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 2017

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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 Communications, Climate Action and Environment, for the period May 1st 2017 to April 30th 2018, 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 NLPMS, 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 LPI for each survey location. The use of photographs ensures that area cleanliness ratings are consistently assigned by all local authorities. In 2017, the LMB continued to provide 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 NLPMS, 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 (LQS). LQS 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 2017 the LMB continued to provide training, where required, on the implementation of the NLPMS to local authorities.

Audit

The LMB undertook audits of five local authorities to ensure that the system is being implemented as designed. The local authorities audited were:

- Cavan County Council;
- Leitrim County Council;
- Kilkenny County Council;
- Offaly County Council; and
- Clare 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 LMB also completed a number of additional 'spot check' audits on the 2017 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 of 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 LPS; this will allow the LMB to continually audit the System. The LMB 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 2017

In 2017, 30[2] of the 31 local authorities participated.

Figure 1-1 shows the percentage of local authorities that have participated in the System annually since 2003.

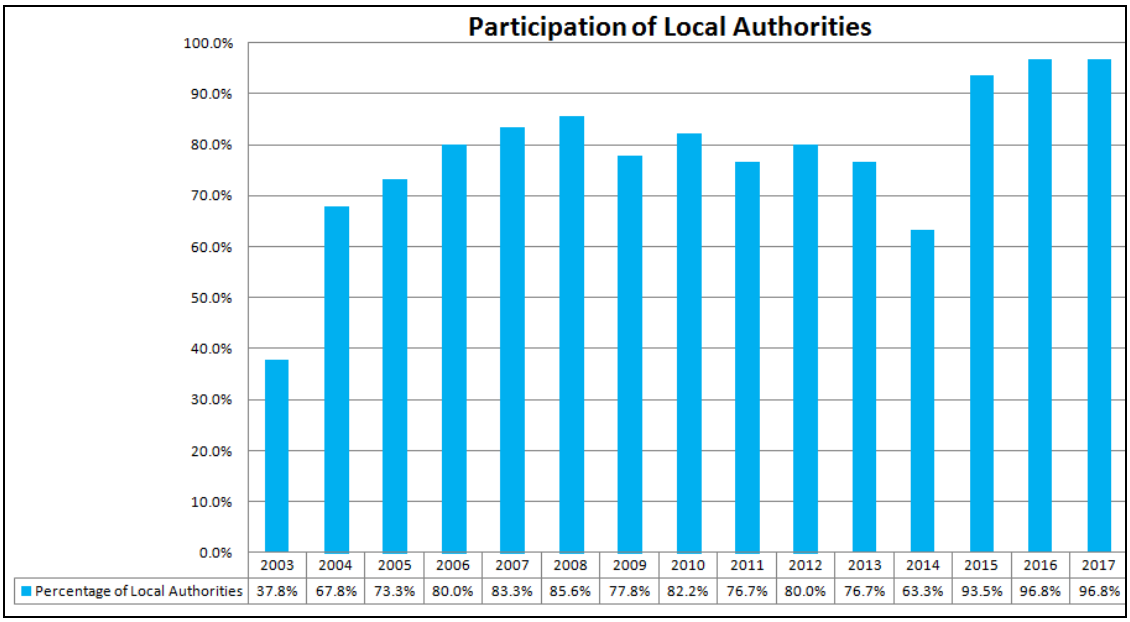


Figure 1-1 Participation of Local Authorities 2003-2017

The 2017 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 (NLPMS) 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 2017 by South Dublin County Council

How littered is the country at local and national level?

In 2017, 4977 Litter Pollution Surveys (LPS) were undertaken nationally. This was a decrease of 24 surveys from 2016.

- 15.6% of areas surveyed were unpolluted (LPI 1) in 2017. The percentage of unpolluted (LPI 1) areas has increased by 2.4%, from 13.2% in 2016.
- 63.9% of all areas surveyed were slightly polluted (LPI 2), a decrease of 1.2% on 2016 (65.1%).
- The percentage of moderately polluted areas (LPI 3) has decreased by 0.9%, from 18.0% in 2016 to 17.1% in 2017.
- The percentage of significantly polluted areas (LPI 4) has decreased slightly (by 0.3%), from 3.3% in 2016 to 3.0% in 2017.
- Grossly polluted areas (LPI 5) have remained the same in 2017 as in 2016 at 0.3%.

What are the main constituent elements of litter pollution?

- Cigarette related litter (56.3%), packaging items (17.6%), food related litter (9.0%), sweet related litter (7.9%) and paper items (4.7%) were the main litter constituents identified nationally.

What are the main causes of litter pollution?

- Passing pedestrians (42.1%), passing motorists (19.7%), retail outlets (10.3%), gathering points (7.0%), places of leisure/entertainment (5.3%) fast food outlets (4.1%), schools/ school children (3.6%) and bus stops (2.2%) were identified as the main causative factors of litter nationally.

CHAPTER 2: HOW LITTERED IS THE COUNTRY?

The 2017 dataset is obtained from 4977 LPS.

The national monitoring system results indicate that the percentage of unpolluted (LPI 1) areas has increased from 13.2% in 2016 to 15.6% in 2017 (2.4%).

A comparison of the results from 2016 to 2017 indicates that the percentage of slightly polluted (LPI 2) areas has decreased slightly from 65.1% in 2016 to 63.9% in 2017.

The percentage of moderately polluted areas (LPI 3) has decreased slightly from 18.0% in 2016 to 17.1% in 2017. The percentage of significantly polluted areas (LPI 4) has decreased slightly (by 0.3%) from 3.3% in 2016 to 3.0% in 2017. The percentage of grossly polluted (LPI 5) areas has remained the same in 2017 as in 2016 at 0.3%.

The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas combined together has increased slightly (by 1.2%) from 2016 to 2017, thus demonstrating there has been a decrease in litter pollution from 2016 to 2017.

Figure 2-1 below compares 2016 and 2017 LPS results.

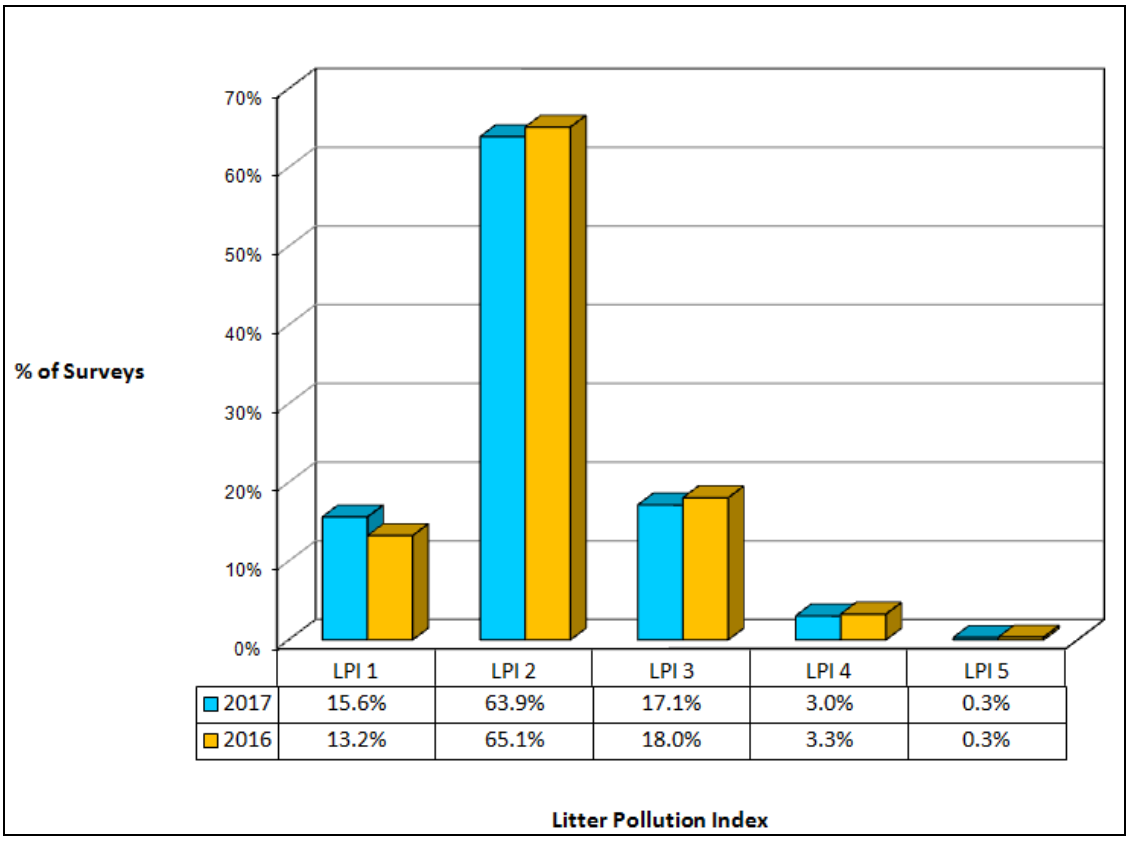
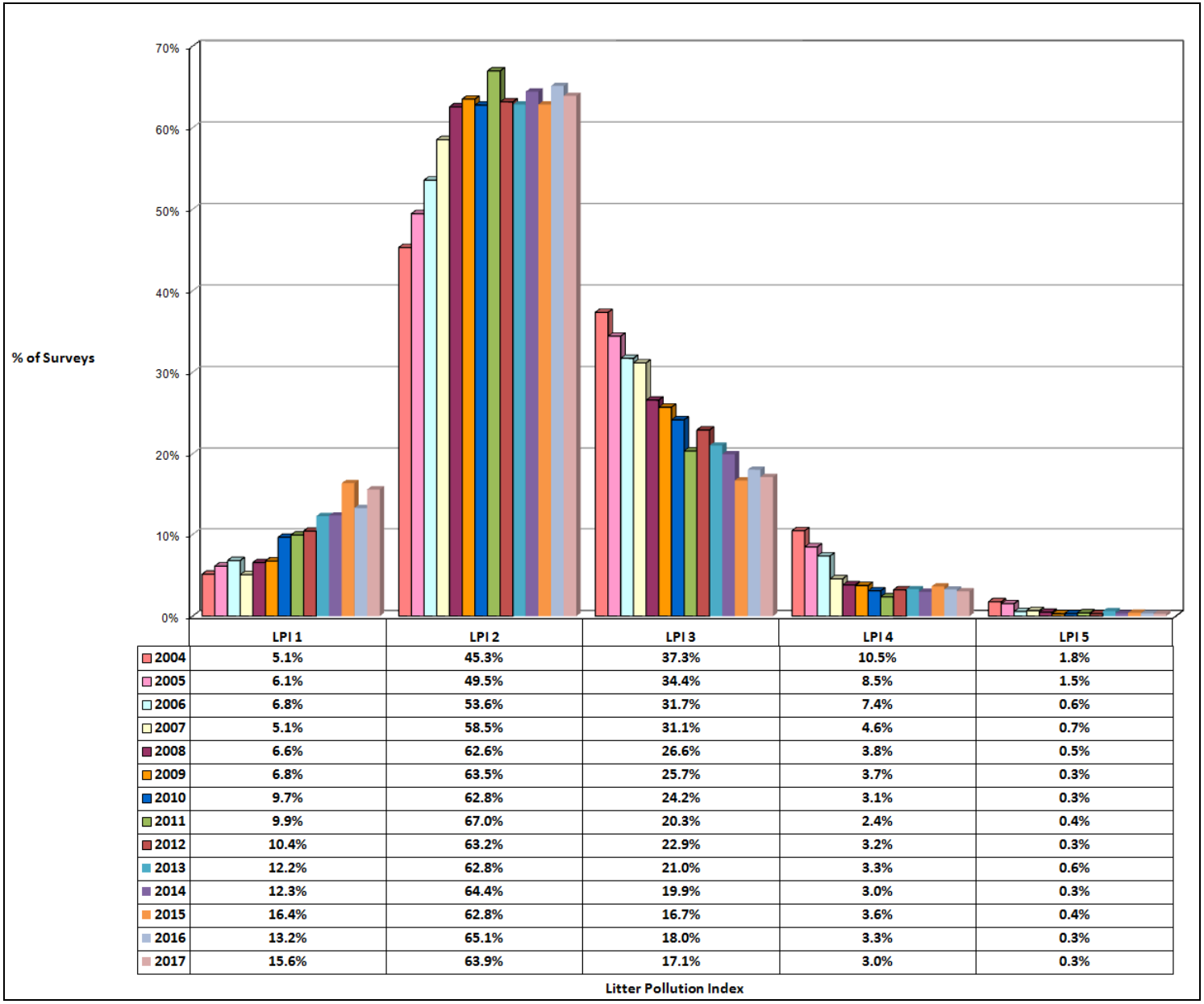


Figure 2-1 Comparison of Litter Pollution Indices (LPI) 2016 – 2017



	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%
2017	15.6%	63.9%	17.1%	3.0%	0.3%

Figure 2-2 Litter Pollution Index 2004-2017

Figure 2-2 illustrates the Litter Pollution Index ratings from 2004 to 2017. The percentage of unpolluted (LPI 1) areas has increased from 5.1% in 2004 to 15.6% in 2017 (a 10.5% increase).

Figure 2-2 also shows the percentage of slightly polluted (LPI 2) areas has increased from 45.3% to 63.9% between 2004 and 2017 (an increase of 18.6%). The number of recorded moderately polluted (LPI 3) areas has shown a steady decrease between 2004 and 2017. The number of significantly polluted (LPI 4) areas has decreased from 10.5% in 2004 to 3.0% in 2017 (decrease of 7.5%). The number of grossly polluted (LPI 5) areas has decreased from 1.8% in 2004 to 0.3% in 2017 (a decrease of 1.5%).

A comparison of urban[3] and rural local authorities[4] is presented below in Figure 2-3. In 2017, 11.5% of urban areas and 18.1% of rural areas were unpolluted (LPI 1).

The percentage of slightly polluted areas (LPI 2) experienced in urban areas is 59.4%, and in rural areas is 66.6%. The percentage of moderately polluted (LPI 3) areas experienced in urban areas is 23.6%, with 13.3% experienced in rural areas. The percentage of significantly polluted (LPI 4) areas is 5.0% in urban areas and 1.9% in rural areas. Grossly polluted (LPI 5) areas are 0.4% in urban areas and 0.2% in rural areas. Please refer to Figures 5-4 and 5-5 for further comparison of urban and rural litter pollution data from 2016 to 2017.

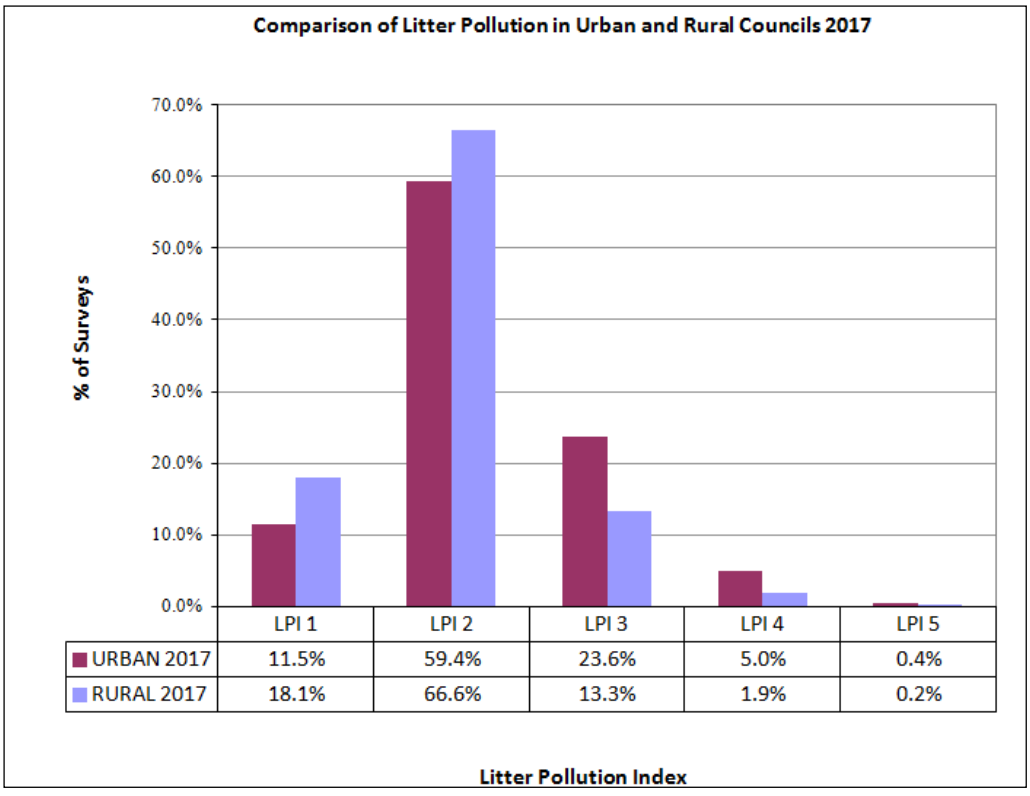


Figure 2-3 Comparison of Litter Pollution within Largely Urban and Rural Areas in 2017

[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 (LQS)** (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**, at **56.3%**, continues to constitute the highest percentage of litter in the locations surveyed – this is comprised mainly of cigarette ends which constitute 52.5% of all litter items nationally.
- **Packaging litter (17.6%)** is the second largest component of national litter pollution recorded. Bottle caps (1.9%), beverage cans (non alcoholic) (1.7%), bottles (1.6%), drink cups (1.4%), drink lids (1.3%) and beverage cans (alcoholic) (1.2%); are the main litter items in this category.
- **Food related litter**, at **9.0%**, is the third 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 8.0% of all litter recorded in the LQS carried out in 2017.

