m·e·l waste insights

Three Rivers Litter Composition Analysis

Hertfordshire Waste Partnership

Summary Report January 2021

THREE RIVERS DISTRICT COUNCIL

WasteAware Hertfordshire Partnership

Reduce Reuse Recycle Recover

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Project details and acknowledgements

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Accuracy Statement

Results from the standard M·E·L sampling protocol for compositional analysis can be taken as accurate for each primary material category to within error bands of +/-10% at the 95% confidence level (2 standard deviations), assuming a normal statistical distribution for:

Overall percentage compositional makeup of litter waste collected and sorted as a single bulked sample. At the data entry stage, 1 in 10 parts of data that is inputted are checked with the data sheets and if errors are found all the data is then rechecked

Introduction

Background

Local Authority collected waste in Hertfordshire is collected by ten Waste Collection Authorities (WCAs) from the kerbside and by the Waste Disposal Authority from seventeen Household Waste Recycling Centres (HWRCs).

On behalf of the Hertfordshire Waste Partnership, a compositional analysis detailing the breakdown of all waste and recycling types (kerbside collected residual waste and kerbside dry recycling) was commissioned to cover nine participating districts and boroughs (Watford was not part of this project). Each of the participating authorities also had a compositional assessment of the waste and recycling collected from non-kerbside households using shared or communal bins (flats) as well as waste sourced from litter bins. By assessing all these waste streams from member local authorities, it will be possible to provide compositional estimates for the waste collected throughout Hertfordshire as a whole.

Reporting will be used to inform the development of a number of strategic work plans for Hertfordshire, with data additionally used as a basis to apportion costs related to the management of post-consumer packaging in both the residual waste (including litter) and dry recycling streams to support further dialogue and discussion with respect to possible funding from the Government's new extended producer responsibility regime. Residual waste from eight of the seventeen HWRCs operating throughout Hertfordshire have also been compositionally assessed.

This report is specifically for litter waste generated in the District of Three Rivers. Findings for the kerbside and flats waste collected in this authority will be contained in separate reports.

Three Rivers currently has a combined recycling and composting rate of 64.1% (2019/20) against a Hertfordshire Waste Partnership average of 52.3%. Decreasing the amount of waste sent to be incinerated or to landfill, will help to reduce the release of harmful greenhouse gases into the atmosphere.

As well as giving indications as to the general composition of litter waste, this report also provides observations on the levels of materials that are potentially recyclable when compared to the domestic recycling collection service.

This report presents results from an analysis of litter waste that was sourced, collected and delivered by the local authority.

Objectives

Specific aims of the work were to:

- Understand the general composition of litter waste
- Evaluate the amount of specific materials collected in the litter that could potentially have been recycled
- Determine the proportion of litter-based waste that was formed from packaging

Executive Summary

Key findings

Three Rivers Litter Bin Waste

- Food waste formed 18.5% of the total litter. Of this food waste 80.5% is deemed to be avoidable with 41% of all discarded food still packaged.
- Animal waste was a main component of the collected litter forming 13.7% of the total collected.
- Paper items made up 8.5% of the litter waste; 53% of this was of a type considered recyclable. Just 10% of litter paper waste was classified as packaging.
- Card and cardboard items made up 9.6% of the litter waste; 28% of this was of a type considered recyclable. Around 26% of litter card and cardboard waste was classified as packaging.
- Plastic items made up 12% of the litter waste; 38% of this was of a type considered recyclable. Around 66% of litter plastic waste was classified as packaging.
- Metallic items made up 6.9% of the litter waste 52% of which was classified as recyclable packaging.
- Glass items made up 8.5% of the litter waste; all of this was classified as recyclable packaging.
- 3.8% of litter was found to be vegetation.
- Overall, 26.7% of collected litter waste was compatible with domestic mixed recycling collections.
- 18.5% of collected litter was compatible with domestic food collections and 3.8% with garden waste collections.
- In total 49.0% of litter waste collected was of a type considered recyclable when compared with domestic recycling collections.
- 25.2% of litter bin contents was classified as packaging waste.
- 79.4% of this packaging waste was classified as recyclable packaging.

