NORTHERN IRELAND LITTER SURVEY 2013

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FOREWORD

Welcome to this, the fifth annual litter survey report, which consists of data collected from all 26 local authorities during 2013. As such it is the most comprehensive survey of litter in Northern Ireland, covering 104km (2,080 individual 50m transects) of city and town centres, housing, country roads and recreational areas for a variety of litter types including cigarettes and dog fouling.

It is interesting to see just how accurate the perceptions of the public were when questioned at the Keep Northern Ireland Beautiful People's Litter Summit a couple of months ago. They felt both litter and dog fouling had got worse recently; and it has. Sadly, around half of all people are continuing to ignore the law, ignore the bins provided and ignore the various messages asking them to do the right thing. How are we to stop this? Knowing the financial burden this places on rate payers is not sufficient; understanding the health and social impacts wont' do it; and seeing the often horrendous environmental damage to our beautiful scenery and wildlife doesn't make the difference. Awareness does not result in behaviour change. At least not without opportunities to act on that awareness. And that's where the next piece of news will be of great interest.

For some years we have been promoting the need to invest in prevention rather than cure, so it is with some excitement that we are now preparing to launch a major new initiative to tackle environmental incivilities. The Department for the Environment, Northern Ireland Tourist Board and many of our local Councils have come together with Keep Northern Ireland Beautiful to firmly grasp this thorny issue. The initiative, called Live Here, Love Here, will focus on building a sense of civic and community pride through a high profile mutli-media campaign and support for positive practical action. Importantly, participating Councils have provided resources to allow a small grants scheme to operate, meaning local communities can really get involved. With these two crucial elements in place we believe Live Here, Love Here is going to begin making a real difference to the quality of people's lives, whilst also reducing the incidence of littering.

Having good local environmental quality data will continue to be an essential requirement, not least to provide one measure of the success of our working together to keep Northern Ireland beautiful.

Dr Ian Humphreys
Chief Executive, Keep Northern Ireland Beautiful

EXECUTIVE SUMMARY

The Keep Northern Ireland Beautiful 2013 Litter Survey is a comprehensive examination of the state of streets and public areas in Northern Ireland: This is the largest ever survey, covering 2,080 transects across all 26 council areas, with 1,040 surveys between January and March, and another 1,040 between August and November. In total, 506 of the 582 electoral wards in Northern Ireland had samples collected in them.

The results indicate that 85% of streets and open spaces in Northern Ireland met or exceeded acceptable standards for visible litter, a fall of 3% on last year. This is the worst return since 2010. 97% of streets and green spaces surveyed had litter present.

Main retail areas had the lowest rate of failure as measured by the LPI, while low obstruction residential areas were overall the cleanest land use.

Cigarette paraphernalia was the most common litter type, observed on 81% of transects, with confectionary (59%) and drinks related litter (47%) again the second and third most common.

Cigarette-related litter was observed on 98% of retail areas and 55% of rural areas, with the other land uses between these limits. Drinks litter was more common than cigarette litter in rural areas, while confectionary was more common in recreational areas.

Every type of litter was observed less frequently in low density residential areas, than in high density residential areas, with around half as much takeaway-packaging, drinks and non-packaging litter in low density housing areas.

Broken glass was observed in 11% of the 302 recreational transects surveyed, while graffiti was visible from 30%.

Dog fouling was recorded on 11% of all transects, up from 9% in 2012, and was most common in high density housing and recreational areas. Dog fouling was the reason for failure of otherwise acceptable transects on 4% of occasions. Dog fouling was observed in 25% of public parks, up from 17% in 2012.

The Detritus Pollution Indicator, a measure of longer term efficacy of cleansing routines, was 5%, up from 4% in 2012.

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INTRODUCTION AND BACKGROUND

How can you produce an effective and efficient solution to a problem if you do not fully understand what the problem is? This is an issue that Northern Ireland has faced in its ongoing battle to combat litter. This survey, only the third of its kind, enables councils and government to formulate plans to solve the problem, while fully understanding issues which need to be addressed.

This survey builds on the more geographically restricted Keep Northern Ireland Beautiful (formerly TIDY Northern Ireland) Borough Cleanliness Survey which has taken place every year since 2005 and the past three year's NI Litter Survey, and with over 2000 streets analysed for litter, helps to paint a detailed picture of the litter situation within the province, covering as it does all 26 council districts.