See Table 3-1 for a comprehensive breakdown of litter items recorded.

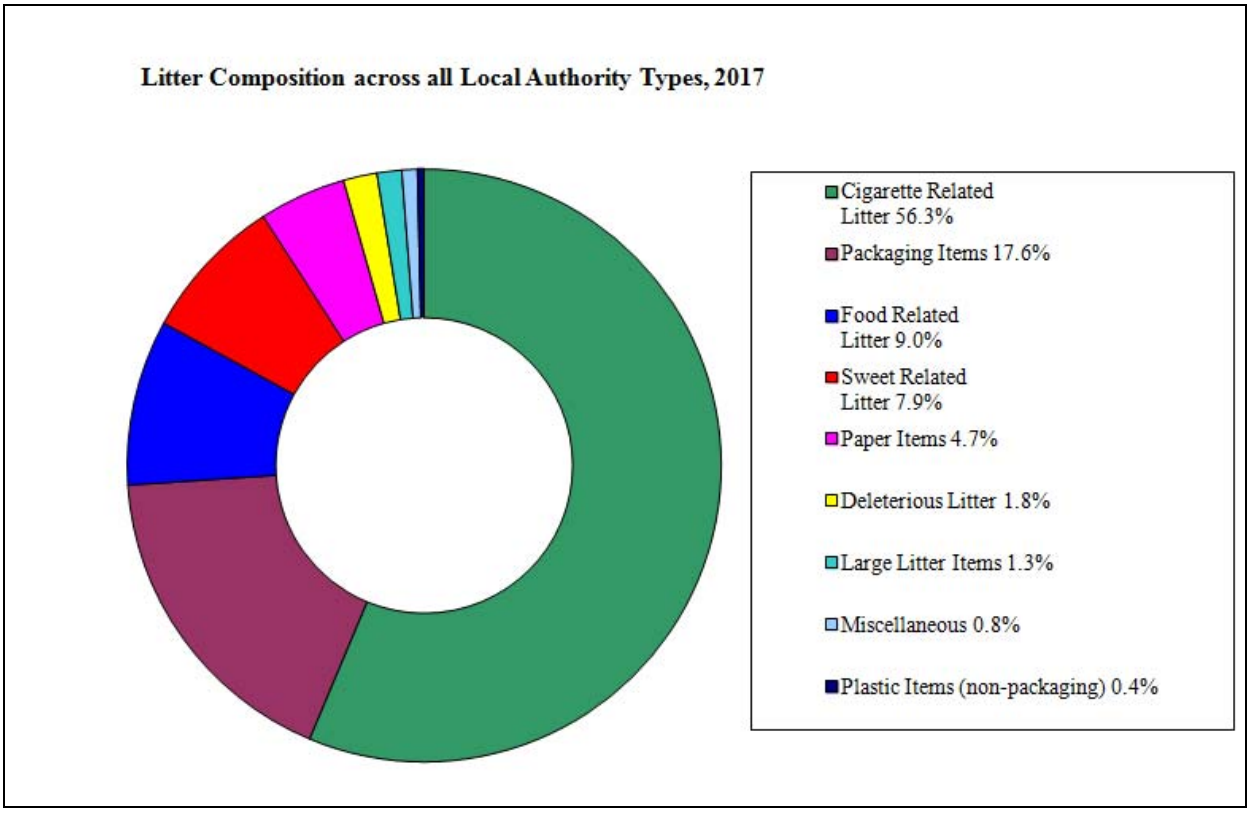
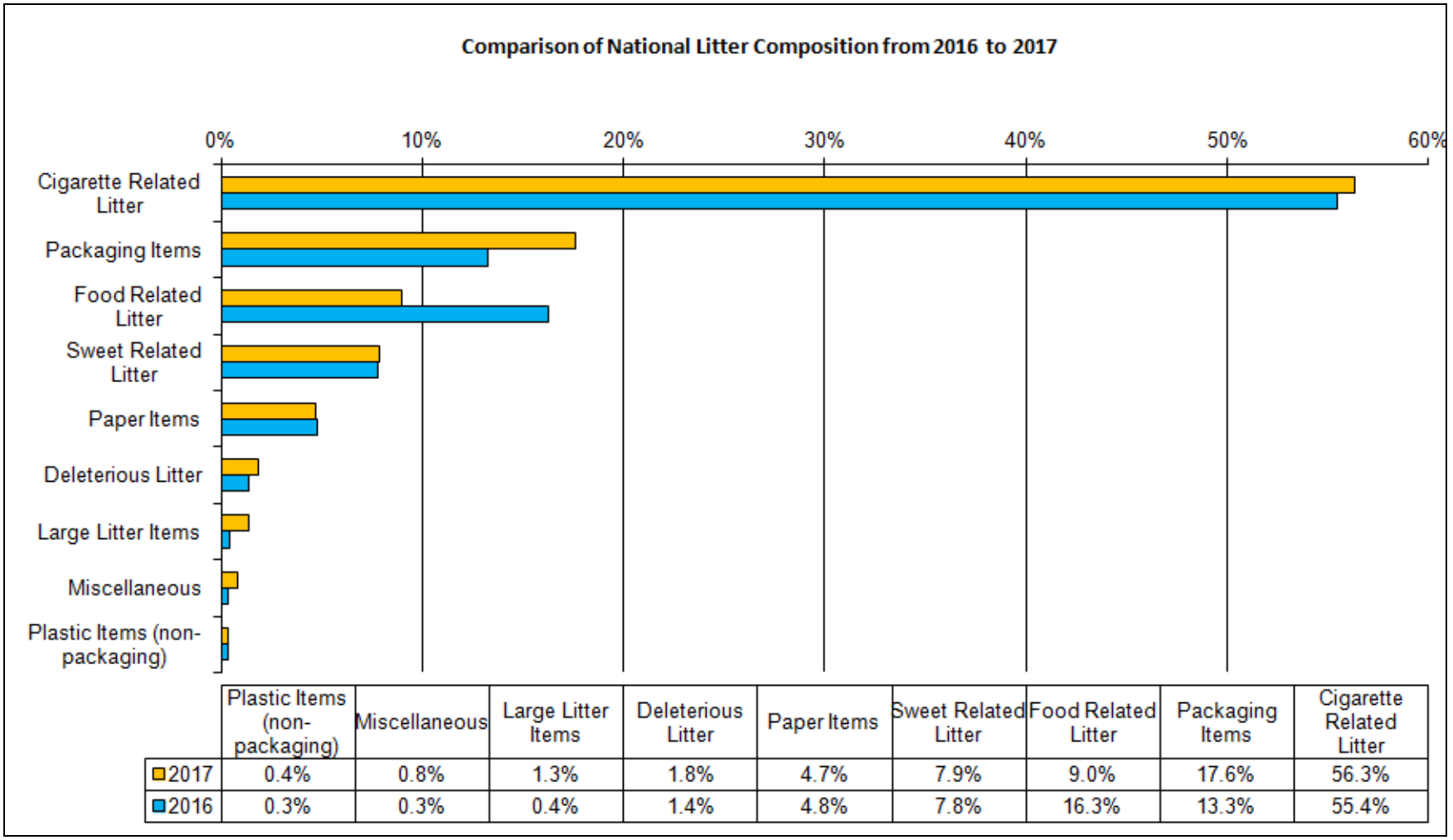


Figure 3-1 Composition of Litter in 2017 Broken Down into Main Categories

3.1 Comparison of Litter Quantification Surveys 2016 – 2017

Figure 3-2 below compares the results of the 2016 and 2017 LQS surveys.



	Plastic Items (non-packaging)	Miscellaneous	Large Litter Items	Deleterious Litter	Paper Items	Sweet Related Litter	Food Related Litter	Packaging Items	Cigarette Related Litter
2017	0.4%	0.8%	1.3%	1.8%	4.7%	7.9%	9.0%	17.6%	56.3%
2016	0.3%	0.3%	0.4%	1.4%	4.8%	7.8%	16.3%	13.3%	55.4%

Figure 3-2 Comparison of National Litter Composition from 2016 to 2017

A comparison of the results of LQS carried out in 2016 and 2017 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 increased by 0.9% since 2016.
- The percentage of packaging items increased by 4.3% since 2016 and is now the second largest component.
- The percentage of food related litter has decreased by 7.3% since 2016.
- The percentage of sweet related litter items increased 0.1% since 2016.
- The percentage of paper items decreased by 0.1% since 2016.
- There has also been an increase in deleterious litter (by 0.4%) since 2016.
- There has been an increase in large litter items (0.9%) since 2016.
- The number of items recorded as miscellaneous litter has increased by 0.5% since 2016.
- There has been a slight increase in plastic items (non-packaging) (0.1%) since 2016.

Table 3-1 on the following page details the composition of litter in 2016 and 2017.

The greatest percentage change in litter composition is in food related litter which has decreased by 7.3% since 2016. This decrease can mainly be attributed to a decrease in chewing gum (reduced by 7.2%).

Table 3-1 overleaf also details the 4.3% increase in packaging items. This can mainly be attributed to increases in beverage cans (non-alcoholic) (0.8%), bags (0.7%), drink cups (by 0.3%), drink lids (by 0.3%), beverage can (alcoholic) (0.4%), other paper packaging (0.3%) and drink cartons (0.3%).

Refer to Appendix C for "Details of Litter Composition from 2016-2017 according to Local Authority Type".

	Detailed National Litter Composition 2017			Detailed National Litter Composition 2016	
Cigarette Related Litter 56.3%	Cigarette ends	**52.5%**	**Cigarette Related Litter 55.4%**	Cigarette ends	**51.8%**
	Cigarette boxes and wrappers	**1.7%**		Cigarette boxes and wrappers	**1.8%**
	Matches	**1.7%**		Matches	**1.6%**
	Matchboxes and lighters	**0.4%**		Matchboxes and lighters	**0.3%**
Food Related Litter 9.0%	Chewing Gum	**8.0%**	**Food Related Litter 16.3%**	Chewing Gum	**15.2%**
	Remnants of confectionery food items	**0.2%**		Remnants of confectionery food items	**0.3%**
	Other food items	**0.3%**		Other food items	**0.3%**
	Fast-food remnants	**0.2%**		Fast-food remnants	**0.2%**
	Bread/ biscuits	**0.1%**		Bread/ biscuits	**0.2%**
	Fruit/ vegetables	**0.3%**		Fruit/ vegetables	**0.1%**
Packaging Items 17.6%	Bottle Caps	**1.9%**	**Packaging Items 13.3%**	Bottle Caps	1.9%
	Bottles	**1.6%**		Bottles	1.6%
	Drink cups	**1.4%**		Drink cups	1.1%
	Drink Lids	**1.3%**		Drink Lids	1.0%
	Bags and wrappers	**1.1%**		Bags and wrappers	1.0%
	Beverage Cans - Non-alcoholic	**1.7%**		Beverage Cans - Non-alcoholic	0.9%
	Beverage Cans - Alcoholic	**1.2%**		Beverage Cans - Alcoholic	0.8%
	Beverage Bottles - Alcoholic	**0.6%**		Beverage Bottles - Alcoholic	0.7%
	Other paper packaging	**0.9%**		Other paper packaging	0.6%
	Beverage Bottles - Non-alcoholic	**0.8%**		Beverage Bottles - Non-alcoholic	0.6%
	Drinks cartons	**0.8%**		Drinks cartons	0.5%
	Plastic film	**0.3%**		Plastic film	0.4%
	Other plastic packaging	**0.5%**		Other plastic packaging	0.4%
	Cardboard	**0.4%**		Cardboard	0.3%
	Tin foil (not sweet wrappers)	**0.4%**		Tin foil (not sweet wrappers)	0.2%
	Bags - shopping bags	**0.3%**		Bags - shopping bags	0.2%
	Other metal litter items	**0.2%**		Other metal litter items	0.1%
	Lids (e.g. from bottles, jars)	**0.2%**		Lids (e.g. from bottles, jars)	0.1%
	Food cans	**0.2%**		Food cans	0.1%
	Aeroboard	**0.1%**		Aeroboard	0.0%
	Jars and other containers	**0.2%**		Jars and other containers	0.0%
	Metal drums	**0.1%**		Metal drums	0.0%
	Bags	**0.9%**		Bags	0.2%
	Boxes	**0.3%**		Boxes	0.1%
	Bags - other (e.g. fertiliser)	**0.1%**		Bags - other (e.g. fertiliser)	0.1%
	Plastic sheeting (e.g. silage)	**0.1%**		Plastic sheeting (e.g. silage)	0.1%
	Bubble-wrap	**0.1%**		Bubble-wrap	0.1%
Sweet Related Litter 7.9%	Sweet Wrappers (plastic/foil)	**4.1%**	**Sweet Related Litter 7.8%**	Sweet Wrappers (plastic/foil)	4.1%
	Lollipop Sticks (wooden/plastics)	**1.6%**		Lollipop Sticks (wooden/plastics)	1.5%
	Straws	**1.0%**		Straws	1.1%
	Crisp Bags	**1.3%**		Crisp Bags	1.1%
Paper Items 4.7%	Tissues	**1.5%**	**Paper Items 4.8%**	Tissues	1.2%
	Receipts	**1.0%**		Receipts	1.1%
	Other paper items	**0.5%**		Other paper items	1.1%
	Tickets (e.g. bus, lottery)	**0.6%**		Tickets (e.g. bus, lottery)	0.5%
	Bank slips	**0.3%**		Bank slips	0.5%
	Newspapers	**0.2%**		Newspapers	0.2%
	Flyers and posters	**0.3%**		Flyers and posters	0.1%
	Letters, envelopes and cards	**0.1%**		Letters, envelopes and cards	0.0%
	Magazines/ brochures	**0.1%**		Magazines/ brochures	0.0%
Deleterious Litter 1.8%	Dog fouling	**1.3%**	**Deleterious Litter 1.4%**	Dog fouling	1.2%
	Municipal Hazardous Waste (e.g. paint, solvents)	**0.1%**		Municipal Hazardous Waste (e.g. paint, solvents)	0.1%
	Other deleterious items	**0.1%**		Other deleterious items	0.1%
	Feminine hygiene products	**0.1%**		Feminine hygiene products	0.0%
	Nappies	**0.1%**		Nappies	0.0%
	Needles and syringes	**0.1%**		Needles and syringes	0.0%
Large Litter Items 1.3%	Other large items	**0.4%**	**Large Litter Items 0.4%**	Other large items	0.3%
	Household refuse in bags	**0.7%**		Household refuse in bags	0.1%
	Appliances (e.g. fridge)	**0.1%**		Appliances (e.g. fridge)	0.0%
	Furniture	**0.1%**		Furniture	0.0%
	Scrap cars	**0.1%**		Scrap cars	0.0%
Miscellaneous 0.8%	**Miscellaneous Litter Items**	**0.8%**	**Miscellaneous 0.3%**	**Miscellaneous Litter Items**	**0.3%**
Plastic Items (Non-packaging) 0.4%	Plastic items	**0.4%**	**Plastic Items (Non-packaging) 0.3%**	Plastic items	0.3%

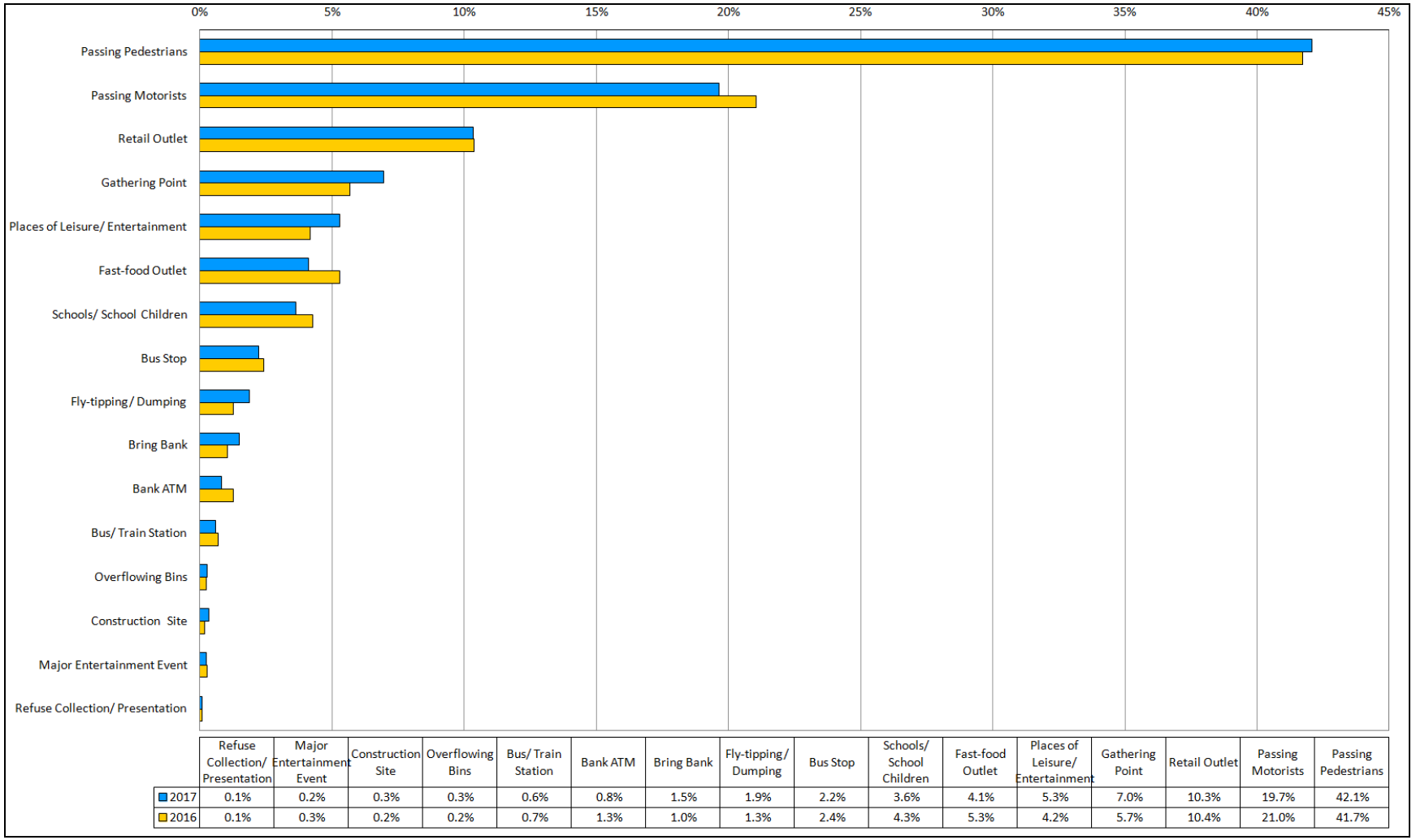
Table 3-1 Detailed National Litter Composition 2016 to 2017

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

The breakdown of causative factors nationally in 2016 and 2017 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 2016 to 2017, with the greatest difference since 2016 occurring between fast food outlets (decreased by 1.2% since 2016) and places of leisure/ entertainment (increased by 1.1% since 2016).

