



# Review of Kerbside Recycling Collection Schemes Operated by Local Authorities

WYG Lyndhurst, Empress House, 12 Empress Road, Hampshire SO43 7AE

Tel: 023 8028 3226

Email: [enviro.lyndhurst@wyg.com](mailto:enviro.lyndhurst@wyg.com)



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## 1.0 Introduction

### 1.1 Background

1.1.1 WYG possesses a team that provides waste consultancy services exclusively for local authorities. Since the publication of Waste Strategy 2000, we have been engaged by:

- 16 London Boroughs plus NLWA and the GLA;
- 19 Unitary/Metropolitan Authorities plus a major project for the Welsh Assembly Government (involving examination of the work of the 22 Welsh Unitaries);
- 5 County/District partnerships;
- 86 District/Borough councils.

1.1.2 As our many clients include authorities delivering household recycling services through kerbside sorting, collection of co-mingled materials, and two-stream collection systems, we are often asked for our views on the merits and disadvantages of the different approaches.

1.1.3 This report represents the results of detailed research based on information from our clients; from non-client local authorities with a strong record in recycling using different systems; and from processors and facility operators.

1.1.4 Recent publications and campaigns have signalled support for kerbside sort as the preferred method for the collection of dry recycle, (e.g. WRAP, Campaign for Real Recycling, Friends of the Earth, Welsh Assembly Government). There are two main reasons stated for this:

- Higher quality of materials which allows maximum value to be derived, and
- Lower net cost compared to co-mingled and dual-stream collections.

1.1.5 Some of these publications recognise that other methods of collection may be appropriate in particular circumstances where kerbside sort systems would be impracticable. For example, in WRAP recognises<sup>1</sup> that single stream co-mingled collections may be appropriate in dense urban areas or for high density flats, areas of high transience and multi-occupied properties. The MRW

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<sup>1</sup> *Choosing the Right Recycling Collection System*, WRAP, June 2009



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Campaign advocates that, as a minimum, local authorities should put in place dual stream collection of dry recyclables by 2020 and while they suggest that, ideally, local authorities should commit to source-separated collection schemes, it is recognised that this system is not always practical. Others are unequivocal in their support for source-separated schemes.

- 1.1.6 Within this context, there appears to have been little published that highlights the benefits of co-mingled collections of dry recyclables.
- 1.1.7 This report is not aimed at saying that one system is necessarily better than any other; rather it aims to highlight successful kerbside recycling schemes (of any design) and to re-examine some of the arguments made by others regarding co-mingled collections.
- 1.1.8 Fundamentally, we continue to agree strongly with a comment made by WRAP in *Choosing the Right Recycling Collection System*:

“Ultimately, the choice of collection system remains a matter for local authorities to decide”.

1.1.9 One size does not fit all; and it seems to us that the choice of collection system is legitimate political territory for local authorities, and that (locally) democratically elected councillors are best placed to make decisions regarding that collection system. We are also clear that, in making such a decision, good quality information is needed. In this report, we believe that we have provided some insights which will add to information already available regarding matters such as cost and diversion rates which are important factors to consider in selecting collection systems, in addition to the local context; and these insights should help to inform such decisions in the future.

1.1.10 We would like to thank those local authorities and other organisations who have contributed to this project by making information available to us.



## 1.2 Executive Summary

1.2.1 The key findings from this research are summarised below.

### Performance

1.2.2 Recently published advice from WRAP suggests that there is little difference between kerbside sort schemes compared to co-mingled systems in terms of performance. Others go further and suggest that there is *“no evidence that co-mingling yields higher diversion – reverse seems true over time”* (Campaign for Real Recycling<sup>2</sup>). However, our research provides strong evidence to the contrary:

- Twenty six of the top 30 performing councils for (dry) recycling diversion rates operate a co-mingled collection service, with Worcester City Council achieving the highest diversion at 36%;
- Analysis of WasteDataFlow 2008/09 data for dry recycling collected at the kerbside, and adjusting for rejects, revealed that, on average, local authorities operating co-mingled collections collect 25% more material for recycling than kerbside sort schemes.
- Analysis of WasteDataFlow 2008/09, adjusted for rejects, indicated that local authorities operating 100% kerbside sort (i.e. no other kerbside recycling scheme offered) achieved a maximum of 239kg/household from kerbside collections (Melton BC), with a weighted average of 131kg/household. Local authorities with 100% co-mingled collections (i.e. no other kerbside recycling scheme offered) achieved a maximum of 285kg/household (North Kesteven DC) from kerbside collections (19% more than the maximum for kerbside sort); with a weighted average of 163kg/household.
- Indicative data from local authority case study research suggests that kerbside recycling yields of 304kg/hh/year (accounting for contamination) are achievable with co-mingled collection schemes compared to yields of 244kg/hh/year which are achievable for kerbside sort schemes, both of which target at least five key materials (paper, card, cans, glass, plastic);
- Overall recycling/composting performance has the potential to reach 70% where weekly food waste, fortnightly refuse and fortnightly co-mingled recycling schemes are provided (combined with chargeable garden waste service);

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<sup>2</sup> <http://www.apse.org.uk/presentations/09/10/environmental-services-seminar/Co-mingled-versus-source-segregation-Andy-Moore.pdf>



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- There is evidence from some councils that, where they have moved from kerbside-sort methodology to co-mingled methodology, there has been a marked increase in the dry recycling rate, even allowing for contamination from the latter; and also some positive comments from their public regarding the change, including relative ease of use.

### Contamination

1.2.3 The Environment Agency estimates that the average reject rate for a typical MRF is 10.85%. Case study research suggests that:

- Overall reject rates of between 2% and 10.8% are typical from our sample data, with 4% being the average;
- WasteDataFlow reporting of rejection rates for MRFs seem to be getting more accurate following Environment Agency intervention: for 2008/09, the most recent year, rates tend to be between 2.3% and 10% (for the middle half of authorities) with 5.7% being the median and a weighted average of 7.3% (for all authorities);
- A number of MRF operators contacted reported low levels of rejection of recycle. Reasons for this included visual inspection of loads, sampling and recording at random (but on a daily basis) of recycle at the transfer station, and very tight quality control as well as staff training and awareness at all levels;
- Contamination rates are much lower for modern MRFs that accept a wide range of materials including mixed plastics and glass;
- Discussions with MRF operators indicated that there are sometimes unrealistic expectations regarding the quality of recycle and some re-processors are probably 'cherry-picking' the best recycle and rejecting the rest (but not because it is unacceptable). Others pointed out that lower quality recycle is not necessarily rejected but can be sold for a lower price;
- Our discussions with UK reprocessors indicated that materials from MRFs are just as acceptable as kerbside sorted materials. For example, 'positive pick' MRFs produce higher grade plastics (J&A Young), while others say that although paper from MRFs is more contaminated (between 3% to 15% - Holmen Paper) it is perfectly acceptable (and paper from kerbside sort operations includes some degree of contamination);



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- In relation to the above point it is worth noting that some MRFs are reporting contamination rates of less than 1% in paper bales which meets the paper specification requirements of typical UK mill requirements as suggested in PAS 105 as well as reprocessors.

### Cost

- 1.2.4 WRAP has consistently advised that co-mingled collections are more expensive than kerbside-sort methodology. In its report *Kerbside Recycling: Indicative Costs and Performance*, WRAP asserts that:

“In current market conditions kerbside sort schemes show lower costs – net of income from material sales – than single stream co-mingled schemes”;

and in WRAP’s report *Choosing the Right Recycling System*, the statement is made that:

“kerbside sort systems have lower net costs than co-mingled systems”.

- 1.2.5 Our evidence is that single stream co-mingled collection schemes have been shown in some recent procurement exercises to be cheaper than kerbside sort systems; but sometimes the reverse is true. Our evidence takes account of the income from material sales associated with the kerbside sort option, as well as the container costs and gate fees associated with co-mingling; and is based upon real situations from competitive tendering situations in the last year.

- 1.2.6 Further, in those cases where kerbside sort schemes are cheaper than co-mingled, the differential would be narrowed if one were to add in – as should be the case in a ‘total cost’ scenario – the additional diversion from landfill that co-mingled systems bring, as noted above. This factor can, on occasion, make the difference in cost quite significant, and in others it could turn a model that initially showed kerbside sort as cheaper to being more expensive. In the longer term, as the costs of waste treatment increase, the savings through greater capture will become increasingly significant and therefore should be a consideration for local authorities when letting long-term contracts.

- 1.2.7 Key factors in determining which option will be cheaper include:

- the proximity of the MRF (direct delivery from collection vehicles lowers the cost of the co-mingled option considerably);
- the MRF gate fee (we have clear evidence, from several tendering situations that gate fees are reducing sharply); and





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- the differential in collection costs from each option, particularly given that to maximise capture kerbside sort systems need to be weekly while co-mingled collections will achieve higher capture rates collecting on a fortnightly frequency.

Since these factors will vary from case to case, and market conditions vary over time (and are reflected in the results of procurement exercises) each case needs to be assessed on its merits.

- 1.2.8 We are not asserting, therefore, that we believe that one system is consistently cheaper than the other: instead we have clear evidence that any such generalised statement – in favour of one system or another – is untrue. For some councils, kerbside sort will prove the cheaper option (even if it produces a lower level of recyclate capture) and for others, particularly where there is access to a local MRF with a reasonable gate fee, co-mingling will prove cheaper (even if one does not consider savings through extra diversion). Each case will be different and modelling and decision-making needs to be made on a case-by-case basis: but there is a strong argument for modelling to consider all costs and savings, which implies closer working between collection and disposal authorities in ‘two tier’ scenarios. Further, the modelling needs to consider the greater diversion from co-mingled collections and the longer term savings in treatment/disposal that arise.

### **Operational Considerations**

- 1.2.9 This study has also established that a number of councils that have changed methodologies from kerbside sort methodologies to co-mingled systems have perceived benefits in terms of operational health and safety, public ease of use and street cleanliness. Although these aspects are not a major focus of this study – and do not, of themselves, argue for or against any one system– they are still of relevance and should be noted.
- 1.2.10 We have not carried out a comprehensive calculation in relation to the carbon impact of each type of collection system, but it is worth noting that, in order to achieve high performance, kerbside sort systems involve a weekly collection of dry recyclables whereas co-mingled collections can achieve a higher level of capture with fortnightly collections.

## **1.3 Methodology**

- 1.3.1 Our methodology involved reviewing information at a national and local level on performance; quality issues (including contamination levels and markets); cost considerations; and operational considerations, including health and safety aspects.
- 1.3.2 The initial stage was to review and analyse publicly available data, including:





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- Previous studies and guidance in relation to kerbside collection systems (e.g. WRAP guidance; articles in trade magazines; briefing papers);
- Data in relation to the top performing local authorities for recycling/composting diversion and for recycling only in 2008/09;
- Analysis of returns submitted to WasteDataFlow – in particular interrogation of data in response to Q010 (tonnes of household kerbside recycling) and Q058 (recyclables to MRF): the full methodology for this analysis is detailed in Appendix 1.

1.3.3 The next stage was to obtain specific data from a cross-section of local authorities in order to analyse in more detail the dry recycling performance achieved. The councils were selected on the basis that they represented a broad cross-section of collection schemes, geographical localities and performance, but also included a number of the 'top performers'. In addition, the authorities chosen included examples of in-house and out-sourced operations, with the latter including contracts operated by May Gurney, Serco, Verdant and Veolia.

1.3.4 A total of 30 local authorities (including the five Somerset authorities represented by the Somerset Waste Partnership) were contacted to ascertain whether they would be willing to participate in the project. A generic questionnaire was developed to capture the key data (see Appendix 2) and was distributed by e-mail to those authorities that agreed to be involved. Once the questionnaire was returned, the information was checked, and contact made with the appropriate council officer if clarification or further data was required. In some cases, WasteDataFlow returns were also analysed to provide supplementary data on historic tonnages and to examine the level of contamination being reported by those authorities using MRFs (Q058 – recyclables to MRF).

1.3.5 In order to provide some feedback as to the quality of materials received by MRF operators, we visited two operational MRFs to observe the process first-hand and to explore the issue of quality (of both received and sold materials). In addition, nine MRF operators were contacted by telephone to discuss similar issues. We also spoke to a number of UK-based reprocessors to ask their views as to the quality of materials received from kerbside recycling schemes.

1.3.6 Finally, we considered the costs of different methods of recycling collection (using recent procurement examples), and operational issues such as health and safety.



