

**Manchester Kerbside Waste**

**Composition Analysis**

**Survey 1 (Combined)**

**Greater Manchester Combined Authority**

Final Report

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**Contents Page**

[Project details and acknowledgements 4](#_Toc536105572)

[Background 5](#_Toc536105573)

[Executive Summary 5](#_Toc536105579)

[Separation of waste 11](#_Toc536105595)

[Introduction 12](#_Toc536105598)

[Co-mingled recycling 12](#_Toc536105599)

[Pulpables (Paper and card) recycling 12](#_Toc536105600)

[Organics (Food and garden) recycling 12](#_Toc536105601)

[Materials accepted (varies between sites): 13](#_Toc536105602)

[Sampling 14](#_Toc536105603)

[Methodology and Analysis 17](#_Toc536105604)

[Statistical Accuracy 18](#_Toc536105605)

[Results – Residual waste 19](#_Toc536105606)

[Set out rates 19](#_Toc536105607)

[**Compositional analysis of residual waste** 21](#_Toc536105608)

[**Potential recyclability of the residual waste** 26](#_Toc536105611)

[**Results - Pulpable recycling (Paper and card)** 27](#_Toc536105612)

[**Set out rates and amount of recycling** 27](#_Toc536105613)

[**Compositional analysis** 29](#_Toc536105614)

[**Pulpable recycling contamination** 32](#_Toc536105615)

[**Recyclable paper and card within residual bins** 33](#_Toc536105616)

[**Capture rates for pulpable recycling** 34](#_Toc536105617)

[**Diversion via pulpable recycling collections** 36](#_Toc536105618)

[**Results - Co-mingled recycling (Glass, metal and plastic)** 37](#_Toc536105619)

[**Set out rates and amount of recycling** 37](#_Toc536105620)

[**Compositional analysis of co-mingled recycling** 39](#_Toc536105621)

[**Recycling contamination** 42](#_Toc536105622)

[**Diversion via co-mingled recycling collections** 49](#_Toc536105626)

[Results – Organic recycling (Food and garden) 50](#_Toc536105627)

[**Set out rates and waste generation levels** 50](#_Toc536105628)

[**Food content of the organic recycling** 55](#_Toc536105629)

[**Organic recycling contamination** 56](#_Toc536105630)

[**Capture rates for organic recyclables** 57](#_Toc536105631)

[**Diversion via organic recycling collections** 61](#_Toc536105634)

[**Results – Total amount of kerbside waste and recycling generated** 62](#_Toc536105635)

[**Maximum achievable diversion** 64](#_Toc536105636)

[**Waste minimisation** 69](#_Toc536105637)

[**Appendix** 72](#_Toc536105642)

[Tonnage composition – residual waste 72](#_Toc536105643)

[Tonnage composition – pulpable recycling 73](#_Toc536105644)

[Tonnage composition – co-mingled recycling 74](#_Toc536105645)

[Tonnage composition – organic recycling 75](#_Toc536105646)

Kerbside collected Waste Arisings and Assays ………………………….……………… 76

Project details and acknowledgements

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Background

GMCAs overarching aim is to increase household recycling across Greater Manchester to 60% by 2020 and reduce household residual waste to 400 kilogrammes/household/year (kg/hh/yr) by 2025. There is therefore a need to establish the composition of the household waste stream, across kerbside and Household Waste Recycling Centre (HWRC) services, to understand how best GMCA can achieve these targets.

The compositional analysis of kerbside collected household waste and recycling covered four waste streams – residual waste, co-mingled (mixed) recycling, pulpables (paper and card) recycling and organics (food and garden) recycling.

The fieldwork was carried out over a twelve-month period covering two seasons; spring/summer and autumn/winter. The results provide an annual representation of kerbside collected waste and recycling for each individual district and GMCA as a whole.

With a greater understanding of the composition of each waste stream, specifically the waste destined for the residual waste container, GMCA will be in a stronger position to identify types and quantities of materials that are not being recycled correctly. This information can then be used to assess the feasibility of GMCA realising their targets.

This report provides the results for the kerbside collection service for Manchester only. The results for the remaining eight Districts and the HWRC service are provided in separate reports.

Executive Summary

Figures are averages obtained from the spring/summer and autumn/winter surveys. All tables are calculated from the fieldwork exercise and apply to households with individual kerbside collected containers and not multiple occupancy dwellings or flats with the use of communal bins. Results show:

* Households in Manchester are producing 218.3kg/household (hh)/year of residual waste; this is within the current target rate of 400kg/hh/yr.
* Against the 2020 GMCA target of 60% recycling, figures from this survey show an average recycling rate of 48.6% for Manchester households. This rate excludes contamination placed within recycling containers.
* The pulpables recycling scheme is currently achieving a diversion rate of 8.4% with 81.1% of all acceptable materials captured. Figures suggest that 78.9% of recyclable paper and 82.7% of recyclable card and cardboard are captured by this collection. Contamination within this recycling stream is 22.9% which equates to 12.9kg/hh/yr with 9.4kg/hh/yr of these materials remaining in the residual waste.
* The co-mingled recycling scheme is currently achieving a diversion rate of 12.1% with 85.8% of all acceptable materials captured. Figures suggest that 82.9% of plastic bottles, 91.7% of glass bottles and jars and 70.8% of recyclable metals are captured by this collection. Contamination within this recycling stream is 27.4% which equates to 23.7kg/hh/yr with 9.7kg/hh/yr of these materials remaining in the residual waste stream.
* The organics recycling scheme is currently achieving a diversion rate of 28.2% with 65.2% of all acceptable materials captured. Figures suggest that 41.7% of food waste, 96.9% of garden vegetation and 67.1% of recyclable pet bedding are captured by this collection. Contamination within this recycling stream is 7.2% which equates to 11.4kg/hh/yr.
* Food waste forms 32% of waste in residual bins, equating to 70.8kg/hh/yr. Over half of the food in the residual bins (64%) is avoidable. If households did not dispose of any edible food waste, then the total amount of residual waste would fall to around 148kg/hh/yr and increase diversion to 56.3%.
* 42.6% of residual waste consists of materials that can be recycled at the kerbside, this equates to 93.1kg/hh/yr of unrecycled materials. Around 4% of residual waste should be in the pulpable recycling bins, 4% should be in co-mingled recycling bins and 34% should be in organic recycling bins.
* If all of these materials were correctly recycled, then the current maximum achievable diversion is 67.6%.
* Textiles are not currently an option for residents to recycle at the kerbside, however they are readily accepted at bring banks, charity shops or local recycling centres. Potentially collectable clothing and fabrics accounted for 9.2kg/hh/yr or 4.2% of the residual waste. By not placing these materials into residual bins then diversion would increase from 48.6% to 49.5%.
* Disposable nappies and AHP waste are a major component of the residual waste forming 12.9% or 28.2kg/hh/yr of the total. If schemes were in place to collect this waste separately or householders’ chose to use washable nappies, then diversion would increase from 48.6% to 51.4%.
* GMCA may choose to expand its mixed recycling collections to include liquid cartons (Tetrapaks) and plastic pots, tubs and trays. The items are present both in the residual waste and also are regularly incorrectly recycled via the current scheme. Manchester households are generating around 13.1kg/hh/yr of these materials. If these items became recyclable at the kerbside and all were correctly recycled, then potentially the achieved diversion would increase from 48.6% to 51.2%

Residual (General) waste – 72% of households set out their residual waste bin for collection

|  |  |  |
| --- | --- | --- |
| Recyclable materials | KG/HH/YR | % |
| Recyclable paper | 4.4 | 2.0% |
| Recyclable card & cardboard | 5.0 | 2.3% |
| Plastic bottles | 2.5 | 1.1% |
| Recyclable glass | 3.3 | 1.5% |
| Recyclable metals | 3.9 | 1.8% |
| Recyclable food waste | 70.7 | 32.4% |
| Recyclable garden waste | 2.8 | 1.3% |
| Recyclable pet bedding | 0.4 | 0.2% |
| Total | 93.1 | 42.6% |

Manchester households dispose of 218.3kg/hh/yr of residual waste. Collections take place fortnightly. The survey shows that 42.6% of the waste found in the residual bin is recyclable which equates to 93.1kg/hh/yr. The bulk of the recyclable material is food waste which accounts for 70.7kg/hh/yr or 32.4% of the recyclable material that is present.

Pulpables (Paper and card) recycling – 56% of households set out these bins for collection

Manchester households place 56.4kg/hh/yr of material in their pulpable recycling bins. Collections take place every two weeks. Of the materials households are recycling in this bin, around 22.9% or 12.9kg/hh/yr is formed from contaminants which are unacceptable to the scheme. Around 50% (11% of recycling) of the contamination was due to non-recyclable paper and card along with liquids cartons. General residual waste (including materials such as plastic and plastic film, rubble and disposable nappies) made up 8% of the recycling or 33% of the contamination. Food waste made up 12% of the contamination present with food waste forming 3% of recycling. A small amount of material in the paper and card recycling bin was due to co-mingled recyclables. These contributed 1% of recycling and 5% of contamination.

|  |  |  |  |
| --- | --- | --- | --- |
| Recyclable materials | KG/HH/YR | % | Capture rate |
| Recyclable paper | 18.0 | 31.9% | 78.9% |
| Recyclable card & cardboard | 25.5 | 45.2% | 82.7% |
| Contamination | 12.9 | 22.9% | - |
| Total | 56.4 | 100.0% | 81.1% |

Of all the recyclable paper generated by households, 79% is correctly captured in the pulpable recycling bin. The proportion of card and cardboard successfully captured is higher at around 83%.

Co-mingled (Mixed) recycling – 58% of households set out these bins for collection

Manchester households place 86.2kg/hh/yr of material in their co-mingled recycling bins. Collections take place every two weeks. Of the materials households are recycling in this bin, around 27.4% or 23.7kg/hh/yr is formed from contaminants which are unacceptable to the scheme. Around 32% (9% of recycling) of material in the co-mingled recycling bins is due to waste not recyclable in any of the kerbside collection containers with items such as plastic pots, tubs and trays, plastic film, scrap metal and contained liquids commonly present. Food waste made up 3% of the collected recycling (10% of contamination), non-recyclable glass made up an additional 1.5% (5% of contamination), while another 2% of the collected recycling (7% of contamination) were non-recyclable metals.

|  |  |  |  |
| --- | --- | --- | --- |
| Recyclable materials | KG/HH/YR | % | Capture rate |
| Plastic bottles | 12.8 | 14.8% | 82.9% |
| Glass bottles and jars | 39.8 | 46.2% | 91.7% |
| Tins, cans, aerosols & foil | 9.9 | 11.5% | 70.8% |
| Contamination | 23.7 | 27.4% | - |
| Total | 86.2 | 100.0% | 85.8% |

Of all the recyclable metal set out at the kerbside for collection, 71% is correctly captured in the co-mingled recycling bin, which means 29% of potentially recyclable material (tins, cans, aerosols and foil) is not being recycled. The proportion of plastic bottles successfully recycled is 83% with 92% of all glass bottles and jars also captured by the co-mingled recycling bin.

Organics (Food and garden) recycling – 34% of households set out these bins for collection

|  |  |  |  |
| --- | --- | --- | --- |
| Recyclable materials | KG/HH/YR | % | Capture rate |
| Food waste | 53.4 | 33.9% | 41.7% |
| Garden vegetation | 91.9 | 58.3% | 96.9% |
| Organic pet bedding | 0.9 | 0.6% | 67.1% |
| Contamination | 11.4 | 7.2% | - |
| Total | 157.7 | 100.0% | 65.2% |

Manchester households place 157.7kg/hh/yr of material in their organics recycling bins. These are collected every week until mid-October, then every two weeks until late March. Of the materials households are recycling in this bin, around 7.2% or 11.4kg/hh/yr is formed from contaminants which are unacceptable to the scheme. Around 45% of contamination is due to soil and turf with 25% scrap wood waste.

Of all the recyclable food waste generated by households, 42% % is correctly captured in the organic recycling bin, which means 58% (74.6kg/hh/yr) of potentially recyclable food is not being recycled. Of the food waste being recycled, 58% is classified as avoidable. Almost all (97%) of garden vegetation is correctly recycled.

Separation of waste

Figures from this analysis suggest Manchester households currently generate around 518.5kg/hh/yr of waste and recycling for kerbside collection. A total of 252.3kg/hh/yr of this is correctly recycled giving a recycling rate of 48.6%. An additional 18% (93.1kg/hh/yr) is formed from recyclable material placed into the residual bins. Finally, there is 5.3kg/hh/yr or 1% of kerbside waste that is due to recyclable material placed into the incorrect recycling bin. If all of the recyclable material that is disposed of at the kerbside were placed into the correct recycling container then the potential rate for diversion would be 67.6%.

Levels of contamination in the recycling bins were relatively high. In total, of the 518.5kg/hh/yr of total kerbside waste and recycling around 48kg/hh/yr is contamination found in the recycling bins (either residual materials or recyclables in the wrong container). This represents over 9% of the total weight set out by householders at the kerbside, levels of contamination in the pulpable (23%) and co-mingled (27%) recycling appear high.

|  |  |  |
| --- | --- | --- |
| Kerbside waste separation | KG/HH/YR | % by weight |
| **Residual waste in residual bin** | **125.2** | **24.1%** |
| **Recycling in residual bin** | **93.1** | **18.0%** |
| **Correctly recycled materials** | **252.3** | **48.6%** |
| **Incorrectly recycled material** | **5.3** | **1.0%** |
| **Residual material in recycling** | **42.7** | **8.2%** |
| Total kerbside waste | **518.5** | **100.0%** |

Introduction

The Greater Manchester Combined Authority (GMCA) disposes of the waste collected by its nine member Districts - Bolton MBC, Bury MBC, Manchester CC, Oldham Council, Rochdale MBC, Salford CC, Stockport MBC, Tameside MBC and Trafford MBC. A four-stream kerbside collection service is operated across all Districts covering co-mingled recycling, pulpable recycling (paper and card), organics recycling (combined food waste and garden waste) and residual waste. Districts also offer recycling services for flats and householders using communal bins, in some cases this is a reduced service.