Survey Structure

The objective of the survey was to obtain a survey sample that was representative of the range of conditions that are to be found throughout Northern Ireland, and would provide accurate information to determine the current extent of the litter problem. Within each of the 26 council districts 40 different streets were assessed, making a total of 1040 transects. This was done twice during the year, to give a total of 2080 transects. Each transect was randomly selected from within the council boundaries, either by council staff or by Keep Northern Ireland Beautiful. A transect on a street is normally 50m long, extended 2m from the backline to the gully on one side of the street. It includes footpaths, kerbs and gullies and may also include landscaped areas such as verges, grassed areas, shrubbed areas, planters, tree pits and the bases of hedges and fences that bound areas of relevant land.
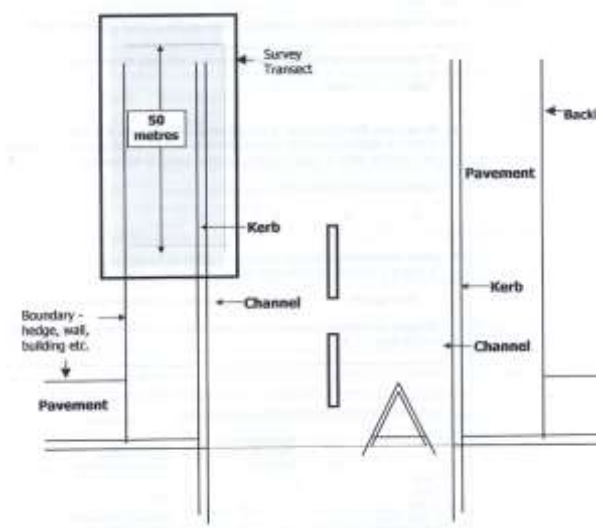
Figure 1: A typical urban transect is defined as shown in the diagram

Survey Coverage and Accuracy

In order to ensure we have a representative sample in the survey findings, we have set the confidence level at 95%, while the confidence interval with 1,040 transects is 3.04[1]. Since each survey of 1,040 transects is a distinct random sample and carried out at different times of the year, we cannot join the two datasets. This means that, providing the assumptions made in the survey structure are accurate; this survey will be a reflection of the average picture across Northern Ireland that is accurate to within 3.04% on 95% of occasions. A more detailed or regional breakdown cannot be provided with anything like the same accuracy. For example, in Belfast we would need to carry out over 1,000 surveys to reach the same level of confidence.

Transects have been located in a quasi-random manner which, following the structure of the survey, concentrates in areas with greater population. When the distribution is examined, transects have been placed in 31.6% of all Census Output Areas in Northern Ireland[2]. A total of 573,338 people, or 31.7% of the population, can therefore be said to live in an area the survey has covered.

Land Use Types

The selection of transects within each council district was broken down by land use type. Where possible the survey attempted to examine an equal number of each land use type, but given the differing make up of each council area this was not always possible. In cases

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[1] *Calculated using population as a proxy for land coverage at 95% confidence level. Population data from NISRA*

[2] *This is calculated by combining NISRA population data and Land and Property Services mapping data, then using GIS to overlay survey data.*

where a land use type fell short of the required number, the total was made up of other land use types.

The eight different land use types are:

1. *Main Retail and Commercial Areas:* This Land Use Class includes the main town and city retail and commercial centres. Normally, there is also a range of public facilities, including libraries, and places of worship.

2. *Other Retail and Commercial Areas:* This Land Use Class covers retail and commercial areas located outside the main city and town retail and commercial centres (but excludes out-of town or edge-of-town 'retail park/retail shed' developments, which are included with landuse 8). Retail and Commercial Areas must contain a *minimum,* continuous retail or commercial frontage of 50 metres.

3. *Rural Roads:* This Class comprises all adopted highways that are located outside built up areas and which are not otherwise included in the Main Roads.

4. *Main Roads:* This Class comprises 'A' roads: throughout rural areas (except where main roads run through larger settlements containing Main and Other Retail and Commercial Areas and High Obstruction Housing Areas); and in urban areas, except where main roads run through Main and Other Retail and Commercial Areas, or through High Obstruction Housing Areas.

5. *High Obstruction Housing Areas:* Housing areas are classified as 'High Obstruction Housing' if less than 50% of dwellings have purpose-made off-street parking/garaging facilities.

6. *Low Obstruction Housing Areas:* Housing areas are classified as 'Low Obstruction Housing' if more than 50% of dwellings have purpose-made off-street parking/garaging facilities.

7. *Recreation Areas:* This Land Use Class includes a wide range of open spaces that are freely accessible to the public and which are maintained by a local authority. Sites include parks, picnic sites, riversides; beaches; municipal cemeteries (but not churchyards) and cycle ways.

8. *Industry, Warehousing, Retail Sheds and Science Parks:* This Class includes industrial and warehousing developments; out-of-town retail parks (including food and non-food developments); and science parks (containing offices, laboratories and manufacturing processes), which contain land that is owned or managed by the local authority, and which is freely accessible to the public.

In some cases it was necessary to survey some land use types more frequently than others, Ensuring all landuses within a council district have been surveyed is an aim but this cannot be a strictly enforced criterion of the survey given the small sample sizes.

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Litter Grading

The Litter (NI) Order 1994 states that litter is any refuse, filth, garbage or any other nauseous offensive or unsightly waste, or any waste which is likely to become nauseous, offensive or unsightly. For surveying a grading scale based on the definition in the Code of Practice for Litter and Refuse (issued under Section 89 of the (English) Environmental Protection Act 1990) was used, with an additional three intermediate scales as defined in National Indicator 195 (produced by Encams on behalf of DEFRA) to allow surveyors to determine a more accurate assessment of cleanliness levels in their district. The seven-point scale has been used on a wide range of sites in the UK and elsewhere in Europe since 1993, and has proven itself to reflect standards more accurately from both service providers and customers perspectives. This is also the system used for grading streets within the Keep Northern Ireland Beautiful Borough Cleanliness Survey.

