

# NORTHERN IRELAND LITTER SURVEY 2012





## FOREWORD

Welcome to this, the fourth annual litter survey report, which consists of data collected from all 26 local authorities during 2012. As such it is the most comprehensive survey of litter in Northern Ireland, covering 52km (1,040 transects) of city and town centres, housing, country roads and recreational areas for a variety of litter types including dog fouling.

This report is an important tool in helping us understand the current situation with regard to litter and dog fouling local environmental quality indicators. It is also beginning to help highlight trends such as changes in the composition of litter across the land use types and the changes in behaviour of dog owners!

This report demonstrates that the improvements in local environmental quality delivered in 2011 have been maintained. This still leaves litter on 96% of all transects surveyed, and street cleansing costs us around £40,000,000 annually or £110,000 every day of the year. It still means more than 1 in every 10 streets fails to meet cleanliness standards, which clearly leaves room for further improvement. That 1 in every 25 streets fails because of dog fouling is a disgrace, made all the worse when you see that the biggest impact of these unsavoury deposits lies in our parks.

However, such information has to be put to better use. It can help shape behaviour change campaigns and actions. The presence of litter has several significant detrimental effects: it reduces inward investment; it creates a barrier to return visits from tourists, who go home and tell others how friendly but also how dirty Northern Ireland is; it negatively impacts on physical health and mental wellbeing; it kills animals, whether on a farm or swimming in the sea; it exacerbates environmental dilapidation through the 'broken windows' consequences and as has already been stated, it costs a fortune to clean up. With such a wide range of impacts there is a clear need for joined up thinking and joined up resourcing of a campaign to properly tackle the issue. It is no longer sufficient to pay lip service to dealing with such a genuinely harmful behaviour.

Although more can be done it is clear that councils continue to deliver excellent cleansing services. The real issue remains how we change the way people think and act in regard to litter. In other words, how we prevent litter being dropped in the first place. Refocusing some of the huge investment put into cleaning up after people and using it for preventive measures (such as media campaigns, supporting voluntary adoption of our spaces and, where needed, high profile enforcement action) is essential.



Dr Ian Humphreys

**Chief Executive, TIDY Northern Ireland**

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## **EXECUTIVE SUMMARY**

The TIDY Northern Ireland 2012 Litter Survey is a comprehensive litter survey of the state of Northern Ireland's streets and public areas in Northern Ireland: it examines litter levels in each of the 26 council areas, across a range of land uses and produces a measure of the quality of the local environment.

The results show that 89% of streets met or exceeded acceptable standards for visible litter, the same figure as last year. Despite small fluctuations, the Litter Pollution Index (LPI) has remained at an average of around 11 over the last 5 years. 96% of streets and parks 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 – they had the best average grade score

Cigarette paraphernalia was the most common litter type, as it has been every year of the survey to date, being observed on 79% of transects, with confectionary (60%) and drinks related litter (48%) again the second and third most common.

Cigarette-related litter was observed on 59% of rural and recreational areas, but 98% of main retail areas. It was also found on 91% of high density residential areas, but just 61% of low density residential areas.

Every type of litter was observed less frequently in low density residential areas, than in high density residential areas, underlining the large difference of 10 in the LPI between these areas.

Dog fouling was recorded on 9% of all transects, down from 12 in 2011. Dog fouling was the reason for failure of otherwise acceptable transects on 4% of occasions. Dog fouling was observed in 16% of public parks, and 7% of children's play areas.

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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 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 1000 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. Each transect was randomly selected from within the council boundaries, either by council staff or by TIDY NI. 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.

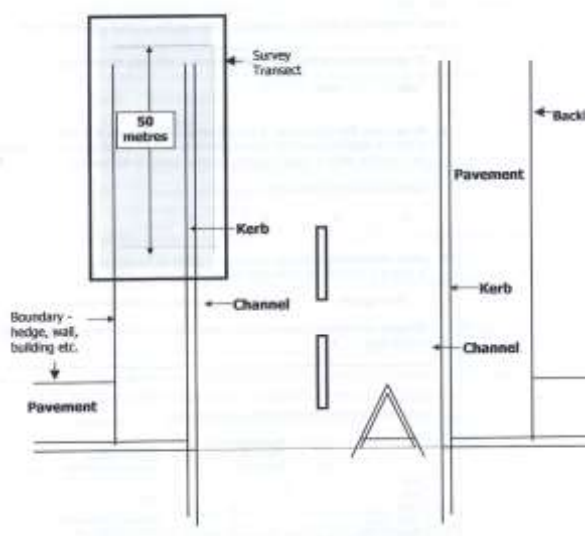


Figure 1: A typical urban transect is defined as shown in the diagram

The confidence level for the survey is set at 95%, while the confidence interval with 1040 transects is 3.04<sup>1</sup>. This means that, assuming 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.

