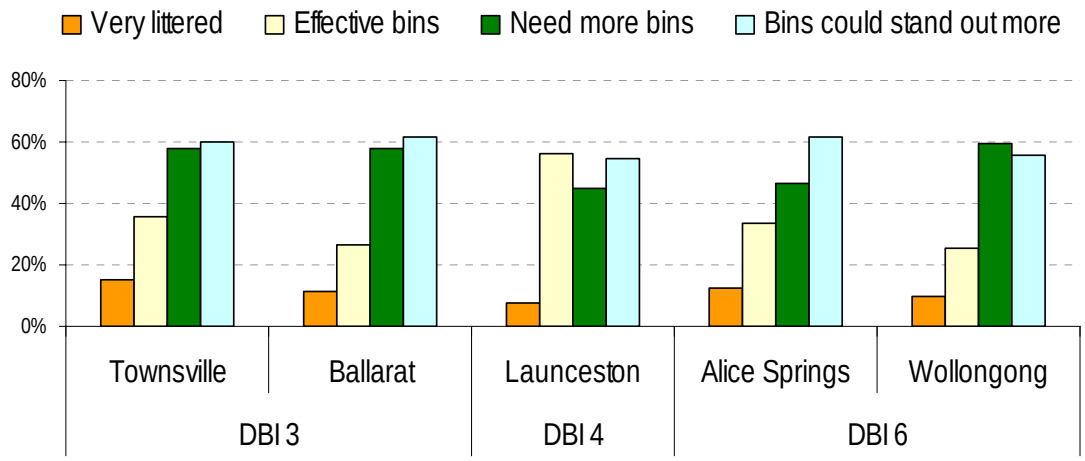

Figure 22 Ratings of Bins and Litter in Regional Sites

Key Findings

1) As in 2003, no consistent relationship was founding 2004 between the DBI level for specific regional centres and respondent's views on a site being very littered, whether they thought bins were effective or should stand out more, and the need for more bins.
2) The majority of respondents in all regional centres reported that bins could stand out more, no matter what the level of disposal behaviour was for the area.

Installing More Ashtrays

Summary Statement

As previously, the great majority of people surveyed in all capital centres and regional centres supported the idea that more ashtrays should be installed in public places. Level of support was not related to DBI outcomes.