## 2.0 Kerbside Recycling Performance

### 2.1 Introduction

2.1.1 WRAP's recent analysis of local authority kerbside recycling performance in 2007/08 concluded that *"the kerbside scheme type (e.g. kerbside sort, single stream co-mingled or two stream co-mingled), acting in isolation, was not a defining influence in that no one type performed consistently better than the others"*<sup>3</sup>. However, when considering a combination of factors, including frequency of collection, container type and volume, WRAP found that the best performing services were:

- weekly box schemes with fortnightly residual waste collection, and
- fortnightly wheeled-bin schemes with fortnightly residual waste collection,

which both achieved similar performance levels. In addition, WRAP's earlier report, *Choosing the Right Recycling Collection System* (June, 2009) concluded that, with the provision of extra containers or more frequent collections, *"kerbside sort schemes can have the same effective volume for recyclates as co-mingled collections and achieve similar results"*.

2.1.2 While this opinion suggests that there is little difference in kerbside sort schemes as opposed to co-mingled systems in terms of performance, we have found this not to be the case. This section examines the top performing local authorities (both overall, and in relation to dry recyclate diversion only) and provides case studies that illustrate the diversion rates achieved by some local authorities. Consideration is also given to the level of contamination that co-mingled schemes attract, by reference to the case studies (this is explored further in Section 3.0).

### 2.2 Top Performing Local Authorities for Recycling

2.2.1 Analysis of the top twenty performing local authorities in England in 2008/09, in terms of overall recycling/composting diversion (NI 192), indicates that both kerbside sort and co-mingled recycling schemes have been adopted in more or less equal measure (9 kerbside sort; 10 co-mingled; one dual-stream - see Table 1).

2.2.2 However, when considering dry recycling performance alone for these authorities it can be seen that the top eight authorities (for dry recycling) all operate a co-mingled collection system, with Uttlesford achieving the highest diversion in terms of kilograms/household/year at 301kg (based on

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<sup>3</sup> WRAP (2009) *Analysis of Kerbside Recycling Performance in England 2007/08*



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an analysis of WasteDataFlow using quarterly returns for 2008/09). Using this same analysis, it can be seen that of those 'top performers' that operate kerbside sort schemes, five achieve levels of recycling diversion of under 20% or around 200kg/hh/year (North Shropshire lowest at 162kg/hh/yr).

- 2.2.3 The top performing authorities achieved recycling/composting levels in excess of 50% (and as high as 61%) in 2008/09; however, these councils tend to collect significant amounts of garden waste (>50% of total household waste) and don't necessarily have high dry recycling rates (<30% of total household waste; <50% of total recycling). Those councils achieving the highest levels of dry recycle diversion (>30% of household waste) tend to have a lower composting rate (<20% of household waste). In this context, there are only two councils who feature in both the overall top performers and the top thirty 'dry recyclers': Mole Valley and Uttlesford, who both collect co-mingled, with diversion rates of 33.7% and 33% respectively (WasteDataFlow analysis by WIN<sup>4</sup>).

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<sup>4</sup> [http://www.win.org.uk/documents/Contracts/wpr\\_High&dry\\_survey\\_1209.pdf](http://www.win.org.uk/documents/Contracts/wpr_High&dry_survey_1209.pdf)



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**Table 1: Local Authorities Achieving Highest Recycling/Composting Rates in 2008/09**

	Authority	Recycling %*	Composting %*	NI192 %	kg/hh/yr Recyclate†	Refuse	Recycling	Composting
1	Staffordshire Moorlands	20.74	40.81	61.58	202.3	AWC (WB)	AWC (WB) Glass, mixed plastic, cans, aerosols, foil, Bag for paper and textiles (co-mingled)	AWC (WB) garden + food including meat + cardboard
2	Cotswold	26.30	34.53	60.83	241.7	AWC (WB)	AWC (box and bag) Paper, card, glass, cans, aerosols (k/s)	Weekly food in 10L container and garden in WB
3	East Lindsey	25.87	33.50	59.45	243.2	AWC (WB)	AWC (WB) Paper, card, plastic bottles, cans, mixed plastics, foil, aerosols (co-mingled)	AWC (WB) garden
4	South Hams	28.42	29.30	57.90	229.4	AWC (WB)	AWC (2 sacks) Paper, card, plastic bottles, cans, aerosols, foil (dual-stream)	AWC (WB) garden + food including meat + cardboard
5	South Shropshire	23.23	34.21	57.45	199.7	AWC (WB)	AWC (box) Paper, cans, foil, aerosols, glass (k/s)	AWC (WB) garden + food including meat + cardboard
6	Teignbridge	21.10	36.27	57.37	184.0	AWC (WB)	AWC (2 boxes) Paper, card, plastic bottles, cans, aerosols, glass, mobile phones, printer cartridges, batteries (k/s)	AWC (WB) garden + food including meat + cardboard
7	Huntingdonshire	26.31	30.87	57.16	265.4	AWC (WB)	AWC (WB) Paper, card, plastic bottles, cans, cartons (co-mingled)	AWC (WB) garden + food including meat
8	Waveney	26.9	29.0	55.91	248.2	AWC (WB)	AWC (WB) Paper, card, plastic bottles, cans, glass, other plastics, textiles, foil, cartons, foil, aerosols, CD's/DVD's, bikes (not tyres) (co-mingled)	AWC (WB) garden + food including meat
9	North Kesteven	27.49	28.19	55.69	290.3	AWC (WB)	AWC (WB) Paper, card, plastic bottles, cans, glass, other plastics, textiles, cartons, foil (co-mingled)	AWC (WB) garden
10	Uttlesford	33.41	20.32	53.73	301.4	AWC (WB)	AWC (WB) Paper, card, mixed plastic, foil, cans, cartons (co-mingled)	AWC (WB) all food waste, sack for garden waste



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	Authority	Recycling %*	Composting %*	NI192 %	kg/hh/yr Recyclate†	Refuse	Recycling	Composting
11	Harborough	19.79	33.9	53.70	201.4	AWC (WB)	Weekly (box) Paper, cans, glass (k/s)	AWC (WB) garden
12	South Cambridgeshire	18.9	34.77	53.64	184.2	AWC (WB)	AWC (box) Paper, glass, cans, plastic bottles, aerosols (k/s)	AWC (WB) garden + food including meat + cardboard
13	Ryedale	18.47	34.63	53.10	207.1	AWC (WB)	AWC (box/sack) Glass, aerosols, cans; Bags for paper (k/s)	AWC (WB) garden
14	Rushcliffe	26.83	26.08	52.92	259.3	AWC (WB)	AWC (WB) Paper, card, plastic bottles, mixed plastic, cans, batteries (co-mingled)	AWC (WB) garden only
15	Warwick	24.67	27.47	52.14	207.4	AWC (WB)	AWC (box) Paper, card, glass, cans, plastic bottles, batteries, textiles, engine oil (k/s)	AWC (WB) garden + food including meat
16	North Shropshire	15.85	35.86	51.75	162.2	AWC (WB)	AWC (Box) Paper, glass, cans, foil, aerosols (k/s)	AWC (WB) garden + food including meat + cardboard
17	Mole Valley	33.73	17.81	51.62	297.7	AWC (WB)	AWC (WB) Paper, card, cans, plastic bottles, mixed plastic, glass (co-mingled)	AWC (WB) garden only
18	Melton	23.54	27.7	51.44	241.6	AWC (WB)	Weekly (Box) Paper, card, cans, glass, plastic bottles, textiles (k/s)	AWC (WB) garden only
19	St Edmundsbury	23.57	27.75	51.30	278.2	AWC (WB)	AWC (WB) paper, card, plastic bottles, mixed plastics, cans, foil (co-mingled)	AWC (WB) garden + food (No meat or cooked food)
20	Fenland	21.59	29.45	51.02	206.7	AWC (WB)	AWC (WB) paper, card, cans, aerosols, plastic bottles, cartons, foil (co-mingled)	Weekly (WB) garden + food including meat + cardboard

\* From analysis of WasteDataFlow – average annual recycling or composting rate

† Using municipal waste statistics for 08/09; number of households from 07/08 waste statistics (source: Defra and WasteDataFlow)

AWC = alternate weekly collection; WB = wheeled-bin; k/s = kerbside sort



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2.2.4 An examination of the top thirty performing councils in terms of dry recycling diversion only indicates that Worcester City Council achieved the highest diversion at 36% and the majority achieved levels in excess of 30% (Gedling being the only exception at 29%: 2008/09 figures see Table 1). Of these, three operate a kerbside sort system (one dual stream) with Waverley Borough Council achieving the highest diversion for this type of scheme (34% or 261kg/hh/year), and the remaining authorities operate a co-mingled collection scheme, with the exception of Charnwood which operates both co-mingled (for e.g. paper, metals, plastics) and separate collections (for e.g. glass).

**Table 2: Top performing local authorities in terms of dry recycling diversion (2008/09)**

	Authority	Type of recycling system	Dry Recycling %	Composting %	Total Recycling % (NI 192)	Dry Recycling kg/hh/year <sup>†</sup>
1	Worcester	Co-mingled	36%	0%	36%	250.0
2	Mid Sussex	Co-mingled	35%	10%	45%	273.0
3	Mid Suffolk	Co-mingled	35%	5%	40%	246.7
4	Waverley	Kerbside sort	34%	6%	40%	261.0
5	City of London	Co-mingled (sack)	34%	1%	35%	290.2
6	Mole Valley	Co-mingled	34%	18%	52%	297.7
7	Uttlesford	Co-mingled	33%	20%	53%	301.4
8	South Kesteven	Co-mingled	33%	17%	50%	291.8
9	Bournemouth	Co-mingled	33%	10%	43%	311.2
10	Hart	Co-mingled	33%	6%	39%	278.5
11	East Hampshire	Co-mingled	33%	6%	39%	252.9
12	South Holland	Co-mingled (sack)	33%	1%	34%	262.8
13	Woking	Co-mingled	32%	12%	44%	264.9
14	Adur	Co-mingled	32%	3%	35%	241.0
15	Broadland	Co-mingled	32%	18%	50%	280.5
16	Blackburn	Co-mingled	32%	9%	41%	326.7
17	Swale	Co-mingled	32%	3%	35%	266.9
18	Chiltern	Dual stream	31%	17%	48%	279.5
19	Redditch	Co-mingled	31%	0%	31%	258.6
20	Chichester	Co-mingled	31%	7%	38%	247.8
21	Eastleigh	Co-mingled	31%	10%	41%	238.4
22	West Dorset	Kerbside sort	31%	2%	33%	221.9
23	Purbeck	Co-mingled	30%	4%	34%	194.3
24	Charnwood	Dual stream	30%	11%	41%	245.4
25	Havant	Co-mingled	30%	1%	31%	220.0
26	South Norfolk	Co-mingled	30%	9%	39%	237.0
27	Castle Morpeth	Co-mingled	30%	11%	41%	271.2
28	Guildford	Kerbside sort	30%	11%	41%	256.4
29	Canterbury	Co-mingled (sack)	30%	18%	48%	253.5
30	Gedling	Co-mingled	29%	6%	35%	254.9

2008/9 figures from WasteDataFlow (figures rounded)

Source: WIN ([http://www.win.org.uk/documents/Contracts/wpr\\_High&dry\\_survey\\_1209.pdf](http://www.win.org.uk/documents/Contracts/wpr_High&dry_survey_1209.pdf))

<sup>†</sup> Using municipal waste statistics for 08/09 (source: Defra and WasteDataFlow)



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2.2.5 Analysing recycling performance in terms of kilograms per household per year for dry recycling indicates that Blackburn and Bournemouth achieved the highest diversion at 327kg and 311kg respectively; however, these are unitary authorities so the recycling percentage will include tonnage delivered to Household Waste Recycling Centres (HWRCs). Of the remaining authorities, 22 achieved diversion levels in excess of 247kg/hh/year which, according to WRAP's Online Recycling Information System (ORIS: see [www.wrap.org.uk](http://www.wrap.org.uk)), signifies upper quartile performance for dry recyclable diversion (kerbside material and bring sites).

