



Beacons of Litter

**A social experiment to understand how the presence
of certain litter items influences rates of littering**

November 2016

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1. Executive Summary

1.1. Background

As part of the Defra funded *Social Innovation to Prevent Littering* programme, Keep Britain Tidy has partnered with local land managers to deliver a series of experiments aimed at changing littering behaviour. These experiments were evaluated to assess their impact on behaviour and litter on the ground, with a view to identifying interventions that could be successfully scaled up across England.

Keep Britain Tidy therefore invited expressions of interest from local land managers to work as partners in an experiment aimed at reducing litter.

Previous research has suggested that people are more likely to litter where litter is present¹. Keep Britain Tidy's recent research has built on this and identified that certain types of litter are perceived to be more prevalent and prominent than others, and are more likely to influence rates of littering. These items tend to be larger, brighter, and often branded pieces of litter, such as drinks, takeaway containers and plastic bags. We therefore aimed to develop an experiment to test whether these items act as 'beacons of litter' by attracting more litter. The results of the experiment could help to identify whether cleansing routines that maintain acceptable standards of cleanliness, but which focus predominantly on the removal of large/salient/branded items of litter, consequently reduce the amount of litter dropped in the area. Ultimately, this could increase the effectiveness of cleansing staff, allowing sites to be cleansed more quickly, and wider areas to be reached.

1.2. Aim and objectives

The aim of the experiment is to measure the impacts of 'beacons of litter' on both littering behaviours and the accumulation of litter at main retail and commercial sites.

The experiment objectives were to identify:

- the impacts on littering behaviours and the accumulation of litter at the sites
- the impacts on the types of litter dropped at the sites
- how cleansing routines can be adjusted for maximum effectiveness and efficiency.

¹ See, for example, Cialdini, R.B., Reno, R.R. & Kallgren, C.A. 1990, 'A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places', *Journal of Personality and Social Psychology*, vol. 58, no. 6, pp. 1015–1026; and Dur, R. & Vollaard, B. 2013, 'The power of a bad example: A field experiment in household garbage disposal', *Environment and Behavior*, Tinbergen Institute Discussion Paper, ref. TI 2012-061/1.

1.3. Methodology

The experiment methodology is detailed at Section 3 of this report and summarised below.

The experiment sites used were main retail areas with high footfall. The size of the target sites were determined by natural boundaries, such as the length of a high street or the boundaries of a pedestrianised area. The experiment involved Keep Britain Tidy and partners planting litter at the sites and monitoring subsequent littering behaviours and litter accumulation. Testing took place under three separate conditions:

- 1) **'Control'**: Site cleansed to a Grade A² standard (completely free from litter at the beginning of the testing session).
- 2) **'Beacons'**: Following a cleanse to a Grade A standard, 25 items of 'beacons' litter (large, bright and/or branded items of food and drinks litter) were planted throughout the site.
- 3) **'Other'**: Following a cleanse to a Grade A standard, 25 items of 'other' litter (smaller, less noticeable litter) were planted throughout the site.

Under all three conditions, litter dropped by people at the site during the two-hour monitoring period was left to accumulate.

The robust monitoring and evaluation of the impact of each condition on littering behaviour was crucial to the success of this experiment. The type and amount of litter dropped at the site was measured, and behavioural observations were conducted across each of the three conditions.

The monitoring results were analysed to determine the percentage of people who littered across each of the three conditions. The items most commonly littered were also recorded, along with the types of items collected on the ground following each monitoring session.

In-depth interviews with project managers and street cleansing staff at the partner organisations, Dudley Metropolitan Borough Council and London Borough of Hackney, also took place to evaluate the experiment. Interviews aimed to provide insight into the success of the experiment, as well as the potential benefits and challenges of implementing a beacons-focused street cleansing regime.

² As defined by the NI195 system of grading – see http://www2.keepbritaintidy.org/ImgLibrary/NI195%20manual_3715.pdf.

1.4. Results

Results from behavioural observations, litter counts and partner interviews are detailed in Section 4. The key findings from this analysis are outlined below.

Objective 1: to identify the impacts on littering behaviours and the accumulation of litter at the sites

- Overall, the largest percentage of people littered under the 'beacons' condition (35%), followed by the 'other' (22%) and 'control' (17%) conditions, respectively (although this pattern was statistically significant at only one of the two sites).
- Littering by the 35-54 age group increased by 25% during the 'beacons' condition compared to the 'other' condition.

Objective 2: to identify the impacts on the types of litter dropped at the sites

- The proportion of people who littered a beacons item was highest under the 'beacons' condition (41%) when compared to the 'other' and 'control' conditions (11% and 10%, respectively).
- Littering of drinks containers rose drastically under the 'beacons' condition (54) compared with the 'other' (1) and 'control' conditions (1).

Objective 3: to identify how cleansing routines can be adjusted for maximum effectiveness and efficiency

- Partners agreed with the experiment findings, in that 'beacons' items were seen to attract more litter than was attracted by 'other' litter items.
- It was suggested that a cleansing routine focused on the removal of 'beacons' items would allow areas further away from the city centre to be cleansed more frequently.
- One partner was particularly interested in how the insights could be applied to tackling night-time economy littering and alcoholic drinks litter.

1.5. Recommendations

The overarching recommendation is that more evidence is needed to fully understand the impact of 'beacons' litter on rates of littering in the form of an experiment that tests a 'beacons' focused street cleansing regime.