Figure 4-1 illustrates that:

- Passing pedestrians continue to constitute the greatest single causative factor of litter pollution, accounting for 42.1% across all local authorities.
- Passing motorists are the second largest causative factor accounting for 19.7% across all local authority types in 2017.
- Causative factors that have increased from 2016 to 2017 include passing pedestrians (from 41.7% to 42.1%), gathering points (from 5.7% to 7.0%), places of leisure/ entertainment (from 4.2% to 5.3%), fly tipping/ dumping (from 1.3% to 1.9%), bring banks (from 1.0% to 1.5%), overflowing bins (from 0.2% to 0.3%) and construction sites (from 0.2% to 0.3%).
- Causative factors that have decreased from 2016 to 2017 include passing motorists (from 21.0% to 19.7%), retail outlets (from 10.4% to 10.3%), fast food outlets (from 5.3% to 4.1%), schools / school children (from 4.3% to 3.6%), bus stops (from 2.4% to 2.2%), bank ATMs (from 1.3% to 0.8%), bus/train stations (from 0.7% to 0.6%) and major entertainment events (from 0.3% to 0.2%).
- Refuse collection/ presentation (0.1%), as a constituent causative factor of national litter, has remained constant since 2016.



	Refuse Collection/ Presentation	Major Entertainment Event	Construction Site	Overflowing Bins	Bus/ Train Station	Bank ATM	Bring Bank	Fly-tipping/ Dumping	Bus Stop	Schools/ School Children	Fast-food Outlet	Places of Leisure/ Entertainment	Gathering Point	Retail Outlet	Passing Motorists	Passing Pedestrians
2017	0.1%	0.2%	0.3%	0.3%	0.6%	0.8%	1.5%	1.9%	2.2%	3.6%	4.1%	5.3%	7.0%	10.3%	19.7%	42.1%
2016	0.1%	0.3%	0.2%	0.2%	0.7%	1.3%	1.0%	1.3%	2.4%	4.3%	5.3%	4.2%	5.7%	10.4%	21.0%	41.7%

Figure 4-1 Causative Factors of Litter Pollution across all Local Authorities in 2016 and 2017

During the LPS, 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 LPS. 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 2017 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, places of leisure/ entertainment, fast-food outlets, schools/ school children, and bus stops are considerable sources of litter across all local authority types.

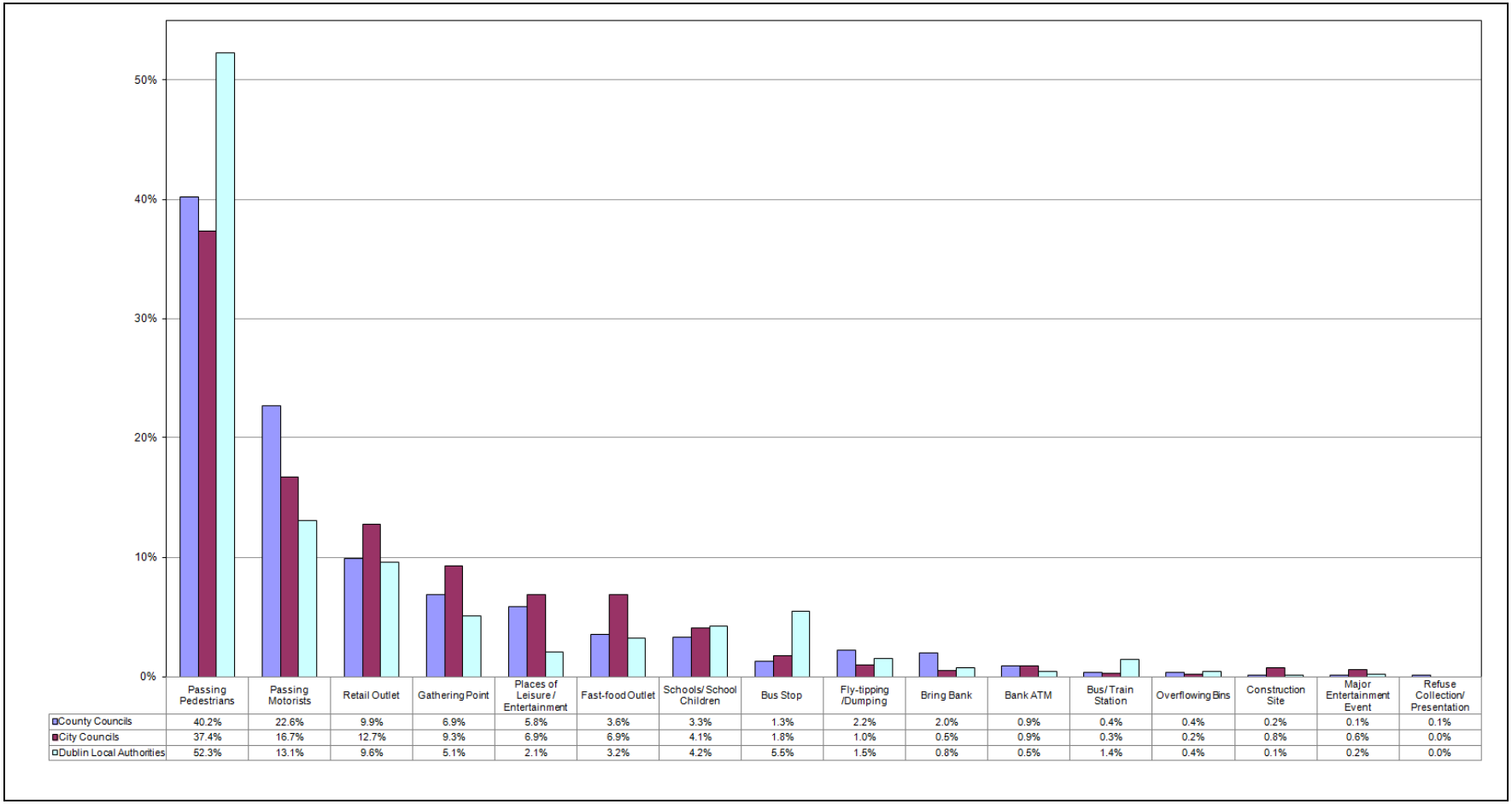
Survey results from 2017 show that the contribution of passing motorists, fly-tipping, bring banks and refuse collection/ presentation to litter pollution is greater in County Councils than in other local authority types.

Retail outlets, gathering points, places of leisure/ entertainment, fast food outlets, construction sites and major entertainment events are more significant causative factors in City Councils than in other local authority types.

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

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 NLPMS 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 2016 and 2017 graphs under each litter pollution index (on the same page) to facilitate the comparison of the 2016 and 2017 results.



	Passing Pedestrians	Passing Motorists	Retail Outlet	Gathering Point	Places of Leisure / Entertainment	Fast-food Outlet	Schools/ School Children	Bus Stop	Fly-tipping /Dumping	Bring Bank	Bank ATM	Bus/ Train Station	Overflowing Bins	Construction Site	Major Entertainment Event	Refuse Collection/ Presentation
County Councils	40.2%	22.6%	9.9%	6.9%	5.8%	3.6%	3.3%	1.3%	2.2%	2.0%	0.9%	0.4%	0.4%	0.2%	0.1%	0.1%
City Councils	37.4%	16.7%	12.7%	9.3%	6.9%	6.9%	4.1%	1.8%	1.0%	0.5%	0.9%	0.3%	0.2%	0.8%	0.6%	0.0%
Dublin Local Authorities	52.3%	13.1%	9.6%	5.1%	2.1%	3.2%	4.2%	5.5%	1.5%	0.8%	0.5%	1.4%	0.4%	0.1%	0.2%	0.0%

*City Council results also include the Limerick and Waterford county areas (i.e. these local authorities are now known as Limerick City and County Council and Waterford City and County Council).
**County Council results exclude Limerick and Waterford.

Figure 4-2 Causative Factors of Litter Pollution According to Local Authority Type in 2017

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. LPS results for 30 out of 31 local authorities have been returned to the Litter Monitoring Body (LMB) and analysed for 2017 - those local authorities are detailed in Appendix A.

Comparison of the 2017 LPS 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 increased from 14.3% in 2016 to 15.5% in 2017. This constitutes an increase of 1.2%.
- Slightly polluted (LPI 2) areas decreased from 55.6% in 2016 to 52.4% in 2017. This constitutes a decrease of 3.2%.
- Moderately polluted (LPI 3) areas increased from 24.5% in 2016 to 25.7% in 2017. This constitutes a 1.2% increase.
- Significantly polluted (LPI 4) areas increased from 5.3% in 2016 to 6.1% in 2017. This constitutes a 0.8% increase.
- Grossly polluted (LPI 5) areas increased, by 0.1%, from 0.2% in 2016 to 0.3% in 2017.
- The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas combined together, show a decrease of 2.0% from 2016 to 2017.

Overall, the results show an increase in the level of litter pollution in Dublin Local Authorities from 2016 to 2017. Although the percentage of unpolluted (LPI 1) areas increased (by 1.2%) between 2016 and 2017, the percentage of slightly polluted (LPI 2) areas decreased by 3.2%. Furthermore, there was also a combined increase, of 2.1%, in moderately polluted (LPI 3), significantly polluted (LP4) and grossly polluted (LP1 5) areas between 2016 and 2017.

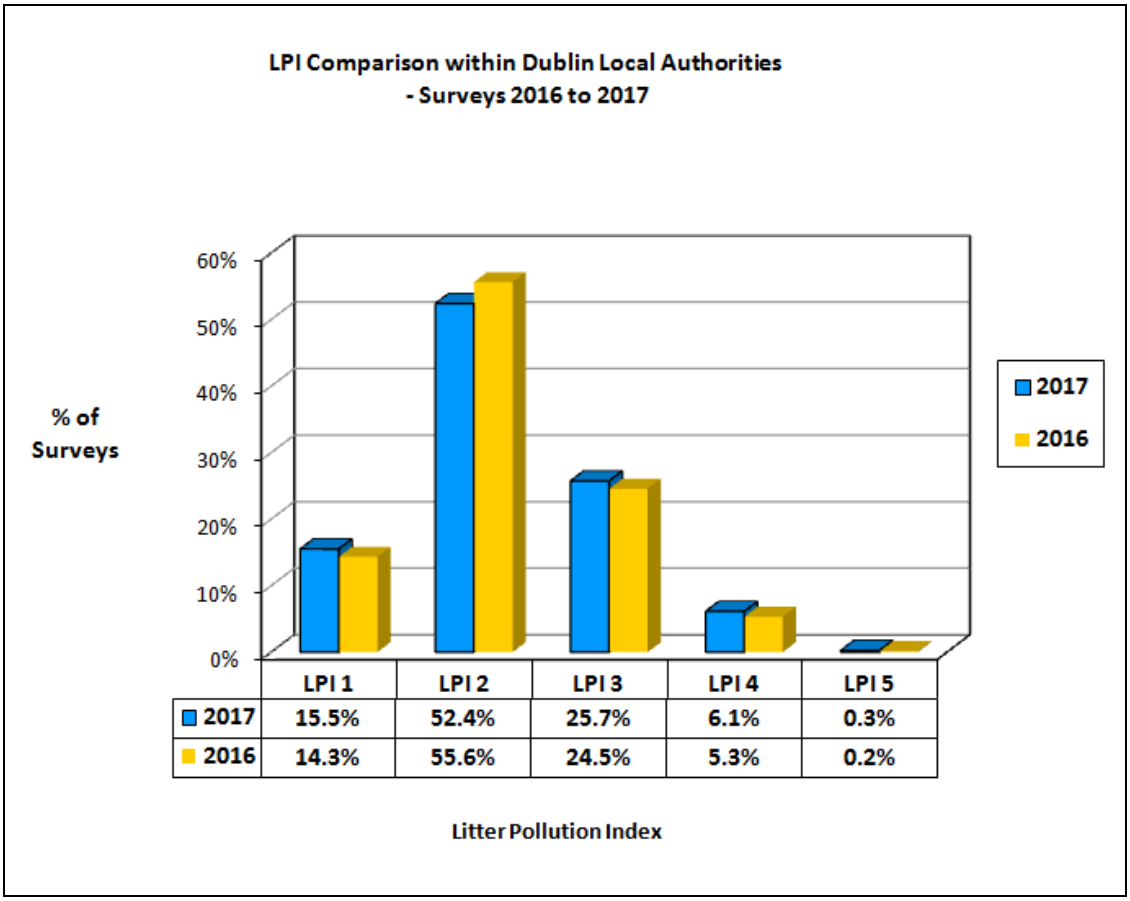


Figure 5-1 Comparison of Litter Pollution within Dublin Local Authorities 2016 to 2017

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 increased from 14.8% in 2016 to 18.1% in 2017. This constitutes an increase of 3.3%.
- Slightly polluted (LPI 2) areas decreased, by 0.5%, from 67.1% in 2016 to 66.6% in 2017.
- Moderately polluted (LPI 3) areas decreased by 1.7%, from 15.0% in 2016 to 13.3% in 2017.
- Significantly polluted (LPI 4) areas decreased from 2.7% in 2016 to 1.9% in 2017. This constitutes a decrease of 0.8%.
- The percentage of grossly polluted (LPI 5) areas decreased from 0.4% in 2016 to 0.2% in 2017. This constitutes a decrease of 0.2%.

- The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas combined together, show an increase of 2.8% from 2016 to 2017.

Overall, these results show a decrease in the level of litter pollution in County Councils from 2016 to 2017. The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas, when combined together, showed an increase of 2.8%; whilst moderately polluted (LPI 3) and significantly polluted (LP4) and grossly polluted (LPI 5) areas showed a combined decrease of 2.7% when compared to 2016.