A transect that falls below a grade B is deemed to have failed. A transect graded either A, B+ or B is deemed to have reached acceptable standards of litter.

Each of the transects was graded to establish the amount of litter and detritus present. Any transect graded A, B+ or B was deemed to have met the required standards, but any transect graded B-, C, C- or D was deemed to have failed.

In compiling the results, each grade is assigned a value for use in calculations. The assigned values are as follows:

Table 1: The values associated with litter grades. These 'scores' allow averages and other calculations to be carried out on the survey data.

Grade	A	B+	B	B-	C	C-	D
Score	3	2.5	2	1.5	1	0.5	0

This allows averages and other descriptors to be calculated for the whole set of results. For example, if a set of 5 transects grades as A, B, B, B+ and B-, that would equate to scores of 3, 2, 2, 2.5 and 1.5, giving an average litter score of 2.2. The closer this litter score is to 3 the better the average grade that was achieved. In this example the average grade is between grades B and B+.

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Grade A – No Litter	Grade B – Predominantly free of litter with some small items

Grade C - Widespread distribution of litter with minor accumulations	Grade D - Heavily littered with significant accumulations

Figure 2: Illustration of the grading system used in this survey. Greater detail on the survey methodology is available in the NI Borough Survey Guidance Manual, version 1.5, which is freely available by contacting Keep Northern Ireland Beautiful.

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RESULTS

Litter Pollution Index

The Litter Pollution Index (LPI) is the standard measure of cleanliness, and was developed for use as a National Indicator, comparable across the UK. It is in essence a percentage of transects surveyed which failed to meet the standard for a B grading detailed above.

Table 2: The B grade was again the most common grade achieved in 2013, with nearly three out of five transects assessed at this grade. B+ was the next most common, with low numbers of other grades.

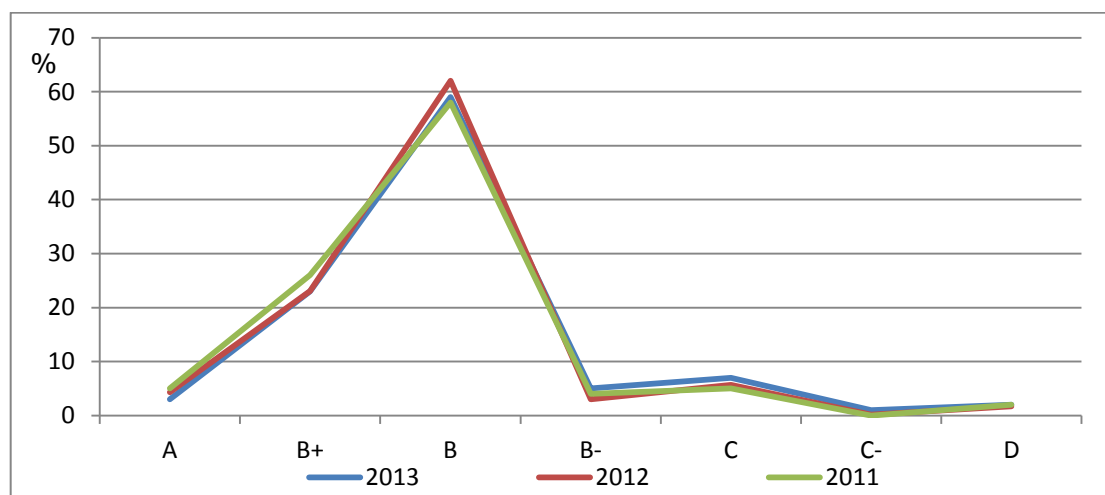|	2013	2012	2011
A	3	4	5
B+	23	23	26
B	59	62	58
B-	5	3	4
C	7	6	5
C-	1	0	0
D	2	2	2

Figure 3: Illustration of grade profile for percentage of transects achieving each grade in terms of litter. Figures are given in Table 2 above. There is little to differentiate between the years, although 2013 does have slightly higher percentage of B- and C grades.

Litter Pollution Index Trend

The results of this survey have been compared with the results of the less comprehensive Borough Cleanliness Surveys conducted in 2005 – 2008 and results of the NI Litter Survey from 2009 – 2012. It should be noted that the early Borough Cleanliness surveys only

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covered a small number of councils, and the number of transects in this 2013 survey has increased from 1,040 to 2,080.