2. Introduction

2.1. Background

As part of the Defra funded *Social Innovation to Prevent Littering* programme, Keep Britain Tidy has partnered with local land managers to deliver a series of experiments aimed at changing littering behaviour. The experiments aimed to build evidence on the behavioural drivers of littering with a view to identifying interventions that could be implemented by other land managers and successfully scaled across England.

In November to December 2014, Keep Britain Tidy partnered with Dudley Metropolitan Borough Council and London Borough of Hackney Council in a new experiment to understand how the presence of certain types of litter influences waste disposal behaviours. The experiment drew on two pieces of previous research conducted by Keep Britain Tidy which provide insight into how the presence of litter can lead to further littering.

The first of these found that people are more likely to litter where litter is present³. The presence of litter can therefore act as both an environmental cue (indicating the cleanliness of a site) and a social cue (implying a level of social acceptability towards littering at the site). The second piece of research, conducted by Keep Britain Tidy's Centre for Social Innovation built on this insight to identify how people perceive certain types of litter to be more prevalent and prominent than others⁴. These items tend to be larger, brighter, often branded pieces of litter, such as drinks containers, takeaway boxes and plastic bags. Therefore, Keep Britain Tidy wanted to test whether these items act as 'beacons of litter' by attracting more litter. The results of the experiment could help to identify whether cleansing routines that maintain acceptable standards of cleanliness, but which focus predominantly on the removal of large/salient/branded items of litter, consequently reduce the amount of litter dropped in the area. Ultimately, this could increase the effectiveness of cleansing staff, allowing sites to be cleansed more quickly, and wider areas to be reached.

2.2. Aim and objectives

The overall aim of the experiment was to identify how cleansing routines could potentially be adjusted for maximum effectiveness and efficiency.

The objectives of the experiment were to identify:

³ *The Little Book of Litter – An essential guide*, Keep Britain Tidy, 2012.

⁴ *Soft Drinks Littering: Understanding and influencing young adult litterers*, Centre for Social Innovation, Keep Britain Tidy, July 2015.

- the impacts of ‘beacons’ and ‘other’ litter items on observed littering behaviours and the accumulation of litter at the sites
- the impacts of ‘beacons’ and ‘other’ litter items on the types of litter dropped
- how cleansing routines can be adjusted for maximum effectiveness and efficiency.

3. Methodology

The experiment was conducted at main retail and commercial sites within the two partner areas. Within these locations Keep Britain Tidy and partners planted ‘beacon’ and ‘other’ items of litter, and monitored disposal behaviours over two-hour observation sessions. Following each observation session a litter count was conducted to record the accumulation of litter at each site.

Testing took place under three conditions:

- 1) **‘Control’**: Site cleansed to a Grade A⁵ standard (completely free from litter at the beginning of the testing session).
- 2) **‘Beacons’**: Following a cleanse to a Grade A standard, 25 items of ‘beacons’ litter (large, bright and/or branded items of food and drinks litter) were planted throughout the site.
- 3) **‘Other’**: Following a cleanse to a Grade A standard, 25 items of ‘other’ litter (smaller, less noticeable litter) were planted throughout the site.

Under all three conditions, litter dropped by people at the site during the two-hour monitoring period was left to accumulate.

Details of the types of litter included in both ‘beacons’ and ‘other’ conditions are provided at Section 3.3.

3.1. Partner selection

Local land managers were invited to express interest in partnering with Keep Britain Tidy for the experiment through the Keep Britain Tidy Network. Partnering involved selecting up to three main retail and commercial sites for the research and cleansing these to a Grade A standard of cleanliness at the beginning of each day of testing at the sites. Partners also ensured that no street cleansing took place at the sites during the testing, however they were asked to empty any street bins as usual so as not to influence rates of littering. In return, local land managers were given the opportunity to gain evidence and insights into the litter issues and waste disposal behaviours present in their areas to

⁵ As defined by the NI195 system of grading – see http://www2.keepbritaintidy.org/ImgLibrary/NI195%20manual_3715.pdf.

inform their future work, as well as opportunities for adjusting their cleansing routines accordingly. Those local land managers who expressed an interest participated in an informal telephone interview to discuss their suitability for partnering in the experiment. Those who were selected for the partnership demonstrated a strong interest in improving environmental quality in their area, were committed to the experiment and represented a range of geographic locations. The selected partners were Dudley Metropolitan Borough Council and London Borough of Hackney Council.

3.2. Research sites

3.2.1. Site selection

Keep Britain Tidy chose to conduct the research at main retail and commercial sites due to the typically high levels of footfall at these sites and the large amounts of time and money generally spent on cleansing this land type. The sites were selected in consultation with the partners, and were followed by site visits to determine their suitability for the research. The criteria for selecting the research sites was 1) that they have high levels of footfall during daytime hours when the research was due to take place; and 2) that there were other sites in the area where the testing could simultaneously be conducted that were comparable in terms of physical environment, visitor demographic and use. This allowed Keep Britain Tidy to reduce the impact of these variables on the research. The sites chosen for the experiment were two public squares in Stourbridge town centre and three sites along a single high street in Hackney, London, as described below.

3.2.2. Stourbridge Town Centre, Dudley

Stourbridge is a market town located in the Metropolitan Borough of Dudley, West Midlands. The town is home to two colleges, and between approximately 11:30am and 1:30pm on weekdays, the town centre is visited by several hundred students during their lunch breaks. This offered an opportunity to target the research to a particular age demographic, though all age groups were included in the research.