Litter Waste

Sampling

Litter waste was collected by each local authority and delivered for sorting. Each sample was delivered in a single load and was formed from litter bin waste as opposed to street swept litter. For Three Rivers a total of 465kg of litter bin waste was assessed. Waste was sorted into the same categories that were used for the domestic waste analysis. The recyclable content of the litter is based on the materials deemed to be recyclable at the kerbside. This provides a useful indication of the types of material present. Litter bins are generally used for on-the-go waste rather than as an alternative to domestic residual and recycling containers. Most of these materials will be additionally recyclable at on street bring banks and/or recycling bins that may be available in the locale. These potentially recyclable items are listed as -

Paper - Newspapers, magazines, printer paper, junk mail, shredded paper, envelopes (including windows), wrapping paper and greeting cards.

Cardboard - Toilet roll centres, plain greeting cards, corrugated card, cardboard boxes, sleeves and tubes. Food and drink cartons - Tetra Paks

Plastics - Plastic bottles, Drinks, toiletry bottles, and cleaning/detergent bottles, pots/tubs/trays

Glass - Bottles/jars: Any colour.

Metals - Drink cans and food tins, Aluminium foil/foil trays, Chocolate/biscuit tins/trays/tubs, Aerosol cans.

Textiles - Clothes, belts, handbags, curtains, towels, bed linen and paired shoes.

Food waste -all scrap food and food by-products

Garden waste -all vegetation

Results
Compositional analysis of litter waste

This section looks at the average composition of the litter sample collected from Three Rivers bins. Hand sorting of the litter gave concentration by weight figures for the main categories of waste as well as the more detailed sub-categories. Looking at the concentration percentages gives an indication as to the proportions of each waste category. Detailed litter composition tables can be found in a separate data appendix. Figure 1 breaks down the main waste types present within the litter. This waste will contain a proportion that is classified as potentially recyclable. That is to say that it is compatible with the recycling collections available to households within Three Rivers.

Table 1: Average litter waste composition (%)