Installing More Ashtrays – Community Assessment Outcomes

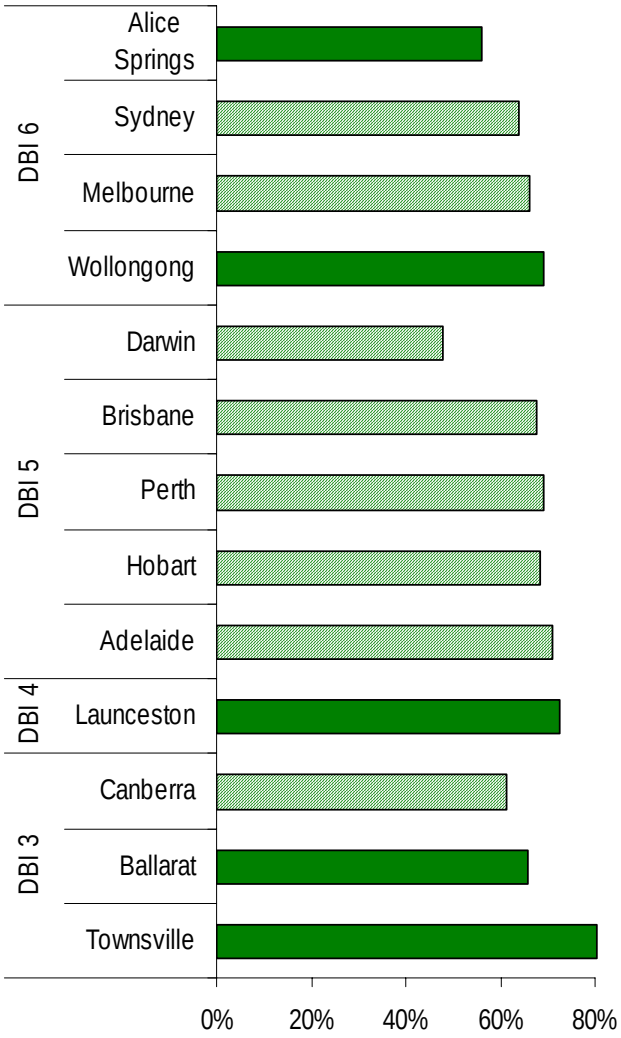

Figure 23 Support for Installing More Ashtrays

Key Findings

1) As in 2003, across all capital cities and regional centres, there was very strong support for the introduction of greater numbers of ashtrays into public places.
2) This support was strongest in Townsville (where the DBI was only at a high base level – 3), with just under 80% of respondents supportive of the need to install more ashtrays.
3) Again, as in 2003, there was no consistent relationship between DBI level and the level of support for installing more ashtrays.

Community Suggestions for Improving Disposal Behaviour

Survey respondents were asked an open ended question about what suggestions they had for improving community disposal behaviour in public places. Community responses are shown below in Figure 24.

Summary Statement

The most common suggestion given by survey respondents to improve disposal behaviour was 'more bins' and the introduction of recycling bins.

Community Suggestions for Improving Disposal Behaviour – Outcomes

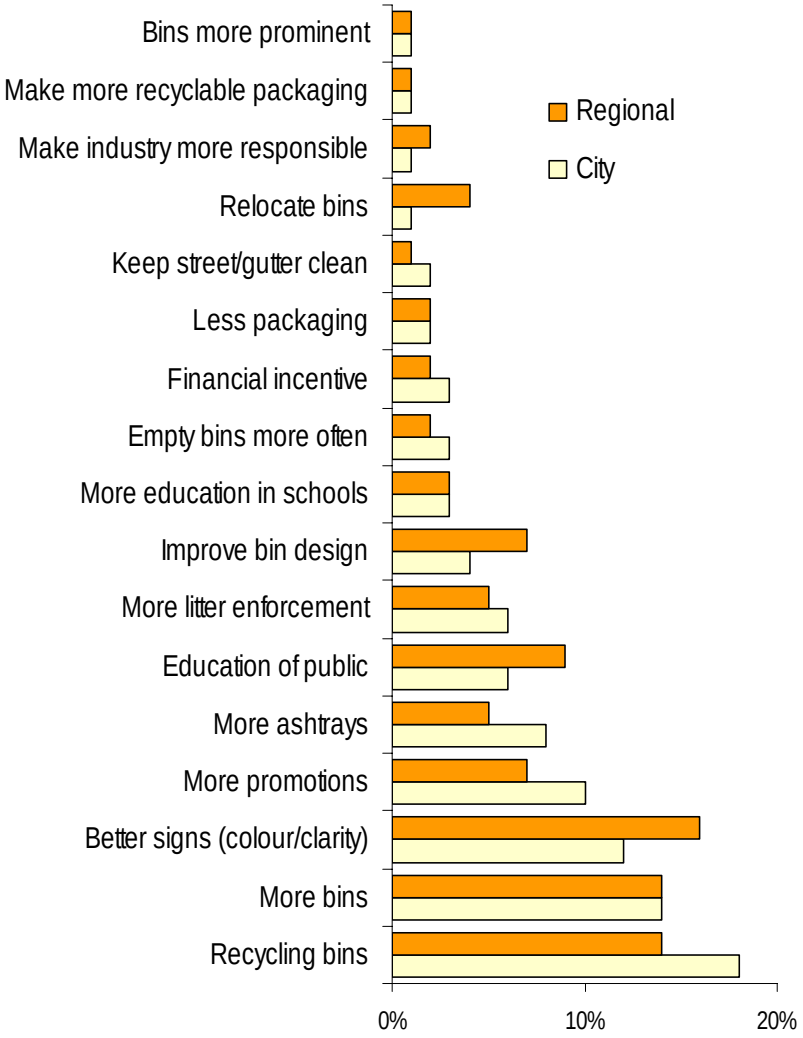

Figure 24 Community Suggestions for Improving Disposal Behaviour

Key Findings

1) In 2004, as previously, the most common suggestions to improve disposal behaviour were 'more bins' and the introduction of recycling bins. Suggestions involving the introduction of some type of bin (including ashtrays) accounted for just under half (44%)

of all responses. In contrast to previous benchmarks, 'better signs' was the third most frequently given response, taking over from 'more ashtrays'.