Co-mingled (Mixed) recycling

* Plastic bottles
* Food tins
* Tin foil
* Drinks cans
* Aerosols
* Glass jars and bottles

Pulpables (Paper and card) recycling

* Egg boxes
* Cardboard
* Card packaging
* Newspapers, magazines, brochures, envelopes and junk mail

Organics (Food and garden) recycling

* Tea bags and coffee grounds
* Fruit and vegetables
* Meat and bones (cooked and uncooked)
* Breads and pastries
* Dairy (e.g. cheese) and egg shells
* All cooked and uncooked food, grass, flowers, hedge and plant cuttings
* Hay and straw

In addition to these regular kerbside collections there is the provision of twenty Household Waste Recycling Centres (HWRCs) for the use of Greater Manchester residents.

Materials accepted (varies between sites):

* Batteries
* Car batteries
* Co-mingled recycling (glass bottles and jars, plastic bottles, aerosols, foil, food and drink cans)
* Cooking oil
* Engine oil
* Fluorescent tubes
* Fridges and freezers
* Garden waste
* Gas bottles
* General waste
* Hardcore and rubble
* Household chemicals
* Large and small electrical appliances
* Media
* Paper and card
* Print cartridges
* Scrap metal
* Textiles
* Timber and wood
* TV and monitors
* Tyres

As part of a continuing drive to reduce the levels of waste being generated, and to identify possibilities for increasing the efficiency with which recyclables are separated, GMCA commissioned M·E·L Research to undertake a series of waste surveys that would determine:

1. Survey 1 - The composition of all kerbside collected waste and recycling streams;
2. Survey 2 - The composition of materials taken by householders to the HWRCs; and
3. Survey 3- Why residents are bringing waste to the HWRCs, what materials they are disposing of, site satisfaction and catchment areas.

The findings for each of the surveys listed above are contained in separate reports. This report covers the results of the composition of household waste and recycling collected directly from the kerbside (Survey 1) and relates specifically to households within the Manchester City Council area.

Since 2011 there have been a number of changes to kerbside collection services. These include changing the frequency of residual waste collections to three weekly from two weekly or reducing residual bin capacity from 240L to 140L. The frequency of some recycling collections has also been changed. GMCA has set clear targets to increase household recycling across Greater Manchester to 60% by 2020 and reduce household residual waste to 400kg/hh/yr by 2025. Findings from the surveys being undertaken will help to gauge progression towards these targets. The results will show whether the targets are achievable and, if that is the case, where attention should be focused in order to achieve or surpass them.

Sampling

The aim of Survey 1 was to sample representative households from within Manchester to gain the best overall picture of the waste and recycling being disposed of by its residents at the kerbside. In order to obtain this objective, all households within Manchester were classified using socio-demographic profiling. M·E·L Research uses licenced software, supplied by CACI ltd, which segments postcodes into various subsets called Acorns (A Classification Of Residential Neighbourhoods)[[1]](#footnote-2). Acorn segments postcodes into 6 Categories, 18 Groups and 62 types, three of which are not private households. By analysing significant social factors and population behaviour, it provides detailed information and in-depth understanding of the different types of people within an area.

Nine dominant Acorn groups were selected to represent the dominant types of householders in Manchester. These were spread throughout the main five private household Acorn categories and represented 82.3% of the householder types present throughout the District (minimum target 75%). These selected groups are highlighted in yellow in Table 1. A selection of households from the selected Acorn groups were sent a letter to make them aware of the waste survey and to give them an opportunity to opt out.

Table 1: Acorn household profile for Manchester

|  |  |  |
| --- | --- | --- |
| **Acorn 1 - Affluent Achievers** | | **5.9%** |
| 1.A | Lavish Lifestyles | 0.1% |
| 1.B | Executive Wealth | 3.2% |
| 1.C | Mature Money | 2.5% |
| **Acorn 2 - Rising Prosperity** | | **14.8%** |
| 2.D | City Sophisticates | 7.0% |
| 2.E | Career Climbers | 7.8% |
| **Acorn 3 - Comfortable Communities** | | **11.7%** |
| 3.F | Countryside Communities | 0.0% |
| 3.G | Successful Suburbs | 4.0% |
| 3.H | Steady Neighbourhoods | 3.4% |
| 3.I | Comfortable Seniors | 0.4% |
| 3.J | Starting Out | 4.0% |
| **Acorn 4 - Financially Stretched** | | **25.5%** |
| 4.K | Student Life | 10.2% |
| 4.L | Modest Means | 5.4% |
| 4.M | Striving Families | 5.9% |
| 4.N | Poorer Pensioners | 4.0% |
| **Acorn 5 - Urban Adversity** | | **42.0%** |
| 5.O | Young Hardship | 11.7% |
| 5.P | Struggling Estates | 13.7% |
| 5.Q | Difficult Circumstances | 16.5% |
| **Acorn 6 - Not Private Households** | | **0.1%** |
| 6.R | Not Private Households | 0.1% |

Highlighted Acorn groups were selected for analysis throughout Manchester

The analysis provides the following outputs:

* An understanding (using socio-demographic profiling) of which types of householders are producing which types of waste and which types of householders are using the recycling provision most effectively
* Total amounts of presented material for each of the four kerbside collection schemes
* Information on the levels of recyclable materials found in the residual waste container
* Amount and types of contamination found in the recycling containers
* Capture rates for individual materials included in each recycling stream
* The amount of overall waste diverted by each recycling scheme and overall

Table 2 shows the kerbside collection system currently available for Manchester households.

Table 2: Kerbside waste and recycling collections for Manchester householders

|  |  |  |
| --- | --- | --- |
| Waste stream | Containers | Collection frequency |
| Co-mingled  (Mixed) recycling | 240 litre or140 litre Bin or Box | Every 2 weeks |
| Pulpable  (Paper and card) recycling | 240 litre or 140 litre Bin or Bag |
| General waste  (Residual) | 140 litre Bin |
| Organics  (Combined food and garden) recycling | 240 litre or 140 litre Bin and/or Street caddy and a Kitchen caddy | Weekly until  Mid-October, then fortnightly until late March |

Table 3 provides reference for the total recorded annual tonnages for the main waste and recycling streams collected throughout Manchester. The appendix section applies these tonnage figures to the percentage composition data from this survey.

Table 3: 2017/18 waste tonnages

|  |  |
| --- | --- |
| Waste stream | Tonnes per annum (tpa) |
| Co-mingled (mixed dry recyclables excl. Pulpables) | 18,526.26 |
| Organics (Food and Garden) | 30,412.76 |
| Pulpables (Paper & Card) | 14,996.40 |
| Residual (General Waste) | 70,043.00 |
| Trade Waste | 96.02 |
| Grand Total | 134,074.44 |

Methodology and Analysis

Households were selected for inclusion in the survey on the basis that they had not opted out and were part of one of the eight nominated Acorn groups shown in Table 1. These selected households were initially sampled during the spring and summer of 2018.

The same range of households was then re-visited during survey 2 (autumn/winter) with the same waste containers again surveyed.

The number of households setting out each waste/recycling was recorded, with the aim of collecting all presented waste and recycling. In some instances, it was not possible to collect all presented waste/recycling (resident refuses, bins too heavy to manhandle or contain hazardous materials or total weight of waste exceeds vehicle capacity). The collected residual waste from each household was bulked together for sorting as a single sample as were the samples of recycling from each household.

The manual hand sorting of the collected waste/recycling gave concentration by weight figures for each of the main categories of waste, as well as the more detailed sub-categories. This gives an indication as to the proportion of each waste category and is expressed as a percentage (by weight). This percentage can be translated into a figure relating to the average waste generation expected for each waste category. This is calculated in kilograms per household per week (kg/hh/wk) and then converted to kilograms per household per year (kg/hh/yr). As this is the unit the GMCA has used to for waste targets.

The amount of waste kg/hh/yr is calculated from the total number of households surveyed and not just those that are participating. This is most representative of the amount of waste that will be collected by regular crews.

For example; where 50 bins of waste are collected from **75** households the set-out rate is 67%.

The total amount of collected waste from the presented bins is **1,250kg**.

Bins are collected on a **fortnightly** basis.

Waste generation = **1,250kg** / **75** households = **16.7kg**

**16.7kg** / **2 weeks** = **8.3kg/hh/wk** or **435kg/hh/yr**

By knowing the composition of waste from the various Acorn samples it is possible to gain an insight into the make-up and volumes of the residual waste that can be expected across Manchester as a whole. Figures expressed as an average for Manchester are weighted from the results for each sample. This accounts for their relative prominence across the District as per their proportion in Table 1.

Statistical Accuracy

In the compositional analysis data tables contained within this report, we have presented figures for the average kg/hh/yr and percentage of waste that falls into each of the compositional categories. To get an indication of the reliability of these figures (given that they are based on analysing just a sample of all the waste being generated) we use a standard statistical technique to generate a ‘confidence interval’, which is a way of representing the possible range of error resulting from using a sample rather than analysing it all.

To do this we have applied validated error tests, which have been standardised for the sampling and analysis technique we use at M·E·L Research, based on controlled testing of both sampling error (caused by taking a sample of the waste and not all of it), and also what is termed instrument (observational) error, which reflects the accuracy of the hand sorting technique used by our analysts. These can be combined statistically to produce an estimate of the accuracy of compositional statistics for this phase.

Based on this standard method, the percentages quoted 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 (note that these accuracies are based on assuming a ‘normal statistical distribution’ in the way waste is being disposed of by the households in the selected samples). This means that, for any of the main compositional category headings, we are 95% confident that the figure we quote based on analysing the sample, is within +/- 10% of the true figure you would get if you analysed all the waste that arrives during a typical collection week.

Results – Residual Waste

Set out rates

Households throughout Manchester have access to a fortnightly collection of residual waste. Average figures suggested 72% of households present their residual bins for collections. Ranges were from 60.7% for Acorn 5O (young hardship) households up to 95.4% for Acorn 2D (city sophisticates) households.

Figure 1: Set out rates for residual waste (%)

**Waste generation levels**

On average, results from this survey suggested 218.3kg/hh/yr of residual waste was generated by Manchester households. Less than 155kg/hh/yr of residual waste was generated by Acorn 5Q households (difficult circumstances), compared with Acorn 4L households (modest means) who generated 317.2kg/hh/yr. Solely considering presented bins; the average amount of waste generated is 301.7kg/hh/yr.

Table 4: Kerbside residual waste

|  |  |  |  |
| --- | --- | --- | --- |
| Sample | % set out rate | Overall KG/HH/YR\* | KG/HH/YR PER presented bin\*\* |
| 2D | 95.4% | 242.9 | 254.6 |
| 2E | 78.8% | 301.8 | 383.2 |
| 3G | 86.1% | 245.6 | 285.2 |
| 4K | 61.6% | 220.8 | 358.5 |
| 4L | 90.2% | 317.2 | 351.5 |
| 4M | 75.5% | 216.4 | 286.6 |
| 5O | 60.7% | 186.6 | 307.6 |
| 5P | 71.2% | 213.7 | 300.2 |
| 5Q | 65.2% | 154.9 | 237.4 |
| Weighted average | 72.4% | 218.3 | 301.7 |

\* The overall kg/hh/yr refers to the total amount of waste generated by all of the households surveyed at the time waste was collected. This includes households that did not present a bin for collection. This figure is the most realistic estimate for the waste generation for a given area as there are always a proportion of households that will not present a bin for every collection.

\*\*Kg/hh/yr for presented bins is used for comparative purposes and is always higher as it only apples to the collected bins and does not account for households not setting out waste. In effect this is the level of waste that would be generated were there a 100% set out rate.

Figure 2: Kg/hh/yr for residual waste

**Compositional analysis of residual waste**

This section looks at the composition of the household residual waste collected across Manchester. It provides information on the main materials present and highlights any differences between the various Acorn group samples and the proportion of recyclable material that each contains. Detailed data sheets are displayed in a separate data appendix.

Figure 3 shows that by far the greatest concentration of material (by weight) was putrescible material, accounting for over a third of the residual waste (36% or 77.9kg/hh/yr). This category includes food waste, garden waste, consumable liquids and biodegradable pet bedding. Food waste was the most prevalent material forming 91% of the putrescibles present in residual waste bins. 19% (43kg/hh/yr) of the material in the residual waste was miscellaneous combustibles. This category includes a broad range of items such as nappies, wood, animal waste and general bric-a-brac. Almost two thirds of this type of waste was due to disposable nappies, which alone, accounted for 13% (28.2kg/hh/yr) of residual waste.

Figure 3: Main materials in the residual waste (Kg/hh/yr and % by weight)

\*all unsortable fragments <10mm in size

**Pulpables (Paper and card)**

Overall, 11.9% or 26.1kg/hh/yr of the total weight of residual waste surveyed across Manchester was due to paper and card. Of this, little over 36% was suitable for recycling at the kerbside in the form of recyclable paper (newspapers, magazines, envelopes, brochures, junk mail and copy paper etc.) and recyclable card and cardboard (corrugated cardboard, packaging card and greetings cards). Householders are therefore estimated to be placing 9.4kg/hh/yr of recyclable pulpables (paper and card) in their residual bins.

The majority (63.9%) of paper and card in the residual waste is, however, classed as non-recyclable for the pulpable recycling collections and includes items such as used wallpaper, tissue paper, waxed or greaseproof paper, laminated or mixed material card.

**Figure 4: Average paper and card content of the residual waste (kg/hh/yr)**

From individual samples it was seen that Acorn 5P (struggling estates) households disposed of just 7.2kg/hh/yr of recyclable paper and card in their residual bins compared with 12.4kg/hh/yr for Acorn 2D (city sophisticates) and 2E (career climbers).