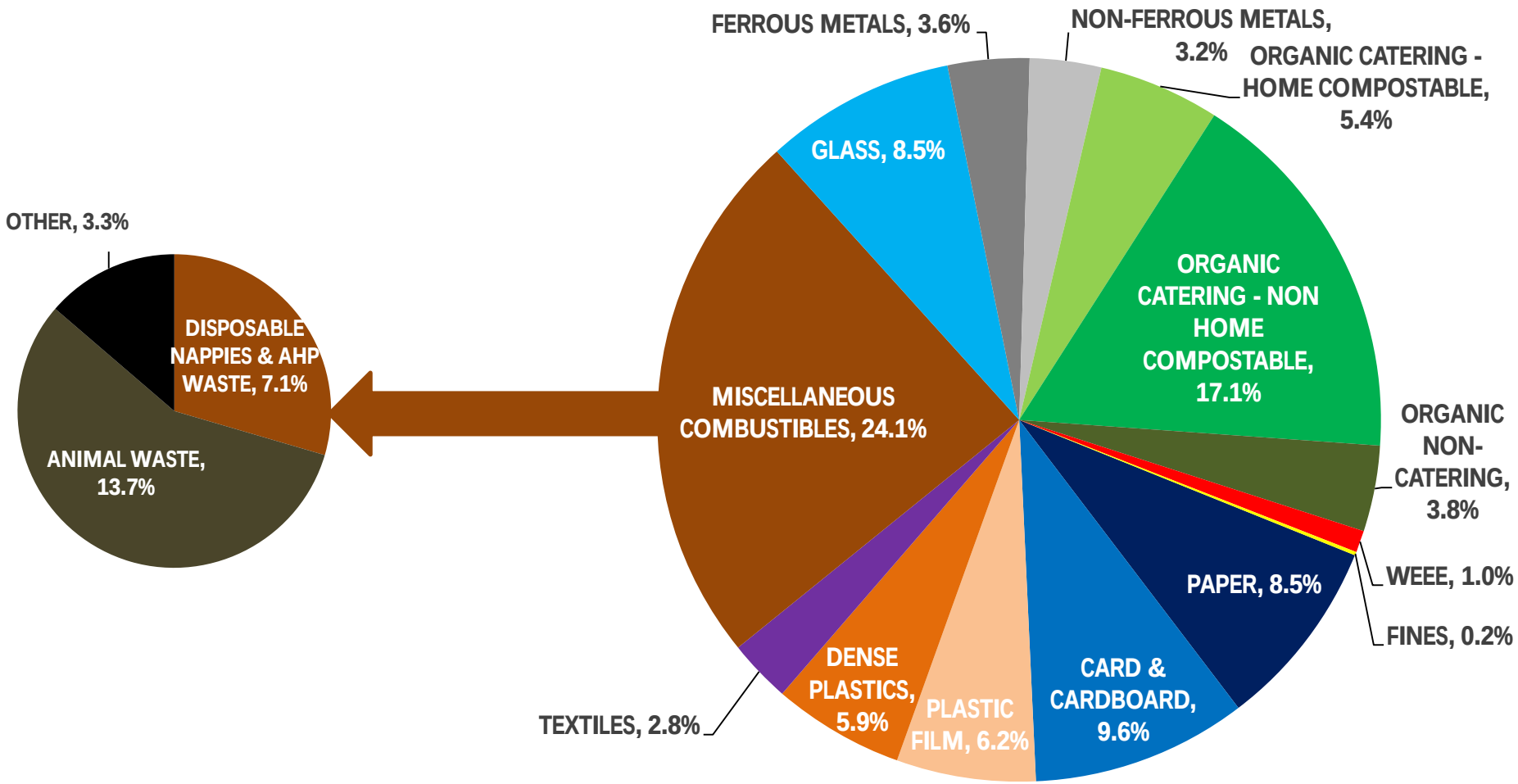
WASTE MATERIAL (%)	% COMPOSITION
PAPER	8.53%
CARD & CARDBOARD	9.61%
PLASTIC FILM	6.23%
DENSE PLASTICS	5.87%
TEXTILES	2.81%
MISCELLANEOUS COMBUSTIBLES*	24.15%
NON-COMBUSTIBLE INERTS**	0.00%
GLASS	8.50%
FERROUS METALS	3.64%
NON-FERROUS METALS	3.21%
ORGANIC CATERING - HOME COMPOSTABLE	5.42%
ORGANIC CATERING - NON-HOME COMPOSTABLE	17.05%
ORGANIC NON-CATERING	3.84%
HHW	0.00%
WEEE	0.98%
FINES	0.17%
TOTAL	100.00%

**Miscellaneous items deemed combustible. Includes nappies & sanitary, wood, carpet and other general bric-a-brac etc.*
***Mixed materials deemed non-combustible. Includes rubble, DIY cement, ceramics, cat litter etc.*

Miscellaneous Combustibles

It can be seen from Table 1 that over 24% of collected litter was classified as miscellaneous combustibles. Almost 57% of this was due to animal waste which formed 14% of litter waste. Additionally, disposable nappies contributed 7%. Where litter bins are in suburban or park areas the level of animal waste generated by dog walkers will be high (even if specific bins for dog waste are also available). Bins located in town centres or business districts are likely to attract less of this waste.

Figure 1: Average litter waste composition (%)



Organic Waste

Organic waste (which includes garden waste, food waste and non-catering organics such as pet bedding) formed 26.3% of the collected litter waste

Food waste alone accounted for 18.5% of the surveyed litter

Table 2: Level of organics within the litter

LITTER ORGANICS (%)	% COMPOSITION
ORGANIC CATERING - HOME COMPOSTABLE	5.42%
ORGANIC CATERING - NON-HOME COMPOSTABLE	17.05%
ORGANIC NON-CATERING	3.84%
% ORGANICS	26.31%
% FOOD WASTE	18.46%

