

# Food Waste Collections from Flats

## Final Report on Trials June 2016

### 1) Summary

As part of a wider drive to improve recycling rates in flats across the borough Barnet Council implemented a small scale trial of food waste collections from these properties. The aim of these trials was to assess the financial, environmental and technical implications of rolling this service out to flats at a borough wide level.

The trials took place across 12 sites, totalling 678 properties, for a three month period between February and May 2016. Six of the sites were social housing managed by Barnet Homes and six were privately managed to assess whether this variable had any impact on the outcomes of the trials.

The results showed that in general people were happy to use the service and recycled, on average, **0.74 kilograms** of food waste per household per week (KG/HH/WK). Individual sites varied quite considerably but on average there was **little difference between social and private housing** in terms of tonnage. Contamination was mostly in the form of **plastic bags**.

### 2) Trial Design

#### 2.1 Aims and Objectives

Flats within blocks of up to five properties already have access to the food recycling service. The aim of the trial was to assess the potential for expansion of the food waste recycling service to larger flats properties borough wide, using a communal collection system. To understand the answer to this, several specific success metrics were examined, specifically:

- Tonnage collected per household per week
- Potential cost savings from tonnage diversion
- How flats tonnages compare with kerbside food tonnages
- Whether tonnage remained constant or appeared to be falling by the end of the trial
- Whether contamination was unacceptably high
- Ease and efficiency of collections
- Vandalism and other negative reactions from residents
- Potential future cost of the service based on the findings of the trial

## 2.2 Collection Methodology

The Flats Technical Officers (TOs) designed and ran the trials. Desktop research combined with site visits to nearby Local Authorities helped determine the basic collection system parameters based on best practice from these sources. It was determined that a bring bank system using a single large bin in a durable bin housing was the best method to use. This is as opposed to collections from individual flats in much the same way as kerbside properties, or a communal collection point for individual 23 litre caddies, two methods used in some Local Authorities. The system chosen represents the most common system currently used in the UK to collect food waste from flats.

For the trials the bring bank system involved siting 240 or 140 litre wheelie bins contained within a lockable bin housing unit at strategic points at flats blocks, to which residents brought their food waste. Two different bin housings were considered; a metal one manufactured by Matussi and a plastic one manufactured by Glasdon. The plastic one (pictured) was chosen as it came in two different sizes, allowing us to use 140 litre bins as well as standard 240 litre bins in bin stores with limited available space, and was around 10% cheaper than the metal one. The cost per bin housing was £310 for the 240 litre model and £300 for the 140 Litre. However this included branded signage attached to the front of the bin housings.



Each resident was issued with a seven litre brown indoor caddy (with a sticker on the lid detailing what could and couldn't be placed inside) along with a roll of liners, introductory letter and service leaflet.

Additional liners were made available to the caretakers and site managers and where there were none a further set of rolls was delivered after two months.

Given the limited scope of the trial it was agreed that the Restricted Access Food Waste (RA Food) crew was able to collect from all the trial sites giving the TOs a single point of contact when coordinating collections and dealing with any problems that arose. Collections were weekly.

## 2.3 Site Selection

It was agreed early in the project design that 12 sites of mixed sizes would be selected. These were split into two sets of six sites, one consisting of social housing and one of privately managed sites. The social housing sites were assigned to the trials by Barnet Homes whereas the private sites were initially selected and then contacted by the TOs, with only those expressly agreeing to be part of the trials being included. Each site was surveyed by the TOs and the best places to locate the bin housings, along with access routes for crews and residents, were noted. Bins were generally placed adjacent to existing recycling facilities where possible. In total, 21 bins were distributed across the 12 sites which encompassed 678 properties. The sites chosen are listed below:

### Social Housing Sites:

| Site Name                      | Address   | Properties | Bins    |
|--------------------------------|---|------------|---------|
| Edgeworth Court                | Fordham Road, EN4 9AE                                   | 12         | 1 x 140 |
| Mount Pleasant / Langford Road | 130-140 Mount Pleasant /<br>30-40 Langford Road EN4 9AE | 12         | 1 x 140 |
| Dollis Croft                   | Bittacy Hill, NW7 1HP                                   | 15         | 1 x 140 |
| Victoria Road Estate           | Victoria Road, NW4 2BD                                  | 287        | 6 x 240 |
| Bell Court                     | Bell Lane, NW4 2BT                                      | 46         | 1 x 240 |
| Fosters Estate                 | New Brent Street, NW4 2DH                               | 154        | 5 x 240 |
|                                | <b>Total</b>  | <b>526</b> |         |