The main testing site (Site 1) encompassed the Stourbridge Clock Tower area, a pedestrianised public space of approximately 1,600m² in Stourbridge Town Centre. A number of shops and businesses are located around the perimeter of the site, including a fast food restaurant, a café and two clothing retailers, along with the entrance to the Crown Shopping Centre. The site contains three closed-top litter bins. All three conditions ('beacons', 'other' and 'control') were tested at Site 1 over a total of 18 hours.

Site 2 encompassed Ryemarket Square, a public space of approximately 1,060m², located approximately 240 metres away from Site 1. Shops located around the perimeter of Ryemarket Square include a café, clothing retailer and pharmacy, along with the entrance to the Ryemarket Shopping Centre. The site contains four small closed-top litter bins. Site 2 acted as a control site for the research, whereby the site was cleansed to a Grade A standard as with Site 1, but no litter was planted for the duration of the experiment.

Behavioural observations were conducted at both sites simultaneously, followed by litter monitoring. The research was conducted during lunchtime hours when the town centre tends to be busiest and when people are more likely to consume and dispose of food and drinks packaging, thereby increasing the likelihood of overall waste disposal incidents.

Figure 1: Photographs of Site 1 and Site 2 in Stourbridge Town Centre

Site 1: Stourbridge Clock Tower



Site 2: Ryemarket Square



3.2.3. Stoke Newington High Street, Hackney

Stoke Newington High Street is a busy high street that runs through Stoke Newington in the London Borough of Hackney. The street forms part of the A10, an arterial road that runs from London Bridge to King's Lynn in Norfolk. The section of Stoke Newington High Street included in the research runs from its intersection with Evering Road in the south, to Garnham Street in the north (approximately 550 metres in length). This site was selected due to its high footfall at all times of day and numerous retail outlets, including many take-away retail outlets that produce disposable packaging. Due to its large size, only the eastern side of the street was included in the research. Three 50 metre testing sites were selected from this section of street, with a 200 metre buffer zone between each. This

allowed the three conditions to be tested simultaneously. Sites were selected to be comparable in terms of the types of shops present and physical environment, with each containing at least one litter bin (all were an open top litter bin design). These were:

- Site 1: between Victorian Road and Batley Road (two litter bins present)
- Site 2: between Tyssen Road and Manley Court (one litter bin present)
- Site 3: between Stoke Newington Church Street and Garnham Street (one litter bin present).

The research was again conducted during lunchtime hours when people at the site were more likely to be consuming and disposing of food and drinks packaging. The research was conducted across six days, giving a total of 12 hours of behavioural observations per condition and 36 hours of behavioural observations overall.

Figure 2: Photographs of Site 1, Site 2 and Site 3 in Stoke Newington High Street, Hackney

Site 1



Site 2



Site 3



3.3. Selecting and planting 'beacons' and 'other' litter

Keep Britain Tidy and partners collected items of rubbish and separated these into 'beacons' and 'other' types of litter. The 'beacons' litter comprised of brightly coloured and larger items of rubbish, such as drinks containers, crisp packets, chicken boxes and sandwich packs. The 'other' litter comprised smaller, less salient items such as transport tickets, cellophane wrapping, foil wrapping, tissue and drink bottle caps. Examples of both categories are shown in Figure 5. Each item of litter was marked discretely with a small black sticker to differentiate it from litter dropped by visitors to the sites during the testing.

Figure 3: Photographs showing sample of 'beacons' and 'other' litter

Sample of 'beacons' litter



Sample of 'other' litter



At the beginning of each testing session, once the site had been cleansed to a Grade A standard, 25 items of either 'beacons' or 'other' litter were planted throughout the site, with one piece placed approximately every two metres. The litter was planted in such a way as to make it appear authentic, e.g. by distributing it unevenly across the site and placing some items on top of or wedged into street furniture. Where required, items of litter were weighed down with pebbles or fastened with adhesive tack to ensure they stay in place.

Figure 4: Photographs showing 'beacons' and 'other' litter planted at the sites

Beacons litter in Stoke Newington High Street



Beacons litter on street furniture in Stourbridge



Other litter in Stoke Newington High Street



Other litter in street furniture in Stourbridge



3.4. Monitoring and evaluation

Behavioural observations and litter counts were conducted during each testing session in order to monitor people's waste disposal behaviours at the sites and the amount and type of litter dropped. Following the experiment, Keep Britain Tidy conducted interviews with project managers and street cleansing staff to gain feedback on the experiment and gain insight into the potential implementation of cleansing routines that focus predominantly on certain types of litter. The monitoring and evaluation methodology of the experiment is detailed below.

3.4.1. Behavioural Observations

Aim:

To identify the impacts of the presence of 'beacons' and 'other' litter items on disposal behaviours.

Data Collection:

Structured naturalistic (unobtrusive) observations were conducted using pre-coded recording forms to identify instances of disposal behaviours at each experiment site.

72 hours of observations were conducted:

- Stourbridge – 18 hours of observations at site 1 (six hours per 'beacons', 'other' and 'control' condition) and an additional 18 hours of observations under the 'control' condition conducted at site 2.
- Stoke Newington High Street – 36 hours of observations (12 hours per 'beacons', 'other' and 'control' condition).

Analysis:

Quantitative data analysis was conducted using Microsoft Excel. The findings of the analysis were cross-checked with the partners' interpretation of the monitoring results (as identified during the partner interviews) and reviewed through internal workshops.

Where appropriate, findings were tested for statistical significance using a 95% probability. All results presented in this report are statistically significant, unless otherwise specified.

3.4.2. Litter monitoring

Aim:

To identify the impacts on the accumulation of litter, as well as the types of litter dropped, at each of the sites.

