THE NATIONAL LITTER POLLUTION MONITORING SYSTEM

LITTER MONITORING BODY

SYSTEM RESULTS
Report - May 2003

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ACKNOWLEDGEMENTS

CHAPTER 1: NATIONAL LITTER POLLUTION MONITORING SYSTEM

1.1   An Overview

TES Consulting Engineers were appointed as the Litter Monitoring Body (LMB) in May 1999 to develop a national litter pollution monitoring system and oversee local authority implementation of it; the current contract with the consultants expires at end 2004.

The Local Government Computer Services Board (LGCSB) has also developed a Litter Geographical Information System (GIS) software package to assist local authorities to map potential sources of litter and identify survey locations as key components of system set-up in their areas; the LGCSB also provides technical assistance to local authorities on the GIS system.

1.1.1   Purpose of system

The main purpose of the National Litter Pollution Monitoring System is to generate, by means of surveys, reliable data to enable each local authority to measure accurately over time changes in the extent and composition of litter pollution in its area, and so provide more effective litter management planning in its area.

In essence, the system requires local authorities to:-

    i)   identify/map the potential sources of litter (potential litter generators) in their areas, using the Litter GIS software,

    ii)   use these data to identify the locations for surveys to determine the composition and extent of litter pollution in their areas,

    iii)   carry out "benchmark" surveys in 2002/2003,

    iv)   carry out further series of surveys annually thereafter, the results of which can be compared to the "benchmark" or previous years survey results to measure progress in tackling litter, and

    v)   complete the appropriate forms for the surveys and forward results to the LMB for analysis/assessment.

The LMB, on receipt of the surveys data from local authorities, will:

    vi)   report back to each local authority with its assessment of that authority's survey data, and

    vii) collate the survey results in a national overview and present it to the Department.

1.1.2   System Surveys - General

There are two types of surveys required –

- **Litter Quantification** surveys to identify the composition i.e. the type and origin of litter pollution prevailing in a particular area, and

- **Litter Pollution** surveys to determine the extent and severity of litter pollution.

The average time to conduct either type of survey is 20 – 30 minutes each. Each survey is conducted along **50 metre stretches** of road in urban/rural areas.   Local authorities determine the locations for their surveys using maps produced by the specially designed Litter GIS software; the software generates zones on maps, which are colour coded according to the density of potential sources of litter in that area. Examples of these maps are set out below.

Potential Litter Generators

Buffer Zone
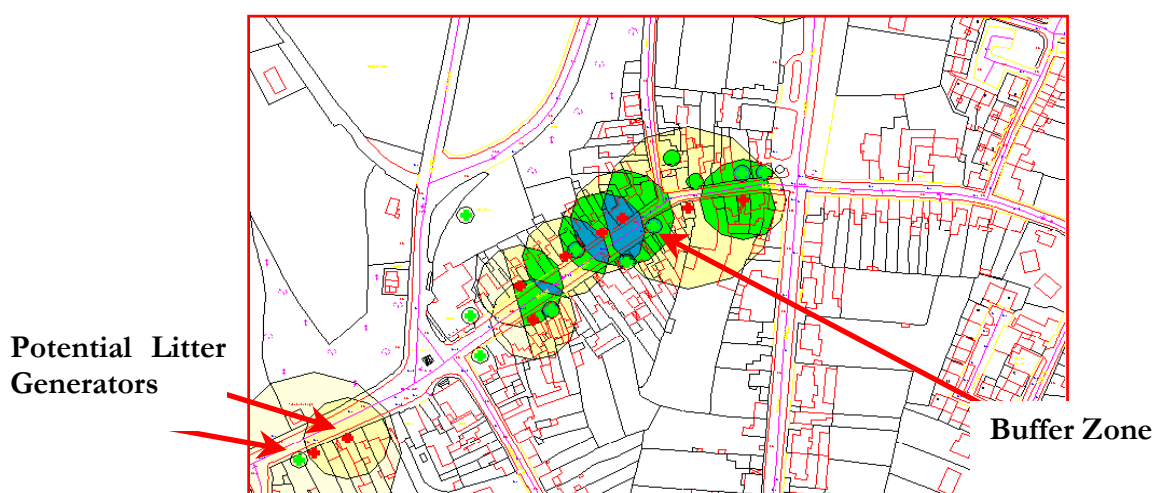
Figure 1.1   **Section of a Litter Generation Potential Map.**
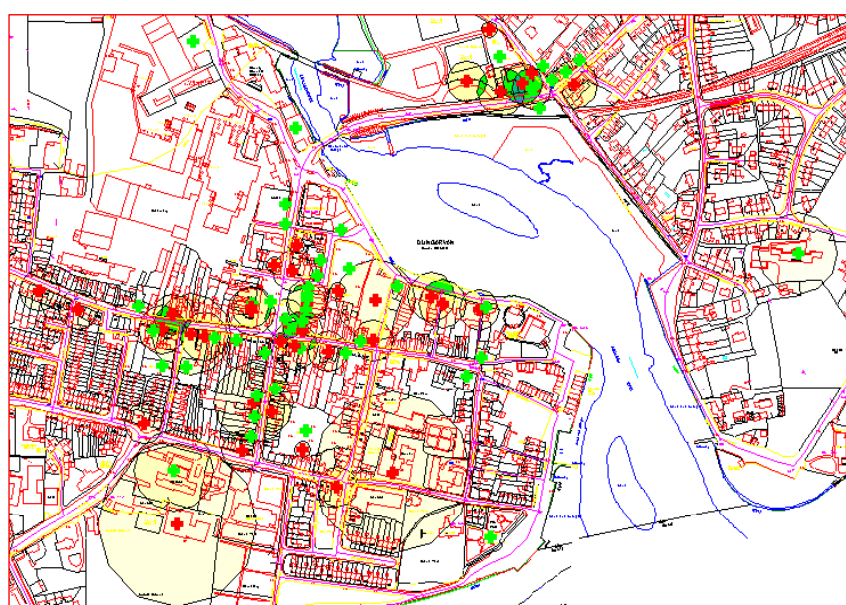
Figure 1.2   **Litter Generation Potential Map in an Urban Area.**

Local authorities are required to carry out a minimum number of each survey type – they can do more to suit own local needs.   Reports are prepared on each survey and forwarded to the LMB for collation/analysis of results; surveys are conducted from May – September each year, to meet the deadline of end October for submission of survey data to the LMB.

Litter Quantification Surveys

Locations for litter quantification surveys are determined by each local authority, using the Litter GIS software package and/or local knowledge as indicated above - the objective is to select locations that, when survey results are aggregated, give the most typical breakdown of litter composition in that local authority's area. Local authorities will carry out a minimum of 600 surveys or 4 to 15 surveys each.

In all, the litter quantification surveys identify eight broad categories of litter:

- cigarette related litter,
- packaging litter (i.e. takeaway, glass, metal, paper, plastic),
- food litter,
- paper litter (e.g. bank slips, bus tickets, newspapers, magazines etc.),
- plastic litter (i.e. non packaging litter e.g. plastic cutlery, toys etc.),
- deleterious litter (e.g. dog fouling, nappies, needles, syringes etc.),
- bulky litter (e.g. household appliances, furniture, etc.), and
- miscellaneous litter (i.e. items not covered by the other categories e.g. twine, clothes, fabrics etc.).

Litter Pollution Surveys

Locations for litter pollution surveys are identified using maps produced by the Litter GIS software package as follows:

- "high risk" locations (i.e. in town and city centres, near fast food outlets, outside schools etc),
- random locations - chosen by a random selection tool under the litter GIS, and
- locations chosen by local authorities (based on local knowledge).

Local authorities will carry out a minimum of over 4000 litter pollution surveys each year (usually between May and September), as shown in the Table 1.1:

	Type of Local Authority		Minimum Number of Surveys to be Completed by all local authorities	Percentage of Total Number of Surveys to be Completed
		Number of Surveys (ranging from small to larger local authorities)		
1.	City Councils	50-350	745	18%
2. **3.**	Borough Councils & Town Councils	20-50	1,470	36%
4.	County Councils	25-125	1,842	46%
	ALL AUTHORITIES		**4,057**	**100%**

Table 1.1   **Numbers of Litter Pollution Surveys to be undertaken annually.**

Local authorities have the discretion to carry out additional surveys at locations and frequencies of their choice.

The litter pollution survey results are expressed as a litter pollution index for the areas surveyed, ranging in value from 1 to 5, as follows:

1.   Unpolluted i.e. litter free;

2.   Slightly polluted;

3.   Moderately polluted;

4.   Significantly polluted; and

5.   Grossly polluted i.e. level of litter expected after a major sporting or entertainment event.

Examples of these area cleanliness ratings are set out in the Appendix to this Report.

1.2   Benefits of System

The data produced by the system surveys will allow local authorities to gauge

- the extent and severity of litter pollution in each local authority area;
- the types, most likely sources and causes of litter;
- 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.

1.2.1   Benchmark phase – Litter Quantification and Pollution Surveys 2002/2003

The initial series of surveys allow local authorities to establish "benchmark" assessments of the extent and composition of litter pollution in their areas; comparison of future survey results with the benchmark surveys will allow progress to be measured. In this way, analysis of survey data will enable each local authority to assess the effectiveness of its litter management strategies on an ongoing basis and ensure the optimum allocation of its resources to tackle litter.

Thus, the National Litter Pollution Monitoring System is an environmental management tool that, when fully implemented, will enable local authorities to tackle litter more effectively, by providing a framework for consistent and accurate self-assessment by local authorities – "if you can measure the litter problem, you can manage it". The System will also consolidate all litter-related data held by local authorities into a single, standardised and documented format; it will be an essential tool for monitoring litter pollution and local authority progress in tackling it.

1.2.2   Local Authority Progress with System Implementation

According to the most recent information available to the Department, a total of 85 local authorities have begun implementation of the Monitoring System. Of those, 46 have carried out, or are in the process of carrying out, their "benchmark" litter surveys. The remaining 39 local authorities are in the process of identifying and mapping the potential litter generators in their areas; completion of these stages will allow local authorities to proceed to carry out their litter surveys. The 5 local authorities that have yet to commence are expected to do so by end 2003.

1.2.3   Litter Management Plans

Another key element of the system has been the assessment by the LMB of all local authority litter management plans adopted under the Litter Pollution Act, 1997; local authorities are required to review such plans every 3 years. The assessments help ensure a consistently high standard of litter management plans as a basis for future local authority action against litter.

1.2.4   LGCSB GIS Software Package

A Geographical Information System (GIS) package is a computerised mapping technique that allows for the visualisation of large amounts of spatial information. The use of a GIS system is a most suitable method to underpin local authority implementation of the national monitoring system because of the flexibility offered by the system and the fact that many local authorities already employ GIS.

The LGCSB developed a Litter GIS package, which allows local authorities to

- implement key mapping activities, and
- identify survey locations

as part of the national monitoring system set-up in their areas.

The GIS package also allows local authorities to map a number of other important aspects of their litter management planning, as follows:-

- the location of all litter bins,
- cleansing and litter warden routes,
- premises which have been the subject of prosecutions / convictions,
- the locations of litter control areas,
- the location and scores of all their litter surveys.

As such, a GIS package forms a key element of local authority litter management planning.

1.3   Conclusion

The National Litter Pollution Monitoring System is an innovative method that will enable local authorities to manage litter in a more systematic and structured manner.   The information gathered will provide local authorities and the Department with essential data to facilitate decision making in relation to litter management planning at local and national levels.

CHAPTER 2: NATIONAL RESULTS

2.1   Litter Quantification Survey Results

2.1.1   Litter Quantification Survey Analysis

To date Litter Quantification Survey results for 31 out of 90 local authorities have been returned and analysed. The local authorities that have returned results are detailed in Table 2.1.

Clare County Council
Carlow County Council
Dun Laoghaire Rathdown County Council
Fingal County Council
Galway County Council
Leitrim County Council
Monaghan County Council
Offaly County Council
Roscommon County Council
Sligo County Council
South Dublin County Council
Waterford County Council
Westmeath County Council
Cork City Council
Dublin City Council
Galway City Council
Limerick City Council
Waterford City Council
Athlone Town Council
Ballinasloe Town Council
Birr Town Council
Carrickmacross Town Council
Carrick on Suir Town Council
Castleblaney Town Council
Clones Town Council
Dungarvan Town Council
Ennis Town Council
Kilrush Town Council
Longford Town Council
Monaghan Town Council
Trim Town Council

Table 2.1   **Local authorities that have returned Litter Quantification Survey results.**

The local authority survey results were returned to the Litter Monitoring Body for collation and analysis. The main categories of litter pollution are set out in Figure 2.1, with a

comparison of the litter composition in each local authority type contained in Figure 2.2. A breakdown of the constituents in each category of litter pollution is set out in Figure 2.3.