### Privately Managed Sites:

| Site Name          | Address                          | Properties | Bins    |
|--------------------|----------------------------------|------------|---------|
| Clifton Lodge      | 160 Oakleigh Road South, N11 1HF | 6          | 1 x 140 |
| Morrison Court     | 43 Manor Road EN5 2JU            | 36         | 1 x 240 |
| Christopher Court  | 80 Leicester Road, EN5 5ED       | 18         | 1 x 240 |
| Cranwell Court     | Field Mead, NW9 5SF              | 26         | 1 x 240 |
| King's Lodge       | Kingsway, N12 0EW                | 59         | 1 x 240 |
| 53 Alexandra Grove | 53 Alexandra Grove, N12 8HE      | 7          | 1 x 140 |
|                    | <b>Total</b>                     | <b>152</b> |         |

## 2.4 Monitoring

The most basic measure of success for the project was the tonnage collected per household per week. As there was no weighing equipment on the RA Food vehicle this was visually estimated by the TOs. Each week, on the day before collections were due to take place, the TOs visually assessed the fullness of each bin and fed the results into a specially designed data capture spreadsheet. This measurement was then converted to litres and correlated with a standardised bulk density coefficient supplied by WRAP<sup>1</sup> to give a total weight. To account for the fact that food waste from only six days per week is accounted for by measuring the bin fullness the day before collections, this total was then divided by six and multiplied by seven to give a final estimated weight. An example of the calculation can be found below:

240 Litre Bin 25% full 1 day before collection

$$\text{Weight} = 7(((0.25 \times 240) \times C)/6)$$

Where C = WRAP bulk density for food waste in 23L caddy 0.29 kg / L

$$= 17.4 \text{ kgs on day of collection}$$

<sup>1</sup> <http://www.wrap.org.uk/sites/files/wrap/Bulk%20Density%20Summary%20Report%20-%20Jan2010.pdf>  
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At some of the locations a high level of use meant that the collection schedule was changed to twice a week which meant that the equations for estimating weight from fullness had to be adapted to account for 2 days of additional input which were not monitored.

Instances and types of contamination were also recorded every time a bin was monitored by the TOs.

All information from the monitoring was fed into a specially designed spreadsheet which formed the basis of the results section.

## 2.5 Health and Safety Concerns

Lone working risk assessments were conducted for the TOs. In summary, every time a TO was working on their own, their location and estimated return time was communicated to either the other TO or a member of staff familiar with the trials as well as in the Outlook calendar of the lone worker.