## 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 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.

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<sup>1</sup> *Calculated using population as a proxy for land coverage at 95% confidence level. Population data from NISRA*

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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. 1040 transects in total were surveyed across the province.

### **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 TIDY NI 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.

<b>Grade</b>	<b>A</b>	<b>B+</b>	<b>B</b>	<b>B-</b>	<b>C</b>	<b>C-</b>	<b>D</b>
<b>Score</b>	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+.



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 TIDY Northern Ireland.

## 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 1: The Litter Pollution Index for the last three years. The LPI is derived from survey data. A score approaching zero indicates very high local environmental quality. The LPI has held at 11 since last year after falling from 14 in 2010. All figures are rounded as appropriate

	2012	2011	2010
<b>Litter Pollution Index</b>	11	11	14
<b>Number of Transects</b>	1040	1040	520

Table 2: The B grade was again the most common grade achieved in 2012, followed by the B+, with low numbers of other grades. Nearly three out of five transects was graded B, with over 60% of the remainder graded B+.

	Percentage of grades assigned in 2012	Percentage of grades assigned in 2011	Percentage of grades assigned in 2010
<b>A</b>	4	5	2
<b>B+</b>	23	26	33
<b>B</b>	62	58	50
<b>B-</b>	3	4	5
<b>C</b>	6	5	6
<b>C-</b>	0	0	1
<b>D</b>	2	2	3

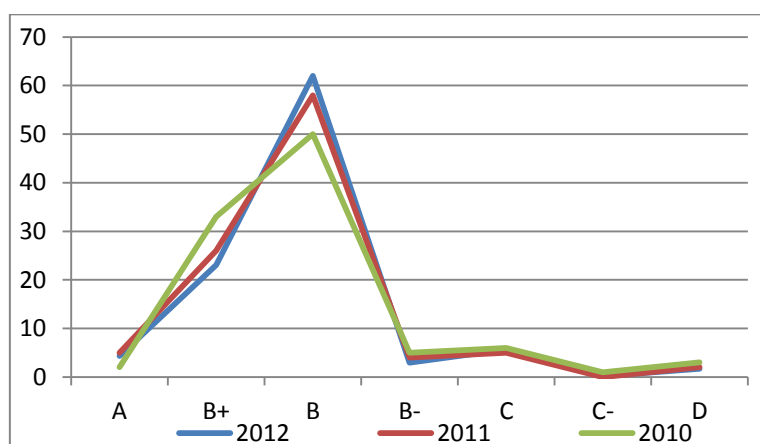


Figure 3: Illustration of grade profile for percentage of transects achieving each grade in terms of litter. Figures are given in Table 2 above. The clustering at grade B indicates an overall trend toward the acceptable, with more transects passing, but fewer achieving good grades. Note also that failing grades appear to be either C or D grades, rather than intermediate ones.

## Litter Score by Land Use Type

Table 3: The average score achieved in each landuse type. The landuses where most litter was observed in 2012 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 score in 2012	Average score in 2011	Average score in 2010
Main Retail	2.1	2.1	2.1
Other Retail	2.0	2.0	2.1
Rural Road	2.0	2.0	1.8
Main Road	2.2	2.1	2.0
High Obstruction Residential	2.1	2.0	2.1
Low Obstruction Residential	2.4	2.4	2.4
Recreational	2.2	2.0	2.0
Industry & Retail Sheds	2.0	1.9	1.8