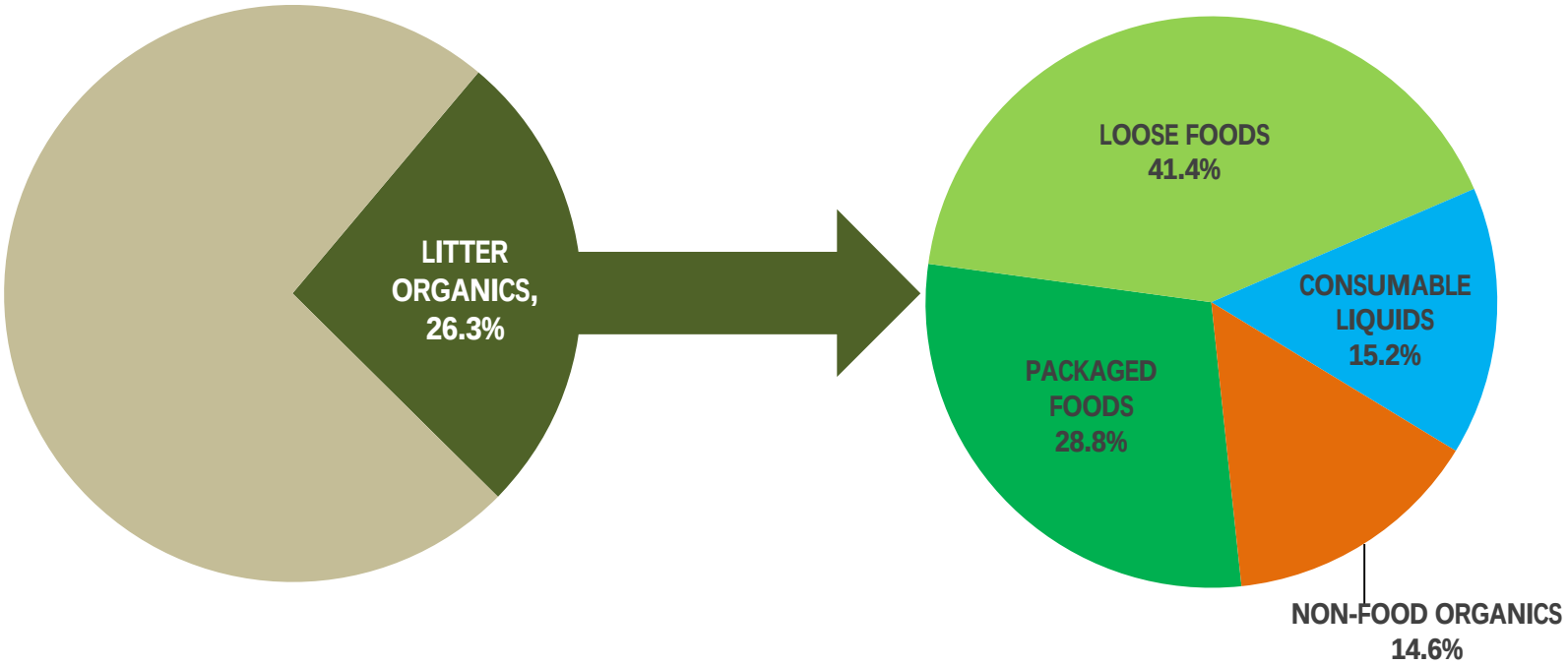
Food waste was separated into home compostable and non-home compostable fractions. Further separation identified whether the food was avoidable (uneaten, unused, or spoilt) or unavoidable (inedible by products such as shells, stones, skin etc). Finally, all avoidable food waste was assessed to determine whether it was disposed of packaged or loose.

Table 3: Breakdown of litter food waste

LITTER FOOD WASTE	% COMPOSITION
% OF ALL FOOD WASTE HOME COMPOSTABLE	29.34%
% OF ALL FOOD WASTE AVOIDABLE	80.52%
% OF ALL FOOD WASTE PACKAGED	41.04%
% OF AVOIDABLE FOOD WASTE PACKAGED	50.97%
% CONSUMABLE LIQUIDS	4.01%

18.5% of litter was deemed to be food waste. Of this, less than 30% consisted of raw fruit and vegetable waste of the type that can be home composted – this formed 5.4% of litter. Over 80% of the food waste disposed of was avoidable – 14.9% of litter. Of the avoidable food being disposed of, 60% was still packaged. Therefore, it can be said that 41% of all the food waste within litter bins was packaged; thus forming 7.6% of the collected waste. In addition to food waste around 4% of the litter contents was due to consumable liquids, mostly drinks in plastic bottles.