*"Twenty six of the top thirty performing councils for dry recycling diversion operate a co-mingled collection service, with Worcester City Council achieving the highest percentage diversion at 36%"*

2.2.6 The WIN survey included case studies from thirteen of the councils with the highest dry recycling rates. In it, councils were asked to state the key factors that they thought had contributed to the achievement of high recycling performance. Responses included:

- Restrict residual waste and collect a wide range of recyclables - "Restricting the amount of refuse capacity available to households means that residents have to think carefully about what they throw into their refuse bin";
- Making it easy and simple for residents to recycle - "A simple two bin scheme with simple rules and similar collections. No extras like additional boxes to confuse users";
- Provide ample capacity for recyclables and collect a wide range of recyclables - "Co-mingling materials - collecting as wide a range of materials as possible in the one bin";
- "Having a disposal contractor able to find markets for all items recycled, so keeping the contamination percentage low";
- Consistent promotion and education including a clear communication strategy – "reinforce the message at every opportunity including residents' success";
- Involve and regularly train crews.

2.2.7 It should be highlighted that these 'top performers' are not directly comparable to one another: some operate weekly collections of residual waste (e.g. Guildford – although now moving to AWC, Chiltern – half district only); some are unitary councils; some collect a wider range of materials than others (e.g. Worcester City collects cardboard and, more recently, mixed plastics, while Waverley does not); and, as noted in the WRAP report performance will also be influenced by less



tangible factors such as locality and communications activity. The four authorities that operate kerbside sort schemes are all relatively affluent areas; and while affluence is thought to be a contributory factor to the achievement of high recycling performance it is not the only influence.

- 2.2.8 In addition, the figures for recyclate in Table 2 include tonnage from 'bring' sites, so it is worth considering the kilograms per household for kerbside recycling only: the case studies below provide greater detail in this respect and illustrate the performance being achieved by local authorities operating different kerbside collection systems.

### 2.3 Top Performing Local Authorities for Kerbside Recycling

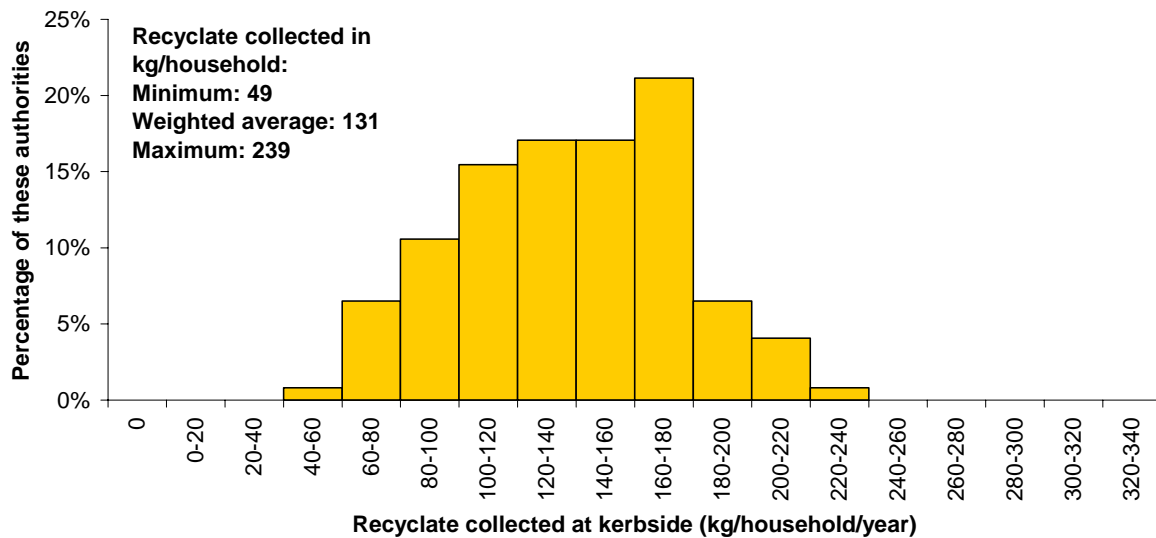
- 2.3.1 The information above displays the level of performance achieved by the top 'dry recyclers' based on all household recycling, including recyclate tonnage from bring sites and, where relevant, household waste recycling centres. Further analysis was performed on WasteDataFlow data for 2008/09 to identify performance from kerbside recycling alone.

- 2.3.2 The data to be interrogated is provided by Q10 (tonnes of household kerbside recycling) in WasteDataFlow (see Appendix 1 for the full methodology). Reject data provided in Q10 for kerbside operations (e.g. loads rejected prior to bulking) and in Q58 for MRF operations was subtracted. Where no reject data was provided in either Q10 or Q58, a 10% reject rate was assumed as per Environment Agency guidance and used in WRAP's *Analysis of Kerbside Recycling Performance in England 2007/08*. The Environment Agency has since served notice on authorities under-reporting or mis-reporting reject data, and the accuracy of MRF reject data appears to have improved: rates in 2008/09 tended to be between 2.3% and 10% (for the middle half of authorities) with 5.7% being the median the weighted average was 7.3%. Further commentary regarding MRF reject rates and quality issues is provided in Section 3.0.

- 2.3.3 This analysis showed that local authorities operating 100% kerbside sort (i.e. no other kerbside recycling scheme offered) achieved a maximum of 239kg/household from kerbside collections (Melton BC), with a weighted average of 131kg/household, with the central 50% of authorities collecting between 107 and 166kg/household (illustrated in Figure 1 below).

Figure 1

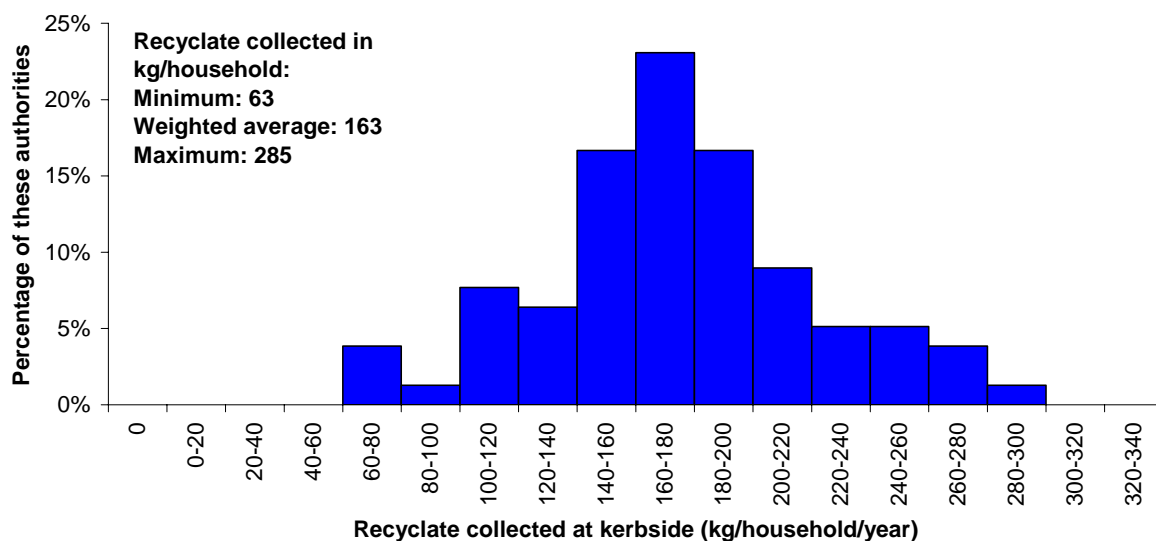
**Percentage frequency of LAs collecting 100% kerbside sort against amount of recyclate collected at kerbside (kg/household)**



2.3.4 In contrast, local authorities with 100% co-mingled collections (i.e. no other kerbside recycling scheme offered) achieved a maximum of 285kg/household (North Kesteven DC) from kerbside collections (19% more than the maximum for kerbside sort), with a weighted average of 163kg/household (25% more than the average kerbside sort) with Figure 2 below). (NB: all this data includes reductions for rejects at the kerbside and at the MRF).

Figure 2

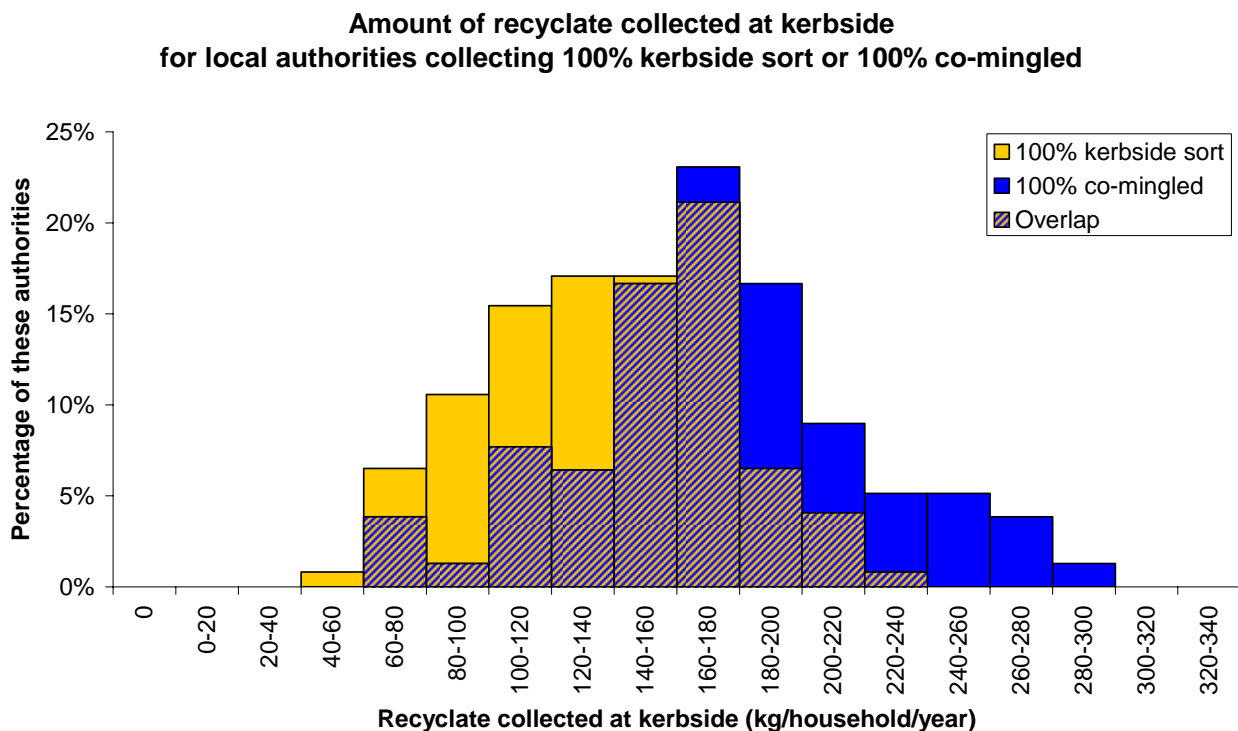
**Percentage frequency of LAs collecting 100% co-mingled against amount of recyclate collected at kerbside (kg/household)**



*“On average, and taking into account contamination at MRF’s, co-mingled collections collect 25% more material for recycling than kerbside sort schemes”*

2.3.5 The difference in the distribution of the amount of recyclate collected at the kerbside for both kerbside sort and co-mingled schemes is illustrated in the graph overleaf, which overlays the two previous graphs. The most frequent amount collected, for both kerbside sort and co-mingled collections, is 160-180 kg/household/year, but authorities collecting co-mingled often collect more than this and those collecting kerbside sort tend to collect less, as shown by the blue and yellow areas respectively. The overlap of the two distributions is shown hatched in Figure 3 overleaf.

Figure 3





## 2.4 Local Authority Case Studies

2.4.1 To analyse in more detail the level of dry recycling performance achieved, a total of thirty local authorities (including the five Somerset authorities represented by the Somerset Waste Partnership) were contacted to ascertain whether they would be willing to participate in the project and seventeen questionnaires were returned. Details of these councils, and a description of their kerbside collection schemes are shown in Table 3.

### Recycling Scheme Descriptions

2.4.2 As Table 3 shows, ten councils collect co-mingled recyclables from a wheeled-bin (generally 240-litre capacity) on a fortnightly basis with recyclate delivered to a materials recovery facility (MRF). All of these authorities collect paper, card, cans and plastic bottles while nine collect glass (seven co-mingled, two separately – in the case of Swale, glass is collected via a box insert in the recycling wheeled-bin) and some collect additional materials such as mixed plastics, waxed cartons, foil and textiles. Of these councils, nine operate an alternate-weekly collection scheme for residual waste and six collect food waste (either mixed with garden waste or as a separate collection, although this is sometimes co-collected with other waste streams e.g. at Surrey Heath).