Table 3: The trend in LPI since 2005. The score fell between 2005 and 2009, but has returned to an upwards trend since then. *NB Data provides a rough estimation of trends only; the total number of transects surveyed and the geographical extent varies between years.*

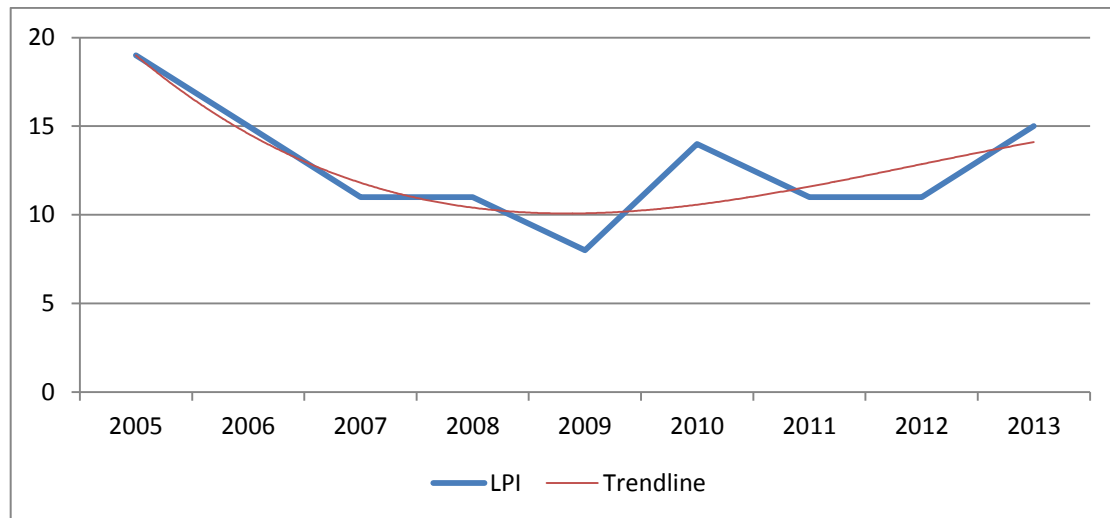|	2005	2006	2007	2008	2009	2010	2011	2012	2013
Litter Pollution Index	19	15	11	11	8	14	11	11	15
Number of Transects	1120	1240	960	840	1040	520	1040	1040	2080

Figure 4: Illustration of the trend in LPI since 2005. The score fell between 2005 and 2009, but has returned to an upwards trend since then.

Litter Score by Land Use Type

Table 4: The average score achieved in each landuse type. The landuse where the worst littering was observed in 2013 were rural roads. The least litter was observed in low obstruction residential. A score of less than 2 would indicate that a significant percentage of transects surveyed failed (B- or worse).

Landuse	Average grade in 2013	Average grade in 2012	Average grade in 2011
Main Retail	2.1	2.1	2.1
Other Retail	2.0	2.0	2.0
Rural Road	1.9	2.0	2.0
Main Road	2.0	2.2	2.1
High Obstruction Residential	2.0	2.1	2.0
Low Obstruction Residential	2.4	2.4	2.4
Recreational	2.1	2.2	2.0
Industry & Retail Sheds	2.0	2.0	1.9

Table 5: Litter Pollution Index for each landuse type. 6% of Main retail areas failed to meet the acceptable standard for litter. The landuse with the highest failure rate was rural areas, where more than a quarter of transects failed.

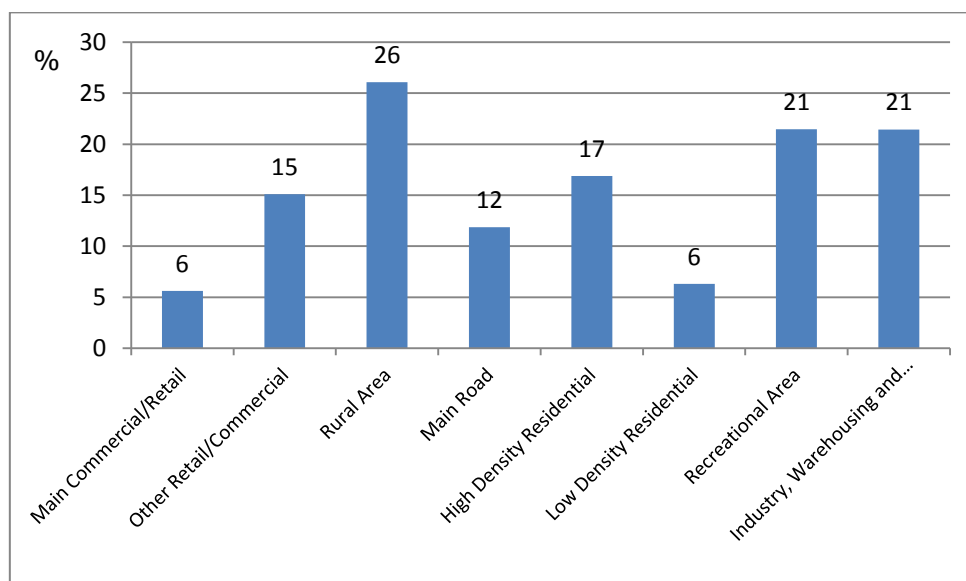| Landuse Types	number of transects surveyed	Percentage of total area surveyed	Number of failing transects	Percentage of transects which fail
Main Commercial/Retail	267	13	15	6
Other Retail/Commercial	192	9	29	15
Rural Area	234	11	61	26
Main Road	253	12	30	12
High Density Residential	332	16	56	17
Low Density Residential	317	15	20	6
Recreational Area	303	15	65	21
Industry, Warehousing and Retail Sheds	182	9	39	21

Figure 5: Illustration of Litter Pollution Index in each landuse type. Because of the differences in number of transects sampled in each land use, the number of failures may not give an accurate picture; the LPI is both constant and comparable between landuses, and serves to illustrate differences better. Rural areas had the worst littering observed, followed by recreational areas and industrial areas.