Litter Composition across all Local Authorities Types

- Cigarette Related Litter 53.87%
- Food Related Litter 19.83%
- Packaging Litter 19.04%
- Paper Litter 4.02%
- Miscellaneous 1.25%
- Plastic Litter 1.09%
- Deleterious Litter 0.65%
- Bulky Litter 0.26%
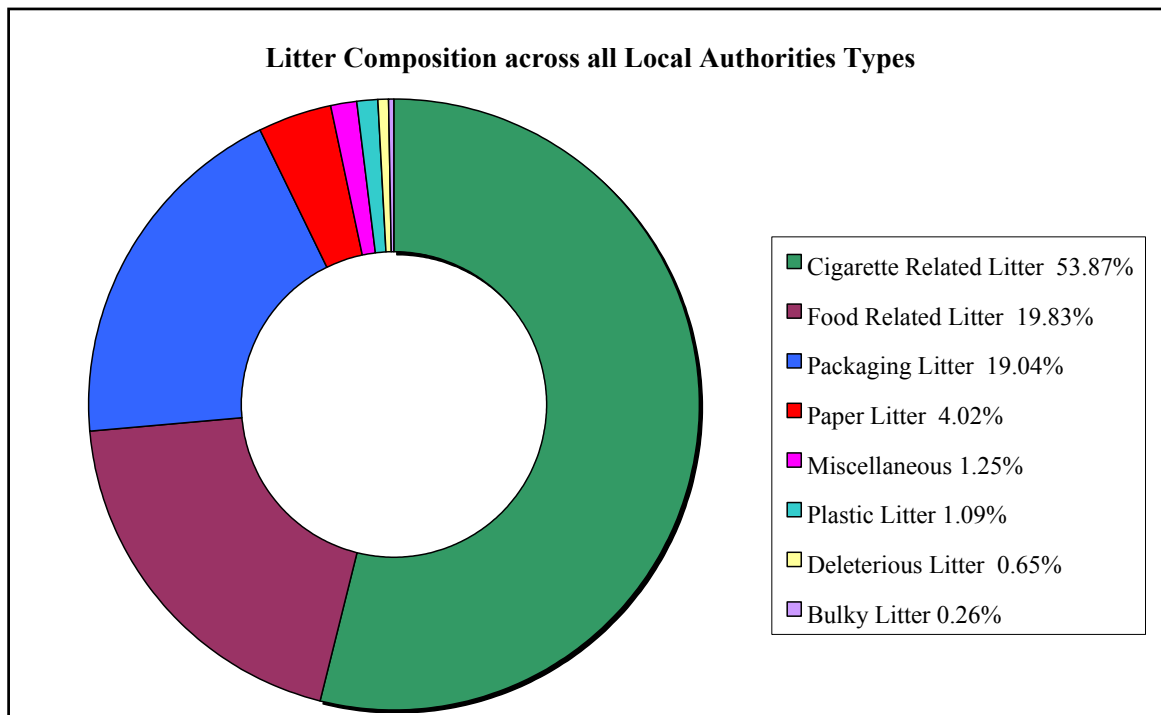
Figure 2.1   **The composition of litter broken down into main categories.**
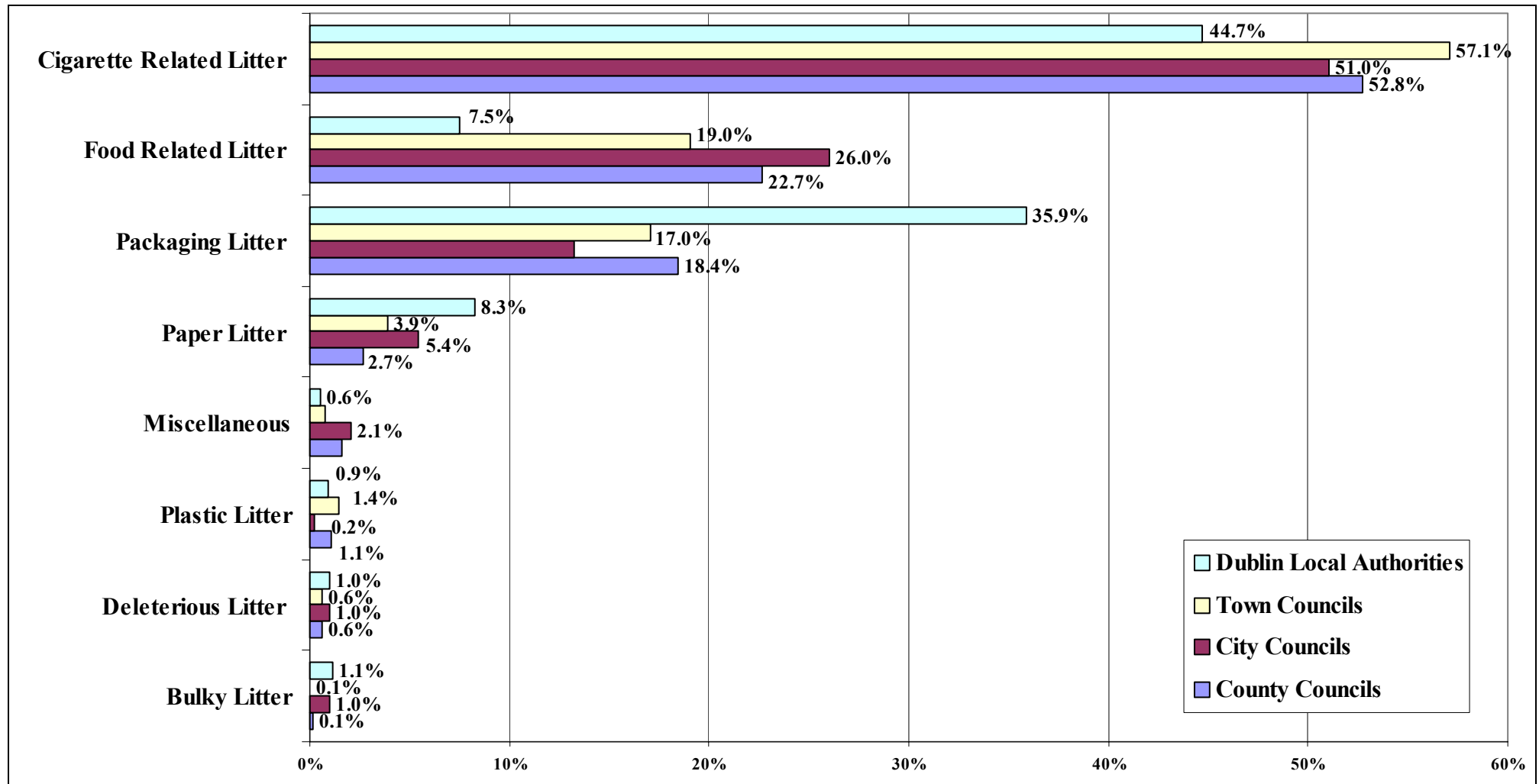
Figure 2.2   **A comparison of litter composition between local authority types.[1]**

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[1] Percentages are rounded to one decimal place, therefore totals for each category of local authority may not add to exactly 100%. The Dublin Local Authorities are Dublin City Council, Fingal County Council, South Dublin County Council and Dun Laoighaire Rathdown County Council. Those local authorities are also included, as appropriate, in City Council and County Council results.

Food Related Litter

- ◼ Chewing Gum 18.49%
- ◼ ruit/ vegetables 0.29%
- ◼ Remnants of confectionery food items 0.28%
- ◼ Bread/ biscuits 0.26%
- ◼ Fast-food remnants 0.25%
- ◼ Other food items 0.25%

Packaging Litter

- ◼ Plastic Packaging 6.63%
- ◼ Paper Packaging 5.72%
- ◼ Takeaway Packaging 3.17%
- ◼ Metal Packaging 2.40%
- ◼ Glass Packaging 1.12%

Deleterious Litter

- ◻ Dog fouling 0.53%
- ◻ Other deleterious items 0.05%
- ◻ Nappies 0.04%
- ◻ Municipal Hazardous Waste (e.g. paint, solvents) 0.02%
- ◻ Needles and syringes 0.01%
- ◻ Feminine hygiene products 0.00%

Bulky Litter

- ◻ Household refuse in bags 0.17%
- ◻ Other large items 0.06%
- ◻ Appliances (e.g. fridge) 0.02%
- ◻ Furniture 0.01%
- ◻ Scrap cars 0.00%

Paper Litter

- ◼ Tissues 0.94%
- ◼ Receipts 0.81%
- ◼ Tickets (e.g. bus, lottery) 0.78%
- ◼ Other paper items 0.71%
- ◼ Bank slips 0.28%
- ◼ Flyers and posters 0.24%
- ◼ Newspapers 0.17%
- ◼ Letters, envelopes and cards 0.06%
- ◼ Magazines/ brochures 0.03%

Plastic Litter

- ◼ Plastic items(Non packaging) 1.09%

Cigarette Related Litter

- ◼ Cigarette ends 44.91%
- ◼ Matches 5.43%
- ◼ Cigarette boxes and wrappers 2.93%
- ◼ Matchboxes and lighters 0.60%

Miscellaneous

- ◼ Miscellaneous Litter Items 1.25%

Detailed Litter Composition at a National Level
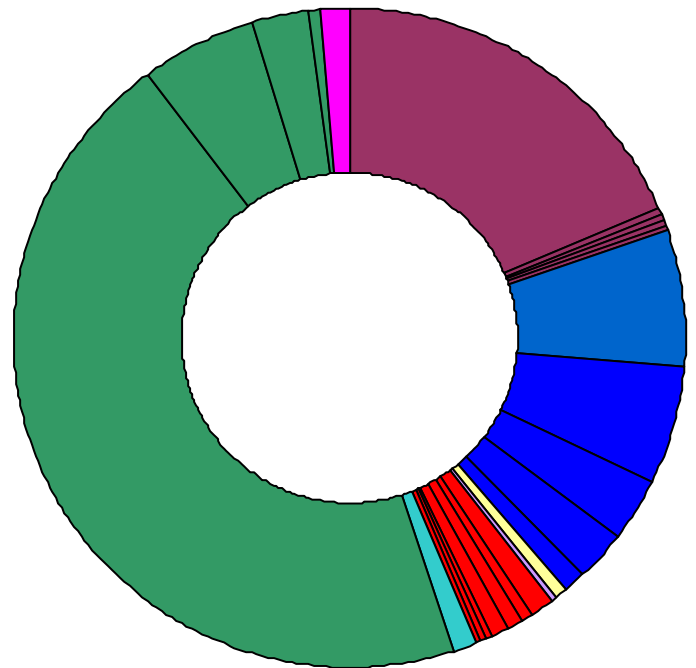
Figure 2.3   **Detailed analysis of litter composition at a national level (individual percentages total 100%)**

Packaging litter accounts for 19.04% of all litter items nationally. This category of litter can be broken down further into the constituent types of packaging set out in Table 2.2.

Packaging Litter Composition	Percentage of Packaging Litter
Bags and wrappers	14.04%
Beverage Cans - Non-alcoholic	5.61%
Plastic Bottles	5.60%
Bubble-wrap	5.58%
Beverage Bottles - Non-alcoholic	4.00%
Beverage Cans - Alcoholic	3.43%
Drinks cartons	3.07%
Drink cups	2.61%
Plastic film	2.40%
Tin foil (not sweet wrappers)	2.15%
Bags	1.88%
Bags - shopping bags	1.70%
Beverage Bottles - Alcoholic	1.67%
Cardboard	1.52%
Boxes	0.63%
Other metal litter items	0.60%
Aeroboard	0.60%
Lids (e.g. from bottles, jars)	0.55%
Bags - other (e.g. fertiliser)	0.31%
Food cans	0.24%
Jars and other containers	0.18%
Plastic sheeting (e.g. silage)	0.14%
Metal drums	0.01%
Other paper packaging	22.37%
Other plastic packaging	19.11%
Total	**100%**

Table 2.2   **Breakdown of Packaging Litter**

2.1.2 Litter Quantification Survey – Main Findings

Cigarette Related Litter
- By quantity, it can be seen in Figure 2.1 that cigarette related litter constitutes the highest percentage (53.87%) of litter at a national level;
- Cigarette butts were 44.91%% of the total litter recorded during the surveys; and
- The highest percentages of this litter type were observed in the Borough Councils and Town Councils (57.1%), whereas the Dublin Local Authorities exhibited the lowest percentage (44.7%).

Food Related Litter
- Food related litter accounted for 19.83% of the total litter count;

- The majority of this litter category was chewing gum, which accounted for 18.49% of the total litter composition nationally; and
- City Councils exhibited the highest percentage of this litter type (26.0%) whereas the Dublin Local Authorities had a substantially lowest percentage recorded for food related litter (7.5%).

Packaging Litter

- Packaging litter accounts for 19.04% of all litter items nationally;
- Apart from miscellaneous packaging, the largest component of packaging litter was takeaway bags and wrappers, which amounted to 14.04% of the total amount of packaging litter, found on the streets during the Litter Quantification Surveys;
- Beverage cans comprise 9.04 % of packaging litter, the breakdown between non alcoholic and alcoholic is 5.61% and 3.43% respectively;
- Glass beverage bottles constitute 5.67% of packaging litter, the breakdown between non alcoholic and alcoholic is 4.00% and 1.67% respectively;
- 5.60% of packaging litter comprised plastic bottles;
- Bubble wrap consists of 5.58% of packaging litter;
- The Dublin Local Authorities had higher levels of packaging litter recorded (35.9%) compared to the City Council category, which had the lowest levels of packaging litter (13.2%) compared to other local authority types.
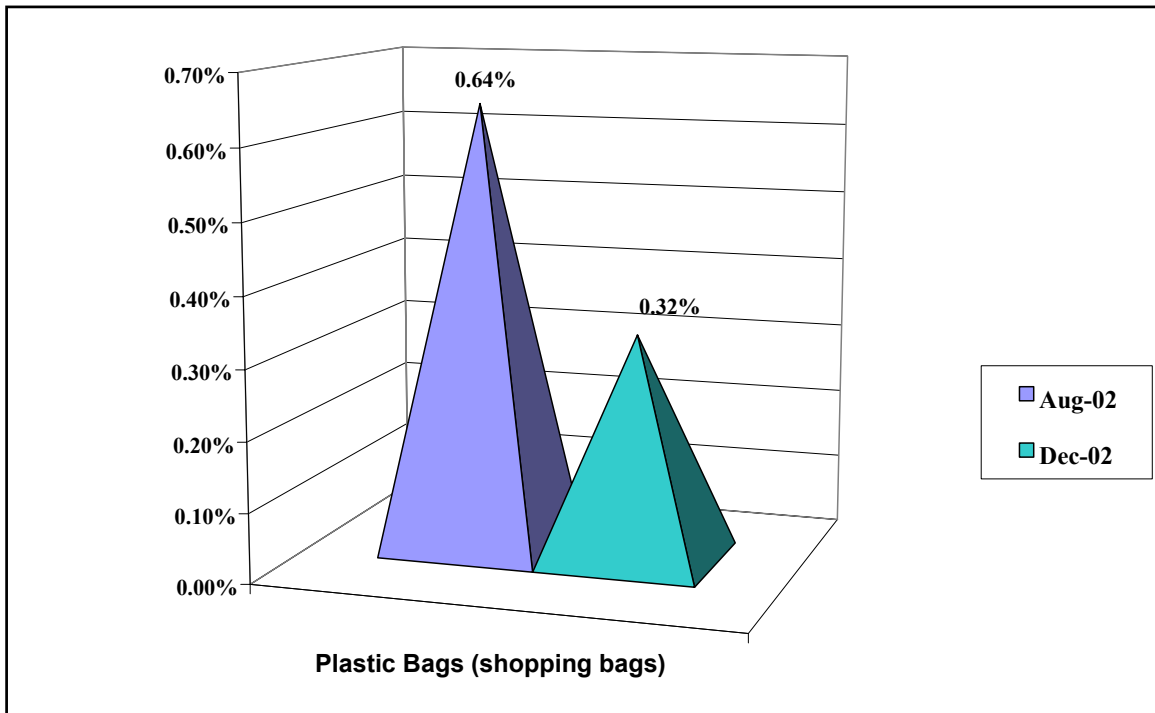
Figure 2.4   **Plastic Bags as % of National Litter Composition**