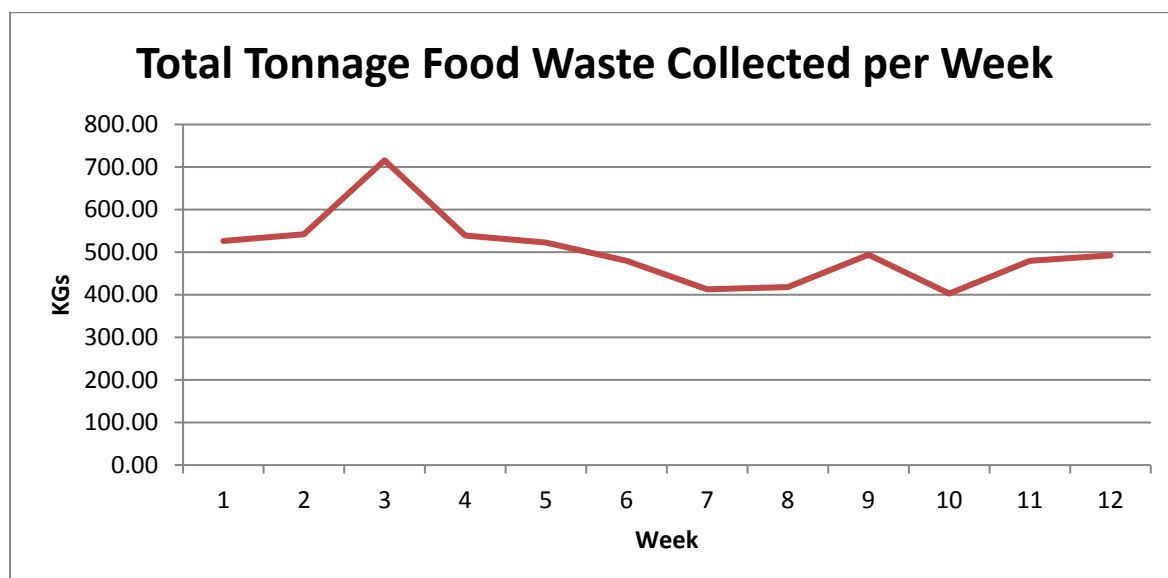
As food waste is especially dense, the RA Crew was instructed to inform the TOs if any bin they were collecting was in excess of 50% full as heavier bins than this could cause problems if handled incorrectly. In these circumstances the bin would be emptied by multiple crew members and the collection rounds would be adjusted to collect multiple times during the week.

## 3) Results

### 3.1 Weight of Material Collected

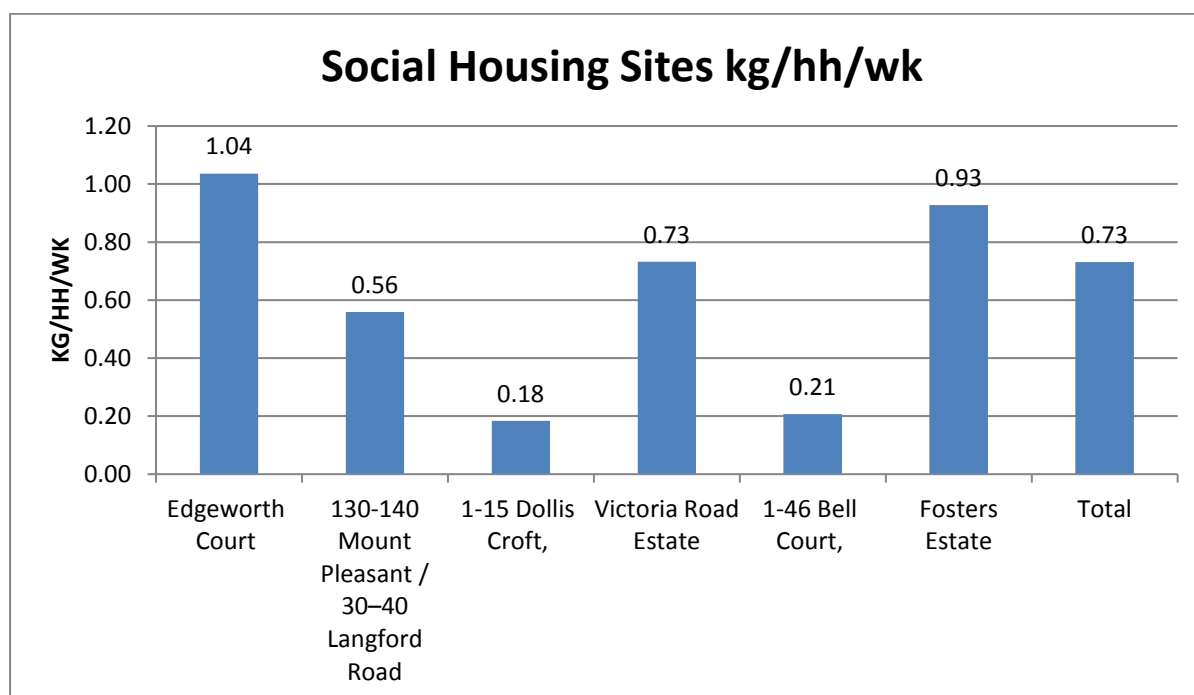
The bins were rolled out at the end of February 2016 and monitoring took place for 12 weeks between week beginning 29/02/2016 and week beginning 23/05/2016.