Whereas just 29% of the paper and card in the residual bins from Acorn 2E (career climbers) was of a recyclable type, this ratio was 50% for Acorn 2D (city sophisticates) households.

**Co-mingled** **(Plastic, metal and glass)**

Overall, 18.7% or 40.9kg/hh/yr of the total weight of residual waste surveyed across Manchester was due to plastic, metal and glass waste. Of this, 23.7% was suitable for recycling at the kerbside via co-mingled recycling bins (plastic bottles, glass bottles and jars, tins, cans foil and aerosols). Householders are therefore estimated to be placing 9.7kg/hh/yr of recyclable co-mingled items (recyclable plastic, metal and glass) in their residual bins.

The majority (76.3%) of plastic, metal and glass in the residual waste is, however, classed as non-recyclable for the co-mingled recycling collections and includes items such as plastic film, plastic pots, tubs and trays, polystyrene, non-packaging glass and scrap metal.

**Figure 5: Average plastic, metal and glass content of the residual waste (kg/hh/yr)**

From individual samples it was seen that Acorn 5Q households (difficult circumstances) disposed of just 5.9kg/hh/yr of recyclable plastic, metal and glass in their residual bins compared with 13.6kg/hh/yr for Acorn 2D (city sophisticates) households.

Additionally, whereas just 17% of the plastic, metal and glass in the residual bins from Acorn 2D (city sophisticates) households was of a recyclable type, this ratio was 27% for Acorn 4K (student life) households.

**Organics (Food and garden)**

Figure 3 shows that by far the greatest concentration of material in the residual waste for all samples was putrescible waste. This category is made up of food waste, consumable liquids garden waste and organic pet bedding. Overall, over 35% or 77.9kg/hh/yr of residual waste surveyed across Manchester was deemed to be putrescible in nature. 91% of the putrescible material was due to recyclable food waste and this accounted for 34% or 70.8kg/hh/yr of all residual waste. Combined, garden vegetation and organic pet bedding amounted to just 3.3kg/hh/yr in the residual waste. Therefore, a total of 74kg/hh/yr or 32% of all residual waste is of a type that could have been recycled via the organic collection bins. Over 95% of the organic material within residual bins is deemed to be recyclable with just 4.9% formed from soil, turf and contained consumable fats and liquids.

**Figure 6: Putrescible content of the residual waste (kg/hh/yr)**

Food waste in this report is shown using WRAPs food and drink categorisations:

1. **Avoidable** – food thrown away that was, at some point prior to disposal, edible (e.g. slice of bread, apples, meat). This includes unused fully packaged food waste; part used food waste in packaging and loose food waste;
2. **Possibly avoidable** – food that some people eat, and others do not (e.g. bread crusts), or that can be eaten when a food is prepared in one way but not in another (e.g. potato skins and vegetable peelings); and
3. **Unavoidable** – waste arising from food preparation that is not, and has not been, edible under normal circumstances (e.g. meat bones, egg shells, pineapple skin, tea bags).

Figure 7: Recyclable food content of the residual waste

On average, 32% of all residual waste consisted of food waste, equating to 71kg/hh/yr. Of all the food waste being placed into residual bins, 64% was avoidable with a further 8% potentially avoidable. Therefore, each household places an average of 45kg/hh/yr of avoidable food in their residual bins.

From individual samples it was seen that Acorn 5Q households (difficult circumstances) disposed the least food waste in their residual bins at around 53.3kg/hh/yr. This compares with levels of 110.2kg/hh/yr for Acorn 4L (modest means).

Across the samples the proportion of all food waste that was avoidable ranged between 39% for Acorn 4L households (modest means) up to 80% for Acorn 5Q (difficult circumstances). An average of 64%.

Of the avoidable food, over two thirds (69%) was disposed of packaged – 31kg/hh/yr. This is food waste either totally unopened or part used and still within its original packaging. Of all the food in the residual bins, between 21% for Acorn 4L (modest means) and 61% for Acorn 2D (city sophisticates) was packaged – 44% for Manchester.

**Potential recyclability of the residual waste**

Overall, 42.6% or 93kg/hh/yr of residual waste is deemed to be acceptable to either the pulpable, co-mingled or organic recycling collections.

**Figure 8: Proportion of waste placed in residual bins that is accepted in current schemes (%)**

**Figure 9: Recyclable waste placed in residual bins that is accepted in current schemes (kg/hh/yr)**

**Results - Pulpable recycling (Paper and card)**

**Set out rates and amount of recycling**

Households throughout Manchester have access to a fortnightly collection of Pulpables (paper and card) recycling. Average figures suggested that 56% of households set out their paper and card recycling bins for collection. Set out rates ranged from 35.5% for Acorn 4K (student life) households up to 70.5% for Acorn 4L (modest means) households. Households generate an average of 56.4kg/hh/yr of pulpable recycling. This equates to around 101.5kg/hh/yr when solely considering presented bins.

Acorn 4K (student life) had a low set out rate but had one of the highest weights for presented bins. This suggests they might be building up the recycling and only putting it out for collection when it is full. Acorn 4L (modest means) had the highest set out rate but also had one of the lowest bin weights (per presented bin); suggesting they are not using the service effectively.

**Table 5: Pulpable recycling**

|  |  |  |  |
| --- | --- | --- | --- |
| Sample | % set out rate | Overall KG/HH/YR | KG/HH/YR per presented bin |
| 2D | 69.6% | 81.8 | 117.5 |
| 2E | 69.9% | 69.2 | 99.0 |
| 3G | 60.5% | 76.0 | 125.7 |
| 4K | 35.5% | 44.4 | 124.9 |
| 4L | 70.5% | 60.7 | 86.1 |
| 4M | 54.2% | 69.3 | 127.9 |
| 5O | 50.5% | 56.9 | 112.7 |
| 5P | 45.2% | 46.7 | 103.3 |
| 5Q | 61.7% | 44.0 | 71.3 |
| Average | 55.5% | 56.4 | 101.5 |

The overall kg/hh/yr refers to the total amount of recycling generated by all of the households surveyed. This includes households that did not present a container for collection. This figure is the most accurate estimate for the recycling generation for a given area as there are always a proportion of households that will not present a container for every collection.

Kg/hh/yr for presented containers is used for comparative purposes and is always higher as it only applies to the containers collected and does not account for households not setting out waste. In effect this is the level of recycling that would be generated were there a 100% set out rate

**Figure 10: Set out rates for pulpable recycling (%)**

**Figure 11: Kg/hh/yr for pulpable recycling**

**Compositional analysis**

This section looks at average amounts and composition of the paper and card recycling presented by households sampled throughout Manchester. Results are again expressed in terms of percentage concentration and kg/hh/yr for individual areas surveyed. Table 6 and Figure 12 show recycling data in terms of percentage composition with Table 7 and Figure 13 showing generation rates for major materials in kg/hh/yr across all households in each sample area.

In previous sections it has been shown that a proportion of the material disposed of in residual bins is classified as recyclable. Collected recycling will also contain a certain amount of material that is deemed to be contamination. That is to say, material that is not compatible with the specific recycling container it is placed into.

On average 45% (25.5kg/hh/yr) of recycling is recyclable card and cardboard and 32% (18kg/hh/yr) is recyclable paper. Therefore 77% (43.5kg/hh/yr) of the pulpable recycling bin consists of the correct materials and 23% is contamination

Around 12% (6.5 kg/hh/yr) of the presented recycling is non-recyclable paper and card. 3% is organic waste (mainly food) and 1% co-mingled recyclables – these materials should have been placed into the other recycling bins that are available. The remaining contamination is made up of residual bin materials such as wood waste, rubble, plastic film and contained liquids.

**Table 6: Pulpable recycling (% composition)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Recyclable paper | 44.9% | 29.5% | 27.4% | 25.6% | 27.4% | 15.0% | 39.6% | 25.3% | 39.4% | 31.9% |
| Recyclable card & cardboard | 36.1% | 43.2% | 52.0% | 41.1% | 49.1% | 55.2% | 44.7% | 52.1% | 40.5% | 45.2% |
| Non-recyclable paper & card | 8.5% | 17.7% | 8.6% | 16.5% | 11.8% | 14.5% | 7.5% | 11.1% | 9.4% | 11.5% |
| Co-mingled recyclables | 0.4% | 0.5% | 0.6% | 2.5% | 0.6% | 0.9% | 1.3% | 1.7% | 0.8% | 1.1% |
| Food & garden waste | 0.5% | 1.7% | 3.8% | 6.9% | 2.2% | 4.7% | 2.4% | 5.2% | 0.1% | 2.8% |
| Residual waste | 9.7% | 7.3% | 7.6% | 7.4% | 9.0% | 9.7% | 4.6% | 4.6% | 9.8% | 7.6% |
| Total recyclable | 80.9% | 72.7% | 79.4% | 66.7% | 76.5% | 70.2% | 84.3% | 77.4% | 79.9% | 77.1% |
| Total contamination | 19.1% | 27.3% | 20.6% | 33.3% | 23.5% | 29.8% | 15.7% | 22.6% | 20.1% | 22.9% |

**Figure 12: Pulpable recycling (% composition)**

**Table 7: Pulpable recycling (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | **2D** | **2E** | **3G** | **4K** | **4L** | **4M** | **5O** | **5P** | **5Q** | **Average** |
| Recyclable paper | 36.7 | 20.4 | 20.9 | 11.3 | 16.6 | 10.4 | 22.5 | 11.8 | 17.3 | 18.0 |
| Recyclable card & cardboard | 29.5 | 29.9 | 39.5 | 18.3 | 29.8 | 38.3 | 25.4 | 24.3 | 17.8 | 25.5 |
| Non-recyclable paper & card | 7.0 | 12.3 | 6.5 | 7.3 | 7.1 | 10.0 | 4.2 | 5.2 | 4.1 | 6.5 |
| Co-mingled recyclables | 0.3 | 0.4 | 0.5 | 1.1 | 0.4 | 0.6 | 0.7 | 0.8 | 0.3 | 0.6 |
| Food & garden waste | 0.4 | 1.2 | 2.9 | 3.1 | 1.3 | 3.3 | 1.4 | 2.4 | 0.1 | 1.6 |
| Residual waste | 7.9 | 5.1 | 5.8 | 3.3 | 5.4 | 6.7 | 2.6 | 2.1 | 4.3 | 4.3 |
| Total recyclable | 66.2 | 50.3 | 60.4 | 29.6 | 46.4 | 48.7 | 47.9 | 36.1 | 35.1 | 43.5 |
| Total contamination | 15.6 | 18.9 | 15.7 | 14.8 | 14.3 | 20.6 | 9.0 | 10.5 | 8.8 | 12.9 |

**Figure 13: Pulpable recycling (kg/hh/yr)**

Figure 14 below summarises the average composition of material disposed of in the pulpable recycling. An average of 22.9% of the paper and card recycling bin contents are due to items not acceptable to the collection and therefore deemed to be contamination. Annually this equates to 12.9kg/hh/yr of waste.

**Figure 14: Materials in pulpable recycling bins.**

**Pulpable recycling contamination**

This section looks to breakdown the 12.9kg/hh/yr of contamination being placed into the recycling across Manchester.

Some forms of contamination may be due to residents’ lack of knowledge in relation to the recycling scheme. For example, a householder may believe napkins and tissue are acceptable forms of paper. Other contamination will be formed from waste that is totally unrelated to the materials collected (i.e. disposable nappies, wood or food waste).

**Table 8: Contamination in pulpable recycling bins (%)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Liquid cartons\* | 3.49% | 2.78% | 1.79% | 3.25% | 2.49% | 2.22% | 2.08% | 2.69% | 1.88% | 2.52% |
| Other non-recyclable paper & card | 5.03% | 14.94% | 6.80% | 13.25% | 9.28% | 12.26% | 5.38% | 8.38% | 7.50% | 8.94% |
| Food waste | 0.48% | 1.71% | 3.77% | 6.21% | 2.17% | 4.71% | 2.38% | 5.22% | 0.13% | 2.76% |
| Co-mingled recyclables | 0.43% | 0.53% | 0.62% | 2.47% | 0.60% | 0.87% | 1.30% | 1.72% | 0.76% | 1.06% |
| Other residual waste | 9.66% | 7.32% | 7.63% | 8.13% | 8.95% | 9.68% | 4.61% | 4.58% | 9.81% | 7.65% |
| Total contamination | 19.09% | 27.28% | 20.61% | 33.32% | 23.49% | 29.75% | 15.74% | 22.58% | 20.09% | 22.94% |

**Table 9: Contamination in pulpable recycling bins (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Liquid cartons\* | 2.9 | 1.9 | 1.4 | 1.4 | 1.5 | 1.5 | 1.2 | 1.3 | 0.8 | 1.4 |
| Other non-recyclable paper & card | 4.1 | 10.3 | 5.2 | 5.9 | 5.6 | 8.5 | 3.1 | 3.9 | 3.3 | 5.0 |
| Food waste | 0.4 | 1.2 | 2.9 | 2.8 | 1.3 | 3.3 | 1.4 | 2.4 | 0.1 | 1.6 |
| Co-mingled recyclables | 0.3 | 0.4 | 0.5 | 1.1 | 0.4 | 0.6 | 0.7 | 0.8 | 0.3 | 0.6 |
| Other residual waste | 7.9 | 5.1 | 5.8 | 3.6 | 5.4 | 6.7 | 2.6 | 2.1 | 4.3 | 4.3 |
| Total contamination | 15.6 | 18.9 | 15.7 | 14.8 | 14.3 | 20.6 | 9.0 | 10.5 | 8.8 | 12.9 |

\*Residents are told to place liquid cartons in their residual bins, however recent changes to the cardboard market now means this material has become acceptable to the pulpable collection scheme.

On average 22.9% or 12.9kg/hh/yr of paper and card recycling collected throughout Manchester was deemed to be contamination.