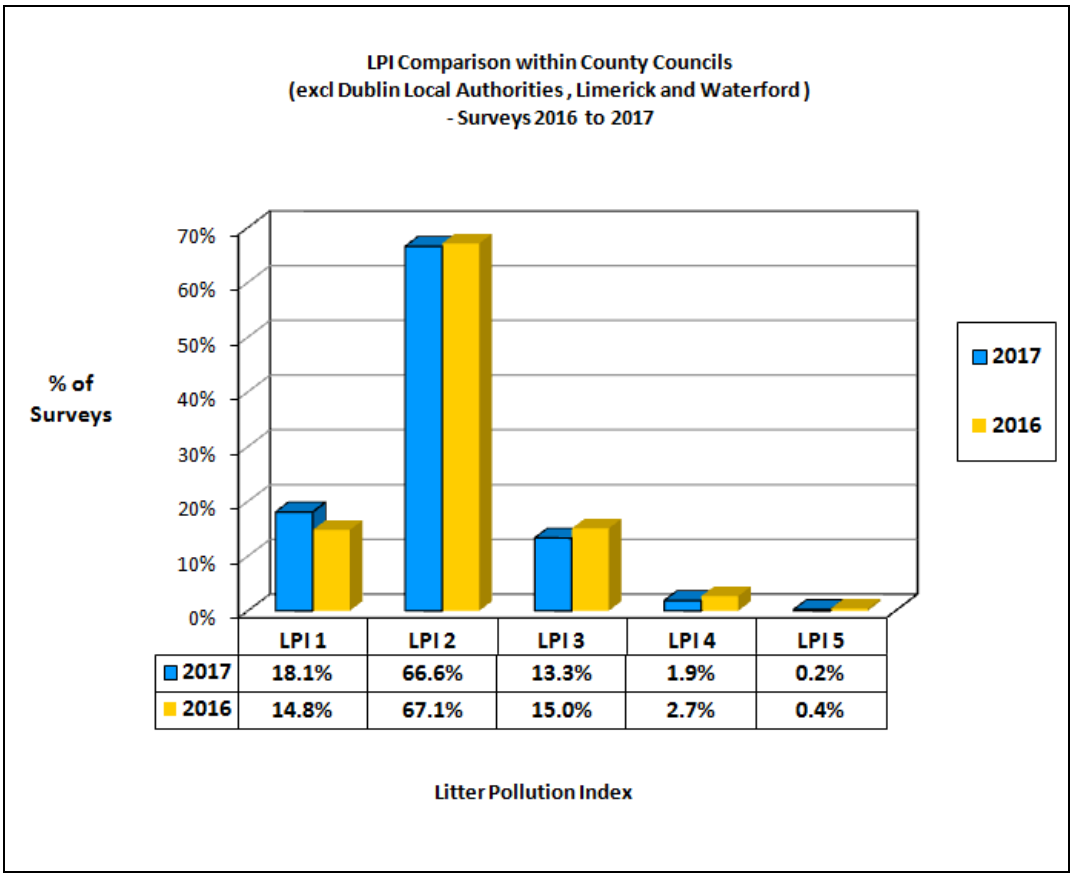


Figure 5-2 Comparison of Litter Pollution within County Councils 2016 to 2017

5.3 Comparison within City Councils

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

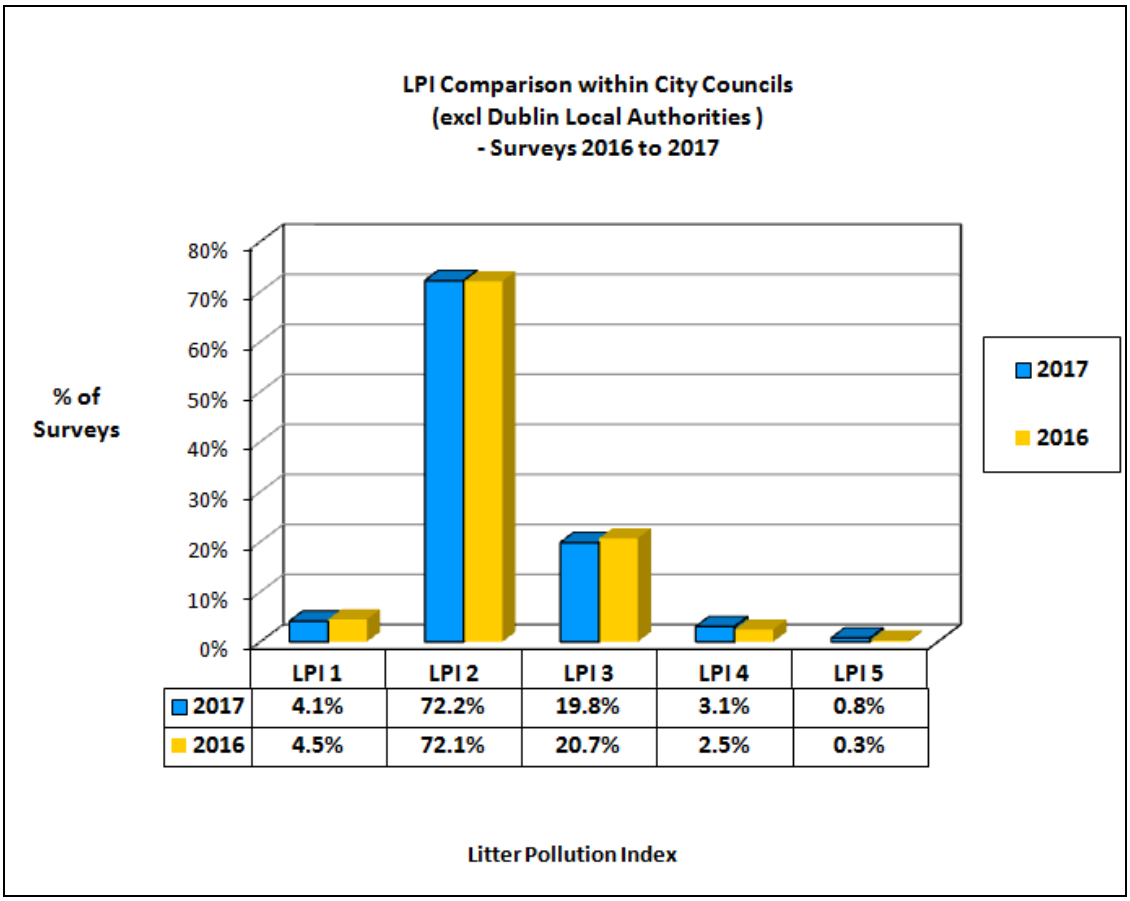
- The percentage of unpolluted (LPI 1) areas has decreased from 4.5% in 2016 to 4.1% in 2017. This constitutes a decrease of 0.4%.

- Slightly polluted (LPI 2) areas have increased slightly, by 0.1%, from 72.1% in 2016 to 72.2% in 2017.

- The percentage of moderately polluted (LPI 3) areas has decreased, by 0.9%, from 20.7% in 2016 to 19.8% in 2017.

- Significantly polluted (LPI 4) areas have increased from 2.5% in 2016 to 3.1% in 2017, an increase of 0.6%.
- The percentage of grossly polluted (LPI 5) has increased, by 0.5%, from 0.3% in 2016 to 0.8% in 2017.
- The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas combined together, show a slight decrease of 0.3% from 2016 to 2017.

These results show an overall slight increase in the level of litter pollution in City Councils from 2016 to 2017. The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas, when combined together, show a decrease of 0.3%. While, there has been an increase of 0.2% in moderately polluted (LPI3), significantly polluted (LPI 4) and grossly polluted (LPI 5) areas, when combined, since 2016.



	LPI 1	LPI 2	LPI 3	LPI 4	LPI 5
2017	4.1%	72.2%	19.8%	3.1%	0.8%
2016	4.5%	72.1%	20.7%	2.5%	0.3%

Figure 5-3 Comparison of Litter Pollution within City Councils 2016 to 2017

The percentage of unpolluted (LPI 1) areas increased in both County Councils and Dublin Local Authorities but decreased in City Councils from 2016 to 2017.

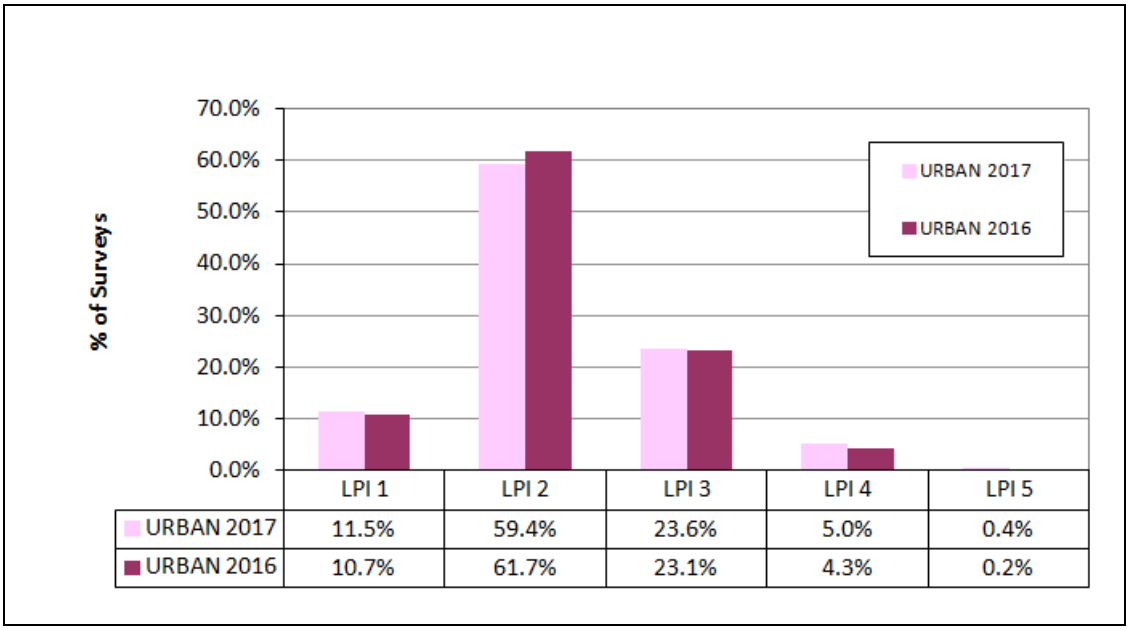
The percentage of slightly polluted (LPI 2) areas decreased in both County Councils and Dublin Local Authorities but increased slightly in City Councils from 2016 to 2017.

The percentage of moderately polluted (LPI 3) areas decreased in all local authority types in 2017 except Dublin Local Authorities.

The percentage of significantly polluted (LPI 4) areas and grossly polluted (LPI 5) increased slightly in City Councils and Dublin Local Authorities from 2016 to 2017 while decreasing in County Councils.

5.4 Comparison within Urban & Rural Areas[5]

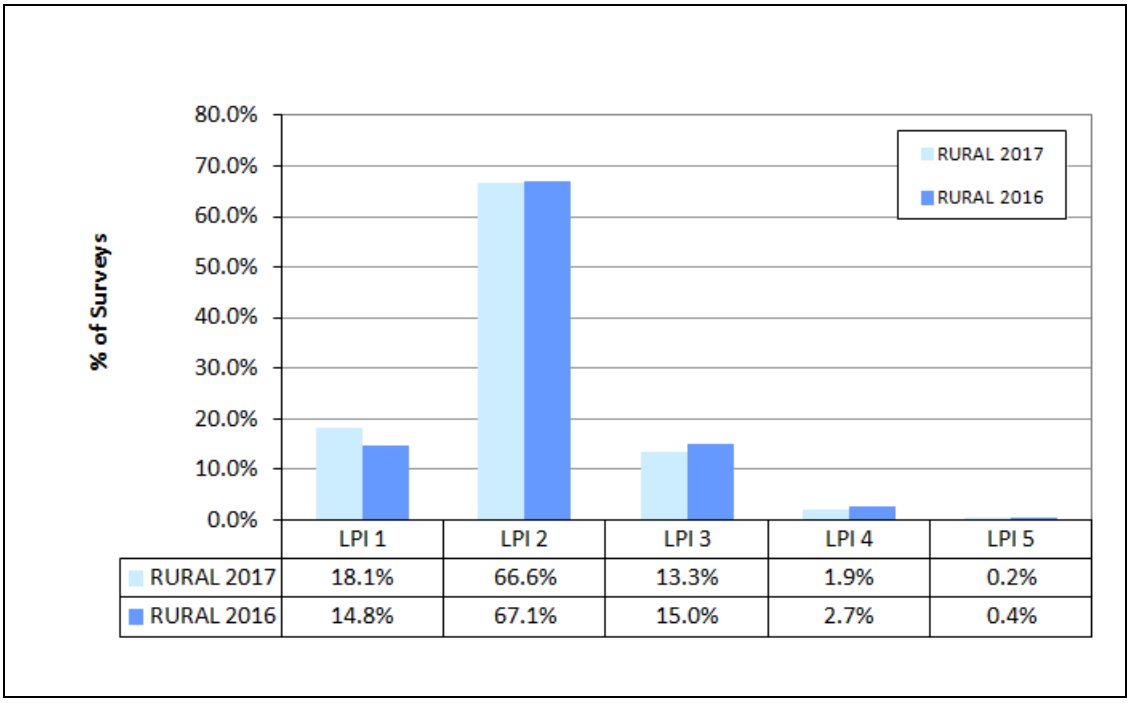
Figures 5-4 and 5-5 below provide a comparison of litter pollution in rural and urban areas from 2016 to 2017.



	LPI 1	LPI 2	LPI 3	LPI 4	LPI 5
URBAN 2017	11.5%	59.4%	23.6%	5.0%	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 2016 to 2017

[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, Waterford City and County Council and Limerick City and County Council. 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 2017	18.1%	66.6%	13.3%	1.9%	0.2%
RURAL 2016	14.8%	67.1%	15.0%	2.7%	0.4%

Figure 5-5 Comparison of Litter Pollution in Rural Areas from 2016 to 2017

The percentage of unpolluted (LPI 1) areas in urban areas has increased, by 0.8%, from 10.7% in 2016 to 11.5% in 2017. The percentage of slightly polluted (LPI 2) areas has decreased, by 2.3%, from 61.7% in 2016 to 59.4% in 2017. Moderately polluted (LPI 3) areas have increased by 0.5%, from 23.1% in 2016 to 23.6% in 2017. Significantly polluted (LPI 4) areas have increased, by 0.7%, from 4.3% in 2016 to 5.0% in 2017. Grossly polluted (LPI 5) areas have increased slightly, by 0.2%, from 0.2% in 2016 to 0.4% in 2017.

In rural areas the levels of unpolluted (LPI 1) areas have increased from 14.8% in 2016 to 18.1% in 2017. The percentage of slightly polluted (LPI 2) areas has decreased slightly, by 0.5%, since 2016 in rural areas. Moderately polluted (LPI 3) areas have decreased, by 1.7%, from 2016 to 2017. Significantly polluted (LPI 4) areas have decreased, by 0.8%, from 2.7% in 2016 to 1.9% in 2017. Grossly polluted (LPI 5) areas have decreased by 0.2% since 2016.

The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas combined together show that urban areas have shown a decrease in cleanliness levels by 1.5% from 2016 to 2017. Rural areas have shown an overall increase in cleanliness levels by 2.8% 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 increased from 55.4% in 2016 to 56.3% in 2017, an increase of 0.9% (see Table 3-1, page 11). Cigarette related litter continues to be the largest component of litter nationally in 2017.

Cigarette ends continue to be the biggest component of cigarette related litter. The percentage of cigarette ends, as a component of national litter, increased (by 0.7%), from 51.80% in 2016 to 52.5% in 2017 (Figure 6-1).

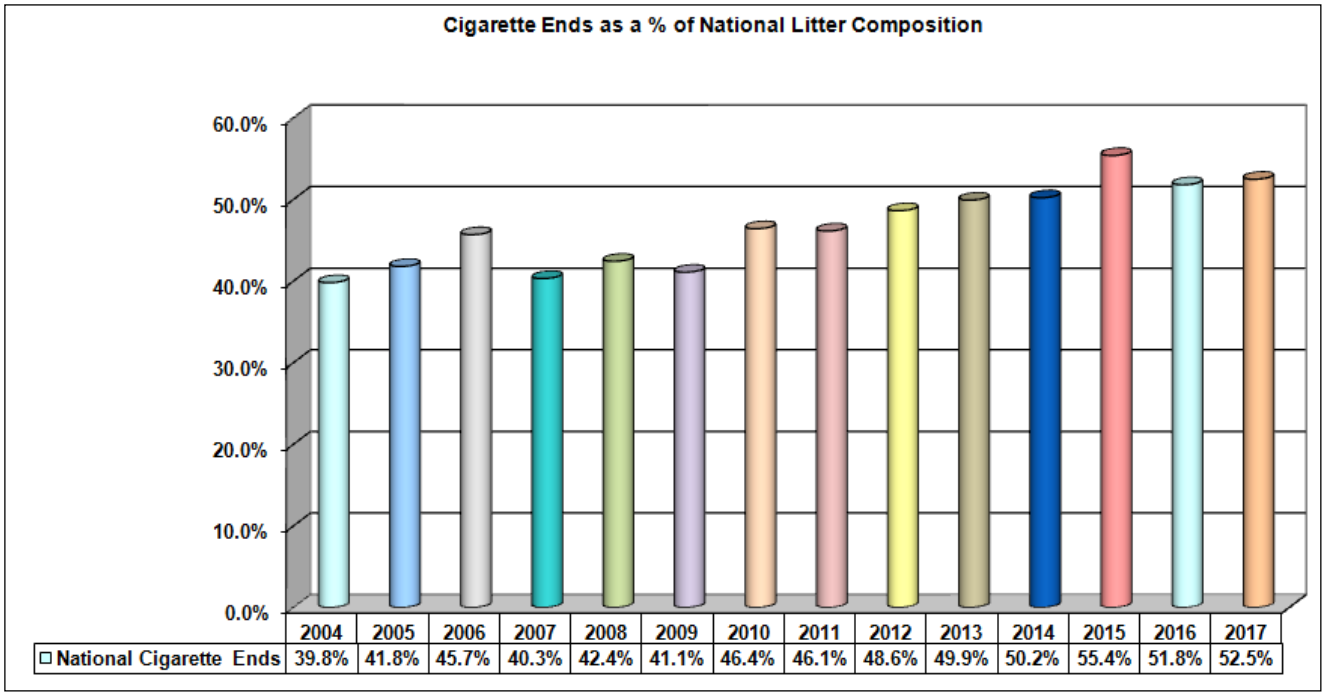


Figure 6-1 Cigarette Ends as a Percentage of the National Litter Composition

6.2 Chewing Gum Litter

Food related litter, and specifically chewing gum, continued to be a noticeable component of litter, nationally, in 2017. Figure 6-2 below illustrates trends in chewing gum related litter since 2004.

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

Chewing gum litter in 2017 (8.0%) had decreased by 7.2% since 2016 (15.15%). This is a significant decrease. Discussions with local authorities has suggested that potential reasons for this could be funding in 2017 for gum removal, the installation of a 'gum resistant' paving and an increased educational effort regarding litter pollution including gum litter.

As shown in Figure 6-2 below, chewing gum levels have decreased from 31.6%, at its highest, in 2005 to 8.0% in 2017, which represents a decrease of 23.6%. The lowest level of chewing gum litter recorded is in 2017.

