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Litter

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The Victorian Litter Report

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Executive summary

Objectives

The *Victorian Litter Report* is the state's annual report card to assess public littering behaviour and litter levels in public places, including problem litter types and litter hot spots that need more effort.

The main purpose of the *Victorian Litter Report* is to monitor the state's progress against 'Towards Zero Waste' (outlined in *Sustainability in Action: Towards Zero Waste*). This is a ten year plan to reduce waste in Victoria, increase recycling and reduce the environmental impact of waste disposal.

A key target of Towards Zero Waste (TZW) is to **improve littering behaviour by 25% by 2014**, compared to 2003 baseline levels when litter assessment first began. Progress towards this target is reported in the *Victorian Litter Report*.

Methodology

Public litter levels and behaviour are assessed using a standardised Clean Communities Assessment Tool (or CCAT) to establish annual benchmark scores and to monitor the state's progress against TZW.

The 2010 *Victorian Litter Report* compares 2010 CCAT outcomes against the:

- 2009, 2007 and 2005 benchmarks
- 2003 baseline levels (the year litter assessment first started)
- Notional TZW targets set for 2010

The *Victorian Litter Report* research was conducted in regional and urban Victoria from September to early December 2010, throughout 216 public place locations divided into 13 site types including beaches, public building and transport sites.

The 2010 *Victorian Litter Report* is supported by the 2009 Victorian litter strategy, *Creating Cleaner, Safer Places*, which outlines next steps in litter prevention and litter management for the state to achieve its TZW target.

Findings

The key findings of the 2010 *Victorian Litter Report* (VLR) are:

1 Litter prevention performance

Litter prevention performance is scored out of 100 and tracks improvements to public places – design and maintenance, for example that influence public littering and bin use. The higher the score, the better the performance.

- In 2010, Victoria scored **77/100** (up from 75/100 in 2009 and much improved from the 2007 score of 69/100). This year's litter prevention performance score exceeded the notional TZW target¹ set for 2010 (74/100) and represents a 20.3% statewide improvement since litter assessment began in 2003.
- The litter prevention performance score for urban areas in 2010 was 75/100 (up from 74/100 in 2009) but less than the regional score of 80/100 (up from 76/100 in 2009), which may reflect stronger community identity and involvement in smaller regional communities.
- The 2010 findings reflect improved scores for general cleanliness of public places including less illegal dumping and graffiti as well as improved bin design, position and servicing, better landscaping, maintenance and cleanliness of street furniture.

¹ Notional TZW targets represent an incremental annual improvement in the derived CCAT scores compared to the baseline established in 2003 to achieve a 25% improvement by 2014

2 Ground litter counts

- Litter counts record the number of littered items found in a 48 square metre area of a public location.
- The average ground litter count increased to 36 items in 2010 (up from 32 items in 2009 but still well below the year of the worst litter count average of 54 items per location in 2007).
- Although this year's ground litter count has not lived up to the benchmark set in 2009, it is still well below the notional TZW target set for 2010 (42 items per location).

3 Litter hot spots

Litter hot spots around the state included:

- **Urban areas** scored higher litter counts (averaging 40 items in 2010) than regional locations (averaging 27 items in 2010), though urban litter counts have generally been consistently higher than regional areas since 2003, perhaps reflecting stronger community pride in the regions.
- The worst location for litter on the ground is **easements**² (the public space immediately outside railway stations), which turned up an average of 118 items per location in 2010 (more than double the 58 items found in 2009).
- Although litter left behind at **events** improved to an average of 28 items in 2010 (down from 53 items in 2009), the rate of public littering at events increased from 29% in 2009 to 48% in 2010, suggesting that people at events choose to litter rather than use bins.

4 Problem litter types

- **Cigarette butts prevail as the most common type of litter** accounting for at least half of all items counted in both urban and regional locations, followed by beverage items and then paper.
- **Cigarette litter** increased to 50% in 2010 (up from 47% in 2009) and represented the highest proportion of litter counts at smoking sites, 78% in 2010 (up from 68% in 2009). Cigarettes also featured prominently as a proportion of ground litter counted in 2010 at beaches (62%), events (58%) and at public building sites (59%).
- **Beverage litter** has increased steadily from 16% in 2005 to 31% in 2010, most of it in the form of glass bits. Although plastic and glass bottles represented less than 2% of beverage litter counts in 2010, glass bits made up 56% and metal and plastic caps and plastic bits made up 31%.
- **Paper litter** decreased to 7% in 2010 (down from 9% in 2009).
- **Confectionary** – lolly and ice cream litter decreased to 3% counted in 2010 (down from 5% in 2009).

5 Rate of public littering

Littering behaviour in 2010 was assessed by monitoring 734 litter disposals in 216 locations to calculate the percentage of litter not disposed of into a bin (or the littering behaviour rate). Note that direct comparisons with littering behaviour in 2009 when conclusions were based on just 406 litter disposals should be approached with caution.

- The 2010 results reveal that **only 65% of Victorians are disposing of waste into bins in public places.**
- The 2010 public littering rate of 35%, however, although higher than notional TZW target of 21% is on par with the 2007 result of 31% and the 2005 result of 30%. This indicates that the rate of public littering appears to be **trending upwards** (rather than down as indicated by the 2009 benchmark of just 16%).
- Despite higher rates of public littering in 2010 compared with 2009, littering decreased in 2010 in malls (down to 25% from 27% in 2009) and at landmark locations (down to 11% from 12% in 2009). Large increases in public littering were observed in park locations (up from 4% in 2009 to 19% in 2010), public buildings (up from 16% in 2009 to 87% in 2010) and events (up from 29% in 2009 to 48% in 2010).

² Refer to Appendix B, Table 9 Site Type Definitions for a more detailed explanation

Conclusion

Victoria is a cleaner place but littering behaviours are increasing

While litter counts help to build a picture of litter accumulation in public places, what people do with unwanted items remains the most effective indicator of public littering and the most accurate measure of success in prevention efforts.

Given that the rate of public littering is trending upwards, despite considerable effort to improve bin design, position, adequacy, signage, cleaning regimes, and given overall community satisfaction with litter management, more work is needed to encourage Victorians to dispose of litter appropriately.

Towards litter prevention

Littering behaviour and the local environment

Littering behaviour is influenced by many factors, including where littering occurs. Public places that are well maintained, safe and offer appropriate litter disposal encourage a sense of ownership and care. In contrast, public places that are poorly maintained often attract not only litter but graffiti and displays of anti-social behaviour that make them appear unsafe³.

Components of litter prevention

The CCAT summary or litter prevention performance score, tracks improvements to public places that contribute to reductions in littering. The factors – ‘Context’, ‘Facilities’ and ‘Perceptions’ – are described in Table 1 and in more detail in Appendix A.

Table 1 Interpretation of high and low CCAT summary (litter prevention performance) scores

Factor/ sub-factor	Description	High score	Low score
CCAT summary score	Features combined in a summary rating	Area likely to be extremely clean and resource recovery successful	Area is highly littered, with contamination of recyclables
Context	Community identity and involvement	Strong sense of pride, ownership over the space	Poor sense of ownership and area is not clean
Facilities	Summarises results for bins and street furniture (i.e. public seating, tables, shelters, etc)	Extremely well maintained, litter free facilities that are easily used and well positioned	Inadequate facilities, poorly maintained
<i>Infrastructure</i>	Condition and cleanliness of all street furniture, streetscape and landscaping	Street furniture is extremely well maintained, clean and appropriate	Poorly maintained and surrounded by litter
<i>BIN</i> Infrastructure	Features and cleanliness of all litter, recycling and butt bins	Bin design, position and maintenance is highly appropriate to area and usage patterns	Inadequate number, configuration, positioning or servicing of bins
Public perceptions & attitudes*	Summary of community views on area	Area is perceived as extremely well looked after and serviced	Area is seen as inadequately presented
<i>Attitudes to place</i>	Views on the area and expected actions	Strong expectation exists for people to do the right thing with used items	No expectation to do the right thing
<i>Attitudes towards disposal facilities**</i>	Perceptions of appropriateness of bins and furniture	Facilities are viewed as highly appropriate and meeting needs of community	Community sees a need to improve facilities

* Abbreviated as Perceptions in the 2010 VLR

** Referred to as *Adequacy of facilities* in the 2010 VLR

Local efforts at litter prevention are measured by rating landscaping, bin design, maintenance and servicing, as well as other features within the control of owners or caretakers that influence littering, bin use and litter accumulation.

The CCAT methodology converts these ratings to a ‘summary’ or litter prevention performance score out of 100. This is the primary measure to track progress against the TZW target to improve littering behaviour by 25% by 2014 compared to 2003 levels. A higher CCAT summary score indicates these elements are working well, encouraging users to keep areas clean and facilitating community ownership and engagement. Lower CCAT scores indicate the need for improvement, such as repairing and cleaning damaged or poorly maintained bins and infrastructure, or adjusting maintenance routines and servicing schedules to reduce overflowing bins.

³ *Fixing Broken Windows: Restoring Order and Reducing Crime in Our Communities* by George L. Kelling and Catharine Coles; Gladwell M. 2000. *The Tipping Point, USA: Little Brown and Company*

Litter prevention: *Statewide*

Figure 1 shows a statewide averaged CCAT summary score for litter prevention performance in all 216 locations assessed throughout Victoria. Figure 2 also shows the state's performance relative to the TZW 'notional' target⁴ for litter prevention expressed as a percentage change since 2003.

Figure 1 VLR litter prevention performance (CCAT summary scores) 2003 – 2010

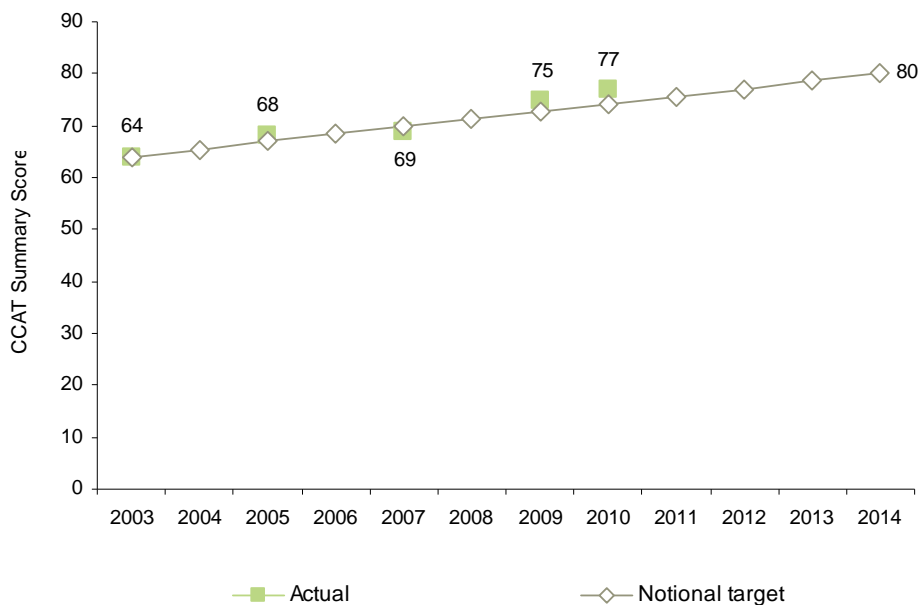
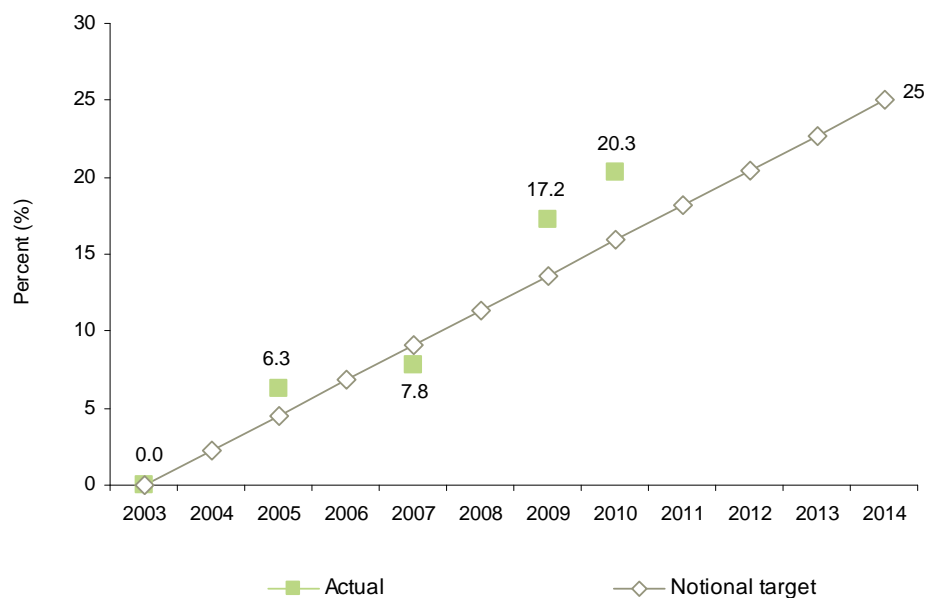


Figure 2 VLR litter prevention performance (CCAT scores percentage change) 2003 – 2010



Observations

- A CCAT summary score of 77/100 for Victoria indicates an improvement in litter prevention performance in public places compared to the 2009 level of 75/100 (Figure 1) and is 3 points above the notional target for 2010 of 74/100.

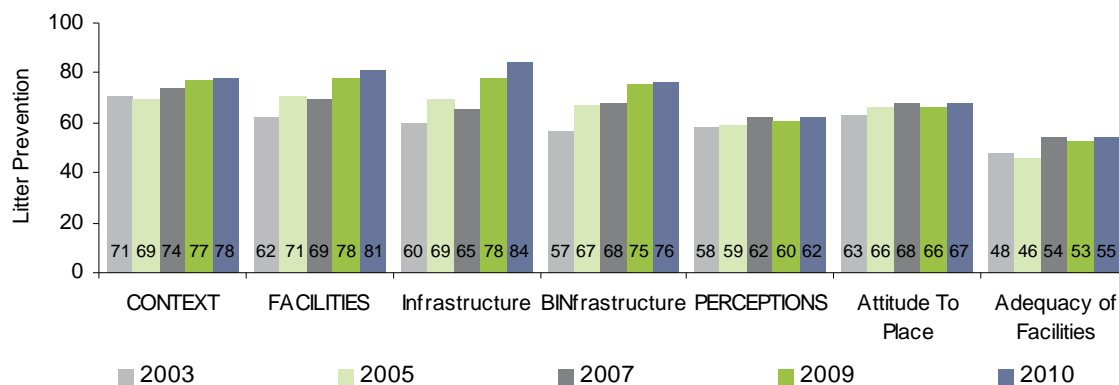
⁴ Notional TZW targets represent an incremental annual improvement in the derived CCAT scores compared to the baseline established in 2003 to achieve a 25% improvement by 2014

- Figure 2 shows the 2010 CCAT summary score has increased by 20.3% since the base year of 2003 and exceeded the notional TZWtarget of 15.9% by 4.4 percentage points.

Components of litter prevention: *Statewide*

Figure 3⁵ scores each of the litter prevention components that make up the CCAT summary score and compares the 2010 results against the 2003, 2005, 2007 and 2009 scores.

Figure 3 Statewide litter prevention (CCAT primary and sub-factor scores) 2003 – 2010



Observations

All three CCAT score factors – Context, Facilities and Perceptions – show improvement since the 2003 baseline that laid the foundations for measuring improved littering behaviour in Victoria. The largest long-term improvement is evident in facilities.