The graph in Figure 2.4 serves to highlight how the National Litter Pollution Monitoring System may be used to measure the impact of certain anti litter measures. Monitoring the % change in the constituent elements of litter pollution at national or local level over time allows conclusions to be drawn on the effectiveness of national or local anti-litter strategies. Take, for example, the impact of an economic instrument such as the plastic bag levy.   Prior to the introduction of the levy in March 2002, it was estimated that 1.3

billion shopping bags were issued annually, as a consequence of which plastic bags ended up as a very visually intrusive form of litter pollution.   Based on data from retailers and revenue collected from the levy the DoELG estimates that since the introduction of the levy, , the number of plastic bags issued has reduced by over 90%.   The most recent surveys data available from the monitoring system shows that plastic bags constitute approx. 0.3% of litter pollution nationally, compared to an estimated 5% prior to the introduction of the levy.

2.2 Litter Pollution Survey Results

2.2.1 Litter Pollution Survey Analysis

The 31 local authorities that have submitted results to the Litter Monitoring Body to date are detailed in Table 2.3. The results are presented in Figure 2.5.

Carlow County Council
Clare County Council
Dun Laoghaire Rathdown County Council
Fingal County Council
Galway County Council
Leitrim County Council
Monaghan County Council
Offaly County Council
Roscommon County Council
Sligo County Council
South Dublin County Council
Waterford County Council
Westmeath County Council
Cork City Council
Dublin City Council
Limerick City Council
Waterford City Council
Athlone Town Council
Ballinasloe Town Council
Birr Town Council
Carrickmacross Town Council
Castleblayney Town Council;
Clones Town Council
Dungarvan Town Council
Ennis Town Council
Kilrush Town Council
Longford Town Council
Monaghan Town Council
Trim Town Council
Tullamore Town Council

Table 2.3   **Local authorities that have submitted Litter Pollution Survey results to date.**

The Litter Pollution Survey indicates the extent and severity of litter pollution within local authority areas. The severity of litter pollution is measured using the Litter Pollution Index (LPI) which is a scale from 1 to 5 as described below:

1. **Unpolluted**
2. **Slightly Polluted**
3. **Moderately Polluted**
4. **Significantly Polluted**
5. **Grossly Polluted**

The graph in Figure 2.5 illustrates the Litter Pollution Survey results to date in terms of the LPI for such surveys for all local authorities. The results are relevant as they highlight relative trends; however, they do not represent national figures as not all local authority results are included.

National Litter Pollution Index Results for all Local Authorities Types

	1	2	3	4	5
% of Surveys	5.50%	42.58%	39.66%	10.37%	1.89%

Litter Pollution Index
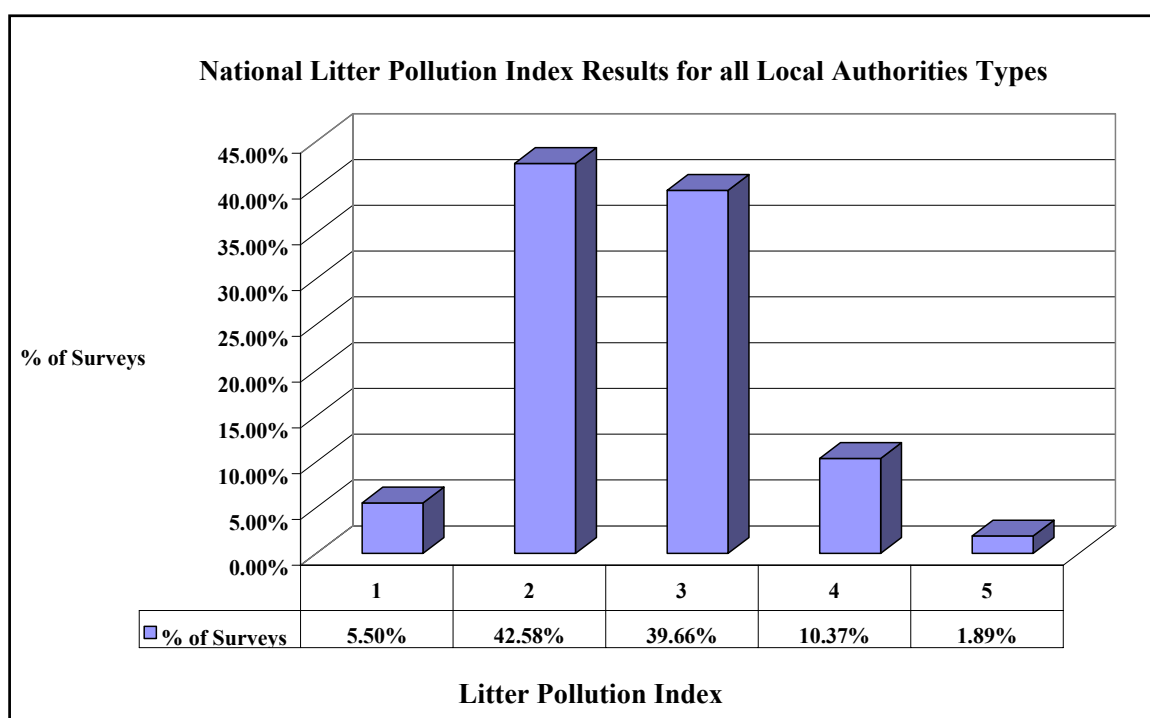
Figure 2.5   **National litter pollution survey results in all local authorities**

Comparision of Litter Pollution Index (LPI) Across Local Authority Type

	1	2	3	4	5
County Councils	3.9%	39.0%	42.5%	12.3%	2.4%
City Councils	10.3%	54.6%	31.9%	2.7%	0.6%
Borough Councils & Town Councils	2.7%	47.0%	31.9%	16.8%	1.6%
Dublin Local Authorities	6.0%	37.8%	44.1%	10.1%	2.0%

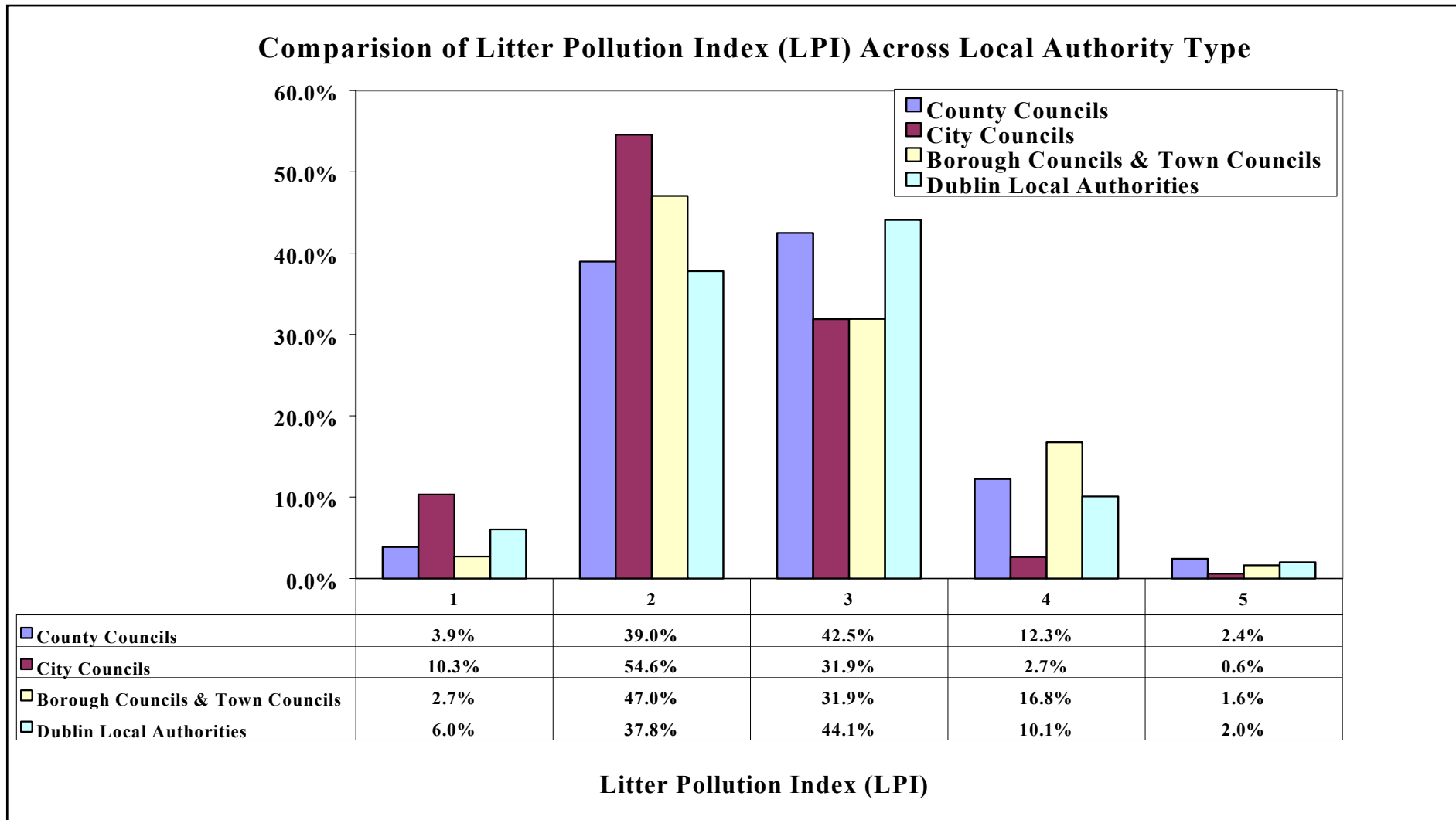**Litter Pollution Index (LPI)**

Figure 2.6   Comparison of Litter Pollution Index results from all local authority types.

Figure 2.5 illustrates the severity of litter pollution for all local authorities that returned results. The results show that 5.5% of all surveys returned had a LPI of 1, which indicates a litter free area. The remaining surveys results are spread across the remaining categories of LPI indicating various degrees of litter pollution. Grossly polluted areas indicated by an LPI of 5 were observed in less than 2% of surveys locations.

Figure 2.6 highlights the comparison of LPI across all local authority types.

The results contained Figure 2.5 and 2.6 are the first set of comprehensive results returned to the Litter Monitoring Body. Although they do not represent National Results as only 31 of 90 local authorities returned results, trends may be observed from the results. It can be seen in Figure 2.5, that at across all local authority types that LPI 1 and LPI 5 are observed in lower percentages. The percentage of LPI 1 observed in City Councils is higher than in the other local authority types, this is most likely due to higher cleansing frequencies. Regarding the frequency of LPI 5 there is a slightly higher frequency of LPI 5 in County Council areas. This is probably due to fly tipping and dumping in rural areas that would give rise to an LPI 5. It is shown in Figure 2.10 that there is a correlation between the LPI 5 ranking and fly tipping which is the main causative factor associated with this ranking.

As the system is in the development stage, methodologies are being reviewed as part of an ongoing review/audit of the system. The system has an external audit built in order to ensure the accuracy of the data. It should be noted that the system is designed to monitor improvement over time and to this end the results will be more meaningful in following years when the data can be compared to previous years and to the baseline year to determine trends and measure progress.