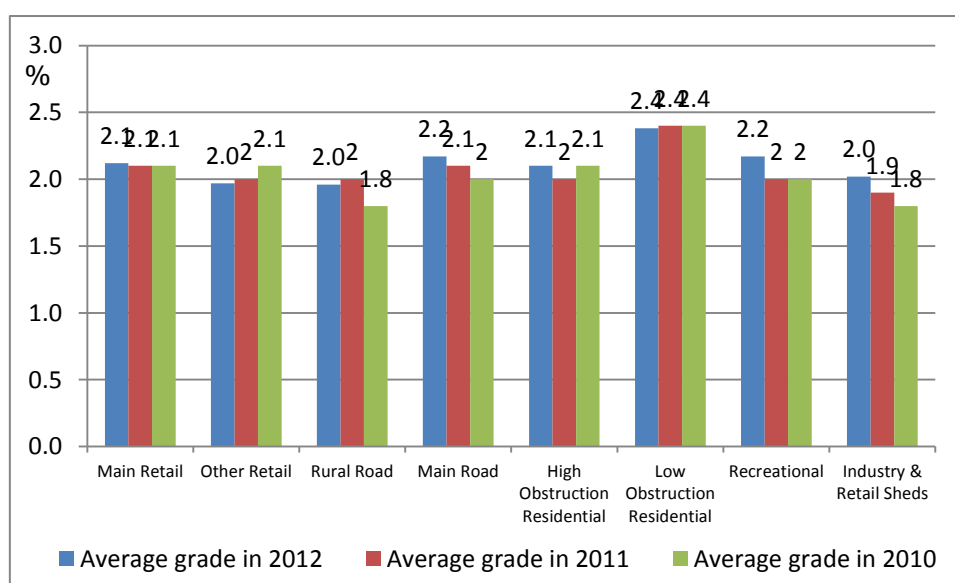


Figure 4: Illustration of the average grade scores comparing 2010, 2011 and 2012

Table 4: Rate of transect failures for litter in each landuse type. The landuse with the highest LPI was rural, closely followed by recreational. Just 2% of main retail transects failed; 15% of rural, high obstruction residential, recreational and industrial areas failed.

Landuse Types	Total transects	Percentage of total area surveyed	Number of failing transects	Litter Pollution Index (LPI)
Main Retail	133	13	2	2
Other Commercial	103	10	12	12
Rural Area	117	11	17	15
Main Road	125	12	11	9
High Density Residential	152	15	22	15
Low Density Residential	161	15	9	6
Recreational Area	155	15	23	15
Industry, Warehousing and Retail Sheds	94	9	14	15

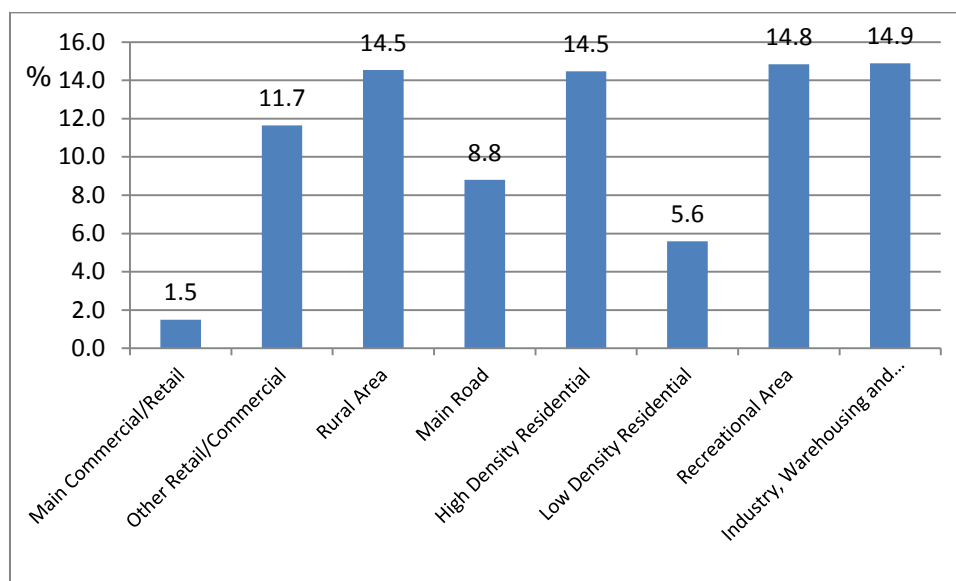


Figure 5: Illustration of the LPI in each landuse type. Because of the differences in number of transects sampled in each land use, the number of failures may not give an accurate picture; the LPI is both constant and comparable between landuses, and serves to illustrate differences better.