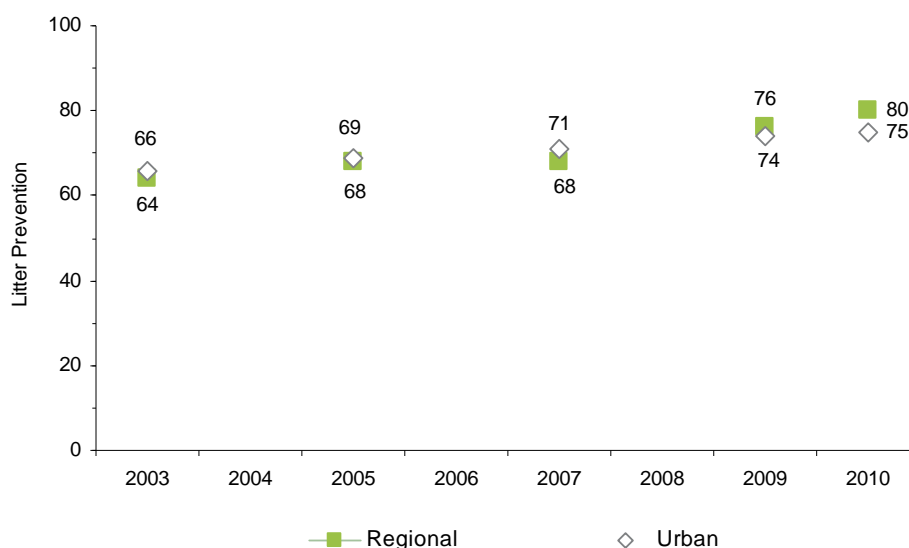
- An improved context score indicates that, in 2010, public places improved in general cleanliness, sense of community belonging and safety, and were reasonably free of graffiti and dumping.
- Increases in facilities scores between 2009 and 2010 follow an overall decrease (in both urban and regional areas) between 2005 and 2007. The *infrastructure* score increase indicates better maintenance, presentation and cleanliness of street furniture and landscaping. The *BINfrastructure* score increase reflects local improvements in bin design, positioning and servicing.
- Community attitudes and views measured by the Perceptions score – have changed only marginally, with slight improvements since litter assessment began in 2003. After a slight decrease in 2009, Perception scores regained in 2010. Interestingly, although the community response represented in *adequacy of facilities* increased by 2 points in 2010, this does not reflect the larger score increase (3 points) in the Facilities component. This may be because:
 - a lack of communication about improvements means the community is not noticing changes over time and / or
 - community expectations of facilities has increased as a result of greater identification with, and use of, the public places (note there is an increase in the Context score measuring community identity and involvement).

⁵ CCAT scores have been presented on a 100-point scale. Note that primary factors (in upper case) comprise the sub-factor scores shown in lower case but do not represent an average of the two sub factor scores. For example, the Perceptions and Attitudes score (PERCEPTIONS) comprises all ratings items for sub-factors *Attitude to Place* and *Attitude to Facilities* but does not represent a numerical average of the two sub-factor total scores.

Litter prevention: *Urban and regional*

Figure 4 shows 2010 CCAT summary scores for urban and regional locations assessed throughout Victoria.

Figure 4 Litter prevention (CCAT summary) scores for urban and regional locations 2003 – 2010



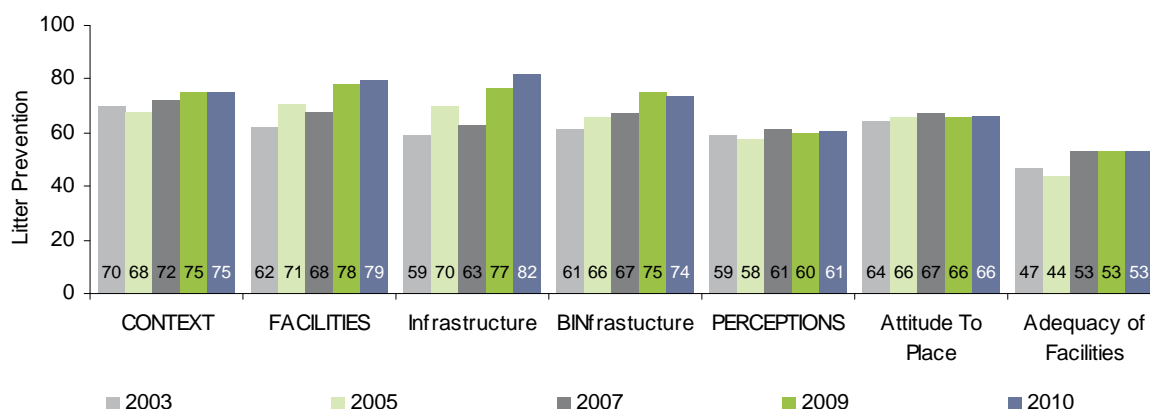
Observations

- In 2010, urban locations recorded a litter prevention score of 75/100 (below their notional TZW target of 77/100), while regional locations scored 80/100 (exceeding their notional TZW target of 74/100). A possible explanation for this could be differences in the demographic profile of age groups interviewed in urban areas (where more respondents were aged between 18 and 34) compared to regional areas (where respondents aged 45⁶ and above seemed over represented (Figure 28)).

Components of litter prevention: *Urban and regional locations*

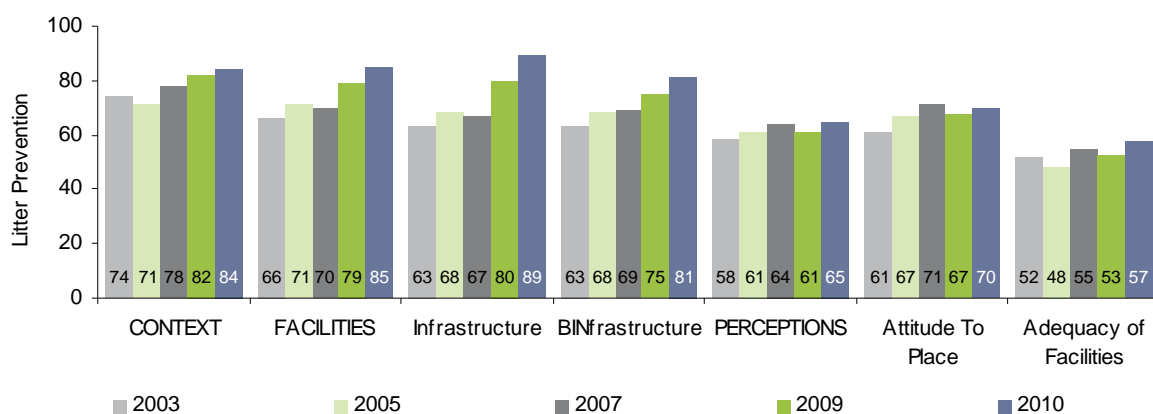
Figures 5 and 6 show the CCAT component scores for urban and regional locations from 2003 to 2010.

Figure 5 Litter prevention urban locations (CCAT primary and sub-factor scores) 2003 – 2010



⁶ Schultz, P. W., Bator, R. J., Large, L. B., Bruni, C. M., & Tabanico, J. J. (2011). Littering in context: Personal and environmental predictors of littering behavior. *Environment and Behavior*. (published online).

Figure 6 Litter prevention regional locations (CCAT primary and sub-factor scores) 2003 – 2010



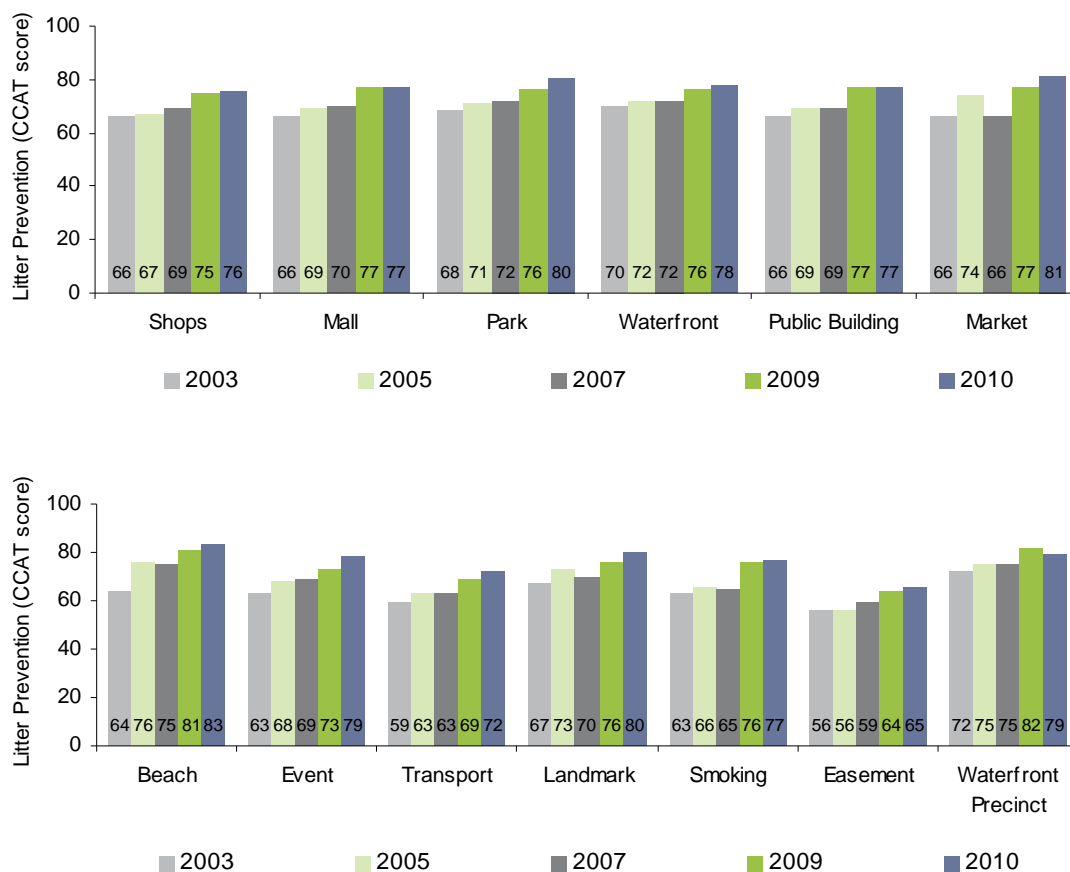
Observations

- Urban and regional litter prevention scores have mostly increased in 2010 with the exception of Context scores in urban areas, which have remained constant since 2009. Regional areas saw larger increases in both Context and Facilities scores than urban areas, largely attributed to *infrastructure* scores, which increased from 80/100 in 2009 to 89/100 in 2010. Urban areas did not improve to the same extent, but did improve on the Facilities score by 1 point, with a 5 point rise in *infrastructure*. Overall, both urban and regional areas have seen increases in both Context and Facilities scores since 2003.
- A noteworthy difference between urban and regional locations is a variation in the Context scores, with urban areas scoring 75/100 against a regional score of 84/100. This variation, however, has existed since 2003 and may represent a stronger sense of community identity and involvement in smaller regional communities.
- The Perceptions score for regional areas has increased by 4 points from 61/100 in 2009 to 65/100 in 2010. In regional areas, both *attitude to place* and *adequacy of facilities* saw increases of at least 4 points. Urban areas saw almost no change in Perception scores.

Litter prevention: Site types

Figure 7 shows CCAT summary scores for litter prevention performance in different site types throughout Victoria.

Figure 7 CCAT summary score for site types 2003 – 2010



Observations

- Litter prevention improvements, ranging from 1 to 4 points, can be seen across all site types since 2009, with the exception of *mall* and *public building* locations, which remained constant at 77, and *waterfront precinct* locations, which decreased by 3 points from 82 in 2009 to 79 in 2010.
- The highest 2010 litter prevention scores were for *beach* sites (83) and *market* locations (81). These two site types were also among the highest in 2009. *Easements*, *transport* sites and *shops* were all below the state CCAT average score of 77.
- The most notable litter prevention improvements were seen in *park*, *market*, *event* and *landmark* areas, all with increases of 4 points. *Smoking* sites had one of the lowest scores in 2007, but this increased by 11 points in 2009 and 1 point in 2010.
- The lowest 2010 litter improvement scores were for areas with high people traffic – *easements* (65) and *transport* areas (72). Both, however, increased from the 2009 scores of 64 for *easement* and 69 for *transport*.

Components of litter prevention: *Site types*

Table 2 shows the CCAT summary scores for each CCAT factors and sub-factors for the different site types.

Table 2 Site type by CCAT summary, factor and sub-factor scores 2010

Site type	CCAT summary score ⁷	CONTEXT	FACILITIES		PERCEPTIONS			
			<i>Infrastructure</i>	<i>BIN</i> Infrastructure	<i>Attitude to place</i>	<i>Adequacy of facilities</i>		
Shops	76	76	81	82	80	60	67	52
Mall	77	77	84	87	83	58	65	49
Park	80	83	84	90	79	65	68	60
Waterfront	78	78	79	84	70	67	73	60
Public building	77	82	80	88	63	61	67	53
Market	81	83	85	88	84	64	71	56
Beach	83	88	87	92	85	66	71	60
Event	79	83	80	78	81	69	74	62
Transport	72	70	79	76	80	56	63	47
Landmark	80	84	82	87	73	70	72	68
Smoking	77	76	83	85	79	61	65	55
Easement	65	66	70	70	63	54	62	44
Waterfront precinct	79	77	84	82	84	66	74	56

Observations

- The two site types demonstrating the highest CCAT summary scores – *market* and *beach* sites – showed higher than average scores for Context and Facilities (both *infrastructure* and *BIN*Infrastructure).
- The *attitude to place* scores were consistently higher than the *adequacy of facilities* scores for each site type. For example *event* and *waterfront* attracted the highest *attitude to place* score of 74 but the *adequacy of facilities* is only 62 and 56 respectively. As previously noted, this perception of the adequacy of facilities is at odds with the facilities scores (both *infrastructure* and *BIN*Infrastructure), which have increased since 2007 and contributed to improvements in CCAT summary scores for every site type.

⁷ Please note that the CCAT summary score is not a simple averaging of the Factors but an averaging of all 87 variables used in the construct of the score.

Litter counts

Litter counts measure the number of littered items in public places in Victoria. Using a standardised approach, the amount of litter present in each location is assessed over a 48m² area including, ideally, a bin and furniture or other infrastructure. In 2007, 2009 and 2010, the litter count methodology was refined to enable improved comparison of litter prevention factors that councils have direct influence on and to provide meaningful comparison against earlier benchmarks. Refinements included: (1) removal of animal faeces and chewing gum; (2) 'other' now includes hazardous litter such as syringes, medical litter such as bandaids, and commercial litter such as trolleys. Data from 2003 and 2005 were adjusted to reflect these changes.

Litter counts are a useful indicator but not a reliable outcome measure as they can be influenced by a range of factors, including the number of people in public places at given times, the number of people littering and levels of maintenance and clean-up schedules. It is important to note that litter counts may vary with the adequacy of litter containment, timing of the litter counts (in particular in relation to clean-up schedules) and weather conditions such as wind and rain.

Effective litter prevention is associated with reductions in litter items found on the ground. While litter counts help to build the picture of litter accumulation in public places, the littering behaviour rate is considered a more accurate measure of success in litter prevention efforts (covered in more detail in 'Towards behaviour change' on p 22). Litter counts in the *Victorian Litter Report* are compared to notional targets that represent the level of expected change based on the TZW equivalent⁸ of 25% improvement by 2014⁸.

Litter levels: *Statewide*

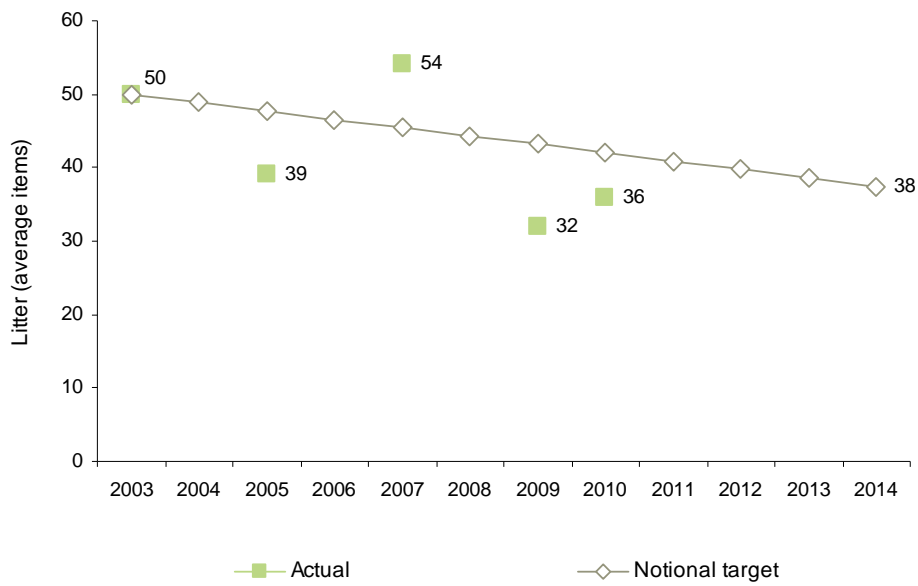
Table 3 and Figure 8 show the number of littered items found in locations throughout Victoria in 2003, 2005, 2007, 2009 and 2010. Notional TZW litter count reduction targets for 2010 are included in Figure 8.