Table 6: Comparison of the prevalence of bins in each landuse, and the likelihood that they will be full. The data includes litter bins, dog fouling bins and bins marked for both. There may be more than one bin per transect. Over 15% of secondary retail areas had an overflowing bin (>3/4 full) observed. Over all eight land uses an overflowing bin was observed on only 4.2% of transects.

	number of transects surveyed	Number of bins observed	Percentage of transects with bins	Number of overflowing bins observed	Percentage of bins which were overflowing
Main Commercial/Retail	267	264	63	18	6.7
Other Commercial/Retail	192	191	61	29	15.1
Rural Area	234	2	1	1	0.4
Main Road	253	61	19	6	2.4
High Density Residential	332	28	8	3	0.9
Low Density Residential	317	12	3	1	0.3
Recreational Area	303	426	79	20	6.6
Industry, Warehousing and Retail Sheds	182	15	7	2	1.1
Total	2080	999	-	80	-
Average	-	-	30		8.0

Litter Types

Table 7: The percentage of transects surveyed where each type of litter was observed. Negative numbers indicate improvement. Cigarette litter was the most commonly observed litter type in 2013, observed on four out of five transects. Confectionary litter was observed on three out of five, transects, 3% more than in 2011. More business and non-packaging litter was observed, but less fresh chewing gum.

Type of Litter	% of transects in 2013	% of transects in 2012	% Change year-on-year
Cigarette Related	81	79	2
Chewing Gum	15	29	-14
Takeaway Packaging	22	27	-4
Glass	10	9	2
Drinks	47	48	0
Plastic Bags	9	9	0
Confectionary Litter	59	60	-1
Business Litter	22	13	10
Non-packaging Litter	44	35	8
Food Residues	4	5	-1
Dog Fouling	11	9	2
Other	21	19	2

Type of Litter by Land Use

Table 8: The percentage observation rate for each litter type in each landuse in 2013. The number highlighted with the dark cell is the most common type of litter, medium shading the second most common and light shading third. In most landuses the most common types of litter is cigarette-related followed by confectionary, but on rural roads it is drinks followed by confectionary. Drinks related litter is usually third most common except in retail areas. Other commercial areas had both Confectionary and Non-packaging litter joint second with 60% of transects.

	Cigarette related	Fresh chewing gum	Takeaway packaging	Glass	Drinks	Plastic bags	Confectionary	Business litter	Non-packaging	Food residue	Dog fouling	Other
Main Commercial/Retail	98	28	15	10	22	3	49	24	53	8	1	3
Other Commercial/Retail	98	27	28	17	40	6	60	32	60	7	7	9
Rural Area	55	0	48	3	74	23	73	11	39	1	4	10
Main Road	90	9	26	10	54	7	65	19	47	3	12	9
High Density Residential	93	18	17	13	53	4	67	35	50	4	17	9
Low Density Residential	67	15	5	6	28	2	38	20	27	2	12	5
Recreational Area	66	15	21	11	57	12	68	7	35	2	17	5
Industry, Warehousing and Retail	84	5	30	18	57	21	53	37	43	5	9	11
Average	81	15	24	11	48	10	59	23	44	4	11	8

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Dog fouling

Dog fouling is noted in the survey and used to produce the Anthropic Pollution Index. Comparing scores with and without dog fouling gives an indication of the size of effect dog fouling has on the perception of litter.

Table 9: The percentage of each landuse on which dog fouling was observed

	Dog fouling
Main Commercial/Retail	1
Other Commercial/Retail	7
Rural Area	4
Main Road	12
High Density Residential	17
Low Density Residential	12
Recreational Area	17
Industry, Warehousing and Retail	9
Average	11

Table 10: The average litter and anthropic litter index for each type of recreational area. A small number of beaches were surveyed during the bathing season. Grades in both public parks and sports pitches improve when dog fouling is discounted, indicating that dog fouling is a problem that significantly impacts these areas. 6% of children's play areas in this survey had dog fouling in them.

	Number of transects surveyed	Percentage of transects with dog fouling	Average anthropic grade score	Average litter grade score
Beach	6	33	1.5	1.4
Children's play area	106	6	2.1	2.1
Public park	152	25	2.2	1.8
Sports pitch	39	18	1.9	1.7

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Dog Fouling Bins

Table 11: The availability of bins. Bins marked for dog fouling are much less prevalent than 'ordinary' litter bins, yet the public may still look for these rather than use an unmarked bin. The only landuse with significant percentage of marked dog fouling bins was recreational.

	number of transects surveyed	Number of bins observed	Percentage of transects with bins	Number of dog fouling bins observed.	Percentage of transects with dog fouling bins
Main Commercial/Retail	267	264	63	2	1
Other Commercial/Retail	192	191	61	2	1
Rural Area	234	2	1	0	0
Main Road	253	61	19	7	3
High Density Residential	332	28	8	7	2
Low Density Residential	317	12	3	1	0
Recreational Area	303	426	79	54	18
Industry, Warehousing and Retail Sheds	182	15	7	5	3
Total	2080	999	-	78	-
Average	-	-	30	-	7.8

Comparison of Quarter 1 and Quarter 3

Table 12: The makeup of the surveys in Q1 and Q3 of 2013. virtually identical numbers of each landuse were surveyed except in main roads with 7% more and recreational areas were 10% fewer were surveyed.