2.4.3 Seven of the case study authorities operate a kerbside sort collection scheme for dry recyclables. Of these, three collect on a weekly basis (Mendip, South Somerset and Taunton Deane) and four collect fortnightly, generally using 44 or 55-litre boxes. The schemes target a range of materials: all collect paper, cans and glass; the majority collect textiles, foil and batteries; four collect cardboard; and three collect aerosols and plastic bottles (although for the latter material only Waverley collects borough-wide on a fortnightly basis). Of these councils, four operate an AWC scheme for residual waste and four collect food waste separately (weekly). None of the authorities collect cardboard and mixed plastics borough-wide alongside a fortnightly collection of residual waste; although Taunton Deane is planning to expand the current trial (which includes the collection of cardboard and plastic bottles) by Autumn 2010.



## Review of Kerbside Recycling Collection Schemes

**Table 3: Waste Collection Arrangements – Case Study Authorities**

District	Kerbside Sort or Co-mingled?	Recycling Collection Frequency	Materials Collected											Recycling Container	Other Waste Collection	
			Paper	Cardboard	Cans	Glass	Plastic bottles	Plastic packaging	Waxed Cartons	Textiles	Aerosols	Foil	Automotive batteries			Engine Oil†
Arun	Co-mingled	Fortnightly	✓	✓	✓	✓	✓		✓		✓	✓		240-l WB	Weekly residual (no container); garden waste in WB (chargeable)	
Babergh/Mid Suffolk	Co-mingled	Fortnightly (AWC)	✓	✓	✓		✓	✓						180 to 240-l WB	AWC residual; fortnightly collection of garden waste in WB (chargeable)	
Central Beds	Co-mingled	Fortnightly (AWC)	✓	✓	✓	*	✓	✓	✓	✓	✓	✓		240-l WB	AWC residual; weekly food; fortnightly garden waste	
Harrow	Co-mingled	Fortnightly (AWC)	✓	✓	✓	✓	✓	✓	✓		✓	✓		240-l WB	AWC residual; weekly food/garden waste	
Elmbridge	Co-mingled	Fortnightly (AWC)	✓	✓	✓	✓	✓							240-l WB	AWC residual; weekly food; garden waste WB or sacks (chargeable)	
Lichfield	Co-mingled	Fortnightly (AWC)	✓	✓	✓	✓	✓	✓			✓	✓		240-l WB	AWC residual in 240l WB; garden and food fortnightly in 240l WB	
Mendip	Kerbside sort	Weekly	✓		✓	✓				✓		✓	✓	Box	AWC residual in WB; weekly food in caddy, garden in WB/sack (chargeable)	
Sedgemoor	Kerbside sort	Fortnightly (weekly in trial areas)	✓	†	✓	✓	†				✓		✓	✓	Box	Weekly residual (sacks); garden in WB/sack (chargeable)
South Bucks	Kerbside sort	Fortnightly	✓	✓	✓	✓								44-l boxes	Weekly sack (AWC with WBs for 20% of district on a garden and food waste trial - 5,700 hhs)	



## Review of Kerbside Recycling Collection Schemes

District	Kerbside Sort or Co-mingled?	Recycling Collection Frequency	Materials Collected											Recycling Container	Other Waste Collection
			Paper	Cardboard	Cans	Glass	Plastic bottles	Plastic packaging	Waxed Cartons	Textiles	Aerosols	Foil	Automotive batteries		
South Oxfordshire	Co-mingled	Fortnightly (AWC)	✓	✓	✓	✓	✓	✓	✓		✓	✓		240-l WB	AWC residual in 180l WB. Garden in WB (chargeable), food weekly in caddy
South Somerset	Kerbside sort	Weekly	✓		✓	✓				✓		✓	✓	Box	AWC residual in WB, weekly food in caddy, garden in WB/sack (chargeable)
Stratford	Co-mingled	Fortnightly (AWC)	✓	✓	✓	✓	✓	✓			✓	✓		240-l WB	AWC residual; fortnightly garden and food in WB
Surrey Heath	Co-mingled	Fortnightly (AWC)	✓	✓	✓	✓	✓	✓			✓	✓		240-l WB	AWC residual in 180l WB; garden in WB (chargeable), food weekly in caddy
Swale	Co-mingled	Fortnightly (AWC)	✓	✓	✓	✓	✓				✓	✓		240-l WB, glass in insert box	AWC residual; fortnightly garden in 240l WB (chargeable)
Taunton Deane	Kerbside sort	Weekly	✓	†	✓	✓	†			✓		✓	✓	Box	AWC residual in WB, weekly food in caddy, garden in WB/sack (chargeable)
Waverley	Kerbside sort	Fortnightly (AWC)	✓		✓	✓	✓				✓			55-l boxes	AWC residual; fortnightly garden in woven sacks (chargeable)
West Somerset	Kerbside sort	Fortnightly	✓	✓	✓	✓				✓		✓	✓	Box	Weekly residual (sacks); garden in WB/sack

\* Not co-mingled, separate collection from 13,000 households only

† SORT IT plus trial areas only – to be rolled out district-wide by Autumn 2010

‡ Continue to be collected in 2009/10 but may cease in future



### Performance Analysis

- 2.4.4 Examining the overall level of performance (reported as NI 192) achieved by the case study authorities in 2008/09 indicates that top performers achieved diversion rates close to 50% (Lichfield, Taunton Deane and Stratford: see Table 4). These authorities all collect compostable material free of charge and this represents around 50% of all material diverted.
- 2.4.5 The level of diversion of dry recyclate alone ranges from 16.9% (Sedgemoor – kerbside sort) to 35% (Mid Suffolk – co-mingled); however, these rates include both kerbside and bring site tonnage. To provide a clearer indication of the performance achieved by the kerbside recycling schemes, the kilograms/household/year were calculated for each authority. This was achieved by two methods: using the returned survey data and by analysing WasteDataFlow (using Q058). The reason for using WasteDataFlow (WDF) was to ensure that any contamination of material (collected, but subsequently rejected as residual waste either at the MRF or other processing facility) was accounted for. The results of this analysis are displayed in Table 3.
- 2.4.6 Examining the kg/hh/year from the WDF analysis for the case study authorities indicates that the level of diversion for the co-mingled schemes ranges from 147kg/hh/year (Arun) to 249kg/hh/year (Elmbridge), while Lichfield achieved the highest diversion at 259kg/hh/year from a dual-stream scheme (targeting paper and card, and glass, cans and plastics on a weekly basis). This compares with the benchmark level of performance for co-mingled schemes proposed by WRAP in *Analysis of Kerbside Recycling Performance in England in 2007/08* of up to 274/kg/hh/year, with between 175 and 204kg/hh/year being classed 'above average'.
- 2.4.7 For the kerbside sort scheme case studies, the level of diversion (in 2008/09) ranges from 110kg/hh/year (Sedgemoor) to 205kg/hh/year (Waverley). This can be contrasted against a benchmark level of performance proposed by WRAP for kerbside sort schemes of up to 266kg/hh/year (although we do not understand how this figure is calculated given that Waverley achieved the highest level of diversion for a kerbside sort scheme in 2008/09) with between 180 and 197kg/hh/year being classed 'above average'.
- 2.4.8 The WRAP study also examined kerbside recycling performance in 2007/08 according to different local authority characteristics, including socio-economic profile and the degree of 'ruralness'. The latter uses DEFRA's Classification of Local Authority Districts and Unitary Authorities in England (2005) to provide a benchmark kerbside recycling performance for six classes of local authority. Table 5 displays this classification and the upper quartile level of performance where five materials are collected, as proposed by WRAP, for each. This indicates that five case study authorities are exceeding, or are close to achieving, the upper quartile level of performance based on this



## Review of Kerbside Recycling Collection Schemes

classification (Central Beds, Elmbridge, Harrow, Lichfield and Swale); and all of these operate co-mingled collection systems.

**Table 4: Summary table of Percentage Diversion and kg/hh/yr for 2008/09**

Authority	Type of Scheme	Dry Recycling (%)	NI 192 (%)	Kg/hh/year for dry recyclate		
				All Recyclate	Kerbside Recyclate (Survey)	Kerbside Recyclate (WDF)
Arun	Co-mingled	26.5%	35%	194	160	147
Babergh/Mid Suffolk	Co-mingled	29% (BDC) 35% (MSDC)	39.8% (both)	251 (BDC) 246.7 (MSDC)	191 (combined)	188 179
Central Beds	Co-mingled	27.9% (Mid) 17.9% (South)	42.8% (Mid) 23.3% (South)	319	206	196 195
Elmbridge*	Co-mingled	27.3%*	37.4%*	257*	248*	249*
Harrow	Co-mingled	21.5%	43.1%	259	239	222
Lichfield*	Dual-stream*	23.5%*	49.9%*	261*	259*	259*
Mendip	Kerbside sort	24.8%	41.7%	196	175†	177
Sedgemoor	Kerbside sort	16.9%	26.5%	138	109†	110
South Bucks	Kerbside sort	25.6%	34.3%	226	169	170
South Oxon*	Co-mingled*	28.9%*	42.8%*	268*	213*	203
South Somerset	Kerbside sort	26.4%	44.2%	182	160	161
Stratford	Co-mingled	22.4%	47%	218	218**	219
Surrey Heath*	Paper/cans*	22.9%*	32.2%*	188*	50*	49
Swale	Co-mingled	31.5%	34.2%	290	243	221
Taunton Deane	Kerbside sort	25.1%	48.2%	178	157†	159
Waverley	Kerbside sort	34.2%	40.4%	262	204	205
West Somerset	Kerbside sort	22.7%	28%	174	133	133

**Source:** Analysis of WasteDataFlow (Q058 adjusted for rejects); DEFRA municipal waste statistics; questionnaire responses (figures rounded for kg/hh/year)

\* Figures relate to previous recycling schemes – for Lichfield and Surrey Heath, co-mingled collections started in Autumn 2009; at South Oxon service change from June 2009 (see case study details below); at Elmbridge AWC collections and separate food waste collection commenced in October 2009, recycling remained the same.

† SORT IT plus trial areas have achieved levels of up to 9.4kg/hh/fortnightly (see case study details below)

\*\* All recyclate collected together so unable to differentiate



## Review of Kerbside Recycling Collection Schemes

**Table 5: Kerbside Performance of Kerbside Authorities Compared to Upper Quartile Performance (WRAP data)**

Authority	Type of Scheme	Kg/hh/yr Kerbside Recyclate 2008/09	WDF Kerbside Recyclate kg/hh/yr 2008/09	DEFRA Classification <sup>1</sup>	Upper Quartile Performance kg/hh/yr <sup>2</sup> 2007/08
Arun	Co-mingled	160	147	Large urban	221
Babergh/Mid Suffolk	Co-mingled	191 (combined)	188 179	Rural-80	224
Central Beds	Co-mingled	206	196 195	Other urban / Rural-80	199
Elmbridge*	Co-mingled	248*	249	Major urban	195
Harrow	Co-mingled	239	222	Outer London	191
Lichfield*	Dual-stream*	165*	259	Rural-50	237
Mendip	Kerbside sort	175†	177	Rural-80	224
Sedgemoor	Kerbside sort	109†	110	Rural-50	237
South Bucks	Kerbside sort	169	170	Rural-50	237
South Oxon*	Co-mingled*	213*	203	Rural-80	224
South Somerset	Kerbside sort	160	161	Rural-50	237
Stratford	Co-mingled	218**	219	Rural-80	224
Surrey Heath*	Paper/cans*	50*	49	Major urban	195
Swale	Co-mingled	243	221	Significant rural	225
Taunton Deane	Kerbside sort	157	159	Significant rural	225
Waverley	Kerbside sort	204	205	Rural-50	237
West Somerset	Kerbside sort	133	133	Rural-80	224

<sup>1</sup> DEFRA Classification of Local Authority Districts and Unitary Authorities in England (2005).

<sup>2</sup> WRAP (2009) Analysis of kerbside recycling performance in England 2007/08 – upper quartile performance for 2007/08 in this DEFRA classification for recycling of 5 materials at the kerbside.

\* Figures relate to previous recycling schemes – for Lichfield and Surrey Heath, co-mingled collections started in Autumn 2009; at South Oxon service change from June 2009 (see case study details); at Elmbridge AWC collections and separate food waste collection commenced in October 2009, recycling remained the same.