In total 6,025 kgs of food waste were collected over the trial period. Below is a chart showing the total weekly food waste collected for recycling across all sites.

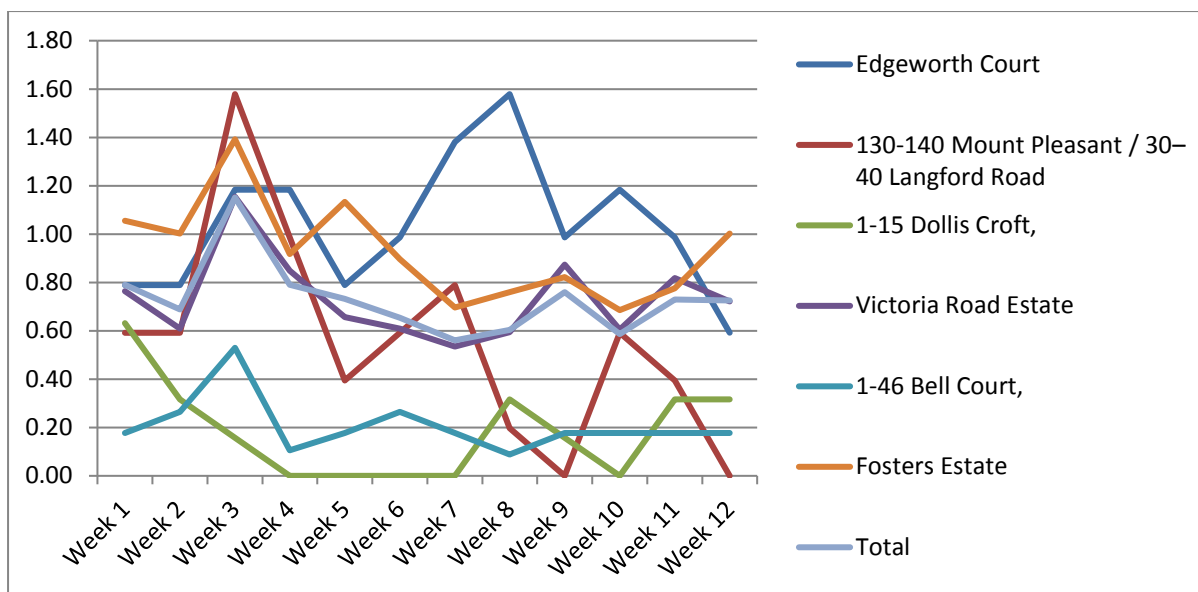


Levels were initially high, at between 500 and 700 kgs per week but then fell and levelled off at around week six at between 400 and 500 kgs per week. This shows a similar trend when compared with the first twelve weeks of the food waste service being provided at street level properties. The average figure was 502 kgs per week across the entire trial.

On a house by house basis the overall figure for food waste collected across all sites was 0.74 kg/hh/wk. This compares with approximately 0.97 kg/hh/wk for street level properties. The results below are divided into Barnet Homes Sites and Privately Managed Sites.