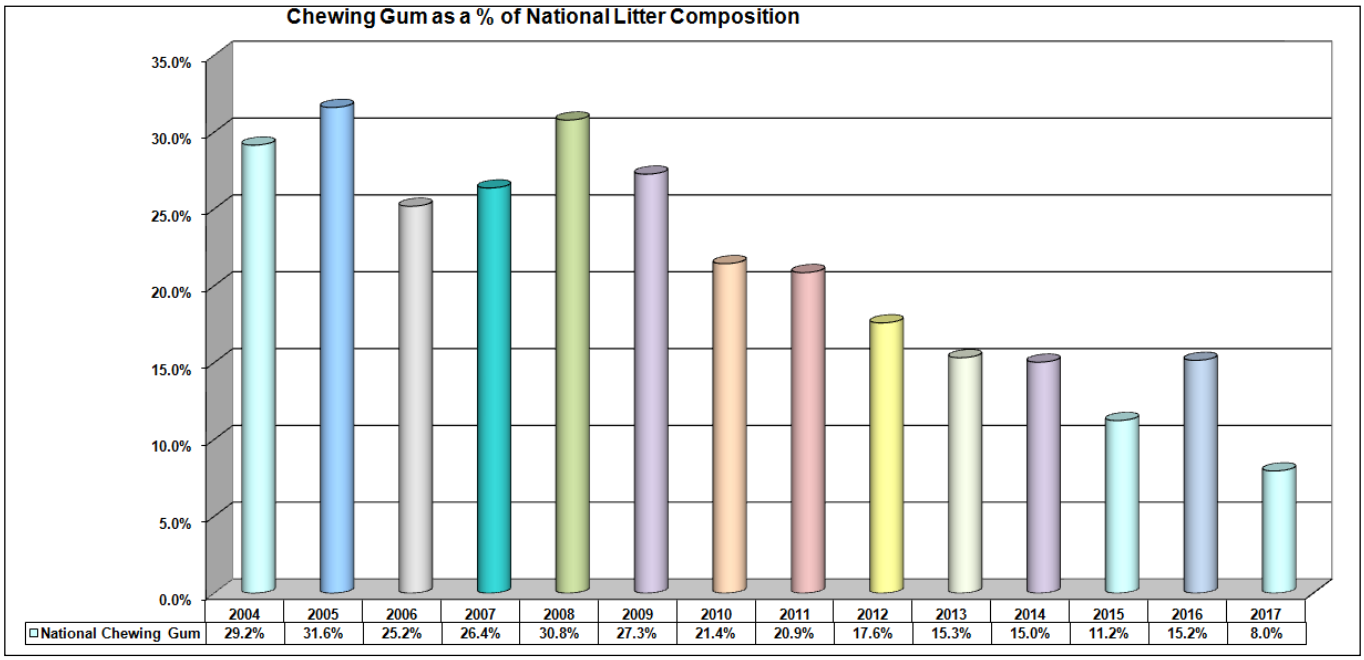


Figure 6-2 Chewing Gum as a Percentage of the National Litter Composition

6.3 Sweet Related Litter

Sweet related litter, or sweet wrappers (plastic/ foil), more specifically, continues to be a large component of national litter. The components of sweet related litter between 2016 and 2017 are presented in Figure 6-3 below.

Sweet related litter, as a component of national litter, increased from 7.8% in 2016 to 7.9% in 2017. The results in Figure 6-3, illustrates that sweet wrappers (plastic/foil), are the highest component of litter in the sweet related litter category. The quantity of lollipop sticks (wooden/plastic) has increased slightly, by 0.07% in 2017. Straws have decreased, by 0.09%, in 2017. Crisp bags also contribute to the sweet related litter category; they have also increased, by 0.22%, in 2017.

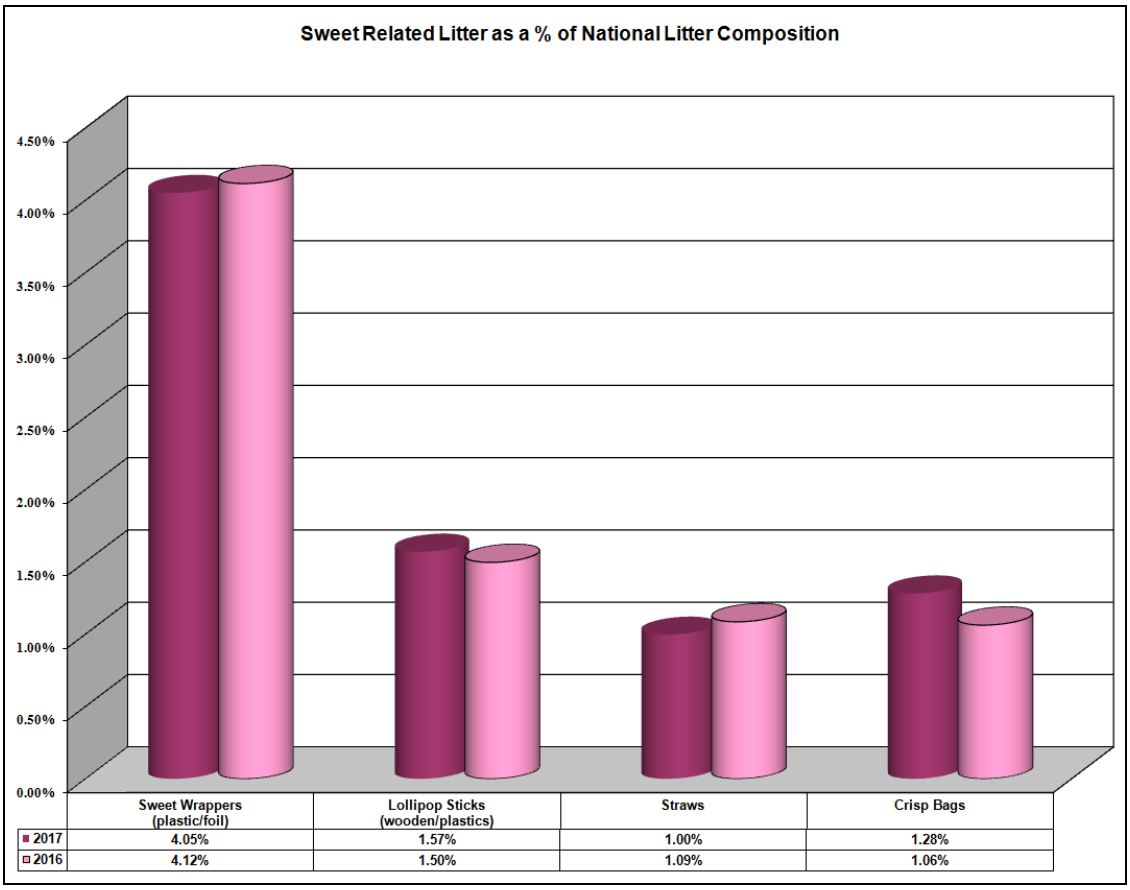


Figure 6-3 Sweet Related Litter Analysed 2016 to 2017

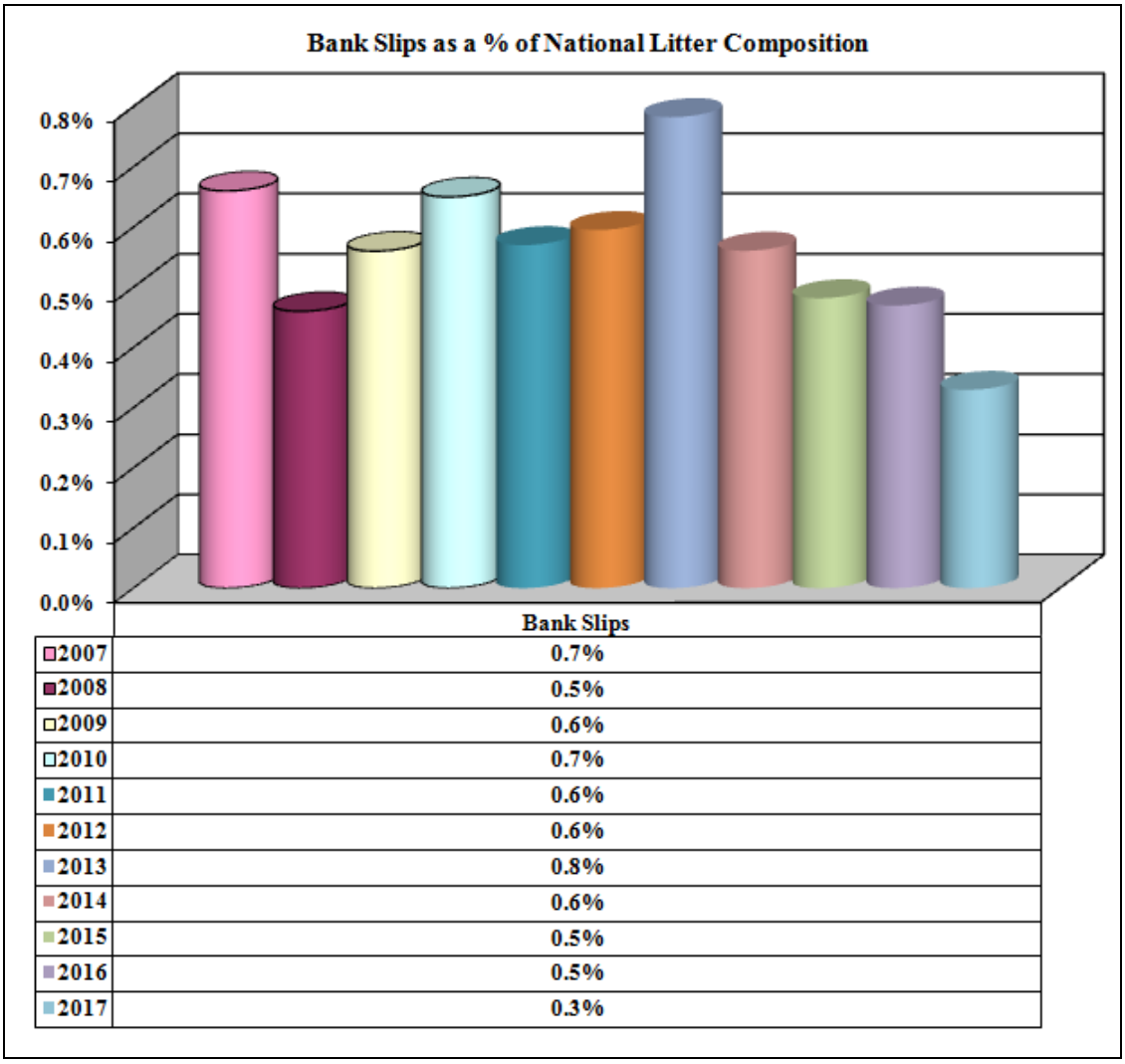
6.4 Bank ATM Receipts

The NLPMS 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 LPS results for 2017 suggest that 'Bank ATM's' as a causative factor has continued to decrease in 2017, from 1.3% in 2016 to 0.8% in 2017, a decrease 0.5% (see Figure 4-1, page 13).

The LQS results reflect the LPS results in this regard. Figure 6-4 illustrates that bank slips, as a percentage of the national litter composition have decreased (by 0.2%) from 0.5% in 2016 to 0.3% in 2017.

The NLPMS will continue to monitor the impact of this protocol.



	Bank Slips
2007	0.7%
2008	0.5%
2009	0.6%
2010	0.7%
2011	0.6%
2012	0.6%
2013	0.8%
2014	0.6%
2015	0.5%
2016	0.5%
2017	0.3%

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

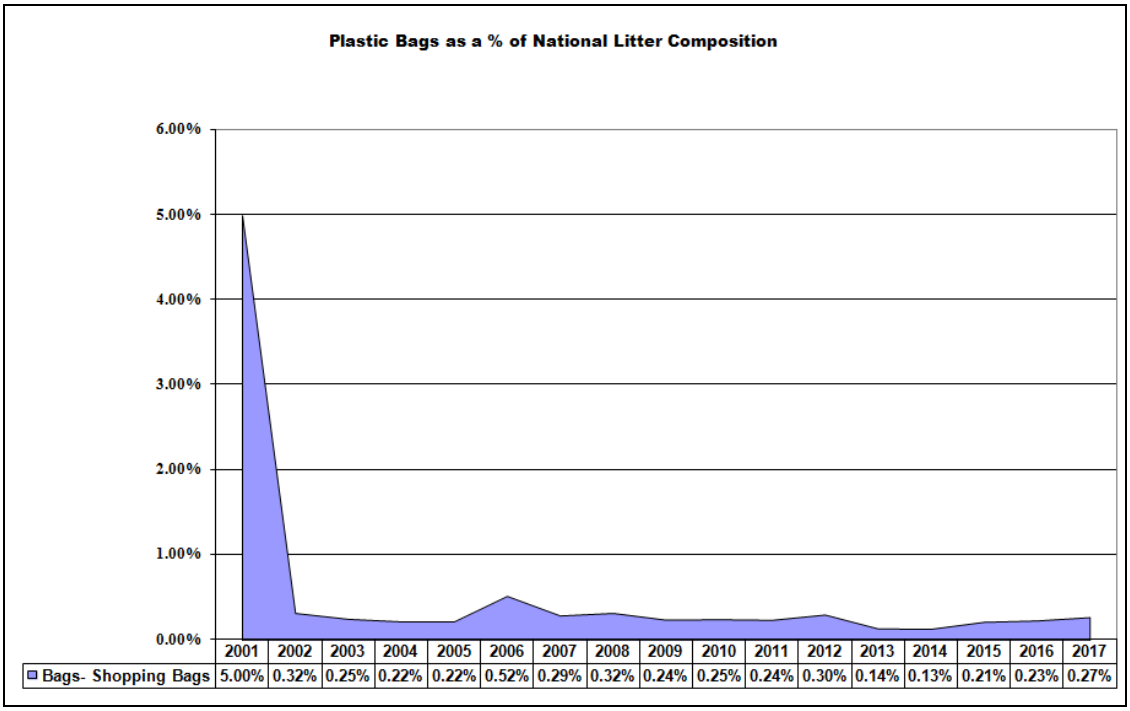
6.5 Plastic Bags

The NLPMS 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 0.25% 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 2017 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 0.27% in 2017). The NLPMS 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 2017.



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
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%	0.27%

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

CHAPTER 7: ITEMS FOR FURTHER ATTENTION UNDER THE NLPMS

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

- The NLPMS will continue to monitor the level of chewing gum litter recorded which had a significant decrease in levels in 2017.

CHAPTER 8: CONCLUSION

As a result of the Local Government Reform Act, 31 local authorities now exist in Ireland. In 2017, 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 2016 to 2017.

The percentage of cigarette related litter, packaging items, sweet related litter, deleterious litter, large litter items, plastic litter items (non-packaging) and miscellaneous litter items have all increased since 2016. Food related litter and paper items have decreased since 2016.

The national results for 2017 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, places of leisure/ entertainment, fast food outlets, and schools/ school children are considerable sources of litter for all local authority types.

Survey results from 2017 show that the contribution of passing motorists, fly-tipping, bring banks and refuse collection/ presentation to litter pollution is greater in County Councils than in other local authority types.

Retail outlets, gathering points, places of leisure/ entertainment, fast food outlets, construction sites and major entertainment events are more significant causative factors in City Councils than in other local authority types.

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

The 2017 national monitoring system results indicate that the percentage of unpolluted (LPI 1) areas has increased from 13.2% in 2016 to 15.6% in 2017 (an increase of 2.4%).

A comparison of the results from 2016 to 2017 indicates that the percentage of slightly polluted (LPI 2) areas has decreased slightly from 65.1% in 2016 to 63.9% in 2017.

The percentage of moderately polluted areas (LPI 3) has decreased slightly from 18.0% in 2016 to 17.1% in 2017. The percentage of significantly polluted areas (LPI 4) has decreased slightly (by 0.3%) from 3.3% in 2016 to 3.0% in 2017. The percentage of grossly polluted (LPI 5) areas has remained the same in 2017 as in 2016, at 0.3%.

The percentage of unpolluted (LPI 1) and slightly polluted (LPI 2) areas combined together has increased slightly (by 1.2%) from 2016 to 2017, thus demonstrating there has been a decrease in litter pollution from 2016 to 2017.

Analysis of specific components of litter in 2017 resulted in the following observations;

- Cigarette related litter, and more specifically cigarette butts, continues to be the greatest component of litter nationally.

- Chewing gum litter in 2017 had decreased, by 7.2%, from 15.15% in 2016 to 8.0% in 2017. This is a significant decrease. Discussions with local authorities has suggested

that potential reasons for this could be funding in 2017 for gum removal, the installation of a 'gum resistant' paving and an increased educational effort regarding litter pollution including gum litter. The NLPMS will continue to monitor the level of chewing gum litter recorded nationally.

- 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 2017 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 2018.

The LMB is satisfied that local authorities are properly implementing the NLPMS. 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 2017

Litter Quantification Survey (LQS) Results

LQS results for 30 out of 31 local authorities were returned to the LMB and analysed for 2017. These are detailed in Table A-1.

Table A.1 Local Authorities that Submitted Litter Quantification Survey Results for 2017

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
Waterford City and County Council
Dublin Local Authorities
Dublin City Council
Dún Laoghaire-Rathdown County Council
Fingal County Council

Litter Pollution Survey (LPS) Results

LPS results for 30 out of 31 local authorities were returned to the LMB and analysed for 2017. These are detailed in Table A.2.

Table A.2 Local Authorities that Submitted Litter Pollution Survey Results for 2017

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
Waterford 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.

