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Kerbside Waste and Recycling Composition Analysis

Barnet Borough Council

November 2014 - April 2015

DRAFT REPORT

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1) Project details and acknowledgements

Title	Kerbside Waste & Recycling Waste Composition Analysis
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Project number	14196
Client reference	Draft Report_Version_1
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Measurement Evaluation Learning

2) Introduction

Background

Barnet Council wishes to study the composition of their domestic kerbside collected residual waste and recycling streams to provide current baseline data. The aim of the waste composition analysis will be to provide information which can be used by the council when planning future services or campaigns. As well as giving indications as to the present levels of waste being generated, observations will be made showing the levels of materials that are currently recyclable at the kerbside and those which could potentially be recyclable via future schemes.

This report compares results taken from the analysis of kerbside collected waste and recycling surveyed during one week periods in November 2014 and April 2015. The current combined recycling and composting rate (percentage of household waste sent for reuse recycling and composting) for Barnet is 36.4%[1], with a target of 50% by 2016. In February 2015 the council began a communication campaign which gave information on the "50% Recycling" target. This campaign is ongoing and a number of different communication methods have been used throughout the Borough:-

- In early February bus shelter posters were displayed
- By mid-February refuse and recycling trucks were fitted with signage which advertised the targets
- In early March households were sent information leaflets
- During mid-March the council magazine (Barnet First) contained recycling information for residents

Both surveys focused on the levels and composition of residual waste, mixed dry recycling and organic recycling containers that are currently available for residents to place out for collection at the kerbside. Comparisons between the figures obtained from the pre (November 2014) and post (April 2015) communications survey will indicate whether there have been any positive benefits from the campaign. There will also be additional information for seasonal variations in the level of garden waste. The sampling regime involved the direct collection and compositional analysis of waste from a target of 250 properties. These covered the most dominant socio-demographics profiled for Barnet. Details on the sampling process are explained more fully in the methodology section. As part of this piece of work a number of flatted developments had their residual waste and mixed recycling sampled. Results for these flats are submitted in a separate report.

Figure E.1 shows the amount of waste currently present in each of the four kerbside bins that are available in kg/hh/wk. This distribution gives a diversion figure of 48.8% for the pre campaign survey and 53.1% for the post campaign survey. Figure E.2 shows how the distribution of materials would be if all of the

[1] WasteDataFlow return 2013/14

recyclables were in the correct bin and no contamination occurred in the recycling. Capturing all of the available recyclables in contamination free bins would give an overall potential diversion of 75.7% for the pre campaign survey and 78.4% for the post campaign survey.

Figure E.1 Kg/hh/wk of waste currently present in kerbside bins

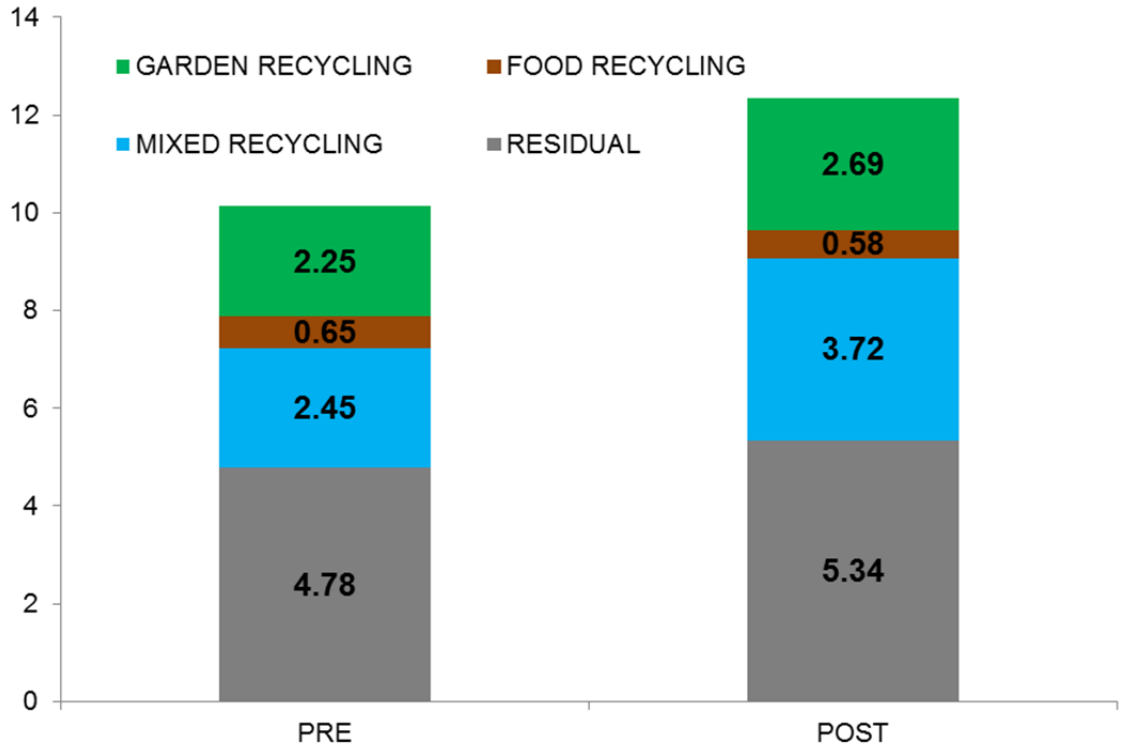
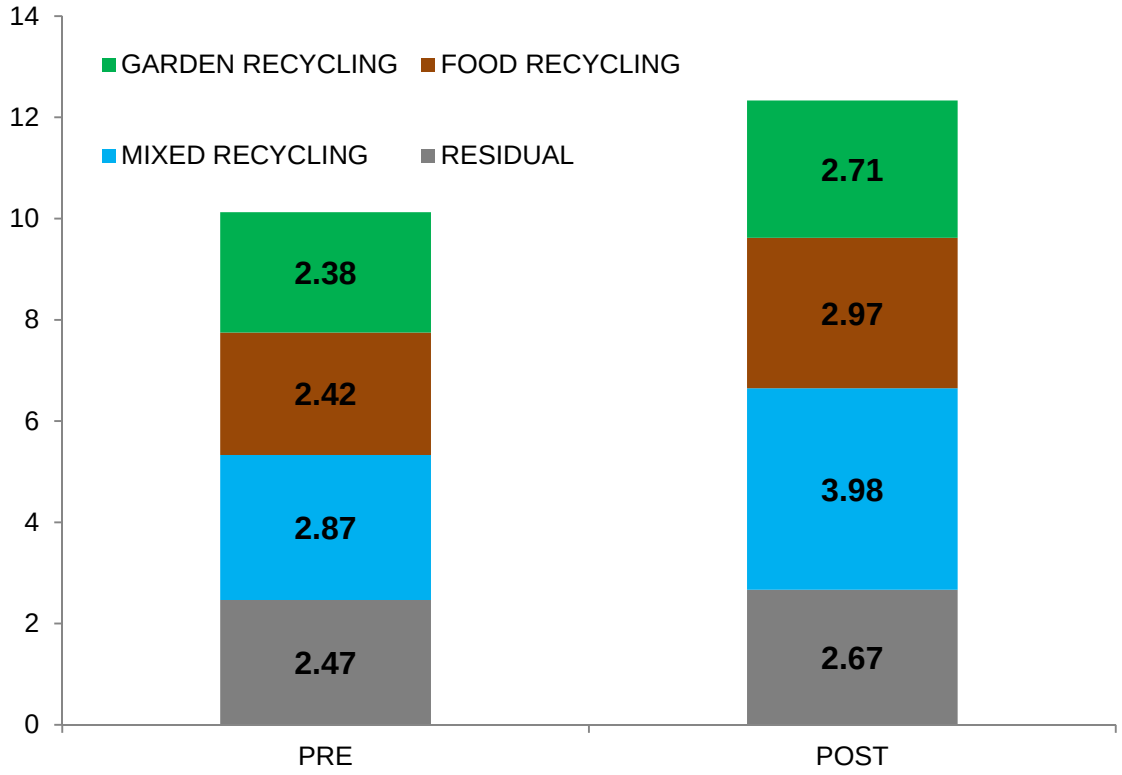


Figure E.1 Kg/hh/wk distribution of waste that is potentially possible



Project Objectives

Specific aims of the work were to:

- Select a sampling framework to gain the best understanding of waste within the council area over two seasonal surveys either side of a communications campaign and compare findings
- Understand, using socio-demographic profiling which sectors of the community are producing which types of waste and which are using the recycling provision most effectively
- Weight all results according to socio-demographics to gain the most representative figures
- Detect capture rates for individual materials which are already collected separately for recycling
- Evaluate the amount of specific materials collected in the residual bin that could potentially be collected separately for recycling
- Evaluate the use of the receptacles used for collecting waste and recycling
- Detect the amount of packaging and biodegradable material present
- Assess the amount of contamination in receptacles meant for recycling material

This report highlights key results recorded across Barnet showing data for individual socio-demographics where applicable.

Acknowledgements

M·E·L Research would like to thank the collection authorities and their staff who participated and helped in the setup and fieldwork stages of the project, and those who provided additional data and other information to inform the project. This report highlights key results, presents the results in tables and charts and discusses the findings. The views and opinions expressed in this report are those of M.E.L Research Ltd. and are not necessarily shared by officers from Barnet Borough Council.

Accuracy Statement

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

3) Executive Summary

Summary

A summary of the changes to average figures recorded during the first (pre) campaign and second (post) campaign surveys

Residual Waste

- Between surveys average set out rates for the weekly collections of residual waste fell from 71% to 58%.
- Despite lower set out rates the amount of collected residual waste rose from 4.78kg/hh/wk to 5.34kg/hh/wk.
- Recyclable food was a major constituent of residual waste in both surveys. The amount of food waste present rose from 1.69kg/hh/wk to 2.34kg/hh/wk which is an increase of 0.65kg/hh/wk or 38%.
- The amount of garden waste present fell from 0.20kg/hh/wk to 0.09kg/hh/wk which is a reduction of 0.11kg/hh/wk or 54%.
- With the exception of plastic bottles and containers the levels of all recyclables compatible with blue bins fell between the two surveys. Overall there was 0.12kg/hh/wk or 17% less blue bin recyclable material in the residual waste.
- Due to increases in food waste the recyclability of the residual waste rose from 2.63kg/hh/wk (54.9%) to 3.04kg/hh/wk (56.8%).

Mixed Recycling

- Between surveys average set out rates for the collections of mixed recycling waste fell from 70% to 60%.
- Despite lower set out rates the amount of collected mixed recycling rose from 2.45kg/hh/wk to 3.72kg/hh/wk; an increase of 1.27kg/hh/wk or 52%.
- Capture rates for paper rose from 83% to 89%
- Capture rates for card and cardboard rose from 69% to 85%
- Capture rates for liquid cartons rose from 57% to 71%
- Capture rates for plastic bottles fell from 80% to 77%
- Capture rates for plastic containers rose from 36% to 48%
- Capture rates for glass rose from 82% to 94%
- Capture rates for tins, cans, aerosols and foil rose from 59% to73%
- Overall 74% of the materials accepted into recycling bins were captured in the first survey rising to 85% in the second survey.
- Mixed recycling contamination was seen to fall from 13.5% down to 9.4% keeping the total amount steady at 0.33 – 0.35kg/hh/wk.
- The amount of material diverted through blue bin recycling collections rose from 20.9% up to 27.3%.

Food Recycling

- Between surveys average set out rates for the collections of food waste fell from 32% to 22%.
- The amount of collected food fell from 0.65kg/hh/wk to 0.58kg/hh/wk; a decrease of 0.07kg/hh/wk or 11%.
- In the first survey 31% of home-compostable foods and 22% of non-home compostable foods were captured – equating to 27% of all food waste. These rates were lower in the second survey being 22%, 17% and 19% respectively.
- Contamination remains low being <3% and 0.02kg/hh/wk of the total.
- The amount of material diverted through food recycling collections fell from 6.4% down to 4.6%.

Garden Recycling

- Between surveys average set out rates for the collections of garden waste remained the same at 24%.
- The amount of collected garden rose from 2.25kg/hh/wk to 2.69kg/hh/wk; an increase of 0.44kg/hh/wk or 20%.
- Capture rates for garden waste rose from 91% to 94%
- Contamination rates for garden waste remained steady at 2.5% - 3% or 0.07kg/hh/wk.
- Organic recycling collections were responsible for 21.5% diversion in the first survey and 21.3% in the second survey.

In terms of the total waste presented at the kerbside; Barnet households increased the amount of total kerbside waste from 10.13kg/hh/wk to 12.33kg/hh/wk. When considering all of the recycling collections available to residents, householders increased the proportion of this waste that they were diverting from 48.8% to 53.1%

4) Compositional Analysis of Residual Waste

4.1 Waste Sampling & Demographics

Over the collection week for each survey, 5 individual samples of waste and recycling were surveyed. Around 50 households were selected per sample; each of which represented a significant Acorn demographic type for each of the five categories.

Table 4.1 summarises the waste and recycling collection services offered by Barnet. Throughout this report materials will alternately be described as recyclable or non-recyclable. A material is deemed to be recyclable only if it is compatible with the kerbside recycling collections operated by the council.

Table 4.1 Kerbside waste collection services and acceptable recyclables.

Blue bin - recyclable waste	Brown bin - food waste
• Paper (newspapers, magazines, junk mail, envelopes etc.) • phone directories and catalogues • card & cardboard • tetrapaks type liquid cartons • metal food and drinks cans • aerosols • clean foil • glass bottles and jars **no other types of glass** • plastic bottles • plastic food trays, pots, tubs & punnets • Batteries in a separate clear bag	• plate scrapings • vegetable peelings • meat and bones • egg shells • cooked and uncooked food • teabags and coffee grounds • Pasta & rice etc. **Green Bin - garden waste** • cut flowers • garden waste such as grass cuttings, prunings and leaves etc.

Table 4.1.1: Acorn profiles for sampling

Acorn	Category Description	Barnet
1	Affluent Achievers	33.75%
2	Rising Prosperity	30.37%
3	Comfortable Communities	12.48%
4	Financially Stretched	9.34%
5	Urban Adversity	13.94%
6	Not Private Households	0.12%

Table 4.1.1 shows the Acorn breakdown for Barnet. Five samples of waste (for each stream) were to be analysed, the sampling strategy needed to be designed to extract the most representative data. Each of the five main Acorn categories are represented throughout Barnet at levels above 5% and therefore all were surveyed. Streets from the dominant Acorn type within each category were selected for waste sampling. All waste was collected at the kerbside and taken for sorting at Mill Hill Depot.

This method allowed average waste figures for Barnet to be calculated by weighting data from each sample against its individual Acorn profile. This was done in the second phase with figures generated from the two surveys being compared.

4.2 Residual waste set out rates & waste generation

Table 4.2.1 and Figure 4.2.1 highlight the average set out rates for residual bins observed at the time waste was collected for compositional analysis. Table 4.2.2 and Figure 4.2.2 show the average amount of residual waste generated in kg/hh/wk. The amount of waste in kilograms per household per week was calculated from each sample of 50 households from each Acorn with the set out relating to the proportion of these households actively placing out their waste.

Table 4.2.1: Kerbside residual waste set out rates

% SET OUT	PRE	POST	DIFFERENCE
ACORN 1	72%	70%	-2%
ACORN 2	77%	39%	-38%
ACORN 3	79%	80%	1%
ACORN 4	48%	34%	-14%
ACORN 5	66%	64%	-2%
WEIGHTED	71%	58%	-14%

Table 4.2.2: Average Kerbside residual waste generation rates (kg/hh/wk)

KG/HH/WK	PRE	POST	DIFFERENCE
ACORN 1	4.00	7.67	3.67
ACORN 2	5.44	2.42	-3.02
ACORN 3	4.53	10.46	5.93
ACORN 4	5.00	4.00	-1.00
ACORN 5	5.30	2.42	-2.88
WEIGHTED	4.78	5.34	0.57

Barnet operates a weekly collection of residual waste. Between the two surveys the average set out rate for residual bins fell from 71% to 58%. Despite the drop in set out, the amount of generated waste increased from 4.78kg/hh/wk up to 5.34kg/hh/wk. The range seen between samples was also far greater in the second survey. Some residents may now be putting out bins fortnightly rather than weekly. This would reduce the set out rate but result in heavier bins when presented. The increase in residual waste was, however, driven by Acorn 1 and 3 households with the other three sample areas registering a reduction in waste levels.

Figure 4.2.1: Kerbside residual waste set out rates

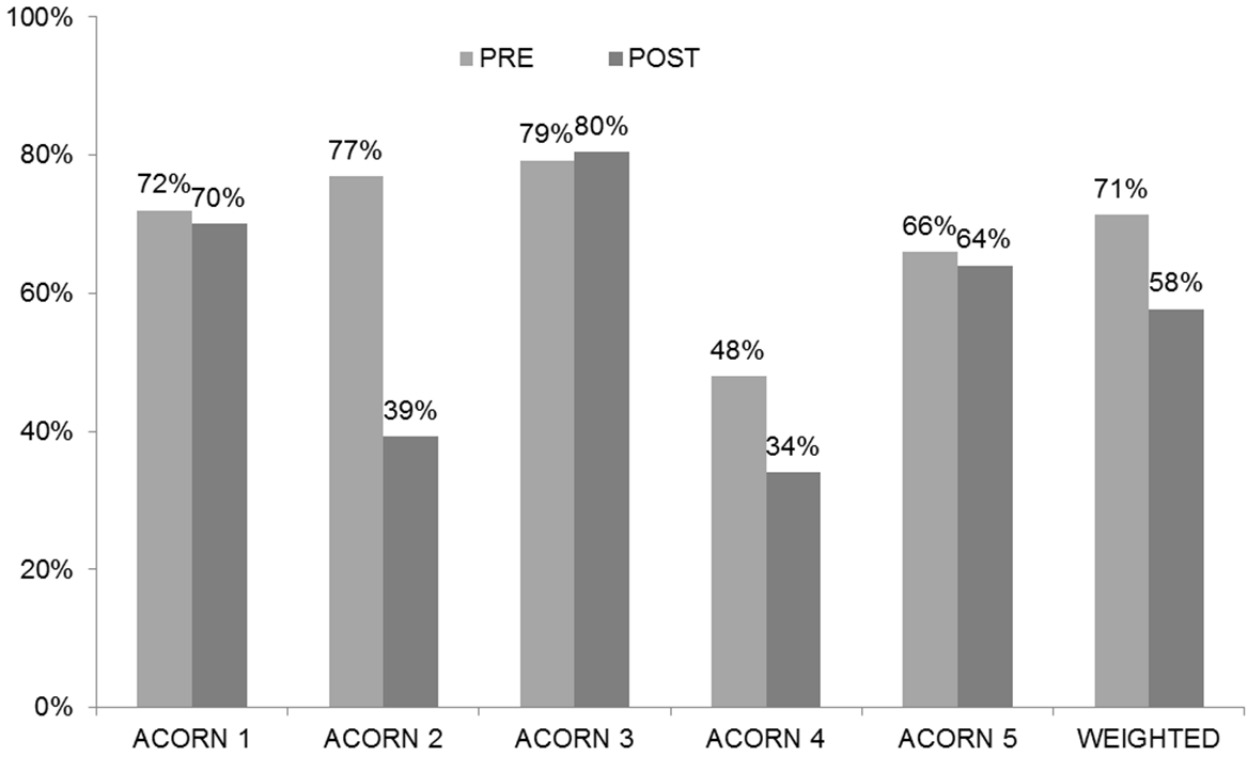
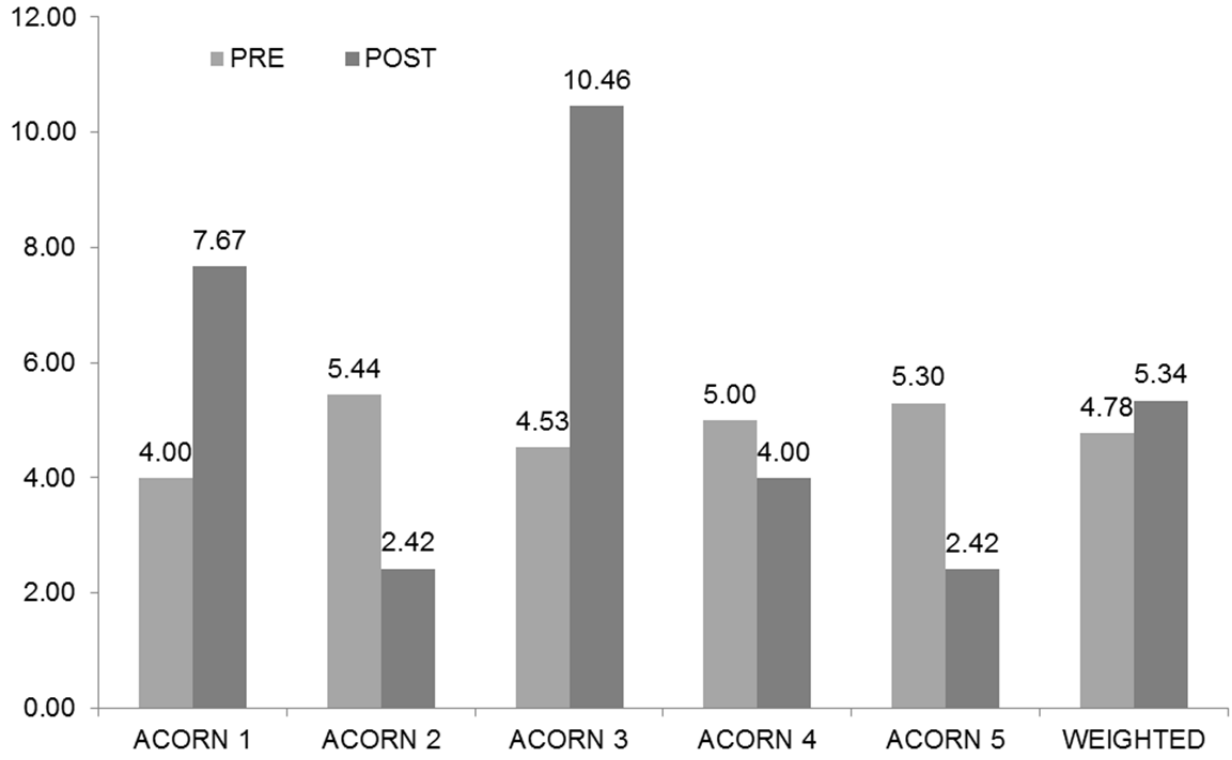


Figure 4.2.2: Average Kerbside residual waste generation rates (kg/hh/wk)



4.3 Compositional analysis of household residual waste

This section looks at average amounts and composition of the residual waste presented by Barnet households. Hand sorting of the residual waste gave concentration by weight figures for the fifteen 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. This can be translated into a figure relating to the average waste generation expected for each waste category; this is given in kilograms per household per week (kg/hh/wk). By knowing the composition of waste from the various Acorn samples it is possible to gain an insight into the make-up and volume of the residual waste that can be expected from Barnet as a whole. Detailed residual composition tables relative to each Acorn sample can be found in a separate data appendix.