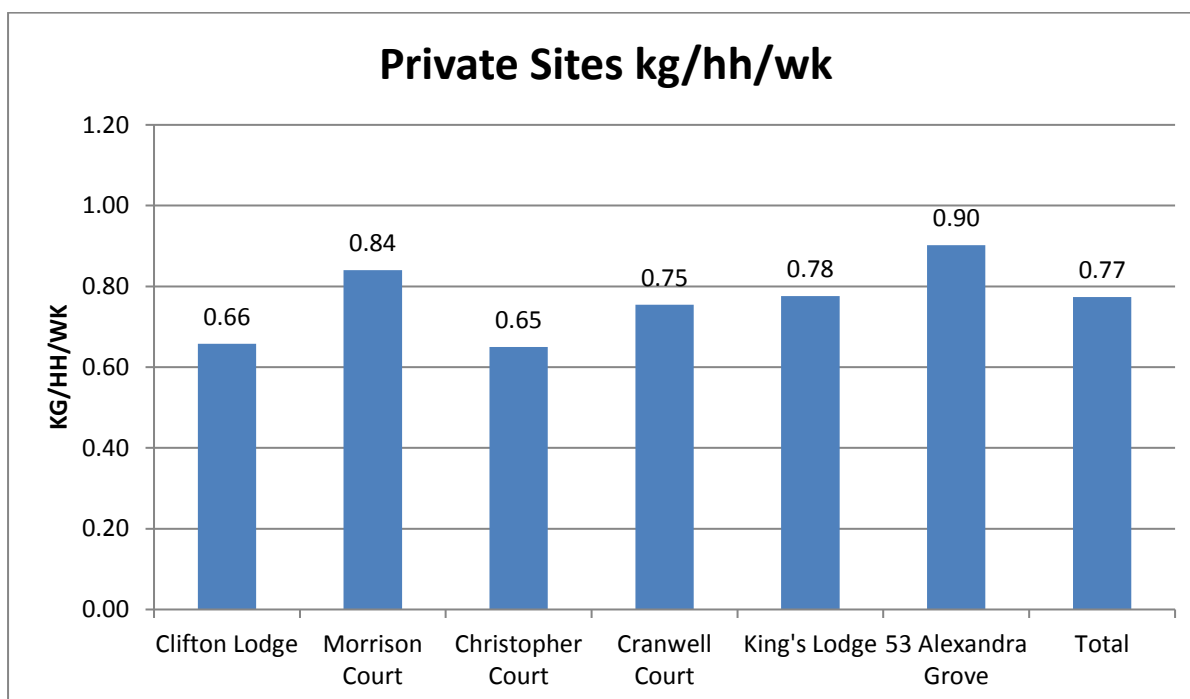


Variation amongst social housing sites was high with weekly totals of between 0.18 kg/hh/wk (the lowest level of all the sites measured) and 1.04 kg/hh/wk (the highest level of all the sites measured). The average was 0.73 kg/hh/wk. Results on a week by week basis are shown below:

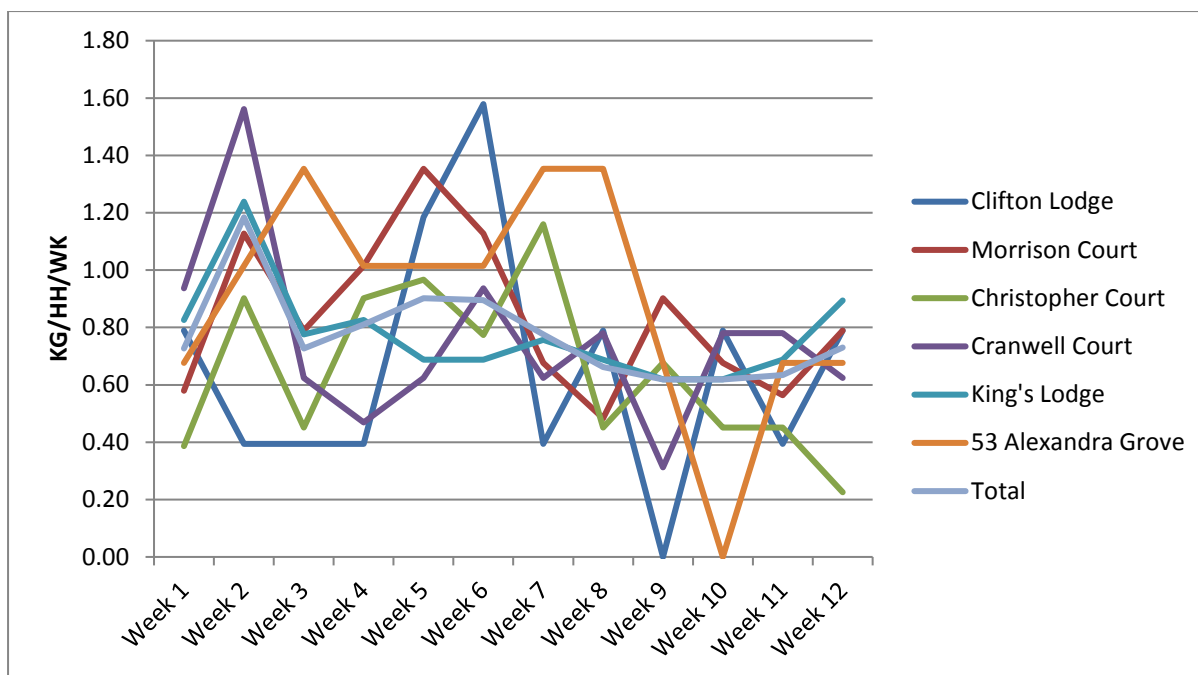


Weekly variation amongst different sites was pronounced though the total level tracked the overall total for all sites quite closely.