\*\* All recyclate collected together so unable to differentiate.



### Case Study Commentary

- 2.4.9 The previous paragraphs have looked at the schemes operating, and level of performance achieved, in 2008/09 for the case study authorities. The following provides some detailed commentary regarding some of the case studies, including data for 2009/10.
- 2.4.10 A radical change to waste collection services was introduced by **Surrey Heath Borough Council** in September 2009. Residents had previously been provided with a weekly, back-door collection of residual waste from sacks and a fortnightly collection of paper and cans (no container provided), with a chargeable garden waste service. Although the council achieved a recycle diversion of around 23% in 2008/09, the majority of this tonnage was collected at the council's bring sites, with only 6% (or 50kg/hh/yr) derived from kerbside collections. The new scheme has seen a move to alternate-weekly collections of residual waste and co-mingled dry recycle from wheeled-bins (180-litre residual; 240-litre for recycling) alongside a weekly collection of food waste for the majority of residents. The recycling scheme has significantly expanded the range of materials collected to include card, glass, cartons, plastic bottles, plastic packaging, waxed cartons, foil and aerosols as well as the previously collected paper and cans.
- 2.4.11 During the first seven months of the scheme's operation (September to March 2010), a total of 5,935 tonnes of dry recycle was collected at the kerbside compared with 825 tonnes during the preceding seven months (February to August 2009): an astounding 620% increase. This suggests an annualised total of around 10,175 tonnes dry recycle collected at the kerbside, or 303kg/hh/year (compared with 50kg/hh in 2008/09). Monthly residual waste tonnages have, on average, decreased by 52% (from circa 1,517 tonnes/month to 725 tonnes/month) and the food waste scheme has diverted around 1.7kg/hh/week, with overall recycling/composting diversion at around 65% (excluding bring site contribution; September to March 2010).
- 2.4.12 This dramatic increase in diversion rate can be attributed to a number of factors of the scheme design: the combination of the reduction in residual waste collection frequency and container size (i.e. restricting the volume of residual waste), the introduction of a food waste service, and the containerised, multi-material recycling scheme are all key components and have resulted in an easy to use service for residents. The council also undertook (and continues to implement) a comprehensive communications strategy to ensure that residents are fully aware of the service changes. This has resulted in minimal customer queries/complaints and the feedback from residents has generally been positive as the following quote indicates *"it makes it so much easier to recycle from home rather than go to the tip or recycling banks"* (Mytchett resident).



## Review of Kerbside Recycling Collection Schemes

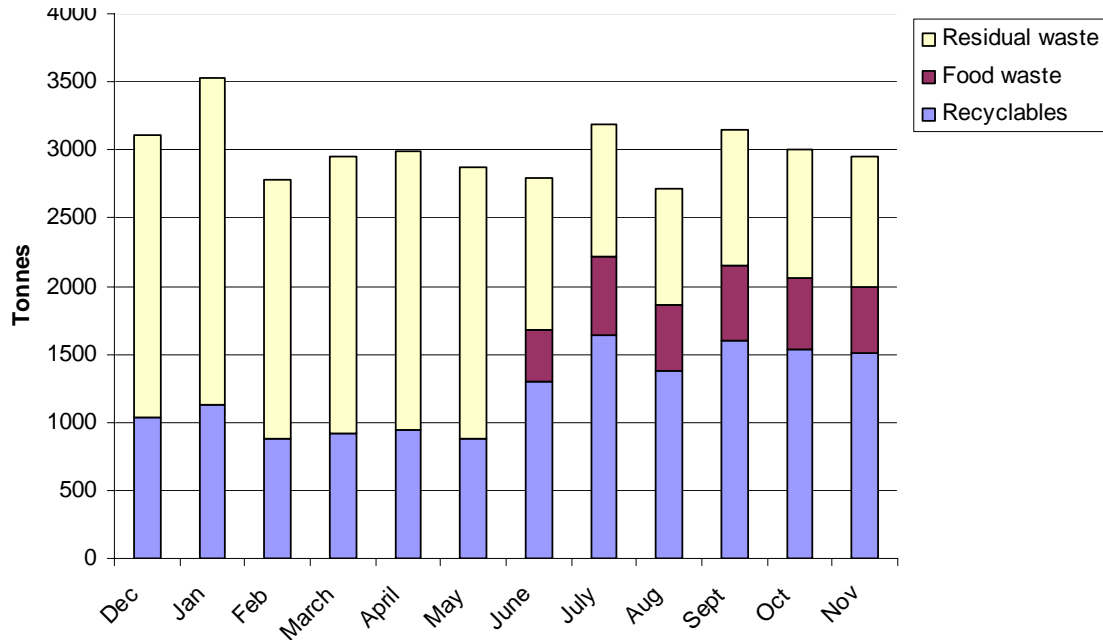
- 2.4.13 All these factors will have contributed to the significant diversion achieved by the kerbside recycling scheme. Even accounting for contamination (stated to be around 4-5%: Greenstar's MRF at Aldridge) the amount of material recycled at the kerbside could reach 287kg/hh/year, which is beyond the maximum levels suggested by WRAP in its recent publication (274kg/hh/year achievable for single stream co-mingled)<sup>5</sup>.
- 2.4.14 A similar change in collection systems was introduced by **South Oxfordshire District Council** in June 2009. This involved a move from weekly collections of refuse and recycling (in sacks and boxes respectively) to an alternate weekly collection scheme using wheeled-bins (180-litre residual; 240-litre for recycling) and a weekly food waste collection with a chargeable garden waste service. The co-mingled recycling scheme expanded the range of materials collected to include glass, waxed cartons, mixed plastic, foil and aerosols as well as the previously collected paper, card, plastics and cans.
- 2.4.15 Comparing kerbside recycling diversion for the six months pre- and post- scheme change indicates that an additional 1,864 tonnes of dry recyclate was collected: a 54% increase (5,796 tonnes December 2008 to May 2009 compared with 8,959 tonnes June to November 2009). This suggests an annualised total of almost 18,000 tonnes, or 320kg/hh/year, suggesting an annualised dry recycling diversion rate of 37% compared with just under 30% in 2008/09.
- 2.4.16 The introduction of AWC has also seen over 50% reduction in residual waste tonnages collected at the kerbside (from around 12,500 tonnes for December 2008 to May 2009 to 5,800 tonnes for June to November 2009), while the food waste scheme has been well received by residents and is diverting around 2.4kg/hh/week. The recycling/composting diversion since the start of the new scheme (June 2009 to March 2010) is currently around 70% (compared with 42.8% in 2008/09). The graphs below and overleaf illustrate the change in proportions of kerbside tonnages pre- and post- scheme change.

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<sup>5</sup> WRAP (2009) Analysis of kerbside recycling performance in England 2007/08

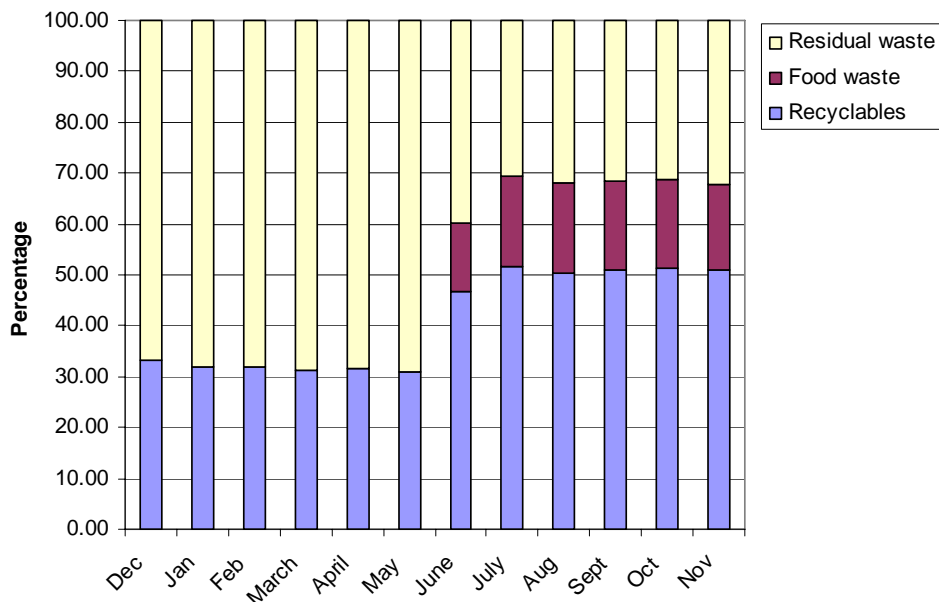


**Figure 4: Kerbside Tonnages by Collection Type in South Oxfordshire (Dec 2008 - Nov 2009)**



2.4.17 Even accounting for contamination (of around 5% at Greenstar’s MRF at Aldridge), the kerbside performance could reach 304kg/hh/year which is close to, or beyond, the maximum levels suggested by WRAP (305kg/hh/year where paper, card, cans, glass, plastic collected – rural-80 authorities; or above 278kg/hh/yr for prospering Southern England; and up to 274kg/hh/year achievable for single stream co-mingled).

**Figure 5: Percentage Contribution of Kerbside Tonnages by Collection Type in South Oxfordshire (Dec 2008 - Nov 2009)**





## Review of Kerbside Recycling Collection Schemes

- 2.4.18 Harrow Council has been operating an alternate-weekly collection scheme of residual waste and garden/food waste (both in 240-litre wheeled-bins) since 2005. Between February and May 2007, the council introduced a change to the kerbside recycling scheme, moving from a box of segregated materials (paper, glass, cans, plastic bottles and textiles) to a co-mingled collection of dry recycle (paper, card, glass, cans, plastic bottles and containers, aerosols, foil and waxed cartons) using 240-litre wheeled-bins.
- 2.4.19 Comparing the average tonnage of recycle collected pre- and post- scheme change indicates that an 80% increase in recycle tonnage was achieved (from an average of 2,654 tonnes per quarter, February to December 2006, to an average of 4,781 tonnes per quarter, April to December 2007<sup>6</sup>). There is a similar level of increase (76%) when comparing 2006 data with 2008/09 tonnages (again, accounting for MRF rejects). The amount of material now diverted at the kerbside, expressed as kilograms per household per year, places Harrow above the maximum level for this parameter according to WRAP (achieved 239kg/hh/year in 2008/09; maximum for an outer London borough is 228kg).
- 2.4.20 In August 2008, **Stratford-on-Avon District Council** introduced fortnightly single-stream co-mingled recycling collections from wheeled-bins for circa 53,000 households. At the same time, wheeled-bins were introduced for residual waste, although the frequency of collection remained weekly until April 2009 when alternate-weekly collections were implemented. The new recycling scheme expanded the range of materials collected to include plastic and cardboard, alongside paper, cans and glass (previously collected via a box scheme), while plastic packaging and aluminium foil were added in December 2009.
- 2.4.21 The initial move to containerisation and co-mingled recycling collections resulted in a 67% increase in tonnage (from 2,030.84 tonnes for the quarter April to June 2008 to 3,400 tonnes for the quarter October to December 2008<sup>7</sup>). Examining this data on an annual basis indicates that recycling tonnages increased by 55% from the period July 2007 to June 2008 compared to July 2008 to June 2009 (8,430 tonnes to 13,040 tonnes), while diversion rates increased from 15.5% in 2007/08 to 22.4% in 2008/09. Recent data indicates that in the order of 14,557 tonnes have been collected in 2009/10: this equates to 271kg/hh/year reducing to 255kg/hh/year when contamination has been accounted for (at 6%).