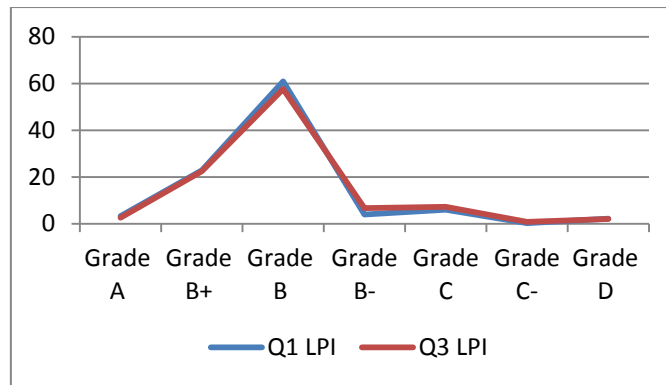|	Q1	Q3
Main Commercial/Retail	133	134
Other Commercial/Retail	95	97
Rural Area	117	117
Main Road	122	131
High Density Residential	163	169
Low Density Residential	159	158
Recreational Area	159	144
Industry, Warehousing and Retail	92	90
LPI	**13**	**17**
DPI	**6**	**5**

Figure 6: The grade profiles in Q1 and Q3 for all observed litter. They are very similar, although there are more B-grades in Q3.
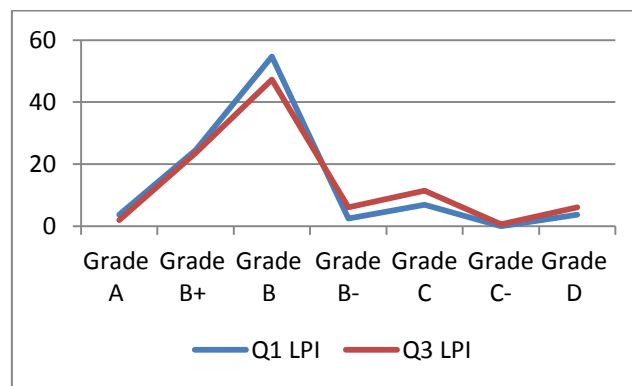

Figure 7: The grade profiles in Q1 and Q3 for recreational litter. There are noticeably fewer B grades and more failing grades in Q3.
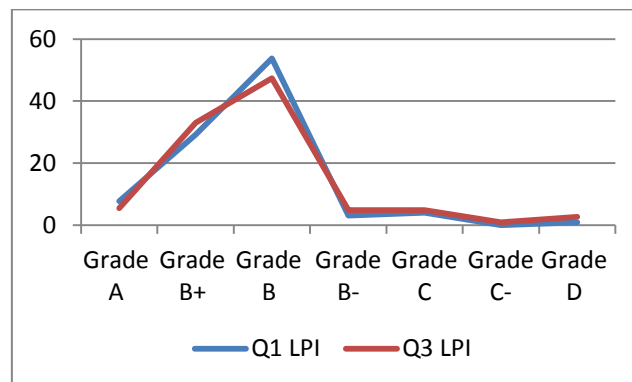

Figure 8: The grade profiles in Q1 and Q3 for litter in both high and low density housing areas. 5% more transects pass in Q1 than in Q3, with a higher percentage of B+ grades as well.
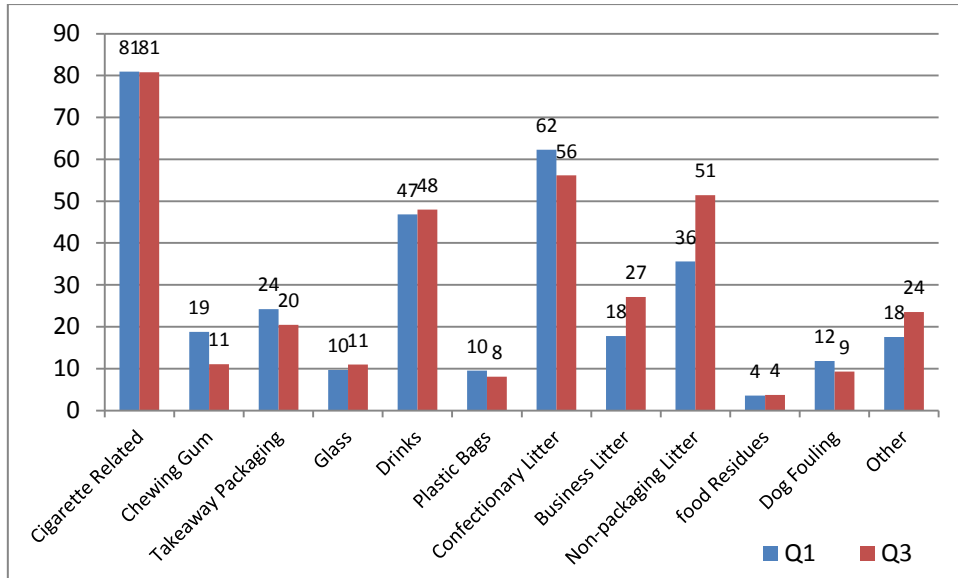
Figure 9: Comparison of the rate of observation of litter types in Q1 and Q3. Chewing gum, takeaway packaging and confectionary litter are more common in Q1, while business litter and non-packaging litter are more common in Q3