Acorn 5O (young hardship) recycling was the least contaminated at 15.7%. In comparison just over a third (33.3%) of Acorn 4K (student life) recycling was due to contamination. Annually, Acorn 4M (striving families) placed the greatest amount of contamination in their recycling bins at 20.6kg/hh/yr.

Around 50% (11% of recycling) of the contamination was due to non-recyclable paper and card along with liquids cartons. General residual waste (including materials such as plastic and plastic film, rubble and disposable nappies) made up 8% of the recycling or 33% of the contamination. Food waste made up 12% of the contamination present with food waste forming 3% of recycling. A small amount of material in the paper and card recycling bin was due to co-mingled recyclables. These contributed 1% of recycling and 5% of contamination.

**Recyclable paper and card within residual bins**

Figures show that an average of 42.6% (93.1kg/hh/yr) of the residual waste collected throughout Manchester could have been recycled at the kerbside. Recyclable paper and card accounts for 4.3% (9.4kg/hh/yr) of the residual waste. Therefore, it can be said that 10% of the recyclable content of the residual waste is due to paper and card.

The residual waste from Acorn 5P households (struggling estates) contained only 7.2kg/hh/yr of recyclable paper and card. In comparison, Acorn 2D (city sophisticates) and 2E (career climbers) disposed of 12.4kg/hh/yr of recyclable paper and card in their residual bins, where it accounted for 5.1% and 4.1% of the total respectively.

**Table 10: Recyclable pulpables placed in residual bins (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Recyclable paper (kg/hh/yr) | 6.0 | 5.3 | 4.6 | 5.1 | 5.0 | 4.0 | 3.7 | 4.3 | 3.1 | 4.4 |
| Recyclable card & cardboard (kg/hh/yr) | 6.5 | 7.1 | 5.6 | 6.3 | 6.4 | 5.6 | 3.8 | 2.9 | 4.6 | 5.0 |
| Total recyclable pulpables (kg/hh/yr) | 12.4 | 12.4 | 10.2 | 11.4 | 11.4 | 9.6 | 7.5 | 7.2 | 7.7 | 9.4 |
| Total recyclable pulpables (% of residual) | 5.1% | 4.1% | 4.2% | 5.2% | 3.6% | 4.4% | 4.0% | 3.4% | 5.0% | 4.3% |

**Capture rates for pulpable recycling**

This section looks in more detail at the pulpable recycling collections and highlights the effectiveness with they are capturing these items. Capture rates determine how much of a material that should be recycled actually is being recycled. Looking at the relationship between the residual and recycling waste streams presented will additionally give indications as to the overall diversion being achieved via the pulpable recycling bin.

Across Manchester it is estimated that 53.6kg/hh/yr of recyclable paper and card is disposed of at the kerbside with around 81.1% or 43.5kg/hh/yr being correctly recycled (captured). Acorn 4K (student life) created just 41.4kg/hh/yr of these pulpable recyclables. In contrast residents from Acorn 2D (city sophisticates) generated 79kg/hh/yr of recyclable paper and card.

All samples captured a similar proportion of their recyclable paper and card at between 71.5% (Acorn 4K – student life) and 85.7% (Acorn 5O - young hardship).

**Table 11: Distribution of recyclable pulpables in kerbside containers (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Recyclable pulpables | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Recyclable paper & card in residual bins (KG/HH/YR) | 12.4 | 12.4 | 10.2 | 11.4 | 11.4 | 9.6 | 7.5 | 7.2 | 7.7 | 9.4 |
| RECYCLABLE PAPER & CARD RECYCLED (KG/HH/YR) | 66.2 | 50.3 | 60.4 | 29.6 | 46.4 | 48.7 | 47.9 | 36.1 | 35.1 | 43.5 |
| RECYCLABLE PAPER & CARD IN CO-MINGLEDL BINS (KG/HH/YR) | 0.4 | 0.6 | 0.5 | 0.4 | 0.3 | 0.7 | 0.3 | 0.8 | 0.0 | 0.4 |
| RECYCLABLE PAPER & CARD IN ORGANICS BINS (KG/HH/YR) | 0.0 | 0.0 | 0.1 | 0.0 | 0.2 | 0.0 | 0.2 | 0.0 | 1.4 | 0.3 |
| TOTAL RECYCLABLE PAPER & CARD DISPOSED OF (KG/HH/YR) | 79.0 | 63.3 | 71.2 | 41.4 | 58.3 | 59.0 | 55.9 | 44.1 | 44.3 | 53.6 |
| % CAPTURE OF RECYCLABLE PAPER & CARD | 83.8% | 79.5% | 84.8% | 71.5% | 79.7% | 82.6% | 85.7% | 81.9% | 79.3% | 81.1% |

**Figure 15: Distribution of recyclable pulpables in kerbside containers (kg/hh/yr) by Acorn group and overall**

There are many different forms of paper and card and therefore decisions have to be made by residents as to whether a particular piece is to go into the recycling or residual waste. There is, however, around 10kg/hh/yr of potentially recyclable paper and card not disposed of in recycling bins. Almost all of this is in the residual bins.

Capture rates for card and cardboard were generally higher (83%) than for recyclable paper (79%). It was especially the case that bulkier corrugated cardboard was well recycled with 93% placed into pulpable recycling bins. In contrast around 71% of thinner card was captured.

**Diversion via pulpable recycling collections**

The pulpable recycling bin service is responsible for diverting 8.4% of all the kerbside waste presented. This proportion excludes all of the contamination materials that are present within these bins. Acorn 2D households (city sophisticates) are estimated to be diverting around 12% of their kerbside waste via pulpable recycling bins. The rate for households in the Acorn 4K (student life) category is just 6.3%.

**Table 12: Diversion via pulpable recycling bins (%)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Diversion rates | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Pulpables recycling bin | 12.2% | 7.1% | 8.7% | 6.3% | 7.1% | 8.2% | 11.8% | 8.3% | 7.3% | 8.4% |

**Results - Co-mingled Recycling (Glass, metal and plastic)**

**Set out rates and amount of recycling**

Households throughout Manchester have access to a fortnightly collection of co-mingled recycling consisting of plastic bottles, glass bottles and jars, tins, cans and foil. At the time of survey, it was seen that an average of 58% of households presented co-mingled recycling bins for collection. Ranges seen were 46.1% for Acorn 5O households (young hardship) up to 79.2% for Acorn 3G households (successful suburbs). It was seen that an average of 86.2kg/hh/yr of co-mingled recycling was being generated. This equates to around 148.2kg/hh/yr when solely considering presented bins.

Acorn 5Q households (difficult circumstances) had one of the lowest set out rate yet presented the heaviest bins –217kg/hh/yr. This suggests they are building up the recycling and only putting it out for collection when it is full. In contrast Acorn 4L (modest means) had a relatively high set out rate of 71% but the lowest presented bin weight – 81kg/hh/yr. This suggests that these households use the service more consistently by setting out less recycling on a more frequent basis.

**Table 13: Co-mingled recycling**

|  |  |  |  |
| --- | --- | --- | --- |
| Sample | % set out rate | Overall KG/HH/YR | KG/HH/YR per presented bin |
| 2D | 76.9% | 103.8 | 134.9 |
| 2E | 61.0% | 92.2 | 151.2 |
| 3G | 79.2% | 89.8 | 113.3 |
| 4K | 55.0% | 81.0 | 147.4 |
| 4L | 70.7% | 57.5 | 81.3 |
| 4M | 64.3% | 88.3 | 137.3 |
| 5O | 46.1% | 57.6 | 125.0 |
| 5P | 57.5% | 88.5 | 153.7 |
| 5Q | 48.5% | 105.2 | 216.9 |
| Average | 58.2% | 86.2 | 148.2 |

**Figure 16: Set out rates for co-mingled recycling (%)**

**Figure 17: Kg/hh/yr for co-mingled recycling**

**Compositional analysis of co-mingled recycling**

This section looks at average amounts and composition of the co-mingled recycling presented by households sampled throughout Manchester. Results can again be expressed in terms of percentage concentration and kg/hh/yr for individual samples surveyed. Table 14 and Figure 18 show recycling data in terms of percentage composition with Table 15 and Figure 19 showing generation rates for major materials in kg/hh/yr across all households in each sample area.

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

On average around 46% (39.8kg/hh/yr) of recycling is due to recyclable glass bottles and jars with 15% (12.8kg/hh/yr) being plastic bottles and 12% (9.9kg/hh/yr) recyclable metals. Therefore 73% (62.5kg/hh/yr) of recycling bin content consists of the correct materials.

Around 24% (20.9kg/hh/yr) of material in the co-mingled recycling bins is due to waste not recyclable in any of the kerbside collection containers with items such as plastic pots, tubs and trays, plastic film, scrap metal and contained liquids commonly present. An average of 3% (2.3kg/hh/yr) is organic waste (mainly food) and just 0.5% paper and card – these materials should have been placed into the other recycling bin that are available.

**Table 14: Co-mingled recycling (% composition)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Plastic bottles | 10.3% | 12.2% | 17.7% | 19.0% | 33.0% | 14.4% | 16.1% | 12.6% | 13.2% | 14.8% |
| Glass bottles and jars | 68.9% | 53.6% | 26.6% | 46.5% | 18.6% | 45.2% | 45.7% | 40.4% | 47.3% | 46.2% |
| Tins, cans & foil | 6.4% | 9.5% | 9.3% | 10.8% | 11.6% | 12.7% | 12.3% | 11.2% | 14.6% | 11.5% |
| Paper & card recyclables | 0.4% | 0.6% | 0.5% | 0.5% | 0.5% | 0.8% | 0.5% | 0.9% | 0.0% | 0.5% |
| Food & garden waste | 1.0% | 3.1% | 3.7% | 3.1% | 7.2% | 3.2% | 3.1% | 2.8% | 1.7% | 2.7% |
| Residual waste | 13.1% | 20.9% | 42.3% | 20.1% | 29.2% | 23.7% | 22.2% | 32.1% | 23.2% | 24.3% |
| Total recyclable | 85.5% | 75.4% | 53.5% | 76.3% | 63.2% | 72.3% | 74.1% | 64.2% | 75.0% | 72.6% |
| Total contamination | 14.5% | 24.6% | 46.5% | 23.7% | 36.8% | 27.7% | 25.9% | 35.8% | 25.0% | 27.4% |

**Figure 18: Co-mingled recycling (% composition)**

**Table 15: Co-mingled recycling (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Plastic bottles | 10.7 | 11.3 | 15.9 | 15.4 | 19.0 | 12.7 | 9.3 | 11.2 | 13.8 | 12.8 |
| Glass bottles and jars | 71.4 | 49.4 | 23.9 | 37.6 | 10.7 | 39.9 | 26.3 | 35.7 | 49.7 | 39.8 |
| Tins, cans & foil | 6.6 | 8.8 | 8.3 | 8.8 | 6.7 | 11.2 | 7.1 | 9.9 | 15.4 | 9.9 |
| Paper & card recyclables | 0.4 | 0.6 | 0.5 | 0.4 | 0.3 | 0.7 | 0.3 | 0.8 | 0.0 | 0.4 |
| Food & garden waste | 1.1 | 2.8 | 3.3 | 2.5 | 4.1 | 2.8 | 1.8 | 2.5 | 1.8 | 2.3 |
| Residual waste | 13.6 | 19.3 | 37.9 | 16.3 | 16.8 | 21.0 | 12.8 | 28.4 | 24.4 | 20.9 |
| Total recyclable | 88.7 | 69.5 | 48.1 | 61.8 | 36.3 | 63.8 | 42.7 | 56.8 | 78.9 | 62.5 |
| Total contamination | 15.1 | 22.7 | 41.7 | 19.2 | 21.2 | 24.5 | 14.9 | 31.6 | 26.3 | 23.7 |

**Figure 19: Co-mingled recycling (kg/hh/yr)**

Figure 20 summarises the average composition of material disposed of in the co-mingled recycling. Glass bottles and jars form 46% of the collected co-mingled recycling resulting in an annual collection of 39.8kg/hh/yr. Plastic bottles form 15% of bin contents resulting in 12.8kg/hh/yr being recycled. Tins, cans and foils form 11% of bin contents resulting in 9.9kg/hh/yr being recycled. An average of 27.4% or 23.7kg/hh/yr of the co-mingled recycling bin contents are due to items not acceptable to the collection and therefore deemed to be contamination.

**Figure 20: Materials in co-mingled recycling bins (kg/hh/yr).**

**Recycling contamination**

This section looks to breakdown the amounts and concentrations of various contaminants being placed into the co-mingled recycling across Manchester.

Some forms of contamination may be due to residents’ lack of knowledge in relation to the recycling scheme. For example, a householder may believe plastic pots, tubs and trays are acceptable forms of plastic. Other contamination will be formed from waste that is totally unrelated to the materials collected (i.e. disposable nappies, wood or food waste).