Table 3 Statewide litter counts 2003 – 2010

Year	Number		
	Locations	Items Total	Items Average
2003	209	10,408	50
2005	247	9,535	39
2007	215	11,496	54
2009	215	6,835	32
2010	216	7,692	36
Notional TZW 2010 target	n.a.	8,752	42

⁸ Notional TZW targets represent an annual incremental improvement compared to the baseline established in 2003 (i.e. a 25% decrease in litter counts)

Figure 8 Statewide average litter counts 2003 – 2010



Observations

- Litter count levels throughout Victoria in 2010 averaged 36 items per location, up from 32 items in 2009 but on the positive side, well below the 2010 notional TZW target levels of an average of 42 items per location, and the substantial 2007 increase of 54 items per location.

Litter levels: Urban and regional

Figures 9 and 10 summarise the average litter count outcomes for urban and regional locations from 2003 to 2010.

Figure 9 Urban average litter counts 2003 – 2010

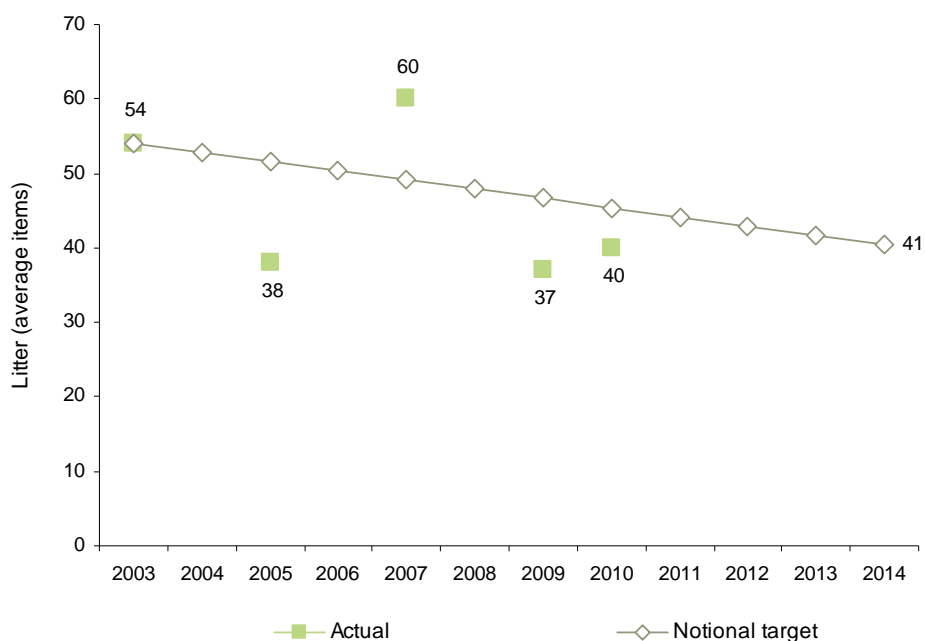
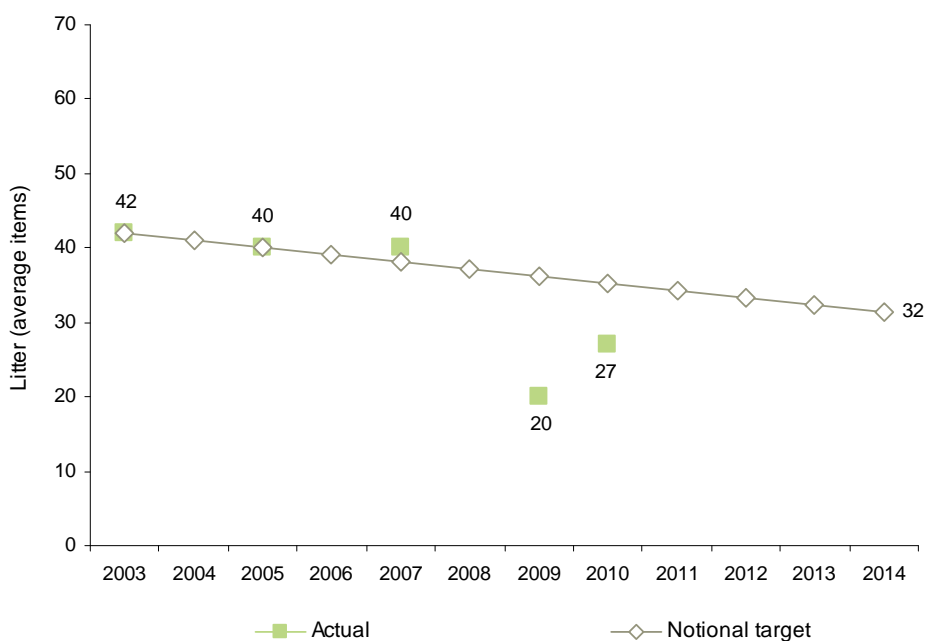


Figure 10 Regional average litter counts 2003 – 2010



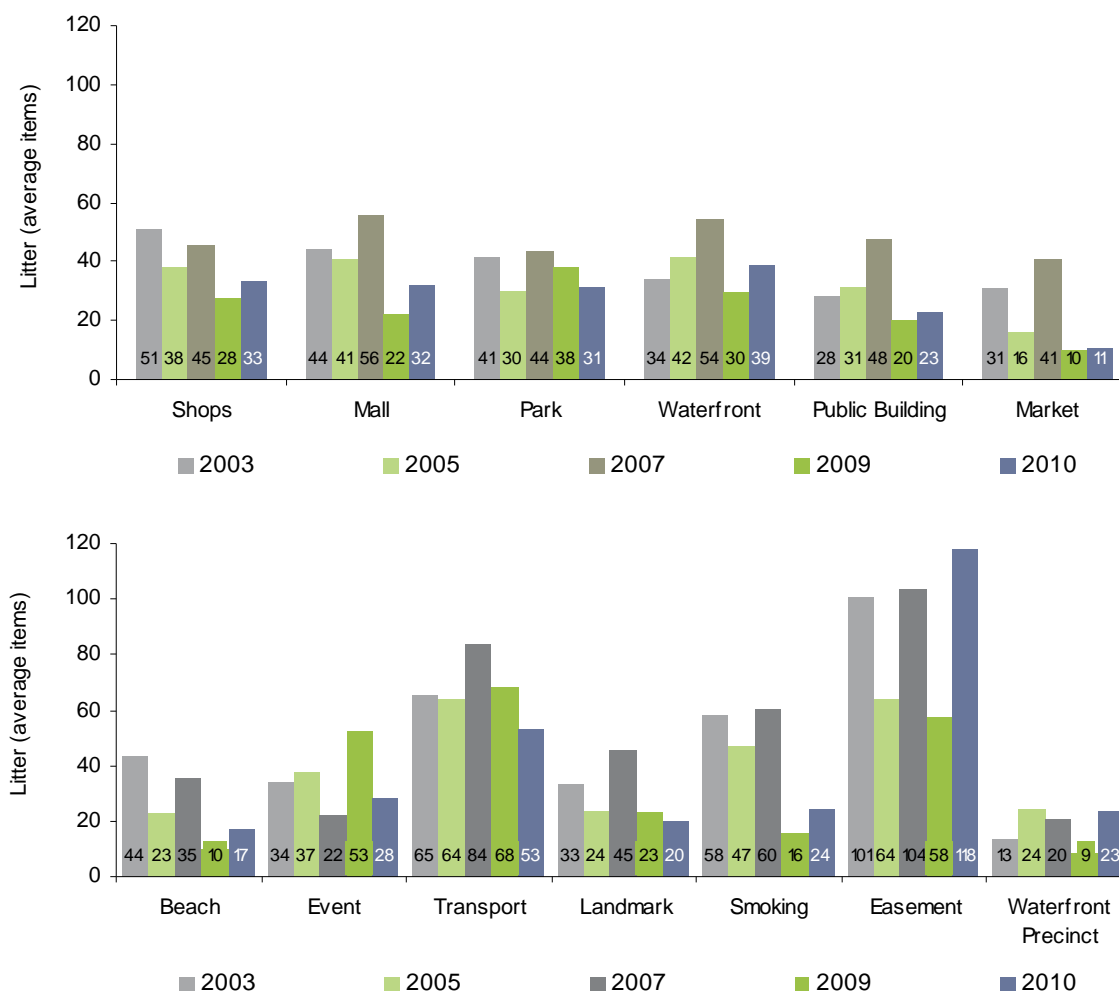
Observations

- Since 2003 the average number of littered items on the ground has generally been higher for urban than for regional areas. In 2010 this remains the same, with an average of 40 items for urban locations and 27 items for regional locations.
- The average number of littered items for both urban and regional sites was below the notional TZW targets of 45 items for urban areas and 35 items for regional areas

Site types and litter

Litter counts were also examined according to site type, as summarised in Figure 11.

Figure 11 Average litter counts in site types 2003 – 2010



Observations

- Most site types showed increases in ground litter compared with 2009, except for *park*, *event*, *transport* and *landmark* sites. The largest decrease was seen in *event* sites which decreased by an average of 25 items. This is a very positive result given that 2009 saw an increase of an average of 31 items.
- Increases in average amounts of litter ranging from 1 to 60 items were seen in the following sites: *shop* (5), *mall* (10), *waterfront* (9), *public building* (3), *market* (1), *beach* (7), *smoking* (8), *easement* (60) and *waterfront precinct* (14).
- Easement*, *transport* and *waterfront* sites were the most littered site types in 2010. *Transport* and *easement* sites have been the most littered site types in every *Victorian Litter Report* since 2003.
- Although *event* sites showed the largest decrease in average litter counts, the littering rate increased from 29% in 2009 to 48% in 2010 (Figure 27). This suggests even though there is less litter at *event* sites, people still choose to litter rather than use bins.

The litter stream

During litter counts, individual litter items found on the ground are identified and tallied to measure their relative contribution to the litter stream. The higher the contribution to the litter stream, the more likely the litter type will be targeted for focussed litter reduction efforts. For example, cigarette butt litter has long been the major item group contributing to litter counts in public places and in recent years has received particular attention in targeted programs. A full list of items assigned to each litter item type is shown in Appendix D.

Litter composition: *Statewide*

Figures 12 to 16 illustrate littered items found in locations throughout Victoria in 2003, 2005, 2007, 2009 and 2010 respectively. Cigarette litter⁹ continues to be the most common item in litter count totals. In 2010, the percentage of cigarette litter increased compared with 2009, but remains below the years prior to 2009.

Figure 12 Littered items 2003

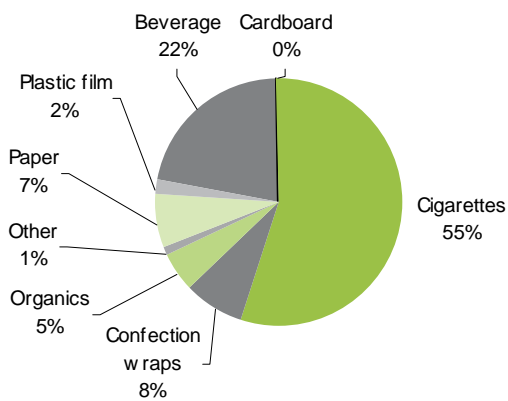


Figure 13 Littered items 2005

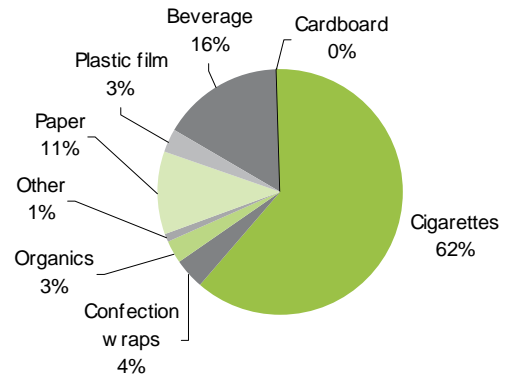


Figure 14 Littered items 2007

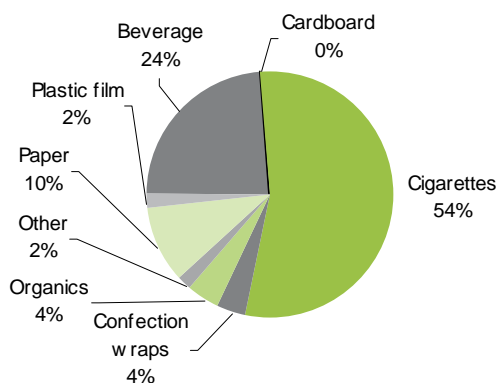
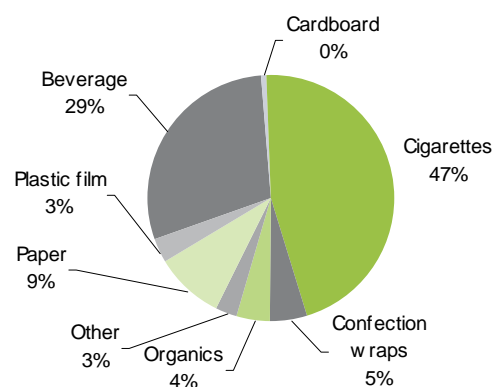
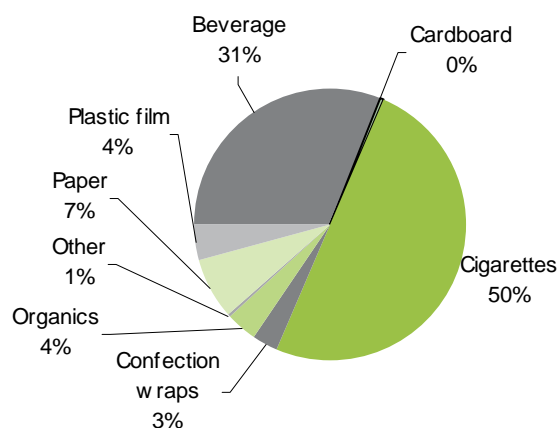


Figure 15 Littered items 2009



⁹ 99% of all cigarette litter is composed of cigarette butts.

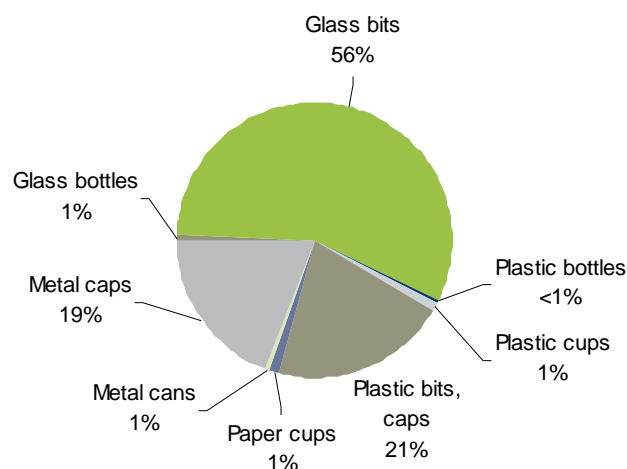
Figure 16 Littered items 2010



In 2010, the most common item evident in litter counts was cigarette litter (50%) followed by beverage litter (31%) and then paper (7%). Compared to 2009, increases were seen in cigarettes (3%) and beverages (2%) and decreases were seen in paper (2%), confectionery (2%) and other litter types (2%).

The composition of beverage items found littered in 2010 is summarised in Figure 18. It shows that over half (56%) of all beverage items found littered were broken pieces of glass, 21% of beverage litter items were 'plastic caps and bits' and 19% were 'metal caps'.