2) Although there were small differences between regional centres and capital cities in terms of the frequency of responses, none of these was greater than 5%.

Community Awareness of Litter Prevention Advertising Campaigns

Awareness of litter prevention advertising campaigns was assessed by having people recall, unprompted, various litter prevention themes or campaigns with results are summarised in Figure 25.

Summary Statement

Most people in public places could not recall, unprompted, any litter prevention theme or campaign. In 2004, *Clean Up Australia* was the campaign most likely to be recalled, particularly by those in regional centres.

Community Awareness of Litter Prevention Advertising Campaigns - Outcomes

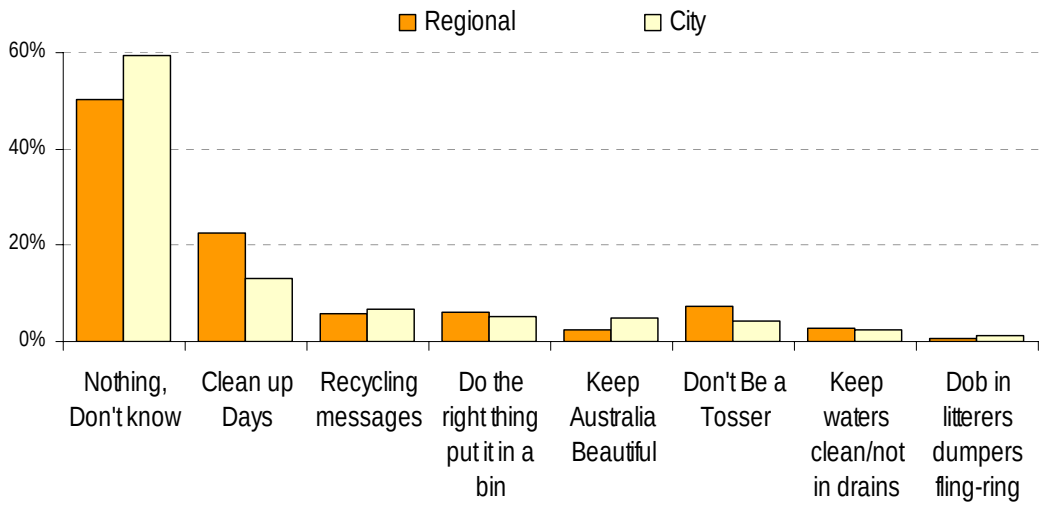

Figure 25 Unprompted Recall of Litter Prevention Advertising Campaigns

Key Findings

1) More than half those surveyed could not recall, unprompted, any advertising campaigns involving litter reduction. Slightly more people responded in this way in 2004 (57%) than in 2003 (55%) and 2002 (45%). Respondents in capital cities were less likely to recall campaigns than their regional centre counterparts.

2) In 2004, 16% recalled the *Clean Up Australia* campaign, with recall of other campaign types at 6% or less. Although 10% of respondents in 2003 recalled the *Do the Right Thing* campaign, only 5% recalled it in 2004, reverting back to 2002 levels.

3) As in 2003, regional centre respondents were still somewhat more likely to recall *Clean Up Australia* than those in capital cities.

Recommendations

The Littering Behaviour Studies provides a valid and comprehensive annual monitor of Australia's progress toward environmentally desirable disposal behaviours and litter prevention.

A number of recommendations made in earlier LBS reports of a medium to long term nature continue to apply in relation to promoting more systematic approaches to litter assessment, management, prevention and evaluation, particularly among local government and other key stakeholders.