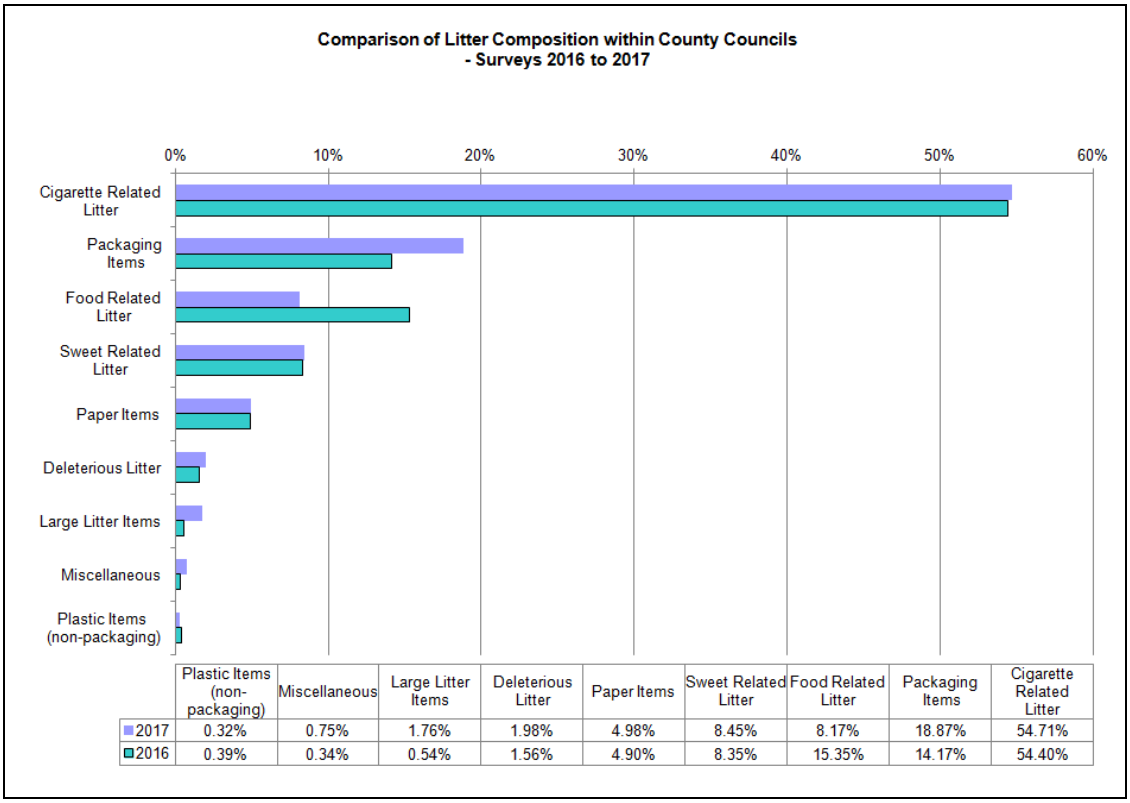
Area Cleanliness Rating 5 (Grossly Polluted)

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 2016 – 2017 ACCORDING TO LOCAL AUTHORITY TYPE

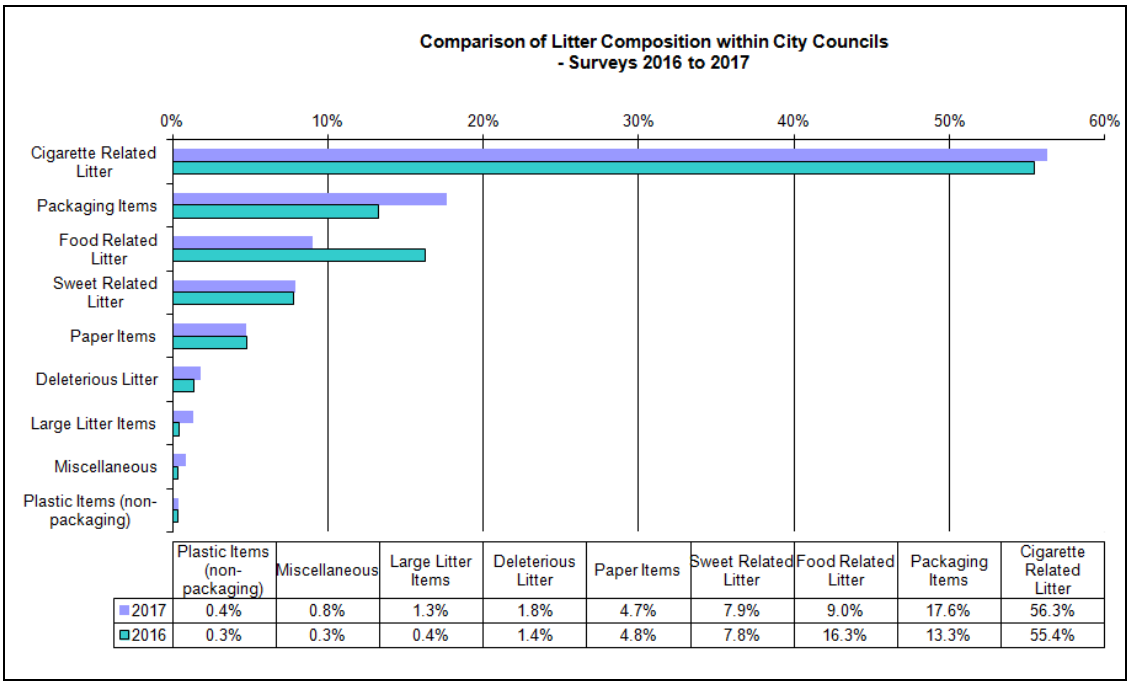
Figure C.1 compares the results of LQS within County Councils from 2016 to 2017. The main observations are that the percentage of cigarette related litter, packaging items, sweet related litter, paper items, deleterious litter, large litter items and miscellaneous items have all increased in 2017. Food related litter and plastic items (non-packaging) have all decreased in 2017.



	Plastic Items (non-packaging)	Miscellaneous	Large Litter Items	Deleterious Litter	Paper Items	Sweet Related Litter	Food Related Litter	Packaging Items	Cigarette Related Litter
2017	0.32%	0.75%	1.76%	1.98%	4.98%	8.45%	8.17%	18.87%	54.71%
2016	0.39%	0.34%	0.54%	1.56%	4.90%	8.35%	15.35%	14.17%	54.40%

Figure C. 1 Comparison of Litter Composition within County Councils 2016 to 2017

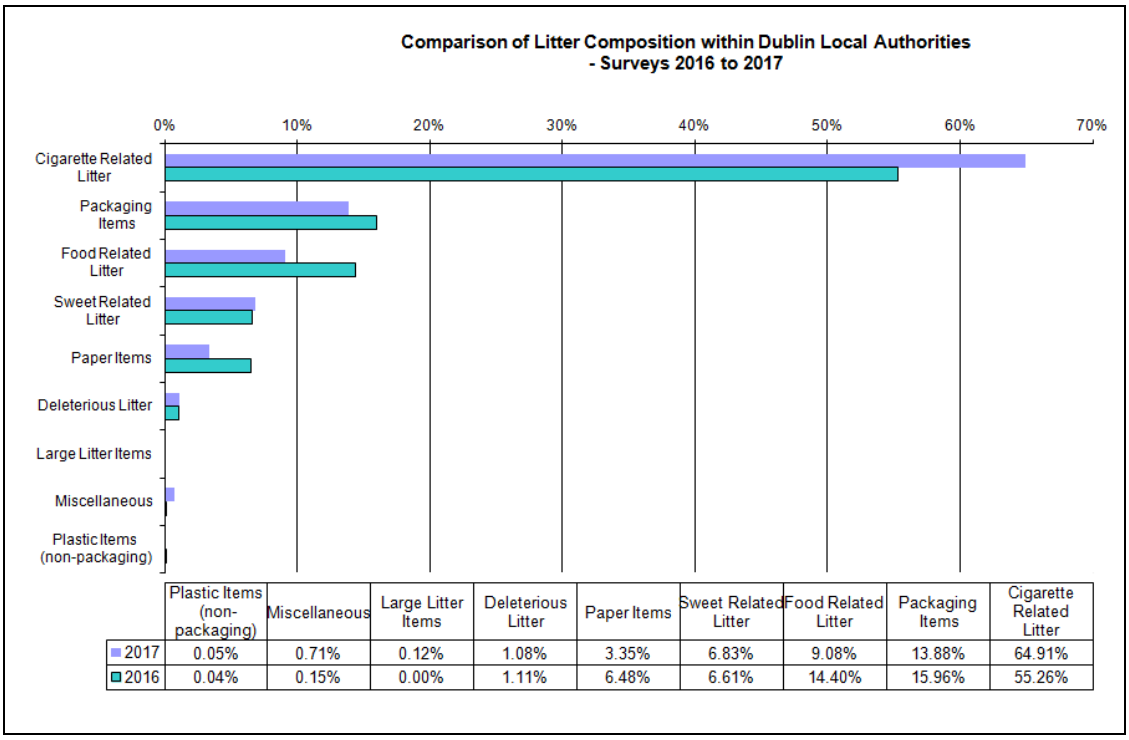
Figure C.2 shows that within City Councils the percentage of cigarette related litter, packaging items, sweet related litter, deleterious litter, large litter items, miscellaneous and plastic items have all increased in 2017. Food related litter and paper items decreased from 2016 to 2017.



	Plastic Items (non-packaging)	Miscellaneous	Large Litter Items	Deleterious Litter	Paper Items	Sweet Related Litter	Food Related Litter	Packaging Items	Cigarette Related Litter
2017	0.4%	0.8%	1.3%	1.8%	4.7%	7.9%	9.0%	17.6%	56.3%
2016	0.3%	0.3%	0.4%	1.4%	4.8%	7.8%	16.3%	13.3%	55.4%

Figure C. 2 Comparison of Litter Composition within City Councils 2016 to 2017

Figure C.3 shows that within Dublin Local Authorities the percentage of cigarette related litter, sweet related litter, large litter items, miscellaneous and plastic items (non-packaging) have all increased in 2017. Packaging items, food related litter, paper items and deleterious litter have all decreased from 2016 to 2017.



	Plastic Items (non-packaging)	Miscellaneous	Large Litter Items	Deleterious Litter	Paper Items	Sweet Related Litter	Food Related Litter	Packaging Items	Cigarette Related Litter
2017	0.05%	0.71%	0.12%	1.08%	3.35%	6.83%	9.08%	13.88%	64.91%
2016	0.04%	0.15%	0.00%	1.11%	6.48%	6.61%	14.40%	15.96%	55.26%

Figure C. 3 Comparison of Litter Composition within Dublin Local Authorities 2016 to 2017

Note cigarette related litter, sweet related litter; large litter items and miscellaneous litter items increased in all local authority types from 2016 to 2017. Packaging Items and deleterious litter increased in City and County Council areas but decreased in Dublin Local Authorities from 2016 to 2017. Food related litter decreased in all local authority types in 2017. Paper litter increased in County Council areas but decreased in City Council areas and Dublin Local Authorities. Plastic litter items (non-packaging) increased in City Council areas and in Dublin Local Authorities but decreased in County Council areas from 2016 to 2017.

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 2017 passing pedestrians constitute 44.4% of all causative factors in LPS of slightly polluted (LPI 2) areas; this percentage decreased to 36.8% for moderately polluted (LPI 3) areas and to 33.5% for significantly polluted (LPI 4) areas and to 17.4% for grossly polluted (LPI 5) areas.

Passing motorists constitute 20.4% of all causative factors in LPS of slightly polluted (LPI 2) areas; this decreases to 17.8% in LPS of moderately polluted (LPI 3) areas, then decreases to 18.9% in LPS of significantly polluted (LPI 4) areas. In 2017, passing motorists as a causative factor decreased again to 10.9% in LPS 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; bring banks and overflowing bins increase as significant causative factors. This trend is similar to previous yearly results.

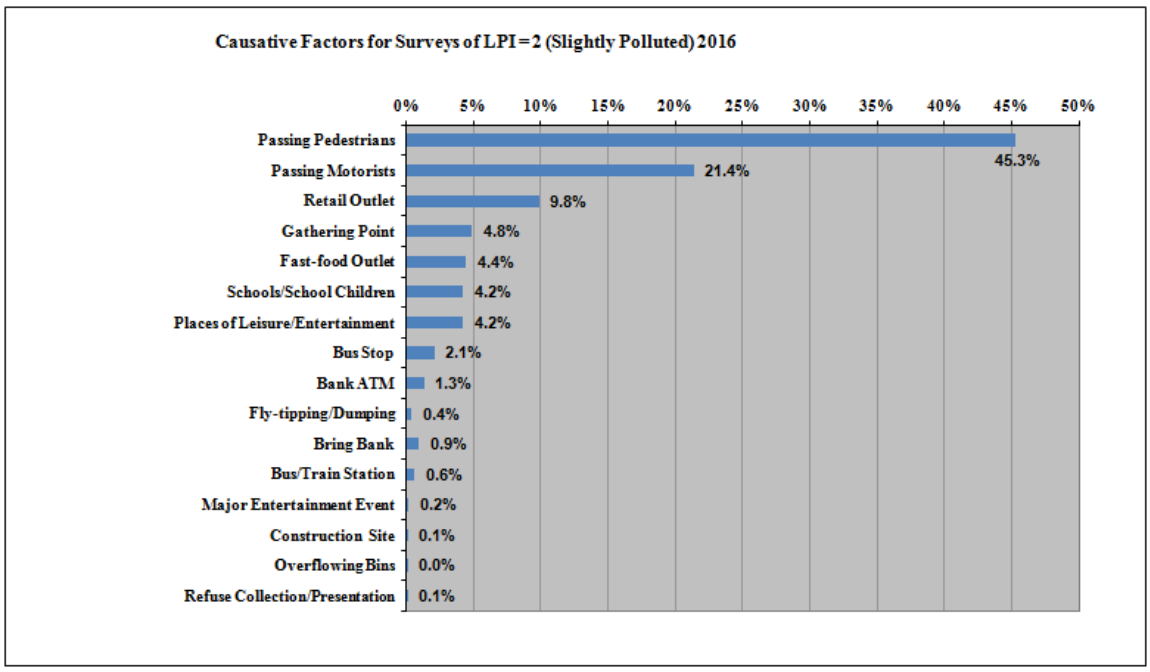


Figure D. 1 Causative Factors of Litter Pollution within Litter Pollution Index Category 2, 2016

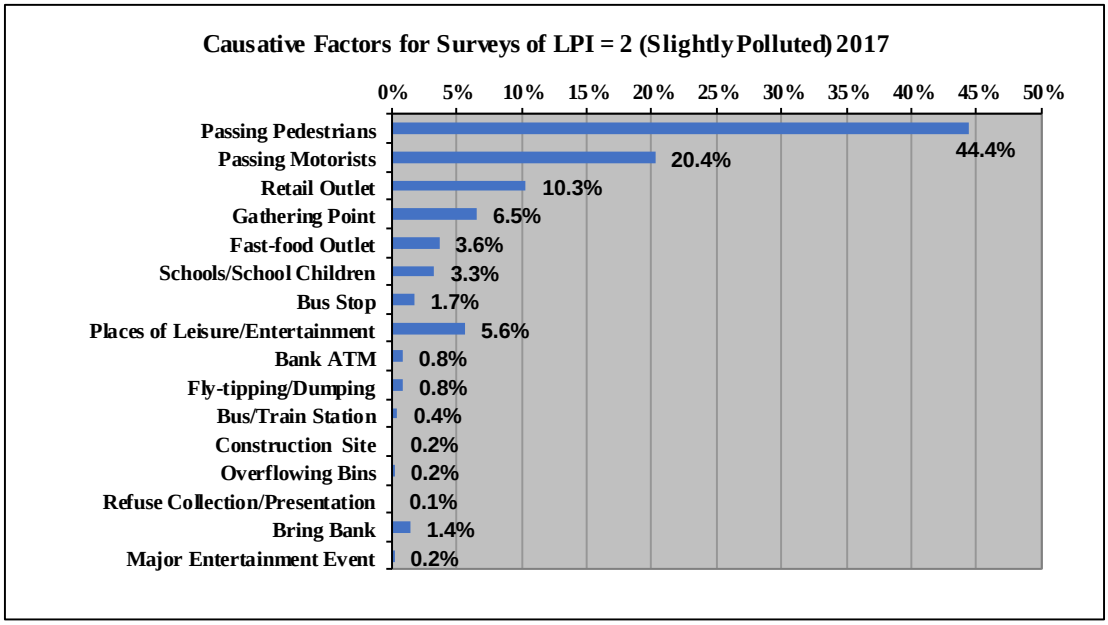


Figure D. 2 Causative Factors of Litter Pollution within Litter Pollution Index Category 2, 2017

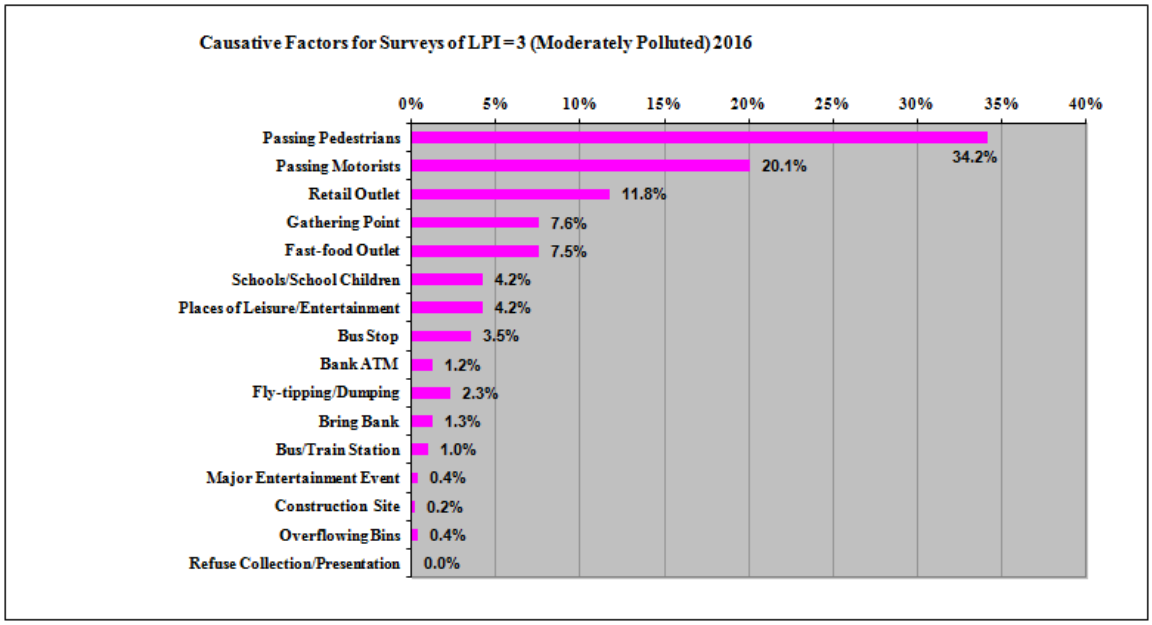


Figure D. 3 Causative Factors of Litter Pollution within Litter Pollution Index Category 3, 2016