Figure 17 Composition of beverage littered items 2010



Observations

- All *Victorian Litter Reports* have found a relative consistency in the composition of items found littered on the ground.
- Beverage litter has increased steadily from 16% in 2005 to 31% in 2010. The majority of this increase has come from glass bits, which has increased by 11 percentage points since 2007.

It should be noted that larger item types, such as bottles and cans, are more visible for clean up, whereas cigarette butts may be excluded from regular cleaning programs. This build up of old and new cigarette butt litter impacts on litter count item type totals, and highlights some of the difficulties of litter count methods.

Litter composition: *Urban and regional*

Figures 18 and 19 summarise the composition of litter on the ground for urban and regional locations in 2010.

Figure 18 Urban littered Items 2010

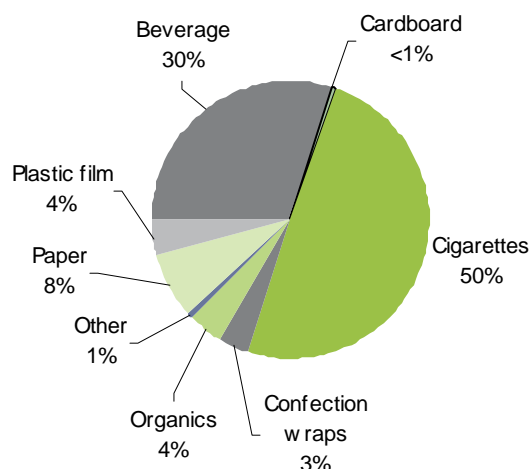
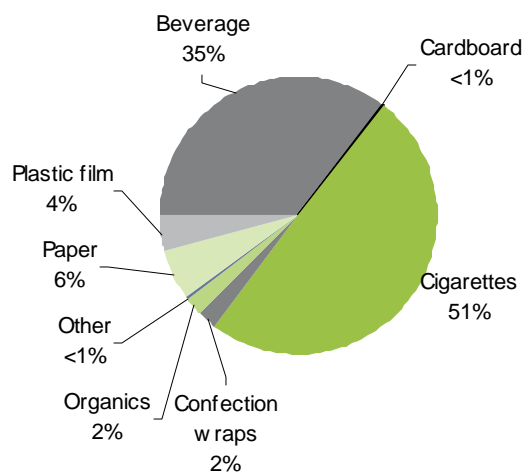


Figure 19 Regional littered items 2010



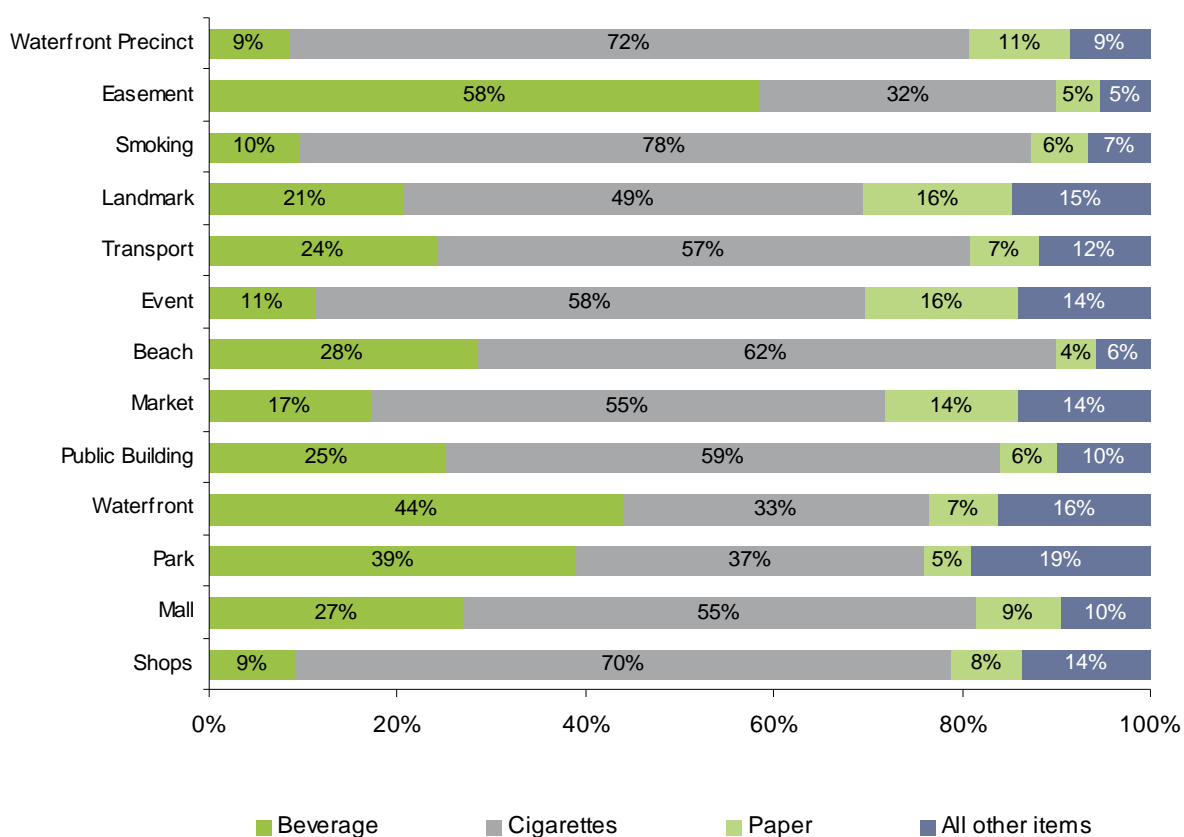
Observations

- The three most common types of items littered on the ground were the same for urban and regional locations, with cigarette litter accounting for at least half of all items on the ground (50% for urban and 51% for regional), followed by beverage litter (30% for urban and 35% for regional) and paper (8% for urban and 6% for regional). Beverage litter in regional areas has increased by 8 percentage points since 2009.

Site types and litter composition

Figure 20 summarises the composition of types of litter on the ground for site types throughout Victoria in 2010.

Figure 20 Composition* of littered items in site types 2010



* Rounding of figures may cause totals not to sum to 100 per cent.

Observations

- As expected, the highest proportion of littered items on the ground in *smoking* sites were cigarette items (78%) up from 68% in 2009.
- A similarly high proportion of cigarette litter was evident at *shop* sites (70%), an increase from 63% in 2007 and 2009. *Waterfront precinct* sites also showed a large proportion of cigarette litter at 72%. Both *mall* and *transport* sites showed marginal improvements since 2009 with *mall* sites (55%, a decrease of 3%) and *transport* sites (57%, a decrease of 1%), while *beach* (62%), *event* (58%) and *public building* sites (59%) had higher than average amounts of cigarette litter.
- Beverage litter was higher than the average (31%) in *easement* (58%), *waterfront* (44%) and *park* sites (39%). Since 2009, improvement in the percentage of beverage litter is evident at the following sites: *landmark* (down from 44% in 2009 to 21% in 2010), *event* (down from 46% in 2009 to 11% in 2010), *beach* (down from 43% in 2009 to 28% in 2010), and *waterfront precinct* (down from 49% in 2009 to 9% in 2010). Areas that have seen a jump in beverage litter since 2009 include *easement* (up from 34% in 2009 to 58% in 2010) and *mall* (up from 12% in 2009 to 27% in 2010).

Towards behaviour change

Observation of 'disposal actions' that is, data gained through direct observation of what people do with unwanted items is the most effective indicator of community littering and bin use. This offers hard evidence, and avoids reliance on self reported measures and the mismatch between what people say *they do* and what they *actually do*.

Given adequate sample sizes, indicators of littering (and bin use) can be calculated and expressed as a percentage, representing littering behaviours as a proportion of overall disposals (positive and negative). This is called the **community littering behaviour rate**. A higher rate indicates more people are littering than using bins.

The aim of litter prevention is to change behaviour. A comparison between the community littering behaviour rate and the TZW target of 25% improvement by 2014 is one way to find out how community littering behaviour is tracking.

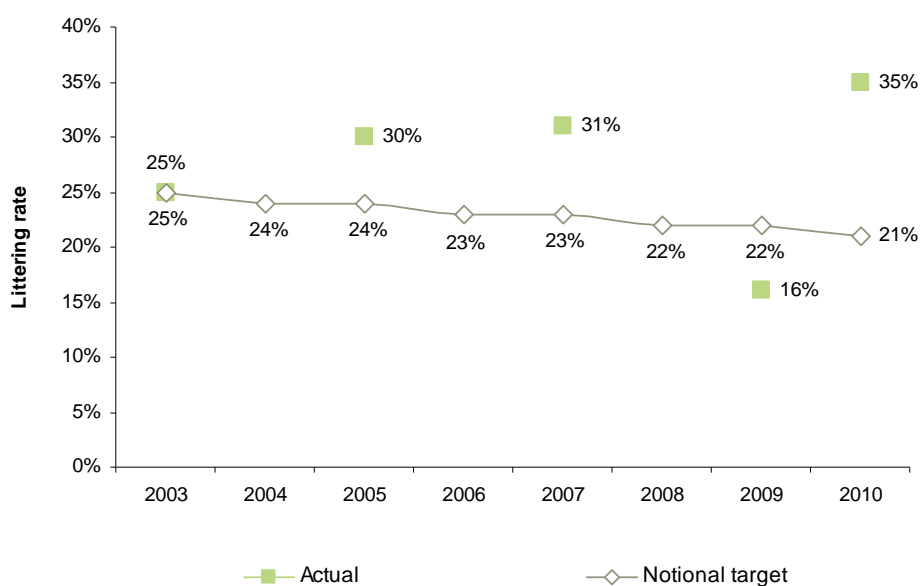
Littering behaviours in Victoria

In 2010, 734 observations of disposal actions recorded in 216 locations throughout Victoria showed 35% of people littered and 65% disposed of used items appropriately by using bins, as shown below in Table 4 and Figure 21.

Table 4 Comparisons of littering in Victoria 2003 – 2010

Year	Number		Behaviour Rate	
	Locations	Observations	Bin Use	Littering
2003	263	685	75%	25%
2005	247	858	70%	30%
2007	215	1,692	69%	31%
2009	215	406 ¹⁰	84%	16%
2010	216	734	65%	35%

Figure 21 Statewide littering rate, 2003 – 2010



Reliability of littering behaviour estimates

Littering behaviour in 2010 was assessed by monitoring 734 litter disposals in 216 locations to calculate the percentage of litter not disposed of into a bin (or the littering behaviour rate). Note that direct comparisons with littering behaviour in 2009 when conclusions were based on just 406 litter disposals should be approached with caution.

Figure 22 shows the littering rate trend with upper and lower 95% confidence intervals added to indicate the error associated with the data. The confidence interval (CI)¹¹ is used to indicate the reliability of an estimate. In this case, the confidence interval (CI) or margin of error is largest for the 2009 period where a much smaller number of littering observations were recorded.

In 2009, the margin of error associated with the littering rate indicated that the value would lie somewhere between 12% and 20%, i.e. plus or minus 4% (see Table 5), compared to 2007 where a much larger numbers of observations were undertaken and the margin of error was smaller at plus or minus 2%. Given the margin of error associated with the 2009 littering rate and the trend not being consistent with the other four survey periods, the data from 2009 should be viewed with caution and considered as an outlier. If we discount the 2009 littering rate, there is a clear upward trend for littering behaviours which indicates that more work is required in behaviour change.

¹¹ The 95% confidence interval was calculated using the Exact Binomial Distribution method. This has been verified by Kaye E Marion, Statistics and Operations Research Group, School of Mathematical and Geospatial Sciences, College of Science, Engineering and Health, RMIT University, June 2012. Melbourne

Figure 22 Statewide littering rate with upper and lower confidence intervals, 2003 – 2010

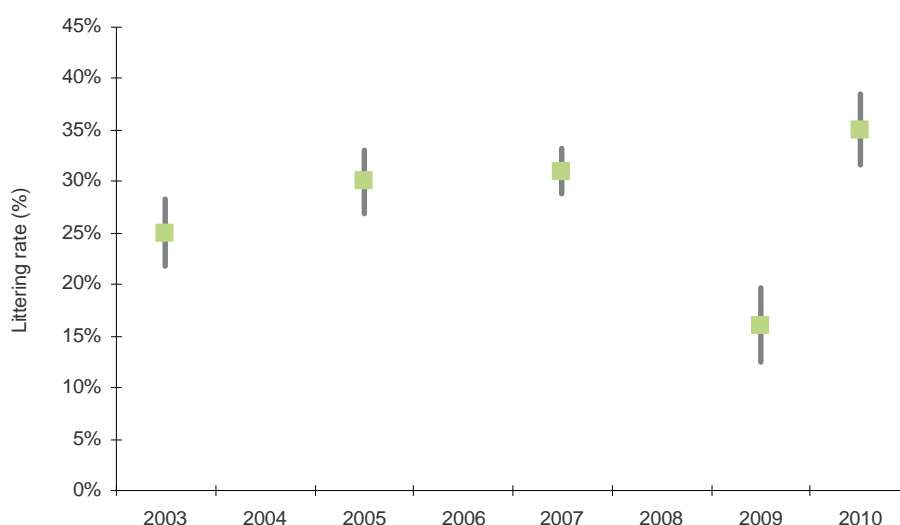


Table 5 State littering rate confidence intervals 2003 – 2010

Year	Littering rate	95% Confidence interval ¹²	
		Lower CI	Upper CI
2003	25%	22%	28%
2005	30%	27%	33%
2007	31%	29%	33%
2009	16%	12%	20%
2010	35%	32%	38%

Observations

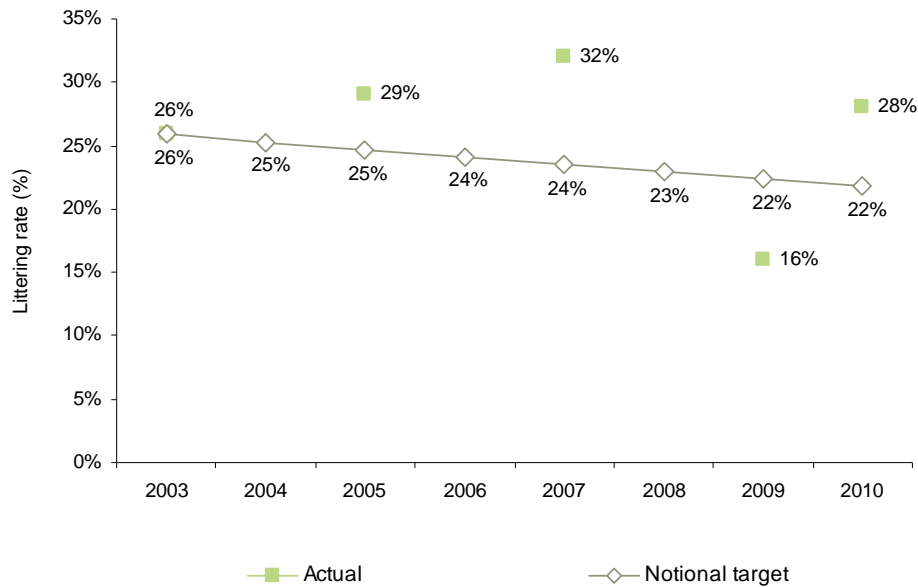
- In 2010, only 65% of Victorians disposed of waste appropriately in public places representing a decrease of 19 percentage points since 2009 (Table 4). The 2010 result is on par with the 2007 result of 69% and the 2005 result of 70%, indicating that the littering rate appears to be trending upwards rather than down as indicated by the 2009 results.
- Littering behaviour throughout Victoria in 2010 was 14 percentage points higher than the notional TZW target. This is similar to the upward trend shown in the previous survey years (other than for 2009) where the littering rate increased relative to the notional TZW target (Figure 21).
- In 2010, the same sites were assessed, but comparisons between littering behaviour in 2009 and 2010 should be approached with caution given that the 2009 benchmark was based on just 406 litter disposals (compared to 734 litter disposals in 2010). Although the 2010 littering rate is closer to the 2007 score of 31%, a four percentage point increase was observed since 2007. This indicates that although a lot of effort has been taken in improving bin design, positioning, adequacy, signage, cleaning regimes and overall community satisfaction with litter management, there is still more work to be done in encouraging Victorians to litter appropriately.