2.2.2 Causative Factors of Litter Pollution

During the Litter Pollution Surveys, surveyors are asked for observations on the primary causative factors of litter pollution. The main causative factors are set out in Figure 2.7, ranked according to the % of surveys in which they have been identified as a factor.
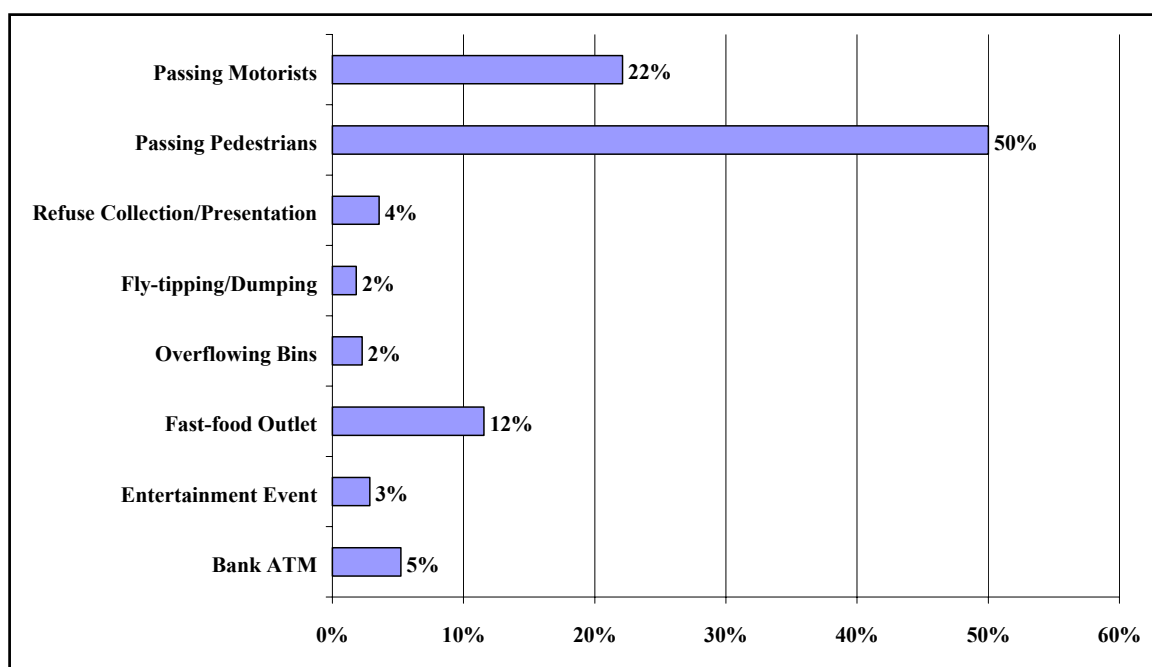
Figure 2.7   **Causative Factors of Litter Pollution across all local authority types.**

From the graph, it can be seen, for example, that passing pedestrians were identified as a cause of litter in 50% of all litter pollution surveys. For each survey, there are usually more than one causative factor for 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 is presented in the graph in Figure 2.8. Furthermore the mechanisms by which litter may be dispersed are presented in Figure 2.9. Weather conditions is included as a distribution mechanism but not as an actual causative factor, as weather although it may contribute to litter pollution is not a source of litter pollution.

TES are examining the possibility of introducing a more comprehensive list of causative to produce more specific data. This will be circulated to local authorities for the 2003 surveys.
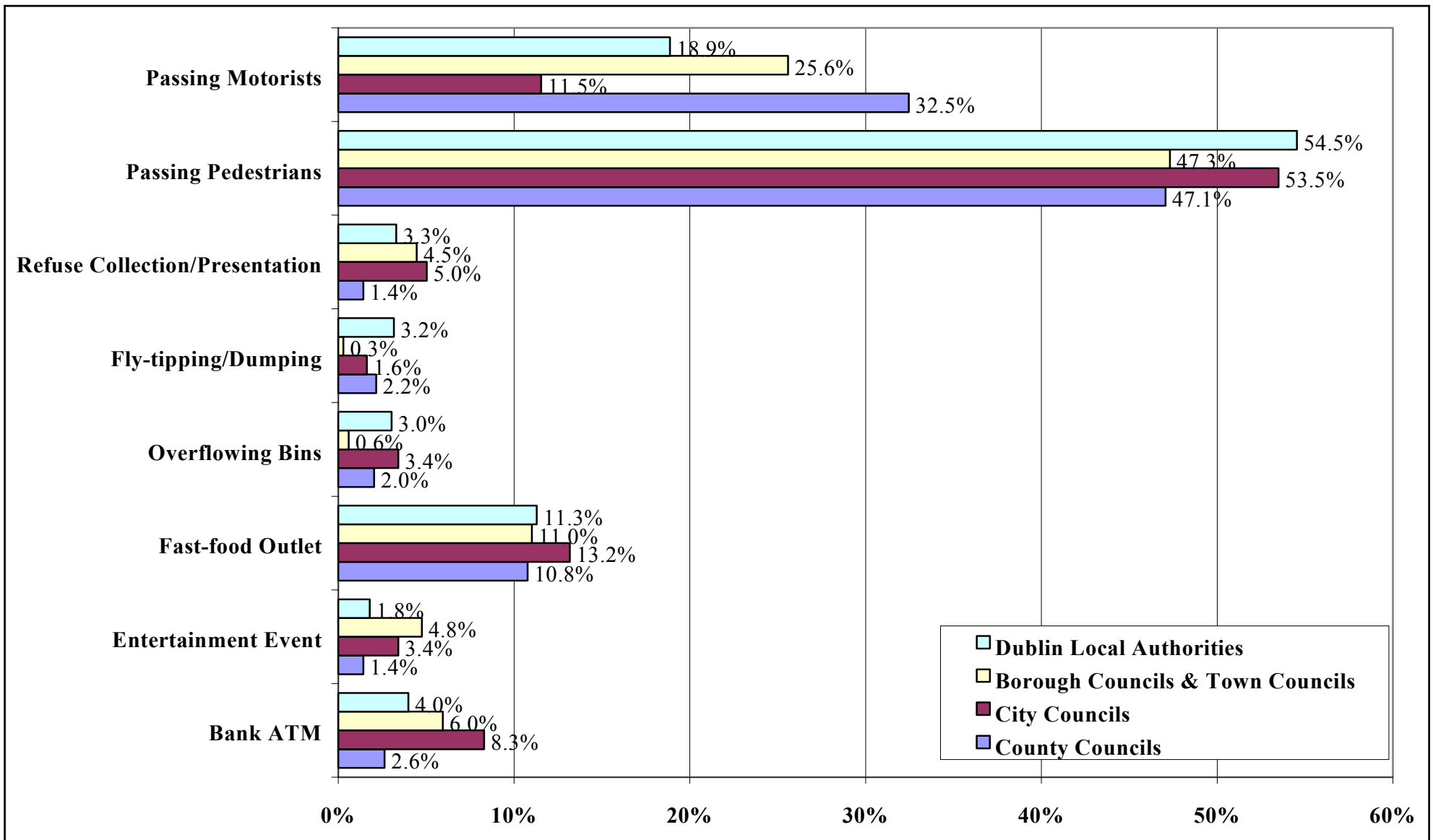
Figure 2.8   **A graph of the causative factors of litter pollution within all local authority types**
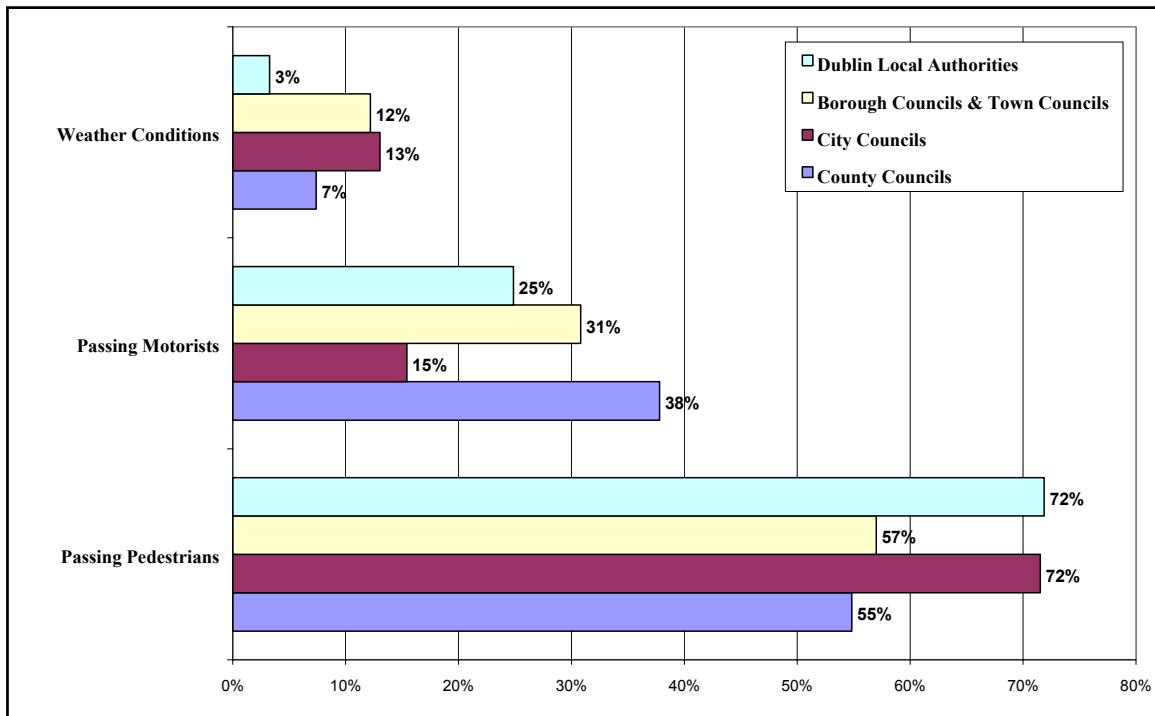
Figure 2.9 **A graph of the comparison of mechanisms by which litter pollution may be dispersed.**
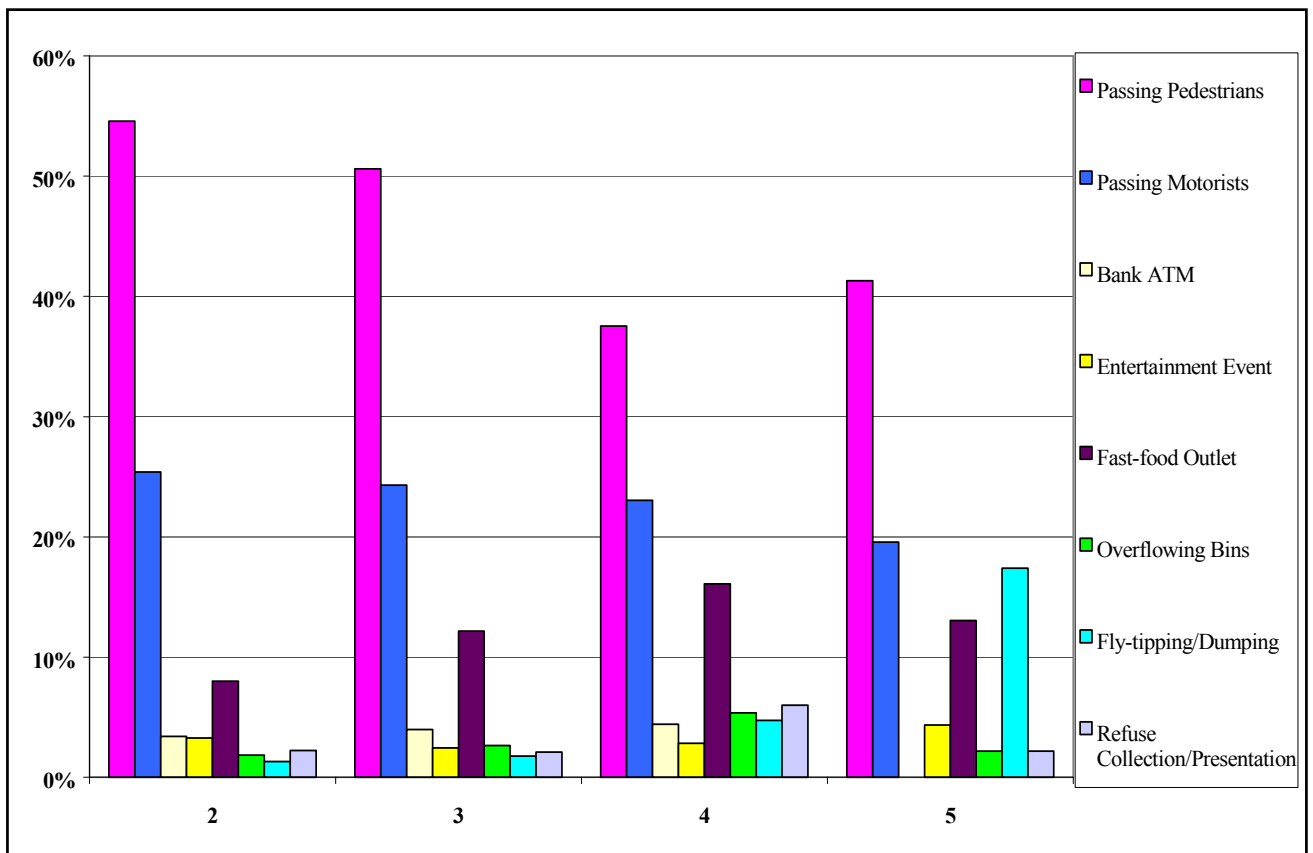
Figure 2.10 **A comparison of causative factors of litter pollution within each Litter Pollution Index category.**

This graph contained in Figure 2.10 highlights the causative factors categorised by Litter Pollution Index (LPI). The causative factors vary with the LPI. Fly tipping is a very obvious causative factor in the Grossly Polluted Category (LPI 5).

2.2.3   Litter Pollution Survey –Main Findings

- The Litter Pollution Index results are presented in Table 2.4. This table highlights the percentage breakdown of each Litter Pollution Index category across all types of local authority.

Litter Pollution Index	Description	Percentage of Surveys
1	Unpolluted	5.50%
2	Slightly Polluted	42.58%
3	Moderately Polluted	39.66%
4	Significantly Polluted	10.37%
5	Grossly Polluted	1.89%

Table 2.4   **Percentage breakdown of Litter Pollution Index results.**

- The majority of areas surveys were rated either LPI 2 (slightly polluted) or LPI 3 (moderately polluted).

- Grossly polluted areas accounted for 1.89% of all areas surveyed.