Table 4.3.1 and Figure 4.3.1 show average residual waste data in terms of percentage composition with Table 4.3.2 and Figure 4.3.2 showing generation rates for major materials in terms of kg/hh/wk. All residual waste will contain a proportion that is classified as potentially recyclable. That is to say that it should have been placed into one of the recycling receptacles supplied by the Council.

Table 4.3.1: Average residual waste composition (%)

AVERAGE % COMPOSITION	PRE	POST	DIFFERENCE
PAPER	9.77%	7.09%	-2.68%
CARD & CARDBOARD	4.95%	2.62%	-2.33%
PLASTIC FILM	6.83%	4.54%	-2.30%
DENSE PLASTIC	6.77%	6.57%	-0.20%
TEXTILES	4.81%	3.36%	-1.45%
MISC COMBUSTIBLES	12.56%	16.70%	4.13%
MISC NON-COMBUSTIBLES	2.25%	1.77%	-0.48%
GLASS	1.79%	1.55%	-0.23%
FERROUS METAL	1.16%	0.73%	-0.43%
NON-FERROUS METAL	2.12%	1.00%	-1.12%
ORGANIC NON-CATERING	6.27%	5.79%	-0.48%
ORGANIC CATERING	36.54%	43.70%	7.16%
FINES	3.12%	3.32%	0.20%
HHW	0.31%	0.17%	-0.14%
WEEE	0.75%	1.09%	0.35%
TOTAL	100%	100%	0%

Table 4.3.2: Average residual waste generation (kg/hh/wk)

AVERAGE KG/HH/WK	PRE	POST	DIFFERENCE
PAPER	0.47	0.38	-0.09
CARD & CARDBOARD	0.24	0.14	-0.10
PLASTIC FILM	0.33	0.24	-0.08
DENSE PLASTIC	0.32	0.35	0.03
TEXTILES	0.23	0.18	-0.05
MISC COMBUSTIBLES	0.60	0.89	0.29
MISC NON-COMBUSTIBLES	0.11	0.09	-0.01
GLASS	0.09	0.08	0.00
FERROUS METAL	0.06	0.04	-0.02
NON-FERROUS METAL	0.10	0.05	-0.05
ORGANIC NON-CATERING	0.30	0.31	0.01
ORGANIC CATERING	1.75	2.34	0.59
FINES	0.15	0.18	0.03
HHW	0.01	0.01	-0.01
WEEE	0.04	0.06	0.02
TOTAL	4.78	5.34	0.57

Note: Not all waste within a material category, such as paper, is recyclable

Figure 4.3.1: Average residual waste composition (%)

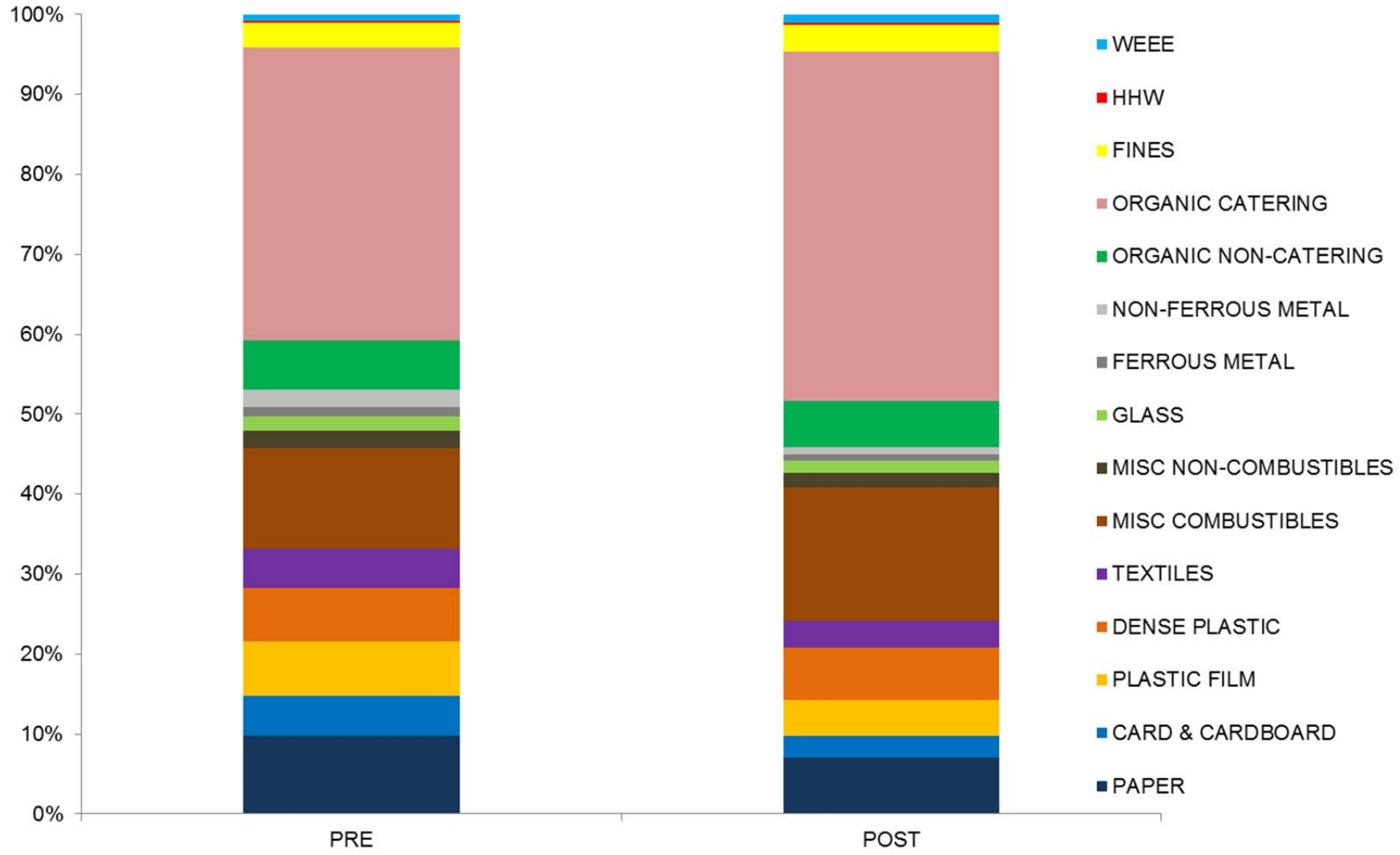
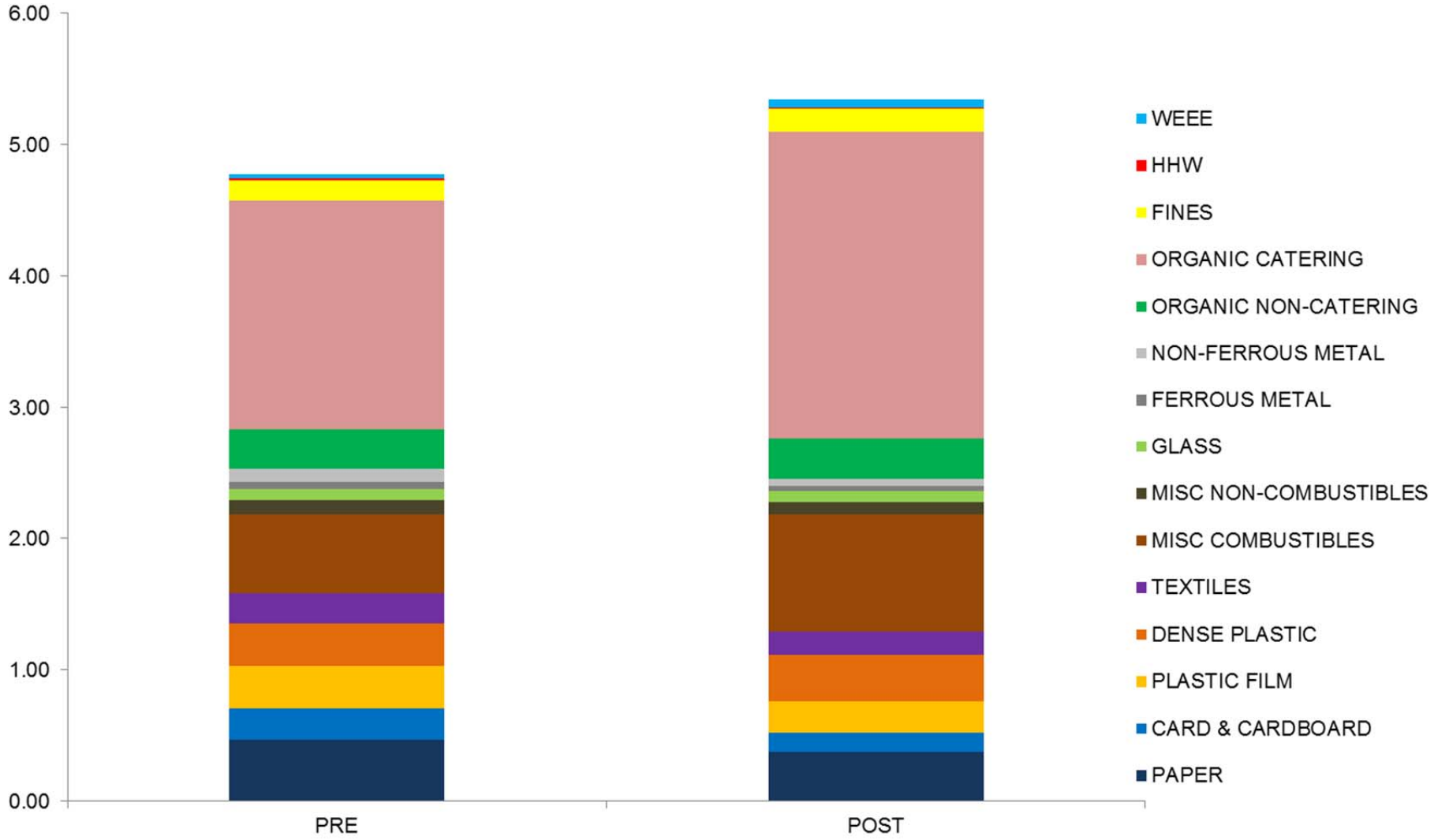


Figure 4.3.2: Average residual waste generation (kg/hh/wk)



4.3.1 Organic Waste within Kerbside residual waste

Organic waste, which includes garden and food waste (putrescibles), formed a major component of primary waste categories for all samples of residual waste. Barnet residents have the ability to recycle both food and garden waste at the kerbside. Figures suggest that average levels of organics in the residual waste rose from 2.05kg/hh/wk to 2.64kg/hh/wk between the pre and post surveys; an increase of 0.59kg/hh/wk. In terms of percentage composition this represented an increase of 6.7% from 42.8% to 49.5%. Figure 4.3.1.1 shows that levels of both home and non-home compostable foods have risen by the second survey. Whereas 45% of food in the first survey was of a home compostable type, this proportion rose to 52% in the April survey – this may be seasonally linked as more fruit and vegetables will be available in April as opposed to November.

Organic catering waste

Barnet residents are able to recycle their food waste separately at the kerbside using brown bins. Increases in the levels of organic waste at the post campaign survey were driven by higher levels of food waste (as opposed to other non-catering organics). In the first survey levels of food waste were 1.69kg/hh/wk or 35.5% of the residual waste. By the time of the second survey, average levels of food waste had risen by 0.65kg/hh/wk to 2.34kg/hh/wk. By this stage, food accounted for 43.7% of the residual waste compared with 35.5% in the first survey.

Organic non-catering waste

Organic non-catering waste covers materials such as garden waste, pet bedding, sawdust etc. Levels of this waste were maintained at around 6% or 0.3kg/hh/wk in both surveys. However it was seen that the contribution from recyclable garden waste had halved from 4.1% (0.20kg/hh/wk) to 1.7% (0.09kg/hh/wk) by the time of the second survey. Tables 4.3.1.1 – 4.3.1.2 and Figure 4.3.1.1 show the average amounts of the different forms of organic waste found for Barnet.

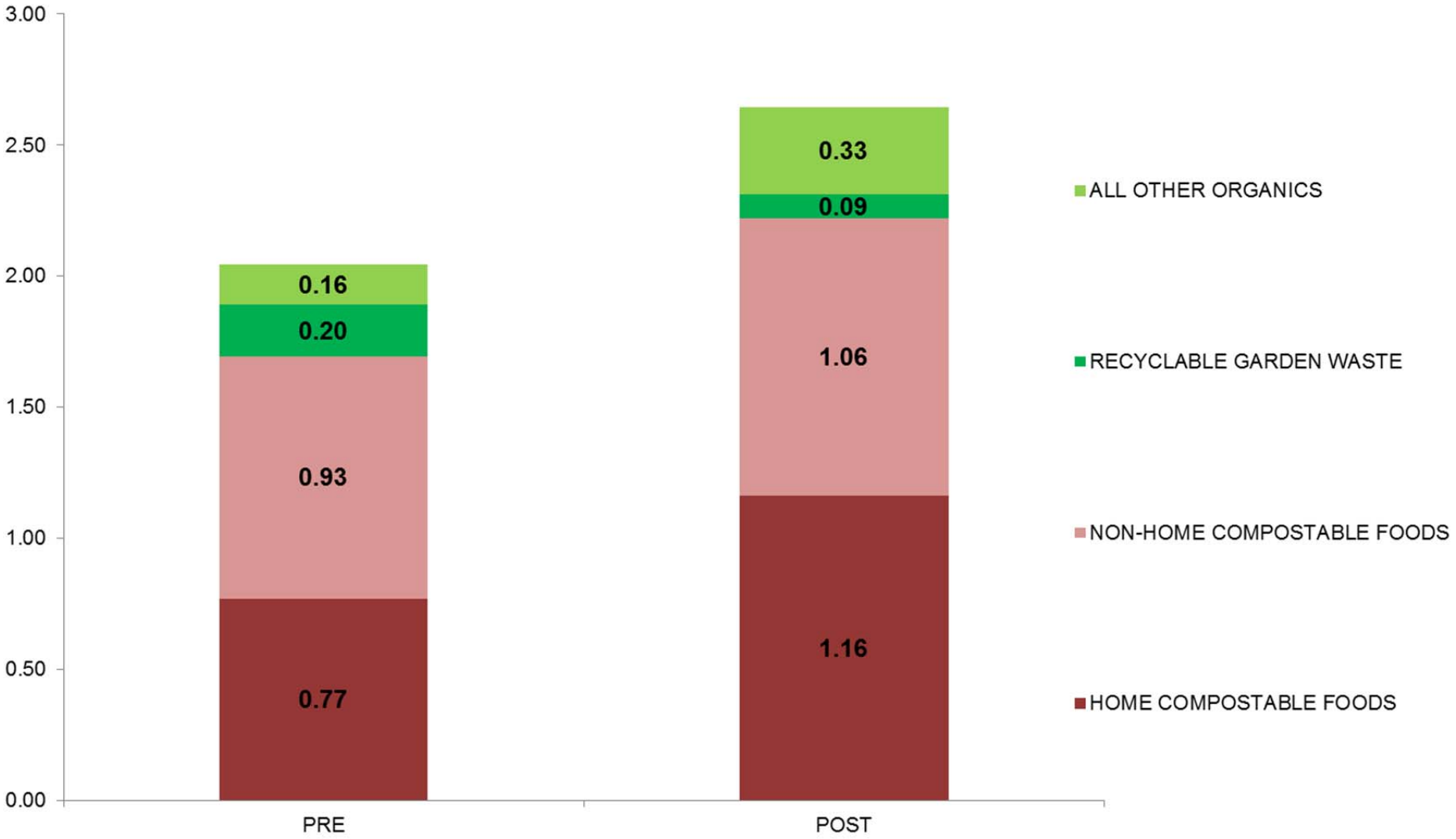
Table 4.3.1.1: Levels of organic wastes within residual waste (kg/hh/wk)

RESIDUAL ORGANICS	PRE	POST	DIFFERENCE
ORGANIC NON-CATERING	0.30	0.31	0.01
FOOD ORGANICS	1.69	2.34	0.65
LIQUID ORGANICS	0.05	0.00	-0.05
TOTAL ORGANICS	2.05	2.64	0.59

Table 4.3.1.2: Levels of organic wastes within residual waste (%)

RESIDUAL ORGANICS	PRE	POST	DIFFERENCE
ORGANIC NON-CATERING	6.27%	5.79%	-0.48%
FOOD ORGANICS	35.46%	43.70%	8.24%
LIQUID ORGANICS	1.08%	0.00%	-1.08%
TOTAL ORGANICS	42.81%	49.49%	6.68%

Figure 4.3.1.1: Levels of organic wastes within residual waste (kg/hh/wk)



4.3.2 Paper within Kerbside residual waste

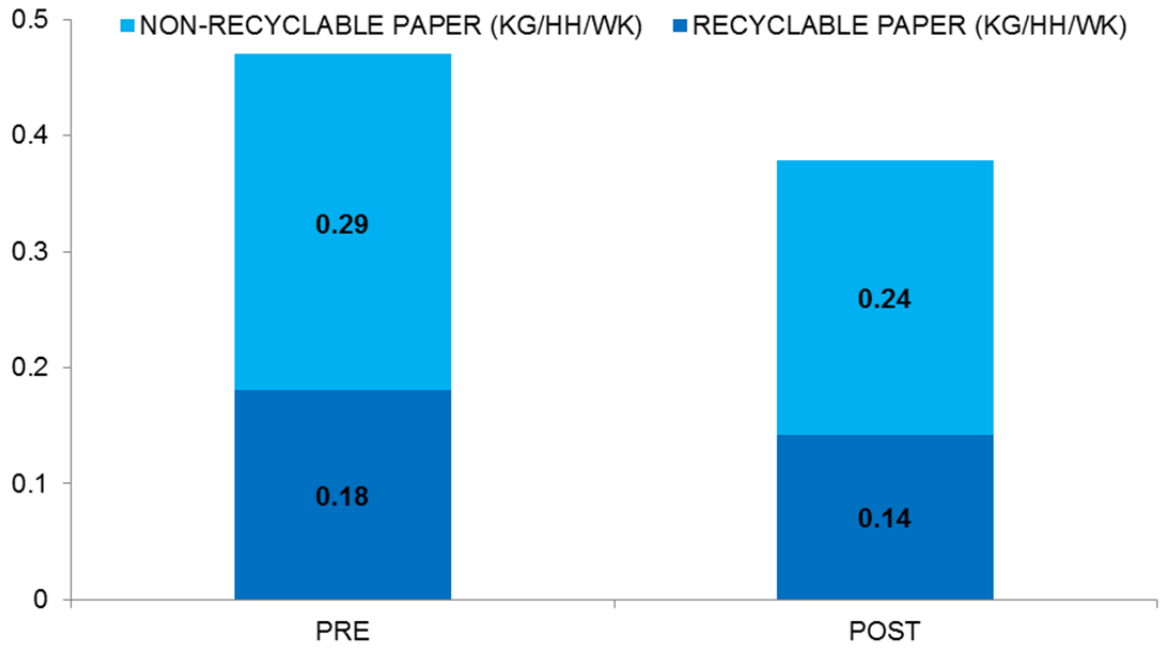
In the pre campaign survey it was seen that 9.8% of residual waste consisted of paper which accounted for 0.47kg/hh/wk. By the time of the second, post campaign, survey the amount of paper in residual bins had fallen to 7.1% or 0.38kg/hh/wk. This represented a decrease of 2.7% or 0.09kg/hh/wk.

A proportion of this paper is suitable for recycling at the kerbside. All householders have the ability to recycle a wide range of paper such as newspapers, junk mail, envelopes and directories. In both surveys it was seen that a similar proportion of residual paper could have been placed into kerbside recycling containers as opposed to the residual bin (37.9% pre and 37.5% post). Due to the lower amounts of overall paper; it was therefore the case that the degree of recyclable paper in residual bins fell from 0.18kg/hh/wk to 0.14kg/hh/wk by the time of the second survey. Table 4.3.2.1 and Figure 4.3.2.1 show the amounts of the different forms of paper waste being disposed of.