**Table 16: Contamination in co-mingled recycling bins (%)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Co-mingled recycling | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Plastic pots, tubs & trays | 3.2% | 3.3% | 4.6% | 7.0% | 6.3% | 3.7% | 4.4% | 3.7% | 3.8% | 4.2% |
| Other non-recyclable plastics | 2.2% | 3.3% | 6.8% | 2.9% | 6.8% | 2.7% | 2.8% | 5.2% | 1.9% | 3.4% |
| Non-recyclable glass | 3.0% | 0.7% | 4.2% | 2.1% | 0.7% | 1.2% | 2.0% | 1.0% | 0.7% | 1.5% |
| Non-recyclable metals | 0.8% | 0.7% | 4.3% | 0.7% | 0.8% | 0.3% | 1.6% | 1.1% | 4.0% | 1.8% |
| Paper & card recyclables | 0.4% | 0.6% | 0.5% | 0.5% | 0.5% | 0.8% | 0.5% | 0.9% | 0.0% | 0.5% |
| Food waste | 1.0% | 3.1% | 3.7% | 3.1% | 6.9% | 3.2% | 3.1% | 2.8% | 1.7% | 2.7% |
| Contained liquids | 1.0% | 2.4% | 10.4% | 2.6% | 7.1% | 9.0% | 2.7% | 9.8% | 1.9% | 4.5% |
| Other residual waste | 2.9% | 10.5% | 12.0% | 4.7% | 7.7% | 6.9% | 8.7% | 11.2% | 11.0% | 8.8% |
| Total contamination | 14.5% | 24.6% | 46.5% | 23.7% | 36.8% | 27.7% | 25.9% | 35.8% | 25.0% | 27.4% |

**Table 17: Contamination in co-mingled recycling bins (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Co-mingled recycling | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Plastic pots, tubs & trays | 3.3 | 3.0 | 4.1 | 5.6 | 3.6 | 3.2 | 2.5 | 3.3 | 3.9 | 3.6 |
| Other non-recyclable plastics | 2.3 | 3.0 | 6.1 | 2.4 | 3.9 | 2.4 | 1.6 | 4.6 | 2.0 | 2.9 |
| Non-recyclable glass | 3.1 | 0.6 | 3.8 | 1.7 | 0.4 | 1.1 | 1.2 | 0.9 | 0.7 | 1.3 |
| Non-recyclable metals | 0.8 | 0.7 | 3.8 | 0.6 | 0.5 | 0.3 | 0.9 | 1.0 | 4.2 | 1.6 |
| Paper & card recyclables | 0.4 | 0.6 | 0.5 | 0.4 | 0.3 | 0.7 | 0.3 | 0.8 | 0.0 | 0.4 |
| Food waste | 1.1 | 2.8 | 3.3 | 2.5 | 4.0 | 2.8 | 1.8 | 2.5 | 1.8 | 2.3 |
| Contained liquids | 1.1 | 2.2 | 9.3 | 2.1 | 4.1 | 7.9 | 1.5 | 8.7 | 2.0 | 3.9 |
| Other residual waste | 3.0 | 9.7 | 10.8 | 3.8 | 4.5 | 6.1 | 5.0 | 9.9 | 11.5 | 7.6 |
| TOTAL CONTAMINATION | 15.1 | 22.7 | 41.7 | 19.2 | 21.2 | 24.5 | 14.9 | 31.6 | 26.3 | 23.7 |

On average 27.4% or 23.7kg/hh/yr of co-mingled recycling collected throughout Manchester was deemed to be contamination. Acorn 2D recycling (city sophisticates) was proportionately the least contaminated at 14.5%. In comparison 46.5% of Acorn 3G (successful suburbs) recycling was due to contamination. Weight wise, Acorn 5O (young hardship) recycling was the least contaminated with 14.9kg/hh/yr. In comparison, Acorn 3G (successful suburbs) was the most contaminated with 41.7kg/hh/yr.

Around 32% (9% of recycling) of the contamination was due to general mixed residual waste (including materials such as bagged waste, WEEE, Hazardous waste, rubble and textiles). Non-recyclable plastics made up 8% of the recycling or 27% of the contamination. Over half (55%) of this was due to pots, tubs and trays which formed 4% of the collected recycling. The remainder was due to plastic film and mixed dense plastics. Contained liquids (mainly inside plastic bottles) made up 17% of the contamination and formed almost 5% of the collected recycling. Food waste made up 3% of the collected recycling (10% of contamination), non-recyclable glass made up an additional 1.5% (5% of contamination), while another 2% of the collected recycling (7% of contamination) were non-recyclable metals. Just 0.5% of the collected co-mingled recycling (2% of contamination) was due to recyclable paper and card.

**Co-mingled recyclables within residual bins**

Figures show that an average of 42.6% or 93.1kg/hh/yr of the residual waste collected throughout Manchester could have been recycled at the kerbside. Recyclable plastics, metals and glass account for 4.4% (9.7kg/hh/yr) of the residual waste. Therefore, it can be said that 10% of the recyclable content of the residual waste is due to co-mingled recyclables.

The residual waste from Acorn 5O households (young hardship) contained 7.7kg/hh/yr of co-mingled recyclables or 4% of the total. Acorn 2D households (city sophisticates) disposed of 13.6kg/hh/r of recyclable plastic, metal and glass in their residual bins where it accounted for 5.6% of the total.

**Table 18: Co-mingled recyclables placed in residual bins (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Plastic bottles (KG/HH/YR) | 2.9 | 2.5 | 2.4 | 3.4 | 2.9 | 3.1 | 1.4 | 3.3 | 1.6 | 2.5 |
| Glass bottles & jars (KG/HH/YR) | 5.8 | 1.3 | 2.3 | 5.3 | 3.5 | 4.9 | 3.6 | 2.9 | 1.6 | 3.3 |
| Tins, cans & aerosols (KG/HH/YR) | 4.9 | 5.0 | 3.4 | 4.7 | 3.5 | 4.5 | 2.7 | 4.7 | 2.7 | 3.9 |
| Total co-mingled recyclables (KG/HH/YR) | 13.6 | 8.7 | 8.0 | 13.4 | 9.9 | 12.5 | 7.7 | 10.9 | 5.9 | 9.7 |
| Total co-mingled recyclables (% of residual) | 5.6% | 2.9% | 3.3% | 6.1% | 3.1% | 5.8% | 4.1% | 5.1% | 3.8% | 4.4% |

**Capture rates for co-mingled (mixed) recycling**

Manchester households are disposing of around 72.8kg/hh/yr of recyclable plastic bottles, tins, cans, aerosols, foil and glass bottles and jars at the kerbside. Of these, over 85% or 62.5kg/hh/yr are correctly captured in the co-mingled recycling bins. Acorn 4L households (modest means) disposed of the smallest amount of co-mingled recyclables at 46.9kg/hh/yr with Acorn 2D households (city sophisticates) disposing of as much as 102.7kg/hh/yr.

All samples managed to capture the vast majority of their comingled recycling, ranging from 78% for Acorn 4L (modest means) to almost 93% for Acorn 5Q households (difficult circumstances).

**Table 19: Distribution of co-mingled recyclables in kerbside containers (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Co-mingled recyclables | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Co-mingled recyclables in residual bins (KG/HH/YR) | 13.6 | 8.7 | 8.0 | 13.4 | 9.9 | 12.5 | 7.7 | 10.9 | 5.9 | 9.7 |
| Co-mingled recyclables in co-mingled bins (KG/HH/YR) | 88.7 | 69.5 | 48.1 | 61.8 | 36.3 | 63.8 | 42.7 | 56.8 | 78.9 | 62.5 |
| Co-mingled recyclables in pulpable recycling bins (KG/HH/YR) | 0.3 | 0.4 | 0.5 | 1.1 | 0.4 | 0.6 | 0.7 | 0.8 | 0.3 | 0.6 |
| Co-mingled recyclables in organics bins (KG/HH/YR) | 0.1 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total co-mingled recyclables disposed of (KG/HH/YR) | 102.7 | 78.6 | 56.6 | 76.3 | 46.9 | 77.0 | 51.2 | 68.5 | 85.2 | 72.8 |
| % Capture of all co-mingled recyclables | 86.3% | 88.5% | 84.9% | 81.0% | 77.5% | 82.9% | 83.5% | 82.9% | 92.7% | 85.8% |

**Figure 21: Distribution of co-mingled recyclables in kerbside containers (kg/hh/yr) by Acorn group**

Plastic Bottles

In all sample areas, the majority of all recyclable plastic bottles are being correctly diverted. There is, however, around 2.6kg/hh/yr of potentially recyclable bottles not disposed of in recycling bins. Acorn 5Q households (difficult circumstances) residents captured the highest proportion of their recyclable plastic bottles with 89.1% correctly being recycled. Acorn 5P households (struggling estates) captured the lowest proportion of their recyclable plastic bottles with 76.5% correctly being recycled. Across Manchester it is estimated that 15.4kg/hh/yr of recyclable plastic bottles are disposed of at the kerbside with around 82.9% or 12.8kg/hh/yr being correctly recycled.

Plastic pots, tubs and trays are currently not part of the recycling collections available in Manchester. Despite this a third (33%) of all the plastic pots, tubs and trays disposed of at the kerbside are placed into the co-mingled recycling bins. In all sample areas over a fifth of pots, tubs and trays are recycled peaking at 48% for the Acorn 4L (modest means) sample.

**Table 20: Distribution of recyclable plastic bottles in kerbside containers (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Plastic bottles | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Plastic bottles disposed of (KG/HH/YR) | 13.7 | 14.0 | 18.5 | 19.0 | 21.9 | 16.0 | 10.9 | 14.6 | 15.5 | 15.4 |
| Plastic bottles recycled (KG/HH/YR) | 10.7 | 11.3 | 15.9 | 15.4 | 19.0 | 12.7 | 9.3 | 11.2 | 13.8 | 12.8 |
| % Capture of plastic bottles | 77.9% | 80.6% | 86.0% | 81.3% | 86.7% | 79.2% | 85.6% | 76.5% | 89.1% | 82.9% |

Glass bottles and jars

Across Manchester it is estimated that 43.4kg/hh/yr of recyclable bottles and jars are disposed of at the kerbside with around 91.7% or 39.8kg/hh/yr being correctly recycled.

Around 3.6kg/hh/yr of potentially recyclable glass is not disposed of in recycling bins. Acorn 2E residents (career climbers) captured the highest proportion of their recyclable glass bottles and jars with 97.5% correctly being recycled. Acorn 2D households (city sophisticates) generated the most recyclable glass at 77.5kg/hh/yr and also have a very high capture rate of 92.2%. All samples were seen to capture over 75% of the glass bottles and jars they disposed of with Acorn 4L households (modest means) generating the least of this waste at 14.2kg/hh/yr.

Table 21 shows the distribution of recyclable bottles and jars throughout the residual and recycling waste by Acorn group and overall.

**Table 21: Distribution of recyclable glass in kerbside containers (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Glass bottles & jars | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Glass bottles & jars disposed of (KG/HH/YR) | 77.5 | 50.7 | 26.2 | 43.7 | 14.2 | 45.0 | 30.3 | 39.1 | 51.5 | 43.4 |
| Glass bottles & jars recycled (KG/HH/YR) | 71.4 | 49.4 | 23.9 | 37.6 | 10.7 | 39.9 | 26.3 | 35.7 | 49.7 | 39.8 |
| % Capture of glass bottles & jars (KG/HH/YR) | 92.2% | 97.5% | 91.0% | 86.2% | 75.0% | 88.8% | 86.9% | 91.4% | 96.4% | 91.7% |

Metals

Across Manchester it is estimated that 14kg/hh/yr of recyclable metals compatible are disposed of at the kerbside with around 71% or 9.9kg/hh/yr being correctly recycled. Acorn 5Q residents (difficult circumstances) captured the highest proportion of their recyclable tins, cans and foils with 85% correctly being recycled. Acorn 5Q households (difficult circumstances) also generated the most recyclable metal at 18.1kg/hh/yr. All samples were seen to capture most of the recyclable metals they disposed of with Acorn 5O households (young hardship) generating the least of this waste at 10kg/hh/yr. Around 4.1kg/hh/yr of potentially recyclable metal is not disposed of in recycling bins.

**Table 22: Distribution of recyclable metal in kerbside containers (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tins, cans, aerosols & foil | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Recyclable metals generated (KG/HH/YR) | 11.6 | 13.9 | 11.9 | 13.7 | 10.8 | 16.1 | 10.0 | 14.9 | 18.1 | 14.0 |
| Recyclable metals recycled (KG/HH/YR) | 6.6 | 8.8 | 8.3 | 8.8 | 6.7 | 11.2 | 7.1 | 9.9 | 15.4 | 9.9 |
| % CAPTURE OF RECYCLABLE METALS (KG/HH/YR) | 57.3% | 63.3% | 69.8% | 64.0% | 62.1% | 69.9% | 70.9% | 66.9% | 85.0% | 70.8% |

**Diversion via co-mingled recycling collections**

The co-mingled recycling bin service is responsible for diverting 12.1% of all the kerbside waste presented. This proportion excludes all of the contamination materials that are present within these bins. Acorn 5Q households (difficult circumstances) and Acorn 2D households (city sophisticates) are estimated to be diverting over 16% of their kerbside waste via co-mingled recycling bins. The rate for households in the Acorn 4L (modest means) area is 5.5%.

**Table 23: Diversion via co-mingled recycling bins (%)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Diversion rates | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Co-mingled recycling bin | 16.4% | 9.8% | 6.9% | 13.2% | 5.5% | 10.7% | 10.5% | 13.0% | 16.4% | 12.1% |

Results – Organic Recycling (Food and garden)

**Set out rates and waste generation levels**

Households throughout Manchester have access to a weekly (spring/summer) and fortnightly (autumn/winter) collection of organic recycling consisting of food waste, garden vegetation and organic pet bedding. Average figures suggested 34% of households presented organic recycling bins for collection. Ranges seen were 24.2% for Acorn 4K households (student life) up to 51.8% for Acorn 2E households (career climbers). It was seen that an average of 157.7kg/hh/yr of organic recycling was being generated. Just 88.8kg/hh/yr of this recycling was generated by Acorn 5P households (struggling estates) compared with Acorn 3G households (successful suburbs) generating 280.4kg/hh/yr. Solely considering presented bins; the average amount of organic recycling generated is 461.6kg/hh/yr.

The relatively low set out rates for organic recycling compared with high individual bin weights suggests households are not using the service regularly. Some households may have little or no garden space and therefore do not use their bins solely for the disposal of food waste. Other households may wait until bins are full before placing out for collection or only recycle food waste when there is garden waste it can be mixed with. Residents should be encouraged to use this service more frequently even if volumes of waste are low or made up purely of food waste. This is especially the case during seasons where levels of garden waste are likely to be low.