CONCLUSIONS

Litter Pollution

The rise in the LPI from 11 in 2012 to 15 in 2013 is disappointing. As shown in Table 2 there has been some volatility over the nine years of the survey. If we discount 2005 and 2006, when a less comprehensive set of surveys were used to calculate the Northern Ireland average, the score is more consistent, with 4 of the seven years recording an LPI of 11 and an average of 11.5. As noted in the introduction, the margin of error for this survey is around 3% so any score between 8 and 14 should be considered to be too small a difference to be of significant note. That said, a jump to an LPI of 15 marks a considerable worsening in performance in a year, with 2013 the only year that lies outside the 3% average in the last seven years, and especially when this was the largest survey ever undertaken, thus conferring the highest degree of accuracy.

It is reasonable to say that the performance has been relatively consistent, for which councils are to be commended. However, despite the financial pressures on councils during this period, spending on street cleansing has risen from £26 million in 2010 to £38 million[3] in 2013 in order to maintain this level of performance.

We see in Table 3 that the number of 'good' passes, A and B+ grades, is at its lowest in the past three years, with 26% of transects graded in this band, down from 31% in 2011. This is a larger shift than in the 'poor' failing grades, C, C- and D, which are 4% more prevalent than in 2011 or 2012. This may indicate that there has been some shift within council cleansing routines to prioritise areas which are failing at the expense of maintaining area with already very low levels of littering. There is, however, no unambiguous trend supporting this in the data. If this were the case, then it would indicate that a rising number of Councils are taking steps to monitor cleansing outcomes and adjust their cleansing routines to maximise their return on expenditure.

Land Use Type

The most littered landuse in 2013 was rural areas with an average grade score of 1.9, or slightly below B average (Table 4). The least littered landuse was low density housing, with a score of 2.4. The Table shows there has been little change in the average burden of litter in each landuse over the past three years, suggesting stable littering habits and cleansing routines. While large numbers of visitors are attracted to retail and recreational areas, the litter in residential areas can be said to be, in large part, dropped by local residents.

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[3] DOE figures obtained by return of Council information.

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Rural areas continue to be among the most littered areas. This is likely due to people discarding persistent in areas which are not subject to regular cleansing. As discussed below, Table 10 indicates that the most common types of litter in rural areas are drinks and confectionary, both made of plastic and highly resistant to weathering which would breakdown paper or food residues relatively quickly.

Assessing the LPI of each landuse type is an alternative to the average grade score, and puts the difference in greater contrast. Table 5 indicates that just 6% of main retail and low density residential areas fail while 26% of rural areas, more than 4 times as many, fail. Looking more closely at this table we note that secondary retail areas are twice as likely to fail as main retail areas (6% as against 15%). Because of the way the landuses are classed, many areas which count as secondary retail are small rows of shops or village centres. By personal observation, these areas tend to have a higher percentage of convenience or takeaway stores than primary retail. This means that people are more likely to discard wrappings or other packaging within a short distance of the outlet. Looking again at table 5 we see that takeaway packaging, drinks, confectionary and non-packaging litter are all more common in secondary retail areas. Because of their small size these areas are also more likely to fall into medium intensity of use class, meaning they are subject to less strict cleansing requirements. This is the likely cause of the higher rate of failure.

Litter Type

The types of litter have remained remarkably consistent in the survey. This suggests that the littering habits of people have changed little since 2012. Table 7 indicates that the biggest change was in Fresh chewing gum, which was observed 14% less often than in 2012. This follows a similar drop between 2011 and 2012. There is no apparent explanation for this and it would be interesting to follow up this work with a study on the purchasing of chewing gum in Northern Ireland.

Business litter and Non-packaging litter were more common in 2013 than in 2012. Indeed the frequency business litter was observed almost doubled. Again we have no indication as to the cause of this change.

Litter Pollution by Land Use Type

Table 8 indicates that cigarette litter is the most common litter type on all but rural and recreational areas, and is in the top three for all landuse types. Drinks and confectionary litter were the most common type of litter in rural areas. This is likely to be a result of infrequent cleansing and the persistent nature of the plastic most of this litter is made from. The ubiquity of this litter and the number and length of rural roads in Northern Ireland mean

there is a considerable volume of recyclable material lost to careless littering each year, as it is either shredded when the verge is cut or washed into field drains.

As stated above, there was a rise in the frequency at which non-packaging litter was observed in 2013, and this is reflected in the fact that it is the second most common type of litter in retail areas, with more than half having had this type of litter observed.