Table 4.3.2.1: Levels of paper within the residual waste (kg/hh/wk)

RESIDUAL PAPER	PRE	POST	DIFFERENCE
RECYCLABLE PAPER (KG/HH/WK)	0.18	0.14	-0.04
RECYCLABLE PAPER (%)	3.70%	2.66%	-1.04%
NON-RECYCLABLE PAPER (KG/HH/WK)	0.29	0.24	-0.05
NON-RECYCLABLE PAPER (%)	6.07%	4.43%	-1.64%
KG/HH/WK TOTAL PAPER (KG/HH/WK)	0.47	0.38	-0.09
KG/HH/WK TOTAL PAPER (%)	9.77%	7.09%	-2.68%
% PAPER RECYCLABLE	37.88%	37.54%	-0.34%

Figure 4.3.2.1: Levels of paper within the residual waste (kg/hh/wk)



4.3.3 Card & Cardboard within Kerbside residual waste

In the pre campaign survey it was seen that 5% of residual waste consisted of card and cardboard which accounted for 0.24kg/hh/wk. By the time of the second, post campaign, survey the amount of card and cardboard in residual bins had almost halved to 2.6% or 0.14kg/hh/wk. This represented a decrease of 2.3% or 0.10kg/hh/wk.

A proportion the card & cardboard is suitable for recycling at the kerbside. All householders have the ability to recycle a wide range of this material such as packaging card, Tetrapak cartons and corrugated cardboard. In both surveys it was seen that the vast majority of card and cardboard could have been placed into kerbside recycling containers as opposed to the residual bin (90% pre and 94.4% post). Due to the overall lower amount of this material; it was therefore the case that the level of recyclable card & cardboard in residual bins fell from 0.21kg/hh/wk to 0.08kg/hh/wk by the time of the second survey. Table 4.3.3.1 and Figure 4.3.3.1 show the different forms of card & cardboard waste being disposed of.

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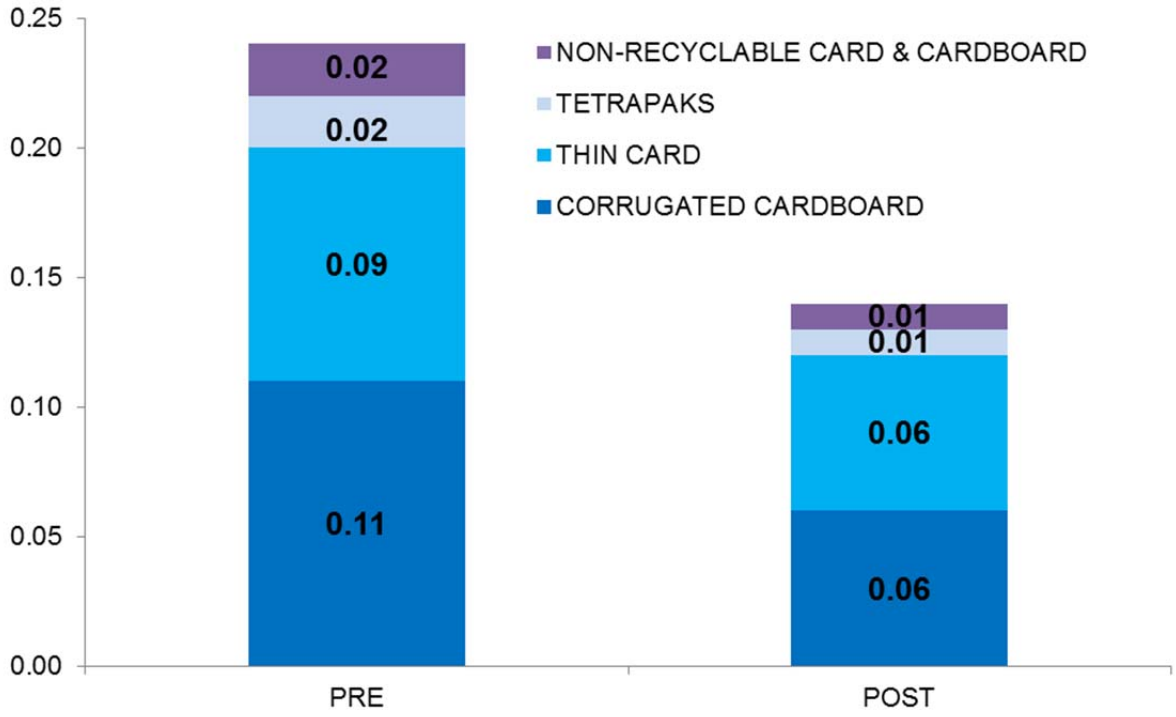
Table 4.3.3.1: Levels of card & cardboard within the residual waste (kg/hh/wk)

RESIDUAL CARD & CARDBOARD	PRE	POST	DIFFERENCE
CORRUGATED CARDBOARD	0.11	0.06	-0.05
THIN CARD	0.09	0.06	-0.03
TETRAPAKS	0.02	0.01	-0.01
NON-RECYCLABLE CARD & CARDBOARD	0.02	0.01	-0.01
TOTAL CARD & CARDBOARD (KG/HH/WK)	0.24	0.14	-0.10
TOTAL CARD & CARDBOARD (%)	4.95%	2.62%	-2.33%
RECYCLABLE CARD & CARDBOARD (KG/HH/WK)	0.21	0.13	-0.08
RECYCLABLE & CARDBOARD (%)	4.45%	2.47%	-1.98%
% OF CARD & CARDBOARD RECYCLABLE	90.00%	94.38%	4.38%

Figure 4.3.3.1: Levels of card & cardboard within the residual waste (kg/hh/wk)



When combining paper and card together from the pre campaign survey it was estimated that these materials formed 14.7% or 0.70kg/hh/wk of the total residual waste collected. Of this, 55.4% or 0.39kg/hh/wk could have been recycled at the kerbside. Therefore 8.2% of collected residual waste consists of recyclable card and cardboard.

At the second, post campaign survey it was seen that the combined amount of residual paper and card fell by 0.19kg/hh/wk to 0.52kg/hh/wk. Of this, 52.5% was recyclable. This means that 0.27kg/hh/wk of recyclable paper and card was present in residual bins which is around a third less (0.12kg/hh/wk) than during the initial survey.

4.3.4 Plastics within Kerbside residual waste

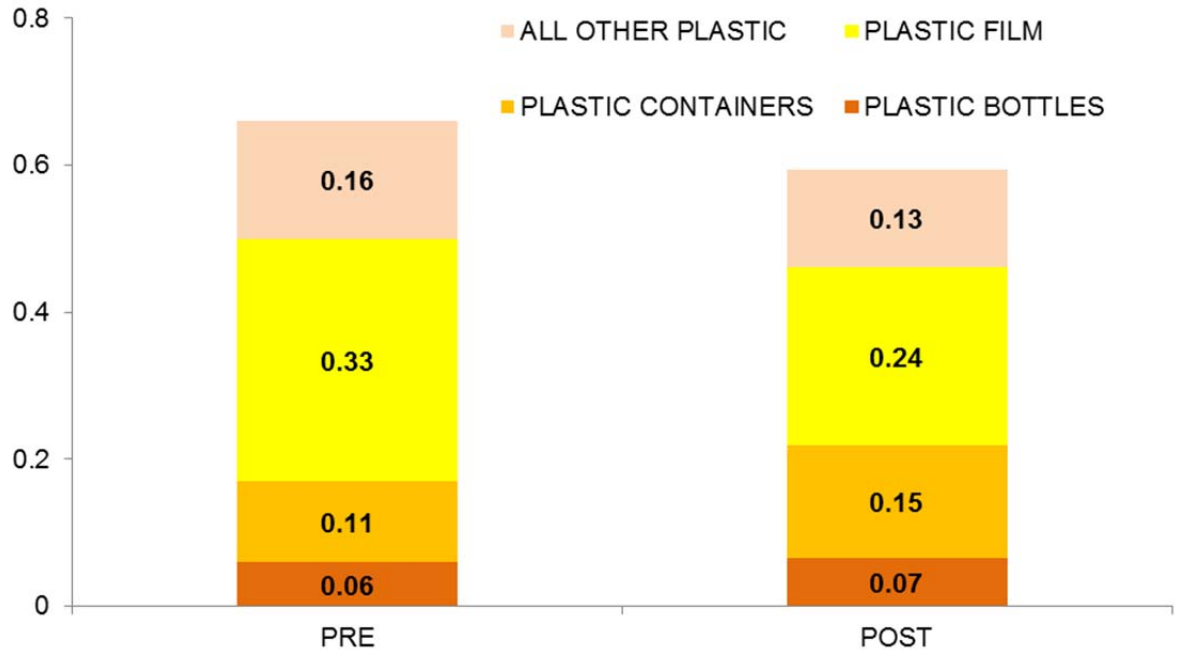
Between the pre and post surveys the proportion of plastics in the residual waste fell from 13.6% (0.65kg/hh/wk) down to 11.1% (0.59kg/hh/wk). Households in Barnet are able to recycle a range of plastics in their recycling containers. Residents can recycle plastic bottles and also plastic packaging containers. On the whole plastic waste, although not heavy in itself, can produce large volumes of waste.

Figure 4.3.4.1 clearly shows the levels of recyclable plastic bottles and containers within the plastic portion of the residual waste. In the first survey it was seen that 26% of plastics were recyclable which accounted for 3.5% or 0.17kg/hh/wk of the residual waste. Despite lower levels of total plastics, the proportion that was recyclable was higher in the second survey at 37%. Therefore recyclable plastics accounted for 4.1% or 0.22kg/hh/wk of residual waste; as rise of 0.05kg/hh/wk.

Table 4.3.4.1: Levels of plastics within the residual waste (kg/hh/wk)

PLASTICS	PRE	POST	DIFFERENCE
PLASTIC BOTTLES	0.06	0.07	0.01
PLASTIC CONTAINERS	0.11	0.15	0.04
PLASTIC FILM	0.33	0.24	-0.09
ALL OTHER PLASTIC	0.16	0.13	-0.03
TOTAL PLASTIC (KG/HH/WK)	0.65	0.59	-0.06
TOTAL PLASTIC (%)	13.60%	11.10%	-2.50%
RECYCLABLE PLASTICS (KG/HH/WK)	0.17	0.22	0.05
RECYCLABLE PLASTICS (%)	3.49%	4.10%	0.61%
% OF PLASTIC RECYCLABLE	25.69%	36.88%	11.19%

Figure 4.3.4.1: Levels of plastics within the residual waste (kg/hh/wk)



4.3.5 Metals within Kerbside residual waste

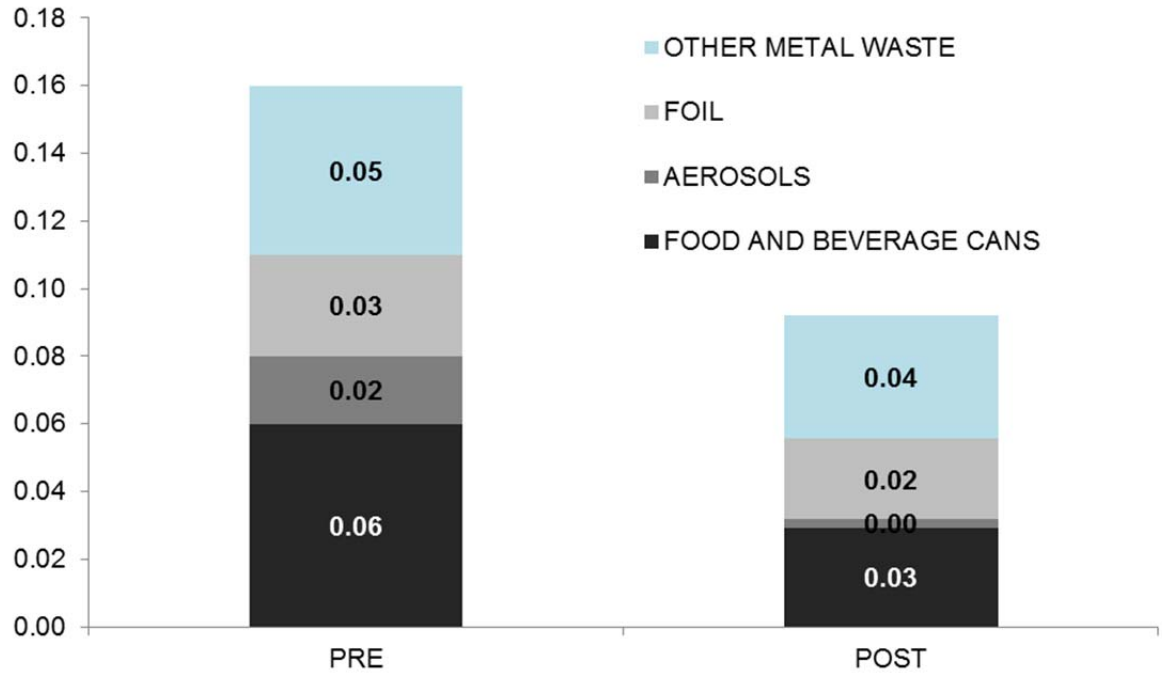
Between the pre and post surveys the proportion of metals in the residual waste almost halved from 3.3% (0.16kg/hh/wk) down to 1.7% (0.09kg/hh/wk). Residents have access to a recycling collection of food and drink cans as well as empty aerosols and clean foil via their recycling service. Food cans tend to require a degree of washing before being placed into recycling containers and as such are often less well diverted than cleaner drinks cans.

Figure 4.3.5.1 clearly shows the levels of recyclable metals within the residual waste. In the first survey it was seen that 66% of plastics were recyclable which accounted for 2.2% or 0.10kg/hh/wk of the residual waste. The proportion that was recyclable was lower in the second survey at 60%. Therefore recyclable metals accounted for just 1% or 0.06kg/hh/wk of residual waste; as drop of 0.04kg/hh/wk.

Table 4.3.5.1: Levels of metals within the residual waste (kg/hh/wk)

METALS	PRE	POST	DIFFERENCE
FOOD AND BEVERAGE CANS	0.06	0.03	-0.03
AEROSOLS	0.02	0.00	-0.02
FOIL	0.03	0.02	-0.01
OTHER METAL WASTE	0.05	0.04	-0.01
TOTAL METALS	0.16	0.09	-0.07
% METALS	3.28%	1.73%	-1.55%
RECYCLABLE METALS	0.10	0.06	-0.04
% RECYCLABLE METALS	2.17%	1.04%	-1.13%
% OF METALS RECYCLABLE	66.09%	60.32%	-5.77%

Figure 4.3.5.1: Levels of metals within the residual waste (kg/hh/wk)



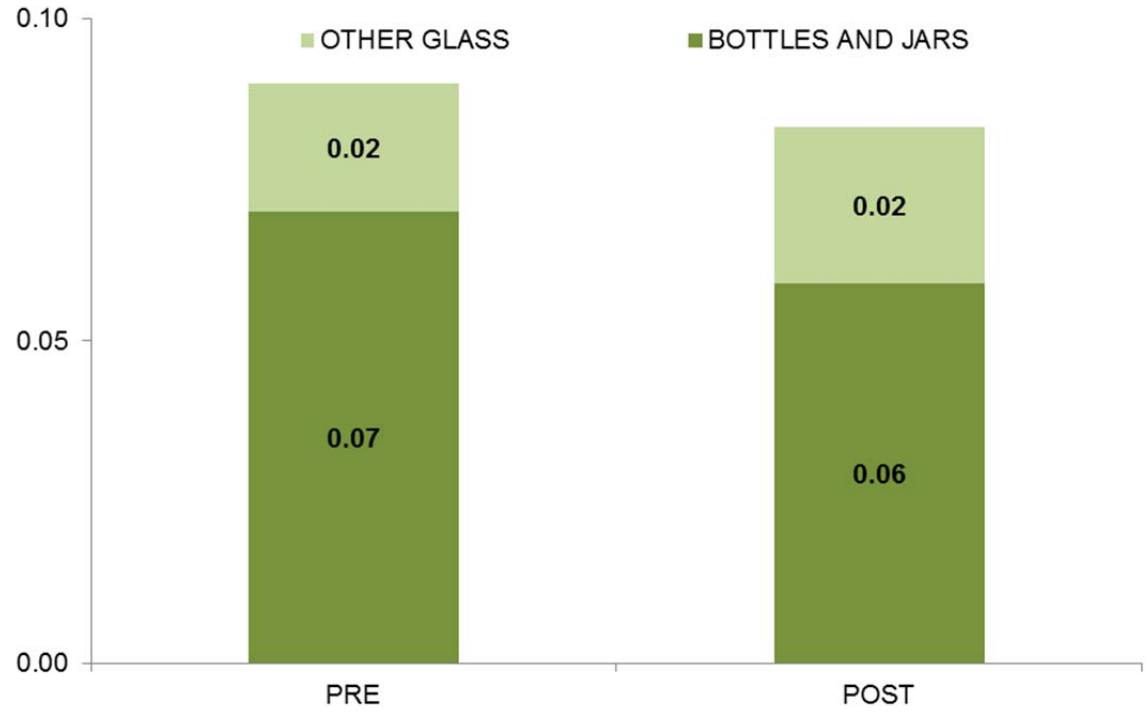
4.3.6 Glass within Kerbside residual waste

Between the pre and post surveys the proportion of glass in the residual waste fell from 1.8% (0.09kg/hh/wk) down to 1.6% (0.08kg/hh/wk). All residents are able to recycle glass bottles and jars at the kerbside using their kerbside recycling service. In the same way that food tins are often recycled less effectively than drink cans; jars often contain food or sauce and residents may choose not to wash them for recycling. Figure 4.3.6.1 clearly shows the levels of recyclable glass within the residual waste. In the first survey it was seen that 79% of glass was recyclable which accounted for 1.4% or 0.07kg/hh/wk of the residual waste. The proportion that was recyclable was lower in the second survey at 70%. Therefore recyclable glass accounted for just 1.1% or 0.06kg/hh/wk of residual waste; as drop of 0.01kg/hh/wk.

Table 4.3.6.1: Levels of glass within the residual waste (kg/hh/wk)

GLASS	PRE	POST	DIFFERENCE
BOTTLES AND JARS	0.07	0.06	-0.01
OTHER GLASS	0.02	0.02	0.00
TOTAL GLASS	0.09	0.08	-0.01
TOTAL GLASS (%)	1.79%	1.55%	-0.24%
RECYCLABLE GLASS (%)	1.42%	1.10%	-0.32%
% OF GLASS RECYCLABLE	79.19%	70.92%	-8.27%

Figure 4.3.6.1: Levels of glass within the residual waste (kg/hh/wk)



4.3.7 Hazardous Items (HHW) & WEEE within Kerbside residual waste

Across both surveys the average overall concentration of hazardous and WEEE waste was seen to be consistent at just over 1% of the total. Table 4.3.8.1 lists the various items of HHW and WEEE directly observed from both surveys.

Table 4.3.8.1: Levels of HHW and WEEE (kg/hh/wk)

RESIDUAL HHW & WEEE	PRE	POST
HHW	0.01	0.01
WEEE	0.04	0.06
TOTAL	0.05	0.07
% HHW & WEEE	1.06%	1.27%

4.3.9 Disposable Nappies & AHP within the Kerbside residual waste

The profile of this type of waste has increased in recent years. Levels of this waste within the residual bins of households with babies can be extremely high. In the first survey the concentrations of disposable nappies and AHP (Absorbent Hygiene Products) waste ranged between 2.1% for Acorn 1 and 9.1% for Acorn 5. This represented an overall average of 5.4% or 0.26kg/hh/wk. In the second survey the concentrations of these items waste ranged between 0.9% for Acorn 2 and 23.3% for Acorn 3. This represented an overall average of 11.3% or 0.60kg/hh/wk.

4.4 Potential recyclability of the residual waste

The overall recyclability of the residual waste relates to all the items present that could have been accepted into the kerbside recycling containers that are available. Figures 4.4.1 and 4.4.2 clearly show the levels of residual materials currently collectable using the various recycling schemes available. In the pre campaign survey it was seen that 54.9% or 2.62kg/hh/wk of residual waste was classified as kerbside recyclable. By the time of the second (post) campaign survey this level had risen to 56.8% or 3.04kg/hh/wk. It was however evident that this increase was almost total driven by increases in food waste, with levels of all other recyclables (with the exception of plastics) showing a reduction.

- Food was the most prevalent recyclable material in the residual waste during both surveys. Levels increased from 1.69kg/hh/wk to 2.34kg/hh/wk which represented a rise of 38%.
- Levels of recyclable paper fell from 0.18kg/hh/wk to 0.14kg/hh/wk; a reduction of 21%.
- Levels of recyclable card & cardboard fell from 0.21kg/hh/wk to 0.13kg/hh/wk; a reduction of 37%.
- Levels of recyclable metals fell from 0.10kg/hh/wk to 0.06kg/hh/wk; a reduction of 44%.
- Levels of recyclable glass fell from 0.07kg/hh/wk to 0.06kg/hh/wk; a reduction of 16%.
- Levels of recyclable plastics rose from 0.17kg/hh/wk to 0.22kg/hh/wk; an increase of 29% (8% for plastic bottles and 40% for plastic containers).
- Levels of recyclable garden waste (excluding soil) fell from 0.20kg/hh/wk to 0.09kg/hh/wk; a reduction of 54%.