Figure 2 – Organic content of Litter



Paper

Across Three Rivers litter samples it was seen that around 8.5% consisted of discarded paper. A proportion of this paper is of a potentially recyclable type such as newspapers, junk mail, envelopes, and directories. It was found that 52.7% of paper consisted of these recyclable items. The remaining paper was of the non-recyclable type such as that associated with fast food (greaseproof wrap, napkins etc). Recyclable paper therefore formed 4.5% of litter waste. Of the recyclable paper present, 70% was due to newspapers, magazines and brochures. A small proportion (10.1%) of paper was due to packaging bags which accounted for just 0.9% of waste.

Table 4: Breakdown of litter paper waste

LITTER PAPER	% COMPOSITION
RECYCLABLE PAPER	4.50%
NON-RECYCLABLE PAPER	4.04%
TOTAL PAPER	8.53%
% OF PAPER RECYCLABLE	52.70%
% OF PAPER DEEMED PACKAGING	10.09%

Card & Cardboard

Across Three Rivers litter samples it was seen that around 9.6% consisted of discarded card and cardboard. A proportion of this card is of a potentially recyclable type such as packaging card, box card etc. It was found that 28.4% of card and cardboard consisted of these recyclable items.

Recyclable card and cardboard formed 2.7% of litter waste. Of the recyclable card and cardboard present, 57% was due to corrugated cardboard with 39% thin card and 3% liquid cartons. Just over a quarter (26%) of card and cardboard was due to packaging related items which accounted for 2.5% of total litter waste.

Table 5: Breakdown of litter card & cardboard waste

LITTER CARD & CARDBOARD	% COMPOSITION
RECYCLABLE THIN CARD	1.08%
RECYCLABLE CORRUGATED CARDBOARD	1.56%
BOOKS	2.78%
BEVERAGE CARTONS	0.09%
NON-RECYCLABLE CARD	4.10%
TOTAL CARD & CARDBOARD	9.61%
RECYCLABLE CARD & CARDBOARD	2.73%
% OF CARD RECYCLABLE	28.44%
% OF CARD DEEMED PACKAGING	26.20%

Plastics

Across Three Rivers litter samples it was seen that around 12.1% consisted of discarded plastics. A proportion of this plastic is of a potentially recyclable type such as plastic bottles and selected packaging containers. It was found that 37.7% of plastics consisted of these recyclable items.

Recyclable plastics therefore formed 4.6% of litter waste. Of the recyclable plastic present, 67% was due to plastic bottles with 337% plastic containers. The majority (66%) of plastic was due to packaging related items which accounted for 8% of total litter waste.

Table 6: Breakdown of litter plastic waste

LITTER PLASTICS	% COMPOSITION
PLASTIC FILM	6.23%
PLASTIC BOTTLES	3.05%
RECYCLABLE PLASTIC CONTAINERS	1.51%
ALL OTHER PLASTICS	1.31%
TOTAL PLASTIC	12.10%
RECYCLABLE PLASTIC	4.56%
% PLASTIC RECYCLABLE	37.68%
% OF PLASTIC DEEMED PACKAGING	66.23%

Metals

Across Three Rivers litter samples it was seen that around 6.9% or consisted of discarded metals. A proportion of this metal is of a potentially recyclable type such as drink cans, foil, tins and aerosols. It was found that 52% of metallic items present in the litter consisted of these recyclable items. All the recyclable metals in the litter waste are also classified as packaging items. Around 83% of recyclable metals were drink cans with 12% aerosols and 5% foils.