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<sup>6</sup> From WasteDataFlow and accounting for contamination

<sup>7</sup> From WasteDataFlow and accounting for contamination



## Review of Kerbside Recycling Collection Schemes

- 2.4.22 The Council reports that the latest data (April to December 2009) shows a rejection rate at the current Materials Recovery Facility (MRF) of around 1.97%, of which 0.96% was material sent to landfill and around 1% was reprocessed as refuse derived fuel. Analysis of WasteDataFlow suggests that around 4.5% of total recycling collected was rejected in 2008/09 from the previous MRF used by the Council.
- 2.4.23 The introduction of AWC has also resulted in a 25% decrease in residual waste tonnages: from 27,695 tonnes in 2008/09 to an annualised total of around 21,000 tonnes in 2009/10 (or 516kg/hh/year to under 400kg/hh/year).
- 2.4.24 A fortnightly collection of co-mingled dry recyclables (paper, card, cans, and plastic bottles) from a 240-litre wheeled-bin was phased in across **Arun District Council** during 2005/06. The new scheme (which replaced a box scheme for paper only) has contributed to an increase in overall diversion rates: from 13% in 2003/04 to 35% in 2008/09 (with no change to the weekly refuse service).
- 2.4.25 In April 2009, the range of materials collected at the kerbside was expanded to include glass, aerosols, aluminium foil and waxed cartons. This has resulted in a 37% increase in material being recycled: from around 2,700 tonnes for April to June 2008 to 3,690 tonnes for the same period in 2009 (NB figures are net of contamination). Assuming that this level of performance continues throughout the year, the council could expect to divert around 213kg/hh/year (compared to 160kg/hh in 2008/09), which is beyond the maximum level indicated by WRAP for similar schemes (204kg/hh/year assuming a 10% contamination for fortnightly co-mingled with weekly residual waste)<sup>8</sup>.
- 2.4.26 The council reports a high level of satisfaction amongst local residents in relation to kerbside recycling with 78.9% reported satisfaction in the 2008 Arun Place Survey.
- 2.4.27 **Lichfield DC** introduced kerbside collections of dry recyclables in 2002. Initially, the scheme was operated as kerbside sort, but the council moved to a dual stream co-mingled system about five years ago (targeting paper and card, and glass, cans and plastics on a weekly basis). At the same time (in 2002), an alternate-weekly collection of residual waste and garden waste, both from 240-litre wheeled-bins, was introduced. The council's overall recycling/composting rate has increased significantly during this period: from 27% in 2001/2 to around 50% in 2008/09.

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<sup>8</sup> WRAP (2009) Analysis of kerbside recycling performance in England 2007/08

## Review of Kerbside Recycling Collection Schemes

2.4.28 The recycling service was changed again in autumn 2009 to a fully co-mingled collection of dry recyclables, targeting a greater range of materials and collected on a fortnightly basis from 240-litre wheeled-bins. The council's initial findings are: that the recycling diversion has increased; that there are health and safety benefits for employees in moving away from kerbside sort to dual stream and again to co-mingled collections; that there are financial benefits in moving from kerbside sort to co-mingled collections; and that there is less litter from bins as opposed to boxes.

2.4.29 The **Somerset Waste Partnership** comprises the district/boroughs of Mendip, Sedgemoor, South Somerset, Taunton Deane, and West Somerset. Three of the councils – Mendip, South Somerset and Taunton Deane - operate SORT IT waste collection services, as detailed below, while Sedgemoor and West Somerset operate weekly refuse collection, fortnightly recycling and fortnightly garden waste (chargeable). For all the Somerset authorities, the range of materials collected and sorted at the kerbside are: paper, cans, glass, foil, textiles, shoes and automotive batteries (West Somerset also collects cardboard; Sedgemoor and Taunton Deane also collect engine oil).

**Figure 6**

SORT IT Services				
	Food Waste	Recycling	Refuse	Garden Waste
Week 1				
Week 2				

Source: SORT IT PLUS Trials Final Report – Summary December 2008  
<http://www.somersetwaste.gov.uk/pdf/SORT%20IT%20PLUS%20Final%20Summ.pdf>

2.4.30 During the period May to September 2008, an enhanced recycling service was trialled in Mendip, Sedgemoor and Taunton Deane covering 8,500 households (circa 6% of total households in the three local authority areas trial continued in Mendip until March 2009 and continued in Sedgemoor and Taunton Deane to cover over 10,000 households in November 2009 – will be rolled out district-wide by Autumn 2010). The SORT IT PLUS trials added plastic bottles and cardboard to the



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materials targeted for collection: these being the main materials remaining in the residual waste bin and those requested by residents to be collected for recycling.

2.4.31 The SORT IT PLUS trials tested a variety of methods of collection, using different vehicle types and frequency of collection. Three approaches (called service packages) were adopted within the trial areas as indicated below:

**Table 6: SORT IT PLUS Service packages**

Recycling Frequencies	Service Package 3	Service Package 2	Service Package 5
<b>Standard Dry Recyclables</b>	Fortnightly	Weekly	Weekly
<b>Plastic Bottles &amp; Cardboard</b>	Fortnightly	Fortnightly	Weekly
<b>Food Waste</b>	Weekly	Weekly	Weekly

Source: SORT IT Plus Trials Final Report – Summary December 2008  
<http://www.somersetwaste.gov.uk/pdf/SORT%20IT%20PLUS%20Final%20Summ.pdf>

2.4.32 Analysis of trial round weights found that 'service package 5' (tried in Mendip and Taunton Deane in 2008) delivered, on average, the highest level of recycling/composting diversion in kilograms per household with an overall predicated rate of 54% if this service package was rolled out across Somerset. The individual recycling yields, expressed as kilograms/household/week were as follows:

- Standard recycling – 3.65kg
- Plastic bottles and cardboard – 1.05kg
- Food waste – 2.0kg

2.4.33 If one were to make a simple extrapolation then this would show that SORT IT PLUS kerbside sort scheme has the potential to divert 348kg/hh/year: 244kg/hh from dry recycling and 104kg/hh from food waste; but we should stress that this is only based on trial data and is still lower than that achieved by the best performing authorities who operate a co-mingled recycling service (e.g. see evidence from Surrey Heath and South Oxfordshire).

2.4.34 The Somerset Waste Partnership report on the trials (referenced above) notes that the addition of plastic bottles and cardboard had a positive effect on increasing the yields of the existing materials



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(paper, glass, cans, food waste). An increase of around 0.7kg and 0.8kg/hh/fortnight was observed compared to previous SORT IT yields and the report concludes that:

“Overall, the effect is that the collections of plastic bottles and cardboard alone adds approximately 2.5% to recycling rates with service packages 3 and 2 and adds about 3.5% with service package 5. On top of this, additional recycling of existing materials adds approximately 3% to recycling rates with service package 2 and adds about another 5% with service package 5”.



## 2.5 Summary

2.5.1 This Section has examined the levels of performance that can be achieved by different kerbside recycling collection approaches, both by reference to top performing local authorities and case study research. While recent publications (from WRAP) suggests that there is little difference between kerbside sort schemes compared to co-mingled systems in terms of performance, our research indicates that:

- Twenty six of the top 30 performing councils for (dry) recycling diversion operate a co-mingled collection service: with Worcester City Council achieving the highest diversion at 36%;
- Analysis of WasteDataFlow 2008/09 data for dry recycling collected at the kerbside and adjusting for rejects revealed that local authorities operating 100% kerbside sort achieved a maximum of 239kg/household (Melton BC) from kerbside collections, with a weighted average of 131kg/household. Local authorities with 100% co-mingled collections achieved a maximum of 285kg/household (North Kesteven DC) from kerbside collections (19% more than the maximum for kerbside sort); with a weighted average of 163kg/household (25% more than the average kerbside sort).
- Indicative data from local authority case studies suggests that kerbside recycling yields of 304kg/hh/year (accounting for contamination) are achievable with co-mingled collection schemes compared to yields of 244kg/hh/year which are achievable for kerbside sort schemes, both of which target at least five key materials (paper, card, cans, glass, plastic);
- Overall recycling/composting performance has the potential to reach 70% where weekly food waste, fortnightly refuse and fortnightly co-mingled recycling schemes are provided (combined with chargeable garden waste service) compared with 54% for kerbside sort schemes;
- There is evidence from some councils that, where they have moved from kerbside-sort methodology to co-mingled methodology, there has been a marked increase in the dry recycling rate, even allowing for contamination from the latter; there have also been some positive comments from their public regarding the change, including relative ease of use.



## 3.0 Quality of Recyclables

### 3.1 Introduction

3.1.1 Achieving high levels of diversion from kerbside recycling is one element of a successful scheme; however, there is little point in collecting materials that cannot be reprocessed into new products. Recovering as much material as possible – and at as high a quality as possible – is critical.

3.1.2 WRAP, in *Choosing the Right Recycling Collection System*, defines quality as “consistently delivering materials to the market place that are:

- *Effectively separated to meet reprocessor and end market requirements;*
- *In the required volumes and with security of supply; and*
- *At a price that sustains the market”.*

3.1.3 From a quality perspective, it has been argued that kerbside sort schemes (or dual-stream, where e.g. paper is kept separate from other co-mingled dry recyclables) offer the most reliable method to collect high quality materials. The reasons cited for this include: contamination is likely to be minimal as non-targeted material can be rejected at the point of collection (and disposed of by residents as residual waste); and targeted materials are not compacted during the collection process which can cause difficulties with recycling.

3.1.4 This section aims to clarify whether co-mingled recycling schemes are capable of delivering quality materials meeting WRAP’s criteria in 3.1.2 above.

### 3.2 MRF Reject Rates

3.2.1 Waste rejected at Materials Recovery Facilities (MRFs) derives from two sources: contamination of incoming recyclables delivered to the MRF, and the residue resulting from MRF processing.

Contamination of incoming recyclate can be classified as follows (from *WRAP 2008, MRF Contract Guidance*):

- “objectionable” materials – materials that can be tolerated in very small quantities; these are materials that are similar in nature to designated recyclables but not officially part of the local authority’s programme (such as waxed papers, margarine tubs and lids, etc); and



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- “prohibitive” materials - materials that are clearly not part of the dry recyclables scheme (e.g. garden waste, food waste, wood, etc) and theoretically, cannot be tolerated in any degree.

3.2.2 MRF processing losses will mean that some targeted recyclables will be rejected during the sorting process: the precise amount dependent on the design and operation of the specific MRF. The overall reject rate (i.e. contamination plus processing loss) will, therefore, vary considerably between local authorities being a function of e.g. scheme design, efficacy of communication initiatives, and efficiency of the MRF.

3.2.3 The Environment Agency estimates that the average reject rate for a typical MRF is 10.85%, while a recent briefing paper by Friends of the Earth (FoE) suggests that typical rates are between 12 – 15%<sup>9</sup>. The FoE reference relates to an earlier study commissioned by WRAP in 2006, which examined a number of MRFs operating in England, Europe and North America. This found that residue rates at the seven English MRFs that were visited ranged from 1.5% to 20%. A more recent report commissioned by WRAP, examining the composition and quality of material being sent to MRFs, indicates average contamination at 13% and rates of <8.4% being achieved at the lower level with single-stream input<sup>10</sup>. The study also found that, for the top 25% of MRFs, 6% of input material is residual waste. Others suggest that modern state-of-the-art MRFs can achieve rates closer to 5% with further reductions possible with appropriate education and enforcement<sup>11</sup>.

3.2.4 As noted in 2.3.2, WasteDataFlow reporting of rejection rates for MRFs is apparently becoming more precise following Environment Agency intervention, including the serving of notices to those authorities who reported zero reject rates. For 2008/09 rates tend to be between 2.3% and 10% (for the second and third quartiles of reporting authorities) with 5.7% being the median and a weighted average of 7.3% (for all authorities). MRF reject rates, as calculated from WasteDataFlow Q058, for all local authorities (including unitary councils) are illustrated in the graph below from 2007/08 and 2008/09.