In 2004, the sixth year of benchmarking, recommendations specific to individual cities, site types and regional areas, have been made. They include the following:

1) At a national level, encourage all stakeholders to continue with programs of strategic improvement as the national DBI has consolidated at a high mid DBI level – 5. Continue to pursue cooperative approaches between key industry groups, organisations and government in achieving sustainable outcomes and make the most of opportunities to acknowledge the progress and congratulate Australians.
2) At the local council level, the development of a litter prevention strategy using a whole-of-council approach can be an effective way to improve management of local sites. Current approaches that view litter prevention within a broader context of creating well cared for, safe and user friendly public places are most likely to be sustainable, with public places remaining clean and accruing numerous other social and economic benefits in addition to environmental ones.
3) At a capital city level, Canberra continues to lag behind other Australian capital cities in relation to disposal behaviour. Although a program of strategic improvement is required to improve DBI levels, Glebe Park and Gorman House market (although both demonstrating some variability in outcomes) are positive examples of what might be achieved in other areas.
4) At the site type level, transport areas continue to be problematic compared with other site types. Key stakeholders in these areas should be encouraged to attempt to consolidate recent improvements in these challenging public places. Particular attention needs to be paid Canberra's Woden Transit Centre, Ballarat's bus stops and Launceston city bus stops which have been consistent hotspots during benchmarking periods. Civic Bus Stops in Canberra, previously also identified as a hotspot area, showed some improvement in 2004. Reasons for improvement should be investigated with the aim of developing strategies which may have been implemented.
5) Continue to disseminate LBS outcomes to key stakeholders in regional centres to enable them to take advantage of knowledge previously available only to their capital city counterparts.
6) Resources are required to support key stakeholders in transport areas in regional centres who have a difficult task ahead in dealing with poor average levels of disposal behaviour.
7) Support should be given to those who are involved in locations where DBI levels have stagnated at low levels. Facilitating positive, cooperative approaches to problem solving, building local capacity and developing strategic approaches to litter prevention should provide the greatest possibility for success.

Appendices

Appendix A: The Complexity of Littering Behaviour

The LBS series is based on the accepted notion that littering behaviour is part of a complex phenomenon and people do not simply fall into stereotypical categories of being either 'litterers' or 'non-litterers'. Efforts at behaviour change need to take a variety of factors into account and seemingly simple solutions - such as the issuing of fines, for example - cannot on their own be expected to lead to sustainable long-term outcomes.

The disposal actions of individuals and groups tend to vary with the items people are using and the context in which they use them. People who report littering consistently in every type of public place seem to be relatively rare. Many people litter in some places and not others, while others only litter particular types of used item, eg, a cigarette butt, chewing gum or bank auto teller receipts but not beverage containers or paper products.

Furthermore, the same item may be littered by the same person in some situations but not others. For example, a smoker may litter a cigarette butt on a beach but not in a grassy waterfront area near a lake. In a shopping mall, a person may litter a cigarette butt but put their used glass bottle into a recycling bin and used lunch wrapping into a litter bin.

In the past, there has been a tendency to focus attention on littering as a separate activity unrelated to the way the public uses bins or takes advantage of other disposal opportunities such as using a public place recycling or composting.

An individual's disposal behaviour is a product of the context in which the behaviour occurs, or site specific factors that influence a person (eg, 'following the herd'), the individual's motivation to control their disposal behaviour, the infrastructure made available for the containment of litter and recovery of resources, as well as the level of community awareness about disposal choices and the approach taken by packaging manufacturers to encourage environmentally desirable behaviour and responsible disposal of used materials.

Appendix B: Definitions and Terms

Words and terms used throughout the report are defined according to their ordinary meanings. The following definitions are provided to clarify the terms used in the Observational Approach and in determining the measures of environmentally desirable behaviour, the DBI.

Litter	Any solid waste object (disposable item or resource) left behind or placed in a location other than a bin or ashtray. Any material disposed of in an inappropriate manner would generally be regarded as litter - the end outcome of an environmentally undesirable disposal action. Common sense was used to determine size of objects to be included as litter. For example, where a few crumbs were left behind they were not considered litter. Cigarette butts were identified as litter.
Litter Hot Spots	Areas where litter is trapped or accumulates. These highly littered areas become litter magnets and attract more littering through *herd behaviour*.
Litter Counts	Systematic method for counting all types of visible litter on the ground in a 48 square metre quadrant within an observation zone.