Table 5: Comparison of the prevalence of bins in each landuse, and the likelihood that they will be full. Almost 10% of secondary retail areas had an overflowing bin (>3/4 full) observed. Over all eight land uses an overflowing bin was observed on only 2.8% of transects. Only 2.8% of transects had a marked dog fouling bin.

	number of transects surveyed	Number of bins observed	Number of overflowing bins observed	Number of marked dog fouling bins observed.	Percentage of transects where an overflowing bin was observed	Percentage of transects with a marked dog foul bin
<b>Main Retail</b>	133	160	6	3	4.5	2.3
<b>Other Retail</b>	103	96	10	0	9.7	0.0
<b>Rural Area</b>	117	2	0	0	0.0	0.0
<b>Main Road</b>	125	12	1	2	0.8	1.6
<b>High Density Residential</b>	152	15	2	3	1.3	2.0
<b>Low Density Residential</b>	161	8	0	1	0.0	0.6
<b>Recreational Area</b>	155	265	8	23	5.2	14.8
<b>Industry, Warehousing and Retail Sheds</b>	94	4	1	1	1.1	1.1
				<b>Average</b>	2.8	2.8

## 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 6: The average litter and anthropic litter index for each land use type. Bins marked for dog fouling are much less common than litter bins on all land uses. Recreational areas were most affected by dog fouling.

	Average of Number of bins present	Average of Number of dog fouling bins	Average of Anthropic grade score	Average of Litter grade score
<b>Main Retail</b>	1.2	0.02	2.12	2.11
<b>Other Commercial</b>	0.9	0.00	1.97	1.94
<b>Rural Area</b>	0.0	0.00	1.96	1.95
<b>Main Road</b>	0.1	0.02	2.10	2.02
<b>High Density Residential</b>	0.1	0.02	2.10	2.01
<b>Low Density Residential</b>	0.0	0.01	2.38	2.30
<b>Recreational Area</b>	1.7	0.15	2.17	1.99
<b>Industry, Warehousing and Retail Sheds</b>	0.0	0.01	2.02	1.97

Table 7: The average litter and anthropic litter index for each type of recreational area. A small number of beaches were surveyed during the bathing season. There were usually an adequate number of bins present in recreational areas, but marked dog foul bins are much less common. Both public parks and sports pitches have better scores when dog fouling is discounted, indicating that dog fouling is a problem that significantly impacts these areas.

	Average Number of bins present	Average number of dog foul bins	Average of Anthropic grade score	Average of Litter grade score
<b>Beach</b>	0.8	0.2	2.00	2.00
<b>Children's play area</b>	1.6	0.1	2.14	2.12
<b>Public park</b>	2.0	0.2	2.21	1.84
<b>Sports pitch</b>	1.1	0.1	2.15	2.05

## Litter Types

Table 8: 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 2011, observed on nearly four out of five transects. Confectionary litter was observed on three out of five, transects, 3% more than in 2011. More takeaway packaging was observed, but less fresh chewing gum.

Type of Litter	% of transects in 2012	% of transects in 2011	% change year-on-year
Cigarette Related	79	78	1
Chewing Gum	29	41	-12
Takeaway Packaging	27	20	7
Glass	9	11	-2
Drinks	48	50	-2
Plastic Bags	9	11	-2
Confectionary Litter	60	57	3
Business Litter	13	14	-1
Non-packaging Litter	35	34	1
Food Residues	5	5	0
Dog Fouling	9	12	-3
Other	19	19	0