- The main causative factors identified in the Litter Pollution Surveys, in order of significance, were as follows:

  - Passing pedestrians (50%)
  - Passing motorists (22%)
  - Fast food outlets (12%)
  - Bank ATM (5%)
  - Refuse Collection/Presentation (4%)
  - Entertainment events (3%)
  - Fly tipping (2%)
  - Over flowing bins (2%)

- In City Councils, the primary causative factors were as follows:
  - Passing pedestrians (53%)
  - Fast food outlets (13%)
  - Passing Motorists (11%)
  - Bank ATMs (8%)

- In the case of County Councils, the most significant causative factors were:
  - Passing pedestrians (47%)
  - Passing Motorists (32%)

- Fast food outlets (11%)

- Results submitted from Borough Councils and Town Councils indicate that the principal causative factors are as follows:

    - Passing pedestrians (41%)
    - Passing Motorists (26%)
    - Fast food outlets (11%)
    - Bank ATMs (6%)
    - Entertainment Event (5%)

- As pollution severity increases, the significance of certain causative factors changes. This is most notable in the LPI 5 category, which represents grossly polluted areas, where the significance of Fly tipping/Dumping increases significantly

CHAPTER 3: RECOMMENDATIONS FOR ACTION

3.1 Action on Specific Components of Litter

The breakdown of litter composition is presented in Table 3.1 and Figure 2.1 highlights the breakdown of litter composition in all local authority types. It should be noted that the results of the Litter Quantification Surveys are based on a litter count; although different litter items have varying impacts e.g. a cigarette butt is less visually intrusive than a plastic bag to an observer, nevertheless the action of dropping those items of litter is equal.

Litter Category	Percentage
Cigarette Related Litter	53.87%
Food Related Litter	19.83%
Packaging Litter	19.04%
Paper Litter	4.02%
Miscellaneous	1.25%
Deleterious Litter	0.65%
Bulky Litter	0.26%
Plastic Litter	1.09%

Table 3.1 **National Litter Composition**

3.1.1 Cigarette Related Litter.

Cigarette related litter, in particular, cigarette butts (44.91% of the total count) are the single most common item of litter on Irish streets. The key elements of tackling this component of litter pollution is through the development of an integrated campaign, which includes education, enforcement, and the provision of receptacles designed for this particular type of litter. Some of the reasons behind this litter being prevalent on our streets include

- the public not being aware of cigarette butts being classed litter items;

- the lack of specifically designed receptacles placed in appropriate locations;

- increase in the number of people congregating outside business premises to smoke due to the fact that many buildings are smoke free zones; and

- the nature of the litter is that people do not want to carry it in their hands until they locate a suitable bin.

It is important to separate the issue of cigarette smoking as a health issue and as an environmental issue. It is important that measures taken to combat the issue of cigarette related litter should in no way be seen to condone cigarette smoking. However, as an environmental issue measures must be put in place to remedy the situation.

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Provision of Cigarette Receptacles on Bins

One of the main contributing factors to the presence of large amounts of cigarettes related litter on our streets is the lack of specially fitted bins. It is therefore recommended that each local authority should assess the quantity of these specifically designed bins within their functional areas and examine the requirement for such bins to be installed.

The strategic location of these bins is vital to their success in removing this type of litter from the streets. It is recommended that locations be chosen in order to maximise the effectiveness of these bins. For example, a project by the City of Stonnington (Australia) showed that there is a significant reduction in cigarette butt litter (approximately 50%) when a bin is located as close as possible to a tram stop where commuters can easily see the bin and can freely move toward it.

Local authorities should ensure that cigarette receptacles are located outside their premises in order to lead by example. State companies and Government Departments should be specifically targeted at a national level.

Personal Cigarette Bins

Local authorities could advocate the use of personal cigarette ashtrays as part of an awareness raising campaign. A strategy which is endorsed by Clean Up Australia to combat cigarette related litter called BUTTsOUT consists of a fully integrated education, publicity and disposal campaign including posters, tee-shirts, display boxes and manual. As part of this campaign the use of personal ashtray is promoted. The personal ashtray is made from fire resistant plastic, traps in smoke and smell and is re usable; an example of a personal ashtray is shown in Figure 3.1. BUTTsOUT UK Ltd. in conjunction with the Australian company BUTTsOUT Pty Ltd., manufacture, supply, promote and distribute the BUTTsOUT personal ashtrays and all related support materials required to run fully integrated publicity, education and disposal programs. The UK company may be accessed on www.buttsout.co.uk, at the time of this report the cost of a personal ashtray was stg£1.35 (which may decrease with size of orders).

source 'www.buttsout.net'

Figure 3.1   **Example of personal ashtray.**

Involvement of the Business Community

Smokers congregating outside particular buildings to smoke usually results in an increase in the number of cigarette related litter items being found outside that building. Owners and occupiers of premises should be targeted by local authorities to

make them aware of their responsibilities under the Litter Pollution Act 1997. Not only can businesses be fined for the presence of litter but also it can negatively affect their corporate image.

At a local level Litter Survey Results, in particular Litter Quantification Survey results, could be circulated to businesses to highlight the particular problem of cigarette related litter. Local Chambers of Commerce, Business Associations etc. could also be contacted with results to highlight the problem and encourage change.

Public Awareness Campaign
Lack of awareness regarding cigarette related litter is one of the primary reasons why this type of litter is very prevalent on our streets. People are under the false impression that cigarette related litter is biodegradable and, also due to the small size of the individual components, that cigarette litter is insignificant. In this respect it is recommended that at both national and local levels dedicated campaigns are required to shift the attitude of people with regards to this matter.

Chewing Gum
Chewing gum is a substantial component of litter, comprising 18% of all litter items counted during the Litter Quantification Surveys. There are a number of reasons why this item of litter is very prevalent:

- It is not regarded as litter by the some of the public;
- People do not want to carry it until they reach a bin;
- It is extremely difficult to clean up;
- It is persistent in the environment; and
- There are insufficient specific designed bins on the streets.

Product Change
Chewing gum producers should be contacted at a national level to discuss the possibility of changing their products to become more biodegradable and therefore less persistent in the environment.

Chewing Gum Receptacles
The installation of specifically designed chewing gum bins aids to focus the problem associated with this type of litter. Although chewing gum may be deposited in any litter bin, the presence of clearly marked 'chewing gum bins' would help to change the public perception regarding chewing gum litter. An example of these specifically designed bins is contained in Figure 3.2. The bin featured in this picture is installed in Malahide, Co. Dublin.

Figure 3.2   **Cigarette and chewing gum tray in Malahide (September 2002).**

3.1.2   Packaging Litter

Reduction at Source

In line with the Waste Management Hierarchy, as shown to the right, prevention of waste packaging is the preferred method of reduction of this type of litter from the streets. Therefore, at both national and local levels, encouragement and pressure should remain on producers of waste to examine means of decreasing the amount of packaging on products. Close liaison with REPAK on this matter is recommended.

3.2   Action on Specific Causative Factors

Causative factors are based on the surveyors opinions documented during Litter Pollution Surveys - for example, as indicated in Table 3.2, passing pedestrians where found to be a causative factor of litter pollution in 50% of all Litter Pollution Surveys. The most prevalent causative factors across all local authorities are:

Ranking	Causative Factor	Percentage of Surveys
1	Passing Pedestrians	50%
2	Passing Motorists	22%
3	Fast food Outlets	12%
4	Bank ATMs	5%
5	Refuse collection presentation	4%
6	Entertainment Event	3%
7	Fly Tipping	2%
8	Overflowing bins	2%

Table 3.2   **Ranking of Causative Factor of Litter Pollution.**

3.2.1   Passing Pedestrians and Passing Motorists

Both of these causative factors are broad ranging and are not very specific. Tackling these causative factors requires an integrated approach involving public education programmes, awareness raising and enforcement.

Regarding passing motorists, a national programme on all National Routes could be implemented to raise public awareness of, and prevent, litter pollution on national routes. The implementation of such a programme could be overseen by a national agency such as the National Roads Authority. This would ensure consistency across the country ensuring standardisation at a national level.

Specific measures to target more defined causative factors, which also encompass passing pedestrians and passing motorists, are discussed in the following sections.

3.2.2   Fast Food Outlets

Take Away/Fast Food Outlets are attributed as being one of the primary causative factors of litter pollution. There are a number of measures, which could be taken in order to tackle this source of litter pollution.

Branding
Fast food outlets should make their packaging recognisable. This could mean putting their name, contact telephone number and address on their packaging or branding the packaging to make it distinct.   This would enable local authorities to target the more prolific polluters with special measures under the Litter Pollution Act, 1997 to prevent and control litter and enable the outlets take their own remedial action based on the easy recognition of their own branded packaging.

Packaging Materials

Fast food outlets should be encouraged to move from non-biodegradable packaging to more biodegradable packaging as well as reducing the amount of packaging used. A levy could target non-biodegradable packaging from a future date if voluntary measures by the fast food sector fail to achieve worthwhile results.

CCTV

The problems associated with fast food outlets are often more serious in the evenings and at weekends when the availability of cleansing staff and litter wardens is limited. Fast food outlets that are re-offending premises under the Litter Pollution Act 1997, could be monitored using CCTV. Although this may be an expensive method of tackling the problem, where CCTV is already in place it could be a practical means of targeting premises that are causing serious litter pollution.

3.2.3 Overflowing Bins

Another widespread causative factor in contributing to litter pollution is overflowing bins. Overflowing bins may be attributed to

- A lack in the number of bins;
- The wrong type of bin;
- Misplacement of bins in strategic locations; and
- Infrequent emptying of bins.

Litter Bin Survey Using Litter GIS

Local authorities should survey the number and location of litter bins in their areas to ensure the adequate provision and placement of bins and that bins are emptied regularly so as not to be a source of litter of themselves.

One method of overcoming placement issues is to map the exact location and number of bins using the Litter GIS. The location and type of bin i.e. differentiating between bins with cigarette receptacles, multi purpose bins to encourage separation/recycling of litter items and conventional bins, can be mapped using the system. Once the exact locations are logged in the GIS, areas that require bins can be then be readily identified. By using this method bins can be placed in strategic positions for example next to bus stops, near take away etc. in order to maximise their effectiveness. Cleansing routes may also be mapped on the GIS. This would aid to identify 'black spot' areas that are not being cleansed on a regular basis.

Private Bins

Businesses should be made aware of their obligations under Section 6 of the Litter Pollution Act, 1997 to ensure that overflowing bins outside their premises are not causing a litter pollution problem.

3.2.4   Bank ATMs

The Litter Pollution Survey results for 2003 highlight Bank ATMs as being a contributing factor to litter pollution. Possible actions regarding these premises include:

- Banks should be encouraged not to provide advice slips. Receipts should only be issued by ATMs which are found indoors;
- As with other premises the Banks should be made aware of their duties under the Litter Pollution Act 1997. Local authorities could target Banks as a particular problem within their area by directly contacting them though a anti litter information campaign which may contain details of Litter Pollution Survey results in order to highlight them as being a causative factor of litter pollution; and
- Banks should ensure that adequate litter receptacles are provided adjacent to the ATM and that these are maintained and emptied regularly.

3.2.5   **Refuse Collection/Presentation**

Local Authorities
Local authorities should assess the efficiency of their waste collection systems to ensure that their operations do not give rise to litter.

Use of Bins for Domestic Waste
The use of bins for domestic waste has grown in the past few years, this should be continued by both local authorities and private operators. An increasing number of local authorities have now introduced segregated waste collections in order to increase recycling rates.

Waste Management Act 1996
Waste collection services are increasingly being provided by commercial concerns. In order to ensure that these operations are carried out in an environmentally sound manner, under section 34 of the Waste Management Act 1996 commercial collectors of waste will require a permit from the relevant local authority.   A permit may be refused or revoked where a person commits, or has committed, specified offences. Furthermore, local authorities are empowered under section 35 to make bye-laws controlling the presentation of waste for collection within their areas. Bye-laws could, for example, require the segregation and separate collection of recyclable wastes (e.g. paper, glass, metal) and could also be used to combat litter by restricting the hours of presentation of waste or the manner in which it is presented.

3.3   Other Recommended Actions

3.3.1   Financial Instruments

Similar to the Plastic Bag Levy other items of packaging could be levied in order to reduce the number of packaging and other litter items found on the streets. The revenue generated by this levy could be ring fenced for cleansing or other environmental activities. This would not only provide extra funding for anti-litter

activities but would encourage the public to act responsibly with regards to litter. The DoELG are currently examining other items on which levies may be applied.

3.3.2   Enforcement

Increased enforcement of the Litter Pollution Act (1997) is required to combat litter pollution. This can be achieved in a number of ways:

- Increasing the frequency of fines issued to polluting premises. The Litter Pollution Survey results highlighted that Fast Food Outlets and Bank ATMs are major causative factors of litter pollution. It is recommended that those two particular types of premises be tackled individually;
- In order for penalties to be effective people should be made aware of the fines and must believe that there is reasonable chance of being fined. The fear of being fined is the single most effective tool for those people who are unlikely to respond to other forms of litter abatement approaches; and
- Continuing co operation of An Garda Síochana is essential to support local authority anti-litter enforcement efforts.

3.3.3   Public/Private Partnerships

TASCQ
Another mechanism which could be employed to increase anti litter measures is to more actively involve the business sector through public/private partnerships. A successful example of this is TASCQ (Traders in the Area Supporting the Cultural Quarter) which is a scheme running in Temple Bar, Dublin. This scheme involves businesses in the area contributing financially to the maintenance and promotion of the area.   For further information on TASCQ, the Temple Bar Properties website may be accessed www.temple-bar.ie. Regarding litter management TASCQ has funded a number of initiatives, which directly improve on the environment of the area. These include:

- The purchase and operation of a cleansing truck which operates seven days a week;
- Environmental monitoring including cleanliness monitoring;
- A Greening truck which provides extra cleansing support;
- Waste categorisation studies in the local businesses; and
- Glass recycling services.

BID Schemes
Business Improvement District Schemes (BIDS) have been in operation in USA and in a number of other countries for some time. Essentially, they provide the legal mechanism through which a group of business owners or private retail owners agree by majority to raise a tax to provide supplementary local government services within their defined districts. Currently, there are over 1,000 BIDS in operation in the USA.

Essentially BIDS involve:-

- a number of businesses in a particular defined area coming together and asking a local authority to levy a special charge on their behalf on all businesses in the area

- the local authority collecting the charge and the business community using the proceeds to pay for improvements and increased services in the BID area. Works could include street cleansing, security, urban landscaping urban renewal measures etc.
- before a charge could be levied, a majority of the business community in the BID area would have to signal agreement to the BID Scheme.
- The charge would have to be paid by all businesses in the area - no freeriders.