¹² The confidence intervals for the Exact Binomial Distribution method are not symmetrical.

Urban and regional littering behaviours

In 2010, the number of litter disposals observed was 550 in urban areas and 184 in regional areas. Figures 23, 24 and Table 6 summarise outcomes for littering behaviour in urban locations since 2003.

Figure 23 Urban littering rates 2003 – 2010



As with the state littering rate, the 2009 urban data represents an anomaly because of the significantly smaller number of litter observations made in that year. The 2010 results are more consistent with the 2003, 2005 and 2007 results. Given the lesser margin of error associated with these years, the urban littering rate trend appears to be relatively stable and is not consistent with the decrease shown by the 2009 data.

Figure 24 Urban littering rates confidence intervals 2003 – 2010

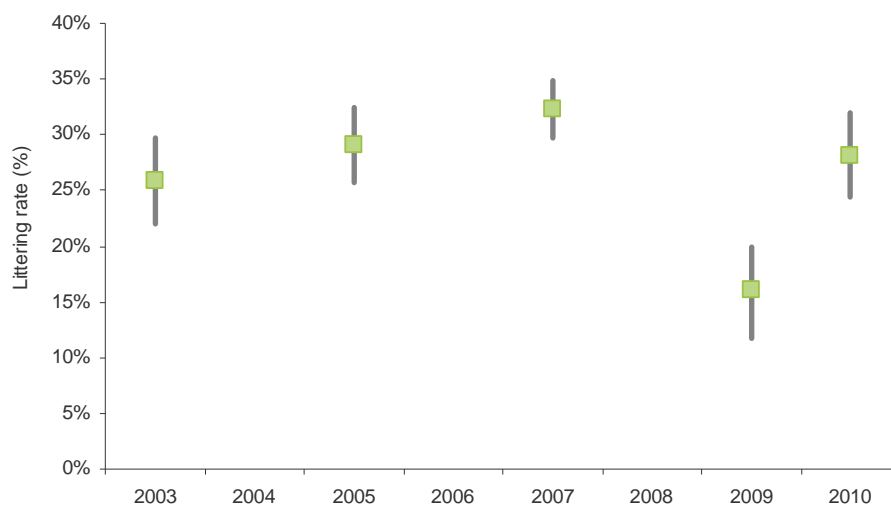


Table 6 Urban littering rates confidence intervals 2003 – 2010

Year	Littering rate	95% Confidence interval	
		Lower CI	Upper CI
2003	26%	22%	30%
2005	29%	26%	32%
2007	32%	30%	35%
2009	16%	12%	20%
2010	28%	24%	32%

Figures 25, 26 and Table 7 summarise the outcomes for littering behaviour rates in regional locations since 2003. In 2010, 184 litter disposals were observed in regional areas. The regional littering rate was 57%, an increase of 41 percentage points compared to 2009 and a 35 percentage point increase compared to 2007. The reliability of this data is in question given the smaller number of observations in general for regional areas. The trend for this time series is therefore unclear.

Figure 25 Regional littering rates 2003 – 2010

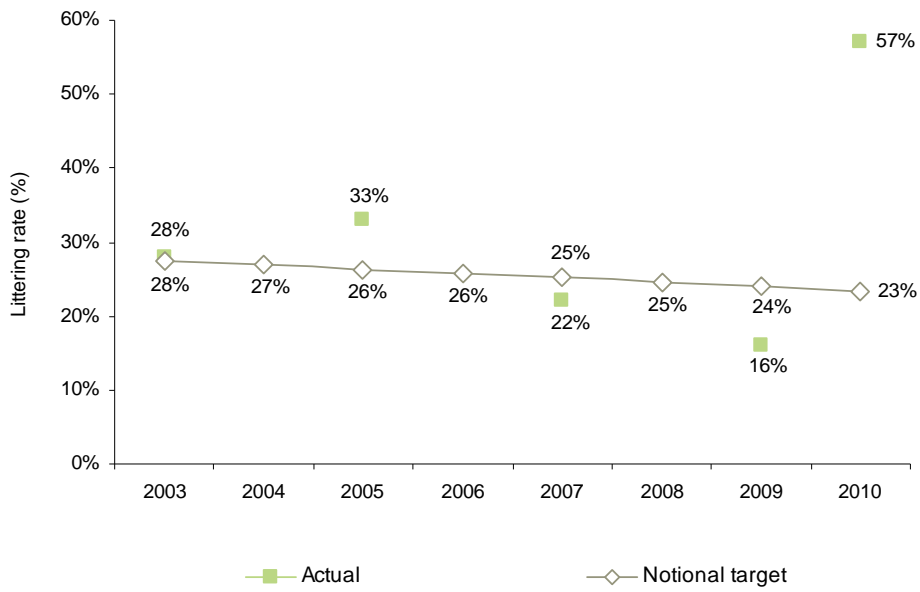


Figure 26 Regional littering rates 2003 – 2010

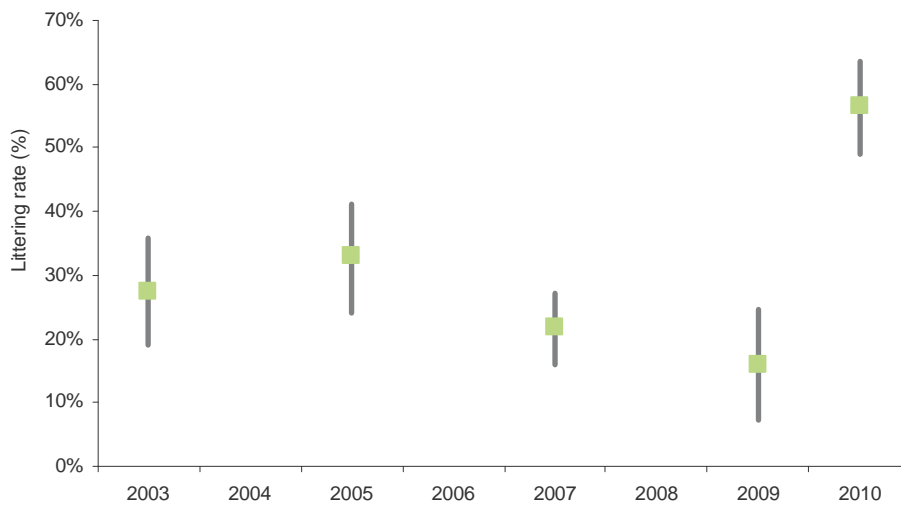


Table 7 Regional littering rates confidence intervals 2003 – 2010

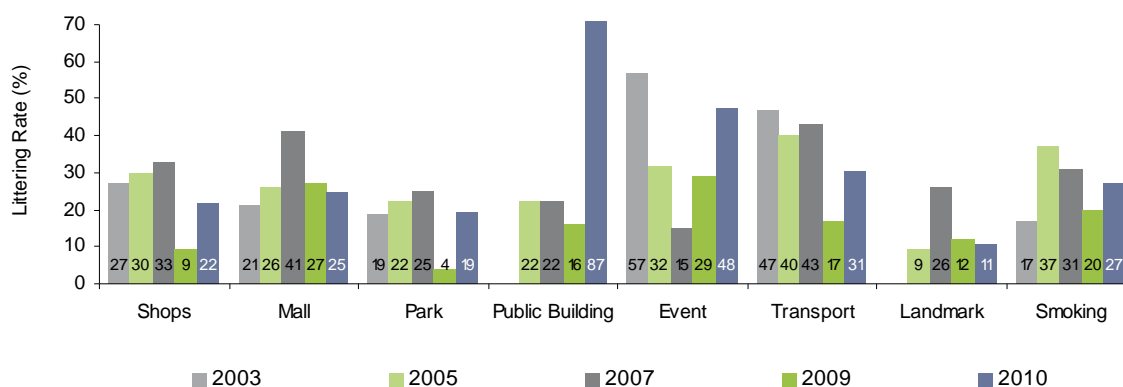
Year	Littering rate	95% Confidence interval	
		Lower CI	Upper CI
2003	28%	19%	36%
2005	33%	24%	41%
2007	22%	16%	27%
2009	16%	7%	25%
2010	57%	49%	64%

Littering and site types

Littering behaviour and bin use at site types are summarised in Figure 27.

Littering rates are not reported for sites where the total number of litter disposals observed was less than 30. For this reason *beach*, *easement*, *waterfront precincts*, *market*, and *waterfront* sites are not shown for the 2010 data presented in Figure 27. See Appendix B for details of site types.

Figure 27 Littering rates in site types 2003 – 2010



Observations

Littering rates varied between site types statewide and there were a number changes from the 2009 rates. Nearly all sites showed increases in littering except for *mall* and *landmark* sites. Large increases were observed in *park* (15%), *public building* (71%) and *event* (19%) sites.

In 2010, the insufficient number of litter disposals observed in regional areas with the exception of *public building* sites meant that it was not possible to make comparisons between urban and regional littering behaviour and bin use at sites.

What people say about litter

As part of the 2010 *Victorian Litter Report*, 502 members of the public in 216 locations agreed to be surveyed about their views on litter.

In addition, survey sample sizes were robust enough to enable reporting of demographic comparisons between urban and regional locations as shown in Table 8.

Demographic profile of survey respondents

Gender and age

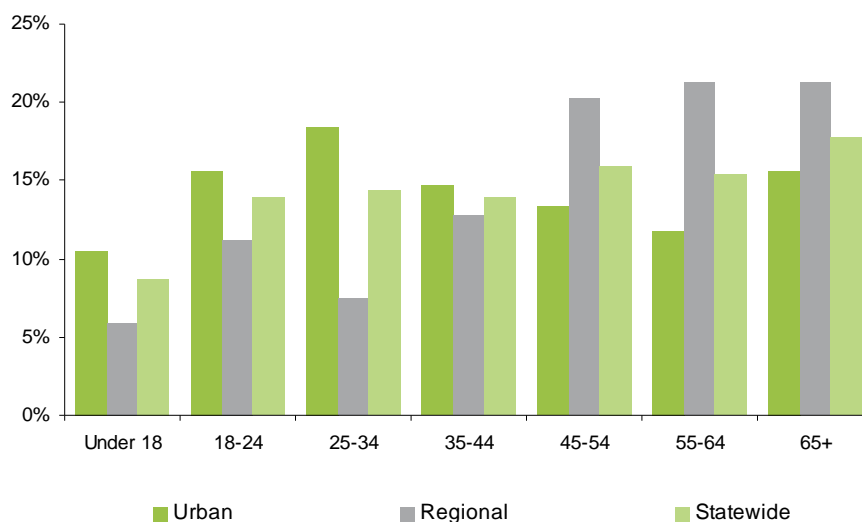
The gender of respondents participating in 2010 surveys is shown in Table 8 below.

Table 8 Gender profile, survey participants 2010

Year	Men	Women	Total	Percent Female
2003	343	402	745	54%
2005	491	507	998	51%
2007	240	281	521	54%
2009	140	143	283	51%
2010	204	298	502	59%
<i>Urban 2010</i>	125	189	314	60%
<i>Regional 2010</i>	79	109	188	58%

The age group of respondents participating in the 2010 survey is illustrated in Figure 28 below.

Figure 28 Age profile, survey participants 2010



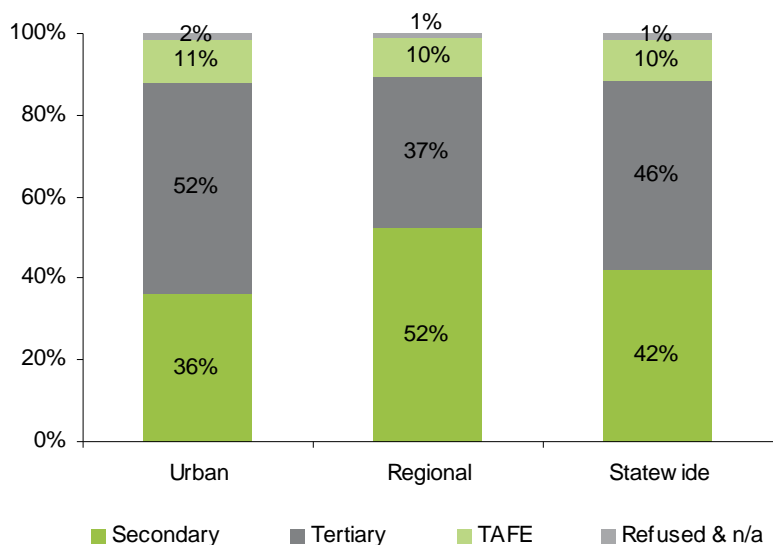
Observations

- The 2010 survey represents a good distribution of ages between 18 and 65 or older. Just under half (49%) of respondents were aged 45 or older. Consistent with previous surveys, people willing to be interviewed in regional areas tended to be older (45 and older) than those in urban locations.

Education and employment

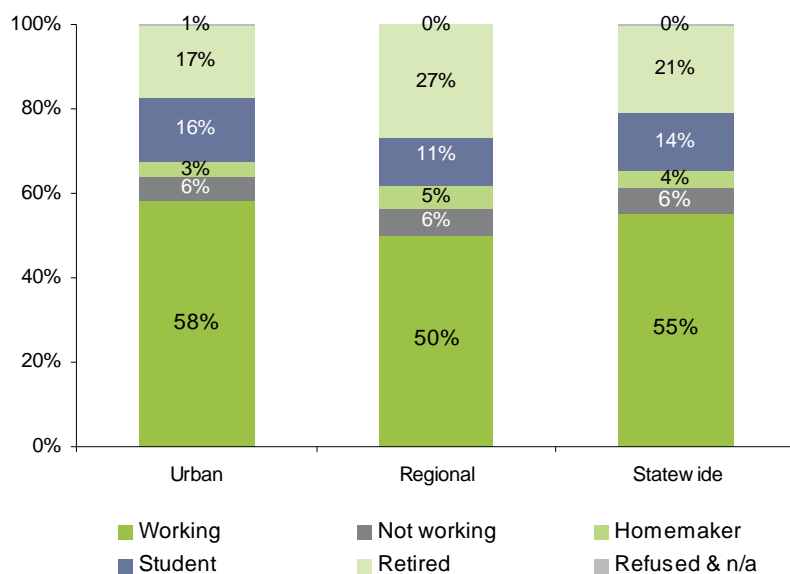
In 2010, the highest level of education achieved by respondents is shown in Figure 29, with employment categories included in Figure 30.

Figure 29 Education profile*, survey participants 2010



* Rounding of figures may cause totals not to sum to 100 per cent.

Figure 30 Employment profile*, survey participants 2010



* Rounding of figures may cause totals not to sum to 100 per cent.

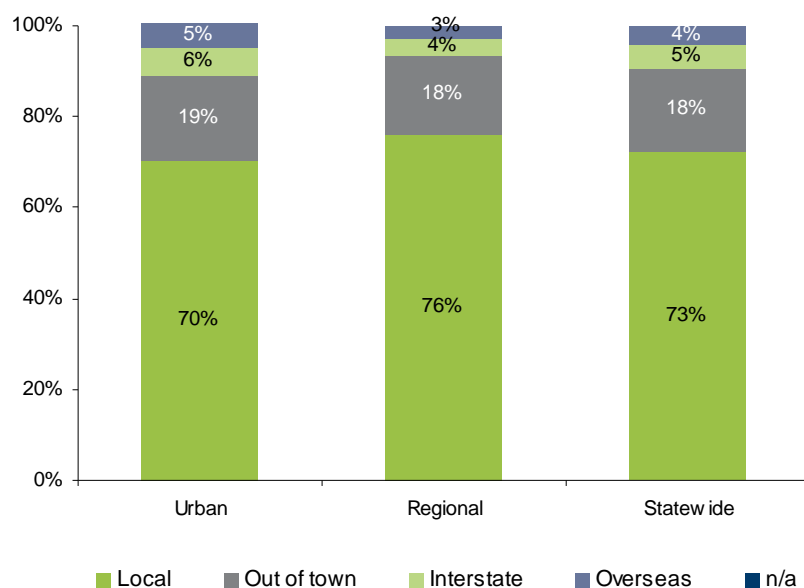
Observations

- The statewide education and employment profiles showed that 46% of respondents had some form of tertiary education and were in paid employment.
- As in 2007 and 2009, urban survey respondents were more likely than regional respondents to be tertiary educated.
- The number of respondents working was slightly higher in urban areas (58%) compared with (50%) in regional areas.