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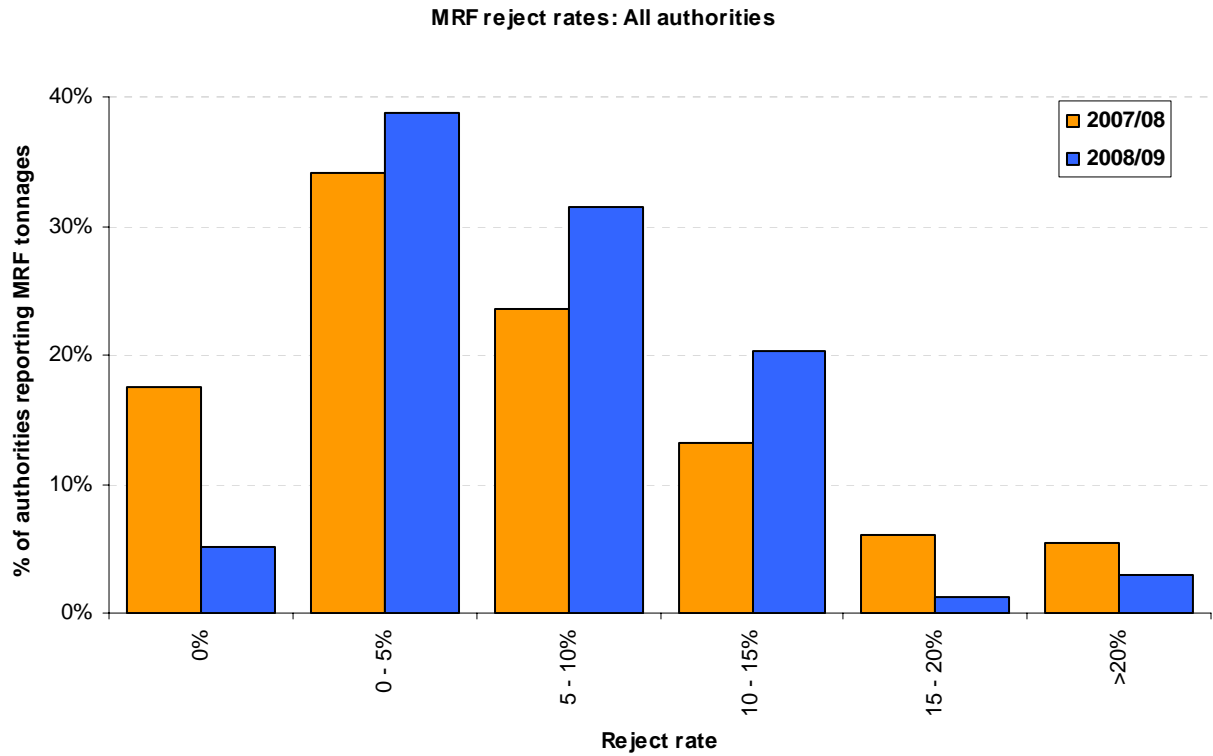
<sup>9</sup> Recycling Collections – Source Separated or Commingled? FoE Briefing, September 2009

<sup>10</sup> WRAP (2009) MRF Quality Assessment Study

<sup>11</sup> Veolia puts forth the case for co-mingled, LAWR, May 2008



Figure 7



3.2.5 The reject rates experienced by those of our case study authorities that operate co-mingled recycling schemes is, indeed, variable with rates of between 0% and 10.8% reported, with an average of 4% (see Table 4). It is interesting to note that higher reject rates are observed for authorities where schemes exclude glass e.g. at Babergh/Mid Suffolk, Central Beds and Swale. Audited data from WasteDataFlow suggests an average reject rate of 5.9% for these authorities in 2008/09 (where schemes were operational).

**Table 7: Reported MRF Reject Rates for Case Study Authorities**

Authority	Reject Rate	
	Stated (Dec 09/Jan 10)	WasteDataFlow (Q058)
Arun	2.18%	10.4% (April 08 – March 09)
Babergh/Mid Suffolk	6%	6.1% (BDC); 7.1% (MSDC) (April 08 – March 09)
Central Beds	3%	6.6% (Mid); 6.5% (South) (April 08 – March 09)
Elmbridge	2%	2% (April 08 – March 09)
Harrow	5%	2.5% (April 08 – March 09)
Lichfield	<1%	3.4% (April 08 – March 09)
South Oxon	5%	N/A – new scheme
Stratford	1.97%	4.5% (July 08 – June 09)
Surrey Heath	4-5%	N/A – new scheme
Swale	10.8% (use EA rate)	9.6% (April 08 – March 09)

3.2.6 **Central Bedfordshire Council** (the unitary council created on 1 April 2009 through an amalgamation of the district councils of Mid Bedfordshire and South Bedfordshire) observed a reduction in MRF rejects following an expansion of materials collected by the kerbside recycling service. Since January 2009, residents have been able to present waxed cartons, foil, all plastics and textiles, as well as the materials already collected - card, paper, cans and plastic bottles. Following the expansion of the scheme, the tonnage of material reject at the MRF (as reported in Q058 in WasteDataFlow) has reduced from 7.8% (combined figure for Mid and South Beds) for the nine months prior to January 2009 to 3% (January to March 2009) and 1.4% (April to June 2009). The Head of Waste Strategy at the council explained the reason for this reduction as follows:

“We have experienced a reduction in contamination since we introduced the new materials. That's mainly due to the fact that the majority of the contamination used to be non-target recyclables which were then added to the scheme such as all plastic packaging and TetraPak”



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- 3.2.7 The reason that **Lichfield** reports minimal contamination is that residents are well educated in terms of what materials are accepted by the scheme: the previous kerbside sort collection scheme meant that incorrect items were left behind so residents are well-versed in what can be recycled and what cannot.
- 3.2.8 Other councils have been carrying out intensive publicity to advise residents what can and cannot be recycled; for example, at **Babergh/Mid Suffolk** this approach has assisted in bringing contamination rates down from 19% a few years ago to around 6% currently.

### 3.3 MRF Processing and Sale of Materials

- 3.3.1 In order to provide some feedback as to the quality of materials received by MRF operators, we visited two operational MRFs to observe the process first-hand and to explore the issue of quality (both received and subsequently sold). In addition, 15 MRF operators were contacted by telephone, of which nine responded, to discuss similar issues.
- 3.3.2 A number of MRF operators contacted reported low levels of rejection of recyclate by reprocessors (<4% of material). Reasons for this included visual inspection of loads, sampling and recording at random (but on a daily basis) recyclate at the transfer station and very tight quality control as well as staff training and awareness at all levels.
- 3.3.3 Of those who reported high rejection of recyclate by reprocessors (10% - 30%), food contamination of cardboard, wet paper and general household-contaminated paper were identified as the highest fraction of reject (note that these overall rates refer to inputs derived from a number of sources: partial sort; co-mingled and commercial).
- 3.3.4 Some believe that this high percentage is compounded due to the effect of reprocessors 'cherry-picking' the best of the recyclate as the demand for their products fluctuates with supply and demand. This unwanted material may be just as acceptable to the overseas market. Others point to a seasonal issue in relation to quality with certain materials being rejected as a result, e.g. wet paper and cardboard (NB this is just as relevant for kerbside sort schemes using boxes and we are aware of material being rejected by reprocessors where this situation has arisen).
- 3.3.5 Greenstar is a large recycling-led waste management company operating in the UK, Ireland and North America. The company operates six MRFs in England, including Britain's largest MRF at Aldridge (near Birmingham) with a processing capacity of 300,000 tonnes per annum. The Aldridge facility was visited as part of this study and discussions held with the Recycling Director.

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3.3.6 All incoming materials undergo an initial visual inspection on arrival and additional materials are recycled e.g. heavy metals. The level of contamination at this point is believed to be up to 3-4% and the majority of this contamination is removed at the first picking station. The MRF processing loss is reported to be around 2.5% to 3% and this tends to comprise finer materials such as plastic bottle tops, shredded paper etc. The overall reject rate is, therefore, up to 7% depending on the quality of the input material.



3.3.7 The contamination rate of incoming material sourced from local authority collection schemes is, on the whole, very low. The most difficult time is at Christmas when residents tend to set-out non-targeted materials such as Christmas lights and artificial trees within their recycling. The other situation which generates high contamination rates concerns communal bins at flats. Greenstar has not rejected any loads from local authorities; however, if a load does come in which needs additional sorting (such as in the above instances) then they will contact the council concerned and make them aware there is a problem with a particular load. The council can then trace that back to the round for targeted communications campaigns.

3.3.8 There are no concerns regarding the quality of material recovered at Aldridge. Contamination within paper bales is rigorously checked twice a day with contamination typically being around 1%. This compares with the lower level benchmark of <3.2% stated in the recent WRAP *MRF Quality Assessment Study* and would also meet the paper specification requirements of typical UK mill requirements as suggested in PAS 105 (2% contraries tolerated<sup>12</sup>) as well as reprocessors such as Aylesford Newsprint (1% contamination tolerated; note also that if paper is wet by >25% then it

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<sup>12</sup> Publicly Available Specification (PAS) 105, Recovered Paper Sourcing and Quality for UK End Markets

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will be rejected, which is just as applicable to kerbside sort material<sup>13</sup>); UPM Shotton Mill (1% contraries in mixed news and pams, and if >12.5% of material is wet it will be rejected: again, just as applicable to material from kerbside sort collections); Palm Paper (up to 3% contamination tolerated); and RockTenn (1% contamination by prohibitive materials tolerated).

- 3.3.9 Greenstar does not have any problems in selling recovered materials within the UK and to the export market. (Photos overleaf – left, mixed paper bales; right, plastic bottles). This confirms that MRFs produce material capable of being recycled in the UK. Clearly some material is exported, but this appears to be a commercial decision rather than one based on quality.



- 3.3.10 Grundon Waste Management operates three material recovery facilities (MRFs) in the southern counties, including at Leatherhead which was visited as part of this study. The Leatherhead facility has a processing capacity of up to 100,000 tonnes per annum, although it is currently operating at 70,000 tonnes per annum. Grundon operates a double-shift system at Leatherhead with the MRF operating 18-19 hours per day.

- 3.3.11 All incoming materials undergo an initial visual inspection on arrival. Grundon also carries out more rigorous inspections of incoming loads immediately following the introduction of new local authority collection schemes, such as food waste collections. The level of contamination at present is believed to be up to 5% and the majority of this contamination is removed at the first picking station. The overall reject rate including the MRF processing loss is reported to be around 5%

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<sup>13</sup> <http://www.aylesford-newsprint.co.uk/PDFs/new%20quality%20spec%20blue.pdf>

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depending on the quality of the input material. Grundon seeks to dispose of all MRF residues via its Energy from Waste facility.



- 3.3.12 It is worth noting that this facility is currently receiving material that used to be processed at Colnbrook prior to its closure, and that this material has a higher level of contamination than that ordinarily processed at Leatherhead. The Colnbrook facility had to be closed last May due to a fire and is scheduled to reopen in October 2010. The refurbished facility will include the latest MRF sorting technology and will be of a higher specification than that currently in place at Leatherhead.
- 3.3.13 The contamination rate of current incoming material sourced from local authority collection schemes is quite variable, with some authorities having contamination rates as low as 2% and others as high as 7-8%. Those authorities with higher contamination rates tend to have more diverse and transient populations. However, materials from these authorities will be diverted back to Colnbrook once it re-opens, meaning that incoming contamination at Leatherhead will reduce significantly after October 2010.
- 3.3.14 As seen at Aldridge, Christmas holidays tend to produce higher levels of contamination. The heavy snowfall in January of this year also reportedly led to increased levels of contamination due to disruptions to usual refuse and recycling collections. Any contamination problems with individual loads are reported back to the relevant council as soon as they are received to enable them to be dealt with as quickly as possible.
- 3.3.15 There are no concerns regarding the quality of material recovered at Leatherhead. For example, contamination of aluminium can bales is typically around 1% which is at the lower end of the

## Review of Kerbside Recycling Collection Schemes

median level benchmark of 0.9% to 4.6% stated in the recent WRAP *MRF Quality Assessment Study*.

- 3.3.16 Grundon routinely works to reprocessors' specifications to maintain quality of output materials (photo below shows paper output). Grundon also has long-standing relationships with many reprocessors and does not have any problems in selling recovered materials within the UK and to the export market.



- 3.3.17 Our discussions with UK reprocessors indicated that materials from MRFs are just as acceptable as kerbside sorted materials; for example, 'positive pick' MRFs produce higher grade plastics (J&A Young), while others say that although paper from MRFs is more contaminated (between 3% to 15% - Holmen Paper) it is perfectly acceptable (and paper from kerbside sort operations includes some degree of contamination as all will require de-inking and staple removal). This contradicts the level of contamination in paper bales at some modern MRFs where contamination of less than 1% is reported (see 3.3.7). A general observation was that as MRF technology improves then so does quality.

*"Our discussions with UK reprocessors indicated that materials from MRFs are just as acceptable as kerbside sorted materials"*

- 3.3.18 Discussions with MRF operators indicated that there are sometimes unrealistic expectations regarding the quality of recyclate and some UK re-processors are probably 'cherry-picking' the best recyclate.
- 3.3.19 It is worth noting that although there is a market for recovered materials in the UK there is insufficient capacity to process all recovered material. For example, in 2008 just over 8.8m tonnes



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of paper and board was recovered from the UK's waste stream, of which 55% was exported for reprocessing with the main end-markets being paper mills in China, India and Indonesia<sup>14</sup>.