Data collection:

Following each observation session, litter on the ground at each of the sites was collected, counted, categorised and recorded according to its type, branding and whether it could be classified as a 'beacons' or 'other' item of litter. Planted litter (identified by a black sticker) was not recorded.

The litter monitoring was conducted by Keep Britain Tidy and the partner organisations.

Analysis:

Quantitative data analysis was conducted using Microsoft Excel. The findings of the analysis were cross-checked with the partners' interpretation of the monitoring results (as identified during the partner interviews) and reviewed through internal workshops.

3.4.3. Partner Interviews

Aim:

To gain partner feedback on the experiment as well as partner interpretations of results and to identify how cleansing routines could potentially be adjusted for maximum effectiveness and efficiency.

Data Collection:

An in depth semi-structured telephone interview was conducted with project managers and cleansing staff at the two partner organisations. This was carried out by Keep Britain Tidy on completion of the experiment.

Analysis:

NVivo software was used to conduct qualitative data analysis. The findings of this analysis were reviewed through internal workshops.

3.5. Public relations and media coverage

Keep Britain Tidy and partners did not promote the experiment and whilst it was not expected that the experiment would attract media attention, a media briefing document was sent to all partners, detailing 'lines to take' in this eventuality. As such, local residents and visitors were not alerted to the fact that the experiments were taking place. This ensured that the results were accurate and unbiased.

3.6. Limitations of the research

As with all experiments conducted in the field, certain variables in the research could not be controlled. Weather, time of year and the demographic of visitors to the sites were all external factors that could potentially have influenced the results of the experiment.

One limitation specific to the current research was the high winds that, in some cases, blew litter away from the experiment sites or gathered items in certain areas of the sites. In order to ensure the amount of litter at the sites remained consistent, pebbles and adhesive tack were used to secure planted litter to the ground. However, it is possible that the number of litter items planted at the sites did not remain consistent throughout the monitoring periods.

The cold temperatures and wet weather during November and December may also have influenced the results of the experiment. If the experiment was repeated during warmer temperatures it is likely

that more people would have been handling waste items outdoors, and thus rates of littering may be altered.

Disposal behaviours recorded during observation monitoring may have benefited from being more detailed. Recording disposal behaviours such as 'put item in pocket' or 'put item in bag' would have provided a more detailed overview of the types of non-littering behaviours carried out by site visitors.

As the experiment was tested across three different conditions ('beacons', 'other' and 'control'), it is unlikely that the sample of each condition was matched in terms of size and demographics. However, this is something that is not possible to control when conducting a field experiment such as this, and it is argued that the sites tested were comparable in terms of user type.

The time spent observing disposal behaviours during each of the three conditions was different at the two sites. With six hours observing each of the 'beacons' and 'other' conditions and 24 hours observing the 'control' condition in Stourbridge and 12 hours spent observing each of the three conditions in Stoke Newington High Street. As outlined in Section 4 below, the impact of 'beacons of litter' on littering rates was not statistically significant at the Stourbridge site. It may therefore be the case that more monitoring sessions than was carried out at Stourbridge are required to observe a significant effect of the presence of 'beacons of litter'.

4. Results and findings

4.1. Objective 1: To identify the impacts on rates of littering and littering behaviours

This section discusses rates of littering under the 'beacons', 'other' and 'control' conditions at the two partner locations.

Overall, the behavioural observations recorded 1,627⁶ incidents of people depositing waste items, either in a bin or as litter on the ground. The behavioural observations only recorded people who were seen depositing a waste item and did not count the total number of people at the sites.

Treatment of Cigarette Butts

Of these waste items, 571 (or just over a third) were cigarette butts (69% of which were littered). Keep Britain Tidy's previous research⁷ has found that people treat cigarette butts differently to other types of waste, and many people who would not normally litter other items, litter cigarettes. This

⁶ 688 in Stoke Newington High Street and 939 in Stourbridge.

⁷ *Research with smokers*, Keep Britain Tidy, February 2013

suggests that the presence or absence of ‘beacons’ or ‘other’ litter at a site is unlikely to influence cigarette disposal behaviours. Additionally, the disposal of cigarette butts can be significantly more frequent than other waste types and analysing this together with all other waste types is likely to skew the results. For these reasons, cigarette disposal has been excluded from the analysis presented in this report. With this data excluded, all results presented in this report are based on 1,056⁸ observations of people depositing 1,135 items of waste.

4.1.1. Impact on overall rates of littering

The results show that the largest percentage of people (as a proportion of all people observed disposing waste items) littered under the ‘beacons’ condition in both partner locations. This was followed by the ‘other’ and ‘control’ conditions, respectively. However, this trend was only found to be statistically significant at the Stoke Newington High Street location (not Stourbridge). The results suggests that the influence of ‘beacons’ on littering becomes less marked where rates of littering are already relatively low, however further research is required to verify and understand this effect.

Table 1: Proportion of people disposing of waste items who littered under each condition

Testing condition	Stoke Newington High Street	Stourbridge	Overall
‘Beacons’	59% (199)	12% (200)	35% (399)
‘Other’	41% (133)	11% (217)	22% (350)
‘Control’	30% (117)	9% (190)	17% (307)

Figures in brackets show the (base) number of people observed at the sites

4.1.2. Accumulation of litter at the sites

Litter counts conducted at the end of each monitoring session support the behavioural observation findings. These show a similar trend, in that the highest accumulation of litter was found under the ‘beacons’ condition at the Stoke Newington High Street location. However it is suggested that these figures are treated with caution, as it cannot be fully known which litter items were dropped at the site and which had been blown onto the site by wind.