The second most common type of litter on average is confectionary litter. In rural areas this litter is found on almost three out of four transects. Even in primary retail areas it is found on just under half of transects. That the third most common type of litter is drinks related suggests that the point of purchase of these consumables – convenience stores – would be a good arena to introduce educational or promotional materials highlighting the costs of littering.

Dog Fouling

Dog fouling continues to be an issue in Northern Ireland, with an average of 11% of transects affected by this type of litter (Table 9). Although a comparison is not strictly accurate due to variations in methodology, the comparable figure reported in Scotland for 2012-13 is 5.4%[4], and in Wales it is 13.8%[5]. The figure has been consistently above 10% of transects since the survey was introduced.

Dog fouling is most common on high density housing and recreational land, where 17% of transects were affected (Table 9). Recreational areas have been identified in previous surveys as a particular issue, and some recreational areas are more affected than others. Table 10 indicates that fouling was observed on 33% of beaches, and 25% of public parks. Beaches were only surveyed during Q3 as this period fell within the bathing season. Outside this time authorities are not required to clean the beach, so it would be unfair to include them in the survey. Worryingly, dog fouling was observed on nearly one in five sports pitches such as football, Gaelic sports or rugby. The nature of the activities undertaken in these areas greatly increase the likelihood of a exposed cuts or a face coming into contact with fouling.

The frequency of dog fouling has been cited as a factor in many of the applications for a Dog Control Order (DCO) made in 2013, and these figures would tend to support the need for them. Without the benefit of a greater spatial analysis it is not possible to say which areas, types or sizes of public parks are most affected, but there is plainly a need to reduce either the opportunity or the motive to allow a dog to foul. The proportionate use DCOs in concert with other measures including education may be effective, but continued monitoring of parks

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[4] National Cleanliness Benchmarking Report 2012-2013. Keep Scotland Beautiful
[5] Technical Report on the Street Cleanliness of Wales. All Wales Local Environmental Audit and Management System Report 2012-13. Keep Wales Tidy

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and other green spaces covered by DCOs for rates of fouling and other antisocial behaviour would seem appropriate.

Table 10 also indicates that the frequency of dog fouling observed in public parks has a significant effect on the LPI for that landuse, with the Anthropic score being above B average, but when dog fouling is included it drops below a B average.

Dog Fouling Bins

Table 11 indicates that there almost two thirds of transects in retail areas have bins available. The availability in recreational areas is higher, with 4 out of 5 transects having at least one bin. Despite this, these areas continue to have problems with litter.

The split in LPI in housing areas observed in Table 4 is mirrored in the bin availability, with the more littered high density housing areas having more than twice the frequency of bins as low density areas, although the numbers are still low, with less than one in ten transects having a bin available.

Bins marked for the disposal of dog fouling are rare in Northern Ireland, with an average of just 3% of transects having one. The only area to have any significant offering is recreational areas which, as we have seen above, have a significant issue with fouling. However, we saw that high obstruction housing areas also had significant problems with dog fouling, and the provision of marked bins in these areas is just 2% of transects. It should be noted that some councils do not place dedicated dog fouling bins. This survey measures the availability of bins marked for fouling. If a bin does not have a sign indicating that it may be used for dog fouling then it is not counted. This precludes bins in some councils which promote the "any bag, any bin" approach. As such this analysis is of limited validity, but the low figures are still an indication of a possible lack of provision.

Comparison of Quarter 1 and Quarter 3

Table 12 indicates that Q3 was the worse period of the year, with an LPI of 17 as against 13 in Q1. Figure 9 indicates that there was not much difference in the frequency in which any litter type was observed, other than for Non-packaging litter, which was more common in Q3. An expectation of greater frequencies of confectionary and drinks litter during Q3 – July to September, including the school summer holiday – proved to be inaccurate. The conclusion drawn is therefore that there was simply more litter in general during the summer months than in winter. It is likely the source of the extra litter is people being outdoors more in summer, and therefore having more time in which to litter.

Although a small difference, on the edge of the margin for error, was the observation that dog fouling was more common in Q1 than in Q3, upholding the common perception that long

nights and the associated lack of public observation when walking dogs leads many to think it is acceptable to allow them to foul.

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RECOMMENDATIONS

This survey follows a well-established pattern in which the transects are chosen to, as closely as possible, provide five examples of each land use type. This format was developed in 2005 to ensure that all the landuses were represented, but as a result the survey significantly over-represents retail and industrial areas. These areas ideally contribute 37.5% of the transects for the survey, yet because they are a much smaller proportion of the actual landuse in Northern Ireland, many of the areas are repeatedly sampled, and the landuse in general is oversampled. In some local authority areas, there simply were not five suitable areas of a particular land use to survey, with the result that most of the councils have variable ratios of the landuses. It would be illuminating to carry out an analysis of this data in which weightings are used to equally represent the different landuses. It might further be interesting to continue this analysis by weighting the data to take into account the relative size of each council area, or to make the proportion of landuse more closely represent the actual proportion of landuse in Northern Ireland.

Further refinement of the analysis, for example greater use of GIS or statistical techniques, may uncover trends in the data at finer scales or in relationship with certain geographic or social trends. Keep Northern Ireland Beautiful currently has a limited capacity to carry out such analysis, but believe it may prove useful if the resources could be committed.

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