**Table 24: Organic recycling**

|  |  |  |  |
| --- | --- | --- | --- |
| Sample | % set out rate | Overall KG/HH/YR | KG/HH/YR per presented bin |
| 2D | 39.8% | 113.0 | 283.8 |
| 2E | 51.8% | 249.6 | 482.0 |
| 3G | 42.8% | 280.4 | 655.7 |
| 4K | 24.2% | 121.4 | 501.4 |
| 4L | 47.6% | 220.8 | 464.3 |
| 4M | 39.1% | 221.9 | 567.7 |
| 5O | 30.8% | 105.2 | 341.3 |
| 5P | 30.9% | 88.8 | 287.8 |
| 5Q | 34.1% | 176.8 | 518.2 |
| AVERAGE | 34.2% | 157.7 | 461.6 |

**Figure 22: Set out rates for organic recycling (%)**

**Figure 23: Kg/hh/yr for organic recycling**

**Compositional analysis of organic recycling**

This section looks at average amounts and composition of the organic recycling presented by households sampled throughout Manchester Results can again be expressed in terms of percentage concentration and kg/hh/yr for individual samples surveyed. Table 25 and Figure 24 show recycling data in terms of percentage composition with Table 26 and Figure 25 showing generation rates for major materials in kg/hh/yr across all households in each sample area.

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

On average around 58% (91.9kg/hh/yr) of organic recycling is due to garden vegetation with 34% (53.4kg/hh/yr) being food waste. There are trace levels of biodegradable pet bedding and compostable liners. Therefore 93% (146.3kg/hh/yr) of organic recycling bin content consists of the correct materials. Around 3% (5.2kg/hh/yr) of material in the organic recycling bins is soil and turf while 4% is other waste materials.

**Table 25: Organic recycling (% composition)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| All food waste | 30.4% | 16.0% | 28.2% | 96.6% | 73.7% | 20.5% | 24.8% | 33.7% | 15.7% | 33.9% |
| Garden vegetation | 55.0% | 82.4% | 70.1% | 3.0% | 24.6% | 65.4% | 69.4% | 66.1% | 64.6% | 58.3% |
| Pet bedding | 0.1% | 0.0% | 0.2% | 0.0% | 0.0% | 0.5% | 0.5% | 0.0% | 2.0% | 0.6% |
| Compostable liners | 0.1% | 0.0% | 0.1% | 0.0% | 0.0% | 0.4% | 0.3% | 0.0% | 0.0% | 0.1% |
| Soil & turf | 0.7% | 1.3% | 0.1% | 0.0% | 0.7% | 0.8% | 2.2% | 0.0% | 11.9% | 3.3% |
| All other waste | 13.6% | 0.3% | 1.3% | 0.3% | 0.9% | 12.5% | 2.8% | 0.2% | 5.8% | 3.9% |
| Total recyclable | 85.7% | 98.4% | 98.6% | 99.7% | 98.3% | 86.8% | 95.0% | 99.8% | 82.3% | 92.8% |
| Total contamination | 14.3% | 1.6% | 1.4% | 0.3% | 1.7% | 13.2% | 5.0% | 0.2% | 17.7% | 7.2% |

**Figure 24: Organic recycling (% composition)**

**Table 26: Organic recycling (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Organic recycling bins | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| All food waste | 34.4 | 39.9 | 78.9 | 117.3 | 162.8 | 45.5 | 26.1 | 30.0 | 27.7 | 53.4 |
| Garden vegetation | 62.2 | 205.6 | 196.7 | 3.7 | 54.4 | 145.1 | 72.9 | 58.7 | 114.3 | 91.9 |
| Pet bedding | 0.1 | 0.0 | 0.5 | 0.0 | 0.0 | 1.0 | 0.6 | 0.0 | 3.6 | 0.9 |
| Compostable liners | 0.2 | 0.0 | 0.3 | 0.0 | 0.0 | 0.8 | 0.3 | 0.0 | 0.0 | 0.1 |
| Soil & turf | 0.8 | 3.3 | 0.3 | 0.0 | 1.6 | 1.7 | 2.3 | 0.0 | 21.0 | 5.2 |
| All other waste | 15.3 | 0.7 | 3.7 | 0.4 | 2.0 | 27.7 | 3.0 | 0.1 | 10.3 | 6.2 |
| Total recyclable | 96.8 | 245.5 | 276.5 | 121.0 | 217.2 | 192.5 | 99.9 | 88.7 | 145.6 | 146.3 |
| Total contamination | 16.2 | 4.1 | 4.0 | 0.4 | 3.7 | 29.3 | 5.3 | 0.1 | 31.2 | 11.4 |

**Figure 25: Organic recycling (kg/hh/yr)**

Figure 26 below summarises the average composition of material disposed of in the organic recycling. Garden vegetation formed 58% of the collected organic recycling resulting in an annual collection of 91.9kg/hh/yr. Food formed 34% of bin contents resulting in 53.4kg/hh/yr being recycled.

An average of 7.2% or 11.4kg/hh/yr of recycling bin contents are due to items not acceptable to the collection and therefore deemed to be contamination.

**Figure 26: Materials in organic recycling bins.**

***\*Levels of garden waste fluctuate greatly depending on the season. Figures represent an annual average of data obtained during spring/summer and autumn/winter seasons.***

**Food content of the organic recycling**

In the organic recycling just 34% of material is due to food waste. Of this food waste, 58% is avoidable which is lower than the proportion seen for food disposed of in the residual waste. Around 2.5% of the avoidable food waste in the organics recycling is still contained within its packaging.

Only two samples (Acorns 2E and 3G) recycled food waste where the majority was unavoidable. In comparison almost 68% of food recycled in Acorns 5P (struggling estates) and 4M (striving families) was avoidable.

On average just 1.5%% of all recycled food waste was still packaged.

**Table 27: Food waste placed into organic recycling bins (kg/hh/yr).**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Avoidable food waste - unused fully packaged | 0.1 | 0.0 | 0.0 | 0.0 | 0.6 | 2.4 | 0.3 | 0.0 | 0.0 | 0.3 |
| Avoidable food waste - part used in packaging | 0.1 | 0.1 | 0.8 | 0.0 | 4.9 | 1.4 | 0.2 | 0.0 | 0.0 | 0.5 |
| Avoidable food waste loose | 21.3 | 14.1 | 33.7 | 62.5 | 100.4 | 27.1 | 15.8 | 20.2 | 16.4 | 30.0 |
| Potentially avoidable food waste | 0.7 | 2.9 | 8.2 | 0.2 | 8.7 | 1.5 | 1.7 | 0.9 | 2.8 | 2.4 |
| Unavoidable food wase | 12.2 | 22.8 | 36.2 | 54.5 | 48.2 | 13.1 | 8.1 | 8.9 | 8.5 | 20.2 |
| Total food waste | 34.4 | 39.9 | 78.9 | 117.3 | 162.8 | 45.5 | 26.1 | 30.0 | 27.7 | 53.4 |
| % Avoidable | 62.5% | 35.5% | 43.7% | 53.3% | 65.0% | 67.7% | 62.6% | 67.6% | 59.2% | 57.7% |
| % Possibly avoidable | 1.9% | 7.3% | 10.4% | 0.2% | 5.4% | 3.4% | 6.4% | 2.8% | 10.0% | 4.5% |
| % Of avoidable packaged | 1.1% | 0.9% | 2.3% | 0.0% | 5.2% | 12.2% | 3.3% | 0.0% | 0.0% | 2.5% |

**Organic recycling contamination**

On average 11.4kg/hh/yr or 7.2% of organic recycling consists of contamination. This section looks to breakdown the amounts and concentrations of various contaminants present.

Some forms of contamination may be due to residents’ lack of knowledge in relation to the recycling scheme. For example, a householder may believe soil and turf, or wood are acceptable. Other contamination will be formed from waste that is totally unrelated to the materials collected (i.e. plastics).

**Table 28: Contamination in organic recycling bins (%)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Soil & turf | 0.7% | 1.3% | 0.1% | 0.0% | 0.7% | 0.8% | 2.2% | 0.0% | 11.9% | 3.3% |
| Scrap wood | 0.1% | 0.1% | 0.8% | 0.0% | 0.0% | 10.9% | 0.2% | 0.0% | 2.6% | 1.8% |
| Other residual waste | 13.5% | 0.2% | 0.5% | 0.3% | 0.9% | 1.5% | 2.6% | 0.2% | 3.2% | 2.2% |
| Total contamination | 14.3% | 1.6% | 1.4% | 0.3% | 1.7% | 13.2% | 5.0% | 0.2% | 17.7% | 7.2% |

**Table 29: Contamination in organic recycling bins (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Soil & turf | 0.8 | 3.3 | 0.3 | 0.0 | 1.6 | 1.7 | 2.3 | 0.0 | 21.0 | 5.2 |
| Scrap wood | 0.1 | 0.3 | 2.3 | 0.0 | 0.0 | 24.2 | 0.2 | 0.0 | 4.6 | 2.8 |
| All other contamination | 15.3 | 0.4 | 1.4 | 0.4 | 2.0 | 3.4 | 2.8 | 0.1 | 5.7 | 3.4 |
| Total contamination | 16.2 | 4.1 | 4.0 | 0.4 | 3.7 | 29.3 | 5.3 | 0.1 | 31.2 | 11.4 |

Only two of the nine samples of organic recycling were less than 1% contamination. In another five samples contamination levels of 1% - 18% were observed. Households in Acorn 2D (city sophisticates) and Acorn 5Q (difficult circumstances) had a contamination level of 14.3% and 17.7%, respectively. On average soil and turf formed 3% of the organic recycling or 45% of the contamination present. Scrap wood made up 2% of the collected recycling and was responsible for 25% of the contamination. Other contamination made up 2% of the organic recycling and tended to be packaging associated with food waste such as plastic film and cardboard.

**Capture rates for organic recyclables**

This section looks in more detail at the individual materials placed out for organic recycling collections and highlights the effectiveness with which recycling collections throughout Manchester are capturing these items. Capture rates determine how much of a material that should be recycled actually is being recycled. Looking at the relationship between the residual and recycling waste streams presented will additionally give indications as to the overall diversion being achieved via this service.

Around 224.3kg/hh/yr of recyclable organic material is generated by households across Manchester. Of this, 65.2% or 146.3kg/hh/yr is captured by the organics recycling bins. Acorn 3G households (successful suburbs) disposed of, by far, the most organic material at 373.3kg/hh/yr. This compares with levels of just 160.8kg/hh/yr for Acorn 5P households (struggling estates). As well as disposing of the least amount of organic waste, these Acorn 5P households captured the lowest proportion at 55.2%. Acorn 4M households (striving families) managed to capture up to 76%.

**Table 30: Distribution of organic recyclables in kerbside containers (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Organic recyclables | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Organic recyclables in residual bins (KG/HH/YR) | 67.5 | 106.3 | 90.7 | 89.0 | 116.8 | 54.7 | 59.8 | 67.2 | 56.9 | 74.0 |
| Organic recyclables in organics bins (KG/HH/YR) | 96.8 | 245.5 | 276.5 | 121.0 | 217.2 | 192.5 | 99.9 | 88.7 | 145.6 | 146.3 |
| Co-mingled recyclables in pulpable recycling bins (KG/HH/YR) | 0.4 | 1.2 | 2.9 | 3.1 | 1.3 | 3.3 | 1.4 | 2.4 | 0.1 | 1.6 |
| Co-mingled recyclables in co-mingled s bins (KG/HH/YR) | 1.1 | 2.8 | 3.3 | 2.5 | 4.1 | 2.8 | 1.8 | 2.5 | 1.8 | 2.3 |
| Total organic recyclables disposed of (KG/HH/YR) | 165.8 | 355.8 | 373.3 | 215.5 | 339.4 | 253.3 | 162.9 | 160.8 | 204.4 | 224.3 |
| % Capture of all organic recyclables | 58.4% | 69.0% | 74.1% | 56.1% | 64.0% | 76.0% | 61.4% | 55.2% | 71.2% | 65.2% |

Levels of organic waste tend to fluctuate over the course of a year largely due to the levels of garden waste being disposed of. During a spring / summer survey, levels of garden waste will be higher than one performed during winter months. Figures in this report provide the best annual estimates as they represent an average of the results from both seasons. Variations in the levels of food waste being disposed of are less pronounced, however it is generally the case that households recycle garden waste far more effectively than food waste. Residents will also have the option to remove garden waste and fruit / vegetable matter from their kerbside waste by using home composters.

Food waste

Across Manchester it is estimated that 128kg/hh/yr of recyclable food is disposed of at the kerbside with around 41.7% or 53.4kg/hh/yr being correctly recycled (Table 31). A total of 74.6kg/hh/yr of potentially recyclable food is not disposed of in organic recycling bins. Acorn 4K (student life) and Acorn 4L (modest means) residents were the only samples to capture more than half of the food waste they disposed of with 55.7% and 58.5%, respectively, being correctly recycled. Acorn 4L (modest means) disposed of the most recyclable food waste at 278.2kg/hh/yr; this was more than three times the amount disposed of by Acorn 5Q (difficult circumstances) – 82.9kg/hh/yr. Acorn 2E households (career climbers) recycled the lowest proportion of the food they were disposing of at just 27.5%.

**Table 31: Distribution of recyclable food waste in kerbside containers (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Food waste | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Recyclable food disposed of (KG/HH/YR) | 101.4 | 145.0 | 168.9 | 210.4 | 278.2 | 106.1 | 88.0 | 97.2 | 82.9 | 128.0 |
| Recyclable food recycled (KG/HH/YR) | 34.4 | 39.9 | 78.9 | 117.3 | 162.8 | 45.5 | 26.1 | 30.0 | 27.7 | 53.4 |
| % Capture of recyclable food (KG/HH/YR) | 33.9% | 27.5% | 46.7% | 55.7% | 58.5% | 42.9% | 29.6% | 30.8% | 33.5% | 41.7% |

Figure 27 shows the distribution of recyclable food throughout the residual and recycling waste by Acorn group and overall.