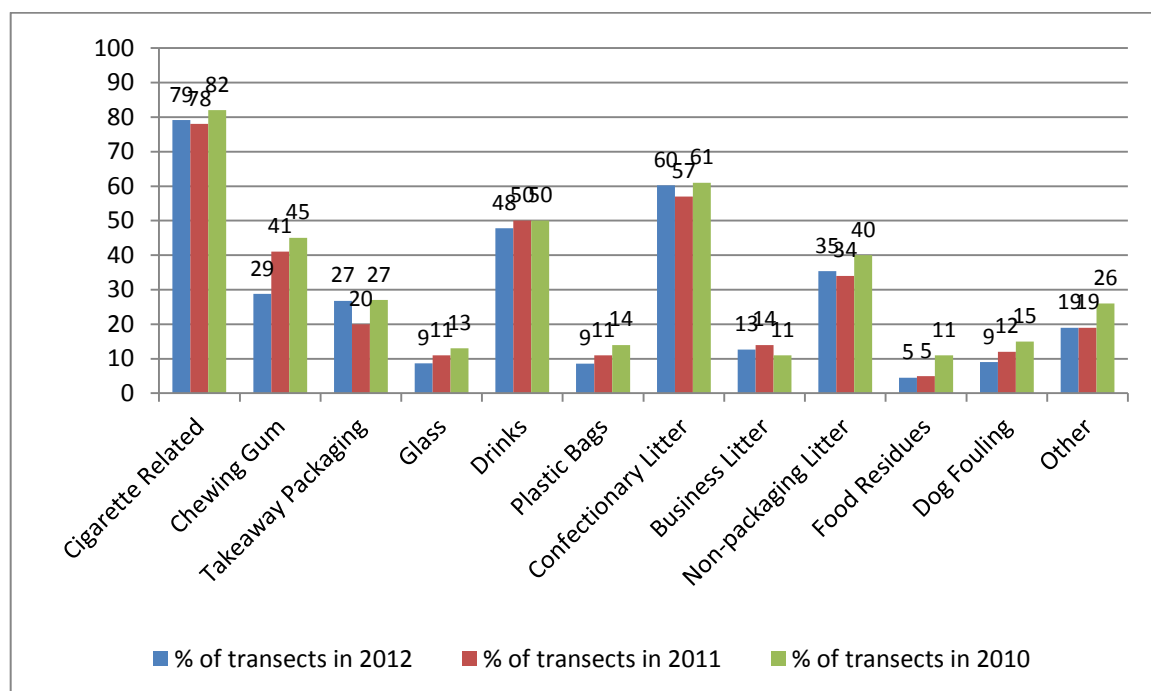


Figure 6: Illustration of the percentage of transects surveyed where each type of litter was observed. Figures for 2011 and 2010 are included to allow trends to be identified.

## Type of Litter by Land Use

Table 9: The percentage observation rate for each litter type in each landuse in 2012. 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. The number highlighted with the dark cell is the most common type of litter, medium shading the second most common and light shading third.

Landuse	Cigarette related	Fresh chewing gum	Takeaway packaging	Glass	Drinks	Plastic bags	Confectionary litter	Business litter	Non-packaging litter	Food residue	Dog fouling	Other
Main Retail	98	54	16	11	23	1	55	19	45	8	4	9
Other Retail	97	57	28	8	46	5	75	17	55	5	6	17
Rural Area	59	4	51	6	80	23	66	6	26	2	1	24
Main Road	86	18	33	8	58	7	59	9	31	5	10	22
High Density Residential	91	36	24	10	49	7	63	13	35	7	18	30
Low Density Residential	61	19	9	2	30	3	43	12	28	2	9	16
Recreational Area	59	27	23	14	50	12	72	3	29	3	12	15
Industry, Warehousing and Retail Sheds	91	14	43	11	57	13	51	28	41	6	10	20
Grand Total	79	29	27	9	48	9	60	13	35	5	9	19