Table 4.4.1. Proportion of residual waste currently recyclable within kerbside collection schemes (%)

RECYCLABLES	PRE	POST	DIFFERENCE
RECYCLABLE PAPER	3.70%	2.66%	-1.04%
RECYCLABLE CARD & CARDBOARD	4.45%	2.47%	-1.98%
PLASTIC BOTTLES	1.17%	1.22%	0.05%
PLASTIC FOOD CONTAINERS	2.32%	2.88%	0.56%
GLASS BOTTLES & JARS	1.42%	1.10%	-0.32%
RECYCLABLE METALS	2.17%	1.04%	-1.13%
RECYCLABLE GARDEN WASTE	4.24%	1.71%	-2.53%
RECYCLABLE FOOD WASTE	35.46%	43.70%	8.24%
TOTAL DRY RECYCLABLES	15.23%	11.38%	-3.85%
TOTAL ORGANIC RECYCLABLES	39.70%	45.42%	5.72%
ALL RECYCLABLES	54.93%	56.79%	1.86%

Figure 4.4.1. % breakdown of recyclable materials in the residual waste

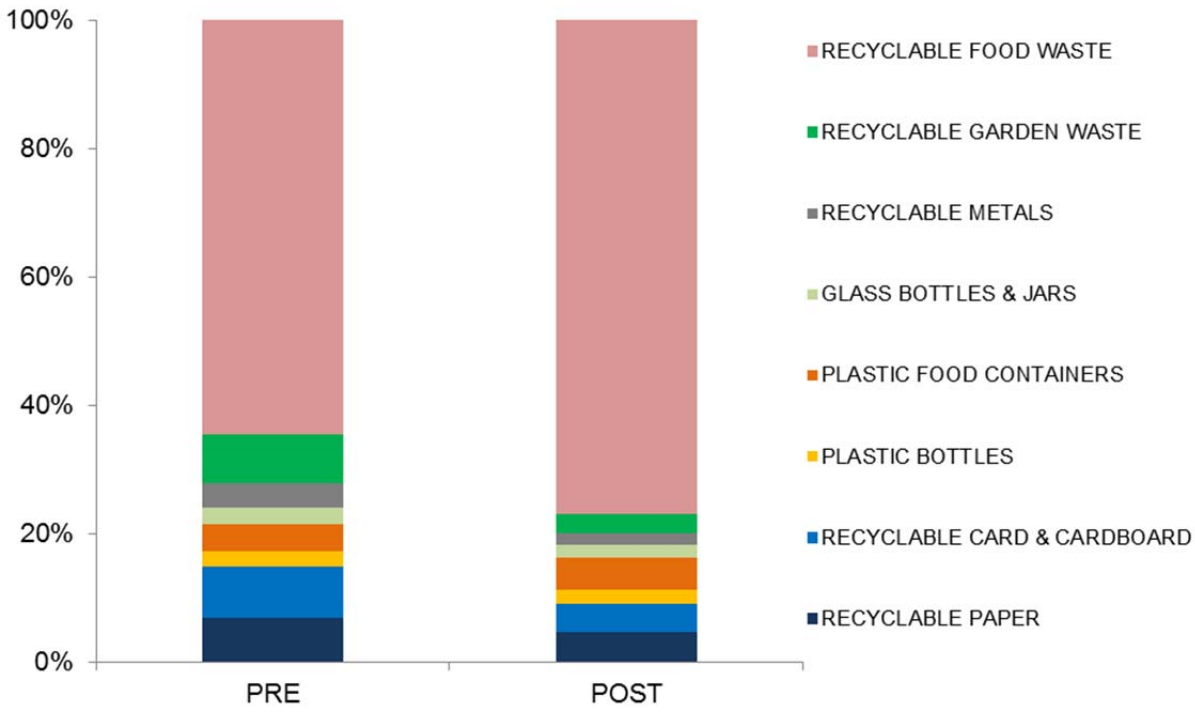
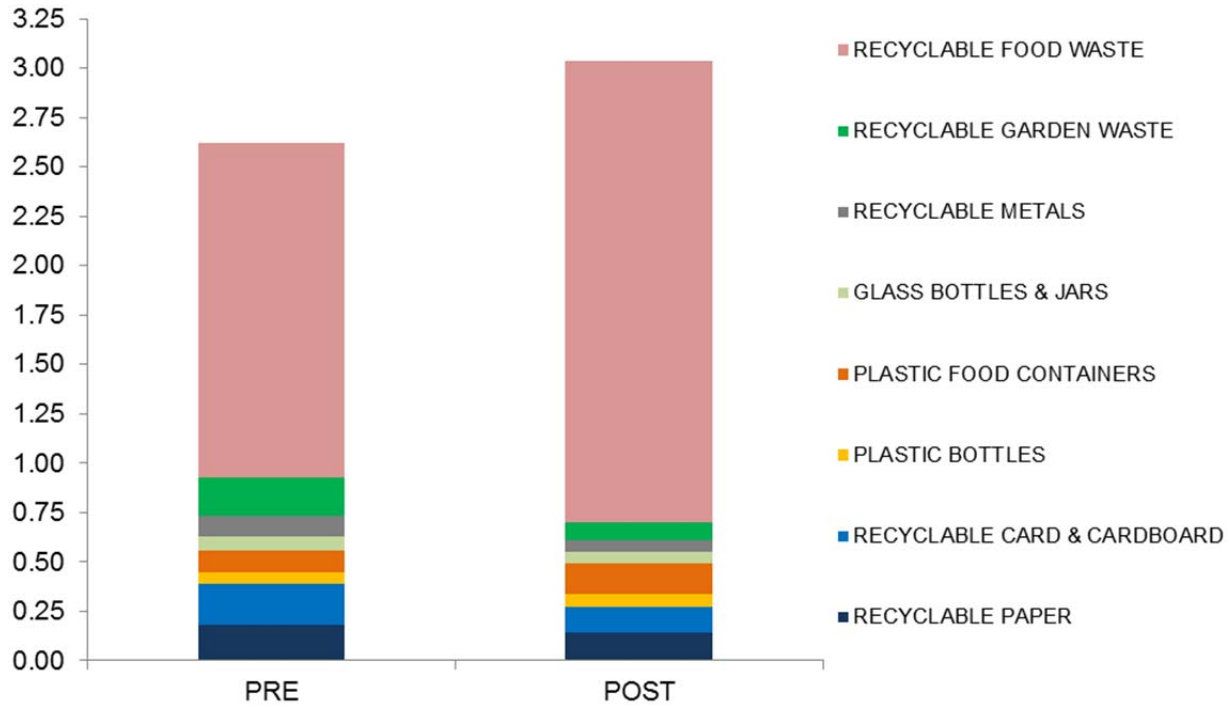


Table 4.4.2. Kg/hh/wk of residual waste currently recyclable relative to kerbside schemes

RECYCLABLES	PRE	POST	DIFFERENCE
RECYCLABLE PAPER	0.18	0.14	-0.04
RECYCLABLE CARD & CARDBOARD	0.21	0.13	-0.08
PLASTIC BOTTLES	0.06	0.07	0.01
PLASTIC FOOD CONTAINERS	0.11	0.15	0.04
GLASS BOTTLES & JARS	0.07	0.06	-0.01
RECYCLABLE METALS	0.10	0.06	-0.04
RECYCLABLE GARDEN WASTE	0.20	0.09	-0.11
RECYCLABLE FOOD WASTE	1.69	2.34	0.65
TOTAL DRY RECYCLABLES	0.73	0.61	-0.12
TOTAL ORGANIC RECYCLABLES	1.90	2.43	0.53
ALL RECYCLABLES	2.62	3.04	0.42

Figure 4.4.2. Kg/hh/wk of residual waste currently recyclable relative to kerbside schemes



4.5 Biodegradable waste within Kerbside residual waste

These figures are useful when considering the proportion of biodegradable waste, which may be subject to the national provision of the Landfill Directive. Targets have been set in an attempt to reduce the emission of greenhouse gases from landfill.

These figures have been calculated using the compositional data in accordance with the percentages outlined in previous reports. For example, only 50% of miscellaneous combustible materials are considered to be biodegradable whereas 100% of paper and card is considered to be biodegradable.

National average figures are around 68%; in this survey the biodegradability of residual waste ranged between 68.8% for the first survey and 70.6% for the second. Levels of biodegradable materials in the residual waste therefore increased from 3.29kg/hh/wk to 3.77kg/hh/wk.

Table 4.5.1: Percentage composition of residual waste – biodegradable materials

BIODEGRADABLE CONTRIBUTION	PRE	POST
PAPER AND CARD	14.29%	9.53%
TEXTILES	2.40%	1.68%
MISC. COMBUSTIBLE*	8.33%	8.96%
PUTRESCIBLES	42.20%	48.80%
FINES	1.56%	1.66%
TOTAL BIODEGRADABLE	68.77%	70.62%

4.6 Packaging Waste

These figures are useful when considering the proportion of packaging waste, which may be subject to the national provision of the Landfill Directive. The data has been calculated using a similar method to that used to calculate biodegradability. Levels of packaging in the residual ranged between 19.1% for the first survey and 11.6% for the second. Levels of packaging materials in the residual waste therefore fell from 0.91kg/hh/wk to 0.62kg/hh/wk.

Table 4.6.1: Percentage composition of residual waste – packaging materials

PACKAGING CONTRIBUTION	PRE	POST
PAPER AND CARD	5.61%	2.78%
PLASTICS	9.91%	6.65%
GLASS	1.42%	1.10%
METALS	2.17%	1.04%
TOTAL PACKAGING	19.10%	11.57%

5) Mixed dry recycling waste

5.1 Set out rates and waste generation

Table 5.1.1 and Figure 5.1.1 highlight the set out rates for the mixed recycling containers observed at the time waste was collected for compositional analysis. Table 5.1.2 and Figure 5.1.2 show the amount of mixed recycling waste generated in kg/hh/wk. The same houses were visited that had their residual waste sampled in both surveys. It was possible to calculate the set out relating to the proportion of these households actively placing out their waste. The amount of waste in kilograms per household per week is derived from the number of households who could set out waste and not just those that are participating. As for residual waste, recycling waste is collected on a weekly basis and this service uses blue bins.

Barnet operates a weekly collection of recycling waste. Between the two surveys the average set out rate for recycling bins fell from 70% to 60%. Despite the drop in set out, the amount of generated waste increased from 2.45kg/hh/wk up to 3.72kg/hh/wk. This increase was driven by the more affluent Acorns 1 – 3 with Acorn 4 and 5 households showing a reduction in the amount of generated recycling by the time of the second survey.

Table 5.1.1: Average Set Out for mixed recycling waste (%)

% SET OUT	PRE	POST	DIFFERENCE
ACORN 1	76%	76%	0%
ACORN 2	71%	47%	-24%
ACORN 3	70%	80%	10%
ACORN 4	52%	24%	-28%
ACORN 5	68%	56%	-12%
WEIGHTED	70%	60%	-10%

Table 5.1.2: Average Mixed Recycling waste generation rates (kg/hh/wk)

KG/HH/WK	PRE	POST	DIFFERENCE
ACORN 1	2.65	5.53	2.88
ACORN 2	3.09	3.31	0.22
ACORN 3	1.32	3.83	2.51
ACORN 4	1.46	0.90	-0.56
ACORN 5	2.24	2.05	-0.20
WEIGHTED	2.45	3.72	1.27

Figure 5.1.1: Average Set Out for mixed recycling waste (%)

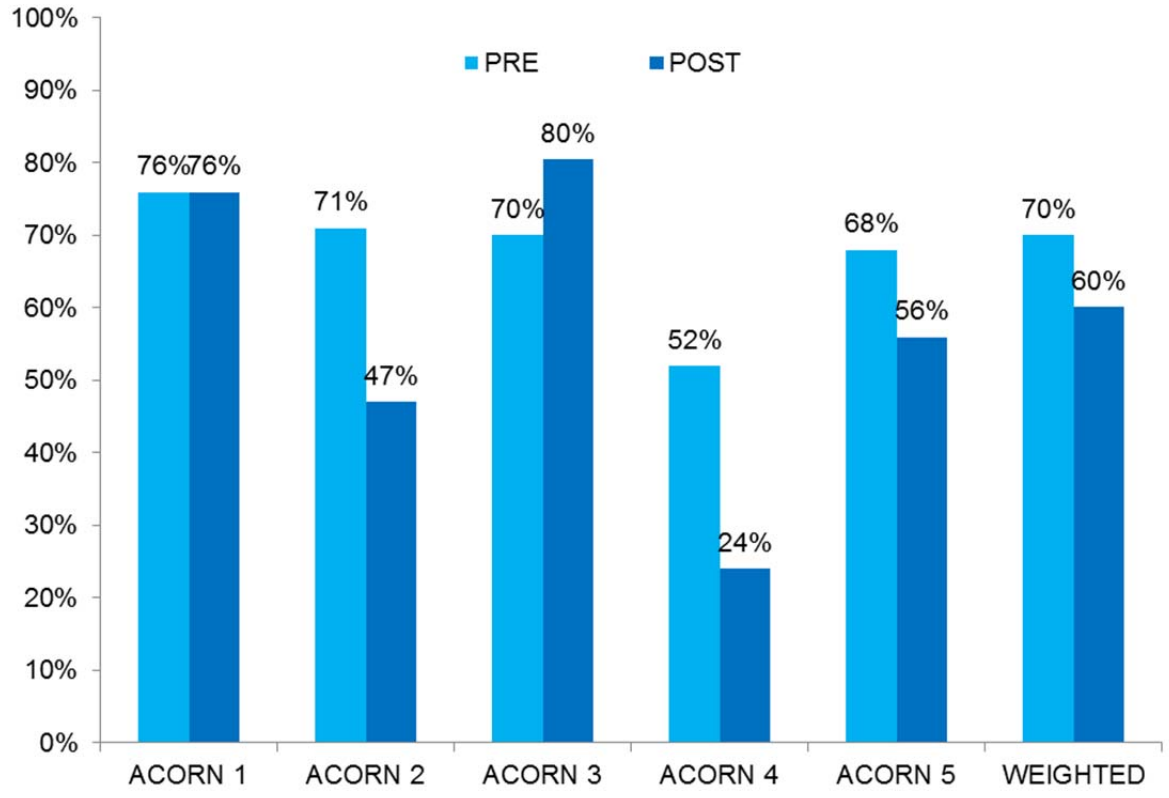
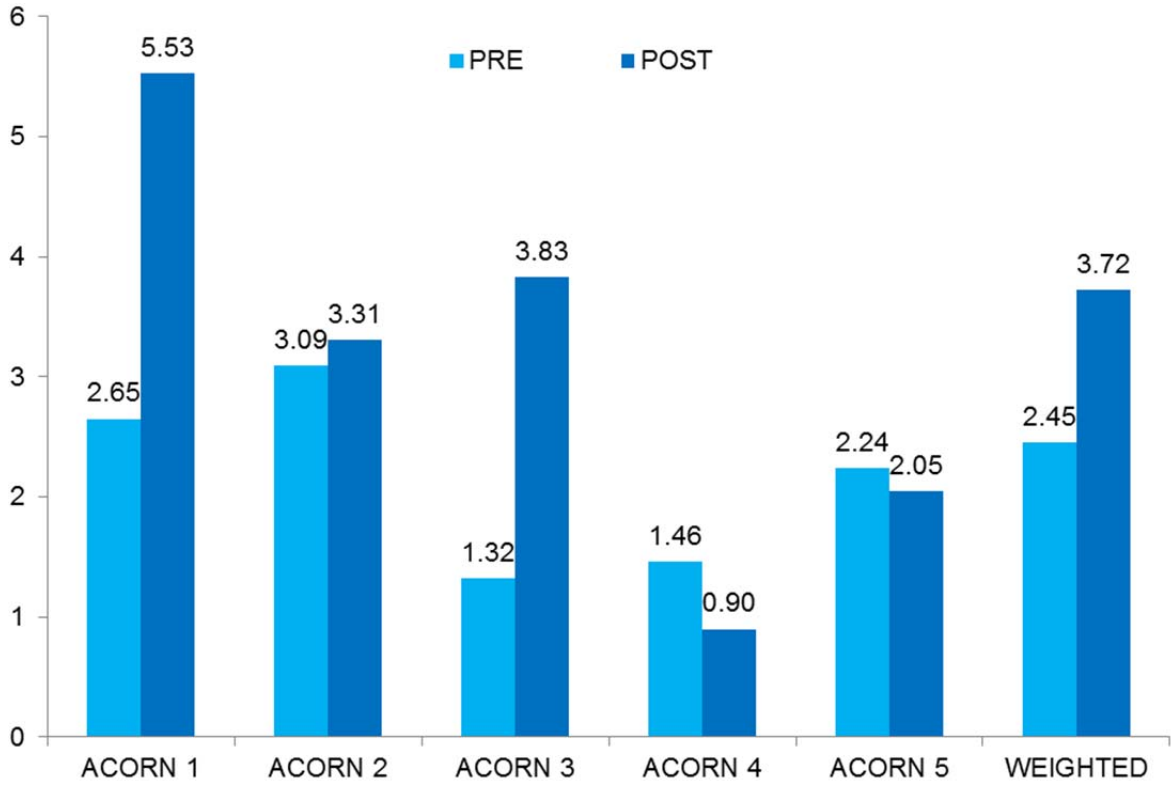


Figure 5.1.2: Average Mixed recycling waste generation rates (kg/hh/wk)



5.2 Compositional analysis of mixed recycling waste

This section looks at the average amount and composition of the mixed recycling waste presented by the households sampled. Hand sorting of the recycling waste gave concentration by weight figures for the main categories of waste as well as the more detailed sub-categories. Results can again be expressed in terms of average percentage concentration and kg/hh/wk; detailed recycling composition tables relative to each Acorn sample can be found in a separate data appendix. Table 5.2.1 and Figure 5.2.1 show mixed recycling data in terms of percentage composition with Table 5.2.2 and Figure 5.2.2 showing generation rates for major materials in terms of kg/hh/wk. The changes in the levels of individual materials are discussed in section 5.3.

As residual waste will contain a proportion that is classified as potentially recyclable; then recycling waste will contain a faction that is deemed to be contamination. That is to say that it is not compatible with the materials currently acceptable to the recycling container it is placed into.

Table 5.2.1: Composition of mixed recycling (% concentration)

% COMPOSITION	PRE	POST	DIFFERENCE
RECYCLABLE PAPER	34.93%	30.56%	-4.37%
TETRAPAKS	0.98%	0.78%	-0.20%
CARD & CARDBOARD	17.81%	18.00%	0.19%
PLASTIC BOTTLES	9.02%	6.00%	-3.02%
PLASTIC CONTAINERS	2.54%	3.87%	1.33%
RECYCLABLE GLASS	15.28%	27.39%	12.11%
RECYCLABLE METALS	5.99%	3.97%	-2.02%
CONTAMINANTS	13.45%	9.43%	-4.02%

Table 5.2.2: Composition of mixed recycling (kg/hh/wk)

KG/HH/WK	PRE	POST	DIFFERENCE
RECYCLABLE PAPER	0.86	1.14	0.28
TETRAPAKS	0.02	0.03	0.01
CARD & CARDBOARD	0.44	0.67	0.23
PLASTIC BOTTLES	0.22	0.22	0.00
PLASTIC CONTAINERS	0.06	0.14	0.08
RECYCLABLE GLASS	0.37	1.02	0.65
RECYCLABLE METALS	0.15	0.15	0.00
CONTAMINANTS	0.33	0.35	0.02

Figure 5.2.1: Composition of mixed recycling (%)