⁸ 449 in Stoke Newington High Street and 607 in Stourbridge.

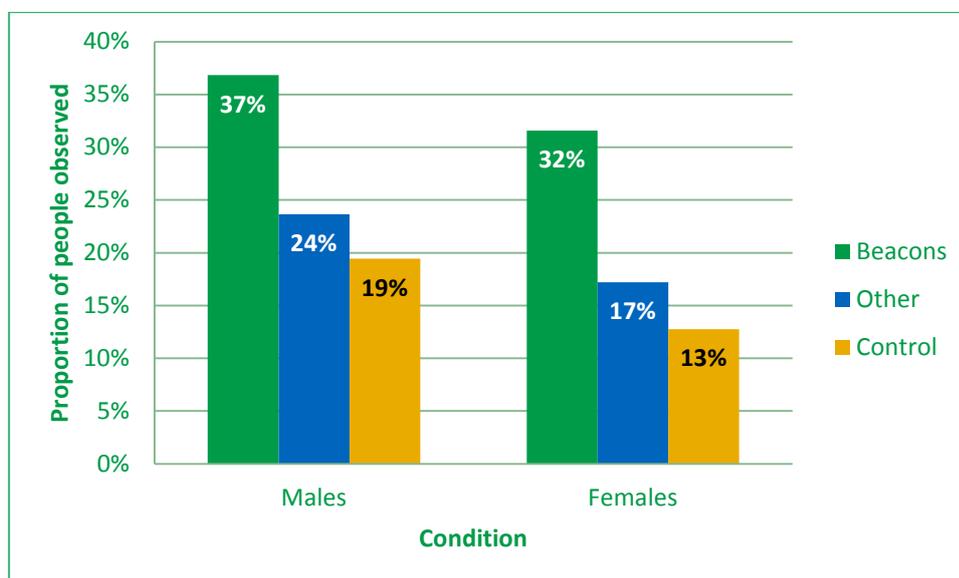
Table 2: Counts of litter accumulated at the sites during the testing sessions under each condition

Testing condition	Stoke Newington High Street	Stourbridge	Overall
'Beacons'	160	82	242
'Other'	115	85	200
'Control'	77	55	132

4.1.3. Impact on rates of littering by gender

Overall, males were more likely to litter than females across all three conditions. Littering was observed to be the highest in the 'beacons' condition for both males and females, followed by the 'other' and 'control' conditions respectively.

Figure 5: Proportion of people disposing of waste items who littered under each condition by gender

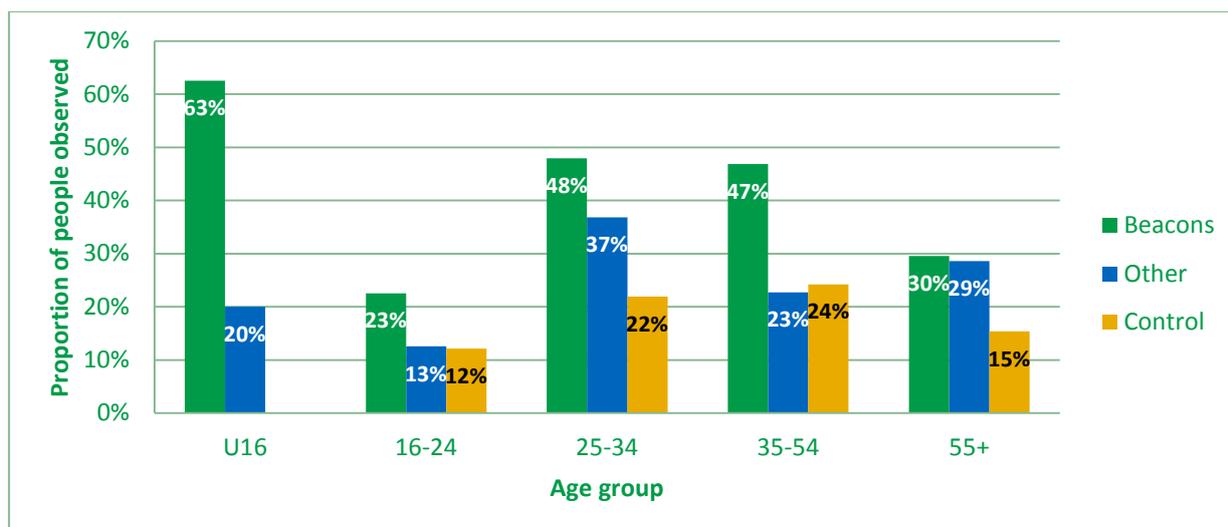


Base: Males: 697 / females: 349

4.1.4. Impact on rates of littering by age group

Within the 'beacons' condition, it was under 16s who were found to be the most prevalent litterers, with littering in this age group accounting for 63% of all observed disposals. This represented a 43% increase when compared to littering observed during the 'other' condition. However, these findings are based on a very small sample of under 16s (13), which may decrease their reliability considerably. With the exception of this age group, it was 35-54 year olds for whom the presence of 'beacons' of litter most significantly impacted on littering behaviour. Littering in this age group increased by 24% during the 'beacons' condition compared to in the 'other' condition and by 23% when compared with the 'control' condition.