Table 7: Breakdown of litter metal waste

LITTER METALS	% COMPOSITION
DRINK CANS	2.96%
FOOD TINS & CANS	0.00%
AEROSOLS	0.43%
ALUMINIUM FOIL AND OTHER PACKAGING	0.17%
OTHER NON-RECYCLABLE METALS	3.29%
RECYCLABLE METALS	3.56%
TOTAL METALS	6.85%
% OF METALS RECYCLABLE PACKAGING	51.98%

Glass

Across Three Rivers litter samples it was seen that around 8.5% or consisted of discarded glass. A proportion of this metal is of a potentially recyclable type such as bottles and jars. It was found that all glass items present in the litter consisted of these recyclable items. All the recyclable glass in the litter waste is also classified as packaging items. All recyclable glass was due to bottles as opposed to jars with an equal split between coloured as opposed to clear glass.

Table 8: Breakdown of litter glass waste

LITTER GLASS	% COMPOSITION
COLOURED BOTTLES	4.26%
CLEAR BOTTLES	4.24%
ALL JARS	0.00%
OTHER GLASS	0.00%
TOTAL GLASS	8.50%
RECYCLABLE GLASS	8.50%
% RECYCLABLE PACKAGING	100.00%

Potential recyclability of litter waste

The potential recyclability of the collected litter waste relates to all items present that are compatible with kerbside recycling schemes currently running in Three Rivers. Results from the survey showed that the potential recyclability of the surveyed litter was 49.0%.

Table 9: Proportion of litter waste compatible with current household recycling collections (%)

% RECYCLABLE MATERIALS WITHIN LITTER WASTE	% COMPOSITION	SPLIT*
RECYCLABLE PAPER	4.50%	9.18%
RECYCLABLE CARD & CARDBOARD	2.73%	5.58%
RECYCLABLE PLASTICS	4.56%	9.32%
RECYCLABLE TEXTILES	2.81%	5.73%
RECYCLABLE GLASS	8.50%	17.36%
RECYCLABLE METALS	3.56%	7.27%
TOTAL DRY RECYCLABLES	26.65%	54.44%
RECYCLABLE FOOD WASTE	18.46%	37.71%
RECYCLABLE GARDEN WASTE	3.84%	7.85%
TOTAL ORGANIC RECYCLABLES	**22.31%**	**45.56%**
TOTAL RECYCLABLE CONTENT	**48.96%**	**100.00%**

**Split is the proportional breakdown of the recyclable content. E.g., Recyclable paper forms 4.5% of the litter equating to 9.2% of the recyclable content*

Figures show that food waste was responsible for 37.7% of the recyclable material present in litter bins where it formed 18.5% of the total.

Recyclable glass was responsible for 17.4% of the recyclable material present in litter bins where it formed 8.5% of the total.

Recyclable paper and card made up 14.8% of the recyclable content forming 7.2% of the litter.