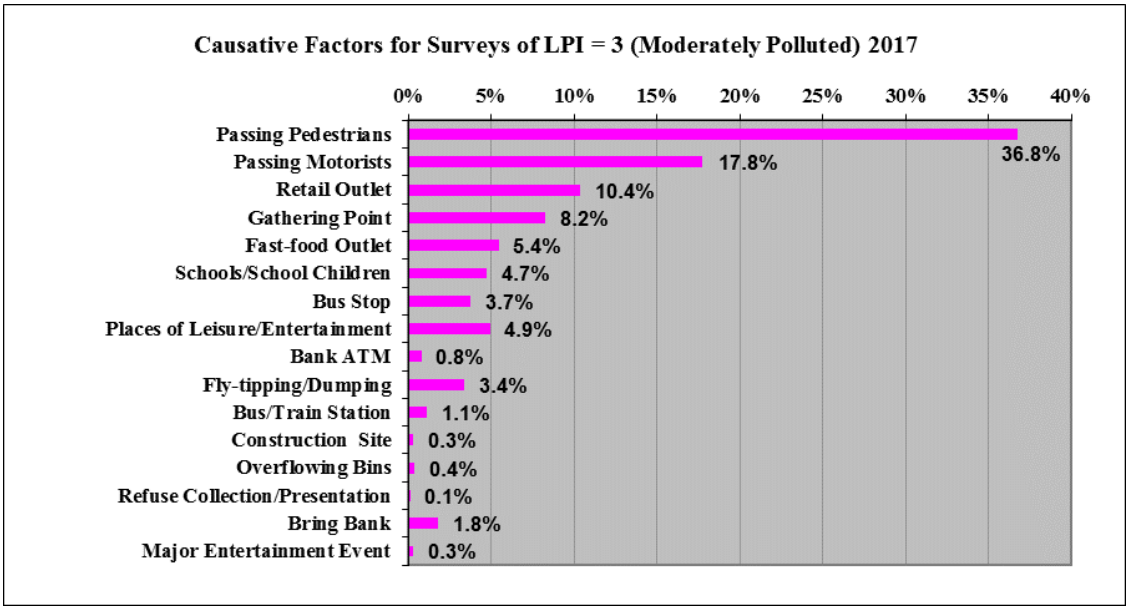


Figure D. 4 Causative Factors of Litter Pollution within Litter Pollution Index Category 3, 2017

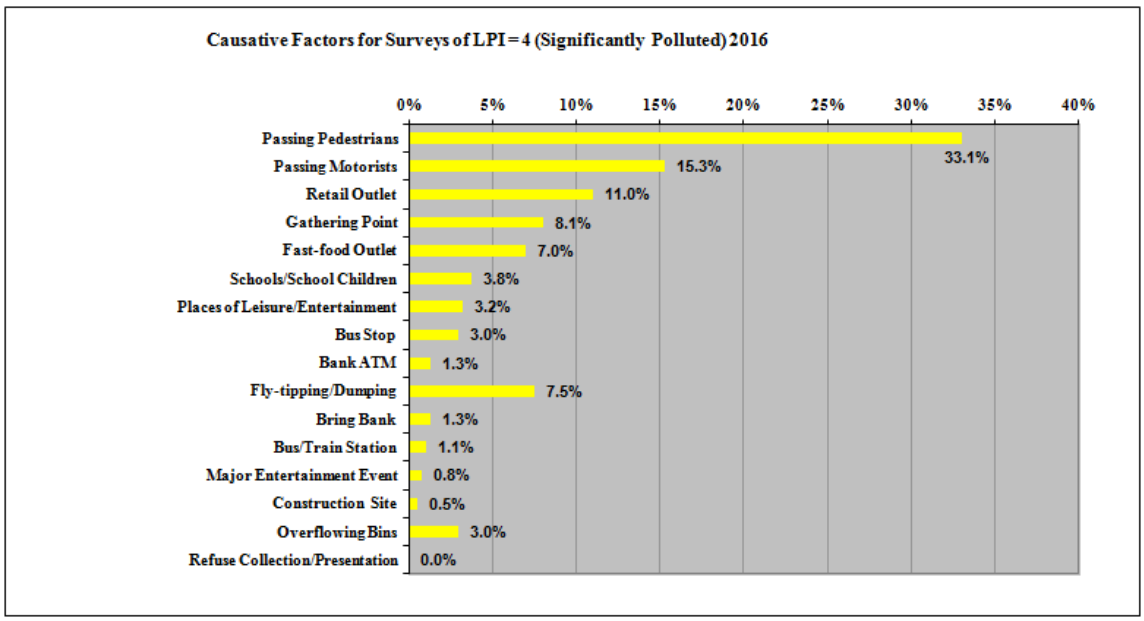


Figure D. 5 Causative Factors of Litter Pollution within Litter Pollution Index Category 4, 2016

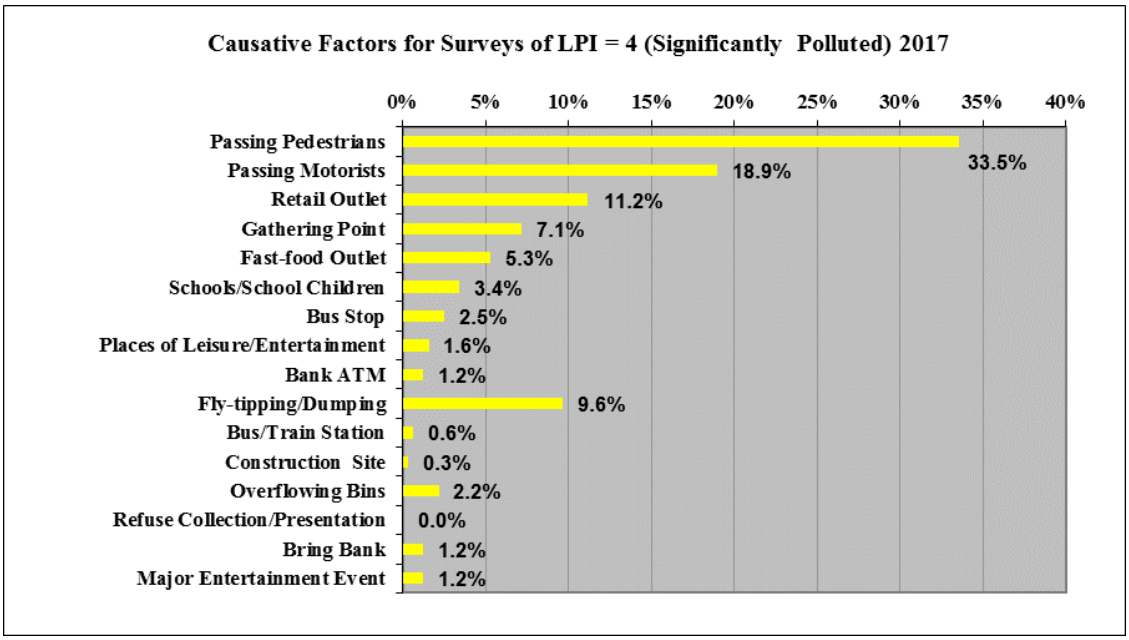


Figure D. 6 Causative Factors of Litter Pollution within Litter Pollution Index Category 4, 2017

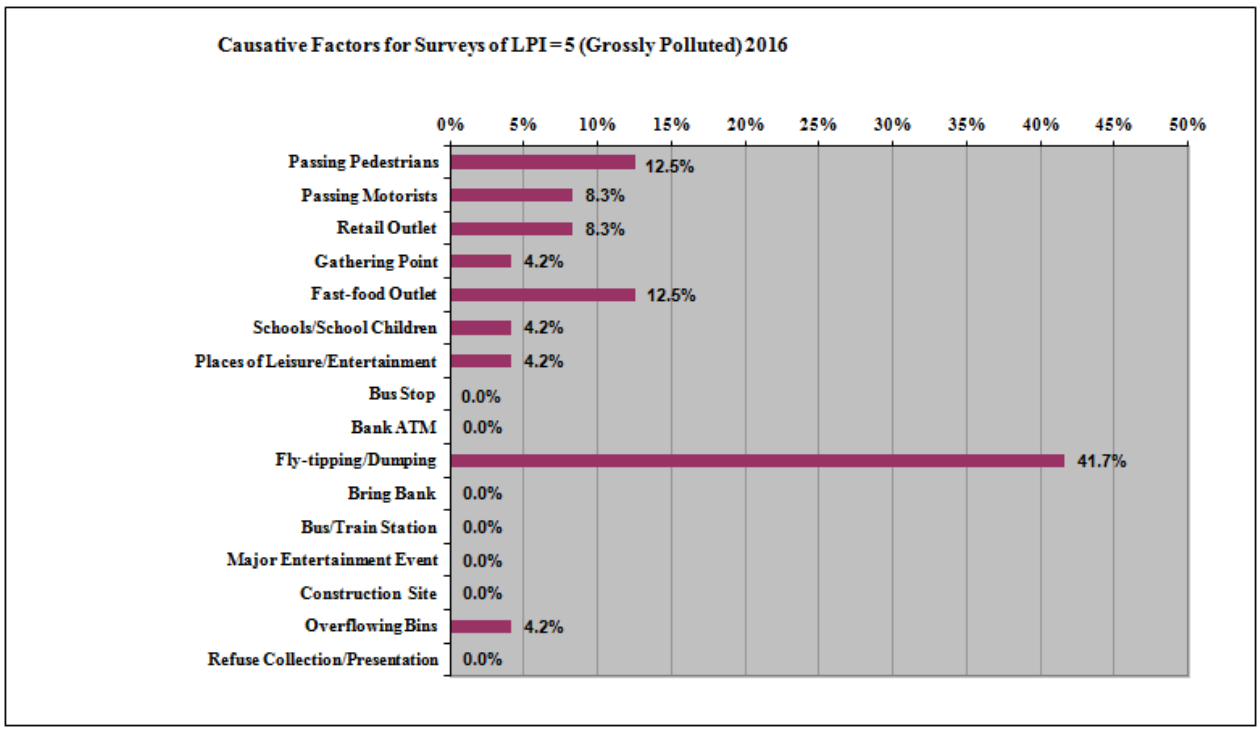


Figure D. 7 Causative Factors of Litter Pollution within Litter Pollution Index Category 5, 2016

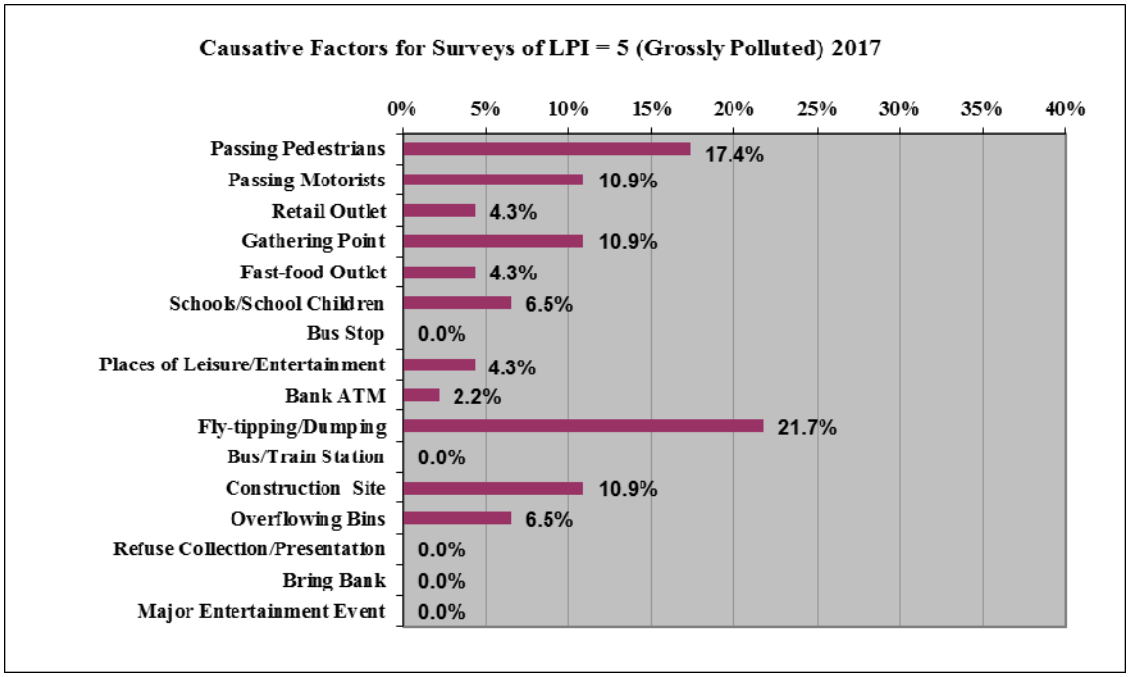


Figure D. 8 Causative Factors of Litter Pollution within Litter Pollution Index Category 5, 2017

APPENDIX E

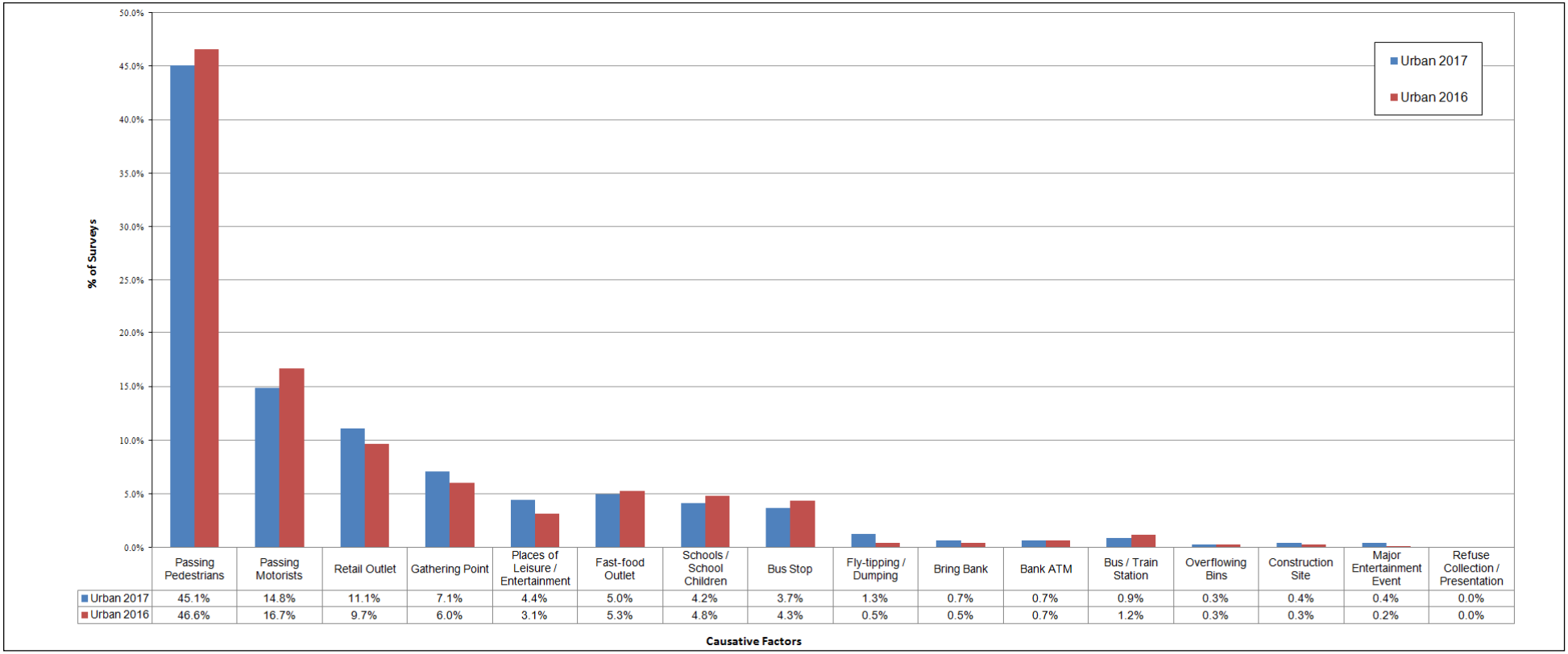
COMPARISON OF CAUSATIVE FACTORS OF LITTER POLLUTION WITHIN URBAN AND RURAL LOCAL AUTHORITIES

Figures E.1 and E.2, compare the causes of litter within urban and rural local authorities from 2016 to 2017.

In 2017, passing pedestrians are the single greatest cause of litter in both urban and rural areas; this is similar to previous yearly results.