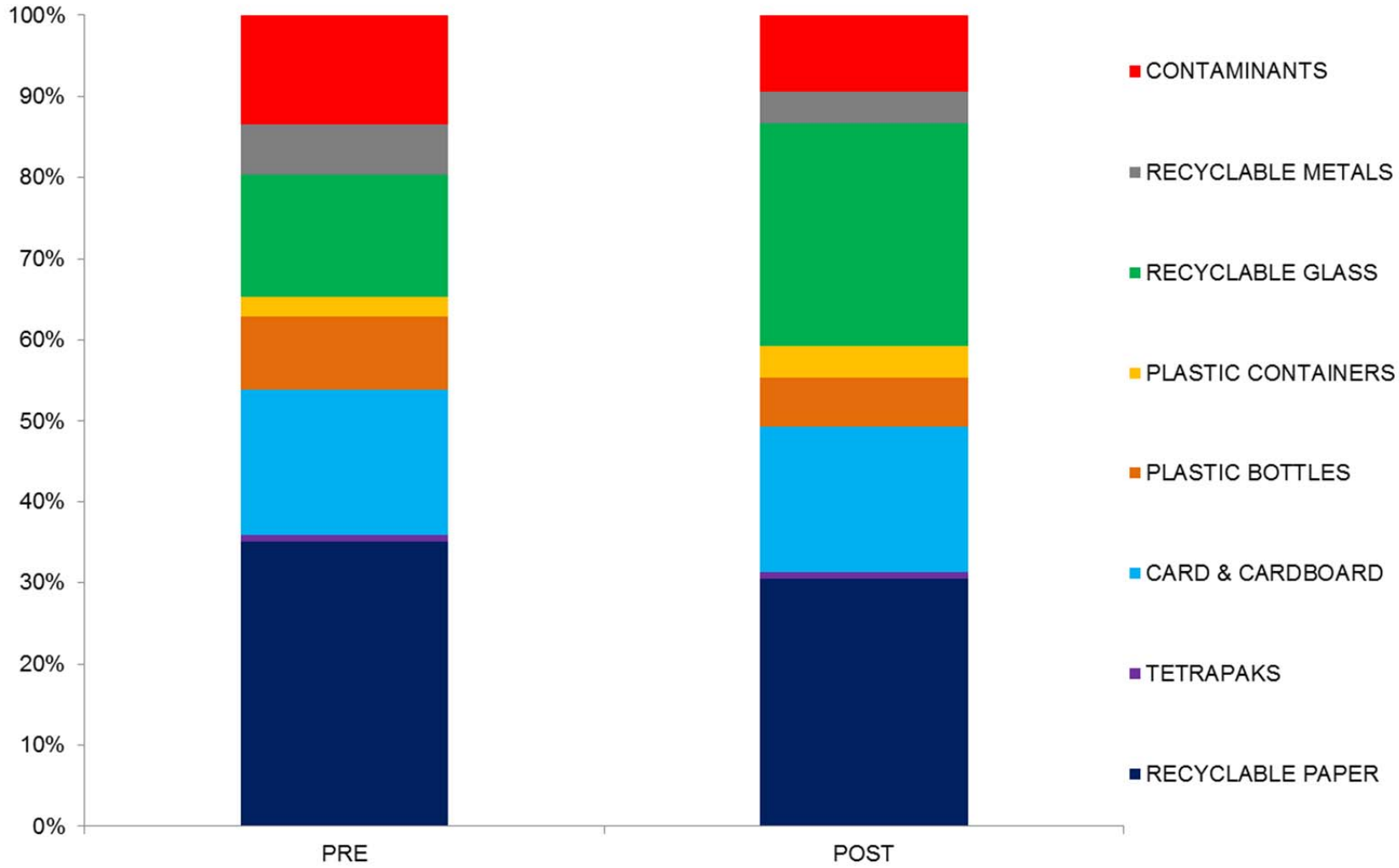
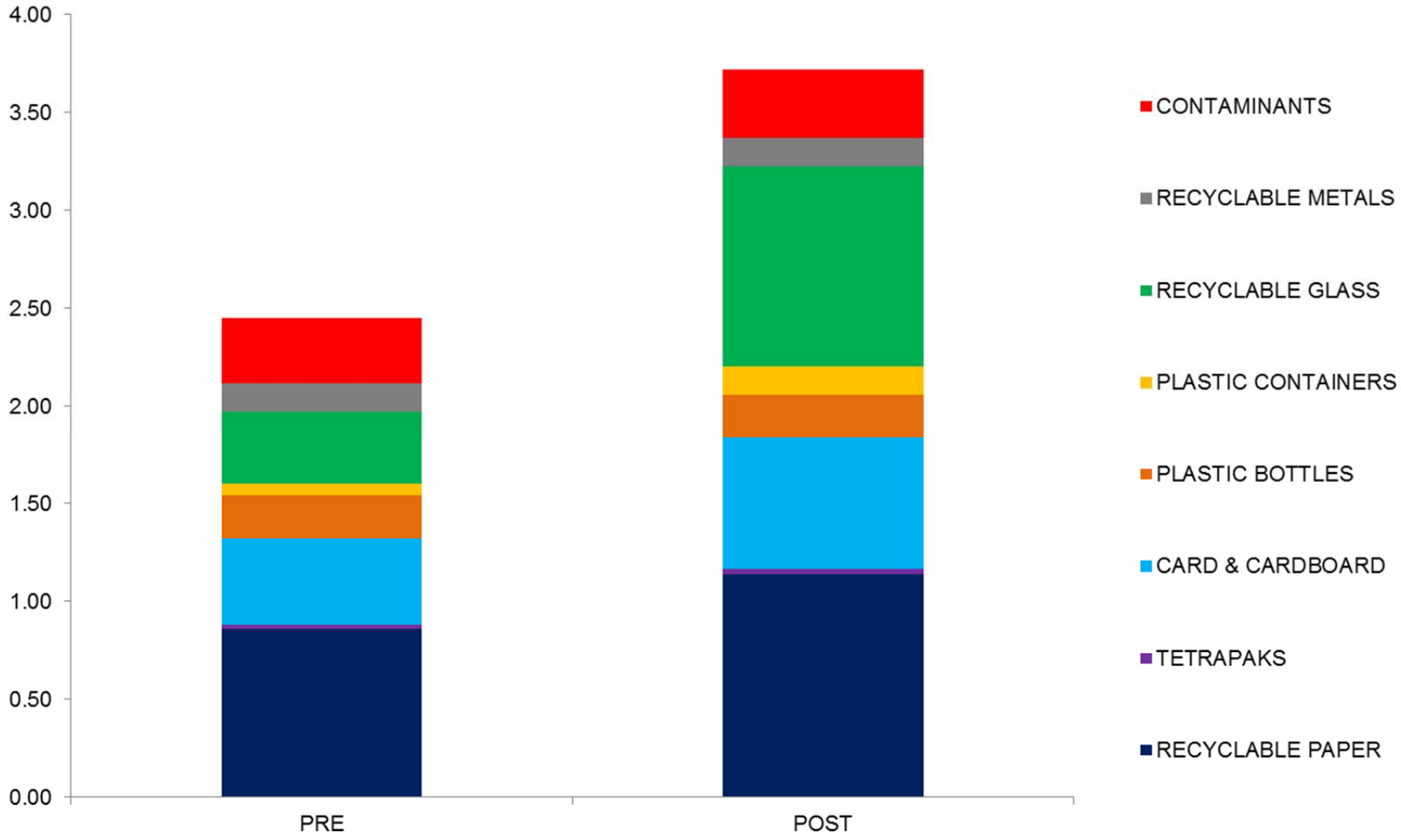


Figure 5.2.2: Composition of mixed recycling (kg/hh/wk)



5.3 Materials placed out for mixed recycling collections

This chapter looks in more detail at the individual materials placed out for mixed recycling collections and highlights the effectiveness with which these schemes are capturing the recyclate. Looking at the relationship between the residual, organic and recycling waste streams presented will additionally give indications as to the overall diversion being achieved throughout Barnet.

Table 5.3.1 summarises the capture and diversion rates seen for the range of materials collected in the mixed recycling bins. These include recyclable forms of paper, card & cardboard, plastics, glass and metals. On average, Barnet households are capturing the majority of all the recyclable materials that are accepted into blue recycling bins. The efficiency of capture for each material was, however, seen to vary although the overall trend was for a greater efficiency of capture in the post campaign survey.

Table 5.3.1: Summary table for material capture and diversion rates (%) for mixed recycling

% CAPTURE (BLUE BIN)	PRE	POST	DIFFERENCE
RECYCLABLE PAPER	82.80%	88.80%	6.00%
TETRAPAKS	57.10%	70.60%	13.50%
CARD & CARDBOARD	69.10%	84.80%	15.70%
PLASTIC BOTTLES	79.70%	77.40%	-2.30%
PLASTIC CONTAINERS	35.90%	48.30%	12.40%
RECYCLABLE GLASS	82.00%	94.40%	12.40%
RECYCLABLE METALS	58.50%	72.50%	14.00%
ALL DRY RECYCLABLES	74.00%	84.60%	10.60%
% DIVERSION	20.90%	27.30%	6.40%

The greatest improvement in capture rates were observed for card, cardboard and Tetrapak style cartons. Capture rates for card and cardboard in the second survey were 84.8% compared with 69.1% at the pre campaign stage – an increase of 15.7%. Capture rates for cartons rose by 13.5% from 57.1% to 70.6%.

In the first survey just over half of all recyclable metals were captured (58.5%). By the time of the second survey almost three quarters were captured (72.5% - an increase of 14%).

Almost all recyclable glass was captured in the post campaign survey (94.4%) up from the 82% recorded in the first survey.

Despite increases in the amount present in the residual waste, capture rates for plastic containers actually increased by 12.4% from 35.9% to 48.3%. Plastic bottles were captured more efficiently at 77.4% although this is slightly down on the 79.7% recorded in 2014.

Recyclable paper retains a high capture rate which has increased by 6% from 82.8% at the pre campaign stage to 88.8% in the latest survey.

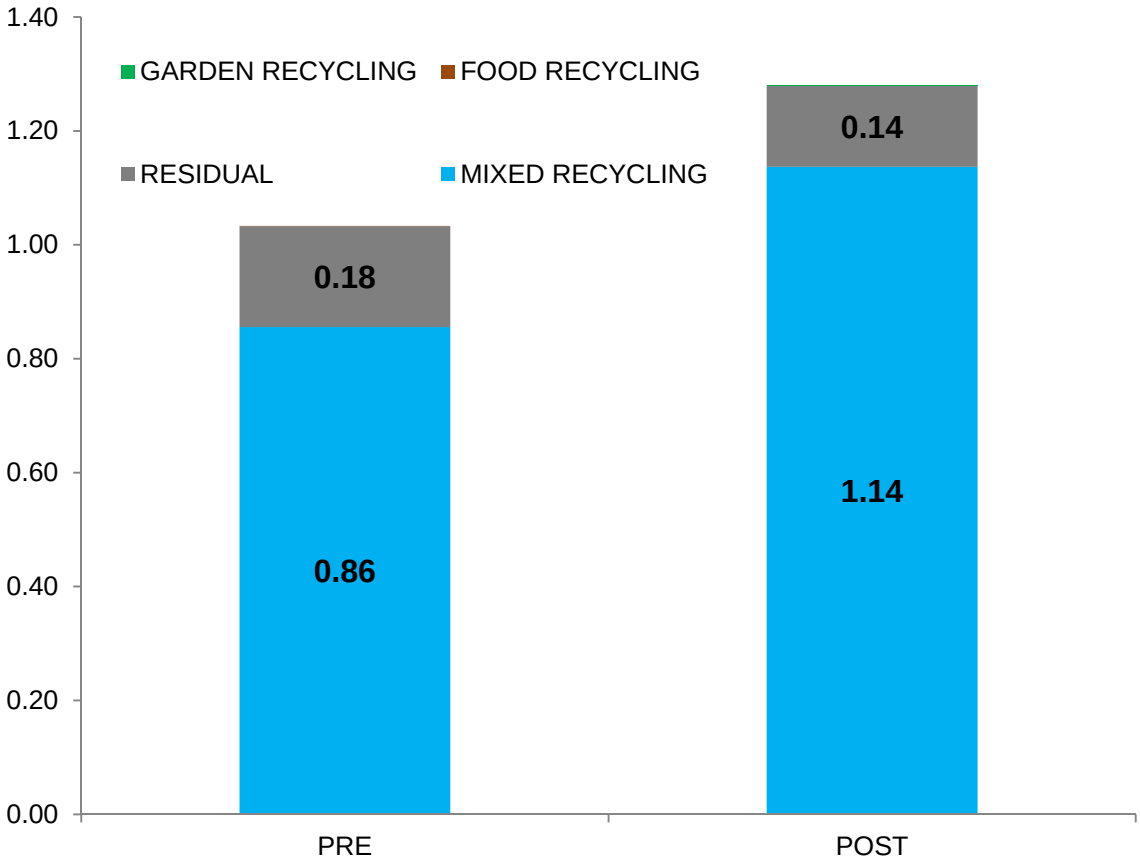
Overall, 84.6% of all dry recyclables are captured; an increase of 10.6% on the first survey.

5.3.1 Paper Capture

At the time of the pre-campaign survey it was seen that 1.03kg/hh/wk of recyclable paper was being generated by households in Barnet. Of this, 0.86kg/hh/wk or 82.8% was correctly captured in blue bins. Figures from the post campaign survey suggested that the total amount of recyclable paper being disposed of was 1.28kg/hh/wk. In addition to there being more recyclable paper generated, a higher proportion was recycled with 88.8% or 1.14kg/hh/wk correctly placed into blue recycling bins.

There are many different forms of paper and decisions have to be made by residents as to whether a particular piece is to go into the recycling or residual waste. The majority of recyclable forms of paper are being correctly diverted by the residents surveyed. From the pre-campaign survey around 0.18kg/hh/wk of recyclable paper was not placed into blue bins. This amount fell to 0.14kg/hh/wk by the time of the second survey.

Figure 5.3.1.1: Distribution of recyclable paper within kerbside waste streams (kg/hh/wk)



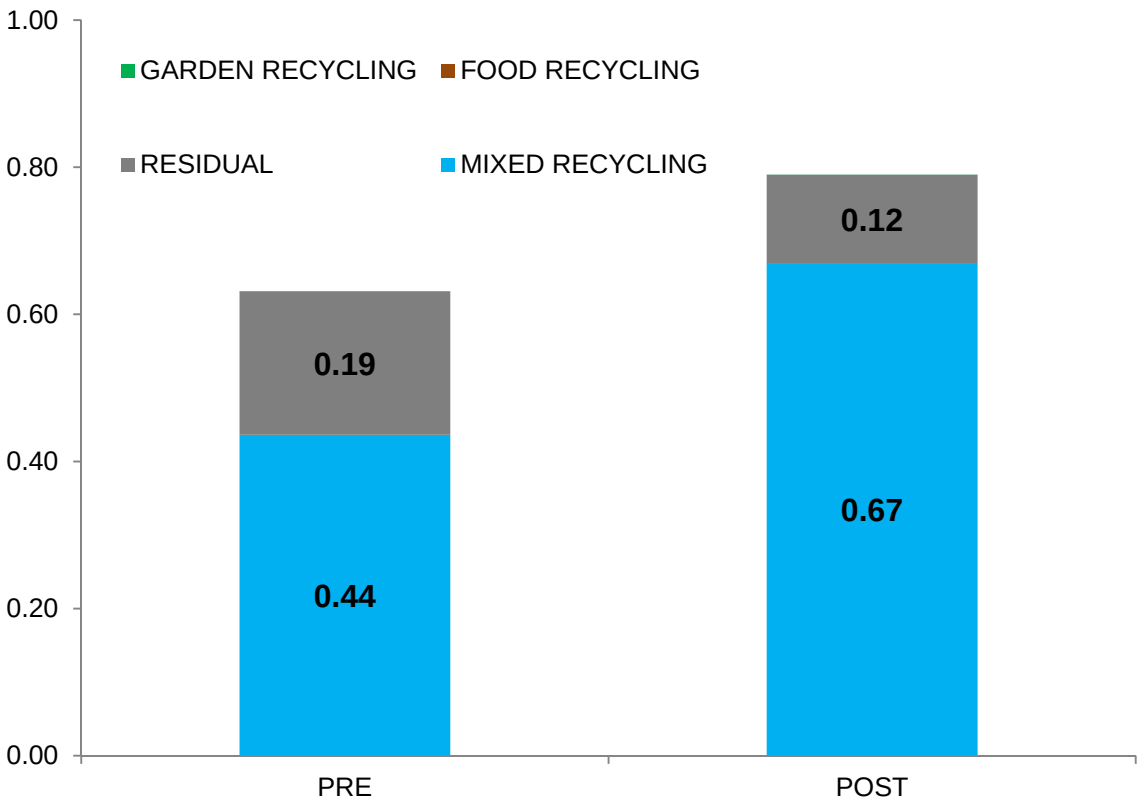
5.3.2 Card & Cardboard Capture

At the time of the pre-campaign survey it was seen that 0.63kg/hh/wk of recyclable card & cardboard was being generated by households in Barnet. Of this, 0.44kg/hh/wk or 69.1% was correctly captured in blue bins. Figures from the post campaign survey suggested that the total amount of recyclable card & cardboard being disposed of was 0.79kg/hh/wk. In addition to there being more recyclable card & cardboard generated, a higher proportion was recycled with 84.8% or 0.67kg/hh/wk correctly placed into blue recycling bins.

There are many different forms of card & cardboard and decisions have to be made by residents as to whether a particular piece is to go into the recycling or residual waste. The majority of all collectable forms of card & cardboard are being correctly diverted by all the residents surveyed. From the pre-campaign survey around 0.20kg/hh/wk of recyclable card & cardboard was not placed into blue bins. This amount fell to 0.12kg/hh/wk by the time of the second survey.

Tetrapak cartons are also recycled at the kerbside with an average of 0.04kg/hh/wk being generated in both surveys. However capture rates for this material were 70.6% in the second survey compared with 57.1% at the pre-campaign stage.

Figure 5.3.2.1: Distribution of recyclable card within kerbside waste streams (kg/hh/wk)*



*excludes Tetrapaks

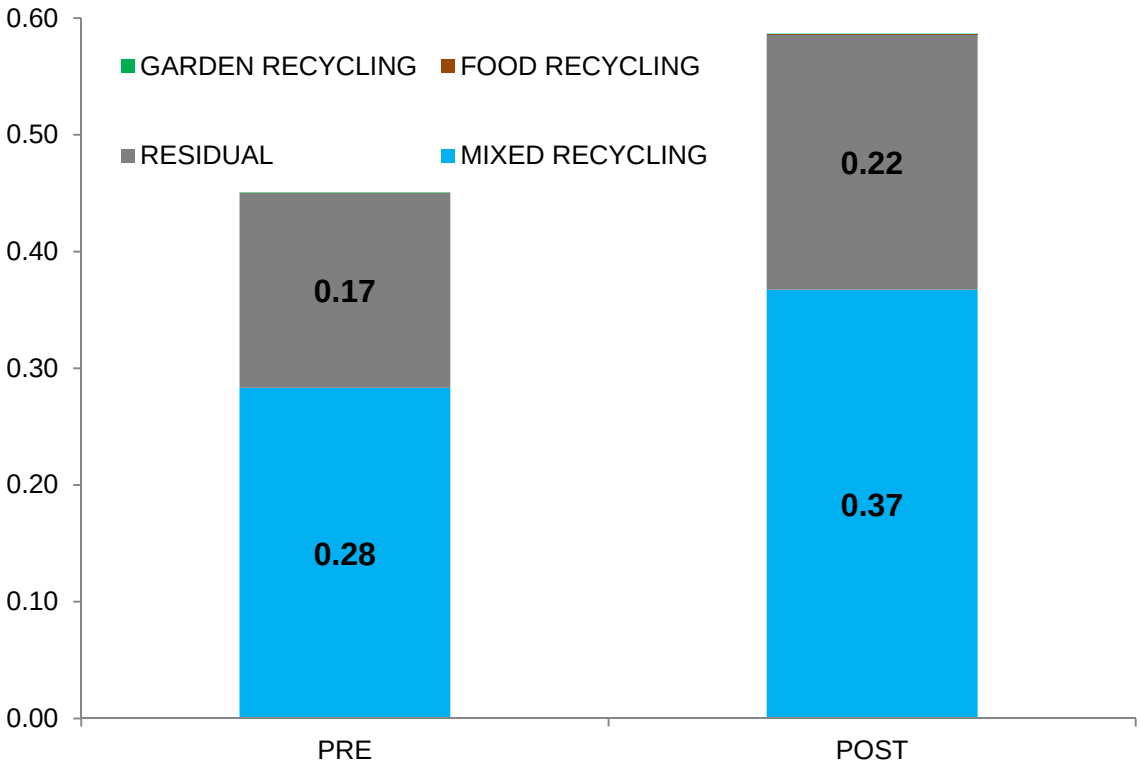
5.3.3 Plastics Capture

At the time of the pre-campaign survey it was seen that 0.45kg/hh/wk of recyclable plastic bottles and containers were being generated by households in Barnet. Of these, 0.28kg/hh/wk or 62.8% were correctly captured in blue bins. Figures from the post campaign survey suggested that the total amount of recyclable plastic bottles and containers being disposed of was 0.59kg/hh/wk. An almost identical proportion was recycled with 62.6% or 0.37kg/hh/wk correctly placed into blue recycling bins.

There are a huge variety of plastic items being disposed of, not all of which are suitable for recycling. Plastics contribute greatly to waste volumes as opposed to overall weight. From the pre-campaign survey around 0.17kg/hh/wk of recyclable plastic bottles and containers were not placed into blue bins. This amount rose to 0.22kg/hh/wk by the time of the second survey.

All residents can recycle both plastic bottles and food containers at the kerbside. On average all households were far more efficient at recycling plastic bottles than containers. In most cases plastic bottles contain liquids and the bottles are clean once empty. Containers are often covered in food waste once empty so require cleaning prior to recycling. Despite this capture rates rose from 36% to 48% for plastic containers; with a slight decrease registered for plastic bottles - down from 80% to 77% by the time of the second survey.