Place of residence

The 2010 survey respondents' place of residence is shown in Figure 31 below.

Figure 31 Place of residence profile*, survey participants 2010



* Rounding of figures may cause totals not to sum to 100 per cent. The category of 'n/a' is less than 1% and does not appear on Figure 31.

Observations

- Similar to previous years, the majority of those surveyed considered themselves local to the area where the interview was conducted (73%), followed by those from out of town (19%). Regional area respondents were more likely than those in urban areas to be locals (76%), and similarly likely to be from out of town (18%).
- In summary, the 2010 Victorian Litter Report demographic profile indicates that the largest proportion of those interviewed were local to the area, employed and with a tertiary education and all age groups were well represented.

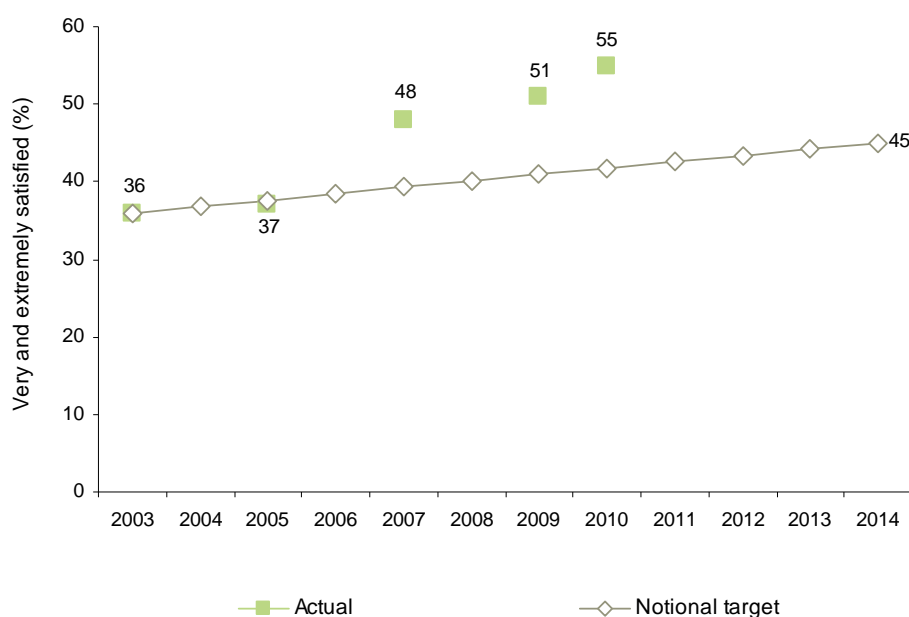
Community satisfaction with litter management

Satisfaction with litter management was measured by survey respondent's attitudes towards the public place itself, the adequacy of bins and overall satisfaction with litter management at the location.

Satisfaction with litter management indicates the degree of community alignment with managers of public places.

Figure 32 summarises overall community satisfaction with litter management in Victoria since 2003 as either 'very satisfied' or 'extremely satisfied'. Notional TZW targets for 2010 community satisfaction with litter management are also shown.

Figure 32 Community satisfaction related to public places and litter 2003 – 2010

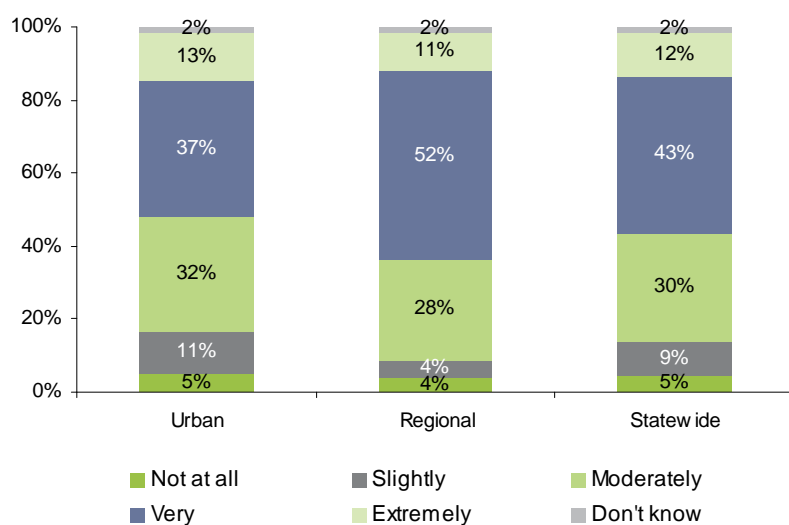


Observations

- Community satisfaction with litter management in public places has increased since 2003 with 55% of those interviewed in public places in 2010 indicating they were ‘very satisfied’ or ‘extremely satisfied’ with litter management in their local area.
- The 2010 community satisfaction level exceeds the notional TZWtarget by 13 percentage points and has increased by 4 percentage points since 2009, indicating more people were satisfied with efforts at litter prevention in 2010.

Responses to community satisfaction with location litter management were combined in Figure 33 to get a picture of how well the community perceives litter to be managed in Victoria as a whole, and in urban and regional locations in particular.

Figure 33 Community satisfaction with location litter management 2010



* Rounding of figures may cause totals not to sum to 100 per cent.

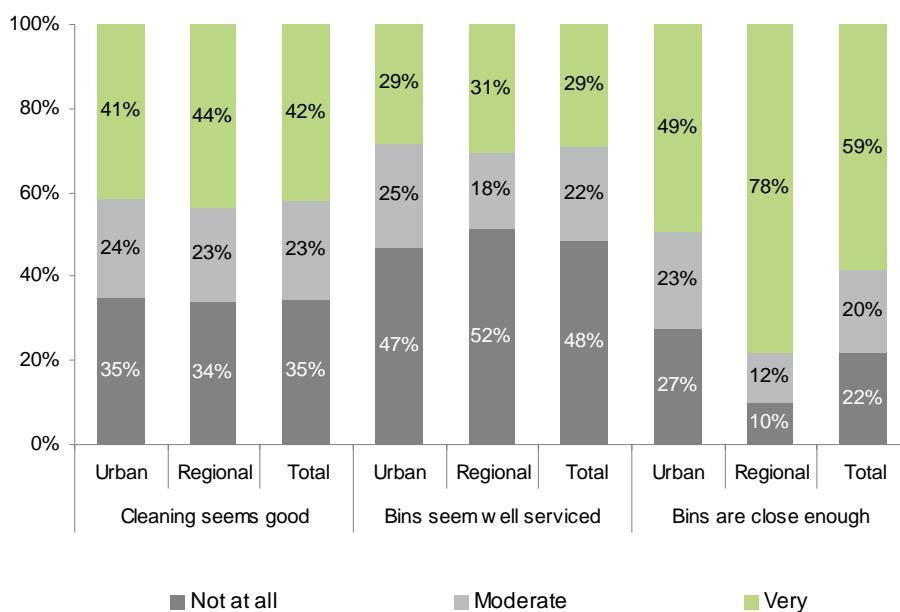
Observations

- Statewide respondents are moderately satisfied (30%); very satisfied (43%) or extremely satisfied (12%) with litter management in their local area. Fewer people are 'very satisfied' or 'extremely satisfied' in urban areas (50%) than in regional areas (63%), although 2010 saw an improvement in urban areas from 2009 (44%).

Community assessment of location features

Community surveys also investigated community assessments of location features, cleaning and *BIN* infrastructure (servicing and position). Responses from statewide urban and regional respondents are shown in Figure 34.

Figure 34 Community assessments* of features of disposal facilities 2010



* Rounding of figures may cause totals not to sum to 100 per cent.

Observations

- 42% of all respondents in Victoria reported cleaning to be 'very good' in the location where they were interviewed. Regional respondents were more likely than their urban counterparts to assess cleaning as 'very good'. However, 35% of respondents in urban and 34% in regional locations commented that cleaning was 'not at all' good.
- Community assessments of bin servicing were less favourable, with only 29% of respondents reporting that bins were 'very well serviced'. A relatively high 48% of all respondents reported that bins were not well serviced.
- Community assessments for proximity of bins were more favourable, with 59% of all respondents agreeing that the bins were close enough. Proximity was even more favourable in regional areas, with 78% agreeing the bins were 'very close to where needed', compared with 49% in urban areas.

Appendix A: Methodology

Background

The original Clean Communities Assessment Tool (CCAT) methodology was designed in 2003 by Community Change P/L. The CCAT provides a systematic assessment of littering behaviour, litter and key features of public places. In 2003, 2005, 2007, 2009 and 2010, Sustainability Victoria used the CCAT to establish statewide benchmarks and assess progress against TZWtargets.

Tools used in the *Victorian Litter Report*

The *Victorian Litter Report* 2010 (VLR) contains the outcomes of this benchmarking exercise based on the following CCAT measures:

1. **Littering behaviour rate** – the primary outcome measure for behaviour change progress against TZWtargets.

Observations of disposal actions are the most effective indicator of community littering and bin use, avoiding reliance on self reporting measures that are often influenced by social desirability, and where there is a frequent mismatch between what people *say they do* with what they *actually do*.

People's littering behaviour is influenced by numerous factors, including the characteristics of public place locations. Public places that are clean, safe and user friendly promote participation of the community (and visitors) in efforts to care for and maintain the location, as well as engendering a sense of ownership and community pride. In contrast, public places that are dirty and poorly cared for attract not only litter, but are more likely to contain graffiti and other characteristics promoting the likelihood of anti-social behaviour and threatening community safety.

The CCAT categorises disposal acts as 'positive' or 'negative' according to whether items have been effectively contained.

- Negative acts include dropping, throwing and leaving items on the ground; on top of full, overflowing or closed bins and brimming on bin edges. It also includes items being swept or kicked into the gutter.
- Positive acts include bin use (an object disposed into a bin regardless of its recycling status); cigarette butts put into personal ashtrays (often used beverage containers); and returning a shopping trolley to a collection bay.

When sample sizes are large enough to provide robust indicators of littering (and conversely bin use) a **littering behaviour rate** can be calculated and expressed as a percentage, representing littering behaviours as a proportion of overall disposals (positive and negative).

2. **Litter counts.** The number of littered items present in a 48 square metre area of a location.

Litter counts provide information about litter 'on the ground,' indicating clean areas, litter hot spots, effectiveness of litter containment and litter management practices (including clean up) by relevant authorities, as well as consistent assessment of the composition of materials littered (when sample sizes are large enough to provide robust indicators).

Using the CCAT, litter counts can be used to provide a proxy or an indirect assessment of littering behaviour, particularly when behavioural information is not available or when the observation sample size is too small. However, caution is required when using litter counts to represent littering behaviour because the indirect measure is susceptible to variability not directly related to littering, including the influences of cleaning routines, containment of litter, animal scavenging and weather conditions, and therefore provides only limited information on actual community behaviour.

To reduce some of the variability associated with litter counts, a standardised approach to counting items is used in a 48 square-metre zone that includes, ideally, a bin and furniture or other infrastructure. In the 2007 *Victorian Litter Report*, reporting of litter count item totals and composition categories were adjusted and previous results recalculated to focus attention on those items where litter prevention efforts are likely to have a behavioural impact and to ensure the most accurate comparison between reports.

3. **CCAT factor ratings.** Assessment of Victoria's progress in litter prevention is based on systematic assessment of the features of public place locations that influence littering, bin use, litter accumulation and litter management.

Trained assessors rate the features of a location and conduct community surveys to provide information about attitudes toward litter, its prevention and perceptions about the location. Three primary CCAT factors ('Context', 'Facilities' and 'Community Attitudes and Perceptions') are comprised of the following sub-factors:

1. **Context** (combines assessor ratings and community surveys)
 - Sense of community
 - Feeling of safety
 - Graffiti
 - Commercial and domestic dumping
 - Overall cleanliness of the location
2. **Facilities** (using assessor ratings)
 - Infrastructure* (street furniture, landscaping, open space, entrances)
 - Condition
 - Cleanliness including presence of old litter and new litter
 - Maintenance
 - BIN* infrastructure (litter, recycling and butt bins)
 - Number
 - Presentation (design, consistency, signage, colour)
 - Position (prominence, proximity, configuration and placement)
 - Performance (ease of use, size of openings, containment of litter, ability to manage weather)
 - Cleanliness
3. **Community attitudes and perceptions** (using community surveys)
 - Attitudes towards the place itself
 - Adequacy of disposal facilities

Each primary factor consists of assessor ratings of sub-factors based on a five-point scale with assessments ranging from 'very low', 'low', 'medium', 'high' to 'very high'. The higher the CCAT rating for a sub-factor, the cleaner it is likely to be and the greater the likelihood it will remain clean.

Using sub-factor ratings (from CCAT assessor ratings and community survey data), a score from 0 to 100 is calculated for each of the three factors – 'Context', 'Facilities' and 'Community Attitudes and Perceptions'. A Summary CCAT score is also calculated to represent the location's overall litter prevention performance averaged over the 87 variables that make up the factors and sub-factors of CCAT.

In summary, the *Victorian Litter Report* uses the CCAT methodology to provide a method for benchmarking litter prevention performance at location, local government, regional and statewide levels. The report summarises information from a range of performance indicators for determining effective litter prevention programs:

1. Littering behaviour rate (littering actions as a proportion of both positive and negative disposals)
2. Litter counts (average number of items)
3. Type of items found in locations (composition percentage)
4. CCAT summary score indicating overall litter prevention performance (0-100)
5. CCAT primary factor scores identifying strengths and weaknesses of location features (0-100)
6. An indication of community satisfaction and support for litter prevention programs.

Victorian Litter Report 2010 methodology

The *Victorian Litter Report* was conducted from September to early December 2010 and followed standardised CCAT data collection procedures used in previous years.

Sampling procedures followed the protocols established in the 2003 benchmark study and used a sample frame determined by Sustainability Victoria to represent urban population areas in the Melbourne Statistical District and major regional centres. As many locations as possible were reassessed to provide comparability with 2007 and 2009 data. The 2010 *Victorian Litter Report* sample consisted of 216 locations.

A more detailed description of CCAT site types, sample selection procedures and summaries of CCAT outcomes for each location is contained in Appendix B.

Inter-rater agreement

The level of agreement between two independent CCAT raters in a location is determined using an inter-rater reliability protocol which involves two raters assessing the same location at the same time with no discussion of ratings until after data has been entered into the database. A total of 5 locations had inter-rater assessments completed by staff members operating in teams of two and comparisons were made by calculating the concordance rate. The concordance rating showed that in many instances, the two raters agreed exactly on the rating. If adjacent values are included in the concordance rating, then in 100% of instances, raters agreed within one ranking difference on either side.

Interpreting CCAT scores

Location features are rated on a scale from 1 to 5, the higher the score, the cleaner the feature being assessed. For analysis purposes, the ratings are converted to scores on a scale from 0 to 100 points.

Table 9 provides a description of CCAT factors at the extreme high and low ends of the scale.

Table 9 CCAT rating guides

Key Indicator	Factor	High	Low
CCAT summary	Features combined in a summary rating	Area likely to be extremely clean and resource recovery successful	Area is highly littered, with contamination of recyclables
Context	Community identity and involvement	Strong sense of pride, ownership over the space	Poor sense of ownership & area is not clean
Facilities	Summarises results for bins and street furniture	Extremely well maintained, litter free facilities that are easily used and well positioned	Inadequate facilities, poorly maintained
<i>Infrastructure</i>	Condition & cleanliness of all furniture, streetscape and landscaping	Furniture is extremely well maintained, clean and appropriate	Poorly maintained & surrounded by litter
<i>BIN</i> rastructure	Features and cleanliness of all litter, recycling and butt bins	Bin design, position and maintenance is highly appropriate to area and usage patterns	Inadequate number, configuration, positioning or servicing of bins
Public perceptions & attitudes	Summary of community views on area	Area is perceived as extremely well looked after and serviced	Area is seen as inadequately presented
<i>Attitudes to place</i>	Views on the area and expected actions	Strong expectation exists for people to do the right thing with used items	No expectation to do the right thing
<i>Attitudes towards disposal facilities</i>	Perceptions of appropriateness of bins and furniture	Facilities are viewed as highly appropriate and meeting needs of community	Community sees a need to improve facilities

Appendix B: Site types

Sustainability Victoria selected a representative sample of locations for the *Victorian Litter Report* survey using a sample frame of all Local Government Authorities (LGAs). LGAs were assigned strata based on population size groupings for urban and regional LGAs. One LGA was selected from each stratum for sampling. The Melbourne Statistical District (MSD) and Greater Geelong City Council were included as separate strata and included in the sample selected. A total of 10 LGAs were included in the survey; three from regional LGAs and seven from urban.