**Figure 27: Distribution of food waste in kerbside containers (kg/hh/yr) by Acorn group and overall**

Garden waste

Almost all samples disposed of their garden waste correctly in the organics recycling stream although there were large differences in the amount generated. On average Manchester households disposed of 94.8kg/hh/yr of garden waste with 97% correctly recycled. Whereas Acorn 4K (student life) households generated just 5.1kg/hh/yr of garden vegetation, this amount was 208.1kg/hh/yr in Acorn 2E households (career climbers).

**Table 32: Distribution of recyclable garden waste in kerbside containers (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Garden waste | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Recyclable garden waste disposed of (KG/HH/YR) | 63.8 | 208.1 | 203.6 | 5.1 | 61.2 | 145.4 | 73.9 | 63.6 | 117.2 | 94.8 |
| Recyclable garden waste recycled (KG/HH/YR) | 62.2 | 205.6 | 196.7 | 3.7 | 54.4 | 145.1 | 72.9 | 58.7 | 114.3 | 91.9 |
| % Capture of recyclable garden waste (KG/HH/YR) | 97.4% | 98.8% | 96.6% | 71.7% | 88.9% | 99.8% | 98.7% | 92.3% | 97.5% | 96.9% |

**Figure 28: Distribution of recyclable garden waste in kerbside containers (kg/hh/yr)**

**Diversion via organic recycling collections**

The organic recycling bin service is responsible for diverting 28.2% of all the kerbside waste presented. This proportion excludes all of the contamination materials that are present within these bins. Whilst Acorn 3G households (successful suburbs) divert 40% of their kerbside waste via their organic recycling bins, Acorn 2D (city sophisticates) divert less than 18%.

**Table 33: Diversion via organic recycling bins (%)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Diversion rates | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Organic recycling bin | 17.9% | 34.4% | 40.0% | 25.9% | 33.1% | 32.3% | 24.6% | 20.3% | 30.3% | 28.2% |

**Results – Total amount of kerbside waste and recycling generated**

This section looks as the total amount of waste and recycling that is generated by each of the samples and as an average for Manchester. Diversion rates show the percentage of total generated waste produced from an area that is being ‘diverted’ via the available recycling stream(s).

On average Manchester households are disposing of 518.5kg/hh/yr of total waste and recycling at the kerbside. Acorn 2E households (career climbers) created the highest levels of total waste at 712.8kg/hh/yr compared with 406.3kg/hh/yr for Acorn 5O (young hardship).

**Table 34: Total amount of kerbside waste and recycling (kg/hh/yr)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Kerbside waste stream | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Residual | 242.9 | 301.8 | 245.6 | 220.8 | 317.2 | 216.4 | 186.6 | 213.7 | 154.9 | 218.3 |
| Paper & card | 81.8 | 69.2 | 76.0 | 44.4 | 60.7 | 69.3 | 56.9 | 46.7 | 44.0 | 56.4 |
| Co-mingled | 103.8 | 92.2 | 89.8 | 81.0 | 57.5 | 88.3 | 57.6 | 88.5 | 105.2 | 86.2 |
| Organics | 113.0 | 249.6 | 280.4 | 121.4 | 220.8 | 221.9 | 105.2 | 88.8 | 176.8 | 157.7 |
| Total kerbside | 541.4 | 712.8 | 691.7 | 467.6 | 656.3 | 595.9 | 406.3 | 437.6 | 480.9 | 518.5 |

**Figure 29: Total amount of kerbside waste and recycling (kg/hh/yr)**

On average it has been seen that Manchester households generate around 518.5kg/hh/yr of kerbside waste. Of this a total of 48.6% or 252.3kg/hh/yr is diverted via the available recycling containers. Organics recycling bins are diverting the majority of kerbside waste at 28% (146.2kg/hh/yr) compared with 12% (62.7kg/hh/yr) for co-mingled recycling bins and 8% (43.6kg/hh/yr) for pulpable recycling bins.

Different household samples varied as to how effectively they diverted their kerbside waste. Four of the nine samples (Acorns 2E, 3G, 4M and 5Q) diverted over half of their kerbside waste through the supplied recycling bins. In contrast Acorn 5P households (struggling estates) were only diverting 42% their kerbside waste.

**Figure 30: Total diversion rates for Manchester samples (%)**

**Maximum achievable diversion**

GMCA has an ambition to reach a 60% recycling rate across Greater Manchester by 2020. The current estimated diversion rate for Manchester from this survey is 48.6%. Table 36 illustrates the maximum amount of diversion that could be obtained if all of the recyclable material that is not placed into the correct recycling container is captured.

Figures from this survey show that Manchester households are diverting 252.3kg/hh/yr of their 518.5kg/hh/yr of total kerbside waste. This is a diversion rate of 48.6%, which is 11.4% below the target of 60%. In order to achieve 60% diversion an additional 58.8kg/hh/yr of recyclable material would need to be diverted bringing the total to 311.1kg/hh/yr (this assumes no changes in the amount of overall kerbside waste generated).

Were all recyclables placed into the correct recycling container, then the maximum achievable diversion would be 67.6% across Manchester. Across the samples the maximum diversion would range between 62.5% for Acorn 5P (struggling estates) and 72.4% for Acorn 3G (successful suburbs).

Overall a total of 98.4kg/hh/yr of recyclable material is not being placed into the correct recycling bin. By far the greatest potential for increasing diversion lies with food waste. This food waste forms 76% (74.6kg/hh/yr) of the material that is not recycled. Recyclable paper and card account for 10% (10.1kg/hh/yr) of the unrecycled items with co-mingled plastic, metal and glass accounting for 11% (10.3kg/hh/yr).

**Table 35: Recyclables currently diverted**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Current diversion | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Recyclables currently diverted (KG/HH/YR) | 251.7 | 365.3 | 384.9 | 212.4 | 300.0 | 305.1 | 190.6 | 181.6 | 259.7 | 252.3 |
| Current diversion | 46.5% | 51.3% | 55.6% | 45.4% | 45.7% | 51.2% | 46.9% | 41.5% | 54.0% | 48.6% |

**Table 36: Maximum potential diversion by capturing all recyclables**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Diversion potential kg/hh/yr and % | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Unrecycled paper | 6.1 | 5.4 | 4.7 | 5.2 | 5.1 | 4.4 | 4.1 | 4.6 | 4.5 | 4.8 |
| 1.1% | 0.8% | 0.7% | 1.1% | 0.8% | 0.7% | 1.0% | 1.1% | 0.9% | 0.9% |
| Unrecycled card & cardboard | 6.8 | 7.5 | 6.1 | 6.6 | 6.8 | 5.9 | 4.0 | 3.4 | 4.7 | 5.3 |
| 1.3% | 1.1% | 0.9% | 1.4% | 1.0% | 1.0% | 1.0% | 0.8% | 1.0% | 1.0% |
| Unrecycled plastic bottles | 3.0 | 2.7 | 2.6 | 3.5 | 2.9 | 3.3 | 1.6 | 3.4 | 1.7 | 2.6 |
| 0.6% | 0.4% | 0.4% | 0.8% | 0.4% | 0.6% | 0.4% | 0.8% | 0.4% | 0.5% |
| Unrecycled glass | 6.1 | 1.3 | 2.4 | 6.0 | 3.6 | 5.0 | 4.0 | 3.4 | 1.8 | 3.6 |
| 1.1% | 0.2% | 0.3% | 1.3% | 0.5% | 0.8% | 1.0% | 0.8% | 0.4% | 0.7% |
| Unrecycled metals | 4.9 | 5.1 | 3.6 | 4.9 | 4.1 | 4.8 | 2.9 | 4.9 | 2.7 | 4.1 |
| 0.9% | 0.7% | 0.5% | 1.1% | 0.6% | 0.8% | 0.7% | 1.1% | 0.6% | 0.8% |
| Unrecycled food | 67.0 | 105.1 | 89.9 | 93.1 | 115.4 | 60.6 | 62.0 | 67.2 | 55.1 | 74.6 |
| 12.4% | 14.7% | 13.0% | 19.9% | 17.6% | 10.2% | 15.2% | 15.4% | 11.5% | 14.4% |
| Unrecycled garden waste | 1.6 | 2.5 | 6.9 | 1.4 | 6.8 | 0.2 | 1.0 | 4.9 | 2.9 | 2.9 |
| 0.3% | 0.4% | 1.0% | 0.3% | 1.0% | 0.0% | 0.2% | 1.1% | 0.6% | 0.6% |
| Unrecycled pet bedding | 0.4 | 2.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.4 |
| 0.1% | 0.4% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.2% | 0.1% |
| Total unrecycled | 95.8 | 132.3 | 116.2 | 120.9 | 144.6 | 84.3 | 79.4 | 91.8 | 74.2 | 98.4 |
| 17.7% | 18.6% | 16.8% | 25.8% | 22.0% | 14.1% | 19.5% | 21.0% | 15.4% | 19.0% |
| Recyclables potentially divertible | 347.5 | 497.7 | 501.1 | 333.3 | 444.6 | 389.3 | 270.0 | 273.4 | 333.9 | 350.7 |
| Potential maximum diversion | 64.2% | 69.8% | 72.4% | 71.3% | 67.7% | 65.3% | 66.4% | 62.5% | 69.4% | 67.6% |

**Figure 31: Recyclable material available for diversion (kg/hh/yr)**

**Figure 32: Maximum diversion potential (%)**

**Potential for increasing pulpables recycling**

Were recyclable pulpables (paper and card) targeted then potentially an additional 10.1kg/hh/yr or 2% of waste could be diverted. This would raise overall diversion to 50.6%. Acorn 4K (student life) holds the greatest potential for raising diversion by capturing all of their recyclable paper. They could increase total diversion by 2.5%.

**Table 37: Targeting pulpables (paper and card) recyclables**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pulpable recyclables | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Kg/hh/yr available | 12.8 | 13.0 | 10.8 | 11.8 | 11.8 | 10.3 | 8.0 | 8.0 | 9.2 | 10.1 |
| % Increase in diversion | 2.4% | 1.8% | 1.6% | 2.5% | 1.8% | 1.7% | 2.0% | 1.8% | 1.9% | 2.0% |
| Achieved diversion | 48.9% | 53.1% | 57.2% | 48.0% | 47.5% | 52.9% | 48.9% | 43.3% | 55.9% | 50.6% |

**Potential for increasing co-mingled recycling**

Were materials suitable for co-mingled recycling targeted then potentially 10.3kg/hh/yr or 2% of waste could be diverted. This would raise overall diversion to 50.6%. Acorn 4K (student life) hold the greatest potential for raising diversion by capturing all of their recyclable paper where each could increase total diversion by 3.1%. Expanding the mixed recycling collections to include either Tetrapak cartons and/or plastic pots, tubs and trays would also act to increase the amount recycled. The potential increase in diversion achieved by introducing these materials is shown in table 43 at the end of this document.

**Table 38: Targeting co-mingled recyclables**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Co-mingled recycling | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| KG/HH/YR available | 14.0 | 9.1 | 8.5 | 14.5 | 10.5 | 13.2 | 8.4 | 11.7 | 6.2 | 10.3 |
| % Increase in diversion | 2.6% | 1.3% | 1.2% | 3.1% | 1.6% | 2.2% | 2.1% | 2.7% | 1.3% | 2.0% |
| Achieved diversion | 49.1% | 52.5% | 56.9% | 48.5% | 47.3% | 53.4% | 49.0% | 44.2% | 55.3% | 50.6% |

The targeting of pulpables (paper and card) as well as co-mingled recycling has the potential to divert an additional 20kg/hh/yr of material. This would boost the overall diversion rate by 4% up to 52.6%. Even with this, none of the samples would reach the 60% target. Four Acorn samples would show above average potential increases for diversion for the successful capture of their dry recyclables; Acorn 2D (5.0%), Acorn 4K (5.6%), Acorn 5O (4.1%) and Acorn 5P (4.5%).

**Potential for increasing organics recycling**

**Table 39: Targeting organics (food and garden) recycling**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Food & garden recycling | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| KG/HH/YR available | 68.9 | 110.3 | 96.8 | 94.6 | 122.3 | 60.8 | 62.9 | 72.1 | 58.8 | 78.0 |
| % Increase in diversion | 12.7% | 15.5% | 14.0% | 20.2% | 18.6% | 10.2% | 15.5% | 16.5% | 12.2% | 15.0% |
| Achieved diversion | 59.2% | 66.7% | 69.6% | 65.6% | 64.3% | 61.4% | 62.4% | 58.0% | 66.2% | 63.7% |

Were materials suitable for food and garden recycling targeted then potentially 78kg/hh/yr or 15% of waste could be diverted. This would raise overall diversion to 63.7%, effectively hitting the required target. Seven of the nine demographic samples would exceed the 60% target. Five Acorn samples would show above average potential increases for diversion for the successful capture of their organic recyclables; Acorn 2E (15.5%), Acorn 4K (20.2%), Acorn 4L (18.6%), Acorn 5O (15.5%) and Acorn 5P (16.5%).

Almost all of this diversion potential is in the form of food waste rather than garden waste and biodegradable pet bedding. Table 36 shows that of the 78kg/hh/yr of potentially divertible organics, almost 96% are due to food waste. If all food waste was diverted, then an additional 7.7% diversion could be achieved.

An average of 98.4kg/hh/yr or 19% of kerbside waste is not being diverted. The maximum achievable diversion is therefore 67.68%. All of the nine sample areas would hit 60% diversion if all of their recyclable materials were correctly recycled.

Acorns 4K (+25.8%) and 4L (+22%) would show the greatest increase in diversion by successfully recycling accepted materials at the kerbside

**Waste minimisation**

Around 218.3kg/hh/yr of residual bins waste is of a type that cannot be diverted into a kerbside recycling scheme. This includes materials such as textiles, and WEEE that could have been taken to one of the HWRC’s and also disposable nappies that are possible to collect separately from the kerbside.