Below are the results for privately managed sites.



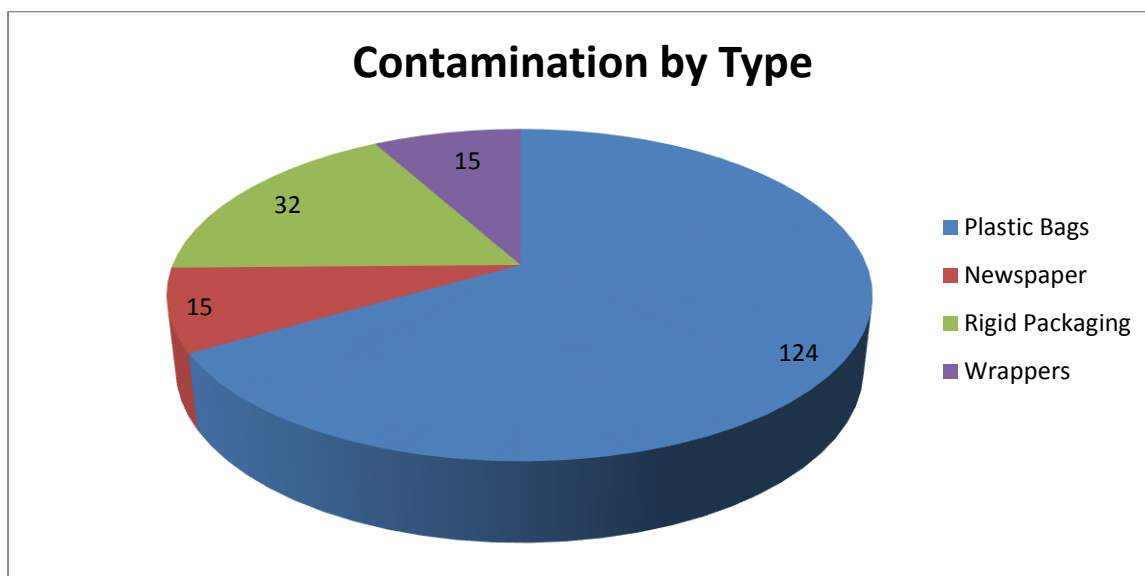
Variation amongst privately managed sites was quite low with results ranging from 0.65 kg/hh/wk to 0.9 kg/hh/wk. The average result was 0.77 kg/hh/wk. Weekly results for individual sites are shown below.