Figure 6: Proportion of people disposing of waste items who littered under each condition, by age group



Base: U16 = 15/ 16-24 = 471/ 25-34 = 245/ 35-54 = 211/ 55+ = 98

4.1.5. Impact on rates of littering when accompanied by others

Keep Britain Tidy’s previous research⁹ has found strong evidence that the presence of other people (in the same group) can influence waste disposal behaviour; Unaccompanied individuals have been found to be less likely to litter their waste, than those who are accompanied by two or three others. It is interesting to note that this trend was not observed within the current research, with rates of littering highest in people who were alone, compared with those in groups of two or three (as shown in the table below.)

Table 3: Proportion of people who littered by group size

Number of people in group	Proportion of people of littered
Individual	27% (570)
Two people	19% (215)
Three people	23% (94)
Four or more people	32% (131)

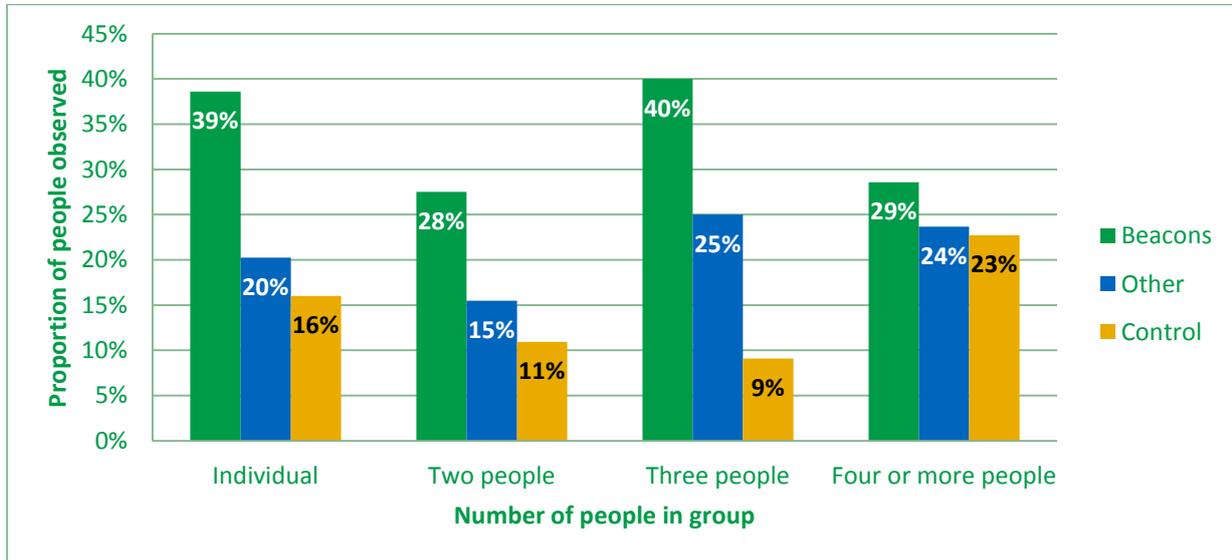
Figures in brackets show the (base) number of people observed at the sites

The chart below explores rates of littering by the different age groups under the three conditions. The results suggest that the presence of ‘beacons’ or ‘other’ litter may influence disposal behaviours

⁹ Multiple projects conducted for clients.

amongst people who are alone or in groups of two or three, but this influence appears to diminish, particularly under the ‘beacons’ conditions, amongst groups of four or more. However, due to the varying sample sizes in each group size category, this finding should be treated with much caution.

Figure 7: Proportion of people disposing of waste items who littered, by group size and under the three conditions



Base: Individual: 570, two people: 215, three people: 94, four people+:131

4.2. Objective 2: To identify the impacts on the type of litter dropped

The second objective of the research was to identify the impact of the presence of ‘beacons’ and ‘other’ litter on the type of litter that was subsequently dropped at the target locations. These findings are outlined below.

Figure 10: Photographs showing ‘beacons’ and ‘other’ litter dropped at the sites

‘Beacons’ litter dropped at a research site



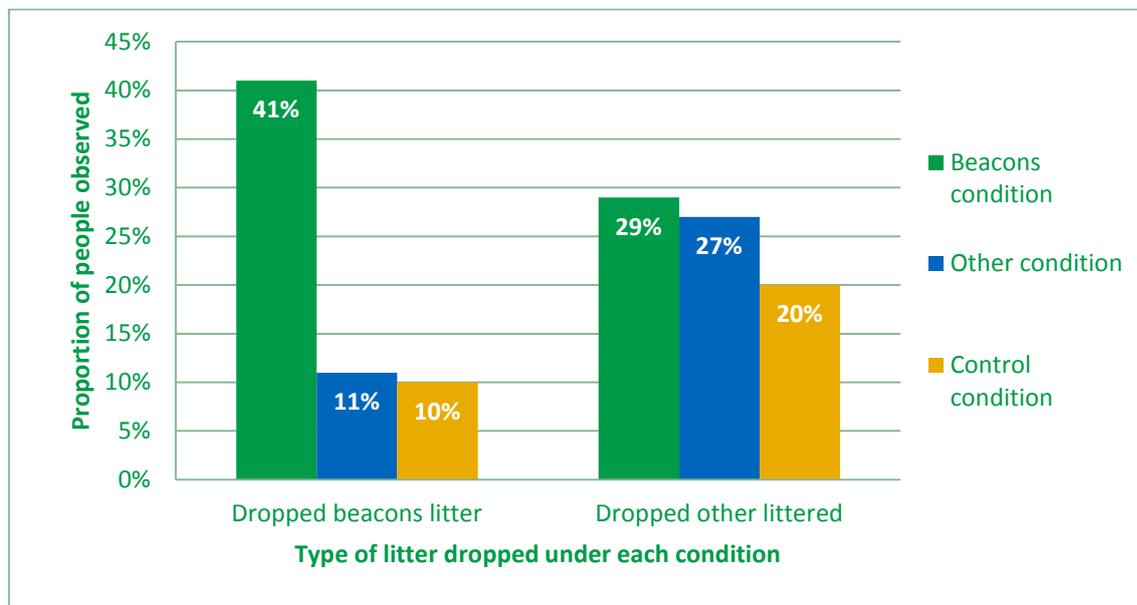
‘Other’ litter dropped at a research site