A legal framework is being drafted in the Department to provide for BIDS along the above principles.

Advantages of BIDS proposal:

- It would be a good example of self help
- It could upgrade the level of services in an area provided by local authorities and others and lead to improvements in the urban environment and the business of a particular part of a city or town.
- Invoking a mandatory charge, irrespective of willingness to pay, would eliminate the possibility of freeloaders.
- It would be a partnership between the Business community and the local authorities

City Neighbourhood Competition
The City Neighbourhood competition – to be launched soon by Minister of State Pat the Cope Gallagher - is also a good example of a partnership type initiative.   This competition will apply in the 5 city councils and will focus on community involvement and effort to improve the physical appearance, environment and general attractiveness of the 5 cities.

The City Neighbourhood competition will also support the participation of the 5 city councils, who are competing for the first time, in the 2003 IBAL National Litter League, another national anti-litter initiative co-funded by IBAL and the Department and which will run to the end of the year.   Co-operation between the various sectors at local level is essential for a successful performance in the League.   In time, the City Neighbourhood competition, with its strong emphasis on communal effort and on litter eradication, can become an integral part of the city councils' anti-litter strategies.

Such approaches as outlined above are in line with the Government's *Litter Action Plan* – the national anti-litter strategy – which calls on local authorities to develop "local partnership" arrangements with local communities and the business and commercial sectors to promote public awareness and participation in local clean up and awareness actions, to improve the local environment. The "local partnership" approach based on action at local level is regarded as the optimum model for tackling litter pollution, especially in urban areas, where the problem is most acute.

It is the recommendation of this report that more initiatives such as the ones described be introduced to areas to improve litter management and instil a sense of responsibility in the business sector, residents and the public that use the space.

The recently launched Neighbourhood Clean Up initiative by Minister Cullen, aims to improve litter management with city environments.

3.3.4   Litter Management Plan/National Litter Pollution Monitoring System

Under the Litter Pollution Act, 1997, local authorities are required to adopt Litter Management Plans as their "blueprint" for tackling litter pollution in their areas. The legislation prescribes the specific minimum components of a Litter Management Plan, requiring information on litter prevention and control activities and the setting of appropriate objectives and targets for the three-year period covered by the Plan.

The National Litter Pollution Monitoring System provides data regarding litter composition and extent in each local authority area. Local authorities should incorporate the information gathered through the monitoring system into their Litter Management Plans. Local authorities can use the surveys data to set targets/performance indicators for their litter prevention and control activities, using the data from subsequent litter surveys to measure progress in attaining these targets, on an ongoing basis. In this way, the overall goal of the national monitoring system of encouraging continual improvement in local authority performance can be realised.

To aid the implementation of the National Litter Pollution Monitoring System the website www.litter.ie was developed. This allows access to a section of the TES Consulting Engineers website which is dedicated to the NLMPS. These web pages provide information on the system, documentation relevant to the system and details regarding litter management best practice.

Currently, the development of a dedicated, stand-alone website and ways to improve the functionality of the website are being explored.

3.3.5   Litter Pollution Act, 1997

Many of the litter problems identified in this report are attributable to business, commercial and other operations located on premises. Local authorities should regularly remind owners, occupiers and persons in charge of premises of their general duties under sections 3 and 6 of the Litter Pollution Act, 1997 to prevent and control litter.

Local authorities are also empowered to issue notices under sections 9, 15,16, 17 and 20 of the Act to take more effective targeted action against potential litter generators and offenders:

- the owner/occupier of any place that is heavily littered requiring the person to clean up and take measures to prevent a recurrence (section 9),

- the operators/occupiers of mobile outlets regarding the location and operation of such outlets to prevent and control litter (section 15)

- the occupiers of certain types of premises specified in the Act - such as fast food outlets, or shops, or other business/commercial enterprises - whose activities tend particularly to create litter, to take ongoing measures to keep the vicinity of their premises free of litter (section 16),

- the promoters/organisers of major events requiring measures regarding litter prevention and control (section 17), and

- occupiers to remove articles and advertisements on, or any defacement of, certain structures (section 20).

It is an offence under the Litter Pollution Act, 1997 not to comply with such notices.

Section 16 notices, in particular, enable local authorities to target a wide range of operations with a propensity to create litter.   More widespread use of these powers by local authorities would result in significant progress by local authorities in tackling many of the categories of litter pollution identified in this report by targeting the sources of this litter.

CHAPTER 4- SYSTEM AUDIT/LITTER POLLUTION INDEX

4.1 System Audit

As the national litter monitoring system is a self-assessment mechanism, the condition of a given local authority's functional area is assessed and recorded by employees of that local authority itself. Such a self-monitoring system is more problematic to design than one that involves the monitoring of one party by another, second party. For the results of a self-monitoring system to be credible, it is necessary to have an external audit mechanism.

In the case of the National Litter Pollution Monitoring System, this condition has been satisfied by the appointment of an independent Litter Monitoring Body, whose task it is to verify the monitoring results and ensure their continuing accuracy and quality.

The Litter Monitoring Body visited three local authorities:

- Waterford County Council;
- Dublin City Council; and
- Dungarvan Town Council.

Each element of the system was examined:

- Identification of Potential Litter Generators;
- Litter Generation Potential Maps;
- Litter Quantification Survey; and
- Litter Pollution Survey.

During the course of the audit, the Litter Monitoring Body reviewed all documentation, verified photographs and interviewed local authority staff to identify problems encountered during system implementation. The purpose was to incorporate the information gathered into the system in order to continuously improve the functionality and accuracy of the system.

4.2 Recommendations/Conclusions

The audit proved that those local authorities were for the most part implementing the system's methodologies correctly in accordance with the Monitoring Manual. As mentioned, however, one of the functions of the audit is to suggest areas where the system may be improved in order to improve the accuracy and functionality of the system. The following sections highlight recommendations made by the Litter Monitoring Body and local authorities arising from the audit.

4.2.1 Adjustment to Litter Pollution Index Calculation

The main adjustment to the system was a correction incorporated into the calculation of the Litter Pollution Index.

The Litter Pollution Index is based on two judgments made by the surveyor:

1. **Indicator Items**
2. **Area Cleanliness Rating**

Indicator Items.

The surveyor is asked to assess the presence of 10 indicator items. The surveyor indicates the level at which each indicator item is present, assigning each item a value as follows:

Ranking	Score
Not Visible	0
Visible at Close Inspection	2
Visible	3
Obvious	4
Extremely Obvious	5

The sum of all the indicator items is then calculated. This is a figure between 1-50. To give an example, if there are no indicator items present then the sum would be 0 and if all indictor items were "Extremely Obvious" then the sum would be 50. Table 4.1 contains an example of this calculation.

	absent	Close Inspection	score	Visible	score	obvious	score	Extremely Obvious	score
Plastic Packaging (includ shopping bags)	0		0		0		0		0
Dog Fouling	0		0		0		0		0
Bottles/Cans	0		0		0		0		0
Household Refuse	0	1	2		0		0		0
Papers/ Cardboard	0		0		0	1	4		0
Chewing gum	0		0		0		0		0
Cigarette-related Litter	0		0		0		0	1	5
Food Residues	0		0	1	3		0		0
Paper Packaging	0		0		0		0		0
Takeaway Packaging	0		0		0		0		0
SUM	0		2		3		4		5

Pollution Rating   **14**   **using the above** table max 50

Table 4.1   **Example of a calculation based on indicator items.**

Area Cleanliness Rating

There are five Area Cleanliness ratings ranging from 1 to 5, based on prescribed photographs as shown in the Appendix.

Calculation of Litter Pollution Index

The information from both exercises is used to calculate the LPI which is a figure from 1 to 5. The formula is as follows.

$$\frac{(Pollution\ Rating/10)+1)+(Cleanliness\ Rating)}{2} = \textbf{LPI}$$

The resultant figure is rounded up to the nearest whole number - the maximum number is five. In the case the resultant figure is greater than 5 and less than 5.5, the number is rounded down to 5.

Correction of Formula

A correction was made following the system audit by adding 1 to the Pollution Rating in the calculation of the LPI formula.

This correction removes the opportunity for a LPI of 1 to be given to a survey region which has indicator items present. In theory, the surveyor should not assign a Cleanliness Rating of 1 to a survey area if there are indicator items present; in reality, it was observed that surveyors occasionally assigned an Area Cleanliness Rating of 1 to areas that contained Indicator Items - the correction to the formula removes that possibility and therefore ensures a truer representation of the situation regarding Litter Pollution.

Example No 1
Small amount of Indicator Items present

Pollution Rating =6
Cleanliness Rating=1

6/10 = .6+1 = 1.6

$$\frac{1.6 + 1}{2} = \frac{2.6}{2} = 1.3\ (rounded\ up\ to\ 2) = \textbf{Litter Pollution Index =2}$$

Example No 2
No Indicator Items present

Pollution Rating =0
Cleanliness Rating= 1

0/10 = 0+1 = 1

$$\frac{1 + 1}{2} = \frac{2.}{2} = 1 = \textbf{Litter Pollution Index =1}$$

4.2.2   Litter Pollution Survey Methodology

It was evident that there is a need for additional training in certain cases. In particular, this was evident in the application of the Litter Pollution Survey methodology. The following are areas that require more attention:

- Hot spot rating not completed correctly, there may be confusion with the Area Cleanliness Rating;

- Area Cleanliness Rating not assessed and completed on questionnaire. It is vital that this is assessed and filled in, as Litter Pollution Index results can not be generated without this;

- Causative factors not identified in all surveys;

- Conclusion/Comment section not completed in all cases. This is vital as it provides feedback regarding possible solutions to the litter problem in a given area;

- At least one photograph is required for each survey region - in some cases photographs were not available to be examined

In order to remedy the above the audit recommendations will be presented to local authority staff at the Annual Litter Seminar.

4.2.3 Information Circulation

It is vital that all members of local authority staff involved with the National Litter Pollution Monitoring System are aware of the documentation that accompanies the system. This information comprises:

1. National Litter Pollution Monitoring System Manual *(available on TES website)*
2. National Litter Pollution Monitoring System Manual Addendum (FAQs)
3. Litter Management Plan Assessment May 2000
4. Annual Report May 2000
5. Annual Report February 2002 *(available on TES website)*
6. Information Updates #1 - 5 *(available on TES website)*

In order to ensure that local authorities are fully aware of any amendments to the system and to inform all staff of system results as well as provide a forum for discussion on the National Litter Pollution Monitoring System, a National Seminar is being held in May 2003.

CHAPTER 5: IMPLEMENTATION PROGRESS

5.1 Introduction

In order to assess local authority progress with system implementation a telephone survey was undertaken in April/May 2003.

To date – May 2003, a total of 31 local authorities have returned survey results to the Litter Monitoring Body. The number of local authorities in a position to undertake surveys in Summer 2003 is 46.

The number of local authorities that have appointed Litter Monitoring Officers has increased significantly. Liaison between Litter Monitoring Officers and the Litter Monitoring Body is ongoing.