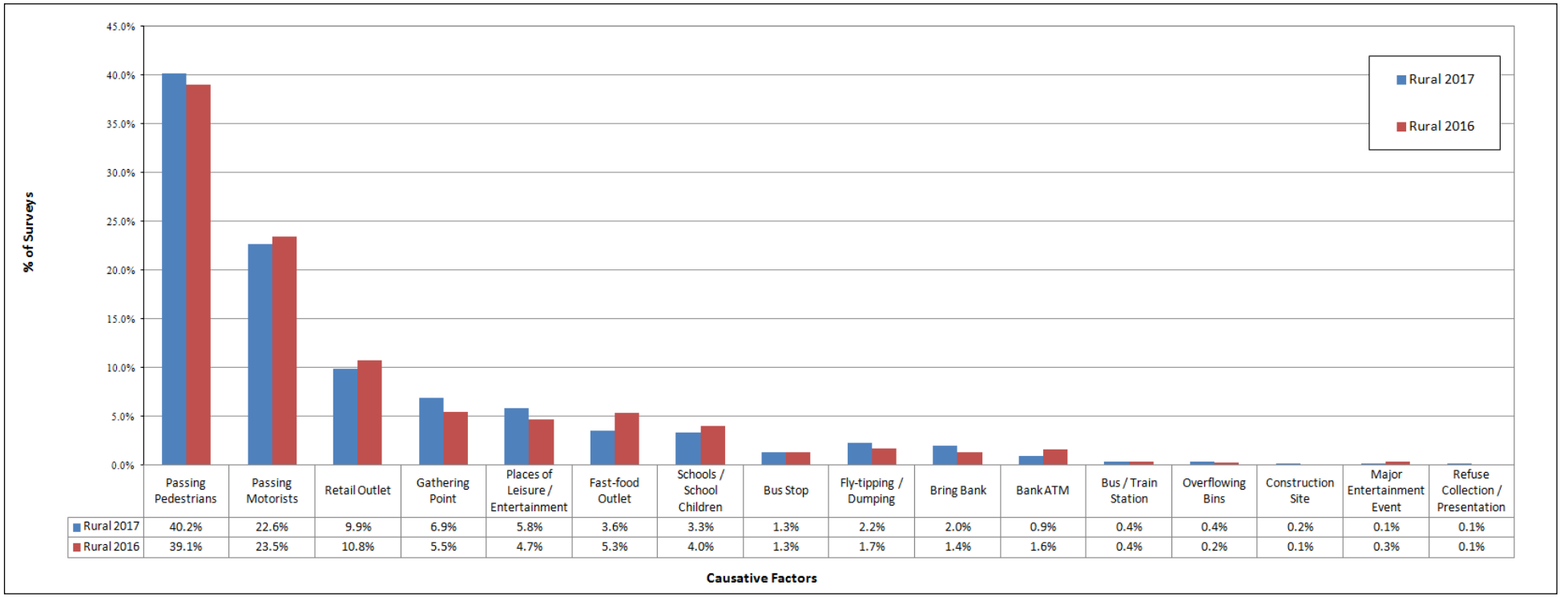
Retail outlets, gathering points, places of leisure/ entertainment, fly-tipping/ dumping, bring banks, construction sites and major entertainment events have all increased as causes of litter pollution in urban areas from 2016 to 2017. Passing pedestrians, passing motorists, fast-food outlets, schools/ school children, bus stops and bus/ train stations have decreased as causes of litter pollution in urban areas from 2016 to 2017. Levels of litter pollution from bank ATM, overflowing bins and refuse presentation/collection; have remained the same in 2017 as recorded in 2016.

In rural areas, passing pedestrians, gathering point, places of leisure/ entertainment, fly-tipping/ dumping, bring bank, overflowing bins and construction sites have all increased as causes of litter pollution from 2016 to 2017. Passing motorists, retail outlets, fast-food outlets, schools/ school children, bank ATM and major entertainment events have all decreased as causes of litter pollution in rural areas from 2016 to 2017. Levels of litter pollution from bus stops, bus/ train stations and refuse presentation/ collection have remained unchanged since 2016.



	Passing Pedestrians	Passing Motorists	Retail Outlet	Gathering Point	Places of Leisure / Entertainment	Fast-food Outlet	Schools / School Children	Bus Stop	Fly-tipping / Dumping	Bring Bank	Bank ATM	Bus / Train Station	Overflowing Bins	Construction Site	Major Entertainment Event	Refuse Collection / Presentation
Urban 2017	45.1%	14.8%	11.1%	7.1%	4.4%	5.0%	4.2%	3.7%	1.3%	0.7%	0.7%	0.9%	0.3%	0.4%	0.4%	0.0%
Urban 2016	46.6%	16.7%	9.7%	6.0%	3.1%	5.3%	4.8%	4.3%	0.5%	0.5%	0.7%	1.2%	0.3%	0.3%	0.2%	0.0%

Figure E. 1 Comparison of Causative Factors in Urban Councils, 2016 to 2017



	Passing Pedestrians	Passing Motorists	Retail Outlet	Gathering Point	Places of Leisure / Entertainment	Fast-food Outlet	Schools / School Children	Bus Stop	Fly-tipping / Dumping	Bring Bank	Bank ATM	Bus / Train Station	Overflowing Bins	Construction Site	Major Entertainment Event	Refuse Collection / Presentation
Rural 2017	40.2%	22.6%	9.9%	6.9%	5.8%	3.6%	3.3%	1.3%	2.2%	2.0%	0.9%	0.4%	0.4%	0.2%	0.1%	0.1%
Rural 2016	39.1%	23.5%	10.8%	5.5%	4.7%	5.3%	4.0%	1.3%	1.7%	1.4%	1.6%	0.4%	0.2%	0.1%	0.3%	0.1%

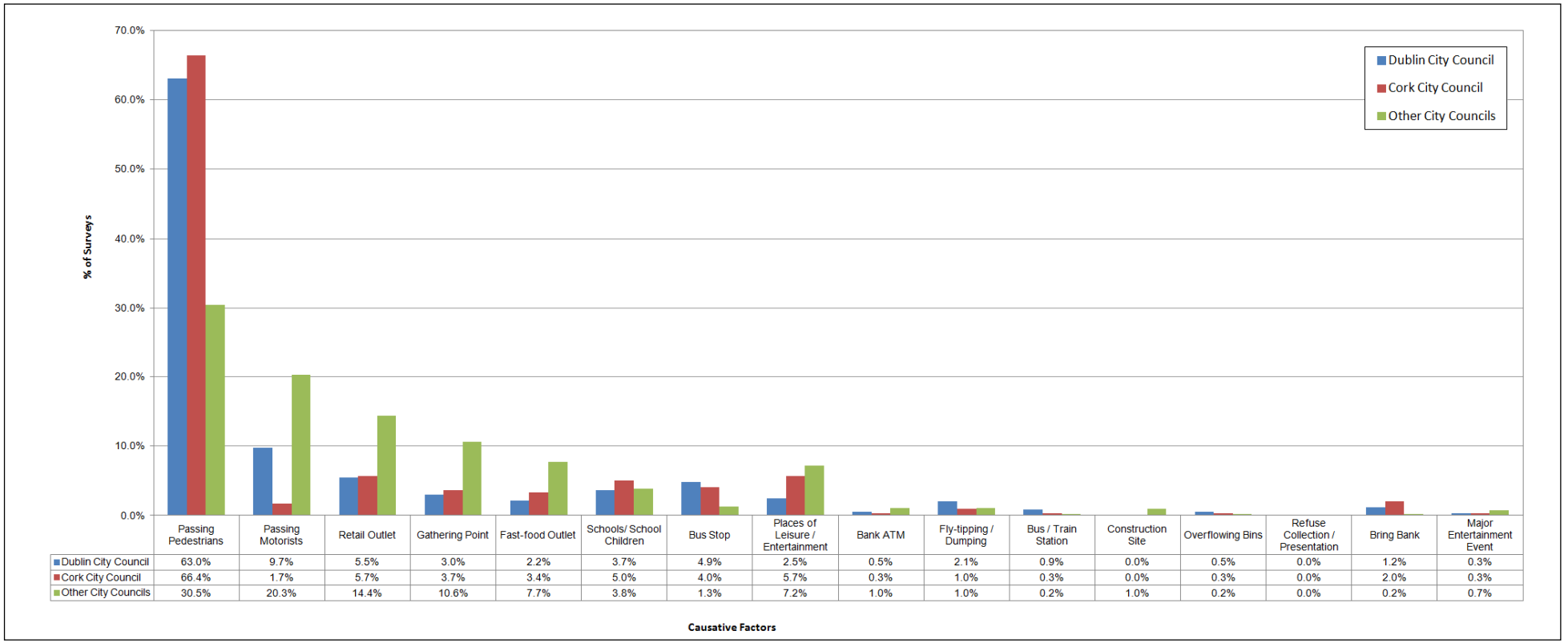
Figure E. 2 Comparison of Causative Factors in Rural Councils, 2016 to 2017

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, Limerick City and County Council and Waterford City and County Councils. Overall, the causes of litter pollution vary somewhat with each category of urban area.

In Dublin, fly-tipping/ dumping, bus stops, bus/train stations and overflowing bin are more significant causative factors of litter pollution than in the other urban categories. Passing pedestrians, schools/ school children and bring banks 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, places of leisure/ entertainment, construction sites and major entertainment events are more significant causative factors of litter pollution in the 'Other City Councils' category than in the other urban categories.

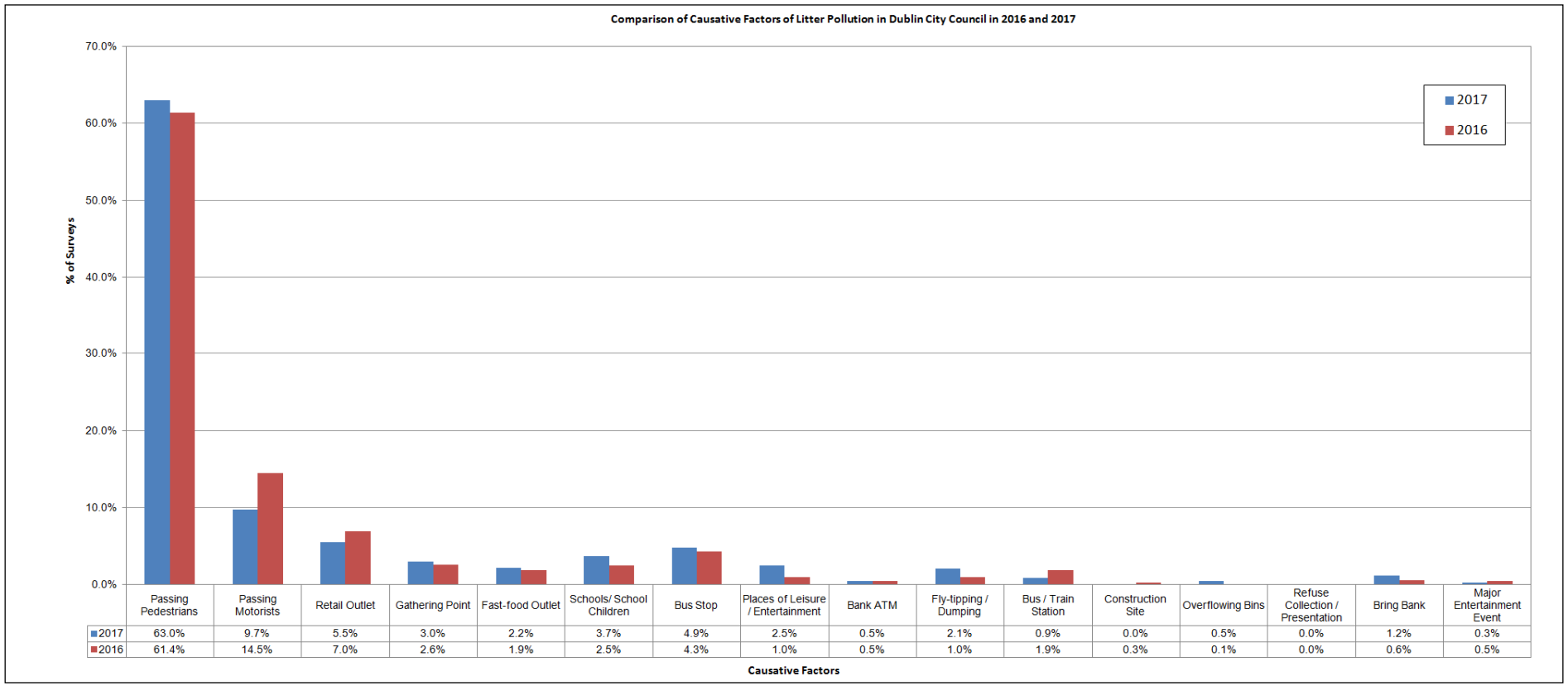
In Dublin City Council, passing pedestrians as causative factors have increased by 1.6%, from 61.4% in 2016 to 63.0% in 2017. Gathering points, fast-food outlets, school children / schools, bus stops, places of leisure/ entertainment, fly-tipping, over-flowing bins and bring banks all increased as causative factors in comparison to 2016. For further detail, please refer to Figure E.4.

In Cork City Council, increases in litter from passing motorists, retail outlets, gathering points, bank ATMs, fly-tipping, over-flowing bins, bring banks and major entertainment events all increased as causative factors in comparison to 2016. For further detail, please refer to Figure E.5.



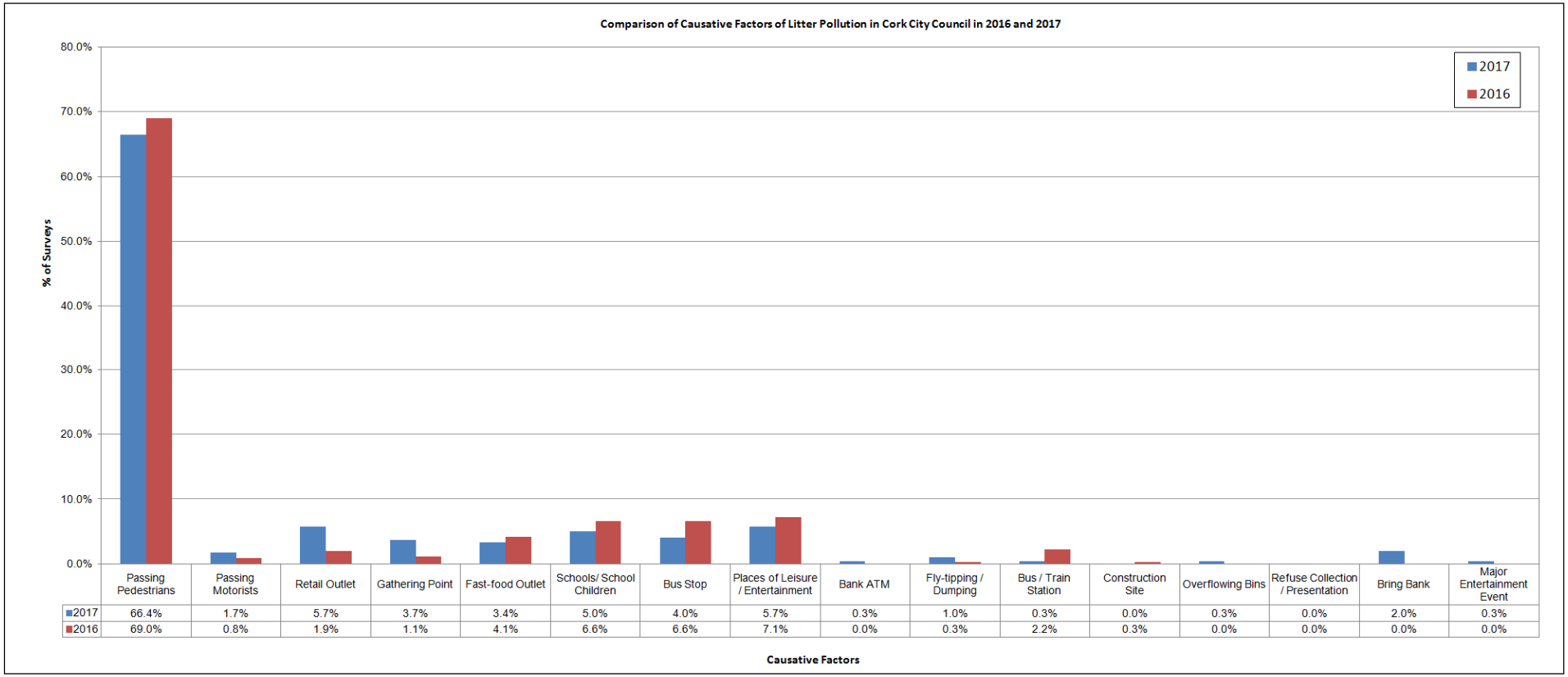
	Passing Pedestrians	Passing Motorists	Retail Outlet	Gathering Point	Fast-food Outlet	Schools/ School Children	Bus Stop	Places of Leisure / Entertainment	Bank ATM	Fly-tipping / Dumping	Bus / Train Station	Construction Site	Overflowing Bins	Refuse Collection / Presentation	Bring Bank	Major Entertainment Event
Dublin City Council	63.0%	9.7%	5.5%	3.0%	2.2%	3.7%	4.9%	2.5%	0.5%	2.1%	0.9%	0.0%	0.5%	0.0%	1.2%	0.3%
Cork City Council	66.4%	1.7%	5.7%	3.7%	3.4%	5.0%	4.0%	5.7%	0.3%	1.0%	0.3%	0.0%	0.3%	0.0%	2.0%	0.3%
Other City Councils	30.5%	20.3%	14.4%	10.6%	7.7%	3.8%	1.3%	7.2%	1.0%	1.0%	0.2%	1.0%	0.2%	0.0%	0.2%	0.7%

Figure E. 3 Comparison of Causative Factors of Litter Pollution within Urban Areas (2017)



	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
2017	63.0%	9.7%	5.5%	3.0%	2.2%	3.7%	4.9%	2.5%	0.5%	2.1%	0.9%	0.0%	0.5%	0.0%	1.2%	0.3%
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 2016 – 2017



	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
2017	66.4%	1.7%	5.7%	3.7%	3.4%	5.0%	4.0%	5.7%	0.3%	1.0%	0.3%	0.0%	0.3%	0.0%	2.0%	0.3%
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 2016 – 2017