Figure 5.3.3.1: Distribution of recyclable plastics within kerbside waste streams (kg/hh/wk)



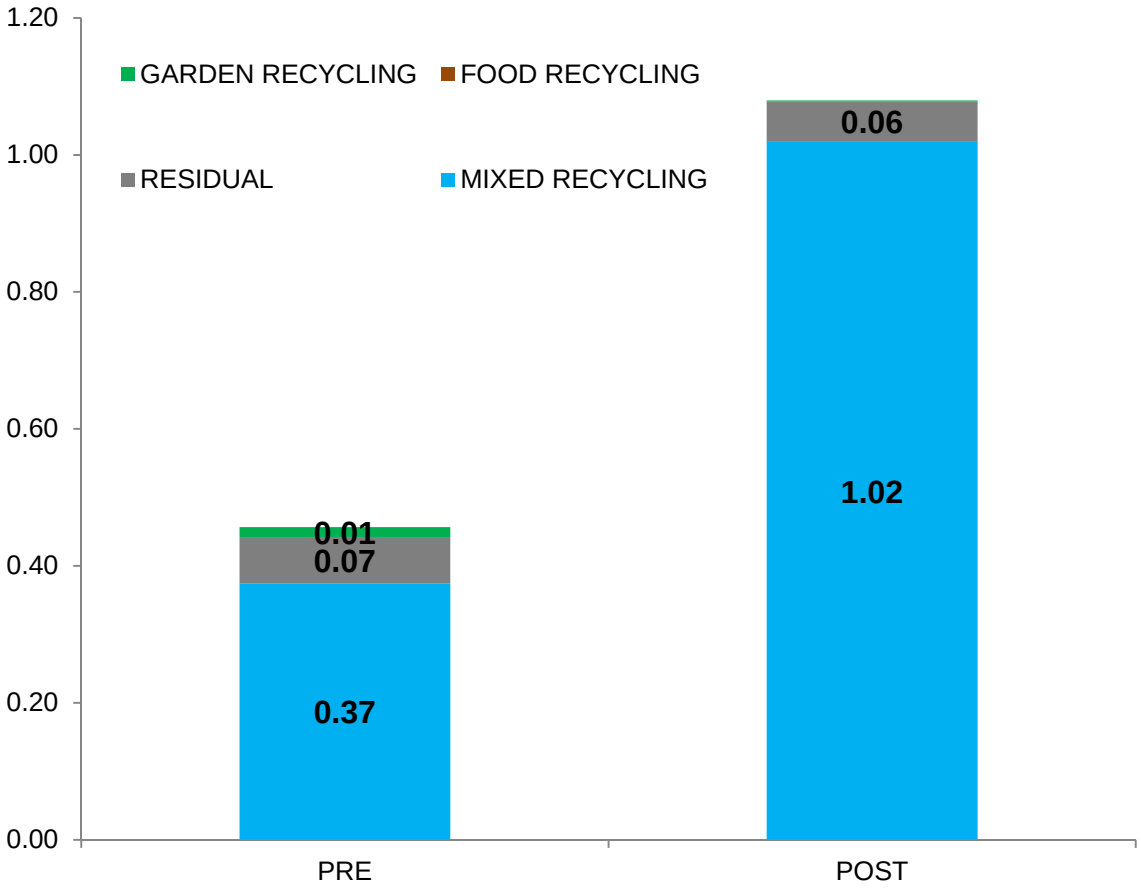
5.3.4 Glass Capture

At the time of the pre-campaign survey it was seen that 0.46kg/hh/wk of recyclable glass was being generated by households in Barnet. Of these, 0.37kg/hh/wk or 82% were correctly captured in blue bins. Figures from the post campaign survey suggested that the total amount of recyclable glass being disposed of had doubled to 1.08kg/hh/wk. Additionally a higher proportion was recycled with 94.4% or 1.02kg/hh/wk correctly placed into blue recycling bins.

Recyclable glass is easily identifiable and generally efficiently recycled. From the pre-campaign survey around 0.08kg/hh/wk of recyclable glass was not placed into blue bins. This amount fell to 0.06kg/hh/wk by the time of the second survey; despite the large increase in the amount disposed of.

Coloured glass is often recycled more effectively than clear glass; most jars are clear glass and these often require a degree of cleaning before being recycled. From the pre campaign analysis it was seen that 80.9% of glass bottles and 83.7% of jars were correctly recycled. At the post campaign survey respective rates were 96.2% for glass bottles and 85.6% for glass jars.

Figure 5.3.4.1: Distribution of recyclable glass within kerbside waste streams (kg/hh/wk)



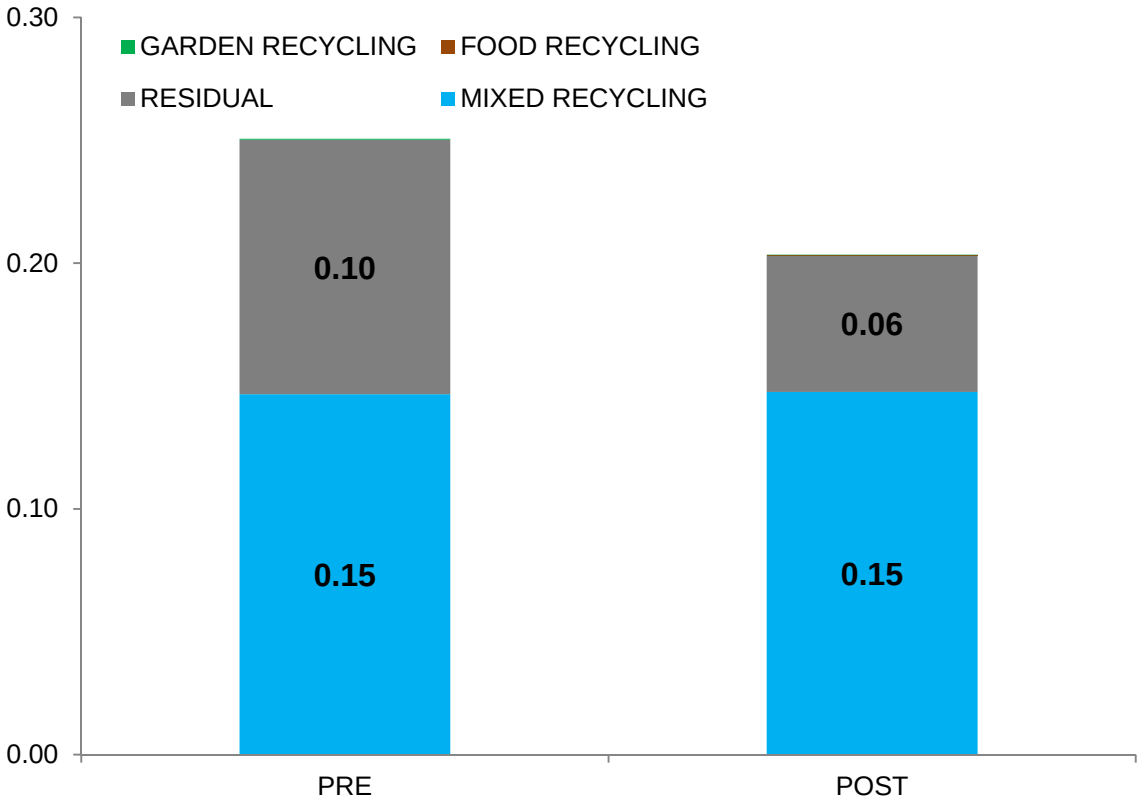
5.3.5 Metals Capture

At the time of the pre-campaign survey it was seen that 0.25kg/hh/wk of recyclable metals were being generated by households in Barnet. Of these, 0.15kg/hh/wk or 58.5% were correctly captured in blue bins. Figures from the post campaign survey suggested that the total amount of recyclable metals being disposed of fell to 0.20kg/hh/wk. However, a higher proportion was recycled with 72.5% or 0.15kg/hh/wk correctly placed into blue recycling bins.

All residents can recycle tins & cans, empty aerosols and clean foil at the kerbside. From the pre-campaign survey around 0.10kg/hh/wk of recyclable metal was not placed into blue bins. This amount fell to 0.06kg/hh/wk by the time of the second survey.

From the first survey, households were most efficient at recycling drink cans with 71.6% captured. In comparison around 68.7% of food tins, 29.4% of aerosols and 8.7% of foils were recycled. Respective figures in the second survey were 79.2% for drink cans, 81.4% for food tins, 79.1% for aerosols and 38% for foils. This represented an increase for all metal types.

Figure 5.3.5.1: Distribution of recyclable metals within kerbside waste streams (kg/hh/wk)



5.4 Mixed Recycling Contamination

From Table 5.2.2 it has been shown that the proportion of blue bin recycling due to contamination materials has fallen from 13.5% down to 9.4% between the pre and post campaign surveys. This section looks to breakdown the amounts and concentrations of the various contaminants being placed into the recycling bins presented at the kerbside. Some forms of contamination may be due to residents' lack of knowledge in relation to the recycling scheme. For example a householder may believe all plastics are accepted alongside bottles and containers. Other contamination will be formed from waste that is totally unrelated to the materials collected (i.e. disposable nappies, wood or bagged kitchen waste). Table 5.4.1 and Figure 5.4.1 show the amounts of contamination materials recovered from the mixed recycling. Table 5.4.2 and Figure 5.4.2 show the contamination as a proportion of the total recycling.

Table 5.4.1: Breakdown of contamination materials in the mixed recycling waste (kg/hh/wk)

KG/HH/WK CONTAMINATION	PRE	POST	DIFFERENCE
NON-RECYCLABLE PAPER	0.05	0.11	0.06
NON-RECYCLABLE CARD	0.02	0.01	-0.01
PLASTIC FILM	0.04	0.08	0.04
NON-RECYCLABLE DENSE PLASTIC	0.03	0.03	0.00
NON-RECYCLABLE GLASS	0.01	0.00	-0.01
NON-RECYCLABLE METALS	0.00	0.02	0.02
TEXTILES	0.02	0.02	0.00
ORGANIC WASTE	0.08	0.07	-0.01
ALL OTHER WASTE	0.08	0.02	-0.06
TOTAL CONTAMINATION	0.33	0.35	0.02

Table 5.4.2: Breakdown of contamination materials in the mixed recycling waste (% of total)

% CONTAMINATION	PRE	POST	DIFFERENCE
NON-RECYCLABLE PAPER	1.91%	2.96%	1.05%
NON-RECYCLABLE CARD	0.66%	0.15%	-0.51%
PLASTIC FILM	1.77%	2.03%	0.26%
NON-RECYCLABLE DENSE PLASTIC	1.14%	0.73%	-0.41%
NON-RECYCLABLE GLASS	0.22%	0.12%	-0.10%
NON-RECYCLABLE METALS	0.18%	0.44%	0.26%
TEXTILES	0.84%	0.55%	-0.29%
ORGANIC WASTE	3.30%	1.87%	-1.43%
ALL OTHER WASTE	3.43%	0.57%	-2.86%
TOTAL CONTAMINATION	13.45%	9.43%	-4.02%

Figure 5.4.1: Breakdown of contamination materials present within mixed recycling containers (kg/hh/wk).

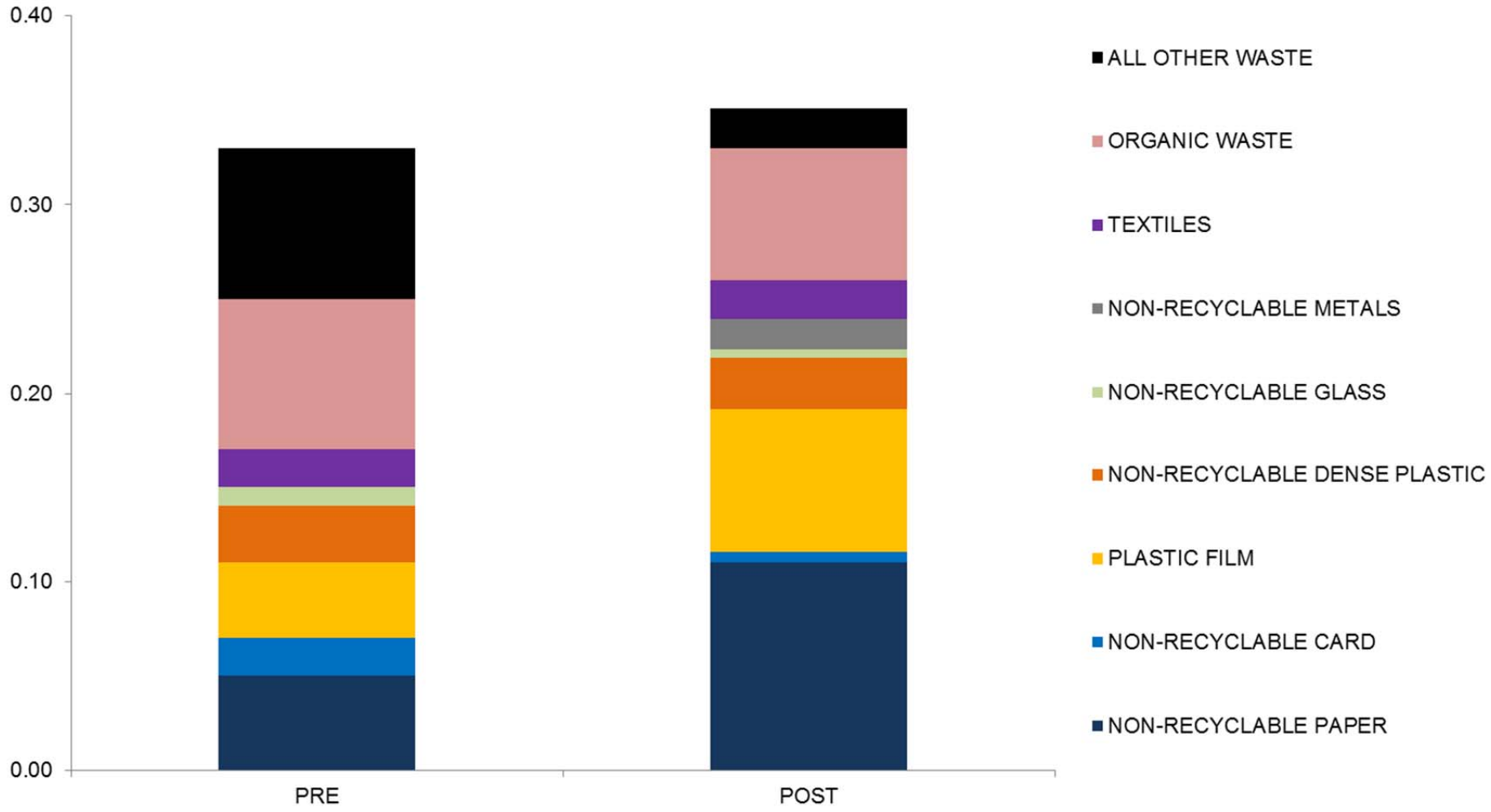


Table 5.4.3 and Figure 5.4.2 break down the differing contaminants proportionately. General residual waste made up 25.5% or 0.08kg/hh./wk of the recycling contamination in the pre-campaign survey. This proportion was much lower in the latest survey where it accounted for just 6% of the contamination or 0.02kg/hh/wk of the collected recycling.

Organic material (mainly food) made up 24.6% or 0.08kg/hh/wk of recycling contamination in the first survey falling to 19.9% or 0.07kg/hh/wk of recycling contamination in the latest survey.

In the pre-campaign survey almost 22% of the contamination present was due to non-recyclable plastics, this formed 0.07kg/hh/wk of the collected recycling. This amount rose to 29.3% of contamination or 0.10kg/hh/wk in the post campaign survey, largely to increases in the amount of plastic film.

19.1% of the pre-campaign contamination present was due to non-recyclable paper and cardboard forming 0.06kg/hh/wk of the collected recycling. This amount rose to 33.1% of contamination or 0.12kg/hh/wk in the post campaign survey, due to increases in the amount of non-recyclable paper (levels of non-recyclable card and cardboard were seen to reduce).

At around 6% or 0.02kg/hh/wk, levels of textile contamination remained consistent between the two surveys.

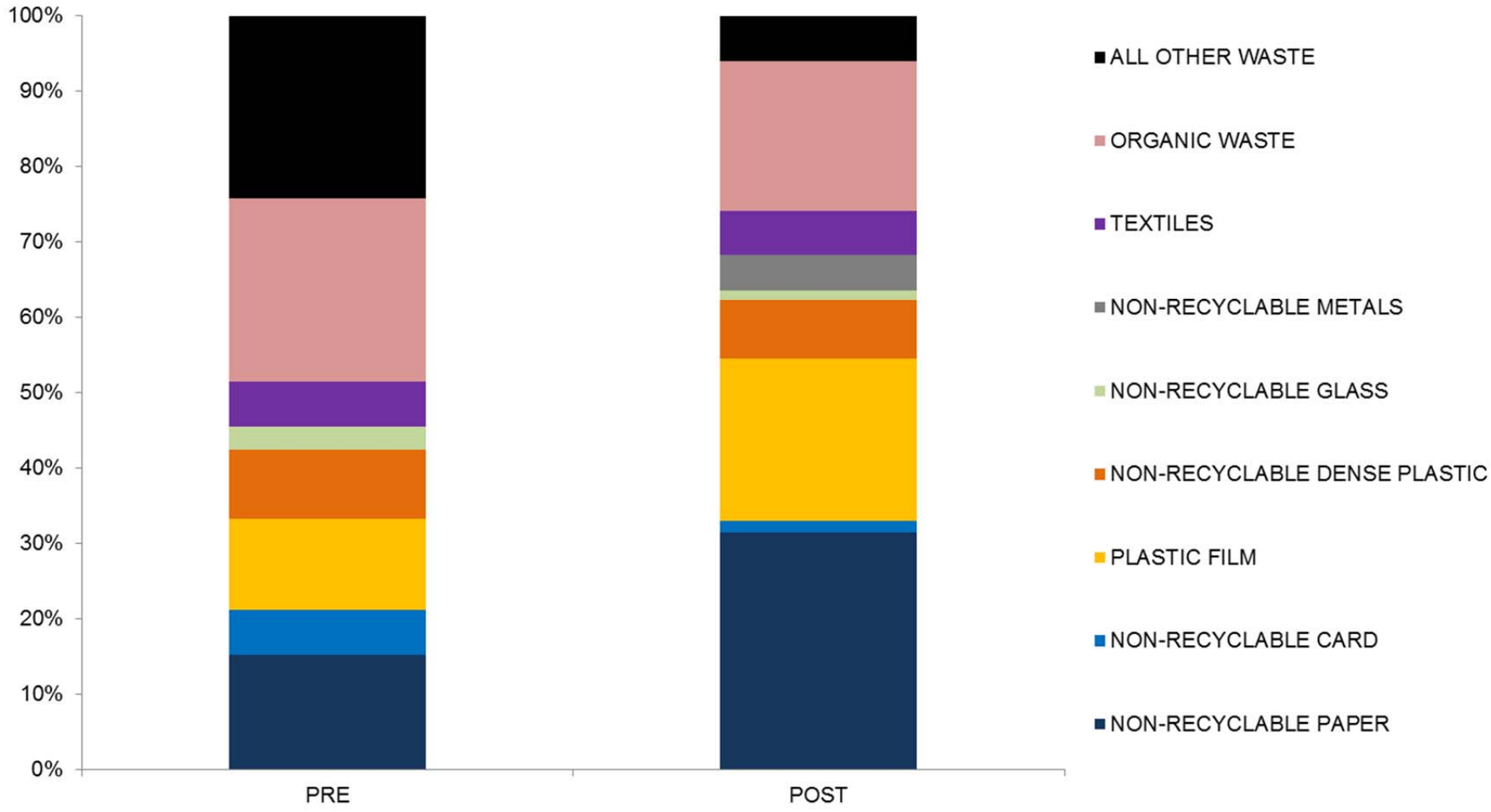
Non-recyclable metals made up just 1.3% or <0.01kg/hh/wk of the recycling contamination in the first survey. This amount rose to 4.7% or 0.02kg/hh/wk in the post campaign survey.

In both surveys only trace levels of non-recyclable glass were present, accounting for less than 1.5% or 0.01kg/hh/wk.

Table 5.4.3: Proportional breakdown of mixed recycling contaminants (% of contamination).

% OF OBSERVED CONTAMINATION	PRE	POST	DIFFERENCE
NON-RECYCLABLE PAPER	14.18%	31.41%	17.23%
NON-RECYCLABLE CARD	4.92%	1.62%	-3.30%
PLASTIC FILM	13.15%	21.55%	8.40%
NON-RECYCLABLE DENSE PLASTIC	8.46%	7.74%	-0.72%
NON-RECYCLABLE GLASS	1.65%	1.28%	-0.37%
NON-RECYCLABLE METALS	1.34%	4.68%	3.34%
TEXTILES	6.24%	5.83%	-0.41%
ORGANIC WASTE	24.55%	19.86%	-4.69%
ALL OTHER WASTE	25.51%	6.02%	-19.49%
TOTAL	100.00%	100.00%	0.00%

Figure 5.4.2: Proportional breakdown of mixed recycling contaminants (% of contamination).



6) Kerbside food recycling

6.1 Set out rates and waste generation

Figure 6.1.1 highlights the average set out rates for food recycling observed across Barnet at the time waste was collected for compositional analysis. The same houses that had their residual waste and mixed recycling surveyed were visited at both campaign stages. Observed average set out rates for food recycling generally fell for all sample areas by the time of the post campaign survey (from an average of 32% down to 22%). The average amount of food recycling generated consequently reduced from an average of 0.65kg/hh/wk down to 0.58kg/hh/wk.