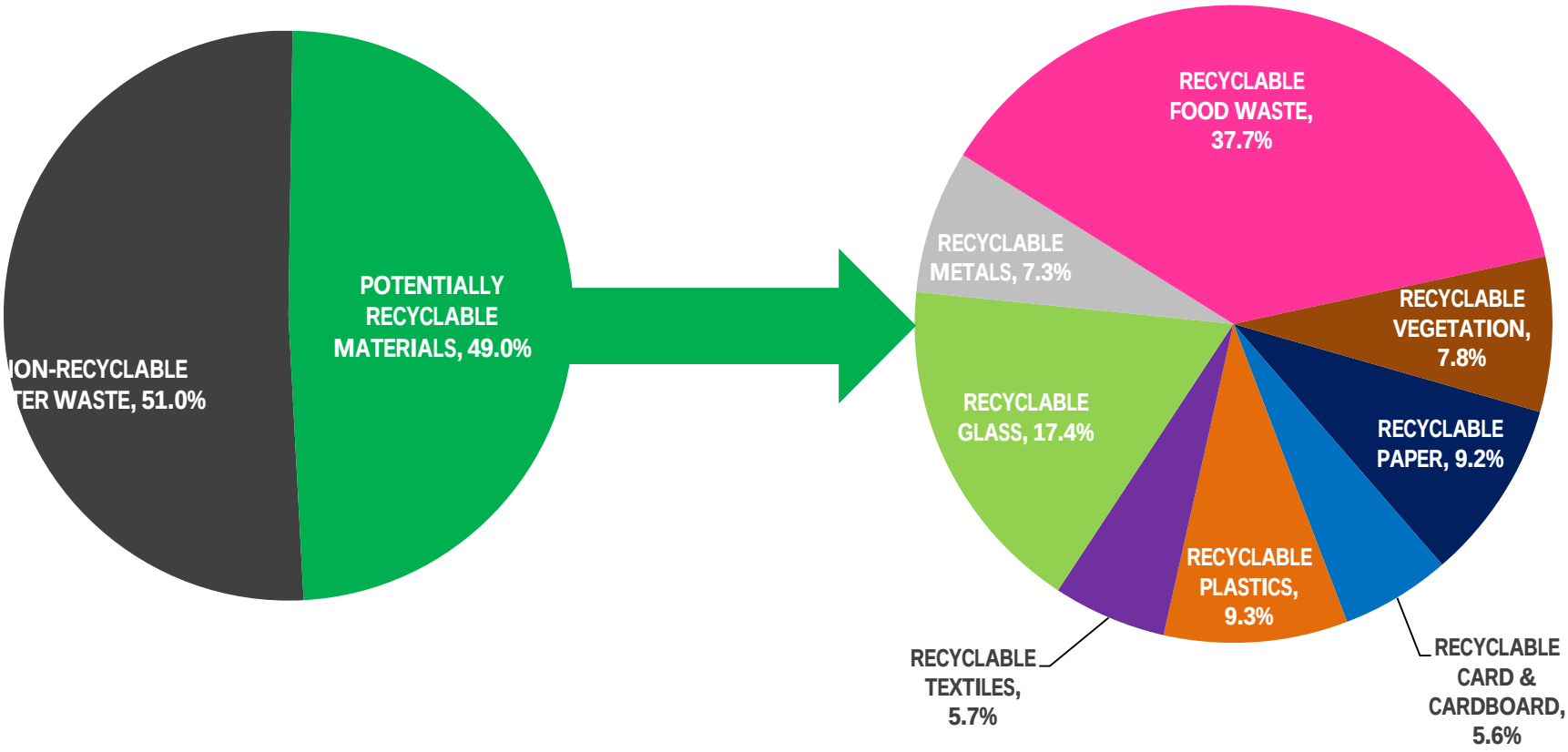
Recyclable plastics made up 9.3% of the recyclable content equating to 4.6% of litter.

Recyclable vegetation formed 7.9% of the recyclable content or 3.8% of litter.

Recyclable metals made up 7.3% of the recyclable content forming 3.6% of the litter.

Recyclable textiles made up 5.7% of the recyclable content forming 2.8% of the litter.

Figure 3: Proportion of litter waste potentially recyclable



Packaging content of litter waste

Hertfordshire Waste Partnership has an interest in the levels of packaging material in its various waste streams. A large proportion of the materials that are potentially recyclable consist of packaging items which could have been diverted from litter bins. Just over a quarter of all litter waste was due to packaging. Around 33.7% of all packaging was glass accounting for 8.5% of total litter waste. Just under a third (31.8%) of packaging was formed from plastics with 14.1% metal packaging, 13.4% paper and card packaging, 4.6 other packaging materials and 2.3% food associated packaging.