Local authority progress in implementing the National Litter Pollution Monitoring System is set out in more detail in Figures 5.1 to 5.4 below.
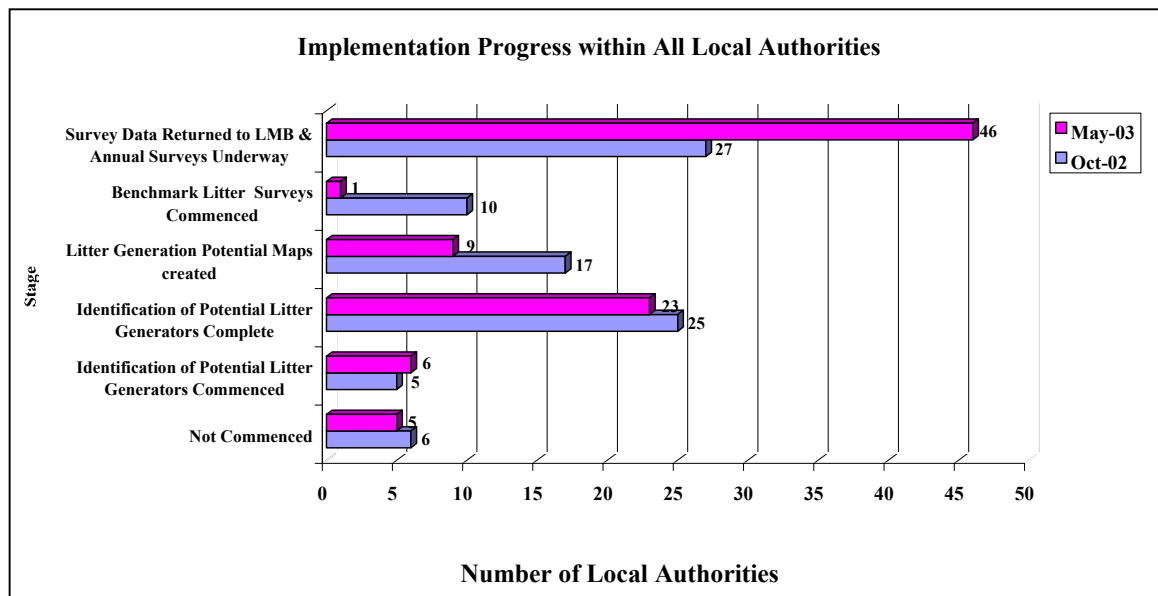
Figure 5.1   **The stages of implementation within all local authorities**
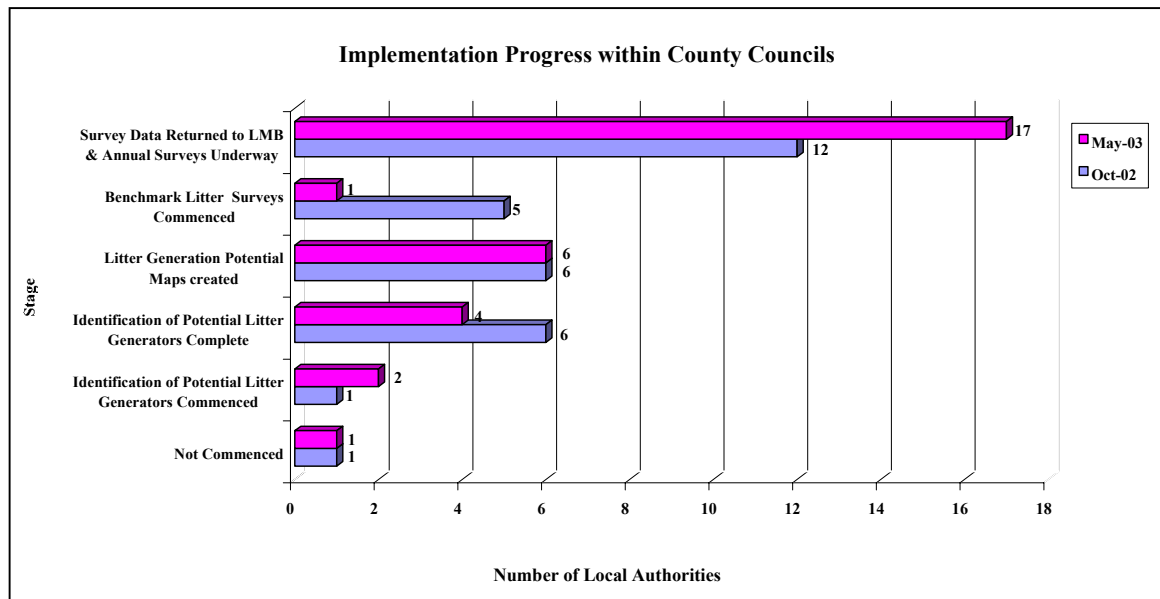
Figure 5.2   **The stages of implementation within County Councils**
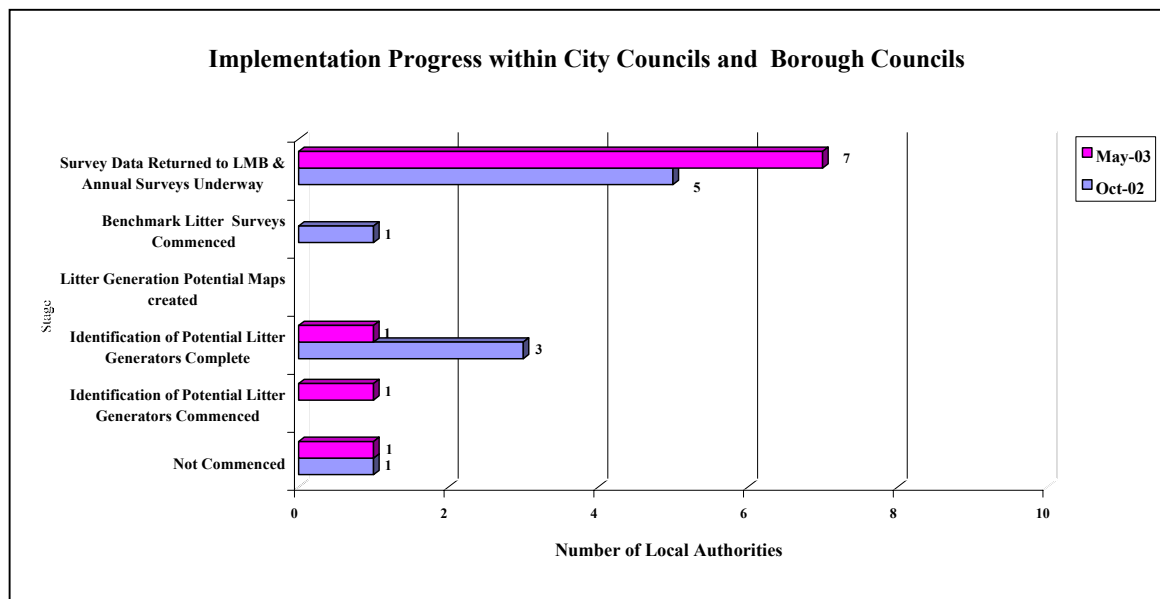
Figure 5.3   **The stages of implementation within City Councils and Borough Councils**
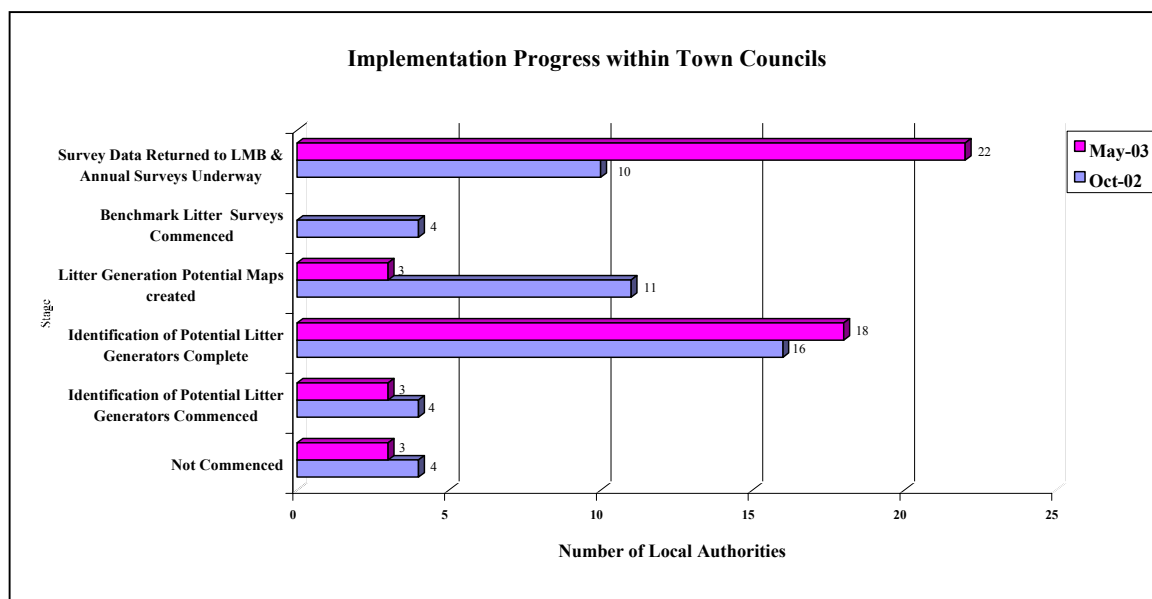
Figure 5.4   **The stages of implementation within Town Councils**

5.2   Summary of Results

To date, a total of five local authorities had yet to commence implementation of the system, as follows:

- Donegal County Council;
- Buncrana Town Council;
- Bundoran Town Council;

- Drogheda Borough Council; and
- Nenagh Town Council.

The above five local authorities explained that they had been slow in implementing the system for the following reasons:

➢ Staff changeovers within local authorities have impeded implementation of the system. It resulted in many of those that were familiar with the litter monitoring system and who had received GIS training, being moved to other duties.   Now that the majority of staff changeovers are completed, progress should be made in the near future; and

➢ Lack of resources was a significant factor in implementing the system, especially in Donegal.

The above reasons were stated in the October 2002 Implementation Survey and remain the reasons currently given for impeding progress.

Ongoing liaison with TES and the Local Government Computer Services Board (LGCSB) will ensure that those local authorities that have yet to commence will do so in the near future.

Progress has been made by those local authorities that had already commenced the Litter Monitoring System, with a total of 31 local authorities with Litter Surveys returned to the Litter Monitoring Body to date by comparison to 17 local authorities with Benchmark Litter Surveys returned in March 2002. It was apparent from the telephone survey that the majority of local authorities were keen to complete phase II of the system as soon as possible.

Progress in implementation can be attributed to a number of factors including:

- Additional GIS training is being provided on request by the LGCSB on the GIS component of the system;

- The number of local authorities that have appointed Litter Monitoring Officers has increased significantly;

- TES is available to provide additional training to those who require on site instruction.

- The implementation survey allows direct contact between the Litter Monitoring Body and all local authorities thus encouraging those not implementing the system to begin the process;

- Continuous telephone support given by TES Consulting Engineers and the LGCSB to all local authorities in relation to queries and problems regarding any aspect of the system and implementation of the system within local authorities;

- DoELG Circular to Directors of Services in July 2002 which provided details regarding progress to that date; and

- Information Update #6 which was distributed to all local authorities in November 2002, providing further examples of Best Practice from around the country, which featured case studies from

  - Dublin City Council;
  - Sligo County Council;
  - Roscommon County Council;
  - Fingal County Council; and
  - Limerick City Council.

APPENDIX: SURVEY METHODOLOGY

AN OVERVIEW OF SURVEYS METHODOLOGIES

Litter Quantification Survey

The Litter Quantification Survey is used to identify the constituent elements of litter pollution in a survey area; a minimum number of these surveys is undertaken annually by each local authority.   The authorities may conduct additional surveys at their own discretion, as often as they require.

Each survey, which takes approximately 20 minutes to complete, involves the counting of all of the litter items occurring within a 50m stretch of roadway or footpath. The minimum number of surveys required of any local authority is 4, whereas the maximum is 15. The results of the surveys are logged on a standardised form (see page iv) and logged in Excel database - see Table 2 on pages vii and viii to this appendix - and the national results analysed and reported upon by the Litter Monitoring Body.

It is a prerequisite of the system that the Litter Quantification Survey is performed in an area providing the largest sample size. The largest sample size is obtained by

- surveying at the locations with the highest risk of pollution (i.e. the clusters or hotspots identified by the Litter Generation Potential Maps or known black-spot areas), and
- by surveying as long after the last cleansing sweep, as possible, to maximise the chances of a large sample size.

Local authorities will undertake a minimum of 594 Litter Quantification Surveys in a variety of locations, including urban and suburban areas, national and non national routes. If there is a popular beach present within the local authority's functional areas, it must be surveyed at least once. Local authorities have been advised that the surveys should be carried out evenly across the range of survey types found within their functional areas.

The first round of the Litter Quantification Surveys are "benchmark" surveys and will form the basis for comparison with all subsequent survey results. The data obtained during the surveys is used to compile statistical data on 8 broad categories of litter pollution. These data can subsequently be analysed in greater detail to identify the sources or origin of the different litter items. In this way, the information obtained from these surveys nationwide will allow the authorities to identify the litter sources most prevalent in their specific local context, and to ascertain the effectiveness of their targeted anti-litter measures.

Litter Pollution Surveys

The monitoring system must also identify the extent and severity of litter pollution nation-wide. The method employed involves the completion of a number of Litter Pollution Surveys. These surveys are effectively visual inspections of a given location to determine the pollution levels within it.

The information obtained from these surveys, which are carried out between the months of May and September inclusive each year, allows local authorities to identify litter blackspots and track changes in pollution levels arising from altered litter management practices.   These surveys also allow for the development of an

accurate and detailed overview of national litter pollution levels, and also allow changes in those pollution levels to be identified.

A minimum of 4,057 Litter Pollution Surveys are carried out each year, as shown below, with the first series of surveys setting the "benchmark" against which all future survey results will be compared.

	Type of Local Authority	**Minimum Number of Surveys to be Completed**	**Percentage of Total Number of Surveys Completed**
1.	City Councils	745	18%
2.	Borough Councils and Town Councils	1,470	36%
4.	County Councils	1,842	46%
	ALL AUTHORITIES	**4,057**	**100%**

Table 1   Numbers of Litter Pollution Surveys required as a minimum on an annual basis.

The numbers indicated above are the minimum requirement for the country, with the authorities having discretion to undertake additional surveys at the frequencies and locations of their choice. The national results of the Litter Pollution Surveys will be used to develop an improvement matrix for the authorities – with each authority being measured only against its last series of surveys, and not against any other authority.

The locations for Litter Pollution Surveys involve a combination of the following:

1.   **High Risk Areas,**
2.   **Random Locations; and**
3.   **Discretionary Surveys.**

High Risk Areas
The High Risk Areas are those that have the most potential to create litter. The GIS package identifies these "high risk" locations and has the ability to list them in ranking order within a functional area. It is in these high risk areas (or hot spots) that **40%** of the Litter Pollution Surveys are performed**.** The high risk area is pinpointed and then the survey location drawn in digitally using the Survey Management Tool.

Random Surveys
A further **40%** of the assigned number of surveys are generated randomly by the GIS package. As previously described, the survey area is marked in and the surveyors are given the location details.

Discretionary Surveys
The remaining **20%** of the surveys are chosen at the discretion of each local authority in areas that merit observation. The freedom to monitor at locations of their own choice has been included in the sampling regime to ensure that local authorities are given the flexibility to use the Monitoring System as a management

tool that specifically meets local conditions. As with the other survey locations, these are also marked on the map and details given to the surveyor.

Once the areas for the Litter Pollution surveys have been chosen, surveyors are asked to complete a customised questionnaire (see pages ix and x) ; this questionnaire requests information not only on the presence of key indicator items but also on the possible causes of the litter, and the surveyor's opinion as to potential solutions. The survey area is comprised of a 50m section of path or roadside verge and each survey takes a few minutes to complete.

A Litter Pollution Index is calculated for each survey location, using a standardised formula – see details below. The data is sent to the Litter Monitoring Body for central analysis and documentation. The national survey results will indicate the percentage of survey locations which were unpolluted, or which exhibited some level of pollution (from low to severe).

The level of litter pollution in each survey site is expressed as a **Litter Pollution Index**. The Index is calculated using a combination of two values:

1. the presence or absence of specific **Key Indicator Litter Items** (e.g. dog-fouling), and

2. an **Area Cleanliness Rating** for each location, using photographs as guidelines. For all grades there is an urban and rural example on which the surveyors judgement should be based – see the examples at the end of this Chapter.