## Sources of Litter Pollution

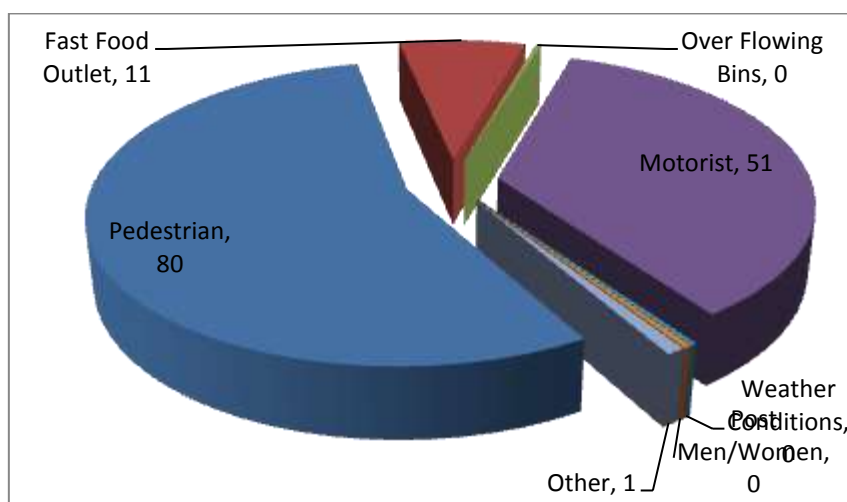


Figure 7: Possible sources of litter. 80% of the observed litter was deemed likely to have been discarded by pedestrians, and 51% by motorists. The numbers total more than 100, indicating that in many cases the origin of the litter is uncertain and may be attributable to more than one source. However, the overall relationship in volume remains, with around two thirds of litter likely to have been discarded by pedestrians and one third by motorists.



## Litter Pollution Index Comparisons

The results of this survey have been compared with the results of the TIDY Northern Ireland Borough Cleanliness Surveys conducted in 2005, 2006, 2007 and 2008 and the last two years Litter Survey. It should be remembered that the surveys from 2009 on cover a much wider geographic range than the similar Borough Cleanliness Surveys of previous years, which focused on a limited number of council areas.

Table 10: The trend in LPI since 2005. The score fell quickly between 2005 and 2007, but has remained relatively constant around 11 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
<b>Litter Pollution Index</b>	19	15	11	11	8	14	11	11
<b>Number of Transects</b>	1120	1240	960	840	1040	520	1040	1040

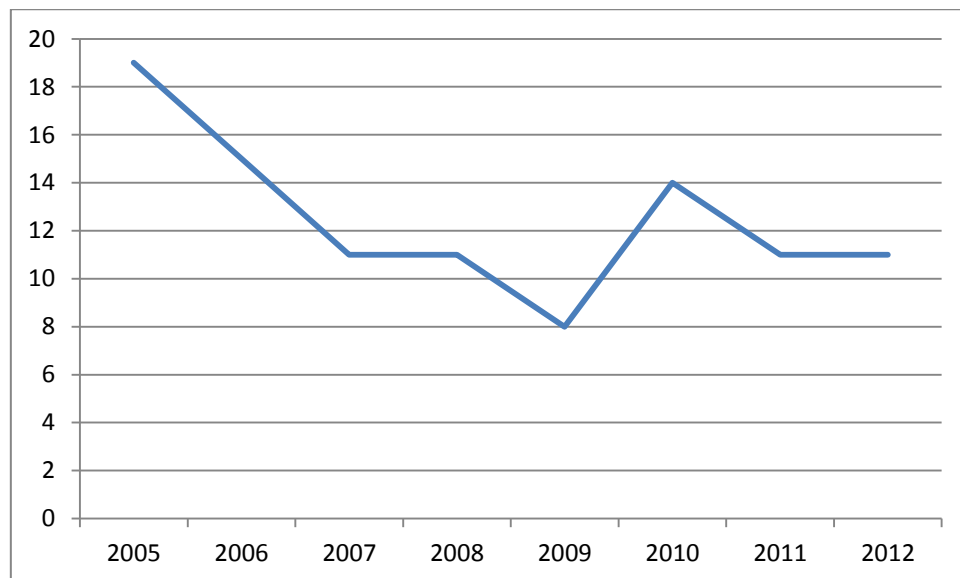


Figure 8: Illustration of the trend in LPI since 2005. The score fell quickly between 2005 and 2007, but has remained relatively constant at around 11 since then.

## CONCLUSIONS

### Litter Pollution

Table 10 shows that the Litter Pollution Index has remained the same as it was last year, at 11. This indicates that around 11% of transects failed to meet the standard required in the Litter Code of Practice for Northern Ireland. The LPI has remained around about 11 since 2007 (Figure 8). Looking to Table 2 and Figure 3 we see that the large majority of transects surveyed were graded B, indicating that there was some litter present, but it did not adversely affect the amenity of the area. The proportion of B grades has risen from 50 to 62 since 2010. Over a quarter of transects were graded as A or B+, indicating that they were either completely or almost completely free of litter this year, although the number of these “good passes” has been falling for the past 2 years, with 35% in 2010. Taken together this may indicate that while the overall standard of litter removal has remained relatively constant over the past 5 years there has been considerable change within the grade structure, with a tendency over that time for grades to cluster around the B grade.