Disposal Actions

Binning	People observed disposing of an object by placing it securely inside a bin. Objects piled on top of full bins that remained in place until the end of the observation session were recorded as binned. If the object fell out, it was counted as litter.
Littering	Discarding or misplacing an object in an inappropriate disposal location. Littering was recorded when observer determined that the object had been in the person's possession, or they interacted with it before disposal. Littering was also identified when disposal of an object appeared to be accidental (eg, a serviette falling off a plate being carried to a bin). Indoor littering occurred in settings where there was an expectation that people would clean up their litter, eg, people in a stadium who left objects under their seats or people leaving objects on tables in food courts.
Recycling	Correct use of a recycling bin, where people put items marked as acceptable for recovery and reprocessing in the recycling bin.
Composting	Correct use of a compost bin, where people put items marked as acceptable for composting in the compost bin.
Multiple Disposer	People using a bin and/or a recycling bin and/or a compost bin and/or littering during disposal. One person's behaviour may be classed as littering, binning, recycling, and composting within the one session.
Pocketing	Placing a disposable object in a bag or pocket presumably for later disposal or re-use.

Measures of Disposal

DBI	Disposable Behaviour Index. An objective mathematical measure of all the environmentally desirable disposal behaviours found for a specified site for an observation session.
Baseline Measure	Initial level of information recorded as a basis for comparing the effects of interventions and identifying changes and trends over time in a range of actions, eg, littering.
Combined Database	Data from all Littering Behaviour Studies have been combined, as information was collected through the set observation procedures for systematic recording using the OA.
Attitude Surveys	Structured questions were adapted for use in different projects to examine people's underlying beliefs, attitudes, and issues related to environmentally desirable behaviour.
Interventions	Strategies and programs implemented to increase environmentally desirable behaviour, eg, improved bin use and/or reduction of littering.
Standard Measures	Systematic assessment of attitudes to littering and littering behaviour to allow for valid comparisons over time and place.
Demographic Profile	A set of social characteristics of people using an area, identified using observations and surveys.

Appendix C: Site Classification

Site Types

Site types were labels used to summarise the characteristics of public places where people congregated. LBS sites usually contained a bin, seating areas, pedestrian access, and an expectation of personal responsibility for disposing of used objects in an environmentally desirable manner.

Two types of sites were used for gathering information to identify characteristics of disposal behaviour associated with different environments – 'core' and 'special' sites.

Location	The place or geographical position where the observation site was situated includes sub-sites within a particular site type, referred to as locations.
Area	Label used to highlight differences within in a location, which vary significantly because of bins, seating, activities and crowd flow characteristics.
Precinct	A local geographic area defined in close consultation with stakeholders, which provided a focal point for integrating waste minimisation efforts and public place recycling.

Core Sites

Core sites were commonly found in most major regional and urban centres and have been systematically assessed in an annual Littering Behaviour Study conducted in capital cities and centres. Core sites provide the basis for setting baselines, benchmarking and making fair comparisons between centres, both rural and urban.

Beaches	The sandy area between the water and a boundary or border that clearly marks areas for recreation.
Mall	A pedestrian thoroughfare (or sometimes sheltered promenade) with merchandise and food vendors lining the walkway or street, often with limitations on vehicular access.
Markets	Open spaces or covered buildings where merchandise and food stalls provide fresh produce and a range of goods to the public, which often included seating and eating areas.
Parks	Grassy sites with shrubbery or garden beds, children's play equipment, and seats and tables used for picnicking and recreation.
Public building	An area around a building open to the public, which often includes places for people to sit and eat, as areas were within walking distance of food vendors.
Shops	Areas for selling goods or services, often with a vehicular thoroughfare in the middle of a shopping strip lined with merchandise and food vendors, with wide footpaths and places for people to sit.
Outdoor Transport	Transport terminals or waiting and transit areas with pedestrian traffic going to and from public transport and often with space for parking and manoeuvring vehicles.
Waterfront	Areas next to bodies of water (eg, river, lake or pond) often with seats or a grassy area used by the public for recreation and picnicking.

Special Sites

Special sites were identified for most large centres and involved a number of special activities in various rural and urban locations. Practical constraints of project planning meant that these site types could not be systematically accessed in every city. Currently there is insufficient data to provide a basis for solid comparisons on a city or regional basis. Some special sites, eg, roadside stops and indoor centres, remain in the early stages of investigation.