Figure 6.1.1: Average set out for food recycling (%)

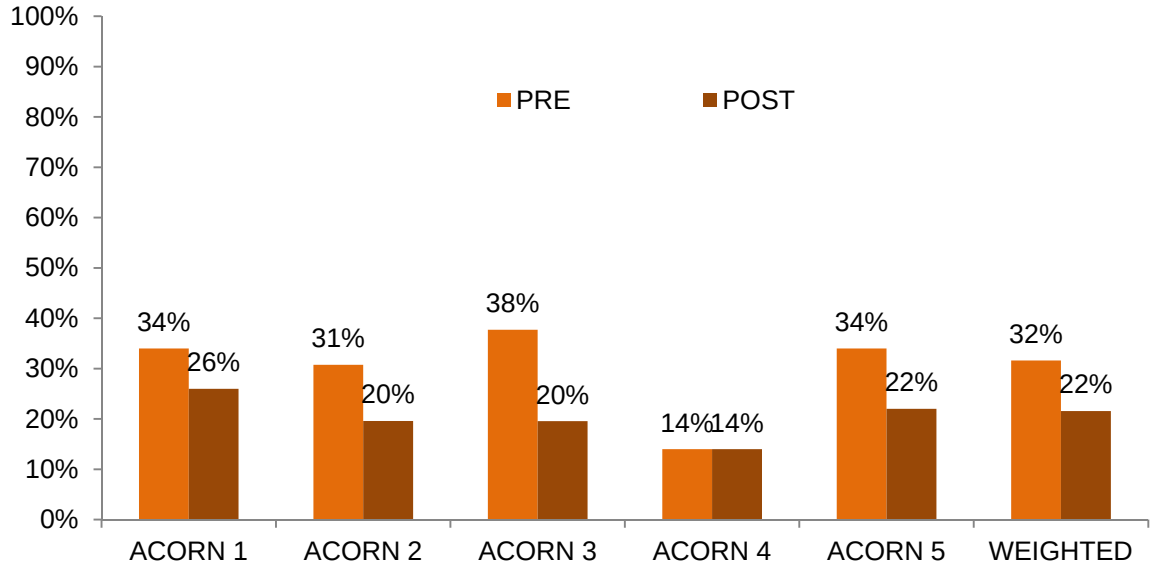
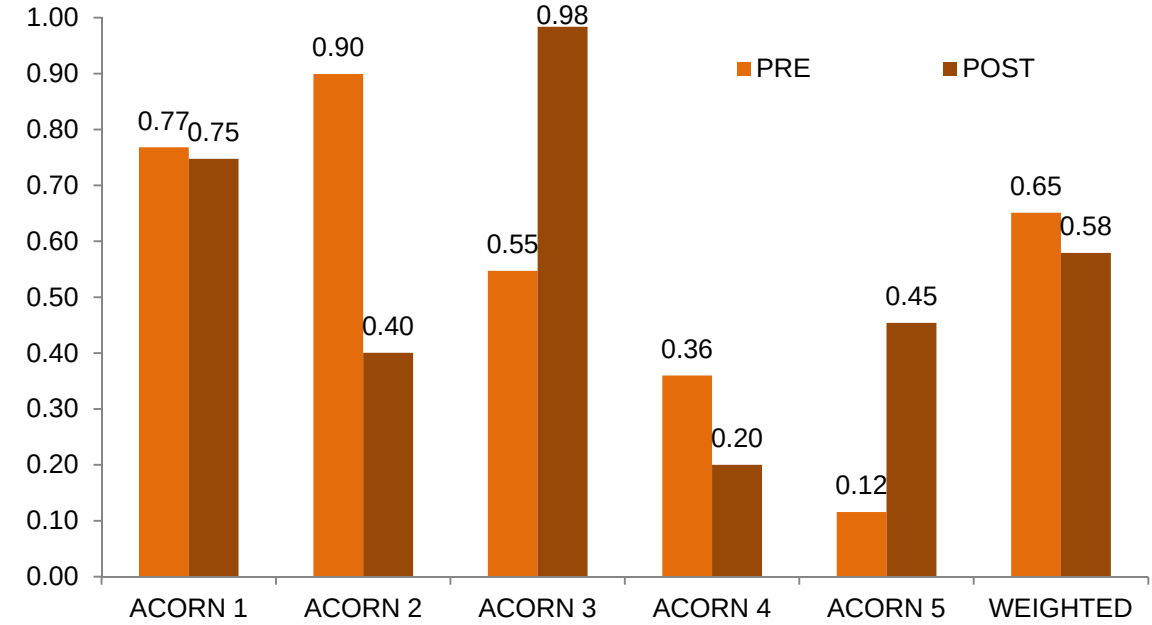


Figure 6.1.2: Average kg/hh/wk for food recycling



6.2 Compositional analysis of kerbside food recycling

This section looks at the average amount and composition of the food recycling waste presented by households sampled throughout Barnet Hand sorting of this waste from collected containers gave concentration by weight figures for the main categories of waste as well as the more detailed sub-categories. The same households were surveyed that were used for the residual and mixed recycling waste samples. Table 6.2.1 and Table 6.2.2 show food recycling data in terms of percentage composition and kg/hh/wk.

As residual waste will contain a proportion that is classified as potentially recyclable; then food recycling waste will contain a faction that is deemed to be contamination. That is to say that it is not compatible with the materials currently acceptable to these recycling bins.

Between the two surveys the total amount of collected food waste fell by 0.07kg/hh/wk to 0.58kg/hh/wk. Even though the amounts of all food waste fell the mix of home compostable to non-home compostable foods increased. In both surveys home compostable food waste was the dominant food category. In the first survey home compostable food formed 56% of all food waste rising to 59% for the latest survey.

Table 6.2.1: Composition of food recycling (% concentration)

% COMPOSITION	PRE	POST	DIFFERENCE
HOME COMPOSTABLE FOODS	54.10%	57.46%	3.36%
NON-HOME COMPOSTABLE FOODS	42.69%	39.64%	-3.05%
COMPOSTABLE LINERS	2.11%	0.00%	-2.11%
ALL OTHER WASTE	1.11%	2.91%	1.80%
TOTAL	100.00%	100.00%	0.00%

Table 6.2.2: Composition of food recycling (kg/hh/wk)

KG/HH/WK	PRE	POST	DIFFERENCE
HOME COMPOSTABLE FOODS	0.35	0.33	-0.02
NON-HOME COMPOSTABLE FOODS	0.28	0.23	-0.05
COMPOSTABLE LINERS	0.01	0.00	-0.01
ALL OTHER WASTE	0.01	0.02	0.01
TOTAL	0.65	0.58	-0.07

Figure 6.2.1: Average Composition of food recycling (% by weight)

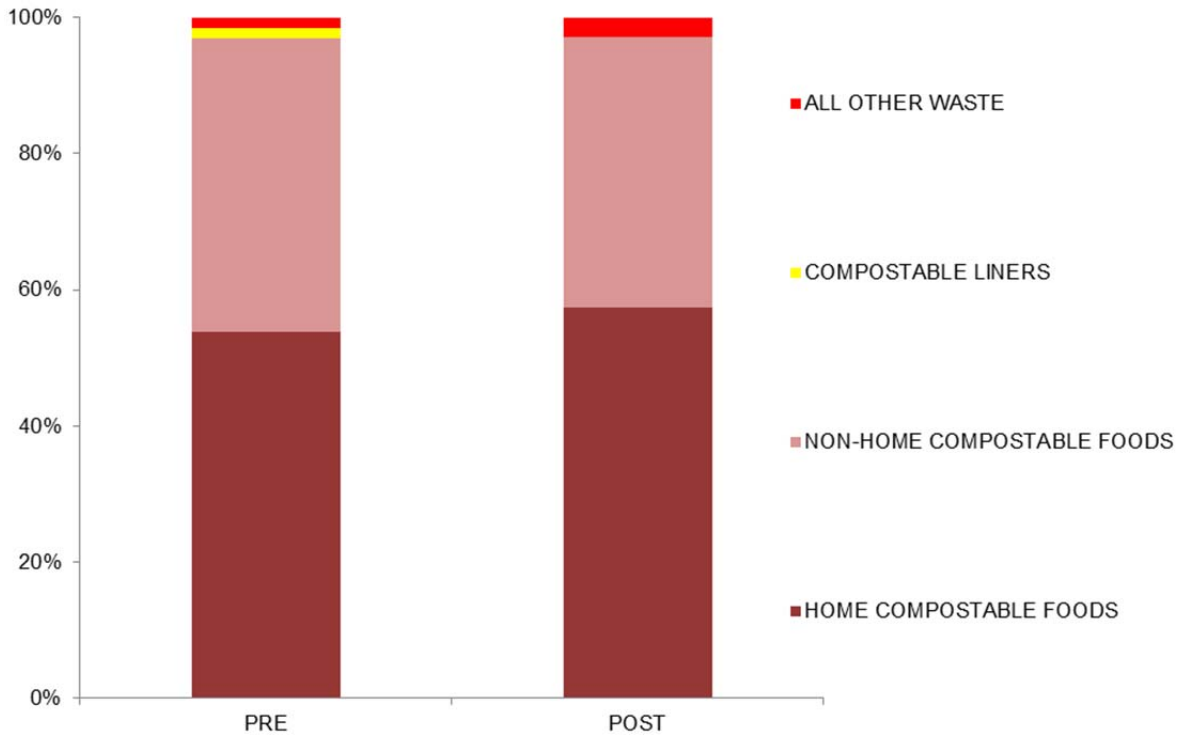
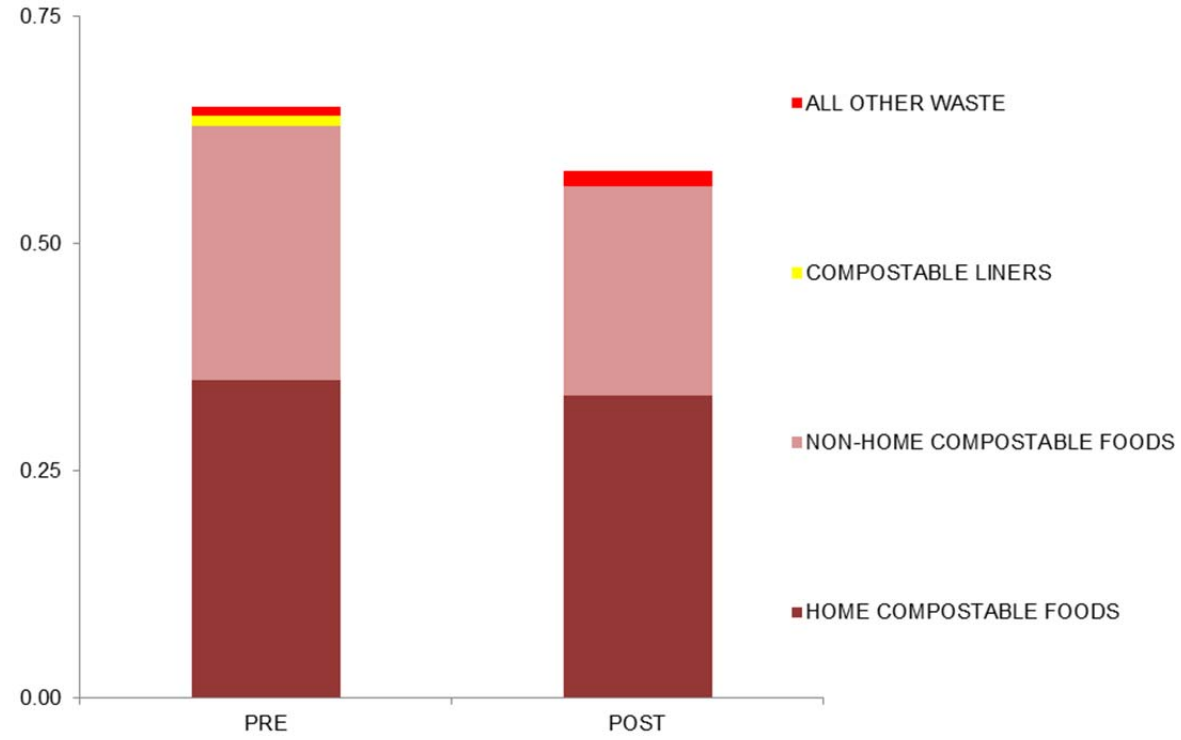


Figure 6.2.2: Composition of food recycling (kg/hh/wk)



6.3 Materials placed out for food recycling collections

This chapter looks in more detail at the individual materials placed out for food recycling collections and highlights the effectiveness with which this scheme is capturing these items. Looking at the relationship between all the kerbside wastes presented will additionally give indications as to the relative diversion being achieved via food recycling.

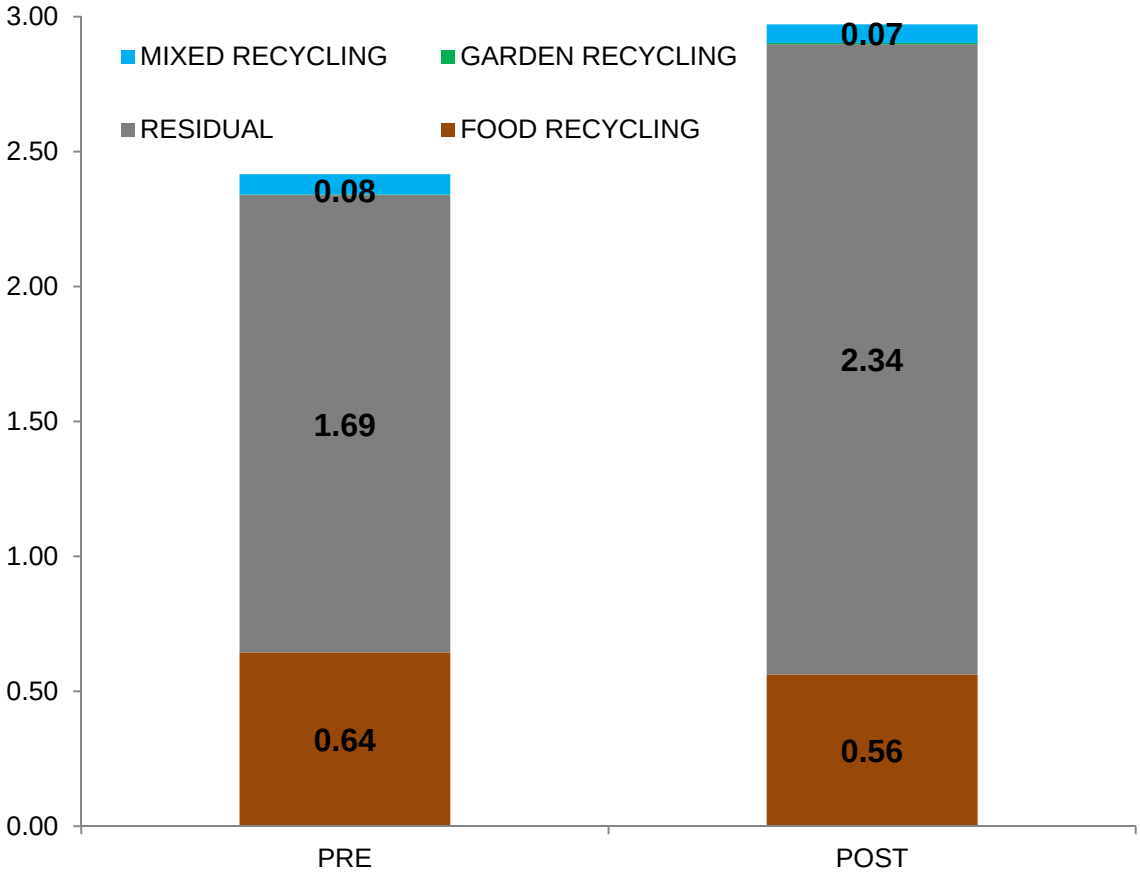
Table 6.3.1: Summary table for material capture and diversion rates (%) for food recycling

CAPTURE & DIVERSION	PRE	POST	DIFFERENCE
HOME COMPOSTABLE FOODS CAPTURE	31.10%	22.21%	-8.89%
NON-HOME COMPOSTABLE FOODS CAPTURE	21.90%	17.33%	-4.57%
TOTAL FOOD CAPTURE	26.70%	18.93%	-7.77%
DIVERSION FOOD RECYCLING	6.40%	4.56%	-1.84%

Table 6.3.1 summarises the average capture and diversion rates seen for materials achieved for the food recycling collections. Figures from the pre-campaign survey indicated that a total of 2.34kg/hh/wk of recyclable food waste was disposed of at the kerbside; of this an average of 26.7% or 0.64kg/hh/wk was correctly placed into food collection bins. At the post campaign survey stage total food waste generation was 2.90kg/hh/wk. Despite creating more food waste, less was actually captured with 18.9% or 0.56kg/hh/wk placed into food containers.

Figure 6.3.1 shows the distribution and levels of food waste throughout the residual, recycling and organic containers. On the whole home-compostable food (fruit and vegetable waste) is recycled more effectively than other non-home compostable food waste. This type of food waste is seen to be less ‘messy’ than processed food and plate scrapings which may be diverted into the residual bins. In the pre-campaign survey around 31.1% of home compostable food was captured compared with 21.9% for non-home compostable foods. Respective capture rates in the second, post campaign survey were 22.2% and 17.3%.

Figure 6.3.1. Distribution of food waste within all kerbside samples (kg/hh/wk)



6.4 Food Recycling Contamination

From Table 6.2.1 it is seen that the collected food recycling generally had a very low contamination rate of just 1% (0.01kg/hh/wk) in the first survey and 2.9% or 0.02kg/hh/wk in the second survey. The majority of this contamination consisted of paper packaging and plastic film which is not accepted in the food recycling bins.

7) Kerbside garden recycling

7.1 Set out rates and waste generation

Figure 7.1.1 highlights the average set out rates for garden recycling observed across Barnet at the time waste was collected for compositional analysis. Observed average set out rates for garden recycling were consistent at 24% for each of the two surveys. Figure 7.1.2 shows the amount of waste in kg/hh/wk, which is derived from the number of households who could set out waste and not just those that are participating. Levels of collected garden waste were 2.25kg/hh/wk in the November survey and 2.69kg/hh/wk in the April survey.

Figure 7.1.1: Average set out for garden recycling (%)

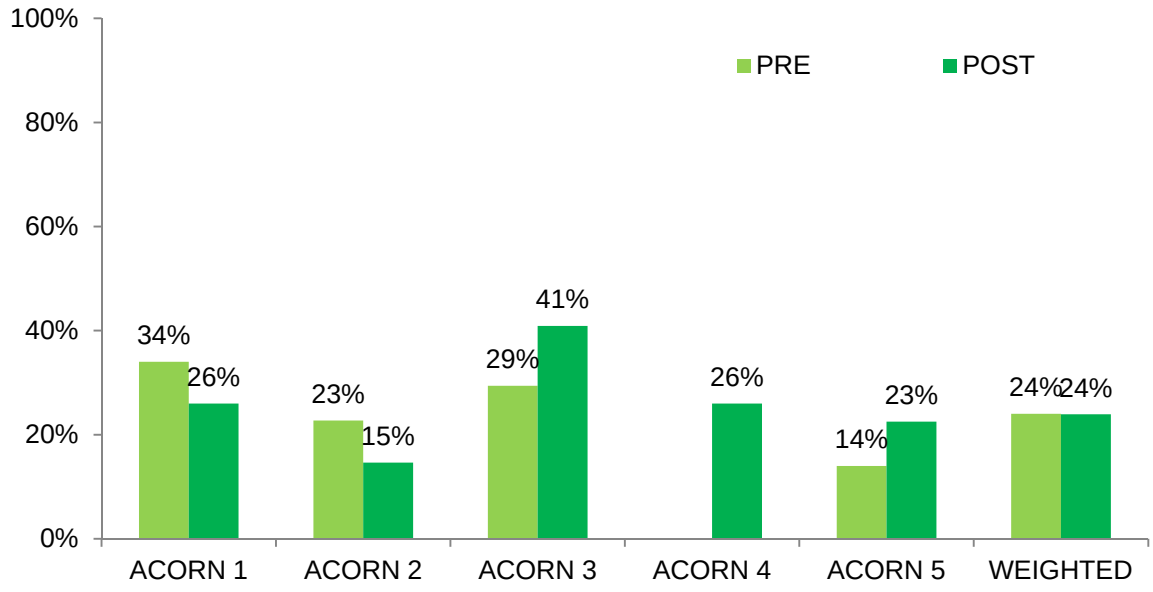
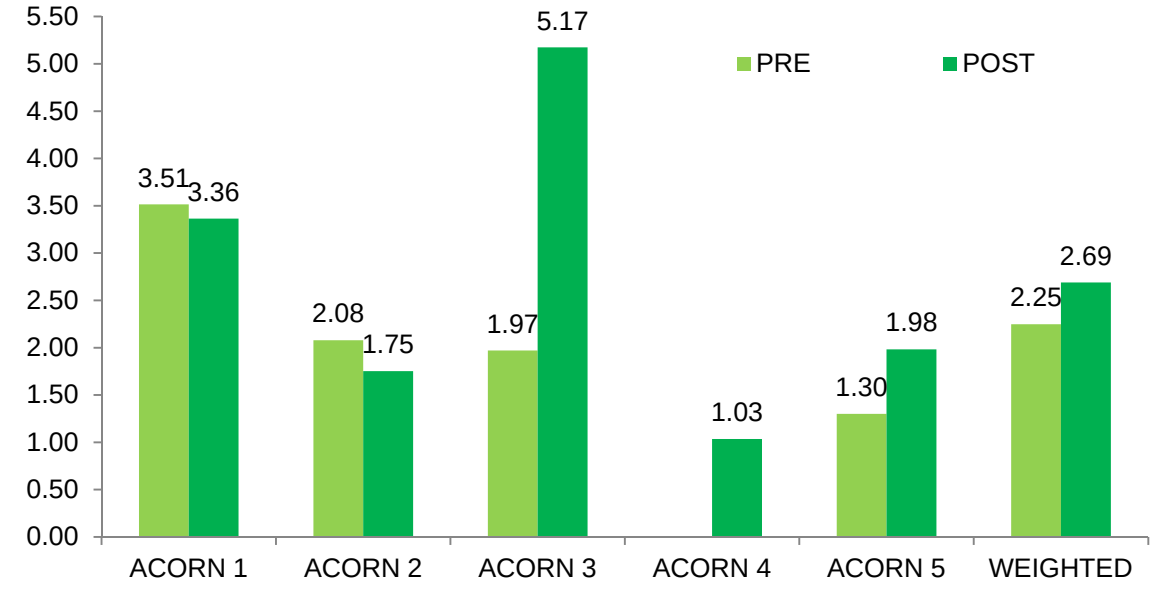


Figure 7.1.2: Average kg/hh/wk for garden recycling



7.2 Compositional analysis of kerbside garden recycling

This section looks at the average amount and composition of the garden recycling waste presented by households sampled throughout Barnet Hand sorting of this waste from collected containers gave concentration by weight figures for the main categories of waste as well as the more detailed sub-categories. Table 7.2.1 and Table 7.2.2 show garden recycling data in terms of both percentage composition and kg/hh/wk.