The selection of LGAs for the *Victorian Litter Report* was based predominately on precedents set in 2003 using geography and population.

Review of site classification and selection

Sustainability Victoria updated the site classification and sample selection system in 2005 to ensure that the sample of site types selected for assessment and monitoring were appropriate for representing public places in Victoria. Locations used in 2010 largely matched those in 2009 and 2007, to increase comparability of outcomes and build a clear picture of progress toward TZW targets.

Selection of sites to be assessed was made to reflect information requirements for particular site types and locations within regions. Some site types were selected more often than others, for example shopping centres, due to their more frequent occurrence in the local government areas selected.

The random sample of sites selected in an LGA was influenced by the availability of each site type within the chosen locations. For example, a beach site type might have been randomly selected to be assessed in Hume but because there are no beaches in that LGA, random selection was replaced by the next available site type in Hume.

Definitions of site types, sample characteristics and the location of sites are presented in the tables below.

Table 10 Site type and sample size by LGA 2010

Site types	Ballarat	Casey	Dandenong	Geelong	Hume	Manningham	Melbourne	Mt Alexander	Port Phillip	Yarra	Total
Beach	—	—	—	4	—	—	—	—	3	—	7
Easement	—	2	2	3	1	—	1	1	1	1	12
Event	—	—	—	1	—	—	4	—	—	—	5
Landmark	1	—	—	4	1	—	9	3	—	—	18
Mall	3	1	1	3	2	2	3	—	—	—	15
Market	—	—	1	1	—	—	3	—	1	—	6
Park	4	2	3	4	2	3	6	1	2	3	30
Public building	1	4	2	6	2	2	2	1	—	2	22
Shops	5	4	4	6	3	2	6	3	2	3	38
Smoking	2	2	1	2	2	1	6	—	—	—	16
Transport	2	4	3	4	2	3	—	—	—	1	19
Waterfront	1	3	1	2	2	2	7	1	3	2	24
Waterfront precinct	—	—	—	1	—	—	2	—	1	—	4
Total	19	22	18	41	17	15	49	10	13	12	216

Table 11 Site type and sample size by urban / regional classification

Site type	Urban	Regional	Total
Beach	3	4	7
Easement	8	4	12
Event	4	1	5
Landmark	10	8	18
Mall	9	6	15
Market	5	1	6
Park	21	9	30
Public building	14	8	22
Shops	24	14	38
Smoking	12	4	16
Transport	13	6	19
Waterfront	20	4	24
Waterfront precinct	3	1	4
Total	146	70	216

Table 12 Site type definitions

Site type	Definition
Beach	The sandy area between the water and a boundary or border that clearly marks areas for recreation. This includes boardwalks and grassy areas adjoining the beach such as St. Kilda beach but excludes parks that are adjacent to the beach such as Brighton beach parkland (included in Parks).
Event	A special occasion often involving large crowds of people attending a venue for a significant activity involving leisure, recreation, or sport. eg, AFL and local VFL football, cricket, Grand Prix, Melbourne Cup, etc.
Landmark	A place (usually a building) characterised as having some significance in terms of the history or culture of the city, and by sightseeing or tourist activity although not designated as such. The Victorian Parliament building in Melbourne offers sightseeing to visitors but its main activity is government. This site type also includes Federation Square and Myer Music Bowl.
Mall	A pedestrian thoroughfare or sheltered promenade with merchandise and food vendors lining the walkway or street, often with limitations on vehicle access, eg, Bourke Street Mall.
Market	An open or covered space where merchandise and food stalls provide fresh produce and/or a range of goods to the public, which often include seating and eating areas, eg, Queen Victoria Market.
Park	Grassy site with shrubbery or garden beds, children's play equipment, seats and tables, often with barbecue facilities 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 within walking distance of food vendors, eg, library, post office, council building, museum, court, cinema, hospital, etc.
Easement	The public space or area immediately outside or leading up to a ticketed area of a railway station which provides access to the public. An actual or implied fence line extending to a point of unauthorised entry is the limit of the easement.
Shops	Areas for selling goods or services, often with a vehicular thoroughfare down the middle of a street lined with merchandise and food vendors with wide footpaths and places for people to sit, eg, Chapel Street, Lygon Street, Elizabeth Street, etc. Restaurants and cafes are included in this definition where they have outdoor seating for patrons.
Smoking area	Places outside a building where cigarette smoking is prevalent. Smokers may be catered for (officially or unofficially) by the placement of permanent or temporary ashtrays.
Transport	Outdoor transport terminal or waiting and transit area with pedestrian traffic going to and from public transport stops, eg, all bus stops and tram stops are outdoor transport terminals.
Waterfront	Area next to a body of water, eg, river, lake or pond, often with seats or grassy areas used by the community for recreation and picnicking, eg, Lake Wendouree in Ballarat, Lake Weeroona in Bendigo, Albert Park lake in Melbourne, Yarra river bank Melbourne. Generally, no significant retail activity takes place in these areas.
Waterfront precinct	Area next to a body of water with cafes and shops, catering for a mix of tourist and significant retail activity, eg, Southbank and the Docklands area in Melbourne.

Appendix C: Locations

The CCAT summary scores for each location audited for the 2010 *Victorian Litter Report* are presented in Table 13 in alphabetical order of LGA¹³ by site type.

Table 13 Location by CCAT summary score 2010

City	Site	Location	Area	CCAT summary score
Ballarat	Landmark	Camp St Precinct		80
Ballarat	Mall	Bridge Mall	Near McDonalds	72
Ballarat	Mall	Bridge Mall	Sturt St End	83
Ballarat	Mall	Phoenix Mall	Eastern Side	78
Ballarat	Park	Botanic Gardens , Ballarat	Morey Gate	91
Ballarat	Park	DeSoza Pk		85
Ballarat	Park	Victoria Pk	Between Sturt & Oak Avenue	85
Ballarat	Park	Windmill Drive Precinct	Adventure Playground	89
Ballarat	Public Building	Ballarat Miner Dome		79
Ballarat	Shops	Bunninyong Shops cnr Learmonth & Warrenheip		81
Ballarat	Shops	Central Sq	Target Entrance	75
Ballarat	Shops	Howitt St 1219B-1225D		74
Ballarat	Shops	Sebastopol Shops cnr Rubicon		74
Ballarat	Shops	Sturt St book city	Book City	81
Ballarat	Smoking	Phoenix Mall	West Side	71
Ballarat	Smoking	Wendouree Village		79
Ballarat	Transport	Central Sq	Myer Entrance	76
Ballarat	Transport	Lt Bridge St Bus Stop		72
Ballarat	Waterfront	Wendouree Parade	Gnarr St	87
Casey	Easement	Cranbourne Railway Station		71
Casey	Easement	Narre Warren Train Station	Car Park Side	61
Casey	Mall	Clydesdale Mall/Cranbourne Park SC		72
Casey	Park	Lawson Poole Reserve		89
Casey	Park	Wilson Botanic Park	Playground	81
Casey	Public Building	Cranbourne Library		70
Casey	Public Building	Family Resource Centre		90
Casey	Public Building	Hampton Park Library		72
Casey	Public Building	Narre Warren Library		64
Casey	Shops	Berwick Village		81
Casey	Shops	Hampton Park Shopping Square		83
Casey	Shops	High St Shops, Cranbourne		72

¹³ Please note that the local governments selected as part of this survey are a representative sample based on population size and the geographic boundary they fall within, i.e. metro or non-metro councils. A sample of 7 metropolitan and 3 non-metro local governments was selected for the VLR 2010. It is not the intent of this report to rank or highlight the overall scores associated with each of the local governments selected as part of this survey but to highlight the overall Summary CCAT scores associated with each of the locations and site types. Appendix C does not represent a ranking of local governments but rather a list sorted by local governments by site type locations for easy reference to the sites selected.

City	Site	Location	Area	CCAT summary score
Casey	Shops	Webb St, Narre Warren		72
Casey	Smoking	Clydesdale Mall/Cranbourne Park SC		74
Casey	Smoking	Cranbourne Park Car park	Safeway	77
Casey	Transport	Fountain Gate Bus Stops		69
Casey	Transport	Hampton Bus Terminal		75
Casey	Transport	Lyll St		69
Casey	Transport	Webb St, Narre Warren		64
Casey	Waterfront	Akoonah Park, Berwick		79
Casey	Waterfront	Banjo Paterson Park		81
Casey	Waterfront	Buchanan Park		80
Dandenong	Easement	Dandenong Train Station		63
Dandenong	Easement	Springvale Station Lightwood rd side		48
Dandenong	Mall	Palm Plaza		74
Dandenong	Market	Dandenong Market		89
Dandenong	Park	Burden Park		84
Dandenong	Park	Dandenong Park	Lonsdale St End	78
Dandenong	Park	Fotheringham Reserve		79
Dandenong	Public Building	Post office on Langhorne St		70
Dandenong	Public Building	Springvale Library Back entrance		73
Dandenong	Shops	Athol St shop	Plaza	73
Dandenong	Shops	Douglas St, Noble Park		78
Dandenong	Shops	Springvale Shops	Safeway	78
Dandenong	Shops	Walker St		77
Dandenong	Smoking	ATO, Mason St		56
Dandenong	Transport	Bus Stop 303-321 Springvale rd		67
Dandenong	Transport	Dandenong Train Station		62
Dandenong	Transport	McCrae St		74
Dandenong	Waterfront	Dandenong Park	Near footbridge	75
Geelong	Beach	Eastern Beach		82
Geelong	Beach	Ocean Grove	Hodgson St	87
Geelong	Beach	Ocean Grove SLSC		82
Geelong	Beach	Rippleside		89
Geelong	Easement	Lara Train Station		75
Geelong	Easement	North Geelong Station		76
Geelong	Easement	North Shore Station		56
Geelong	Event	Skilled Stadium	Graham 'Polly' Farmer Gate	75
Geelong	Landmark	Boer War Memorial Park		71
Geelong	Landmark	City Hall Geelong	Entrance	83
Geelong	Landmark	City Hall Geelong	North Side	80
Geelong	Landmark	Waterworld		76
Geelong	Mall	Highton Shopping Village		82
Geelong	Mall	Labuan Sq		76
Geelong	Mall	Lt Malop St Mall		76
Geelong	Market	Corio Markets		87
Geelong	Park	Cameron Pk		81
Geelong	Park	Eastern Beach	Reserve	83
Geelong	Park	Johnstone Park		82
Geelong	Park	Rippleside	Playground	86
Geelong	Public Building	Centrelink Geelong		73
Geelong	Public Building	Geelong Library		78

City	Site	Location	Area	CCAT summary score
Geelong	Public Building	GPAC		78
Geelong	Public Building	Information Centre		90
Geelong	Public Building	Ocean Grove P.O.		83
Geelong	Public Building	Wool Museum		83
Geelong	Shops	Geelong Train Station		68
Geelong	Shops	High St shops Belmont		80
Geelong	Shops	Market Sq		84
Geelong	Shops	Moorabool St, Cnr Malop St		80
Geelong	Shops	Ocean Grove		88
Geelong	Shops	Separation St, Corner Thompson Rd		67
Geelong	Smoking	ATO		73
Geelong	Smoking	State Government Offices		87
Geelong	Transport	Geelong Train Station		73
Geelong	Transport	High St Bus Stops		79
Geelong	Transport	Malop St Bus Stops		82
Geelong	Transport	Moorabool St Bus Stops		83
Geelong	Waterfront	Balyang Sanctuary		78
Geelong	Waterfront	Barwon Valley Park		82
Geelong	Waterfront Precinct	Carousel		89
Hume	Easement	Broadmeadows Train Station		47
Hume	Landmark	George Evans Museum		83
Hume	Mall	Dallas Square		81
Hume	Mall	Link Arcade, Sunbury		73
Hume	Park	Broadmeadows Town Park		63
Hume	Park	Sunbury Recreation Reserve		75
Hume	Public Building	Broadmeadows Library		80
Hume	Public Building	Council Offices, Broadmeadows		74
Hume	Shops	Mahoney's Plaza Shopping Centre		75
Hume	Shops	Roxburgh Park Shopping Centre		79
Hume	Shops	Sunbury Shops, Evans cnr Brook		73
Hume	Smoking	Centrelink Broadmeadows		74
Hume	Smoking	Meadow Heights Shopping Centre		74
Hume	Transport	Broadmeadows Station Bus Stops		61
Hume	Transport	Sunbury Train Station Bus stop		62
Hume	Waterfront	Apex Park, Sunbury Rd		72
Hume	Waterfront	Jack Roper Reserve		75
Manningham	Mall	Goldfields Plaza		82
Manningham	Mall	Macedon Sq		81
Manningham	Park	Birrarrung Park	Playground	68
Manningham	Park	Koonung Reserve		83
Manningham	Park	Ruffey Lake Park		84
Manningham	Public Building	Doncaster library		83
Manningham	Public Building	The Pines Branch Library		66
Manningham	Shops	Blackburn Rd		69
Manningham	Shops	Templestowe Village		74
Manningham	Smoking	Westfield Doncaster, Smoking area		85
Manningham	Transport	Goldfields Plaza Bus Stop		71
Manningham	Transport	The Pines Shopping Centre		79
Manningham	Transport	Westfield Bus Terminal	Bus Terminal	77

City	Site	Location	Area	CCAT Summary Score
Manningham	Waterfront	Banksia Park	BBQ	77
Manningham	Waterfront	Westerfolds Park, Swamp Gum Car park		76
Melbourne	Easement	Southern Cross Station - Collins St end		73
Melbourne	Event	MCG	Tower 2	74
Melbourne	Event	MCG	Tower 3	81
Melbourne	Event	MCG	Tower 4	81
Melbourne	Event	MCG Footbridge	Vodafone Arena End	82
Melbourne	Landmark	Between Hamer Hall and Arts Centre		83
Melbourne	Landmark	City Square		81
Melbourne	Landmark	Exhibition Building	Fountain	80
Melbourne	Landmark	Exhibition Centre		73
Melbourne	Landmark	Flinders St Station		78
Melbourne	Landmark	Myer Music Bowl	Near George V Statue	82
Melbourne	Landmark	Rialto Towers		75
Melbourne	Landmark	St Kilda Rd in front of Hamer Hall		82
Melbourne	Landmark	VCA, opp George V Statue		75
Melbourne	Mall	Bourke St Mall	Elizabeth St	76
Melbourne	Mall	Bourke St Mall	Swanston St	75
Melbourne	Mall	Hardware Lane	Lonsdale St End	72
Melbourne	Market	Queen Victoria Market		84
Melbourne	Market	Queen Victoria Market	Peel St Side	71
Melbourne	Market	Southbank Sunday Market		81
Melbourne	Park	Fitzroy Gardens		81
Melbourne	Park	Flagstaff Gardens		80
Melbourne	Park	Gordon Reserve		72
Melbourne	Park	Kings Domain		76
Melbourne	Park	Queen Victoria Gardens		83
Melbourne	Park	Treasury Gardens		86
Melbourne	Public Building	Melbourne Town Hall		72
Melbourne	Public Building	State Library		71
Melbourne	Shops	Collins St	Centreway	73
Melbourne	Shops	Elizabeth St	Near Coles	77
Melbourne	Shops	Galleria Plaza, Elizabeth St		76
Melbourne	Shops	Lt Collins St		72
Melbourne	Shops	Swanston St	Between Collins & Lt Collins St	76
Melbourne	Shops	Target Centre, Bourke St		78
Melbourne	Smoking	222 Exhibition St		79
Melbourne	Smoking	242 Exhibition St		79
Melbourne	Smoking	Collins Place, 35- 55 Collins St		80
Melbourne	Smoking	Defence Plaza		77
Melbourne	Smoking	Melbourne Central, 360 Elizabeth St		81
Melbourne	Smoking	William St	Corner Bourke St Boat sheds replaces park ground under repair	83
Melbourne	Waterfront	Alexandra Gardens		78
Melbourne	Waterfront	Birrarrung Park	Near Federation Square	80
Melbourne	Waterfront	Birrarung Marr	Tollway End	82
Melbourne	Waterfront	Docklands	New Quay	81
Melbourne	Waterfront	Royal Bot Gardens Melbourne	Central Lakes	82
Melbourne	Waterfront	Yarra Park	BBQ	91