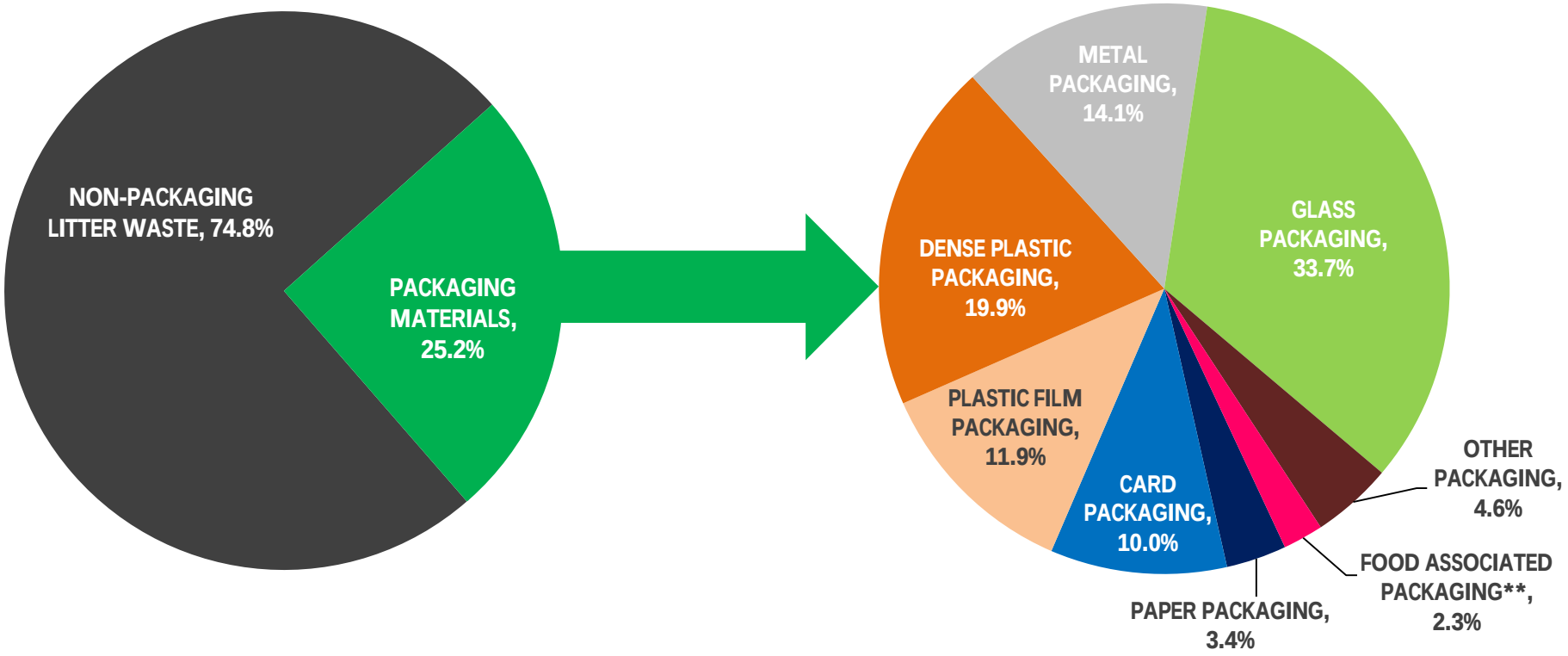
Table 10: Proportion of litter due to packaging materials

PACKAGING CONTENT (%)	% COMPOSITION	SPLIT*
PAPER PACKAGING	0.86%	3.42%
CARD PACKAGING	2.52%	9.99%
PLASTIC FILM PACKAGING	3.01%	11.94%
DENSE PLASTIC PACKAGING	5.01%	19.89%
METAL PACKAGING	3.56%	14.13%
GLASS PACKAGING	8.50%	33.74%
OTHER PACKAGING	1.16%	4.60%
FOOD ASSOCIATED PACKAGING**	0.58%	2.30%
TOTAL PACKAGING	25.19%	100.00%

**Split is the proportional breakdown of the packaging content. E.g., Card packing forms 2.5% of the litter waste equating to 10.0% of the packaging content*

*** Estimated for food waste disposed of in original packaging (5% of discarded weight)*

Figure 4: Proportion of litter waste due to packaging



Packaging recyclability

Packaging is seen to form 25.2% of the collected litter. Of the packaging material present in the litter bins, an average of 79.4% was of a type compatible with domestic recycling collections. Therefore, an estimated 20.0% of litter waste is due to recyclable packaging items. Over 45% of recyclable packaging is glass with 23.8% plastic, 16.6% paper & card and 14.6% metal.

Figure 5: Recyclable content of packaging in litter bins