**Textiles**

On average, 5% or 10.7kg/hh/yr of residual waste consisted of different types of textiles. Over 86% of the weight of items in this category were classified as linen, clothing and shoes. These items account for 4.2% or 9.2kg/hh/yr of residual waste and depending on the condition of these items much of this could potentially be diverted to HWRCs, bring banks or charity shops. 7.5% of Acorn 2D (city sophisticates) and Acorn 4M (striving families) residual waste was due to textiles where it accounted for 18.2kg/hh/yr and 16.1kg/hh/yr respectively.

If all of the potentially recyclable textiles were removed from residual bins and diverted to HWRCs or elsewhere then 9.2kg/hh/yr of residual waste reduction would be possible. This in turn would raise diversion by almost 1% to 49.5%

**Table 40: Textile content of the residual waste**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Totaltextiles (%) | 7.5% | 4.4% | 7.2% | 2.9% | 5.4% | 7.5% | 3.6% | 4.7% | 4.2% | 4.9% |
| Total textiles (KG/HH/YR) | 18.2 | 13.3 | 17.6 | 6.3 | 17.2 | 16.1 | 6.8 | 10.0 | 6.6 | 10.7 |
| Linen, clothing & shoes (%) | 6.7% | 4.0% | 5.9% | 2.3% | 4.7% | 6.2% | 3.3% | 4.3% | 3.3% | 4.2% |
| Linen, clothing & shoes (KG/HH/YR) | 16.2 | 12.2 | 14.4 | 5.1 | 14.9 | 13.5 | 6.1 | 9.2 | 5.1 | 9.2 |
| % Of textiles from linen, clothing & shoes | 89.2% | 91.5% | 81.8% | 80.6% | 86.4% | 83.6% | 90.3% | 92.1% | 77.3% | 86.4% |

**Disposable nappies**

Disposable nappy levels within the residual waste of households with babies can be extremely high. In this survey, the concentrations of disposable nappies and AHP (absorbent hygiene products) waste ranged between 3.6% (7.9kg/hh/yr) in Acorn 4K (student life) up to 22% (69.8kg/hh/yr) in Acorn 4L (modest means). The average Manchester householders’ residual waste bin contained 12.9% or 28.2kg/hh/yr of disposable nappies and AHP waste.

Were a separate collection of these products made available or households switched to reusable nappies then this would represent a sizeable reduction in residual waste. As a result, diversion could potentially rise from 48.6% to 51.4%

**Table 41: Disposable nappy & AHP content of the residual waste**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Total disposable nappies & ahp (%) | 14.1% | 11.8% | 14.4% | 3.6% | 22.0% | 9.1% | 15.8% | 18.3% | 8.1% | 12.9% |
| Total disposable nappies & ahp (KG/HH/YR) | 34.2 | 35.6 | 35.5 | 7.9 | 69.8 | 19.6 | 29.5 | 39.1 | 12.5 | 28.2 |

**WEEE**

Waste electrical and electronic equipment (WEEE) formed an average of 0.7% or 1.5kg/hh/yr of collected residual waste. These items should not be in residual bins and should be disposed of at recycling centres. Common items include small kitchen appliances, cables, plugs and leads, adaptors, hairdryers, lamps etc. The Acorn 4L sample (modest means) had the highest amount of this type of waste at 9kg/hh/yr of the total, and also the highest percentage of this type of waste (2.8%). Removal of these items from the residual waste would have only a small effect on diversion by increasing it from 48.6% to 48.8%

**Table 42: WEEE content of the residual waste**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Total weee (%) | 0.4% | 0.3% | 0.9% | 0.2% | 2.8% | 0.6% | 0.4% | 0.3% | 0.9% | 0.7% |
| Total weee (KG/HH/YR) | 1.0 | 0.8 | 2.3 | 0.4 | 9.0 | 1.3 | 0.7 | 0.7 | 1.4 | 1.5 |

Were it possible for households to remove the recyclable textile, disposable nappy and WEEE items from their residual waste, then this would represent a minimisation of around 39kg/hh/yr or 17.8% of the total residual waste. As a result, diversion could increase from 48.6% to 52.6% with no additional changes in the amount of recycling collected.

**Tetrapak and plastic pots, tubs and trays (PTTs)**

Tetrapak cartons and plastic pots, tubs and trays (PTT) form around 13kg/hh/yr of kerbside waste from Manchester households. These items are not currently part of the recycling scheme operated by GMCA. Should they be introduced the effect on diversion would be an increase from 48.6% to 51.2%. More potential is available for PTT which could increase diversion by 2.1% as opposed to 0.4% for Tetrapaks.

**Table 43: Tetrapak and PTT disposed of at the kerbside**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | 2D | 2E | 3G | 4K | 4L | 4M | 5O | 5P | 5Q | Average |
| Total tetrapak & ptt (%) | 3.4% | 2.3% | 1.8% | 3.6% | 1.5% | 2.1% | 2.1% | 3.0% | 2.4% | 2.5% |
| Total tetrapak & ptt (KG/HH/YR) | 18.2 | 16.6 | 12.4 | 16.7 | 10.1 | 12.8 | 8.5 | 13.0 | 11.5 | 13.1 |

Were it possible for households to remove the recyclable textile, disposable nappy and WEEE items from their residual waste, then this would represent a minimisation of around 39kg/hh/yr or 17.8% of the total residual waste. As a result, diversion could increase from 48.6% to 52.6% with no additional changes in the amount of recycling collected. Additionally, diverting Tetrapaks and PTT away from residual bins and into the recycling scheme could raise this amount further to 55.1%.

**Appendix**

Annual collected tonnage data for the kerbside waste and recycling collections is shown in table 3. These tonnages can be applied to the percentage composition of hand sorted waste obtained from this survey. Caution needs to be taken when applying these waste proportions to annual tonnages as the composition relates to the waste collected at the time of the survey only – and this may differ seasonally. For example, garden waste volumes will be drastically higher during certain months, therefore applying the percentage by weight figure for this (or any other) single phase survey to Manchester annual tonnages will not accurately model what would be expected over a twelve month period.

**Tonnage composition – residual waste**

|  |  |  |
| --- | --- | --- |
| Recyclable materials | % Composition | Projected annual tonnage |
| Recyclable paper | 2.0% | 1,397 |
| Recyclable card & cardboard | 2.3% | 1,617 |
| Plastic bottles | 1.1% | 802 |
| Recyclable glass | 1.5% | 1,057 |
| Recyclable metals | 1.8% | 1,246 |
| Recyclable food waste | 32.4% | 22,699 |
| Recyclable garden waste | 1.3% | 911 |
| Recyclable pet bedding | 0.2% | 142 |
| Non-kerbside recyclable | 57.4% | 40,172 |
| Total | 100.0% | 70,043 |
| Recyclables by bin | % Composition | Projected annual tonnage |
| Pulpable recyclables | 4.3% | 3,014 |
| Co-mingled recyclables | 4.4% | 3,105 |
| Organic recyclables | 33.9% | 23,752 |
| Total recyclable | 42.6% | 29,871 |

**Tonnage composition – pulpable recycling**

|  |  |  |
| --- | --- | --- |
| Recyclable materials | % composition | Projected annual tonnage |
| Recyclable paper | 31.9% | 4,778 |
| Recyclable card & cardboard | 45.2% | 6,777 |
| Plastic bottles | 0.2% | 36 |
| Recyclable glass | 0.5% | 77 |
| Recyclable metals | 0.3% | 46 |
| Recyclable food waste | 2.8% | 415 |
| Recyclable garden waste | 0.1% | 10 |
| Recyclable pet bedding | 0.0% | 0 |
| All other waste | 19.1% | 2,857 |
| Total | 100.0% | 14,996 |
| Recyclables by bin | % Composition | Projected annual tonnage |
| Pulpable recyclables | 77.1% | 11,556 |
| Co-mingled recyclables | 1.1% | 159 |
| Organic recyclables | 2.8% | 425 |
| Total contamination | 19.1% | 2,857 |
| Total | 100.0% | 14,996 |

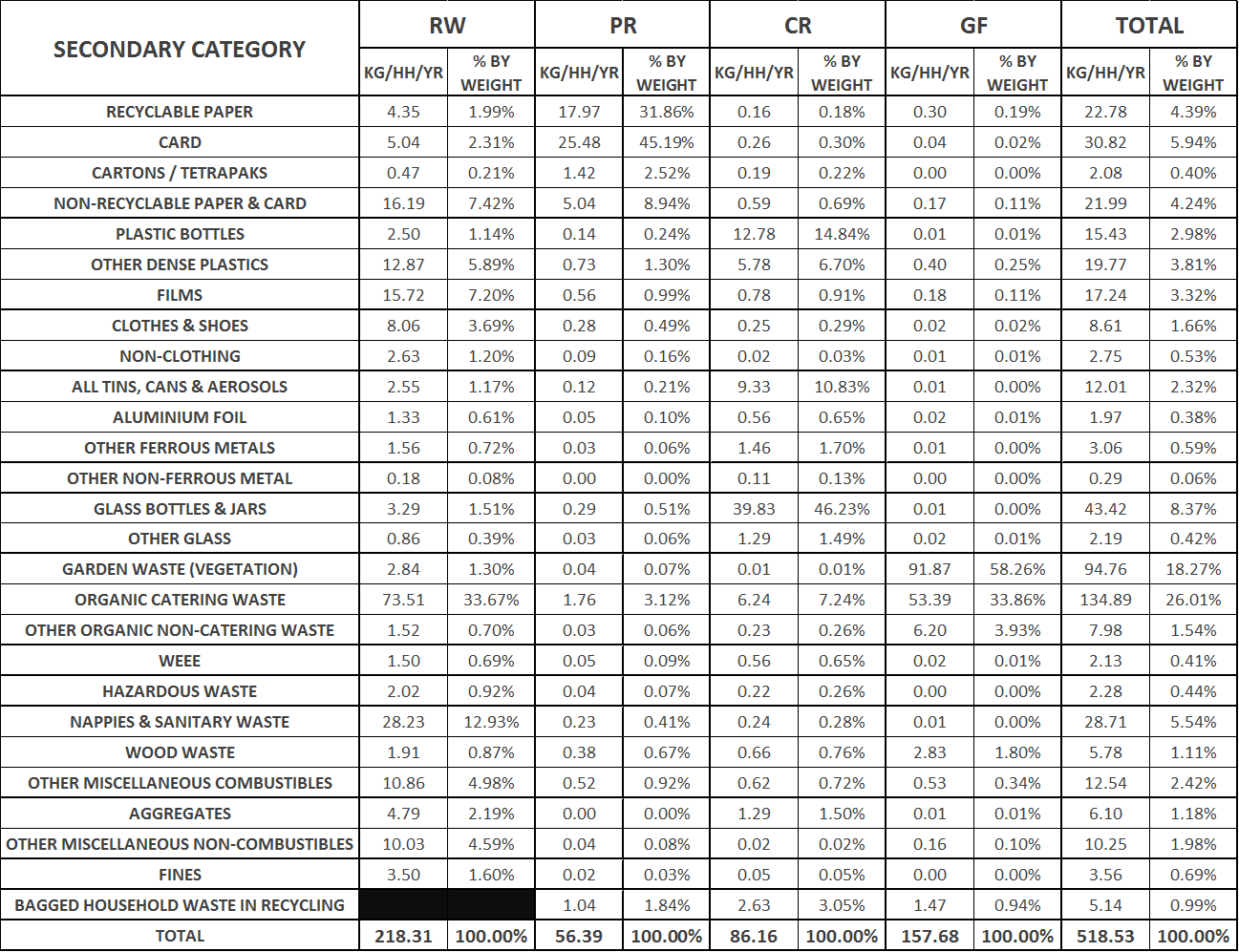
**Tonnage composition – co-mingled recycling**

|  |  |  |
| --- | --- | --- |
| Recyclable materials | % Composition | Projected annual tonnage |
| Recyclable paper | 0.18% | 33 |
| Recyclable card & cardboard | 0.30% | 56 |
| Plastic bottles | 14.84% | 2,749 |
| Recyclable glass | 46.23% | 8,565 |
| Recyclable metals | 11.48% | 2,127 |
| Recyclable food waste | 2.70% | 499 |
| Recyclable garden waste | 0.01% | 3 |
| Recyclable pet bedding | 0.00% | 0 |
| All other waste | 24.26% | 4,494 |
| Total | 100.00% | 18,526 |
| Recyclables by bin | % Composition | Projected annual tonnage |
| Pulpable recyclables | 0.48% | 89 |
| Co-mingled recyclables | 72.55% | 13,441 |
| Organic recyclables | 2.71% | 502 |
| Total contamination | 24.26% | 4,494 |
| Total | 100.00% | 18,526 |

**Tonnage composition – organic recycling**

|  |  |  |
| --- | --- | --- |
| Recyclable materials | % Composition | Projected annual tonnage |
| Recyclable paper | 0.19% | 58 |
| Recyclable card & cardboard | 0.02% | 7 |
| Plastic bottles | 0.01% | 2 |
| Recyclable glass | 0.00% | 1 |
| Recyclable metals | 0.02% | 5 |
| Recyclable food waste | 33.86% | 10,296 |
| Recyclable garden waste | 58.26% | 17,720 |
| Recyclable pet bedding | 0.57% | 174 |
| Liners | 0.09% | 26 |
| All other waste | 6.98% | 2,123 |
| Total | 100.00% | 30,413 |
| Recyclables by bin | % Composition | Projected annual tonnage |
| Pulpable recyclables | 0.21% | 65 |
| Co-mingled recyclables | 0.03% | 8 |
| Organic recyclables | 92.78% | 28,216 |
| Contamination | 6.98% | 2,123 |
| Total | 100.00% | 30,413 |

**Kerbside collected Waste Arisings (kg/hh/yr) and Assays (% by wt)**





1. *https://acorn.caci.co.uk/what-is-acorn* [↑](#footnote-ref-2)