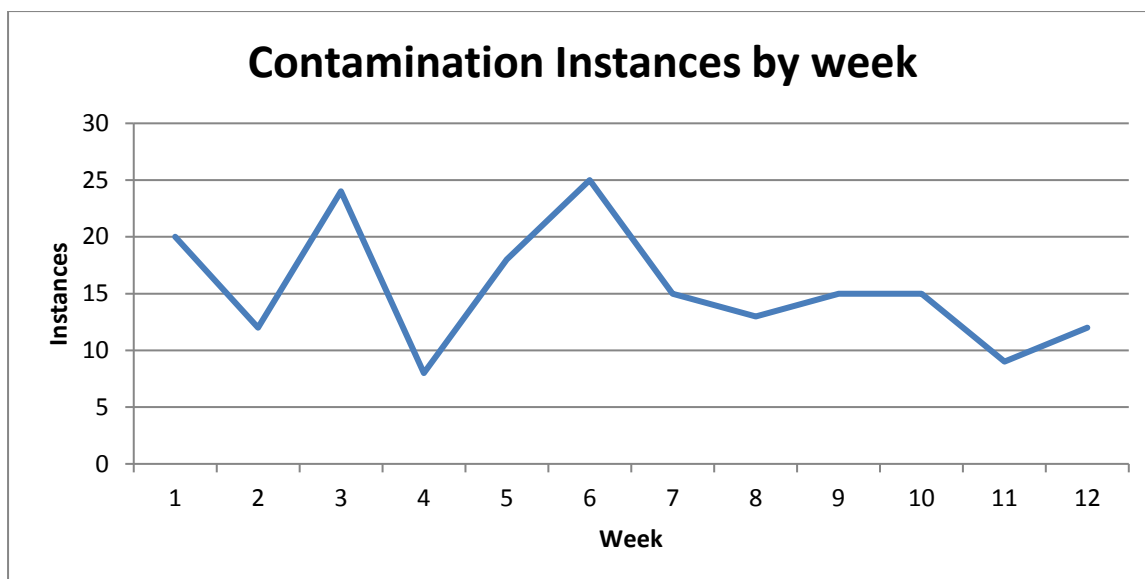
Weekly variation between sites was initially pronounced but soon diminished with the total tracking the overall total for all sites quite closely.

### 3.2) Contamination

Instances and types of contamination were monitored in all 21 bins. Results by type are shown below:



Plastic bags dominated the contamination classification, however there were frequent instances of Newspaper, Rigid Packaging (for example cans, plastic bottles and rigid food packaging) and Wrappers (such as crisp packets). The results of total instances of contamination by week are shown below.



Instances of contamination were initially highly varied and peaked in week six at 25 but then began falling into a more consistent pattern. Anti-contamination stickers were added at the end of week five. The average number of instances per week was 16.

#### 4) Analysis

Overall food waste collected rises significantly at first, peaking at over 700 kg per week in week three. The reasons for this are more than likely householders trying out the service, with the subsequent drop off in weeks four to six being people that dislike the practicalities of the service giving up. Some householders may have chosen to empty their existing stocks of out of date food into the recycling at this stage as well, though there is no direct evidence for this. By week seven the amount of food waste collected starts to level off at around 450 kg per week or 0.66 kg/hh/wk, an approximate level we might expect from a wider rollout for the first year.

However there is some level of bias in the results as the privately managed sites were self-selecting – these were in the minority of sites where there was a willingness to accept the installation of food waste bins, which may have positively affected the outcomes. The Barnet Homes sites, however, were selected for us and gave almost identical results in terms of kg/hh/wk from week six onwards. Even if we assume that the amounts collected would be slightly lower in a wider rollout, 450 kgs collected from just 21 bins is potentially a very efficient method of collection. It is worth noting that LB Islington recently changed its food waste collections system for kerbside properties to a communal bring bank model.



As mentioned previously the overall tonnage results for both Social and private flats blocks were very similar however variation within the social housing sites was very high. These sites included both the two best performers in the entire sample and the worst performers. The most likely reason for this variation compared to the privately managed sites was the positioning of the food waste bins. In the case of the privately managed sites, all the food waste bins were located in or next to existing bin stores which housed both the residual and dry recycling bins for the block. This meant there was a single location to which people went with their waste and this appeared to boost usage. With the social housing sites all food waste bins were located next to recycling bins however this was, in some cases, separate from the residual waste bins. These sites included Bell Court, Dollis



Croft and Mount Pleasant / Langford Road, the three worst performing sites. On the Fosters and Victoria Road Estates there was a mixture of locations - some in integrated bin stores and some with only recycling bins, generally reflecting the overall trends for these two groups. The picture (above) shows an integrated bin store on the Fosters Estate which performed well during the trials.

The trials demonstrated that both 140 litre and 240 litre bins and their respective housings were appropriate dependent on block size. Initially we deemed anything below 15 properties in size to be suitable for a 140 litre bin however the trials demonstrated that anything up to 20 properties would probably be viable with a 140 as opposed to a 240. 140 litre bin housings are approximately £10 cheaper than 240 litre ones and could be prioritised as a cost saving measure wherever possible. A single 240 seemed to be appropriate for blocks of up to 50 properties. Beyond this number of properties, we looked to install multiple bins to avoid any getting overfull and health and safety risks to the collection crews from very heavy bins. At Longford Court we installed two food waste bins adjacent to each other however residents would completely fill the one closest to the door before starting to fill the other. As a result we had to increase the collection frequency to twice a week, with a similar situation occurring at the two most used bins on the Fosters Estate.