### Land Use Type

The scores quoted in the Figures are comparable to the grades, as explained in the introduction. Tables 3 and 4 show the breakdown of litter over each of the eight land use types. We can see in Table 3 that the average score in some landuses appears to have risen slightly over the last year. This tends to contradict the headline figure for LPI, which has remained at 11, suggesting there has been no change. However, the gains are small enough that they are masked by rounding to whole digits. Of greater note is that none of the landuses had average scores less than two, which would indicate an acceptable cleanliness standard if this was spread evenly across all transects.

We see in Figure 4 that rural and industrial areas are usually the areas with lowest LPI. These areas tend to have less rigorous cleansing regimes, and are often considered areas where people can litter with impunity. However, looking at the secondary retail scores suggest that these areas have been experiencing a fall in quality over the last 2 years, and that they were in fact the third most littered landuse during the survey. If we look to Table 5 we see that other retail areas have the highest frequency of overflowing bins of any landuse. The figure of 9.7% means overflowing bins are almost twice as common as in the next most affected landuse, recreational areas, and nearly 4 times more common than on average. There was no indication that overflowing bins were actually responsible for the litter on these transects. Indeed, none of the failing secondary retail transects had an overflowing bin present, but this may suggest a wider pattern, with secondary retail areas not being cleansed with the same frequency as in the past. It should also be noted that bin collection does not necessarily

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correlate with the cleansing schedule, and that more work would be needed to establish a definite link.

Figure 5 shows the rate at which each landuse type failed to make the passing grade. We see from this chart that if main retail were removed from the survey the LPI would increase considerably. The LPI in half of the land use types is nearly 15, with only main retail, main roads and low density residential areas not significantly affected by litter.

## Litter Type

Table 8 and Figure 6 show how common each type of litter is. In general, the frequency of observation of most litter types has remained reasonably constant over the past two and three years respectively. Although some litter types have recorded consecutive increases and some consecutive decreases, they have not been particularly large changes.

The amount of fresh chewing gum observed has fallen significantly over the past two years. In 2011 the drop was attributed to a change in the way it was recorded compared to the 2010 survey. A further, larger drop this year may indicate a change in habits, and it would be interesting to follow this up with further study, as chewing gum is the major contributor to unsightly staining of pavements.

Dog fouling was recorded less often this year down from 15% of transects in 2010 to 9% in this survey. However, as shown in Tables 6 and 7, the impact of dog fouling is high generally in the recreational landuse type and in public parks in particular. Over 4% of all transects surveyed fail due to dog fouling suggesting nearly half of all transects with dog fouling present have more than one occurrence.

## Litter Pollution by Land Use Type

Table 9 shows the most common types of litter in each land use. As in previous years, the most common type of litter on most land uses was cigarette-related, followed by confectionary and drinks-related. These three were also the most common in rural and recreational areas, but in differing proportion. Drinks related litter was most common in rural areas, perhaps a reflection of the longevity of the plastic it is made from, while confectionary litter was most common in recreational areas, perhaps a reflection of the age of those using these areas.

Recreational areas appear to have a number of incongruous points: The rate at which each type of litter was observed appears low compared to other land uses, yet the LPI for

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recreational areas was quite poor. Also, Table 7 tells us that public parks have the greatest availability of bins, yet the worst LPI for recreational areas. Looking more closely at the figures in Tables 6, 7 and 9 suggests that dog fouling is a likely suspect. When we review these relationships for anthropic litter, recreational areas go from one of the worst performing areas to one of the best, and public parks become the cleanest recreational areas.

### **Sources of Litter**

Figure 6 indicates that four out of five pieces of litter might be attributed to pedestrians, while half might be attributed to motorists. In many cases the origin of the litter is uncertain and may be attributable to more than one source, hence the ambiguity in the numbers. However, this result indicates that the most profitable target for litter reduction campaigns is still the pedestrian, as the largest source of litter. If we were to take the whole set of data and convert it to a percentage basis, 55% of the litter observed could be attributable to pedestrians, and 35% to motorists, while all other sources would total less than 10%. Remember however that there is a high level of uncertainty involved in collecting this data, and that such a transformation is not strictly appropriate, but presented here only for illustration.

## **RECOMMENDATIONS**

This survey follows a well-established pattern in which the transects are chosen to, as closely as possible, provide 5 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 some 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 both over sampled and repeated. 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 might 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.



Supported by: