Roinn Cumarsáide, Gníomhaithe ar son na hAeráide & Comhshaoil
Department of Communications, Climate Action & Environment

THE NATIONAL LITTER POLLUTION MONITORING SYSTEM

LITTER MONITORING BODY

SYSTEM RESULTS 2016

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Please Note: Individual percentage values illustrated in figures throughout this document are rounded and may, therefore, not total 100%.

ACKNOWLEDGEMENTS

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1. The Department of Communications, Climate Action and Environment; and
2. The local authorities that provided us with their Litter Survey Results.

OVERVIEW OF THE NATIONAL LITTER POLLUTION MONITORING SYSTEM

TOBIN Consulting Engineers were appointed to act as the Litter Monitoring Body (LMB) by the Department of the Environment, Community and Local Government, for the period May 1st 2016 to April 30th 2017, to continue the development of the National Litter Pollution Monitoring System (NLPMS). The data produced by the NLPMS surveys allow local authorities to gauge:

- The extent and the severity of litter pollution in each local authority area;
- The types, most likely sources and causes of litter pollution;
- The changes in litter levels from location to location and over time;
- The location of litter black spots; and
- The impact of new anti-litter measures.

Under the national monitoring system, the **extent** and **severity** of litter pollution is measured using a Litter Pollution Index (LPI), which is a scale of 1 to 5 as described below:

1. Unpolluted or litter free;
2. Slightly polluted;
3. Moderately polluted;
4. Significantly polluted; and
5. Grossly polluted.

Prescribed standards for each category of the LPI have been circulated to all local authorities in the form of area cleanliness rating photographs to ensure a consistent approach nationwide to measuring the extent of litter pollution in the surveyed areas. Examples of those photographs are contained in Appendix B of this report together with an explanation of each LPI. They are also available via the litter website (www.litter.ie).

The area cleanliness rating[1] is then used in the calculation of the Litter Pollution Index for each survey location. The use of photographs ensures that area cleanliness ratings are consistently assigned by all local authorities. In 2016, the Litter Monitoring Body continued to provide training and guidance to local authorities, thus ensuring that a consistent methodology for surveying is applied across the country to guarantee that reliable and comparable data is compiled.

A key feature of the national monitoring system is its focus on monitoring in areas that are polluted, or are likely to be polluted, i.e. where potential sources of litter are located. To this end, local authorities select the locations for their surveys using maps produced by specially designed Litter GIS software, as follows:

- 40% in "high risk" locations (e.g. in town or city centres) where the concentration of potential litter sources is greatest;
- 40% in random potential litter generating areas - chosen by the Litter GIS software; and

[1] The Area Cleanliness Rating is determined using a visual inspection of the survey area and rating it according to prescribed standards.

- 20% in locations chosen by local authorities, based on local knowledge of litter pollution.

Note that some local authorities do not have the resources to apply Litter GIS. In these instances local authorities use local knowledge to select their 'high risk' and 'chosen' survey areas and then randomly choose 40% of their locations by identifying random areas on maps or by using a random function tool on Arc GIS.

Under the national monitoring system, the **type** and **origin** of litter pollution is also measured by counting litter items while they remain on the ground. These surveys are called Litter Quantification Surveys. Litter Quantification Surveys are completed in the most heavily polluted areas (i.e. the clusters or 'black spots' identified by the Litter Generation Potential Maps) and as long after cleansing as possible to further increase the chances of a large sample size. The statistics obtained during the surveys are divided into a number of litter categories including, food, packaging, paper and plastic.

Training

In 2016 the Litter Monitoring Body continued to provide training, where required, on the implementation of the NLPMS to local authorities.

Audit

The Litter Monitoring Body undertook on-site audits of five local authorities to ensure that the system is being implemented as designed. The local authorities audited were:

- Louth County Council;
- Cork City Council;
- Limerick City and County Council;
- Sligo County Council; and
- Donegal County Council.

The Audit Report is available at www.litter.ie. The audits have revealed that, for the most part, these local authorities are implementing the system correctly.

The Litter Monitoring Body also completed a number of additional 'spot check' audits on the 2016 results received, whereby photographs of survey locations received from local authorities are cross checked with the awarded LPI. These audits revealed that a small number of local authorities were not assigning the correct area cleanliness rating to an area, specifically in assigning an area as "unpolluted or litter free" (LPI 1) that should be considered "slightly polluted" (LPI 2). In some cases, however, the area cleanliness rating assigned to an area by the local authority was a higher index than appropriate.

These audits allowed for reassessments to Litter Pollution Surveys (LPS) in collaboration with the relevant local authority, where necessary, to apply a revised determination of the LPI assigned to the area under study.

It is considered for future year's surveys that local authorities should continue to submit photographs with the Litter Pollution Surveys (LPS); this will allow the Litter Monitoring Body to continually audit the System. The Litter Monitoring Body is satisfied that the results outlined in this report are accurate and reflective of the country as a whole.

CHAPTER 1: SUMMARY SYSTEM'S SURVEY RESULTS FOR 2016

In 2016, 30[2] of the 31 local authorities participated.

Figure 1-1 shows the participation of local authorities since 2003. The restructuring of local authorities has lead to a perceived lower overall participation in 2015 and 2016 (see Figure 1-1).

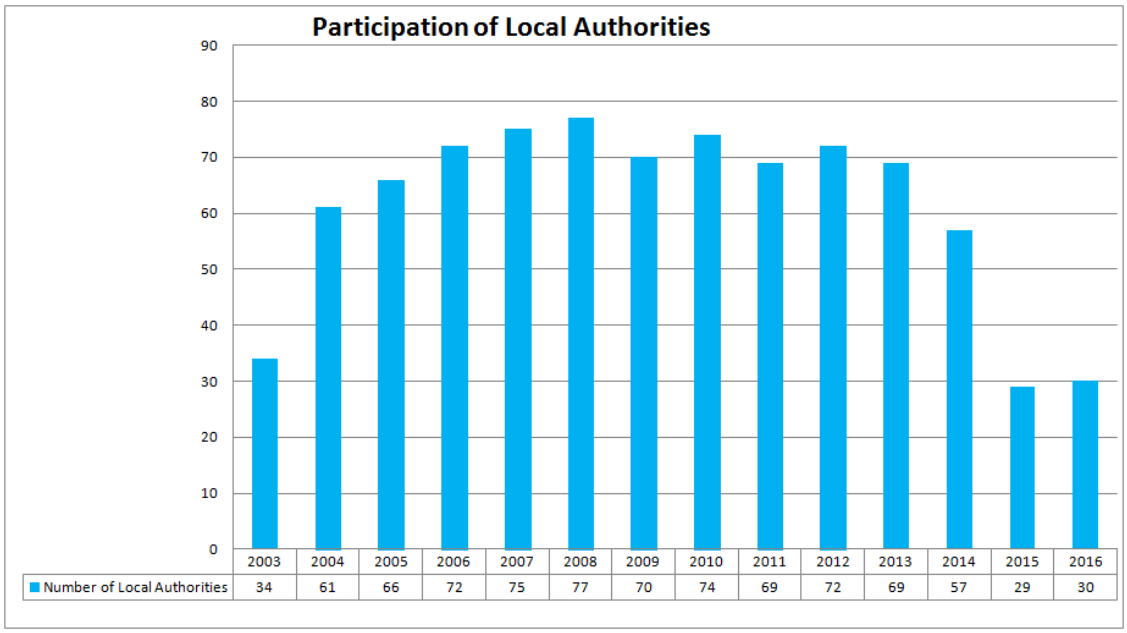


Figure 1-1 Participation of Local Authorities 2003-2016

The 2016 survey results provide reliable information on the extent, composition and causes of litter pollution in Ireland and facilitate analysis of any emerging trends in litter pollution. The results allow a full and more comprehensive comparison of year-on-year developments with regard to combating litter pollution.

This National Litter Pollution Monitoring System has set out to answer three key questions:

1. How littered is the country at local and national level?
2. What are the main constituent elements of litter pollution?
3. What are the main causes of litter pollution?

[2] No results were submitted in 2016 by South Dublin County Council

How littered is the country at local and national level?

In 2016, 5001 litter pollution surveys were undertaken nationally. This was a decrease of 107 surveys from 2015.

- 13.2% of areas surveyed were unpolluted (LPI 1) in 2016. The percentage of unpolluted (LPI 1) areas has decreased by 3.2%, from 16.4% in 2015.
- 65.1% of all areas surveyed were slightly polluted (LPI 2), an increase of 2.3% on 2015 (62.8%).
- The percentage of moderately polluted areas (LPI 3) has increased by 1.3%, from 16.7 in 2015 to 18.0% in 2016.
- The percentage of significantly polluted areas (LPI 4) has decreased slightly (by 0.3%), from 3.6% in 2015 to 3.3% in 2016.
- Grossly polluted areas (LPI 5) have decreased by 0.1%; from 0.4% in 2015 to 0.3% in 2016.

What are the main constituent elements of litter pollution?

- Cigarette related litter (55.44%), food related litter (16.28%), packaging items (13.28%), sweet related litter (7.76%) and paper items (4.78%) were the main litter constituents identified nationally.

What are the main causes of litter pollution?

- Passing pedestrians (41.74%), passing motorists (21.04%), retail outlets (10.37%), gathering points (5.68%), fast food outlets (5.31%), schools/ school children (4.28%) and places of leisure/entertainment (4.16%) were identified as the main causative factors of litter nationally.

CHAPTER 2: HOW LITTERED IS THE COUNTRY?

The 2016 dataset is obtained from 5001 litter pollution surveys.

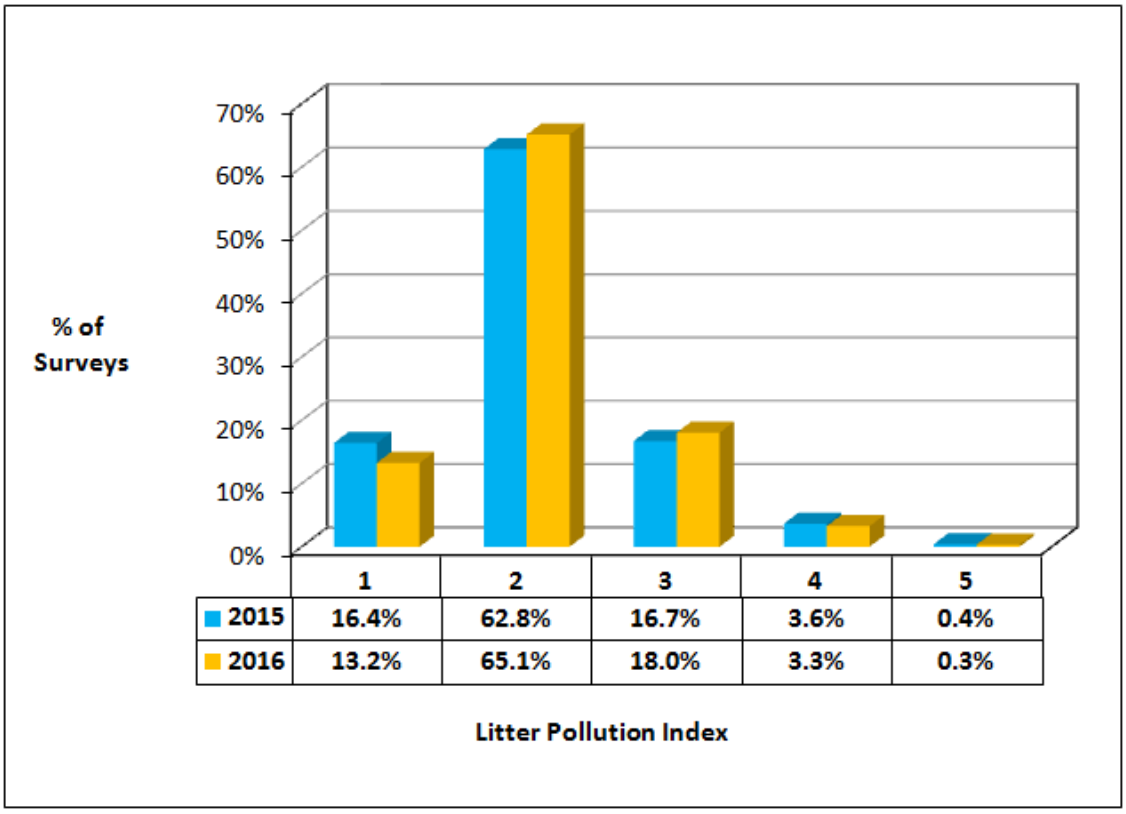
The national monitoring system results indicate that the percentage of unpolluted (LPI 1) areas has decreased from 16.4% in 2015 to 13.2% in 2016.

A comparison of the results from 2015 to 2016 indicates that the percentage of slightly polluted (LPI 2) areas has increased slightly from 62.8% in 2015 to 65.1% in 2016.

The percentage of moderately polluted areas (LPI 3) has increased from 16.7% in 2015 to 18.0% in 2016. The percentage of significantly polluted areas (LPI 4) has decreased slightly (by 0.3%) from 3.6% in 2015 to 3.3% in 2016. The percentage of grossly polluted (LPI 5) areas has decreased slightly (by 0.1%) from 0.4% in 2015 to 0.3% in 2016.

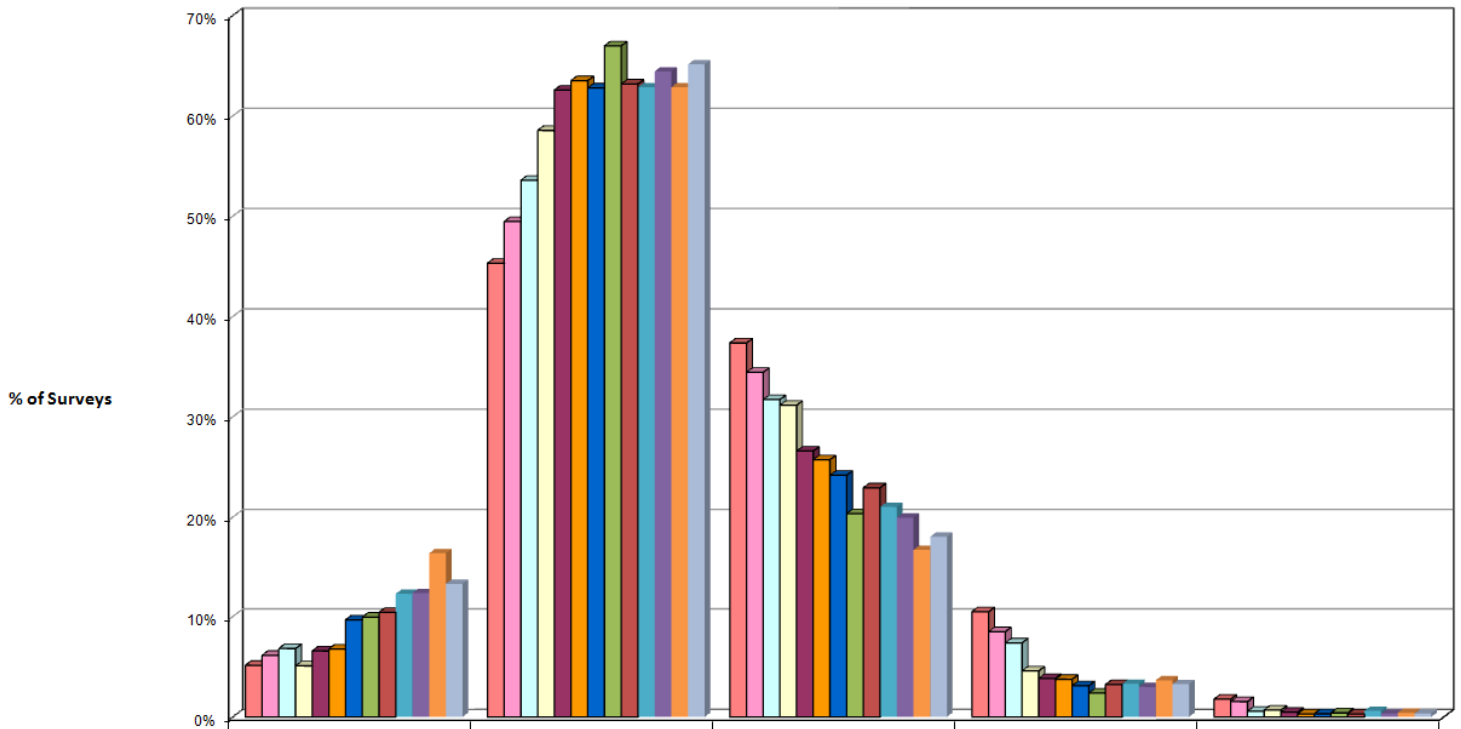
The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas combined together has decreased slightly (by 0.9%) from 2015 to 2016, thus demonstrating there has been an increase in litter pollution from 2015 to 2016.

Figure 2-1 below compares 2015 and 2016 litter pollution survey results.



	1	2	3	4	5
2015	16.4%	62.8%	16.7%	3.6%	0.4%
2016	13.2%	65.1%	18.0%	3.3%	0.3%

Figure 2-1 Comparison of Litter Pollution Indices (LPI) 2015 – 2016



	LPI 1	LPI 2	LPI 3	LPI 4	LPI 5
2004	5.1%	45.3%	37.3%	10.5%	1.8%
2005	6.1%	49.5%	34.4%	8.5%	1.5%
2006	6.8%	53.6%	31.7%	7.4%	0.6%
2007	5.1%	58.5%	31.1%	4.6%	0.7%
2008	6.6%	62.6%	26.6%	3.8%	0.5%
2009	6.8%	63.5%	25.7%	3.7%	0.3%
2010	9.7%	62.8%	24.2%	3.1%	0.3%
2011	9.9%	67.0%	20.3%	2.4%	0.4%
2012	10.4%	63.2%	22.9%	3.2%	0.3%
2013	12.2%	62.8%	21.0%	3.3%	0.6%
2014	12.3%	64.4%	19.9%	3.0%	0.3%
2015	16.4%	62.8%	16.7%	3.6%	0.4%
2016	13.2%	65.1%	18.0%	3.3%	0.3%

Litter Pollution Index

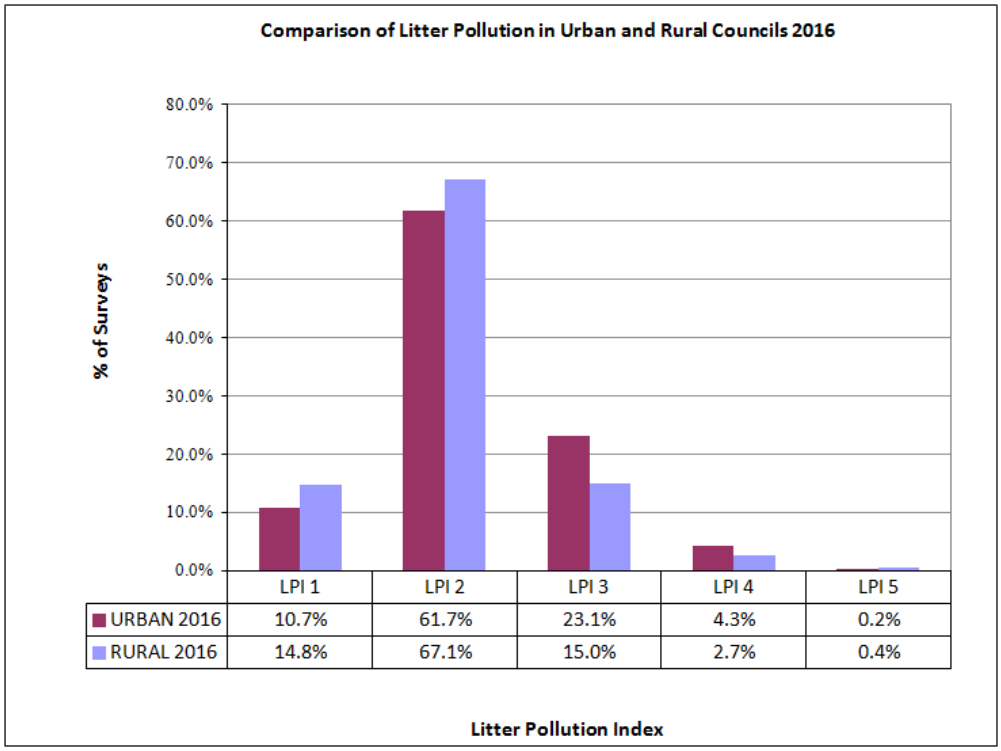
Figure 2-2 Litter Pollution Index 2004-2016

Figure 2-2 illustrates the Litter Pollution Index ratings from 2004 to 2016. The percentage of unpolluted (LPI 1) areas has increased from 5.1% in 2004 to 13.2% in 2016 (an 8.1% increase). The 2015 results had the largest percentage of unpolluted areas ever recorded by the system.

Figure 2-2 also shows the percentage of slightly polluted (LPI 2) areas has increased from 45.3% to 65.1% between 2004 and 2016 (an increase of 19.8%). The number of moderately polluted (LPI 3) areas showed a steady decrease between 2004 and 2015 but increased slightly in 2016. The number of significantly polluted (LPI 4) areas has decreased from 10.5% in 2004 to 3.3% in 2016 (decrease of 7.2%). The number of grossly polluted (LPI 5) areas has decreased from 1.8% in 2004 to 0.3% in 2016 (a decrease of 1.5%).

A comparison of urban[3] and rural local authorities[4] is presented below in Figure 2-3. In 2016, 10.7% of urban areas and 14.8% of rural areas were unpolluted (LPI 1).

The percentage of slightly polluted areas (LPI 2) experienced in urban areas is 61.7%, and in rural areas is 67.1%. The percentage of moderately polluted (LPI 3) areas experienced in urban areas is 23.1%, with 15% experienced in rural areas. The percentage of significantly polluted (LPI 4) areas is 4.3% in urban areas and 2.7% in rural areas. Grossly polluted (LPI 5) areas are 0.2% in urban areas and 0.4% in rural areas. Please refer to Figures 5-4 and 5-5 for further comparison of urban and rural litter pollution data from 2015 to 2016.



	LPI 1	LPI 2	LPI 3	LPI 4	LPI 5
URBAN 2016	10.7%	61.7%	23.1%	4.3%	0.2%
RURAL 2016	14.8%	67.1%	15.0%	2.7%	0.4%

Figure 2-3 Comparison of Litter Pollution within Largely Urban and Rural Areas in 2016

[3] For the purpose of this Report urban local authorities include Cork City Council, Dublin City Council, Dun Laoghaire Rathdown County Council, Fingal County Council, Galway City Council and Limerick City and County Council

[4] For the purpose of this Report rural local authorities include all other county councils.

CHAPTER 3: WHAT ARE THE MAIN CONSTITUENT ELEMENTS OF LITTER POLLUTION?

Local authorities also carried out **litter quantification surveys** (or item counts) to determine the composition of litter in their areas. A breakdown of the main constituents of litter pollution is highlighted in Figure 3-1 below:

From the data below, it can be seen that:

- **Cigarette related litter** continues to constitute the highest percentage (**55.44%**) of litter in the locations surveyed – this is comprised mainly of cigarette ends which constitute **51.80%** of all litter items nationally.

- **Food related litter**, at **16.28%**, is the second largest category of litter pollution recorded. **Chewing gum** is the single largest litter component in the food related litter category, and also the second largest component nationally, comprising **15.15%** of all litter recorded in the litter quantification surveys carried out in 2016. See Table 3-1for a comprehensive breakdown of this category.

- **Packaging litter (13.28%)** is the third largest component of national litter pollution recorded. Bottle caps **(1.87%)**, bottles **(1.56%),** drink cups **(1.14%)** drink lids **(1.05%)** and bags and wrappers **(1.02%),** are the main litter items in this category.

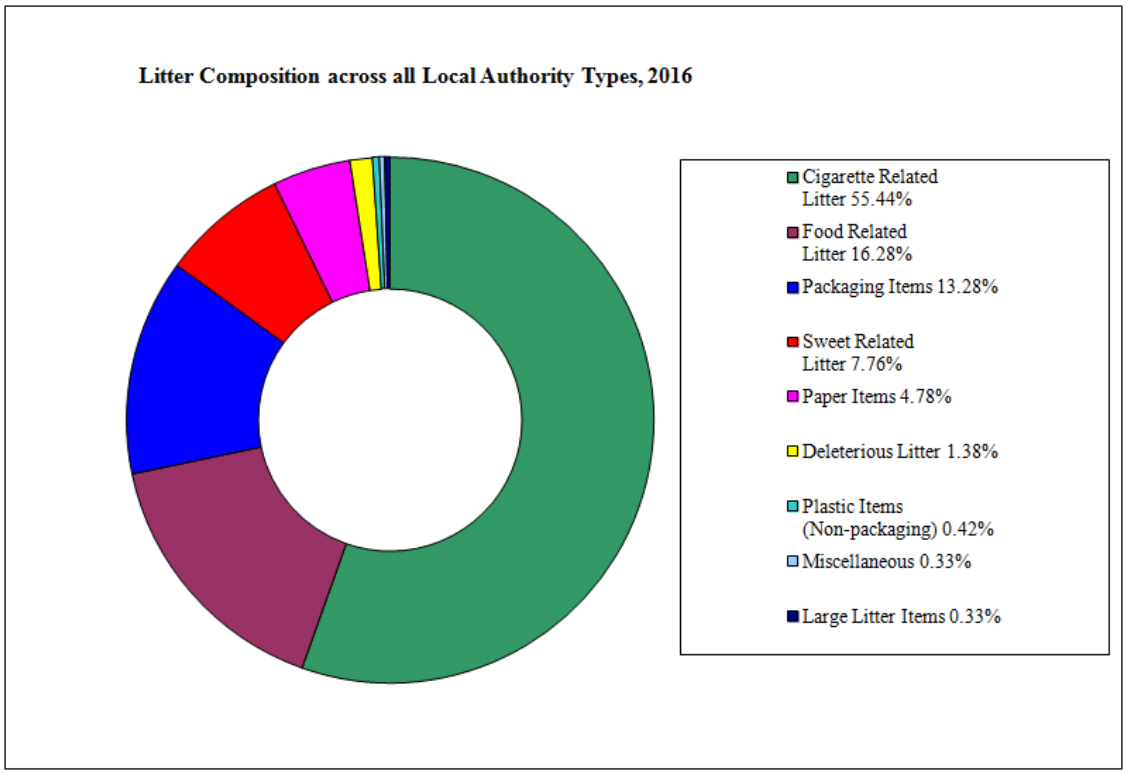
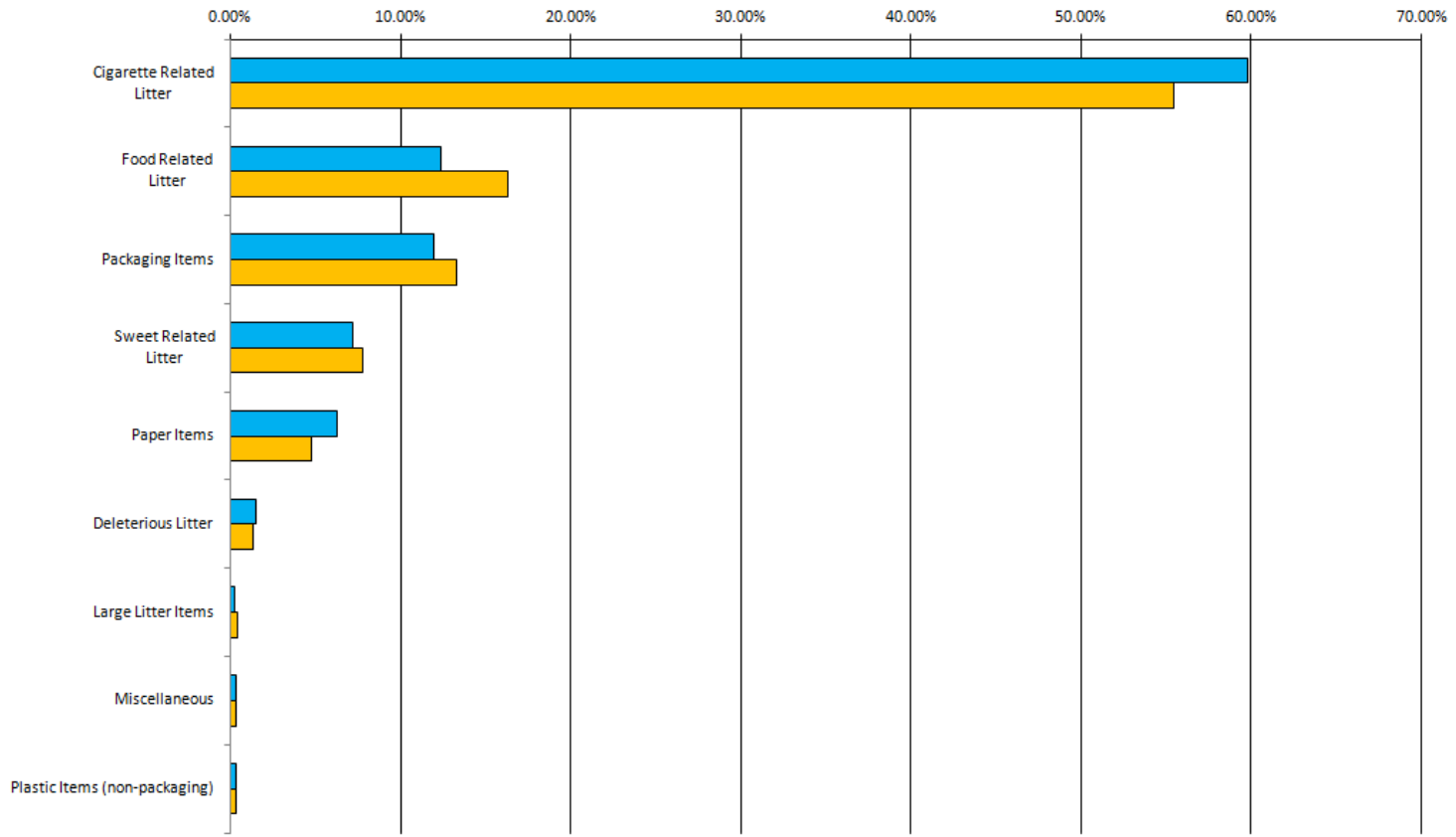


Figure 3-1 Composition of Litter in 2015 Broken Down into Main Categories

3.1 Comparison of Litter Quantification Surveys 2015 – 2016

Figure 3-2 below compares the results of the 2015 and 2016 surveys.



	Plastic Items (non-packaging)	Miscellaneous	Large Litter Items	Deleterious Litter	Paper Items	Sweet Related Litter	Packaging Items	Food Related Litter	Cigarette Related Litter
2015	0.34%	0.33%	0.24%	1.50%	6.26%	7.22%	11.95%	12.40%	59.76%
2016	0.33%	0.33%	0.42%	1.38%	4.78%	7.76%	13.28%	16.28%	55.44%

Figure 3-2 Comparison of National Litter Composition from 2015 to 2016

A comparison of the results of Litter Quantification Surveys carried out in 2015 and 2016 shows a relatively similar composition of litter. However, analysis reveals some differences in the relative quantities of certain components.

- The percentage of cigarette related litter has decreased by 4.32% since 2015.
- The percentage of food related litter has increased by 3.88% since 2015.
- The percentage of packaging items increased by 1.33% since 2015.
- The percentage of sweet related litter items increased 0.54% since 2015.
- The percentage of paper items decreased by 1.48% since 2015.
- There has also been a decrease in deleterious litter (by 0.12%) since 2015.
- There has been an increase in large litter items (0.18%) since 2015.
- The number of items recorded as miscellaneous litter has remained unchanged since 2015 (0.33%).
- There has been a slight decrease in plastic items (non packaging) (0.01%) since 2015.

Table 3-1 on the following page details the composition of litter in 2015 and 2016.

The greatest percentage change in litter composition is in the cigarette related litter category which has decreased by 4.32% in 2016. This large increase in 2015 can be attributed to a decrease in cigarette ends (by 3.58%), matches (by 0.91%) and matchboxes and lighters (by 0.07%). It is noted that cigarette boxes and wrappers was the only litter item within this category to increase in 2016, this category increased by 0.24%.

Table 3-1 overleaf also details the 3.88% increase in food related litter when compared to 2015 figures. This increase in 2016 can be attributed to an increase in chewing gum (by 3.91%), remnants of confectionary food items (by 0.10%) and other food items (by 0.09%). All other items within this category decreased since 2015 (fast-food remnants by 0.03%, bread/ biscuits by 0.09% and fruit and vegetables by 0.11%).

Refer to Appendix C for "Details of Litter Composition from 2015-2016 according to Local Authority Type".

	Detailed National Litter Composition 2016			Detailed National Litter Composition 2015	
Cigarette Related Litter 55.44%	Cigarette ends	51.80%	Cigarette Related Litter 59.76%	Cigarette ends	55.38%
	Cigarette boxes and wrappers	1.75%		Cigarette boxes and wrappers	1.51%
	Matches	1.56%		Matches	2.47%
	Matchboxes and lighters	0.33%		Matchboxes and lighters	0.40%
Food Related Litter 16.28%	Chewing Gum	15.15%	Food Related Litter 12.40%	Chewing Gum	11.24%
	Remnants of confectionery food items	0.29%		Remnants of confectionery food items	0.19%
	Other food items	0.26%		Other food items	0.17%
	Fast-food remnants	0.23%		Fast-food remnants	0.26%
	Bread/ biscuits	0.20%		Bread/ biscuits	0.29%
	Fruit/ vegetables	0.15%		Fruit/ vegetables	0.26%
Packaging Items 13.28%	Bottle Caps	1.87%	Packaging Items 11.95%	Bottle Caps	1.42%
	Bottles	1.56%		Bottles	0.91%
	Drink cups	1.14%		Drink cups	1.09%
	Drink Lids	1.05%		Drink Lids	1.14%
	Bags and wrappers	1.02%		Bags and wrappers	1.38%
	Beverage Cans - Non-alcoholic	0.90%		Beverage Cans - Non-alcoholic	0.46%
	Beverage Cans - Alcoholic	0.81%		Beverage Cans - Alcoholic	0.56%
	Beverage Bottles - Alcoholic	0.66%		Beverage Bottles - Alcoholic	0.47%
	Other paper packaging	0.65%		Other paper packaging	0.61%
	Beverage Bottles - Non-alcoholic	0.60%		Beverage Bottles - Non-alcoholic	0.64%
	Drinks cartons	0.53%		Drinks cartons	0.52%
	Plastic film	0.44%		Plastic film	0.43%
	Other plastic packaging	0.40%		Other plastic packaging	0.50%
	Cardboard	0.28%		Cardboard	0.26%
	Tin foil (not sweet wrappers)	0.24%		Tin foil (not sweet wrappers)	0.41%
	Bags - shopping bags	0.23%		Bags - shopping bags	0.21%
	Other metal litter items	0.14%		Other metal litter items	0.09%
	Lids (e.g. from bottles, jars)	0.14%		Lids (e.g. from bottles, jars)	0.13%
	Food cans	0.09%		Food cans	0.15%
	Aeroboard	0.03%		Aeroboard	0.04%
	Jars and other containers	0.02%		Jars and other containers	0.06%
	Metal drums	0.01%		Metal drums	0.01%
	Bags	0.19%		Bags	0.22%
	Boxes	0.10%		Boxes	0.11%
	Bags - other (e.g. fertiliser)	0.08%		Bags - other (e.g. fertiliser)	0.04%
	Plastic sheeting (e.g. silage)	0.06%		Plastic sheeting (e.g. silage)	0.05%
	Bubble-wrap	0.05%		Bubble-wrap	0.04%
Sweet Related Litter 7.76%	Sweet Wrappers (plastic/foil)	4.12%	Sweet Related Litter 7.22%	Sweet Wrappers (plastic/foil)	3.82%
	Lollipop Sticks (wooden/plastics)	1.50%		Lollipop Sticks (wooden/plastics)	1.51%
	Straws	1.09%		Straws	0.92%
	Crisp Bags	1.06%		Crisp Bags	0.97%
Paper Items 4.78%	Tissues	1.23%	Paper Items 6.26%	Tissues	1.99%
	Receipts	1.14%		Receipts	1.59%
	Other paper items	1.07%		Other paper items	0.63%
	Tickets (e.g. bus, lottery)	0.51%		Tickets (e.g. bus, lottery)	1.09%
	Bank slips	0.47%		Bank slips	0.48%
	Newspapers	0.16%		Newspapers	0.13%
	Flyers and posters	0.13%		Flyers and posters	0.21%
	Letters, envelopes and cards	0.05%		Letters, envelopes and cards	0.07%
	Magazines/ brochures	0.03%		Magazines/ brochures	0.07%
Deleterious Litter 1.38%	Dog fouling	1.21%	Deleterious Litter 1.50%	Dog fouling	1.33%
	Municipal Hazardous Waste (e.g. paint, solvents)	0.06%		Municipal Hazardous Waste (e.g. paint, solvents)	0.00%
	Other deleterious items	0.08%		Other deleterious items	0.06%
	Feminine hygiene products	0.02%		Feminine hygiene products	0.02%
	Nappies	0.02%		Nappies	0.08%
	Needles and syringes	0.00%		Needles and syringes	0.01%
Large Litter Items 0.42%	Other large items	0.32%	Large Litter Items 0.24%	Other large items	0.14%
	Household refuse in bags	0.07%		Household refuse in bags	0.06%
	Appliances (e.g. fridge)	0.02%		Appliances (e.g. fridge)	0.00%
	Furniture	0.02%		Furniture	0.03%
	Scrap cars	0.00%		Scrap cars	0.01%
Miscellaneous 0.33%	Miscellaneous Litter Items	0.33%	Miscellaneous 0.33%	Miscellaneous Litter Items	0.33%
Plastic Items (Non-packaging) 0.33%	Plastic items	0.33%	Plastic Items (Non-packaging) 0.34%	Plastic items	0.34%

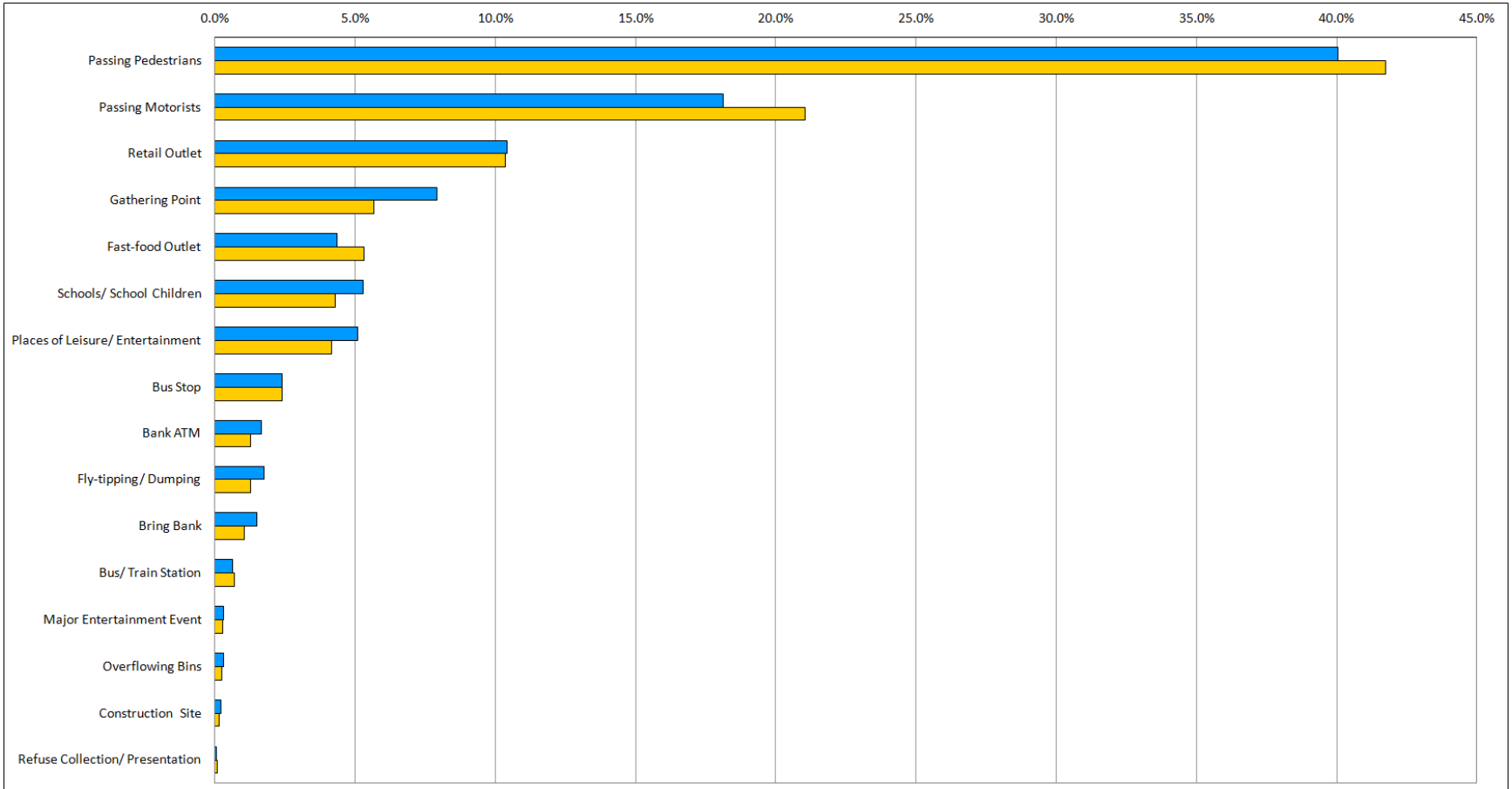
Table 3-1 Detailed National Litter Composition 2015 to 2016

CHAPTER 4: WHAT ARE THE MAIN CAUSES OF LITTER POLLUTION?

The breakdown of causative factors nationally in 2015 and 2016 for all local authorities is presented in Figures 4-1 and 4-2. It can be seen from these figures that the relative ranking of causative factors is similar from 2015 to 2016, with the greatest difference since 2015 occurring between passing motorists (increased by 2.9% since 2015) and gathering points (decrease of 2.2% since 2015).

Figure 4-1 illustrates that:

- Passing pedestrians continue to constitute the greatest single causative factor of litter pollution, accounting for 41.7% across all local authorities.
- Passing motorists are the second largest causative factor accounting for 21% across all local authority types in 2016.
- Causative factors that have increased from 2015 to 2016 include passing pedestrians (from 40.1% in 2015 to 41.7% in 2016), passing motorists (from 18.1% to 21%), fast-food outlets (from 4.4% in 2015 to 5.3% in 2016) and bus/ train station (from 0.6% to 0.7%).
- Causative factors that have decreased from 2015 to 2016 include gathering points (from 7.9% in 2015 to 5.7% in 2016), schools/ school children (from 5.3% to 4.3%), places of leisure/ entertainment (5.1% in 2015 to 4.2% in 2016), bank ATM (from 1.6% in 2015 to 1.3% in 2016), fly-tipping/ dumping (from 1.7% in 2015 to 1.3% in 2016), bring bank (from 1.5% to 1%) and overflowing bins (decreasing from 0.3% to 0.2%).
- Retail outlet (10.4%), bus stop (2.4%), major entertainment events (0.3%), construction site (0.2%) and refuse collection/ entertainment (0.1%), as constituent causative factors of national litter, have remained constant since 2015.



	Refuse Collection/ Presentation	Construction Site	Overflowing Bins	Major Entertainment Event	Bus/ Train Station	Bring Bank	Fly-tipping/ Dumping	Bank ATM	Bus Stop	Places of Leisure/ Entertainment	Schools/ School Children	Fast-food Outlet	Gathering Point	Retail Outlet	Passing Motorists	Passing Pedestrians
2015	0.1%	0.2%	0.3%	0.3%	0.6%	1.5%	1.7%	1.6%	2.4%	5.1%	5.3%	4.4%	7.9%	10.4%	18.1%	40.1%
2016	0.1%	0.2%	0.2%	0.3%	0.7%	1.0%	1.3%	1.3%	2.4%	4.2%	4.3%	5.3%	5.7%	10.4%	21.0%	41.7%

Figure 4-1 Causative Factors of Litter Pollution across all Local Authorities in 2015 and 2016

During the Litter Pollution Surveys, surveyors are asked for observations on the primary causes of litter pollution. Causative factors are expressed as a percentage of the total number of causative factors identified in all Litter Pollution Surveys. For each survey, there is usually more than one causative factor of the litter found, e.g. passing pedestrians, fast-food outlets and overflowing bins may all be contributing to litter pollution in a particular survey area.

The breakdown of causative factors found in each local authority type is presented in Figure 4-2.

The national results for 2016 show that passing pedestrians are the most significant cause of litter pollution within all local authority types. It is also clear from Figure 4-2 that passing motorists, retail outlets, gathering points, fast-food outlets, schools/ school children, places of leisure/ entertainment and bus stops are considerable sources of litter across all local authority types.

Survey results from 2016 show that the contribution of passing motorists, retail outlets, bank ATMs, fly-tipping/ dumping, bank ATMs, bring banks and refuse collection/ presentation to litter pollution is greater in County Councils than in other local authority types.

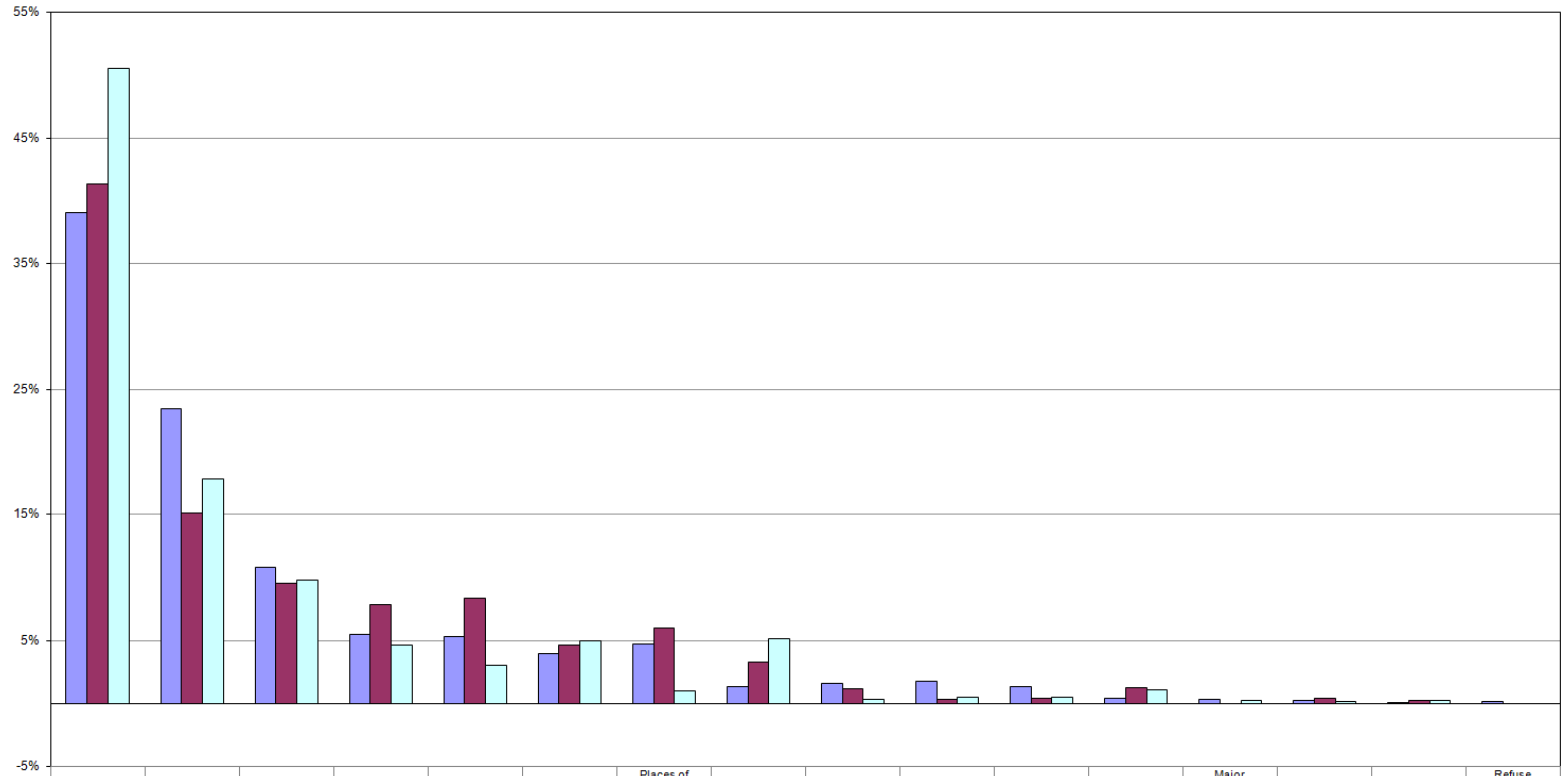
Gathering points, fast-food outlets, places of leisure / entertainment, bus/ train stations, and overflowing bins are more significant causative factors in City Councils than in other local authority types.

Passing pedestrians, school/ school children and bus stops are more significant causative factors in Dublin Local Authorities than in other local authority types.

Construction sites were a less significant causative factor for County Councils than for City Councils or Dublin Local Authorities in 2016. Major entertainment events were a more significant causative factor for County Councils and Dublin Local Authorities in comparison to City Councils in 2016.

Figure 4-2 also illustrates that less significant causes of litter pollution in all types of local authority include overflowing bins and refuse collection/presentation. This is similar to trends identified in the previous National Litter Pollution Monitoring System annual results. This data indicates that the causes of litter pollution nationwide continue to remain relatively homogeneous, irrespective of local authority type. This is not unexpected, given that local authorities carry out their litter pollution and quantification surveys largely in areas where potential sources of litter (i.e. people) are located.

The homogeneous nature of the causative factors of litter pollution in Ireland is further illustrated by the ranking of these causative factors and the linking of them to the level of litter pollution in the locations surveyed – see Figures D.1 to D.8 in Appendix D. The percentage of causative factors varies with each category of LPI. The data is organised illustrating the 2015 and 2016 graphs under each litter pollution index (on the same page) to facilitate the comparison of the 2015 and 2016 results.



	Passing Pedestrians	Passing Motorists	Retail Outlet	Gathering Point	Fast-food Outlet	Schools/ School Children	Places of Leisure/ Entertainment	Bus Stop	Bank ATM	Fly-tipping/ Dumping	Bring Bank	Bus/ Train Station	Major Entertainment Event	Overflowing Bins	Construction Site	Refuse Collection/ Presentation
County Councils	39.1%	23.5%	10.8%	5.5%	5.3%	4.0%	4.7%	1.3%	1.6%	1.7%	1.4%	0.4%	0.3%	0.2%	0.1%	0.1%
City Councils	41.3%	15.1%	9.6%	7.8%	8.3%	4.6%	6.0%	3.3%	1.1%	0.4%	0.4%	1.3%	0.0%	0.4%	0.3%	0.0%
Dublin Local Authorities	50.5%	17.8%	9.7%	4.7%	3.0%	5.0%	1.0%	5.1%	0.3%	0.5%	0.5%	1.1%	0.3%	0.2%	0.3%	0.0%

*City Council results also include the Limerick county area (i.e. this local authority is now known as Limerick City and County Council). Waterford City and County Council and South Dublin County Council did not take part in LPS surveys.
**County Council results exclude Limerick.

Figure 4-2 Causative Factors of Litter Pollution According to Local Authority Type in 2016

CHAPTER 5: ASSESSMENT OF LITTER POLLUTION DATA BY LOCAL AUTHORITY TYPE

This chapter focuses on comparative data for litter pollution across different local authority types. Litter Pollution Survey results for 29 out of 31 local authorities have been returned to the Litter Monitoring Body and analysed for 2016 - those local authorities are detailed in Appendix A.

Comparison of the 2016 litter pollution survey data for the different categories of local authorities is examined in Figures 5-1, 5-2, 5-3 and 5-4.

5.1 Comparison within Dublin Local Authorities

In comparing the litter pollution data for Dublin Local Authorities, Figure 5-1 illustrates the following:

- The percentage of unpolluted (LPI 1) areas decreased from 25.0% in 2015 to 14.3% in 2016. This constitutes a decrease of 10.7%.
- Slightly polluted (LPI 2) areas increased from 42.9% in 2015 to 55.6% in 2016. This constitutes an increase of 12.7%.
- Moderately polluted (LPI 3) areas increased from 23.9% in 2015 to 24.5% in 2016. This constitutes a 0.6% increase.
- Significantly polluted (LPI 4) areas decreased from 7.7% in 2015 to 5.3% in 2016. This constitutes a 2.4% decrease.
- Grossly polluted (LPI 5) areas decreased, by 0.4%, from 0.6% in 2015 to 0.2% in 2016.
- The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas combined together, show an increase of 2% from 2015 to 2016.

Overall, the results show a decrease in the level of litter pollution in Dublin Local Authorities from 2015 to 2016. Although the percentage of unpolluted (LPI 1) areas decreased (by 10.7%) between 2015 and 2016, the percentage of slightly polluted (LPI 2) areas increased by 12.7%. Furthermore, there was also a combined decrease, of 2.2%, in moderately polluted (LPI 3), significantly polluted (LP4) and grossly polluted (LP1 5) areas between 2015 and 2016.

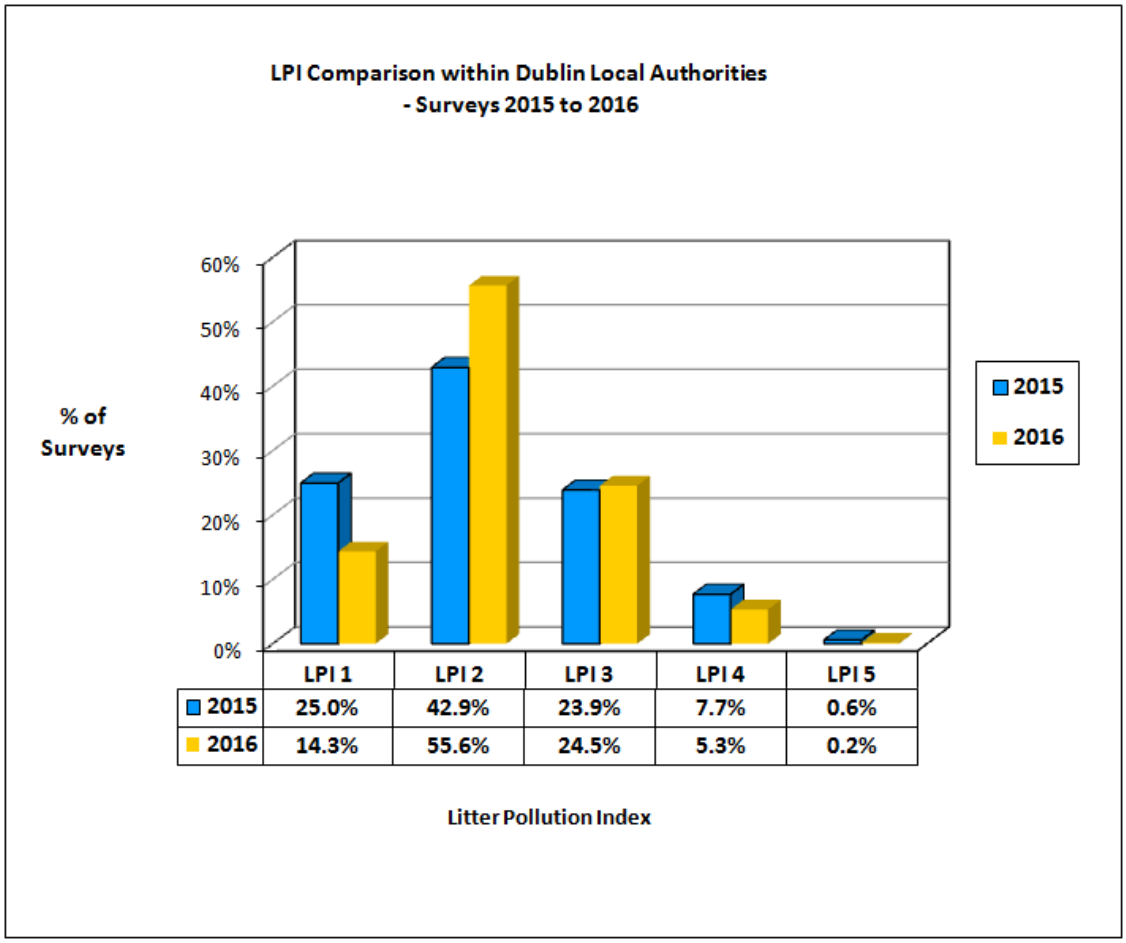


Figure 5-1 Comparison of Litter Pollution within Dublin Local Authorities 2015 to 2016

5.2 Comparison within County Councils

In comparing the litter pollution data for County Councils, Figure 5-2 illustrates the following:

- The percentage of unpolluted (LPI 1) areas decreased from 15.4% in 2015 to 14.8% in 2016. This constitutes a decrease of 0.6%.
- Slightly polluted (LPI 2) areas increased, by 0.2%, from 66.9% in 2015 to 67.1% in 2016.
- Moderately polluted (LPI 3) areas increased by 0.3%, from 14.7% in 2015 to 15% in 2016.
- Significantly polluted (LPI 4) areas increased slightly from 2.6% in 2015 to 2.7% in 2016. This constitutes an increase of 0.1%.
- The percentage of grossly polluted (LPI 5) areas remained the same for 2015 and 2016 at 0.4%.

- The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas combined together, show a decrease of 0.4% from 2015 to 2016.

Overall, these results show an increase in the level of litter pollution in County Councils from 2015 to 2016. The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas, when combined together, showed a decrease; whilst moderately polluted (LPI 3) and significantly polluted (LP4) and grossly polluted (LPI 5) areas showed a combined increase of 0.4% when compared to 2015.

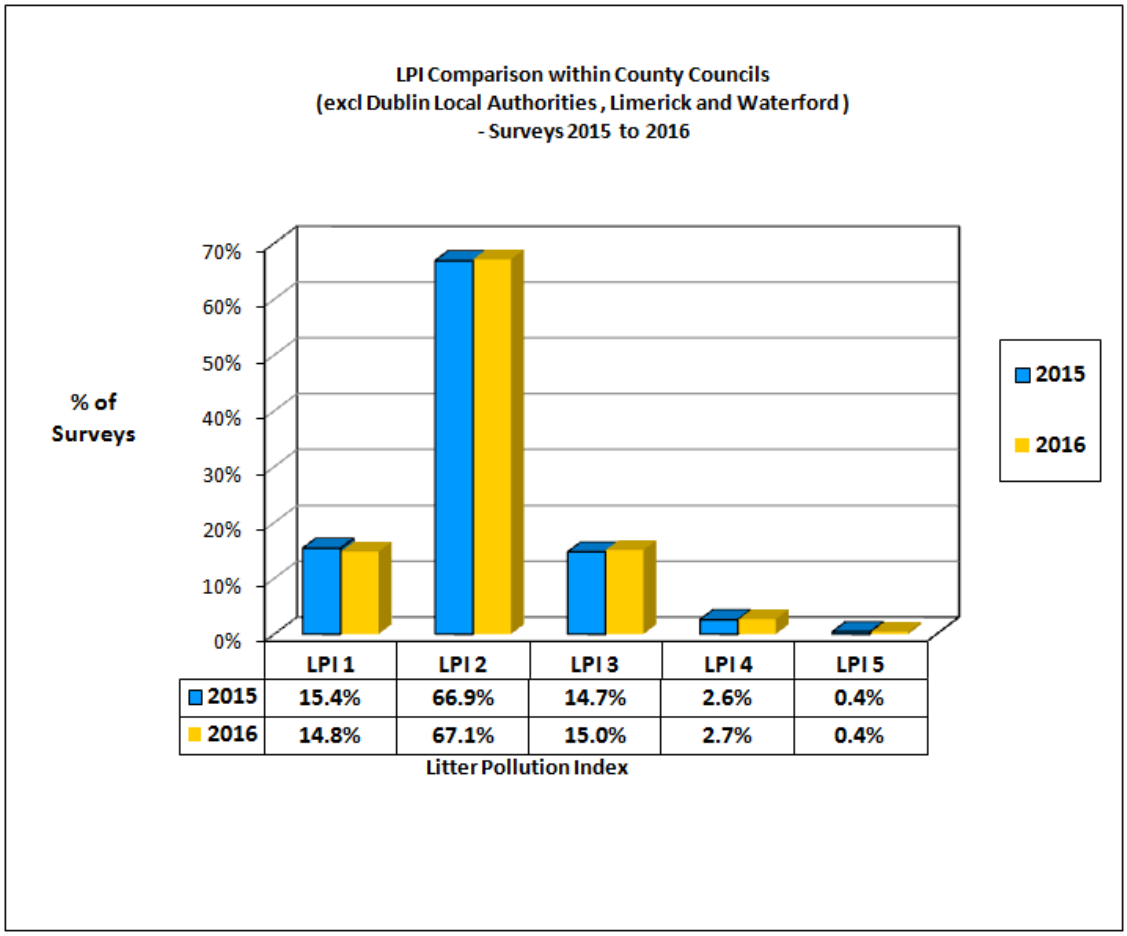


Figure 5-2 Comparison of Litter Pollution within County Councils 2015 to 2016

5.3 Comparison within City Councils

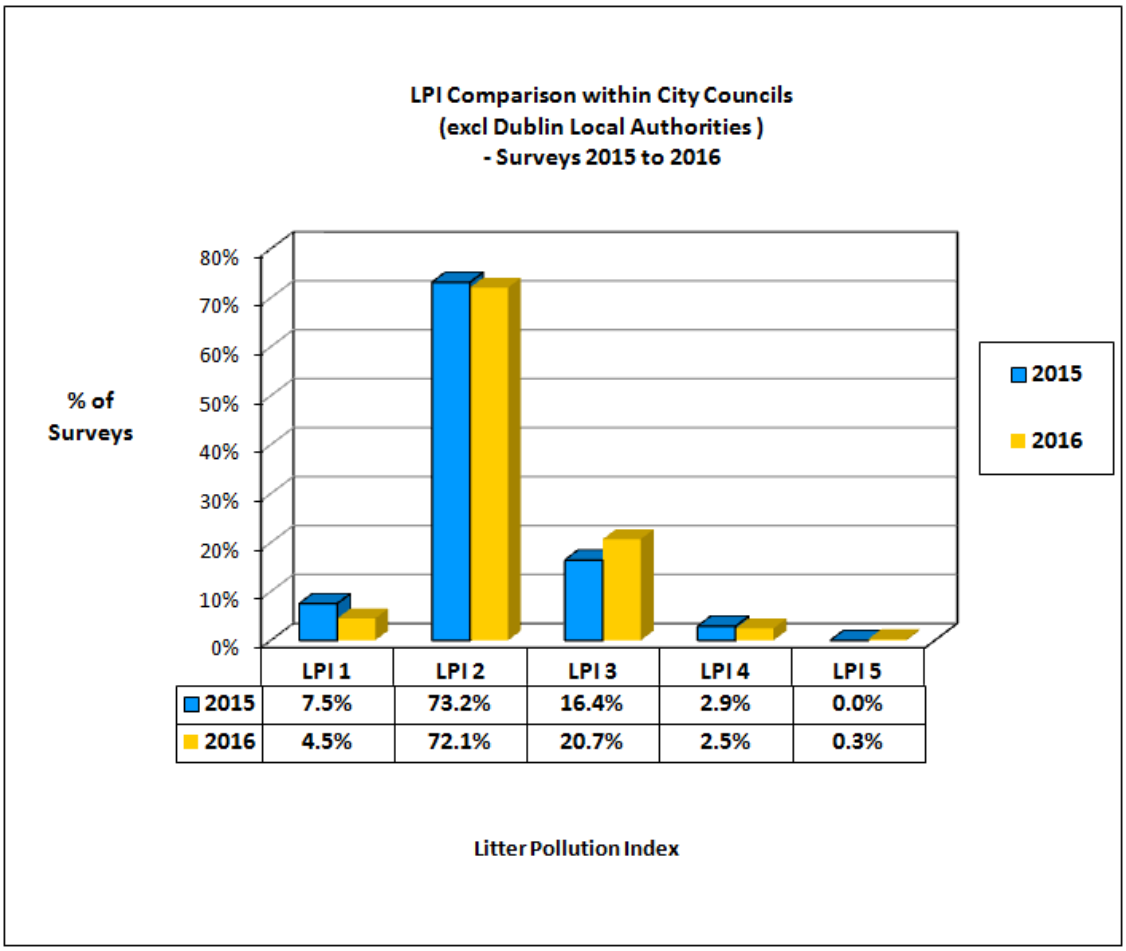
In comparing the litter pollution data for City Councils, Figure 5-3 illustrates the following:

- The percentage of unpolluted (LPI 1) areas has decreased from 7.5% in 2015 to 4.5% in 2016. This constitutes a decrease of 3%.

- Slightly polluted (LPI 2) areas have decreased, by 1.1%, from 73.2% in 2015 to 72.1% in 2016.

- The percentage of moderately polluted (LPI 3) areas has increased, by 4.3%, from 16.4% in 2015 to 20.7% in 2016.
- Significantly polluted (LPI 4) areas have decreased slightly from 2.9% in 2015 to 2.5% in 2016, a decrease of 0.4%.
- The percentage of grossly polluted (LPI 5) has increased, by 0.3%, from 0% in 2015 to 0.3% in 2016.
- The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas combined together, show a decrease of 4.1% from 2015 to 2016.

These results show an overall increase in the level of litter pollution in City Councils from 2015 to 2016. The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas, when combined together, show a decrease of 4.1%. While, there has been a 4.2% increase in moderately polluted (LPI3), significantly polluted (LPI 4) and grossly polluted (LPI 5) areas, when combined, since 2015.



	LPI 1	LPI 2	LPI 3	LPI 4	LPI 5
2015	7.5%	73.2%	16.4%	2.9%	0.0%
2016	4.5%	72.1%	20.7%	2.5%	0.3%

Figure 5-3 Comparison of Litter Pollution within City Councils 2015 to 2016

The percentage of unpolluted (LPI 1) areas decreased in all local authority categories from 2015 to 2016.

The percentage of slightly polluted (LPI 2) areas decreased in City Councils from 2015 to 2016, while increasing in County Councils and Dublin Local Authorities.

When the national percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas are combined there is an overall decrease, of 2.5%, in litter pollution in 2016, when compared to 2015.

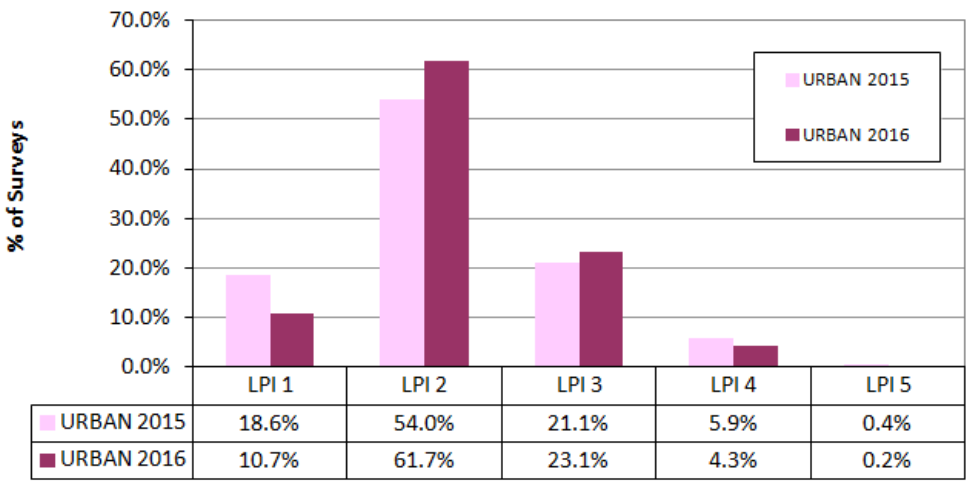
The percentage of moderately polluted (LPI 3) areas increased in all local authority types in 2016.

The percentage of significantly polluted (LPI 4) areas increased slightly in County Councils from 2015 to 2016, while decreasing in City Councils and Dublin Local Authorities.

The percentage of grossly polluted (LPI 5) areas decreased slightly in Dublin Local Authorities, increased slightly in City Councils and remained unchanged in County Councils between 2015 and 2016.

5.4 Comparison within Urban & Rural Areas[5]

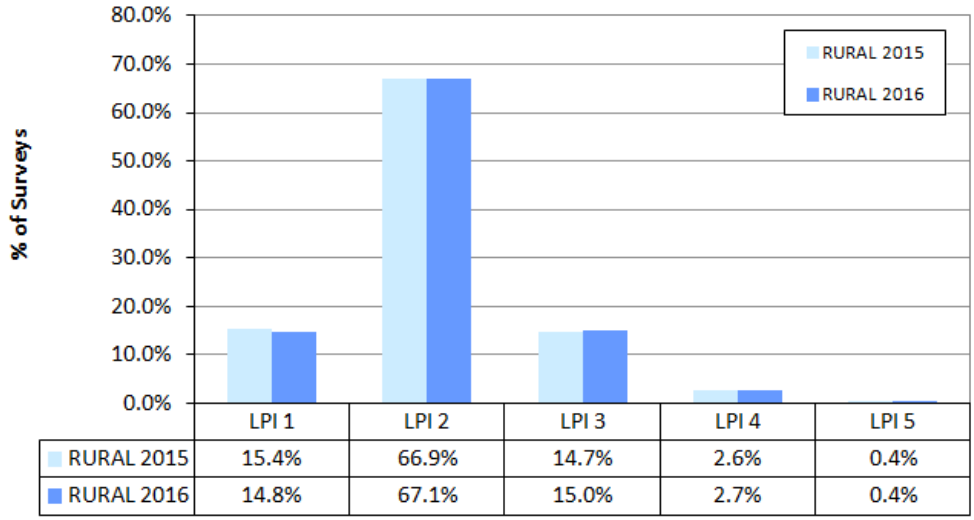
Figures 5-4 and 5-5 below provide a comparison of litter pollution in rural and urban areas from 2015 to 2016.



	LPI 1	LPI 2	LPI 3	LPI 4	LPI 5
URBAN 2015	18.6%	54.0%	21.1%	5.9%	0.4%
URBAN 2016	10.7%	61.7%	23.1%	4.3%	0.2%

Figure 5-4 Comparison of Litter Pollution in Urban Areas from 2015 to 2016

[5] For the purpose of this Report urban local authorities include Dublin City Council, Fingal County Council, Dun Laoghaire Rathdown County Council, Cork City Council, Galway City Council and Limerick City and County Council. Waterford City and County Council and South Dublin County Council did not take part in LPS surveys. For the purpose of this report, rural local authorities included all other County Councils.



	LPI 1	LPI 2	LPI 3	LPI 4	LPI 5
RURAL 2015	15.4%	66.9%	14.7%	2.6%	0.4%
RURAL 2016	14.8%	67.1%	15.0%	2.7%	0.4%

Figure 5-5 Comparison of Litter Pollution in Rural Areas from 2015 to 2016

The percentage of unpolluted (LPI 1) areas in urban areas has decreased, by 7.9%, from 18.6% in 2015 to 10.7% in 2016. The percentage of slightly polluted (LPI 2) areas has increased, by 7.7%, from 54% in 2015 to 61.7% in 2016. Moderately polluted (LPI 3) areas have increased by 2%, from 21.1% in 2015 to 23.1% in 2016. Significantly polluted (LPI 4) areas have decreased, by 1.6%, from 5.9% in 2015 to 4.3% in 2016. Grossly polluted (LPI 5) areas have decreased slightly, by 0.2%, from 0.4% in 2015 to 0.2% in 2016.

In rural areas the levels of unpolluted (LPI 1) areas have decreased from 15.4% in 2015 to 14.8% in 2016. The percentage of slightly polluted (LPI 2) areas has increased slightly, by 0.2%, since 2015 in rural areas. Moderately polluted (LPI 3) areas have increased, by 0.3%, from 2015 to 2016. Significantly polluted (LPI 4) areas have increased, by 0.1%, from 2.6% in 2015 to 2.7% in 2016. Grossly polluted (LPI 5) areas have remained the same as in 2015 at 0.4%.

These results show that both urban and rural areas have shown a decrease in cleanliness levels. Urban areas have shown an overall decrease of 0.4% since 2015 whilst rural areas have shown an overall decrease of 0.8% since 2016.

Refer to Appendix E "Comparison of Causative Factors of Litter Pollution within Urban and Rural Local Authorities".

CHAPTER 6: ANALYSIS OF SPECIFIC COMPONENTS OF LITTER

6.1 Cigarette Related Litter

The percentage of national litter represented by cigarette related litter has decreased from 59.76% in 2015 to 55.44% in 2016, a decrease of 4.32%.

Cigarette ends continue to be the biggest component of cigarette related litter, although the percentage of cigarette ends, as a component of national litter, has also decreased (by 3.58%), from 55.38% in 2015 to 51.80% in 2016.

The reductions in cigarette ends and cigarette related litter, in general, in 2016 has ended an increasing trend of cigarette related litter that has been ongoing since 2009. Despite this, cigarette related litter continued to be the largest component of litter nationally in 2016.

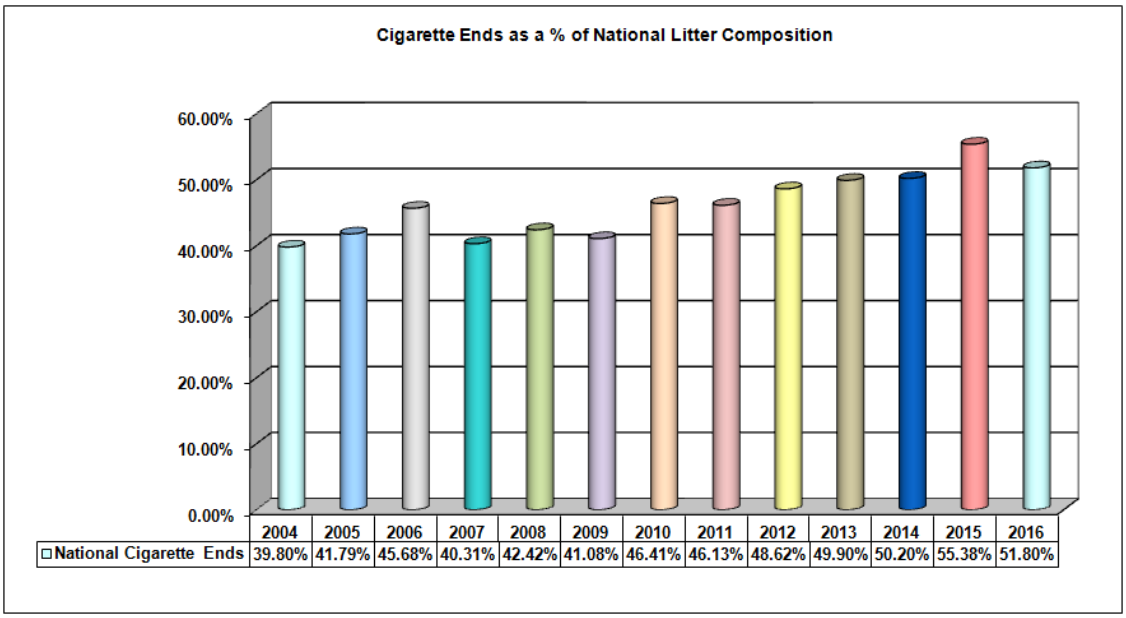


Figure 6-1 Cigarette Ends as a Percentage of the National Litter Composition

6.2 Chewing Gum Litter

Food related litter, and specifically chewing gum, continued to be the second largest component of litter, nationally, in 2016. Figure 6-1 below illustrates trends in chewing gum related litter since 2004.

Chewing gum has remained the single largest component of litter in the food related litter category and the second biggest component of litter nationally over the past thirteen years.

Since 2015 chewing gum levels, as a percentage of national litter composition, have increased by 3.91%, from 11.24% in 2015 to 15.15% in 2016. This increase could possibly be due to a cessation of the Gum Litter Taskforce (GLT) Awareness Campaign 2012- 2014. This campaign was focused on raising public awareness of appropriate chewing gum litter. It involved outdoor advertising around the country, national radio advertising, in-store and around store advertising, point of sale materials and promotion of greater awareness of litter fines for irresponsible disposal of gum.

As shown in Figure 6-2 below, chewing gum levels show an improvement from 2008 to 2015. Despite the climb in levels in 2016, the percentage of national litter represented by chewing gum has still decreased from 31.61%, at its highest, in 2005 to 15.15% in 2016, which represents a decrease of 16.11%,

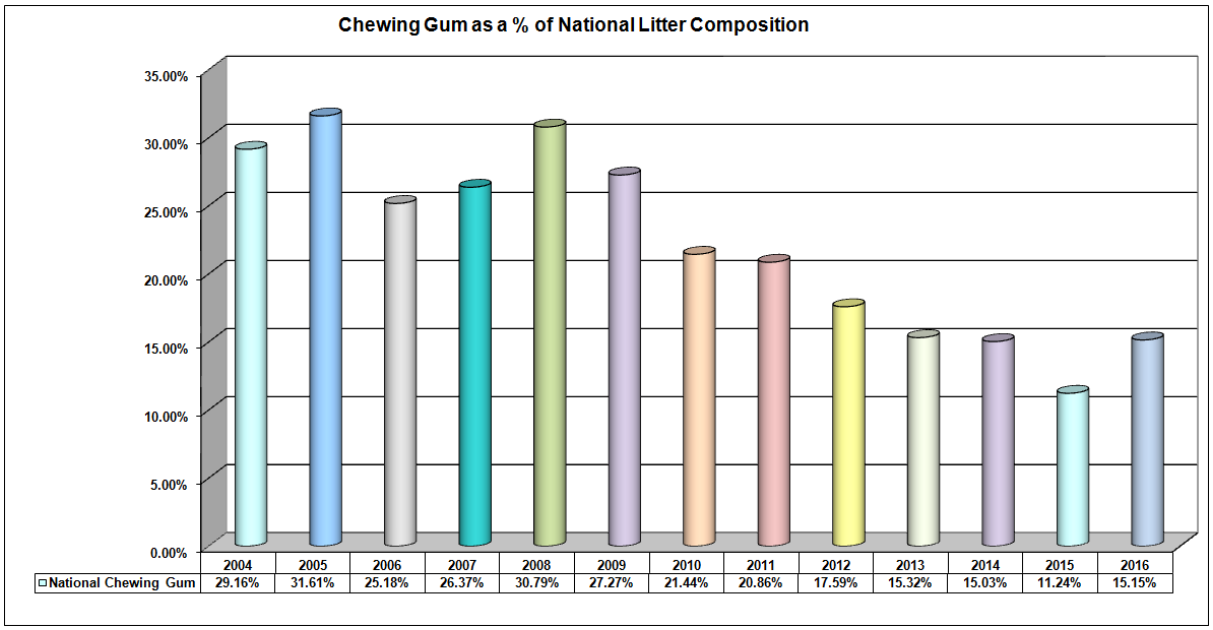


Figure 6-2 Chewing Gum as a Percentage of the National Litter Composition

6.3 Sweet Related Litter

The third biggest constituent of litter nationally is sweet related litter, or sweet wrappers (plastic/ foil), more specifically. The components of sweet related litter between 2015 and 2016 are presented in Figure 6-3 below.

Sweet related litter, as a component of national litter, increased from 7.22% in 2015 to 7.76% in 2016. The results in Figure 6-3 illustrate that sweet wrappers (plastic/foil), the highest component of litter in the sweet related litter category, increased by 0.3% from 2015 to 2016. The quantity of lollipop sticks (wooden/plastic) has decreased, by 0.01%, in 2016. Straws have increased, by 0.17%, in 2016. Crisp bags also contribute to the sweet related litter category; they have also increased slightly, by 0.09%, in 2016.

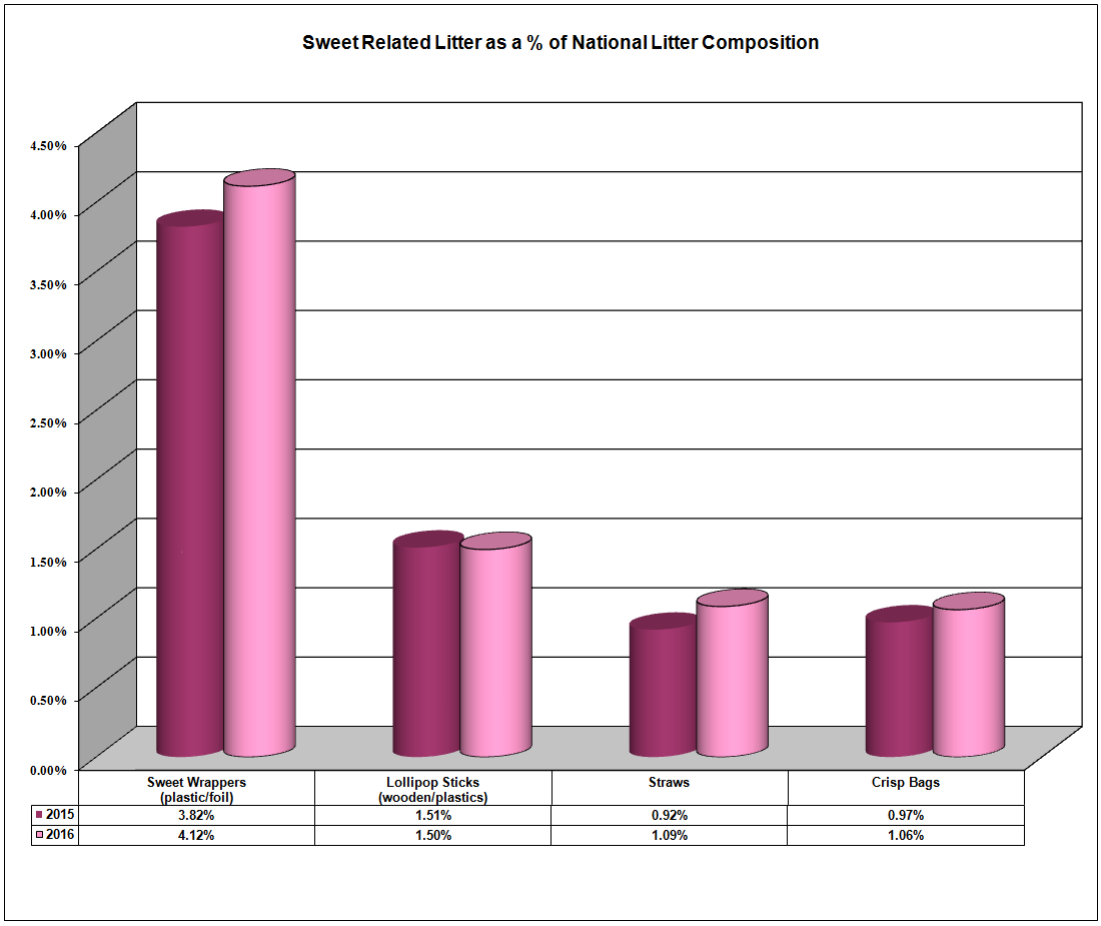


Figure 6-3 Sweet Related Litter Analysed 2015 to 2016

6.4 Bank ATM Receipts

The Litter Monitoring System is also used to assess the impact of a protocol to tackle litter generated by ATM advice slips which was announced in January 2007 by the then Minister for the Environment, Heritage and Local Government and then Irish Banking Federation (IBF) on behalf of the retail banking groups with ATM networks.

The litter pollution survey results for 2016 suggest that 'Bank ATM's' as a causative factor has continued to decrease in 2016 (by 0.36%), from 1.64% in 2015 to 1.28% in 2016.

The litter quantification survey results reflect the litter pollution results in this regard. Figure 6-4 illustrates that bank slips as a percentage of the national litter composition, have decreased, by 0.01%, from 0.48% in 2015 to 0.47% in 2016.

The Litter Monitoring System will continue to monitor the impact of this protocol.

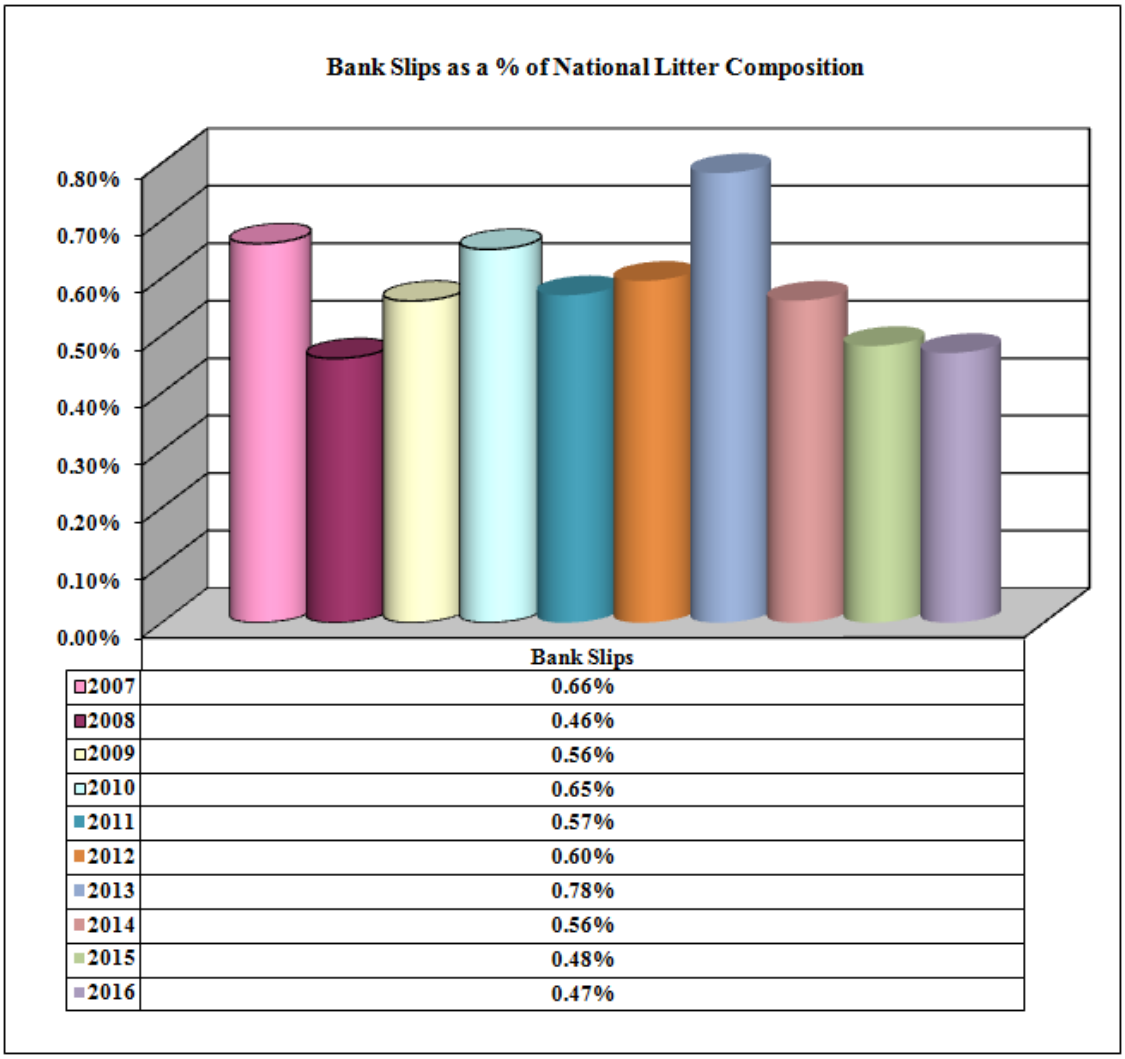


Figure 6-4 Bank Slips as a Percentage of the National Litter Composition

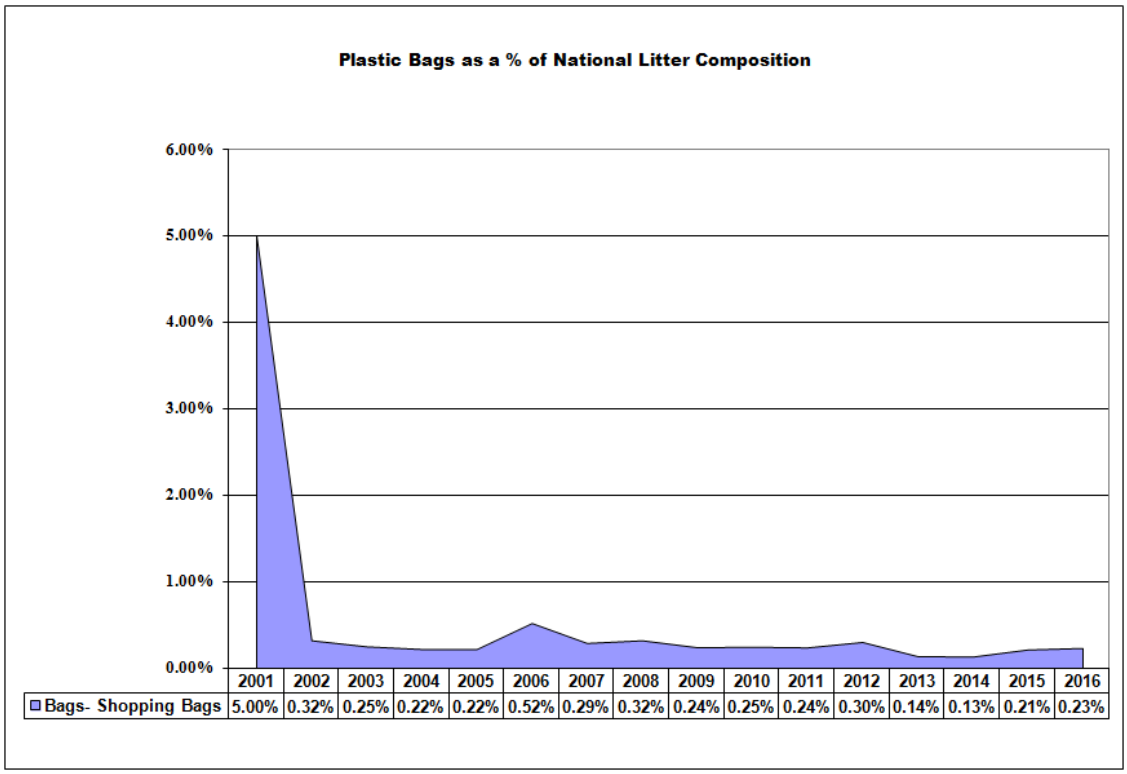
6.5 Plastic Bags

The Litter Pollution Monitoring System can be used as a tool to monitor the success of measures implemented to tackle specific issues. Prior to 2002, it was estimated that 1.3 billion shopping bags were issued annually. As a consequence of incorrect disposal, many plastic bags ended up as a very visually intrusive form of litter pollution. Prior to the introduction of the NLPMS, it was estimated that plastic bags constituted 5% of litter. A plastic bag levy was introduced in March 2002 in order to tackle this issue. Results of the System indicated that plastic bags, as a component of national litter, responded positively and constituted 0.3% of litter in May 2003.

Between 2004 and 2006, levels of plastic bags recorded by the System steadily began to climb again. The plastic bag levy increased, from 15c to 22c, in July 2007 in a further bid to reduce littering. The results of the System once again indicated that the measures were having a positive impact on littering; plastic bags as a percentage of National Litter Composition reached an all-time low in 2014 (0.13%).

The 2016 results show that there has been an increase in plastic bags as a percentage of the National Litter Composition since 2014 (from 0.13% in 2014 to 0.23% in 2016). The Litter Monitoring System will continue to monitor the level of plastic bag litter in Ireland and the impact of this levy.

Figure 6-5 illustrates the percentage of shopping bags as a percentage of the National Litter Composition from the period mid-2001 to 2016.



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Bags- Shopping Bags	5.00%	0.32%	0.25%	0.22%	0.22%	0.52%	0.29%	0.32%	0.24%	0.25%	0.24%	0.30%	0.14%	0.13%	0.21%	0.23%

Figure 6-5 Plastic Bags as a Percentage of the National Litter Composition

CHAPTER 7: ITEMS FOR FURTHER ATTENTION UNDER THE NLPMS

- The Litter Monitoring System will be used, to continue to assess, the impact of the protocol to tackle litter generated by ATM advice slips. This Protocol was announced in January 2007 by the then Minister for the Environment, Heritage and Local Government and the Irish Banking Federation (IBF) on behalf of the retail banking groups with ATM networks. The agreement currently operates between the Minister for Communications, Climate Action and Environment and the Banking and Payments Federation Ireland (BPFI).

- The Litter Monitoring System will be used, to continue to assess the impact of the plastic bag levy, which was introduced in Ireland in March 2002 and which was increased from 15c to 22c in July 2007.

- The Litter Monitoring System will continue to monitor the level of cigarette related litter which is the largest litter component recorded nationally.

CHAPTER 8: CONCLUSION

As a result of the Local Government Reform Act, 31 local authorities now exist in Ireland. In 2016, 30 local authorities have submitted their survey results.

The constituent components and the causative factors of litter pollution nationally remain relatively constant across all local authority types from 2015 to 2016.

The percentage of cigarette related litter, paper litter, plastic items (Non-packaging) and deleterious litter have all decreased since 2015 while food related litter, packaging items, sweet related litter, and larger litter items have increased since 2015. Miscellaneous litter has remained unchanged since 2015.

The national results for 2016 indicate that passing pedestrians are the most significant cause of litter pollution for every local authority type in Ireland. It is also clear that passing motorists, retail outlets, gathering points, fast food outlets, schools/ school children and places of leisure/ entertainment are considerable sources of litter for all local authority types.

Survey results from 2016 show that the contribution of passing motorists, retail outlets, bank ATMs, fly-tipping/ dumping, bring banks and refuse collection/ presentation to litter pollution is greater in County Councils than in other local authority types.

Gathering points, fast-food outlets, places of leisure/ entertainment, bus/ train stations and overflowing bins are more significant causative factors in City Councils than in other local authority types.

Passing pedestrians, school/ school children and bus stops are more significant causative factors in Dublin Local Authorities than in other local authority types.

Construction sites were a less significant causative factor for County Councils than for City Councils or Dublin Local Authorities in 2016. Major entertainment events were a more significant causative factor for County Councils and Dublin Local Authorities in comparison to City Councils in 2016.

The percentage of unpolluted (LPI 1) areas decreased from 16.4% in 2015 to 13.2% in 2016. This is the second largest percentage of unpolluted areas ever recorded by the System.

A comparison of the results from 2015 to 2016 indicates that the percentage of slightly polluted (LPI 2) areas has increased slightly from 62.8% in 2015 to 65.1% in 2016.

The percentage of moderately polluted areas (LPI 3) has increased from 16.7% in 2015 to 18.0% in 2916. The percentage of significantly polluted areas (LPI 4) has decreased slightly (by 0.3%) from 3.6% in 2015 to 3.3% in 2016. The percentage of grossly polluted (LPI 5) areas has decreased slightly (by 0.1%) from 0.4% in 2015 to 0.3% in 2016.

The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas, combined together, has decreased slightly (by 0.9%) from 2015 to 2016, thus demonstrating there has been an increase in litter pollution from 2015 to 2016.

Analysis of specific components of litter in 2016 resulted in the following observations;

- Cigarette related litter, and more specifically cigarette butts, continues to be the greatest component of litter nationally, despite a decrease in the numbers recorded in 2016.

- Chewing gum also continues to be the second largest component of litter nationally. Monitoring results of the System appear to demonstrate that the GLT awareness campaign was successful, with a reduction in gum litter recorded between 2009 and 2014. Gum litter has however increased since 2015, which coincides with the cessation of the GLT awareness campaign.

- Monitoring of plastic bags, as a component of national litter, has indicated the number of plastic bags responded positively to the introduction and increases in the levy in 2002 and 2007, respectively. Monitoring by the System recorded an all time low in the levels of plastic bags in the environment in 2014, after which time the level has slowly increased. The results of the 2016 monitoring may indicate that further action with respect to plastic bags may be required.

The degree, composition, causes and trends in litter pollution identified and discussed in this report are representative of the national picture, and will continue to be monitored into 2017.

The Litter Monitoring Body is satisfied that local authorities are properly implementing the National Litter Pollution Monitoring System. Local authorities will continue to be audited to ensure the System is being implemented as designed.

APPENDIX A

DETAILS OF LOCAL AUTHORITIES THAT CARRIED OUT SURVEYS IN 2016

Litter Quantification Survey Results

Litter Quantification Survey results for 29 out of 31 local authorities were returned to the Litter Monitoring Body and analysed for 2016. These are detailed in Table A-1.

Table A.1 Local Authorities that Submitted Litter Quantification Survey Results for 2016

County Councils
Carlow County Council
Cavan County Council
Clare County Council
Donegal County Council
Galway County Council
Kerry County Council
Kildare County Council
Kilkenny County Council
Laois County Council
Leitrim County Council
Longford County Council
Louth County Council
Mayo County Council
Meath County Council
Monaghan County Council
Offaly County Council
Roscommon County Council
Sligo County Council
Tipperary County Council
Westmeath County Council
Wexford County Council
Wicklow County Council
City Councils
Cork City Council
Galway City Council
Limerick City and County Council
Waterford City and County Council
Dublin Local Authorities
Dublin City Council
Dún Laoghaire-Rathdown County Council
Fingal County Council

Litter Pollution Survey Results

Litter Pollution Survey results for 29 out of 31 local authorities were returned to the Litter Monitoring Body and analysed for 2016. These are detailed in Table A.2.

Table A.2 Local Authorities that Submitted Litter Pollution Survey Results for 2016

County Councils
Carlow County Council
Cavan County Council
Clare County Council
Cork County Council
Donegal County Council
Galway County Council
Kerry County Council
Kildare County Council
Kilkenny County Council
Laois County Council
Leitrim County Council
Longford County Council
Louth County Council
Mayo County Council
Meath County Council
Monaghan County Council
Offaly County Council
Roscommon County Council
Sligo County Council
Tipperary County Council
Westmeath County Council
Wexford County Council
Wicklow County Council
City Councils
Cork City Council
Galway City Council
Limerick City and County Council
Dublin Local Authorities
Dublin City Council
Dún Laoghaire-Rathdown County Council
Fingal County Council

APPENDIX B

AREA CLEANLINESS RATING PHOTOGRAPHS

Area Cleanliness Rating 1 (Unpolluted)

This rating is only given to an area with no litter present i.e. the area may be freshly swept.

Area Cleanliness Rating 2 (Slightly Polluted)

This rating is only given to an area with small litter items present, i.e. not visually intrusive.

Area Cleanliness Rating 3 (Moderately Polluted)

This rating is given to an area with some large litter items present, i.e. visually intrusive.

Area Cleanliness Rating 4 (Significantly Polluted)

This rating is given to an area with large litter items present throughout the survey area.

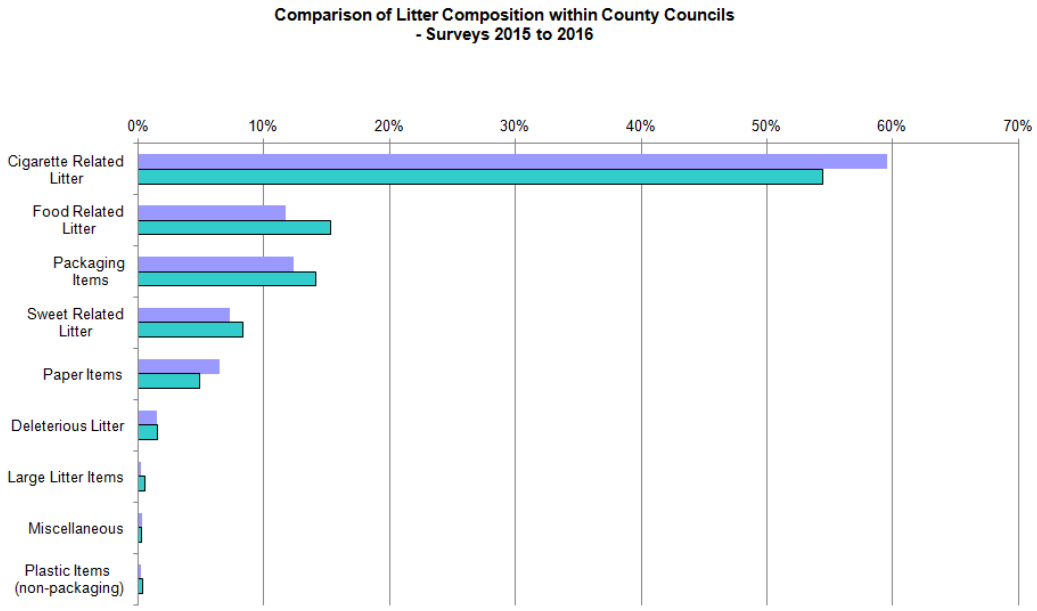
Area Cleanliness Rating 5 (Grossly Polluted)

This rating is given to an area, which is heavily littered throughout the survey area, i.e. after an event such as a concert/ festival or a fly-tipping incident.

APPENDIX C

DETAILS OF LITTER COMPOSITION FROM 2015 – 2016 ACCORDING TO LOCAL AUTHORITY TYPE

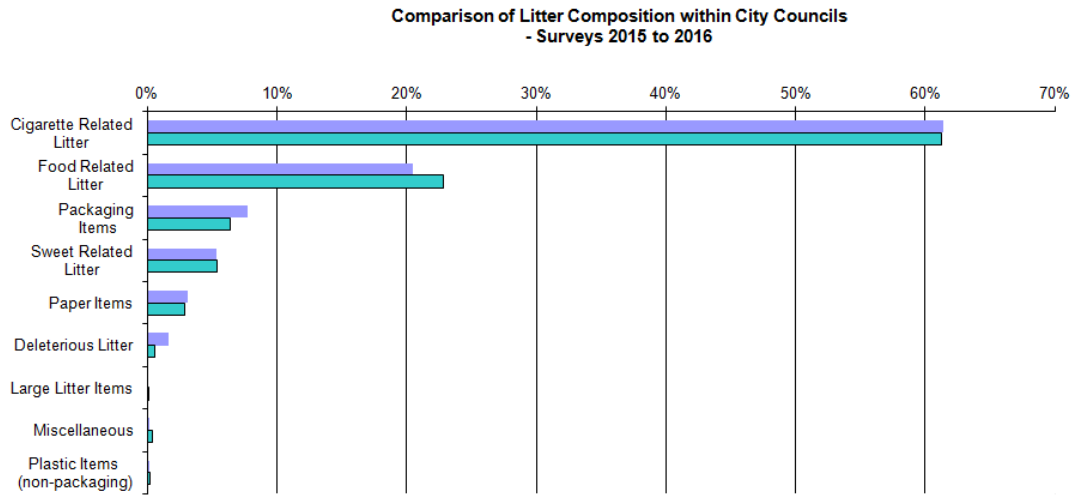
Figure C.1 compares the results of Litter Quantification Surveys within County Councils from 2015 to 2016. The main observations are that the percentage of cigarette related litter, paper items and miscellaneous items have decreased in 2016, while food related litter, packaging items, sweet related litter, larger litter items and plastic litter have all increased between 2015 and 2016.Deleterious litter remained unchanged over the same period.



	Plastic Items (non-packaging)	Miscellaneous	Large Litter Items	Deleterious Litter	Paper Items	Sweet Related Litter	Packaging Items	Food Related Litter	Cigarette Related Litter
2015	0.30%	0.37%	0.27%	1.56%	6.48%	7.32%	12.40%	11.76%	59.54%
2016	0.39%	0.34%	0.54%	1.56%	4.90%	8.35%	14.17%	15.35%	54.40%

Figure C. 1 Comparison of Litter Composition within County Councils 2015 to 2016

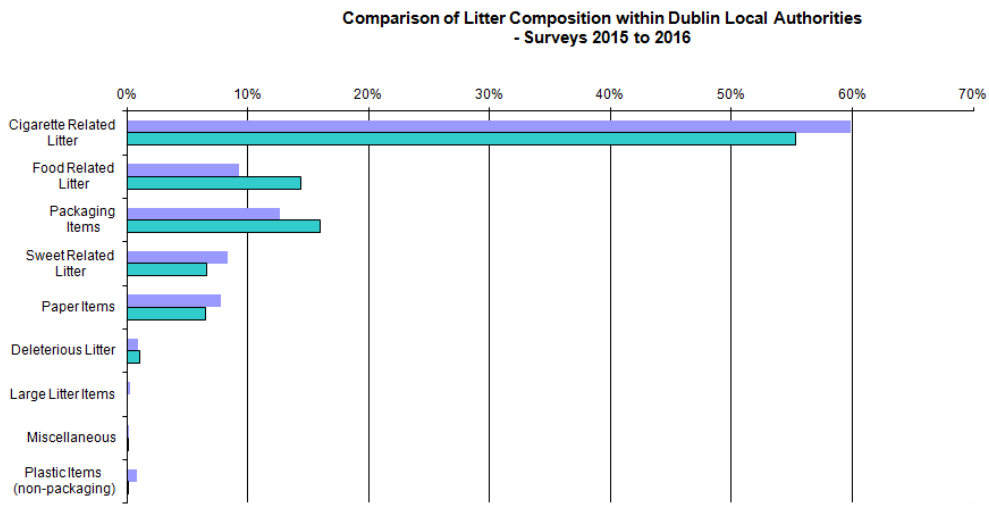
Figure C.2 shows that within City Councils the percentage of food related litter, sweet related litter, larger litter items, miscellaneous items and plastic litter all increased in 2016. Cigarette related litter, packaging items, paper items and deleterious litter items have all decreased from 2015 to 2016.



	Plastic Items (non-packaging)	Miscellaneous	Large Litter Items	Deleterious Litter	Paper Items	Sweet Related Litter	Packaging Items	Food Related Litter	Cigarette Related Litter
2015	0.16%	0.16%	0.00%	1.65%	3.07%	5.32%	7.74%	20.47%	61.43%
2016	0.22%	0.40%	0.05%	0.57%	2.87%	5.37%	6.38%	22.84%	61.30%

Figure C. 2 Comparison of Litter Composition within City Councils 2015 to 2016

Figure C.3 shows that within Dublin Local Authorities the percentage of cigarette related litter, sweet related litter, paper items, large litter items and plastic litter all decreased from 2015 to 2016. Food related litter, packaging items, deleterious litter and miscellaneous litter items increased from 2015 to 2016.



	Plastic Items (non-packaging)	Miscellaneous	Large Litter Items	Deleterious Litter	Paper Items	Sweet Related Litter	Packaging Items	Food Related Litter	Cigarette Related Litter
2015	0.84%	0.14%	0.23%	0.93%	7.79%	8.37%	12.64%	9.25%	59.82%
2016	0.04%	0.15%	0.00%	1.11%	6.48%	6.61%	15.96%	14.40%	55.26%

Figure C. 3 Comparison of Litter Composition within Dublin Local Authorities 2015 to 2016

Note cigarette related litter and paper litter decreased in all local authority types from 2015 to 2016. Food related litter increased, in all local authority types, when compared to 2015. Packaging litter increased in Dublin Local Authorities and County Council local authorities in 2016 but decreased in City Councils. Sweet related litter decreased in Dublin local authorities in 2016 but increased in County and City Councils.

APPENDIX D

COMPARISON OF CAUSATIVE FACTORS OF LITTER POLLUTION WITHIN LITTER POLLUTION INDEX CATEGORIES

In each category of LPI, with the exception of grossly polluted areas (LPI 5), passing pedestrians constitute the most significant causative factor of litter pollution. Figures D.1 – D.8 illustrate that as the degree of litter pollution increases (and the LPI value increases), this causative factor becomes a less significant contributor to litter pollution. Accordingly, in 2016 passing pedestrians constitute 45.3% of all causative factors in litter pollution surveys of slightly polluted (LPI 2) areas; this percentage decreased to 34.2% for moderately polluted (LPI 3) areas and to 33.1% for significantly polluted (LPI 4) areas and to 12.5% for grossly polluted (LPI 5) areas.

Passing motorists constitute 21.4% of all causative factors in litter pollution surveys of slightly polluted (LPI 2) areas, this decreases to 20.1% in litter pollution surveys of moderately polluted (LPI 3) areas, then decreases to 15.3% in litter pollution surveys of significantly polluted (LPI 4) areas. In 2016, passing motorists as a causative factor decreased again to 8.3% in litter pollution surveys of grossly polluted (LPI 5) areas.

Passing pedestrians, passing motorists and retail outlets tend to be the main causative factors in LPI 2 and LPI 3 areas where as in LPI 4 and LPI 5 areas fly-tipping increases as significant causative factor. This trend is similar to 2015 findings.

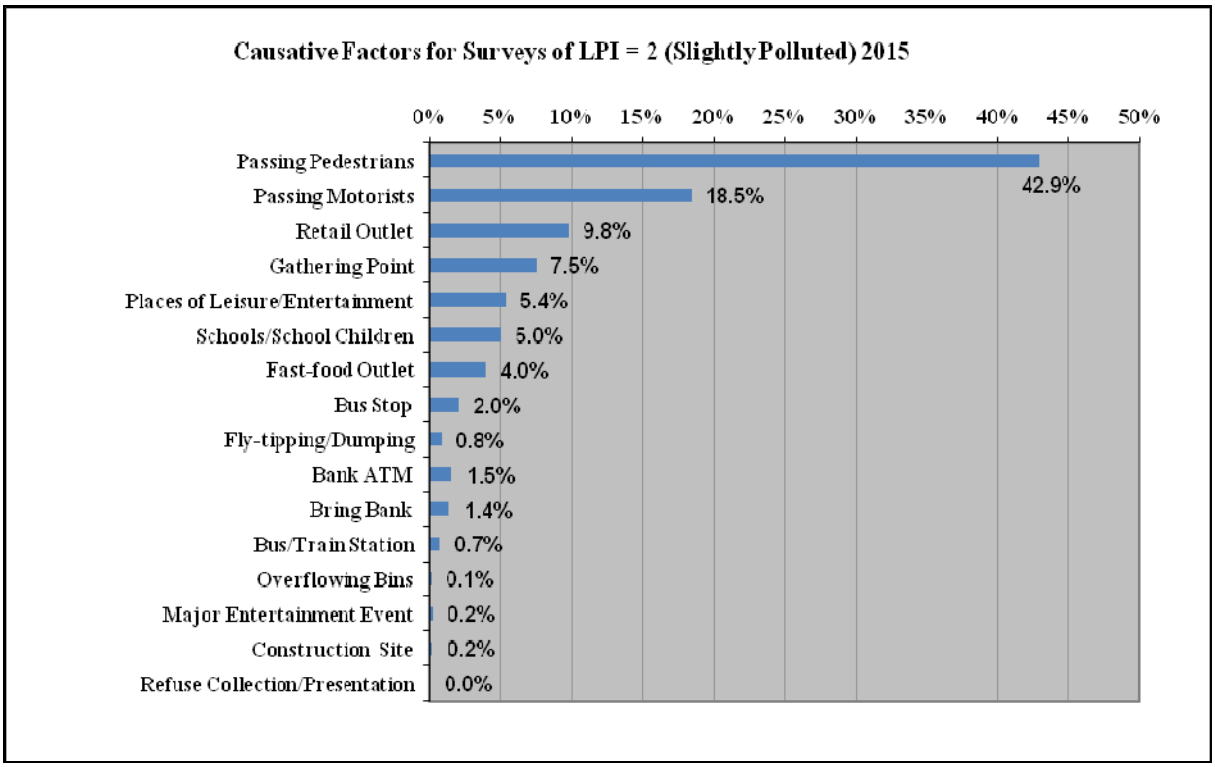


Figure D. 1 Causative Factors of Litter Pollution within Litter Pollution Index Category 2, 2015

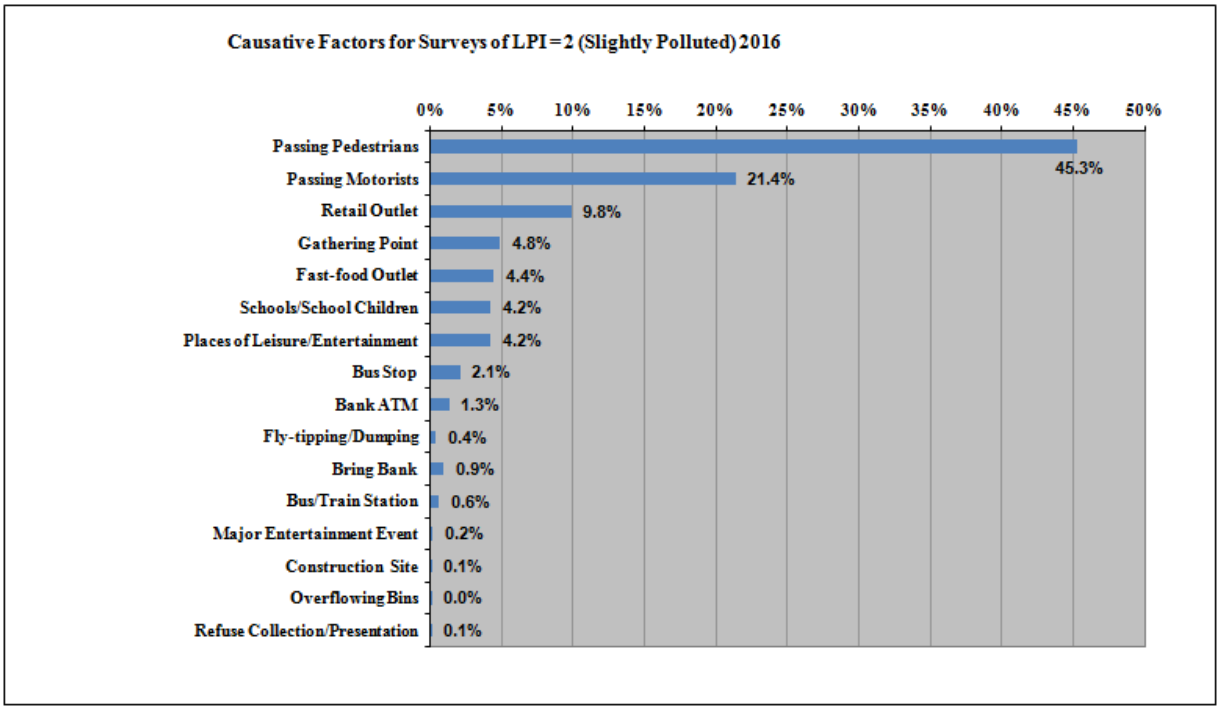


Figure D. 2 Causative Factors of Litter Pollution within Litter Pollution Index Category 2, 2016

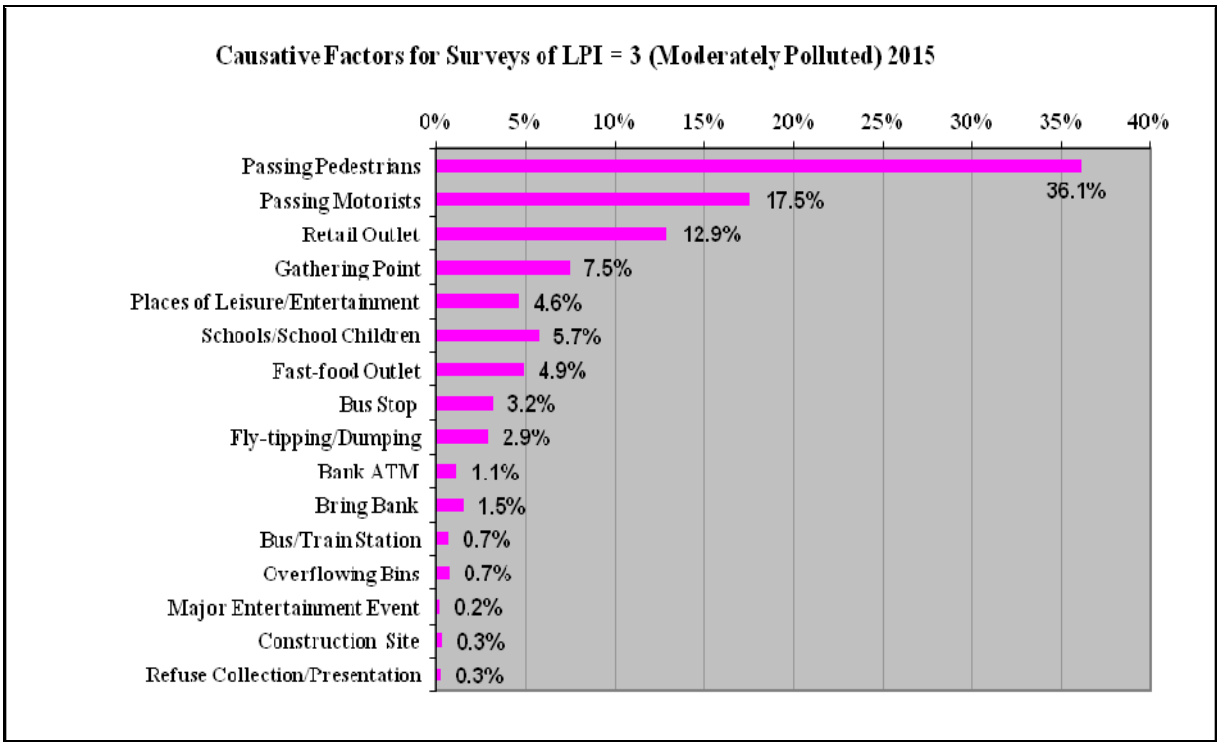


Figure D. 3 **Causative Factors of Litter Pollution within Litter Pollution Index Category 3, 2015**

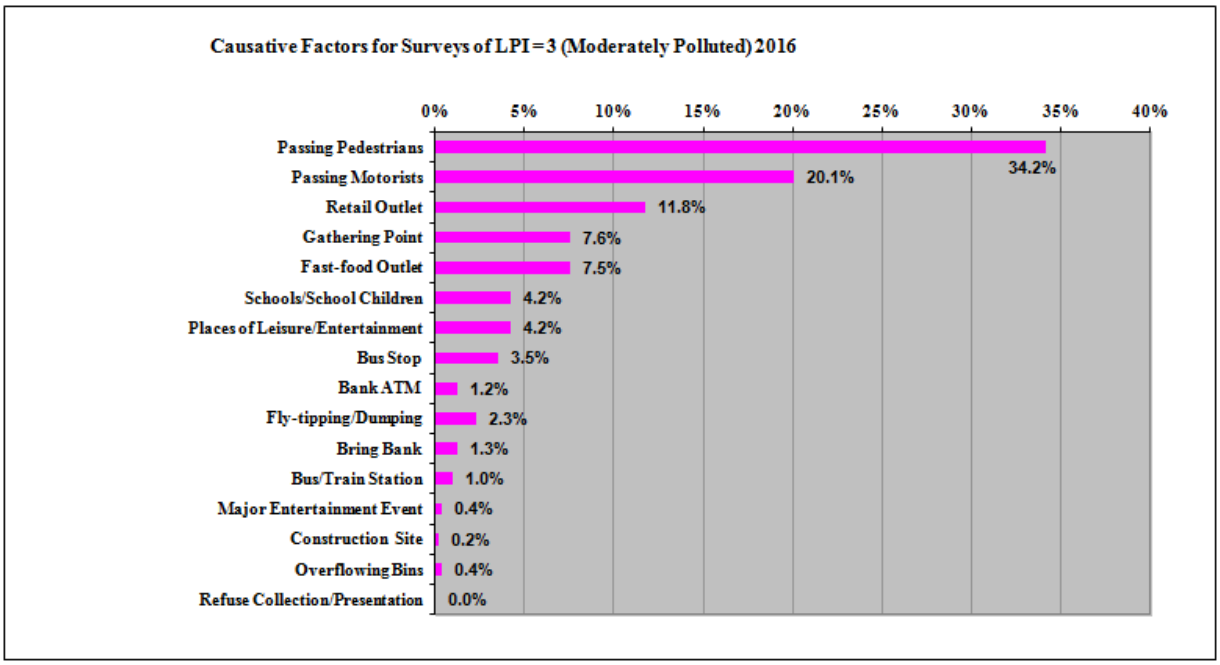


Figure D. 4 **Causative Factors of Litter Pollution within Litter Pollution Index Category 3, 2016**

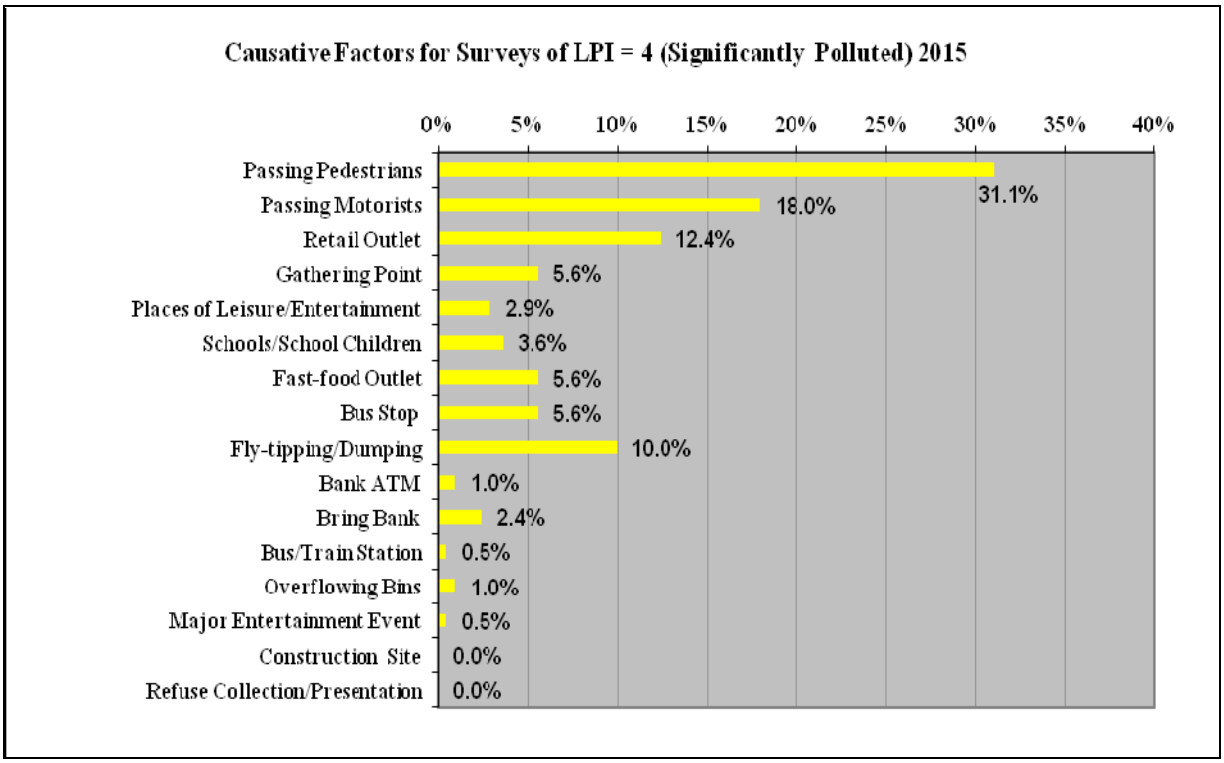


Figure D. 5 Causative Factors of Litter Pollution within Litter Pollution Index Category 4, 2015

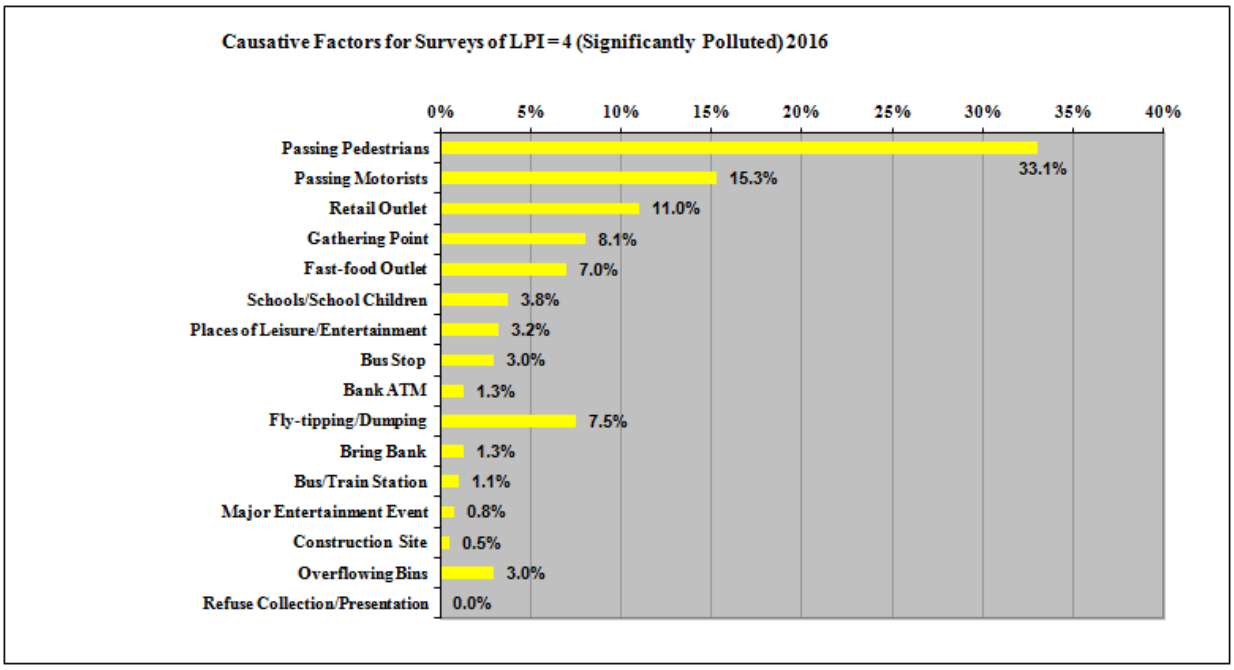


Figure D. 6 Causative Factors of Litter Pollution within Litter Pollution Index Category 4, 2016

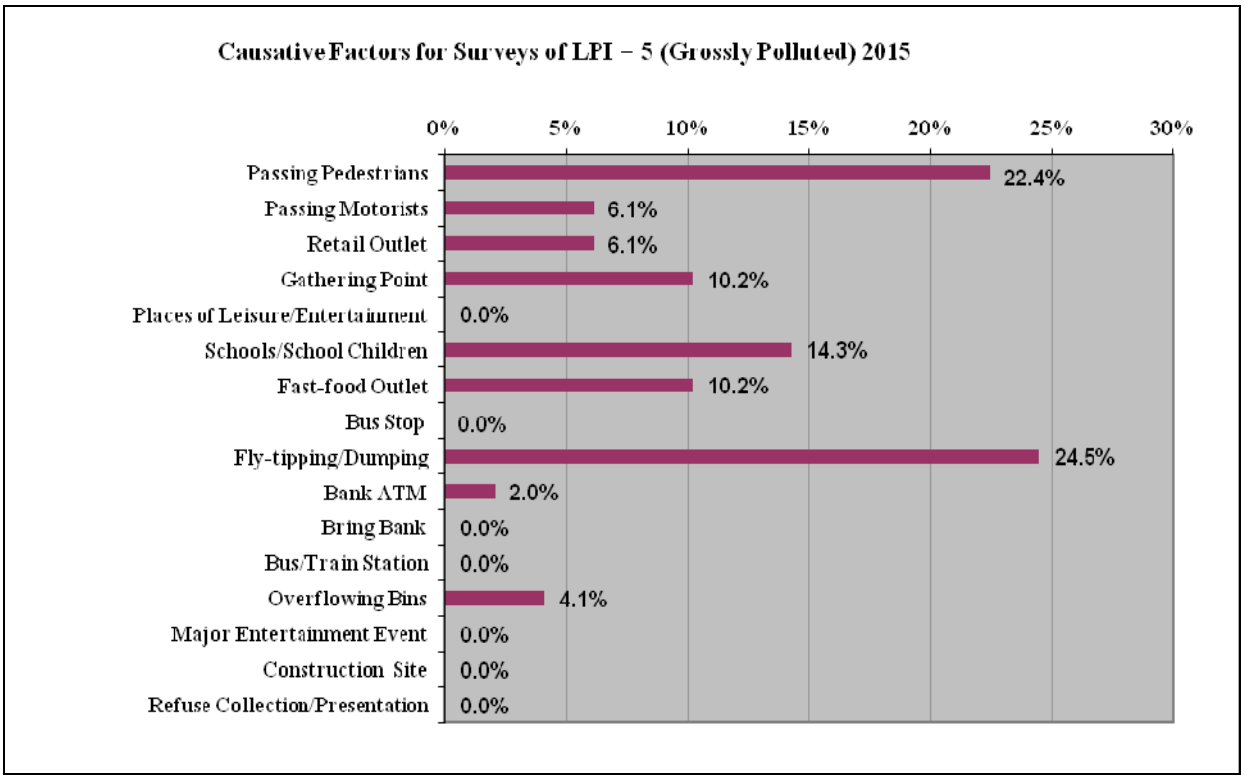


Figure D. 7 **Causative Factors of Litter Pollution within Litter Pollution Index Category 5, 2015**

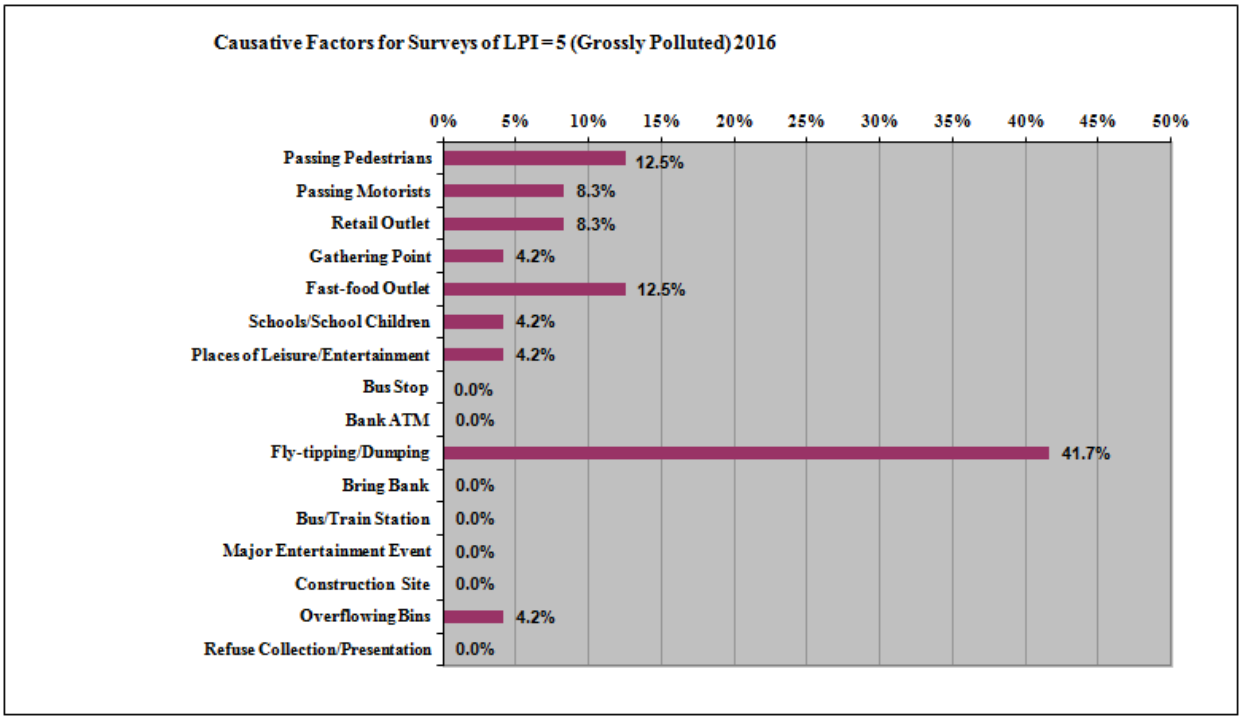


Figure D. 8 **Causative Factors of Litter Pollution within Litter Pollution Index Category 5, 2016**

APPENDIX E

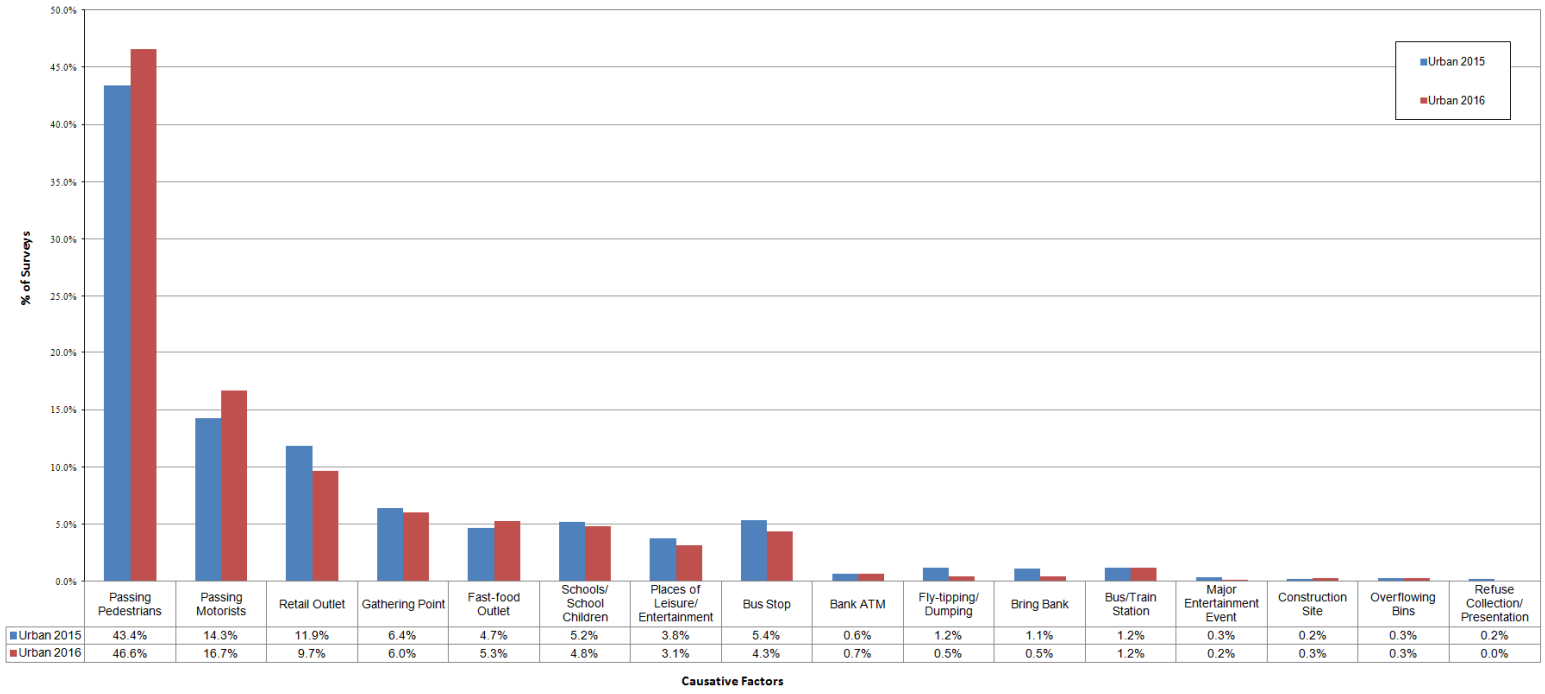
COMPARISON OF CAUSATIVE FACTORS OF LITTER POLLUTION WITHIN URBAN AND RURAL LOCAL AUTHORITIES

Figures E.1 and E.2, compare the causes of litter within urban and rural local authorities from 2015 to 2016.

In 2016, passing pedestrians are the single greatest cause of litter in both urban and rural areas; this is similar to previous yearly results.

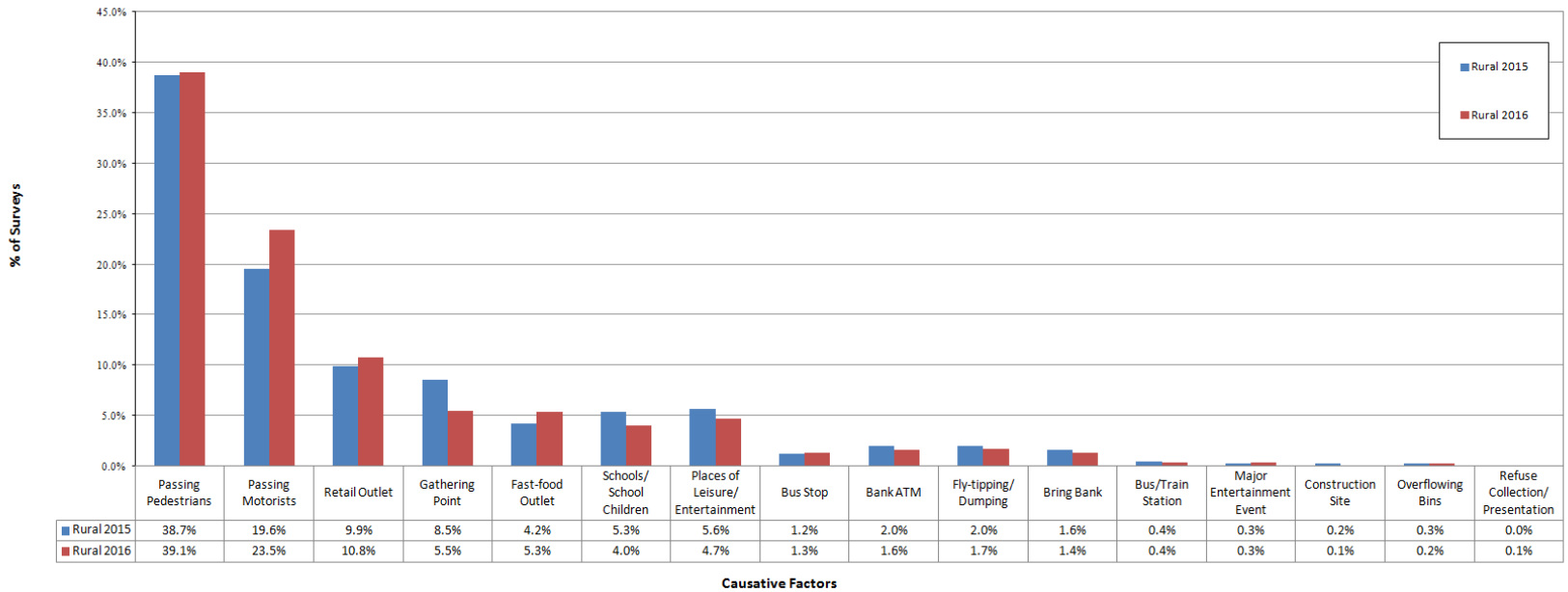
Passing pedestrians, passing motorists, fast-food outlets, bank ATMs and construction site have all increased as causes of litter pollution in urban areas from 2015 to 2016. Retail outlets, gathering points, schools/ school children, places of leisure/ entertainment, bus stops, fly-tipping/ dumping, bring banks, major entertainment events and refuse collection/ presentation have decreased as causes of litter pollution in urban areas from 2015 to 2016.

In rural areas, passing pedestrians, passing motorists, retail outlets, fast- food outlets, bus stops and refuse collection/ presentation have all increased as causes of litter pollution from 2015 to 2016. Gathering points, schools/ school children, places of leisure/ entertainment,, bank ATMs, fly-tipping/ dumping, bring banks, construction sites and overflowing bins have all decreased as causes of litter pollution in rural areas from 2015 to 2016.



	Passing Pedestrians	Passing Motorists	Retail Outlet	Gathering Point	Fast-food Outlet	Schools/ School Children	Places of Leisure/ Entertainment	Bus Stop	Bank ATM	Fly-tipping/ Dumping	Bring Bank	Bus/Train Station	Major Entertainment Event	Construction Site	Overflowing Bins	Refuse Collection/ Presentation
Urban 2015	43.4%	14.3%	11.9%	6.4%	4.7%	5.2%	3.8%	5.4%	0.6%	1.2%	1.1%	1.2%	0.3%	0.2%	0.3%	0.2%
Urban 2016	46.6%	16.7%	9.7%	6.0%	5.3%	4.8%	3.1%	4.3%	0.7%	0.5%	0.5%	1.2%	0.2%	0.3%	0.3%	0.0%

Figure E. 1 Comparison of Causative Factors in Urban Councils, 2015 to 2016



	Passing Pedestrians	Passing Motorists	Retail Outlet	Gathering Point	Fast-food Outlet	Schools/ School Children	Places of Leisure/ Entertainment	Bus Stop	Bank ATM	Fly-tipping/ Dumping	Bring Bank	Bus/Train Station	Major Entertainment Event	Construction Site	Overflowing Bins	Refuse Collection/ Presentation
Rural 2015	38.7%	19.6%	9.9%	8.5%	4.2%	5.3%	5.6%	1.2%	2.0%	2.0%	1.6%	0.4%	0.3%	0.2%	0.3%	0.0%
Rural 2016	39.1%	23.5%	10.8%	5.5%	5.3%	4.0%	4.7%	1.3%	1.6%	1.7%	1.4%	0.4%	0.3%	0.1%	0.2%	0.1%

Figure E. 2 Comparison of Causative Factors in Rural Councils, 2015 to 2016

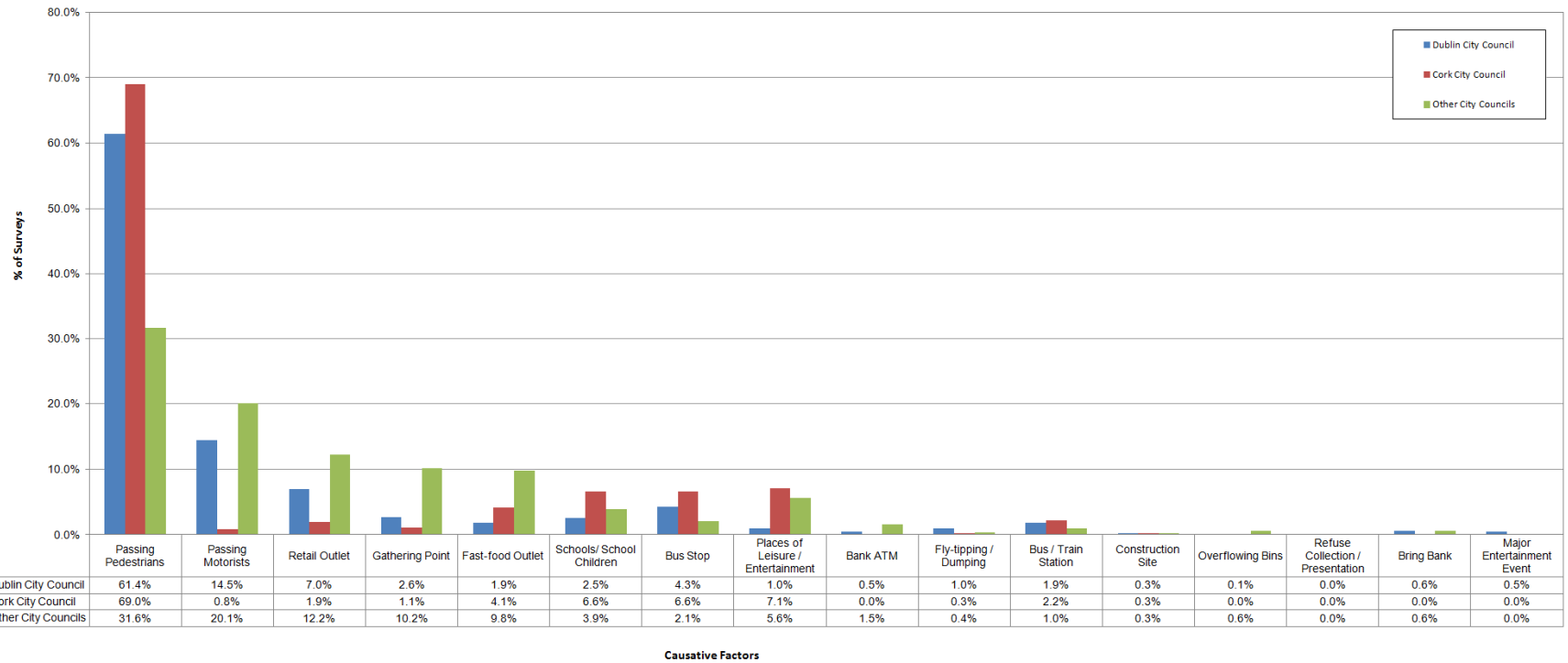
Figure E.3 allows for comparison of the various causative factors of litter pollution between urban areas. The 'Other City Councils' category comprises results from Galway City and Waterford City and County Councils[6]. Overall, the causes of litter pollution vary somewhat with each category of urban area.

In Dublin, fly-tipping/ dumping and major entertainment events are more significant causative factors of litter pollution than in the other urban categories. Passing pedestrians, schools/ school children, bus stops, places of leisure/ entertainment/ and bus/ train stations are more significant causative factors of litter pollution in the 'Cork City Council' category than in the other urban categories. Passing motorists, retail outlets, gathering points, fast-food outlets, bank ATMs and overflowing bins are more significant causative factors of litter pollution in the 'Other City Councils' category than in the other urban categories.

In Dublin City Council, passing pedestrians as causative factors have increased by 6.6%, from 54.8% in 2015 to 61.4% in 2016. Passing motorists, places of leisure/ entertainment, construction site and major entertainment events have also increased in 2016. Retail outlets, gathering points, fast-food outlets, schools/ school children, bus stops, bank ATMs, fly-tipping/ dumping, bus/ train stations, overflowing bins and bring banks have all decreased as significant causative factors in comparison to 2015. For further detail, please refer to Figure E.4.

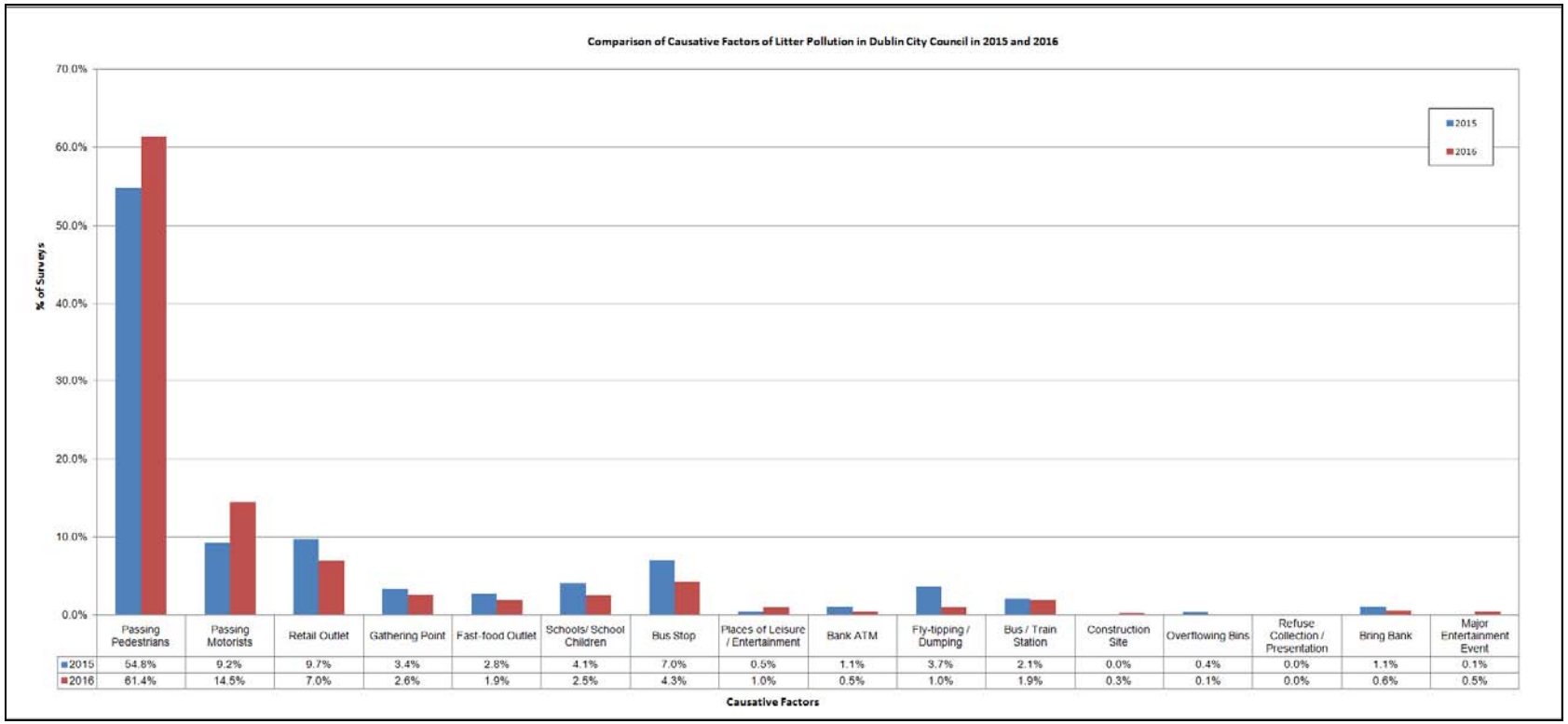
In Cork City Council, increases in litter from passing pedestrians, fast-food outlets, schools/ school children, bus / train stations, and construction sites was coupled with decreases in litter from passing motorists, retail outlets, gathering points, bus stops, places of leisure/ entertainment, fly tipping/ dumping, overflowing bins and bring banks. For further detail, please refer to Figure E.5.

[6] Note Limerick City Council did not take part in the 2016 LPS surveys therefore the 2016 results for 'Other City Councils' only includes for results from Waterford City and County Council and Galway City Council



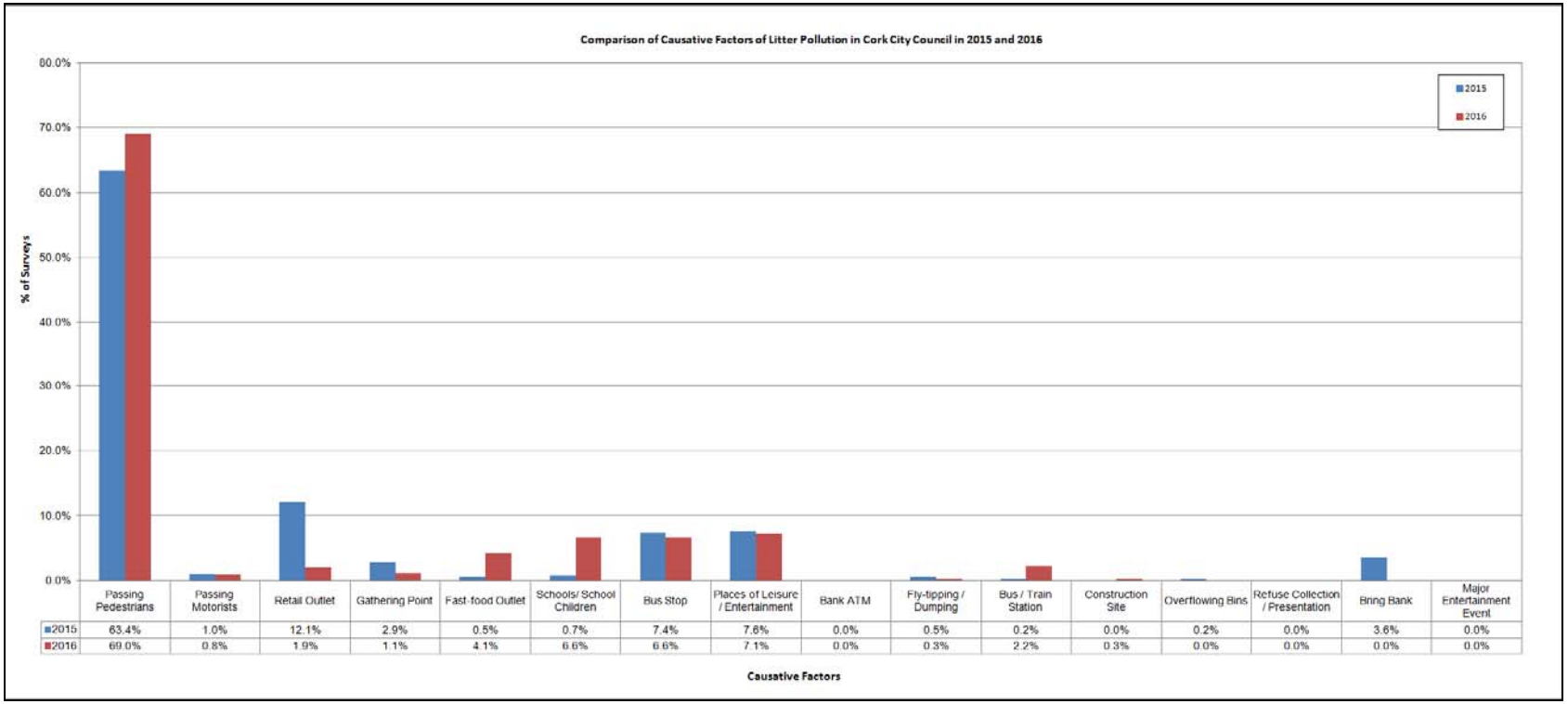
	Passing Pedestrians	Passing Motorists	Retail Outlet	Gathering Point	Fast-food Outlet	Schools/ School Children	Bus Stop	Places of Leisure / Entertainment	Bank ATM	Fly-tipping / Dumping	Bus / Train Station	Construction Site	Overflowing Bins	Refuse Collection / Presentation	Bring Bank	Major Entertainment Event
Dublin City Council	61.4%	14.5%	7.0%	2.6%	1.9%	2.5%	4.3%	1.0%	0.5%	1.0%	1.9%	0.3%	0.1%	0.0%	0.6%	0.5%
Cork City Council	69.0%	0.8%	1.9%	1.1%	4.1%	6.6%	6.6%	7.1%	0.0%	0.3%	2.2%	0.3%	0.0%	0.0%	0.0%	0.0%
Other City Councils	31.6%	20.1%	12.2%	10.2%	9.8%	3.9%	2.1%	5.6%	1.5%	0.4%	1.0%	0.3%	0.6%	0.0%	0.6%	0.0%

Figure E. 3 Comparison of Causative Factors of Litter Pollution within Urban Areas (2016)



	Passing Pedestrians	Passing Motorists	Retail Outlet	Gathering Point	Fast-food Outlet	Schools/ School Children	Bus Stop	Places of Leisure / Entertainment	Bank ATM	Fly-tipping / Dumping	Bus / Train Station	Construction Site	Overflowing Bins	Refuse Collection / Presentation	Bring Bank	Major Entertainment Event
2015	54.8%	9.2%	9.7%	3.4%	2.8%	4.1%	7.0%	0.5%	1.1%	3.7%	2.1%	0.0%	0.4%	0.0%	1.1%	0.1%
2016	61.4%	14.5%	7.0%	2.6%	1.9%	2.5%	4.3%	1.0%	0.5%	1.0%	1.9%	0.3%	0.1%	0.0%	0.6%	0.5%

Figure E. 4 Comparison of Causative Factors of Litter Pollution within Dublin City Council 2015 – 2016



	Passing Pedestrians	Passing Motorists	Retail Outlet	Gathering Point	Fast-food Outlet	Schools/ School Children	Bus Stop	Places of Leisure / Entertainment	Bank ATM	Fly-tipping / Dumping	Bus / Train Station	Construction Site	Overflowing Bins	Refuse Collection / Presentation	Bring Bank	Major Entertainment Event
2015	63.4%	1.0%	12.1%	2.9%	0.5%	0.7%	7.4%	7.6%	0.0%	0.5%	0.2%	0.0%	0.2%	0.0%	3.6%	0.0%
2016	69.0%	0.8%	1.9%	1.1%	4.1%	6.6%	6.6%	7.1%	0.0%	0.3%	2.2%	0.3%	0.0%	0.0%	0.0%	0.0%

Figure E. 5 Comparison of Causative Factors of Litter Pollution within Cork City Council 2015 – 2016