City	Site	Location	Area	CCAT Summary Score
Melbourne	Waterfront	Yarra River	North Side	64
Melbourne	Waterfront Precinct	Southbank		69
Melbourne	Waterfront Precinct	Southbank	Southgate Entrance	85
Mt Alexander	Easement	Castlemaine Train Station		84
Mt Alexander	Landmark	Burke and Wills Monument		88
Mt Alexander	Landmark	Maldon War Memorial		90
Mt Alexander	Landmark	Mt. Tarrangower Lookout		82
Mt Alexander	Park	Victory Park		85
Mt Alexander	Public Building	Castlemaine Post Office		86
Mt Alexander	Shops	Barker Street Shops, cnr Lyttleton St		84
Mt Alexander	Shops	Main Street Shops Maldon, Dolphin St to Garage		77
Mt Alexander	Shops	Mostyn Street Shops, cnr Frederick		80
Mt Alexander	Waterfront	Castlemaine Botanical Gardens		83
Port Phillip	Beach	Elwood Beach		79
Port Phillip	Beach	Port Melbourne Beach		84
Port Phillip	Beach	Sandridge Beach		79
Port Phillip	Easement	Ripponlea Station		70
Port Phillip	Market	The Esplanade	Opposite Footbridge	74
Port Phillip	Park	Alma Park East		79
Port Phillip	Park	Elwood Park		74
Port Phillip	Shops	Bay St Shops	Outside Coles	68
Port Phillip	Shops	Carlisle St	Corner Woodstock Street	70
Port Phillip	Waterfront	Acland St	Safeway	69
Port Phillip	Waterfront	Albert Park	Playground	83
Port Phillip	Waterfront	Pt Ormond Reserve		76
Port Phillip	Waterfront Precinct	Beacon Cove		74
Yarra	Easement	Richmond Station - Brunton Ave		60
Yarra	Park	Citizens Park		73
Yarra	Park	Darling Gardens - Hoddle St entrance		82
Yarra	Park	Edinburgh Gardens - Rowe St entrance		74
Yarra	Public Building	Carlton Library		73
Yarra	Public Building	Collingwood Town Hall		77
Yarra	Shops	Bridge Road - Richmond Plaza		71
Yarra	Shops	Queen's Parade Micheal St -cafes		78
Yarra	Shops	Victoria St, Richmond 176-214		64
Yarra	Transport	Bridge Rd & Church St Tram Stop		73
Yarra	Waterfront	Dight Falls		72
Yarra	Waterfront	Flockhart Reserve		64

Appendix D: Littered items classification

Table 14 Littered items classification

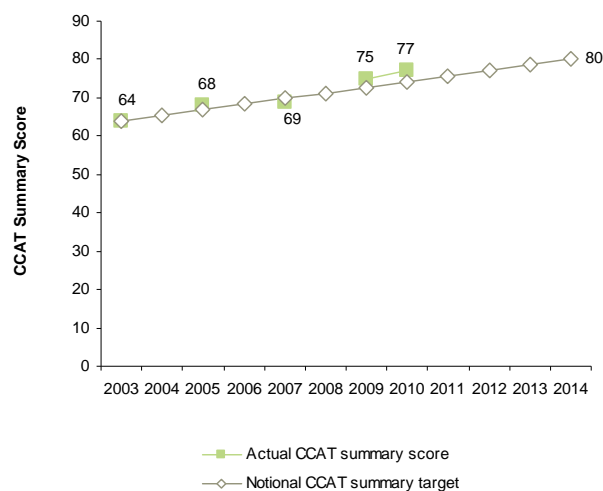
2005 ¹⁴ Littered item type	Items Included	2010 Littered item type	Items Included
Confectionery	Chewing gum Confectionery wrappers Ice cream wrappers	Confection wraps	Confectionery wrappers Ice cream wrappers
Paper	Paper bags Serviettes and tissues Receipts and tickets Paper pieces, newspaper, advertising material Takeaway boxes, cardboard boxes, cardboard pieces	Paper Cardboard	Paper bags Serviettes and tissues Receipts and tickets Paper pieces, newspaper, advertising material Paper cups Takeaway boxes, cardboard boxes, cardboard pieces
Beverage	Glass bottles and pieces Plastic bottles and cups Plastic caps, straws and utensils Paper cups and tetra boxes Aluminium cans, metal caps, ring pulls and pieces	Beverage Component items of beverages are reported separately	Glass bottles and pieces Plastic bottles and cups Plastic bits, caps, straws and utensils Aluminium cans, metal caps, ring pulls and pieces
Cigarette	Cigarette butts Cigarette packets, wrappers, foil and matches	Cigarettes	Cigarette butts Cigarette packets, wrappers, foil and matches
Organic	Animal poo Food Wooden utensils	Organics	Food Wooden utensils
Plastic film	Plastic film, bags and wrappers	Plastic film	Plastic film, bags and wrappers
Other	Packaging straps Shopping trolleys Syringes Other items not listed above	Other	Packaging straps Shopping trolleys Syringes Other items not listed above
		Not reported	Dog poo Chewing gum

¹⁴ Up until the 2005 VLR, the classification used for littered items is shown above. The 2007, 2009 and 2010 VLR used the modified version which excluded animal faeces and chewing gum as littered items.

Appendix E: CCAT summary scores and notional targets

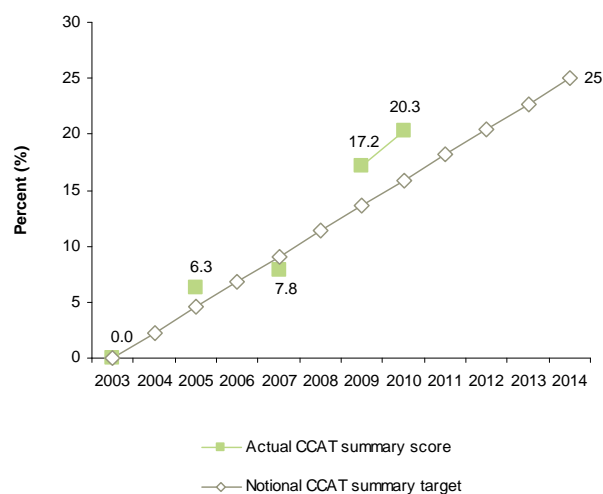
CCAT summary score

Year	Actual CCAT summary score	Notional CCAT summary target
2003	64	64
2004		65
2005	68	67
2006		68
2007	69	70
2008		71
2009	75	73
2010	77	74
2011		76
2012		77
2013		79
2014		80



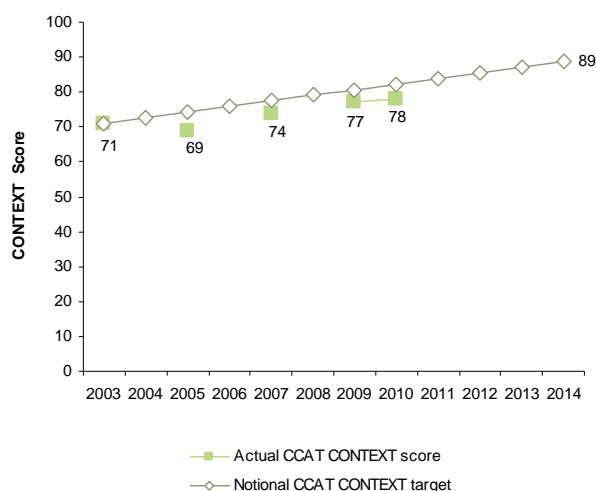
Percent change in CCAT summary Score

Year	Actual CCAT summary score % change	Target CCAT summary score % change
2003	0.0	0.0
2004		2.3
2005	6.3	4.5
2006		6.8
2007	7.8	9.1
2008		11.4
2009	17.2	13.6
2010	20.3	15.9
2011		18.2
2012		20.5
2013		22.7
2014		25.0



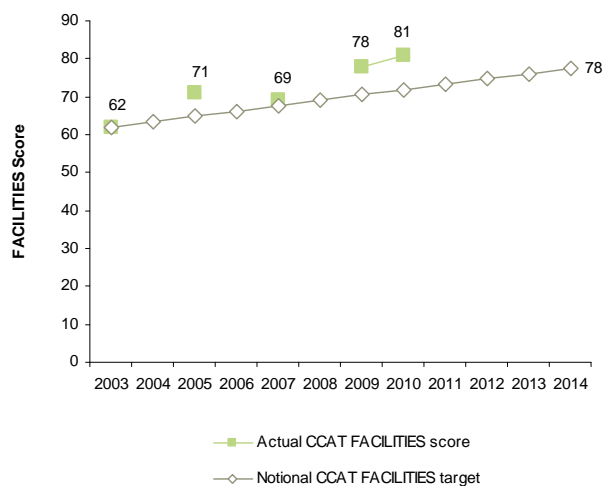
Context score

Year	Actual CCAT context score	Notional CCAT context target
2003	71	71
2004		73
2005	69	74
2006		76
2007	74	77
2008		79
2009	77	81
2010	78	82
2011		84
2012		86
2013		87
2014		89



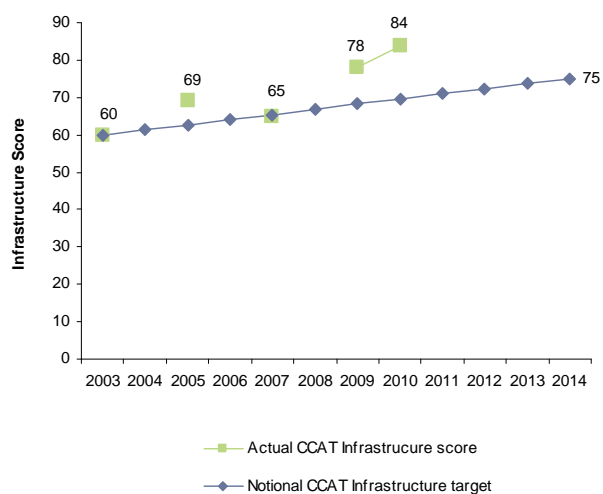
Facilities score

Year	Actual CCAT facilities score	Notional CCAT facilities target
2003	62	62
2004		63
2005	71	65
2006		66
2007	69	68
2008		69
2009	78	70
2010	81	72
2011		73
2012		75
2013		76
2014		78



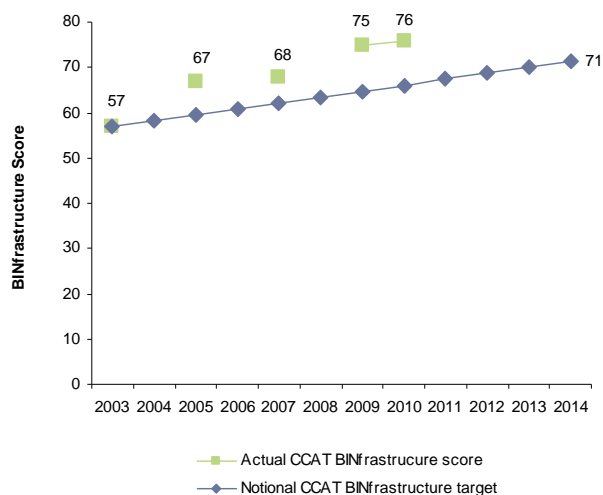
Facilities – Infrastructure score

Year	Actual CCAT infrastructure score	Notional CCAT infrastructure target
2003	60	60
2004		61
2005	69	63
2006		64
2007	65	65
2008		67
2009	78	68
2010	84	70
2011		71
2012		72
2013		74
2014		75



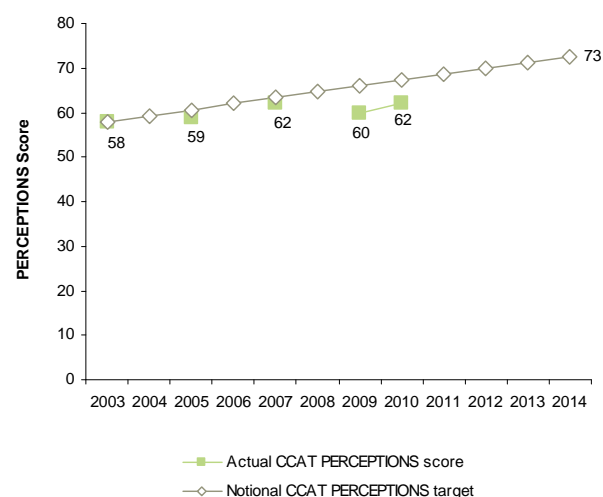
Facilities – BINfrastructure score

Year	Actual CCAT BINfrastrucure score	Notional CCAT BINfrastructure target
2003	57	57
2004		58
2005	67	60
2006		61
2007	68	62
2008		63
2009	75	65
2010	76	66
2011		67
2012		69
2013		70
2014		71



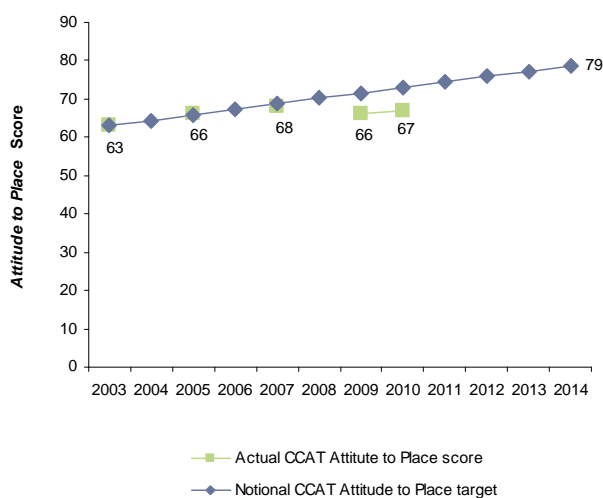
Perceptions score

Year	Actual CCAT perceptions score	Notional CCAT perceptions target
2003	58	58
2004		59
2005	59	61
2006		62
2007	62	63
2008		65
2009	60	66
2010	62	67
2011		69
2012		70
2013		71
2014		73



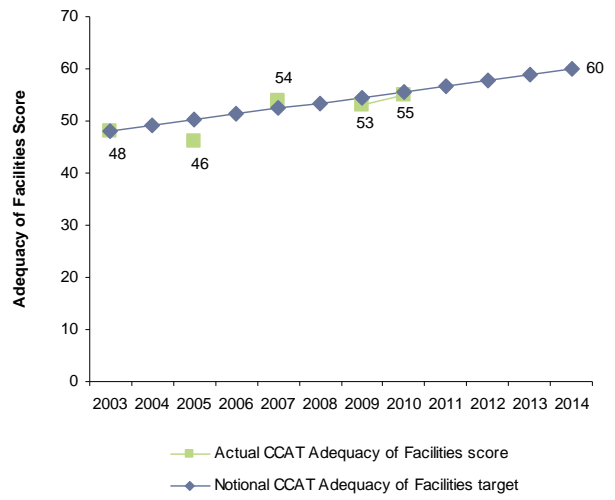
Perceptions – Attitude to place score

Year	Actual CCAT attitude to place score	Notional CCAT attitude to place target
2003	63	63
2004		64
2005	66	66
2006		67
2007	68	69
2008		70
2009	66	72
2010	67	73
2011		74
2012		76
2013		77
2014		79



Perceptions – Adequacy of facilities score

Year	Actual CCAT adequacy of facilities score	Notional CCAT adequacy of facilities target
2003	48	48
2004		49
2005	46	50
2006		51
2007	54	52
2008		53
2009	53	55
2010	55	56
2011		57
2012		58
2013		59
2014		60



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