As residual waste will contain a proportion that is classified as potentially recyclable; then garden recycling waste will contain a faction that is deemed to be contamination. That is to say that it is not compatible with the materials currently acceptable to these recycling bins.

Table 7.2.1: Composition of garden recycling (% concentration)

% COMPOSITION	PRE	POST	DIFFERENCE
GARDEN VEGETATION	91.12%	80.67%	-10.45%
SOIL & TURF	5.60%	16.81%	11.21%
SCRAP WOOD	2.08%	1.85%	-0.23%
ALL OTHER WASTE	1.19%	0.67%	-0.52%
TOTAL	100.00%	100.00%	0.00%

Table 7.2.2: Composition of garden recycling (kg/hh/wk)

KG/HH/WK	PRE	POST	DIFFERENCE
GARDEN VEGETATION	2.05	2.17	0.12
SOIL & TURF	0.13	0.45	0.32
SCRAP WOOD	0.05	0.05	0.00
ALL OTHER WASTE	0.03	0.02	-0.01
TOTAL	2.25	2.69	0.44

Figure 7.2.1: Composition of garden recycling (% by weight)

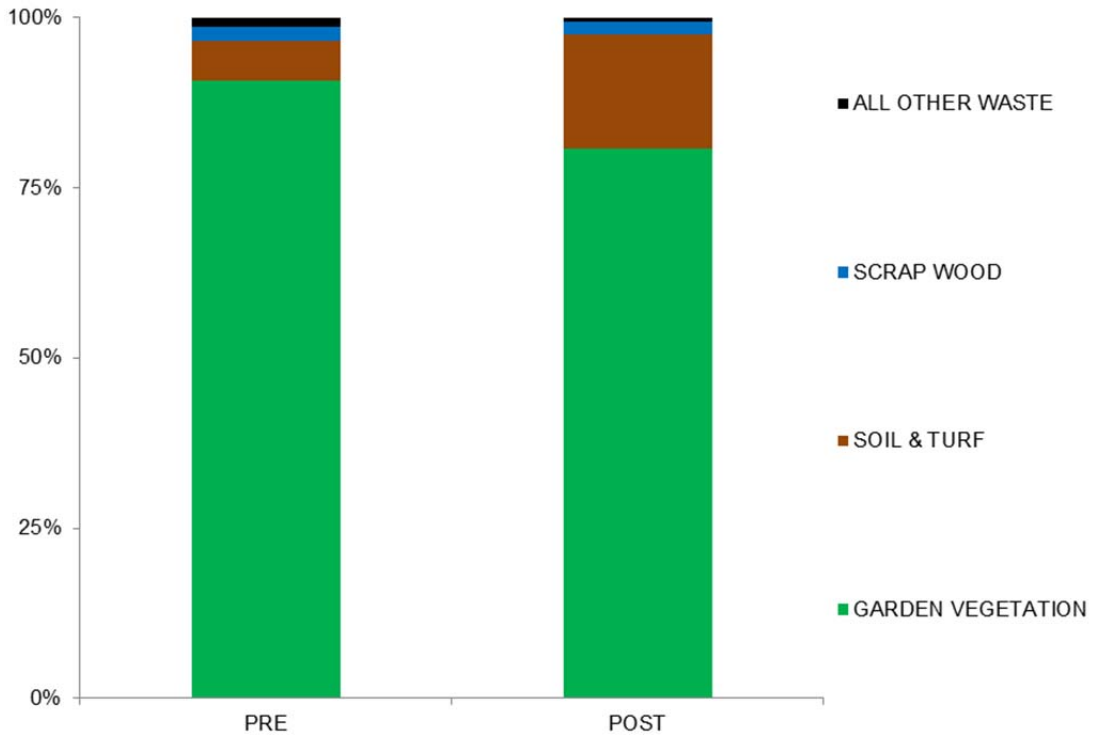
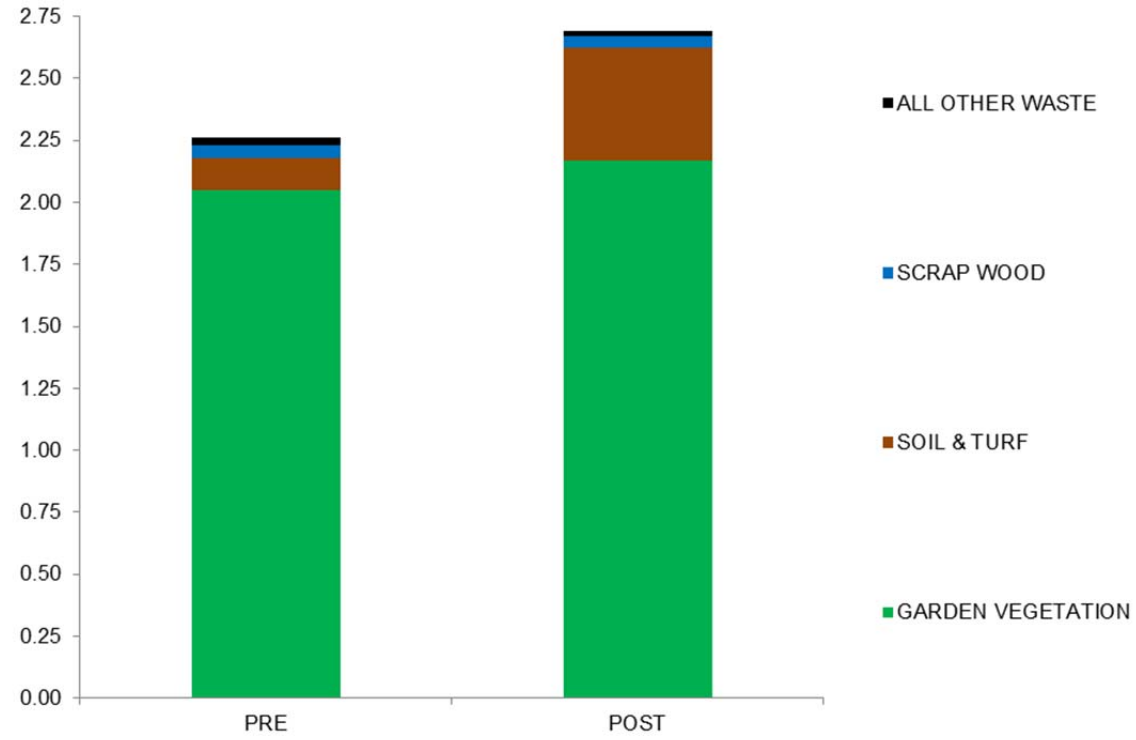


Figure 7.2.2: Composition of garden recycling (kg/hh/wk)



7.3 Materials placed out for garden recycling collections

This chapter looks in more detail at the individual materials placed out for garden recycling collections and highlights the effectiveness with which this scheme is capturing these items. Looking at the relationship between all the kerbside wastes presented will additionally give indications as to the relative diversion being achieved via garden recycling.

Table 7.3.1: Summary table for material capture and diversion rates (%) for garden recycling

CAPTURE & DIVERSION	PRE	POST	DIFFERENCE
GARDEN WASTE CAPTURE	91.40%	94.04%	2.64%
DIVERSION GARDEN RECYCLING	21.50%	21.26%	-0.24%

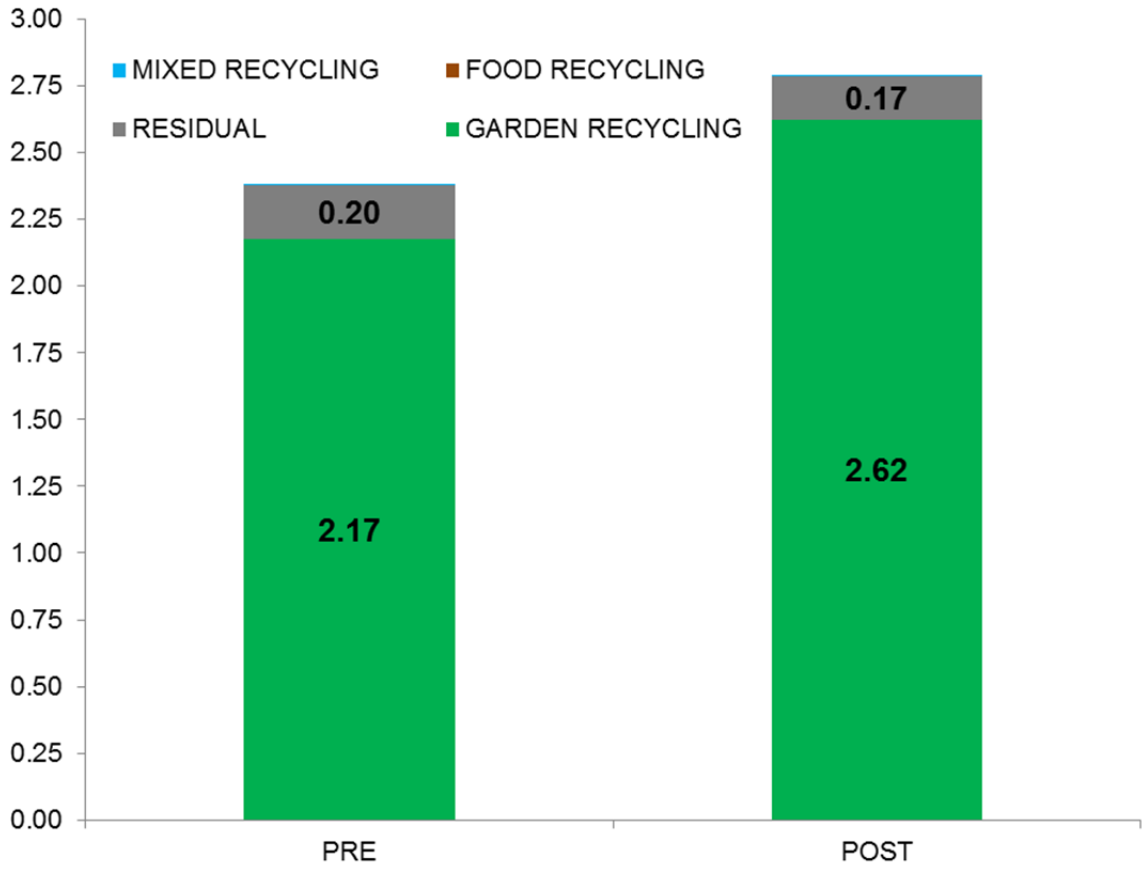
Table 7.3.1 summarises the average capture and diversion rates seen for materials achieved for the garden recycling collections. Both the average capture and diversion rates for garden waste were very similar for both surveys.

Figure 7.3.1 shows the distribution and levels of garden waste throughout the residual, recycling and organic containers.

7.4 Garden Recycling Contamination

From Table 7.2.1 it is seen that the collected garden recycling has a contamination level of around 3.3% or 0.07kg/hh/wk for the first survey and 2.5% or 0.07kg/hh/wk in the second survey. It is deemed that the levels of soil and turf present were acceptable for the recycling. Large amounts of this waste from individual households would be classified as contamination only if it meant the bin was too heavy for tipping. The main contaminant was scrap wood (both treated and untreated). This contaminant formed around 2% of collected recycling in both surveys.

Figure 7.3.1. Distribution of garden waste within all kerbside samples (kg/hh/wk)



8) Total Diversion through Kerbside Recycling Collections

8.1 Total waste generation levels & diversion

Capture rates determine how much of a material that should be recycled actually is being recycled. Diversion rates show the percentage of total generated waste produced from an area that is being 'Diverted' via the available recycling stream(s).

Tables 8.1.1 and Figure 8.1.1 show the total average waste generation (residual waste, mixed recycling and organic recycling) for each of the two surveys. With the exception of food waste, levels of all other waste streams were higher in the post campaign survey. There was 0.56kg/hh/wk or 12% more residual waste, 0.44kg/hh/wk (20%) more garden waste and 1.27kg/hh/wk (52%) more mixed recycling. Collected food recycling fell by 0.07kg/hh/wk or 11%. Overall, 22% or 2.20kg/hh/wk more waste was generated in the second survey.

Tables 8.1.2 and Figure 8.1.2 show the proportion of this total waste that is being diverted through the various recycling collections. Using the available services, Barnet residents were diverting 48.8% of their kerbside waste during the pre-campaign survey. This proportion was seen to have increased to 53.1% by the time of the second, post campaign survey. As diversion via food and garden collections was seen to reduce, this overall increase was solely driven by a 6.4% increase in the diversion rate for mixed recycling which rose from 20.9% to 27.3%.

Table 8.1.1: Average waste generation levels (kg/hh/wk)

WASTE GENERATION KG/HH/WK	PRE	POST	DIFFERENCE
RESIDUAL	4.78	5.34	0.56
MIXED RECYCLING	2.45	3.72	1.27
FOOD RECYCLING	0.65	0.58	-0.07
GARDEN RECYCLING	2.25	2.69	0.44
TOTAL KERBSIDE	10.13	12.33	2.20

Table 8.1.2: Average diversion rates via kerbside recycling (%)

DIVERSION RATES	PRE	POST	DIFFERENCE
MIXED RECYCLING	20.90%	27.32%	6.42%
FOOD RECYCLING	6.40%	4.56%	-1.84%
GARDEN RECYCLING	21.50%	21.26%	-0.24%
TOTAL DIVERSION	48.80%	53.14%	4.34%

Figure 8.1.1: Average waste generation levels (kg/hh/wk)

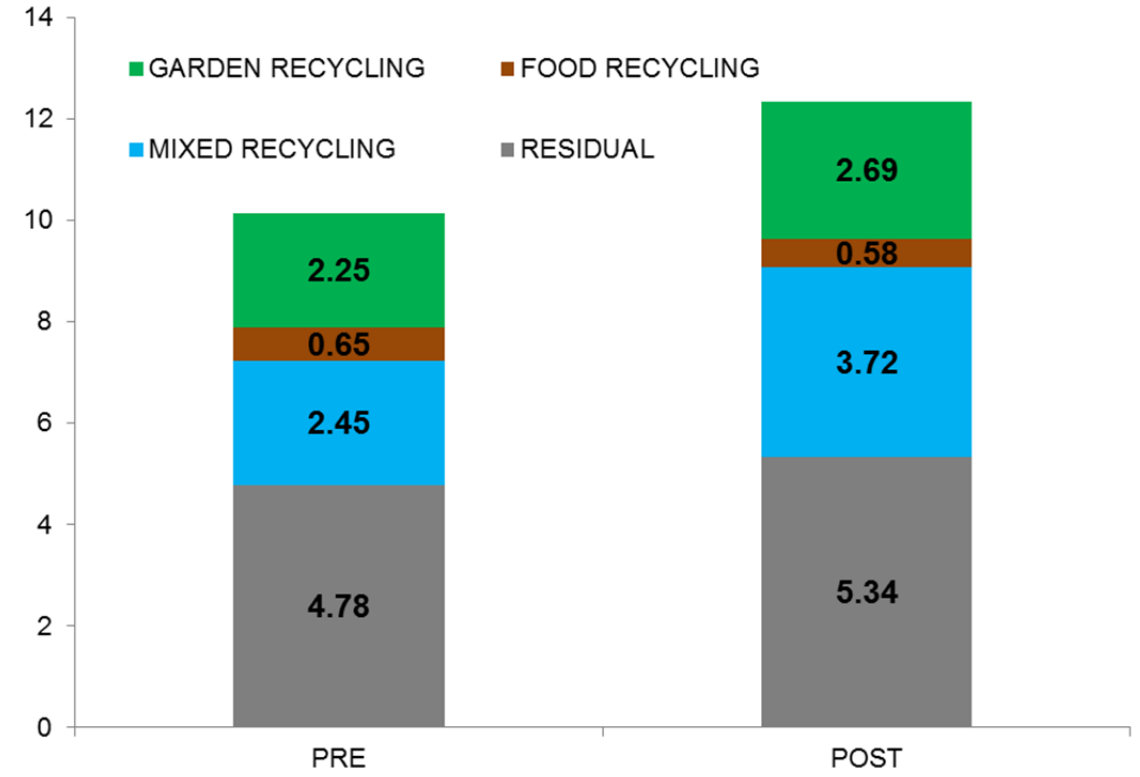
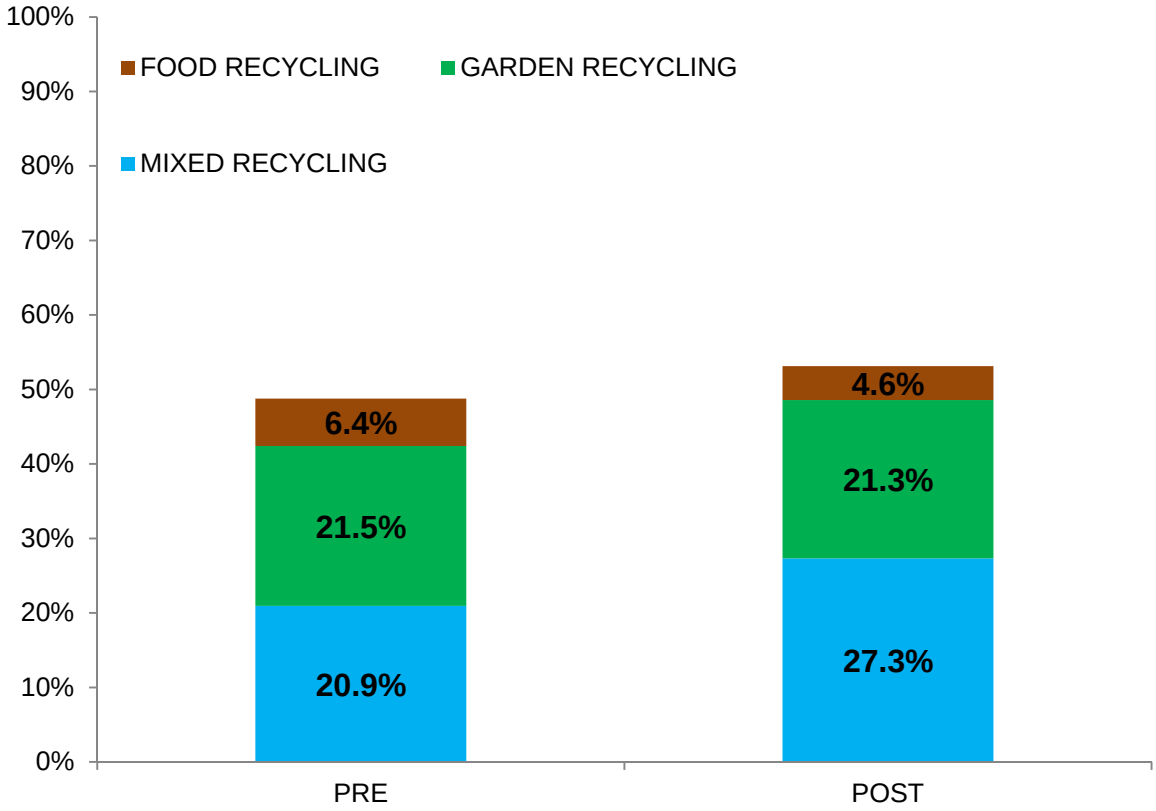


Table 8.1.2: Average diversion rates via kerbside recycling (%)



Appendix 1 – Sort sheet categories

Primary categories	Sub-categories
PAPER	Newspapers
	Magazines
	Other recyclable paper
	Paper Packaging
	Non-recyclable paper
CARD & CARDBOARD	Liquid cartons
	Thick Cardboard Packaging
	Thin Card Packaging
	All Other Card non-recyclable
PLASTIC FILM	Packaging Plastic Film
	Other Plastic Film
DENSE PLASTIC	Plastic Bottles
	Dense Plastic Packaging (e.g. Recyclable tubs, pots, trays, cartons)
	All Other Dense Plastic
TEXTILES	All Textiles
	Shoes
MISC COMBUSTIBLES	Treated Wood
	Untreated Wood
	Furniture
	Disposable nappies and sanitary products
	Other Miscellaneous Combustibles
	Carpet and Underlay
MISC NON-COMBUSTIBLES	Construction and Demolition
	Other Miscellaneous Non-Combustible
GLASS	Glass Bottles
	Glass Jars
	Other Glass
FERROUS METAL	Food tins & cans
	Drink cans
	Aerosols
	All other ferrous
NON-FERROUS METAL	Food tins & cans
	Drink cans
	Aerosols
	Aluminium foil and food trays
	Other non- ferrous
ORGANIC NON-CATERING	Garden waste
	Soil
	Other Organic
ORGANIC CATERING	Home compostable kitchen waste
	Non-home compostable kitchen waste
	Compostable Liners
	All Consumable liquids, oils and fats
FINES	Sweepings < 10mm
WEEE	White Goods
	Large Electronic goods
	TV's and Monitors
	Other WEEE
HHW	Household Batteries
	Car Batteries
	Engine Oil
	Other potentially hazardous
	Identifiable clinical

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