4.2.1. Impacts on disposal of 'beacons' and 'other' litter types

The proportion of people who littered (rather than place in a bin) a 'beacons' item of waste was observed across the three conditions. As displayed in Figure 11 below, people were more likely to litter a 'beacons' item under the 'beacons' condition (41% of those depositing a beacons item littered it, rather than place it in a bin) compared to rates of 'beacons' littering under the 'other' and 'control' conditions (11% and 10% littered, respectively). The littering of 'other' items remained fairly constant across the three conditions. These findings indicate that the presence of 'beacons' litter may have a normative influence on people's disposal behaviours by influencing perceptions of how people typically behave at a site. The visibility of 'beacons' litter appears to prompt others (either consciously or subconsciously) to do the same with their 'beacons' items. This finding builds on previous research¹⁰ which has found that the presence of litter has a normative influence on people's littering behaviours. Moreover, it suggests that the presence of 'beacons' items in an area increases the likelihood that further 'beacons' litter will accumulate.

Figure 11: Proportion of people who littered 'beacons' and 'other' items under the three conditions



Base: Total number of people depositing Beacons waste items under the 'Beacons' condition = 210, under the 'Other' condition = 131, under the 'Control' condition = 109; Total number of people depositing Other waste items under the 'Beacons' condition = 165, under the 'Other' condition = 191, under the 'Control' condition = 171.

In assessing the impact on individual litter types, as outlined in the table below, it is interesting to note that the littering of drinks containers (e.g. plastic bottles; coffee cups) rose drastically under the

¹⁰ Cialdini, R.B., Reno, R.R. & Kallgren, C.A. 1990, 'A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places', *Journal of Personality and Social Psychology*, vol. 58, no. 6, pp. 1015–1026; and Dur, R. & Vollaard, B. 2013, 'The power of a bad example: A field experiment in household garbage disposal', *Environment and Behavior*, Tinbergen Institute Discussion Paper, ref. TI 2012-061/1.

‘beacons’ condition (54) compared to under the ‘other’ (1) and control conditions (1). In most cases, drinks containers can be classified as ‘beacons of litter’, as they are fairly large and are often brightly coloured or branded.

Although to a lesser extent, this trend was also observed for food packaging and utensils, food and general litter, with instances of littering for these item types increasing with the presence of ‘beacons’ of litter.

Table 6: Counts of litter item types under each of the three conditions

Item Type	‘Beacons’	‘Other’	‘Control’
Drinks containers	54	1	1
Food packaging and utensils	24	13	11
Food	18	13	4
General litter (all other waste)	15	11	6
Paper	11	19	14
Cellophane Wrapping	10	14	9
Gum	4	0	3
Plastic bags	3	1	2
Unknown	2	4	4
Total	141	76	54

4.3. Objective 3: To identify how cleansing routines can be adjusted for maximum effectiveness and efficiency

Semi-structured telephone interviews were conducted with project managers and cleansing staff at the two partner organisations. Interviews aimed to gain feedback on the experiment as well as identify how current cleansing routines could potentially be adjusted for maximum effectiveness and efficiency.

4.3.1. Partner feedback on the experiment

Overall, the project was well received by partners. Largely, the general observations of street cleansing teams and project managers were supportive of the findings outlined in this report. Partners agreed with the findings, in that ‘beacons’ items were seen to attract more litter than ‘other’ litter items.

“Cans and branded products stood out quite a bit. Branded stuff does seem to attract lots more litter.” (Partner)

Partners reported to be pleased with the relationship with Keep Britain Tidy, and with the feedback that was provided on completion of the analysis and throughout the project. The partnership was suggested to be well organised and the experiment was said to be easy and convenient to implement.

“The guys on the ground enjoyed doing it.” (Partner)

4.3.2. Partner perceptions on a ‘beacons’ focused cleansing routine

Partners were asked to comment on their perceptions of the results, as well as their thoughts on the following hypothetical ‘beacons’ focused cleansing regime.

A full site cleanse will be conducted at the beginning of each day, followed by sweeps throughout the day that focus only on ‘beacons’ litter, leaving ‘other’ litter on the ground. A full clean will then take place at the end of the day and early the following morning to ensure statutory cleansing requirements are met.

Partners suggested that a ‘beacons’ focused street cleansing regime would potentially mean that more ground could be covered within the same time frame. Partners expressed interest in the key findings and the potential positive impacts that could be generated. For example, one partner suggested that a cleansing routine such as this would allow areas further away from the city centre to be reached and cleansed more frequently. The other partner was particularly interested in how the insights could be applied to tackling night-time economy littering and alcoholic drinks litter.

“We would be interested to discuss with you how we could use it [a ‘beacons’ focused regime].”
(Partner)

“We would be interested in using it for night-time economy and alcoholic drinks litter.” (Partner)

“You would be covering more ground more quickly so you could clean a larger area with less staff in a shorter space of time.” (Partner)

“At the moment residential streets are swept twice a week. Potentially if they had more time they could litter pick some streets three or four times a week and still do full sweeps as well.” (Partner)

However, partners also highlighted a number of potential challenges to implementing a ‘beacons’ focused street cleansing regime. A key barrier was perceived to be difficulties in overcoming the deep-rooted / ingrained attitudes and working styles of cleansing staff, who are very familiar with the litter patterns of their areas and have consistently cleansed the main retail and commercial sites to a Grade A standard. Often, current regimes have already been refined to generate the most impact within the time and resources available. In addition, a ‘beacons’ focussed cleansing regime would be very difficult for those cleansing operatives conducting a manual cleanse, with a barrow and brooms, etc. as well as mechanical sweepers, as it would be easier and therefore more cost effective for them to sweep all litter. In these situations, amending to a ‘beacons’ focussed regime would be unlikely.

“It would be a big change for our staff to say ‘you need leave things down.’” (Partner)

“If you have a broom in your hand and you are sweeping a whole pavement you would pick up cigarette butts (‘other’ litter) at the same time.” (Partner)

“Even though we would not be giving more work, and we would be covering more ground, it’s still a big change.” (Partner)

Similarly, it was felt that there could be a backlash from local residents and councillors if sites some, albeit smaller / less salient items of litter, were being left. One partner further explained that the public tends to expect local areas to be cleansed to a Grade A standard, and may require some persuasion for this type of cleansing regime to be fully accepted. However, since a ‘beacons’ focused cleansing regime would be expected to reduce the overall amount of litter on the ground, and allow for a wider area to be cleansed, it could be suggested that the perceived prominence of litter in the target areas will decrease.

“Residents and councillors demand their roads reach Grade A standard.” (Partner)

“Councillors might have complaints if the area is not clean.” (Partner)

Finally, although there was interest from partners in the potential of a ‘beacons’ focussed cleansing routine, ultimately a larger evidence base would be required to enable local land managers to consider significant or permanent changes to cleansing routines. Replicating this experiment across other locations and / or trialling a ‘beacons’ focussed cleansing regime as a further experiment would be beneficial.

“We would need more than just this as an evidence base to change the way we work.” (Partner)

“If you ran it [the experiment] at other sites...that would give us a bigger picture.” (Partner)

5. Conclusion

The experiment findings appear to support previous research¹¹ that suggests people to be more likely to litter in areas where litter is already present. The findings also appear to suggest that the presence of large, more salient items of litter (e.g. branded or brightly coloured items) might further increase the likelihood of additional litter being dropped, although this observation needs further testing as it was statistically significant at only one of the two sites. The presence of ‘beacons of litter’ have also

¹¹ Cialdini, R.B., Reno, R.R. & Kallgren, C.A. 1990, ‘A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places’, *Journal of Personality and Social Psychology*, vol. 58, no. 6, pp. 1015–1026; Dur, R. & Vollaard, B. 2013, ‘The power of a bad example: A field experiment in household garbage disposal’, *Environment and Behavior*, Tinbergen Institute Discussion Paper, ref. TI 2012-061/1.

shown to be more likely to attract the littering of additional 'beacons' items, more so than 'other' items of litter, which further exacerbates the issue.

If the initial indications from this experiment are supported by subsequent work, we could say with confidence that cleansing routines which focussed on the removal of 'beacons' items will 1) allow cleansing staff to move more quickly through sites, potentially covering more sites per day and 2) decrease overall rates of littering in the area.

6. Recommendations

The findings of the experiment indicate that reducing the amount of 'beacons' litter on the ground works to decrease the amount of litter subsequently dropped. However, Keep Britain Tidy believes that further evidence to fully understand the impact of 'beacons' litter on rates of littering is required before we could fully conclude the impact on the ground. As such, the overarching recommendation is to conduct a further experiment that tests a 'beacons' focused street cleansing regime and evaluates whether this would provide a low cost practical solution to reducing rates of litter overall.

A series of practical recommendations for those wishing to replicate this experiment is outlined below:

- If possible, conduct the experiment during the summer months, when footfall is higher and a larger number of people can therefore be observed depositing waste items.
- In order to test the true impact of the experiment, partners should not alert residents / users of the area to the fact that the experiment is taking place. As such, partners should not promote the experiment in any way.
- Ensure that planted litter items will withstand weather conditions and remain at the testing site throughout the monitoring period. (E.g. items can be weighed down using pebbles or stuck to surfaces using sticky tack, etc.).
- Ensure that the number of hours spent observing each of the three conditions is the same across all three conditions and across all areas if multiple areas are selected.
- It is not strictly necessary to have a separate 'control' site, as the levels of litter recorded at the dedicated control site in Stourbridge (site 2) were very similar to those recorded during the 'control' condition at site 1.
- During observations, record additional behaviours such as '*put item in bag*' and '*put item in pocket*' in the monitoring of disposal behaviours. These were not recorded in the current experiment and would have provided a more accurate representation of disposal behaviour.

Things to consider for any additional experiments that trial and monitor a 'beacons' focussed cleansing regime:

- Drinks bottles are likely to accumulate more quickly than any other litter type. It is therefore recommended that these items should be prioritised for cleansing.

- Provide thorough training for cleansing teams, fully defining what is meant by 'beacons' and 'other' litter items. This will ensure maximum engagement with the change in routine and help to ensure consistency in cleansing practice.
- Work to engage local residents and councillors with the benefits of a 'beacons' focused cleansing routine.
- 'Main retail and commercial sites' are the priority areas for 'beacons' focussed cleansing regimes as they are the areas with high footfall and high prevalence of litter.



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