The Litter Pollution Index is then calculated using the results of **1** and **2** above. A description of this calculation is contained in Chapter 4. The Litter Pollution Index ranges from a value of 1 to 5, as described below:

1 Unpolluted
2 Slightly Polluted
3 Moderately Polluted
4 Significantly Polluted
5 Grossly Polluted

A location with a Litter Pollution Index of 1 would be free of litter pollution i.e. a freshly swept street, whereas an area with an Index of 5 would be polluted to the extent expected after a major sporting or entertainment event.

LITTER QUANTIFICATION SURVEY

SURVEY FORM

DED NAME _____

SURVEY LOCATION _____

FROM _____ **TO**_____

SURVEY AREA TYPE

	Town Centre		Suburban Area		Beach		National Route		Non-National Route

Additional Information   _____

WEATHER CONDITIONS
 (e.g. Windy, Fair, Stormy, Raining) _____

SURVEYOR'S NAME   _____   **POSITION**_____

DATE _____ **DAY** _____   **TIME** _____

TIME SINCE LAST CLEANSING _____
MAJOR SOURCES OF LITTER IN AREA
(e.g. specific takeaways, newsagents, schools, passer-by or passing motorists)
_____

Notes:
1.   Only solid litter waste is counted, liquid spills are not included in this survey.
2.   Straw, hay, silage and animal manure (with the exception of dog fouling) are not counted.
3.   For chewing gum, cigarettes and matches a distance of 10m is counted the figures are then multiplied by 5 to estimate amounts for 50m

1.   Food Residues

	Running Count	Total
Bread/ biscuits		
Chewing gum (10m)		
Remnants of confectionery food		
Fast-food remnants (e.g. burgers)		
Fruit/ vegetables		
Other food litter		

2.   Takeaway Packaging

	Running Count	Total
Bags and wrappers		
Drinks cups		

3.   Glass Packaging

	Running Count	Total
Beverage bottles – alcoholic		
Beverage bottles– non-alcoholic		
Jars and other glass containers		

4.   Metal Packaging

	Running Count	Total
Beverage cans - alcoholic		
Beverage cans – non-alcoholic		

Food cans		
Lids (e.g. from jars)		
Metal drums		
Tin foil (not sweet wrappers)		
Other metal packaging items		

5. Paper Packaging (excl takeaway packaging)

Aeroboard		
Bags		
Boxes		
Cardboard		
Drinks cartons		
Other paper packaging items		

6 Plastic Packaging(excl takeaway packaging)

Bags – shopping		
Bags – other (e.g. fertiliser)		
Bubble-wrap		
Bottles		
Plastic film		
Plastic sheeting (e.g. silage)		
Other plastic packaging		

7. Deleterious Litter Items
Dog fouling

Feminine hygiene products		
Hazardous Waste (e.g. paint, solvents)		
Nappies		
Needles/ syringes		
Other deleterious litter		

8. Large Litter Items

Appliances (e.g. fridges)		
Furniture		
Household refuse in bags		
Abandoned cars		
Other large litter items		

9. Non-Packaging Paper Litter

Bank slips		
Flyers and posters		
Letters, envelopes and cards		
Magazines & brochures		
Newspapers		
Receipts		
Tickets (e.g. bus, lottery)		
Tissues		
Other paper litter (non-packaging)		

10. Non-Packaging Plastic Litter
Plastic Items

**11.   Cigarette-related   Litter
          Items**
          Cigarette boxes and wrappers
          Cigarette ends (10m)
          Matchboxes and lighters
          Matches (10m)
12.   Miscellaneous Litter
          Miscellaneous Items

13   Fly-tipping Incidences
          Very Severe (lorry-load)
          Severe (van-load)
          Moderate (bin-load)
          Mild (less than a bin-load)

14. Fragments (Rough Estimate)	Low Impact	Medium Impact	High Impact
Bale ties			
Fabric			
Glass			
Metal			
Paper			
Plastic			
Rubber			
Wood			
Other fragments			

15.   Surveyor Observations

a)   In your opinion, is the litter observed new or old? _____

b)   Did you notice any particular distribution patterns (e.g. fast-food packaging outside a
          particular takeaway)? _____

c)   Please list the litter items which can be associated with a particular premises (e.g.
          supermarket plastic bags or takeaway wrappers)?_____

16.   Surveyor's Signature
a) Signed: _____   b) Dated:_____

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Table 2   Litter Quantification Survey Results Database (MS Excel)

LITTER TYPE	DESCRIPTION				LITTER COUNT	% FOR CATEGORY	% OF TOTAL
Food Residues	Bread/ biscuits				0	0.00%	0.00%
	Chewing Gum				7	33.33%	8.33%
	Remnants of confectionery	food items			6	28.57%	7.14%
	Fast-food remnants				6	28.57%	7.14%
	Fruit/ vegetables				2	9.52%	2.38%
	Other food items				0	0.00%	0.00%
Total Food Residues					**21**	100.00%	
Packaging Items	**Takeaway**	Bags and wrappers			3	100.00%	3.57%
	Packaging	Drink cups			0	0.00%	0.00%
		Total Takeaway Packaging			**3**	100.00%	
	Glass Packaging	Beverage Bottles - Alcoholic			4	100.00%	4.76%
		Beverage Bottles - Non-alcoholic			0	0.00%	0.00%
		Jars and other containers			0	0.00%	0.00%
		Total Glass Packaging			**4**	100.00%	
	Metal Packaging	Beverage Cans - Alcoholic			5	71.43%	5.95%
		Beverage Cans - Non-alcoholic			0	0.00%	0.00%
		Food cans			1	14.29%	1.19%
		Lids (			0	0.00%	0.00%
		Metal drums			0	0.00%	0.00%
		Tin foil (not sweet wrappers)			1	14.29%	1.19%
		Other metal litter items			0	0.00%	0.00%
		Total Metal Packaging			**7**	100.00%	
	Paper Packaging	Aeroboard			0	0.00%	0.00%
	(excld takeaway packaging)	Bags			5	62.50%	5.95%
		Boxes			0	0.00%	0.00%
		Cardboard			2	25.00%	2.38%
		Drinks cartons			1	12.50%	1.19%
		Other paper packaging			0	0.00%	0.00%
		Total Paper Packaging			**8**	100.00%	
	Plastic Packaging	Bags - shopping bags			2	50.00%	2.38%
		Bags - other (e.g. fertiliser)			1	25.00%	1.19%
		Bubble-wrap			1	25.00%	1.19%
		Bottles			0	0.00%	0.00%
		Plastic film			0	0.00%	0.00%
		Plastic sheeting (e.g. silage)			0	0.00%	0.00%
		Other plastic packaging			0	0.00%	0.00%
		Total Plastic Packaging			**4**	100.00%	
Total Packaging Items					**26**		

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Deleterious Litter Items	Dog fouling		1	100.00%	1.19%
	Feminine hygiene products		0	0.00%	0.00%
	Municipal Hazardous Waste (e.g. paint, solvents)		0	0.00%	0.00%
	Nappies		0	0.00%	0.00%
	Needles and syringes		0	0.00%	0.00%
	Other deleterious items		0	0.00%	0.00%
Total Deleterious Litter Items			1	100.00%	
Large Litter Items **(Bulky)**	Appliances (e.g. fridge)		0	#DIV/0!	0.00%
	Furniture		0	#DIV/0!	0.00%
	Household refuse in bags		0	#DIV/0!	0.00%
	Scrap cars		0	#DIV/0!	0.00%
	Other large items		0	#DIV/0!	0.00%
Total Large Litter Items			0	#DIV/0!	
Paper Items (non-packaging)	Bank slips		10	62.50%	11.90%
	Flyers and posters		1	6.25%	1.19%
	Letters, envelopes and cards		3	18.75%	3.57%
	Magazines/ brochures		0	0.00%	0.00%
	Newspapers		1		1.19%
	Receipts		0	0.00%	0.00%
	Tickets		1	6.25%	1.19%
	Tissues		0	0.00%	0.00%
	Other paper items		0	0.00%	0.00%
Total Non-packaging	**Paper Items**		16	100.00%	
Plastic Items (non-packaging)	Plastic items		2		2.38%
Total Non-packaging	**Plastic Items**		2		
Cigarette-related Litter	Cigarette boxes and wrappers		2	11.76%	2.38%
	Cigarette ends		13	76.47%	15.48%
	Matchboxes and lighters		2	11.76%	2.38%
	Matches		0	0.00%	0.00%
Total Cigarette-related	**Litter**		17	100.00%	
Miscellaneous Litter Items	**Total Miscellaneous Litter Items**		1		1.19%
TOTAL NO.OF LITTER ITEMS			84		100.00%

Litter Pollution Survey Questionnaire

DED NAME _____

SURVEY LOCATION _____**FROM**_____**TO**_____*e.g. Main Street No 1 to No 51*

SURVEY AREA DESCRIPTION:

☐ Town Centre	☐ Suburban Area	☐ Beach	☐ National Route	☐ Non-National Route

WEATHER CONDITIONS _____

SURVEYOR'S NAME _____ **DATE** ___/___/____

 DAY_____**TIME**_____

MAJOR SOURCES OF LITTER IN AREA   _____

PHOTO IDENTIFICATION #   _____

HOT SPOT RATING (if known)   _____

1.   INDICATOR ITEMS

Assess the survey area for the presence or absence of the following litter items. It should be noted that although there may be other types of litter on the ground in the survey area, the assessment should be confined to the items listed below. Information on other important, unlisted litter streams observed during the survey should be included in the surveyor's comments (Section 7).

	Visible on Close Inspection	Visible	Obvious	Extremely Obvious
Packaging Litter				
Plastic Packaging (incl shopping bags)				
Paper Packaging				
Takeaway Packaging				
Bottles/Cans				
Other Litter Items				
Household Refuse				
Papers/ Cardboard				
Dog Fouling				
Cigarette-related Litter				
Chewing Gum				
Food Residues				

2.   SURVEY AREA CLEANLINESS RATING

Please rate the cleanliness of the survey area on a scale of 1 to 5, where 1 approximates the cleanliness of a freshly-swept area and 5 would be expected after a major concert, sporting event or festival etc.

	1	2	3	4	5
Survey Area Rating	☐	☐	☐	☐	☐

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3.   LITTER DISTRIBUTION PATTERNS

- Where is the majority of the litter to be found?

Widespread [ ]   **Clusters   Associated   with   Particular Premises** [ ]

If clusters are observed, please specify where they occur (e.g. outside Mc Grath's Takeaway):_____

- Where is the litter located within the survey area?

	Key Locations (Please tick those which apply)	**Ranking** (Indicate which location is the most important for this survey area, using a 1,2,3 scale where location 1 has the largest accumulation of litter)
Path		
Gully		
Road		
Grass Verge		
Trees/ Shrubs		
Adjoining Private Premises		

Other Locations (Please Specify):

_____

4.   LITTER BINS

	Local Authority	Private
- Number of Litter Bins in Survey Area		
- of these number the fitted with an ash tray		
- Number of Full or Overflowing Bins		

5.   ANTI LITTER ACTIVITY

- Are Anti-Litter Advertising/ Warnings Visible?   _____

- When was the last cleansing sweep?   _____

- Was there evidence of private cleansing?   _____

6.   CAUSATIVE FACTORS

Please tick the factors which you believe to be contributing to litter pollution in the survey area.

Key Factors

Passing Pedestrians	
Bank ATM	
Entertainment Event	
Fast-food Outlet	
Overflowing bins	
Passing Motorists	
Fly-tipping/ Dumping	
Refuse Collection/ Presentation	
Weather Conditions	

Other (Please Specify):

_____

7.   CONCLUSIONS

Other comments or observations:

_____

Area Cleanliness Rating 1

Relates to an area, which gives the impression that it has just been freshly swept.

Area Cleanliness Rating 2

This rating would be given to an area which contains small amounts of litter as illustrated below
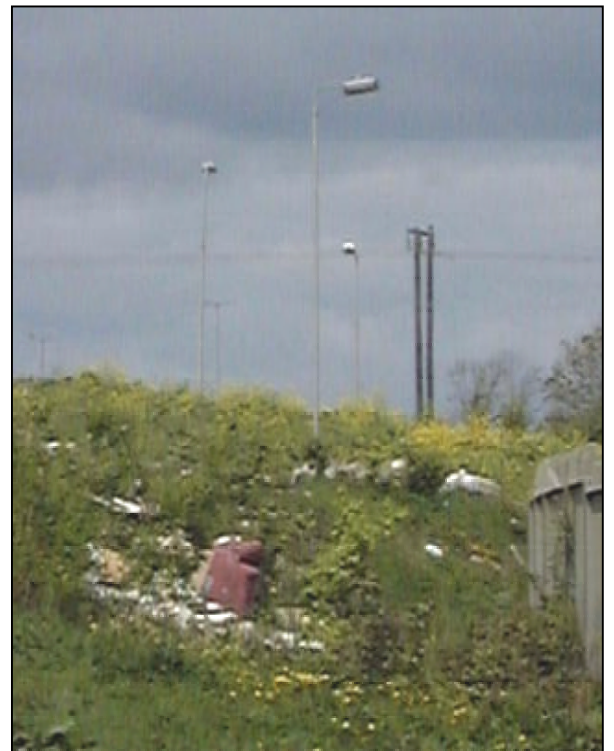

Area Cleanliness Rating 2

Area Cleanliness Rating 3
This is assigned to an area which contains litter items and quantities of litter which quite obvious as highlighted below

Area Cleanliness Rating 3

Area Cleanliness Rating 4

Areas with considerable litter pollution as illustrated below are give a rating of 4

Area Cleanliness Rating 4

Areas with considerable litter pollution as illustrated below are give a rating of 4

Area Cleanliness Rating 5

Areas with considerable litter pollution as illustrated below are give a rating of 5

Area Cleanliness Rating 5

Areas with considerable litter pollution as illustrated below are give a rating of 5