Events	Special occasions often involving people attending a venue for a significant activity involving leisure, recreation, or sport, eg, Sydney Olympic Games, Football Grand Final.
Festivals	Areas where people gather for a celebration of special importance and often associated with feasting of some sort.
Tourist Spots	Areas of symbolic interest that attracted the public as part of an organised tour or special outing to visit the site.
Roadside Stops	Public wayside and recreational areas that border roads, used for rest breaks and often included toilets, barbecue areas, seating, gardens and take away food vendors.
Indoor Centre	Indoor leisure, recreation, or shopping areas, often with takeaway concessions or food courts, where customers were expected to dispose of waste but tables were cleaned by staff.
Indoor Transport	Indoor transport terminals usually large, often covered, but are not enclosed public spaces or buildings, eg, Central Railway Station in Sydney.

Appendix D: Disposal Behaviour in City Locations

DBI measures collected in capital city core sites during baseline and 2004 have been presented to enable comparison of changes in behaviour over time.

CITY	SITE	LOCATION	1997	2000	2001	2002	2003	2004
Hobart	Shops	Murray St	2	3	2	2	4	4
	Shops	Liverpool St	3	5	2	2	6	5
	Mall	Elizabeth St Mall	2	2	3	3	2	4
	Park	Parliament Square		5	6	4	1	6
	Waterfront	Constitution Dock	3	5	5	3	6	7
	Public Building	GPO	2	2	2	1	5	5
	Market	Salamanca Markets	4	4	5	3	6	7
	Beach	Clifton Beach	1			1		
		Kingston Beach						7
		Blackman's Bay						5
	Transport	Elizabeth St	2	2	2	2	3	2
		Macquarie St						5
Melbourne	Shops	Eliz & Lt Bourke Sts	4	3	4	6		
	Shops	Swanston St					4	7
	Shops	Southgate	4	5	5	6	6	6
	Mall	Bourke St Mall	2	3	4	5	6	6
	Park	Treasury Gardens		7			5	6
	Park	Alexandra Gardens	5	6	4	2		
	Waterfront	Yarra River	6	6	6	5	5	7
	Public Building	National Museum					6	5
	Market	Victoria Market	4	2	3	6	7	5
	Beach	St Kilda Beach		3	3	3	4	4
	Transport	Tram Stop Grand Prix		1	2		3	6
	Transport	Flinders St Station	3	1	3	4	6	3

CITY	SITE	LOCATION	1997	2000	2001	2002	2003	2004
Canberra	Shops	Garema Place	3	3	4	3	3	4
	Shops	Petrie Plaza	3	3	2	2	6	2
	Shops	Dickson Shop Ctr	3	2	4	4	4	3
	Mall	City Walk	4	3	3	5	4	3
	Park	Glebe Park	4	3	5	6	5	6
	Waterfront	Regatta Point	3	3	3		5	2
	Market	Gorman House	7	7	6	3	7	7
	Transport	Woden Transit Centre	1	1	1	1	2	2
	Transport	Civic Bus Stops			2	1	1	3
Sydney	Shops	Alfred & Loftus Sts	5	4		5		
	Shops	Circular Quay			6	7	6	6
	Shops	Bondi Junction Mall	3	3	3	4	4	6
	Mall	Pitt St Mall	3	4	5	5	4	7
	Mall	Manly Mall			5	6	6	7
	Park	Bondi Beach Park	4	4	4	6	6	
	Park	Hyde Park	4	4	4	5	7	7
	Park	Circular Quay Park	3	5		7		
	Park	Bronte Park		6				
	Park	Manly Beach Park			7			
	Waterfront	Darling Harbour	5	4	5	4	6	5
	Public Building	Town Hall	1	4	3	3	6	6
	Beach	Bondi Beach	4	3	6	5	5	3
	Beach	Manly Beach		5	6	6	4	6
	Transport	Circular Quay	5	5	5	7	5	6
	Transport	City Bus Stops	1				4	6
Adelaide	Shops	Glenelg Shops	6	6	5	5	5	5
	Shops	Rundle Mall - King	5	4	6	7	6	6
	Mall	Rundle St Mall	6	4	3	4	5	5