In some local authorities a special wheelie bin with an aperture lid is used instead of a bin housing to reduce the overall cost of the scheme. Pictured right is an example. These could be considered for use in bin stores in small blocks with little chance of vandalism.

Contamination levels, especially plastic bags, were initially relatively high and in response to this we designed anti-contamination stickers which were placed on the lids of all the bins housings (see picture right). This did appear to reduce contamination though not eliminate it. The vast majority of contamination incidents were caused by people using plastic bags to contain their food waste. The provision of free liners no doubt reduced this tendency. It is worth noting that whilst most anaerobic digestion plants these days accept plastic bags, the NLWA does not as some may end up going for in-vessel composting, though none to date has.

The remaining contamination was mostly food packaging, or more specifically food still in its packaging. This included loaves of bread in polyethylene bags, cans and bottles of soft drinks and rigid plastic food trays. This seems to indicate that people are at least willing to participate in the service if not read the information about what can and cannot go in the bins. The same can probably be said of those contamination incidents involving newspaper, where it was invariably used to wrap the food waste instead of a liner.



Liner usage appeared high amongst those people that participated in the trials. Of concern was that additional liners were requested by trial householders during the trial from sites where boxes of liners had been supplied to caretakers for distribution. This indicates that either those residents calling for the replacements were unaware of the caretaker having rolls or the caretakers were not present for residents to be able to obtain any liners. Only one caretaker requested an additional box during the trial.

## 5) Recommendations

The trial produced some promising outcomes in relation to the yield of food waste per household. However it should be noted that this was a small trial, and the incremental costs of rolling out the service to all larger flat blocks in the borough (vehicles, crew, bin housing units, communications and staff resource) would be significant. Given the low differential between food waste recycling and disposal costs (£14.68 per tonne) it is highly unlikely that there would be a cost saving. Therefore any decision on the rolling out of food waste recycling to larger flat blocks would be based on achievement of the 50% recycling rate target by 2020. Further work could be carried out to estimate the effect on the recycling rate and the costs of a full rollout. A further trial can be arranged if required.

The trials produced several recommendations which should be considered if the service is to be rolled out to additional properties in the future.

- Only roll out the food waste service to blocks which already have a dry recycling collection service
- Model predicted tonnages collected based on a figure of 0.6kg/hh/wk
- Phase any rollout of the service as the bin housings are bulky and difficult to store and deliver.
- Consideration could be given to the use of wheelie bins with aperture lids, rather than normal wheelie bins in bin housings, for properties with limited space.
- Supply each property in the block with a caddy, leaflet, introductory letter and roll of liners within two days of the bin housing being installed.
- If liners are to be supplied continuously to properties, a roll of 26 liners every two months is sufficient.
- If sites have caretakers, leave additional liners with them and brief them fully beforehand. Make sure that residents are aware that additional liners can be obtained through the caretakers and that caretakers can, in turn, contact the Recycling and Waste team for additional boxes. Caretaker / Site Manager buy-in can be crucial to the success of a scheme.
- Press the NLWA to guarantee all food waste is sent to anaerobic digestion as this removes the need to use biodegradable caddy liners.
- Place bin housings in existing bin stores where possible. If not, prioritise locations close to main egress / entry points and in proximity to existing residual waste bins. Ignore recycling bins that are distant from the block unless this is the only place the bin housing can be placed.
- For blocks with 20 or fewer properties, use a 140 litre bin. For blocks of 21 – 50 properties use a 240 litre bin. For blocks in excess of 50 properties use multiple 240 litre bins if there are multiple exits and / or bin stores. If not then use a single 240 litre bin and consider collecting it twice weekly.
- Always put an anti-contamination sticker on the lid of the bin housing.
- Mention that food still contained within its packaging is not acceptable on the introductory letter and in any additional communications to help reduce contamination.