CITY	SITE	LOCATION	1997	2000	2001	2002	2003	2004
Adelaide	Park	Hindmarsh Square	5	5	5	4	4	5
	Park	Glenelg Foreshore Park		6	6	6	6	6
	Waterfront	Fisherman's Wharf			4	5	5	5
	Public Building	War Memorial	5	4	5	3	7	6
	Market	Fisherman's Wharf			2	5	3	2
	Beach	Glenelg Beach	5	2	3	3	5	4
	Transport	City Bus Stops			4	3	3	3
Perth	Shops	Murray & Barrack Sts	3	4	3	5	6	6
	Shops	William & Hay Sts	5	4	4	4		
	Shops	Barrack & Hay Sts		4			5	7
	Mall	Murray St Mall	5	3	3	2	5	4
	Park	Central Park		6	5	7	7	7
	Park	Esplanade Park	5	7				
	Waterfront	Swan River Ferry		7	5	6	6	6
	Public Building	GPO	2	3	3	2	6	3
	Market	Fremantle Market	7		1			
	Market	Subiaco Market				1	3	2
	Beach	Scarborough Park	5	3		1		
	Beach	Cottesloe Beach	7	3	6	5	4	1
	Transport	Swan Ferry Terminal			3	6	6	
	Transport	City Bus Stop					6	4
Darwin	Shops	Parap Market	5	7		7	7	7
	Shops	Rapid Creek Market	6		5	6	2	7
	Mall	Smith St Mall	5		3	5	6	5
	Mall	Darwin Plaza		5	1		6	4
	Park	Tamarind Park	2		3	6	4	5
	Waterfront	Strokes Hill Wharf	1		5	3	2	4
	Public Building	Raintree Park			4		1	6

CITY	SITE	LOCATION	1997	2000	2001	2002	2003	2004
Darwin	Market	Nightcliffe Market		5	5	7	7	7
	Market	Mindil Beach Market					7	7
	Beach	Mindil Beach	6		3	3	7	7
	Transport	Casuarina Bus Stop			2	1	3	1
Brisbane	Shops	Albert & Queen Sts	4	3	4	6		
	Shops	Albert & Elizabeth Sts	3	2	4		6	5
	Shops	Adelaide & Edward Sts						4
	Mall	Queen St Mall	4	3	6	4	5	3
	Park	PO Square	5	4	2	5	7	7
	Park	Anzaac Square					6	7
	Waterfront	South Bank Parklands	5	4	3	5	7	5
	Waterfront	Roma St Parklands				5	3	
	Public Building	GPO	3	3	6	4	6	7
	Market	Riverside Market	5			6		
	Market	Brunswick St Market		3	1	7	6	5
	Beach	Main Beach		4	4	4	5	5
	Transport	Adelaide St Bus Stop		2	2	6	5	3

Appendix E: Disposal Behaviour in Regional Centre Locations

CENTRE	SITE	LOCATION	2000	2003	2004
Townsville	Mall	Flinders Street Mall		4	4
	Park	Sister Kenny Park		4	2
	Waterfront	Rock Pool		2	4
	Beach	The Strand		4	3
	Transport	Townsville Transit Mall		2	2
Launceston	Shops	Brisbane St		5	6
	Mall	Brisbane St Mall		4	6
	Park	Royal Park		1	1
	Park	Punchbowl Reserve			6
	Waterfront	Gorge Park		7	6
	Transport	City bus stops		2	2
Ballarat	Shops	Central Square		1	1
	Mall	Bridge Mall		4	6
	Park	Adventure Playground		4	4
	Waterfront	Lake Wendouree		7	7
	Market	Ballarat Market		5	7
	Transport	Bus Stops		2	1
Alice Springs	Shops	Coles Car Park		5	5
	Mall	Todd Mall		3	5
	Park	Telegraph Station		4	5
	Public Building	GPO		7	7
	Market	Todd Mall Markets		7	7
Wollongong	Shops	Crown St Shops		2	7
	Mall	Crown St Mall		5	3
	Park	Stuart Park		7	5
	Waterfront	Harbourside		4	7
	Market	Crown St Market		6	5
	Beach	North Wollongong Beach		7	7
	Transport	City bus stops		1	3

Appendix F: References

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