Recovered materials have become a global commodity for a number of reasons – notably: the shift in manufacturing base and decline in domestic demand for e.g. recovered fibre from UK Europe and North America to Asia and Indian economies; the downturn in the global economy (note: Abitibi Bowater paper mill at Ellesmere Port has recently gone into administration); increasing demand for imported material in these developing markets due to the lack of sufficient secondary raw materials and the flow of manufactured goods to the West resulting in lower transport costs. This is summed up by WRAP:

“As the Chinese and Asian economies develop and become the world's principal manufacturing base – with large trade surpluses in manufactured goods with North America and Europe - the flow of packaging and printed materials wrapped around these manufactured goods is steadily rising”

(WRAP, 2007)”

- 3.3.20 The demand for exported materials is expected to continue - for example, a WRAP study in 2007 predicted that China's demand for recovered fibre will account for 58% of world trade by 2015, and there is even concern that the worldwide supply of recovered fibre will not meet the demand from new Asian mills<sup>15</sup>. However, there is an element of risk in relying heavily on one market (i.e. China where the UK is only a small supplier) as any change in the manufacturing base of the export country could impact on demand and subsequently prices (unless prices are fixed).
- 3.3.21 Quality of material is important to the export market and MRF operators should ensure they are delivering material to the required specification. The WRAP Market Situation Report indicates that *“Market contacts have indicated that China is enforcing its quality standards more stringently and other major importing economies are also introducing tighter inspection regimes....so it is important that the UK's recovered fibre can meet these more demanding quality requirements”*.
- 3.3.22 Although there has been much talk in the media in recent years concerning recyclate being taken to East Asia and either landfilled or burnt, the cases are few and the quantities are relatively very small. However, the media impact on the public should not be underestimated; for example an

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<sup>14</sup> WRAP (2010) Realising the value of recovered paper: an update; Market Situation Report Winter 2009/10

<sup>15</sup> WRAP (2007) Assessment of the UK export market for recovered paper, research project MSP010



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investigation by the Sunday Times in 2007 reported that *“household refuse...being sent overseas for recycling is being dumped, burnt or strewn across the streets in less developed countries”*; with WRAP countering the argument by stating that *“the idea that Chinese manufacturers are paying the high prices they are for plastics and paper because they want to burn them or bury them and damage their environment is illogical”*<sup>16</sup>

3.3.23 In summary there is clear evidence that high performing modern MRFs are certainly capable of producing high quality material that can be used in the UK. An important point to consider is that whatever system is used it is vital to minimise contamination, to provide a clear audit trail so that recycling is ensured, and that local authorities recycle as much of the material presented by residents as possible.

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<sup>16</sup> The Sunday Times (17.07.07) Britain's 'Recycled' Waste Dumped in Asia



## 4.0 Cost

- 4.1.1 There have been a number of statements to the effect that (generally) kerbside sort operations are cheaper than co-mingled operations. For example, in WRAP's *Kerbside Recycling: Indicative Costs and Performance* it is stated that *"In current market conditions kerbside sort schemes show lower costs – net of income from material sales – than single stream co-mingled schemes"*. Additionally, WRAP's leaflet *Choosing the Right Recycling Collection System* (June, 2009) includes modelling which *"shows that on a like for like basis kerbside sort systems have lower net costs than co-mingled systems"*. Modelling is, of course, a valid technique in terms of calculating costs; but the first statement quoted above seems to suggest that this assertion is based on actual case studies (although the detailed evidence is unclear).
- 4.1.2 WYG has evidence – from procurement projects for councils where proposals from operators for different methodologies have been sought – that shows that in some scenarios kerbside-sort is indeed cheaper than co-mingling; but in other scenarios co-mingled systems are cheaper. On the basis of this evidence – which covers procurements in the last year – we would say that sometimes kerbside sort systems have lower net costs than co-mingled systems but sometimes the reverse is true: and we would urge any council (or any other body that represents local authorities or offers advice to them) to approach this subject with some caution; and not to assume that one answer will be correct – in terms of which system costs less - for all cases. Indeed, we believe that individual cases should be considered as individual cases with no pre-conceived ideas as to cost (although some general principles may emerge as more evidence becomes available).
- 4.1.3 Before considering this evidence, it may be helpful to provide a (fairly general) overview. Kerbside sort operations generally incur greater collection costs (most of those which achieve high diversion rates operate weekly collections and sometimes crew productivity in terms of households per round is lower) but have a price advantage in terms of container costs and income is received from the sale of the recyclate collected; whereas co-mingled systems typically involve a fortnightly collection from wheeled-bins (meaning lower collection costs but initially marginally higher costs for containers) and a gate fee is paid for processing the materials via a MRF. We appreciate that this scenario does not apply for all authorities (e.g. it is unlikely to be accurate for Central London where fortnightly recycling collections are not common) but it is a common scenario for the vast majority of collection authorities.
- 4.1.4 We have noted earlier that, from the evidence available, co-mingled systems divert more material, even after allowing for contamination: and this is another factor which needs to be considered in



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terms of overall cost modelling. It is possible that, in part, the calculations that underpin some models might be skewed by assuming (a) that kerbside sort schemes divert more material from landfill (which, as noted earlier, flies in the face of the evidence) and/or (b) that reject rates from a typical MRF average 10.85% (which we believe, from our evidence, is too high a figure).

- 4.1.5 The key point is: do the different cost profiles and these different factors always give an advantage to one methodology or another? Or, to put it another way, building upon the overview above, do the savings in collection costs plus the savings from additional diversion which arise from a co-mingled collection scheme outweigh the additional cost for containers, the gate fee payable for MRF operations and the foregone income from the sale of recyclate? Our clear experience is that often they do: and the key factor in determining this is usually the location of the MRF relative to the collection authority as well as the gate fee. In other words, where collection authorities can deliver directly to a MRF charging a reasonable gate fee (and, ideally, able to process a large range of materials with low contamination), then co-mingling will be cheaper; but if MRF facilities are a long way away and/or MRF facilities are expensive (and particularly if it is a MRF processing a small range of materials with poor contamination processes) then kerbside sort systems will be cheaper. As more modern MRFs are built then both gate fees and transport costs should reduce.
- 4.1.6 It is worth saying that in some procurement exercises which involve the most experienced operators of kerbside-sort methodologies competing against those most experienced in delivering co-mingled solutions, we have seen lower costs (including the differential in container costs) for co-mingled collections than for kerbside-sort even without considering the much higher diversion from landfill that is typically seen from co-mingled operations (as discussed previously). To comment that kerbside sort systems (always or even generally) have lower costs than co-mingled operations is contrary to our evidence: and, given the strength of evidence regarding the higher diversion from landfill from co-mingled collection systems and given that the costs of disposal through landfill will rise sharply in future years, in the longer term co-mingled collection systems will increase their cost effectiveness further in the future.
- 4.1.7 We now show evidence from some particular case studies which involve contracts procured in the last year: and where bids were sought from private sector organisations with the two alternative options (i.e. co-mingled recycling collected fortnightly from wheeled-bins; and kerbside sort recycling collected weekly from boxes) being sought from the bidders, in addition to fortnightly residual waste collections, weekly food collections and ancillary services such as bulky waste, collection from bring sites etc. For reasons of commercial confidentiality we do not name the



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authorities or the bidders: but each was a situation where several competitive tenders were received.

- 4.1.8 In the first case, kerbside-sort methodology proved to be the cheapest option. In this case the authority was extremely rural and had a relatively small number of households: but, more particularly, the nearest MRF was more than 100 miles by road in distance. The cheapest price per annum for the kerbside-sort option was £1,329,626 including the cost of additional containers and net of income from the sale of recyclate; whereas the cheapest price per annum for the co-mingled option was £1,624,443 including MRF gate fees, transport and the cost of containers. The difference of £294,817 would have reduced somewhat if an allowance for additional diversion was calculated: but it would have been insufficient to close the gap.
- 4.1.9 In the second case, co-mingled collection methodology proved to be the cheapest option. In this case the authority was urban and was sizeable; but, more particularly, there was a MRF within 10 miles of the authority's boundary, meaning that for the co-mingled option delivery could be made by collection vehicles direct to the MRF. The cheapest price per annum for the kerbside-sort option was £3,518,619 including the cost of additional containers and net of income from the sale of recyclate; whereas the cheapest price per annum for the co-mingled option was £3,485,643 including MRF gate fees and the cost of containers. The difference of £32,976 would have increased further if an allowance for additional diversion was calculated (by over £100,000). Interestingly, the authority also requested prices for a two-stream recycling option: but this was the most expensive of all at £3,550,812 on a like-for-like basis (i.e. without considering diversion savings).
- 4.1.10 In the third case, co-mingled collection methodology again proved to be the cheapest option. In this case the authority was a mixture of urban and rural; but, more particularly, there was a MRF within 10 miles of the authority's boundary, meaning that for the co-mingled option delivery could be made by collection vehicles direct to the MRF. In this case the authority included a formula in the cost calculation which assumed some additional diversion for the co-mingled recycling option. The cheapest price per annum for the kerbside-sort option was £2,392,731 including the cost of additional containers and net of income from the sale of recyclate; whereas the cheapest price per annum for the co-mingled option was £1,868,014 including MRF gate fees and the cost of containers. It is worth noting that, even if no allowance had been made for additional diversion, the co-mingled option would have been cheaper.



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- 4.1.11 Now, it is worth saying that cost is never the absolute factor in deciding on the winning tender or in an authority deciding which recycling system is better for its residents (and we believe that the choice of recycling system should be for each authority to decide). We also believe, however, that authorities should make their choice on the basis of evidence rather than belief: and blind statements that kerbside-sort systems give lower costs in all cases or even generally, appear to us to be inaccurate and therefore somewhat unhelpful. Our evidence is that kerbside sort methodology can be cheaper but it can be more expensive: and we believe that the most critical factor is how close the MRF facility is. If the MRF is close enough to facilitate direct deliveries from collection vehicles, then co-mingled collection is, in our experience, cheaper; if it is many miles distant then kerbside sort becomes more competitive (it is worth noting that, in the case discussed in 4.10, bids were received from MRF operators ca. 100 miles away: but the prices were around £750,000 more expensive than kerbside sort on a like-for-like basis).
- 4.1.12 In conclusion, then, we believe that every case needs to be examined on an individual basis in terms of cost profile: but it is by no means the case that co-mingled operations are always cheaper – indeed, where direct delivery to a MRF is possible, co-mingled collections will generally be cheaper.
- 4.1.13 Further, given the higher capture rate from co-mingled systems, where landfill is the alternative, co-mingled systems will significantly increase their price advantage over kerbside sort systems in the long-term in terms of a total net cost given the increasing costs of landfill including taxes. We recognise that this net cost may, in two-tier structures (i.e. where there are collection authorities separate to disposal authorities) , imply that there are greater costs for one body but more significant savings for another (typically greater collection costs but greater savings through increased diversion); but we would urge local authorities to consider the total costs and the long-term costs (ideally through better collaborative working between the two tiers and possibly involving shared risk/reward arrangements).

*'Our research shows that in some cases co-mingled systems offer lower cost – it is inappropriate to say that they will generally be more expensive, and each case must be examined to take account of local circumstances before determining which method will be cheaper. In the longer term, the cost advantage of co-mingled systems will become more significant given the higher capture rates and the savings from greater diversion. '*



## 5.0 Operational Considerations

### 5.1 Health and Safety

- 5.1.1 The number of people killed in the waste and recycling industry is more than nine times the national average (HSE website). An analysis undertaken on behalf of the HSE in 2004 found that the majority of accidents occur during refuse collection activities, including musculoskeletal injuries as a result of slips, trips and falls; sharps injuries; and injuries resulting from transport related incidences<sup>17</sup>.
- 5.1.2 Given this context, there has been much debate as to the relative health and safety risks associated with different methods of kerbside recycling collection. A study carried out by the Health and Safety Laboratory (HSL) in 2006 recommended, where possible, the use of wheeled-bins for the collection of recyclables in order to reduce the risk of injury from manual handling<sup>18</sup>. The study also recommended that, where boxes were used for kerbside recycling, the box capacity should be reduced to 40-litres and suggested that lids were used both to control overfilling and protect the contents from rainwater. The Centre for Health and Environment Research and Expertise (CHERE) undertook a similar study but looked specifically at the health and safety issues associated with the use of boxes and bags<sup>19</sup>. The research concluded that there were no significant risks associated within kerbside recycling operations using boxes and bags that could not be effectively managed and controlled.
- 5.1.3 There have been a number of criticisms levied at the HSL research, e.g. confusing boxes with slave bins; relatively small sample size; and no consideration of the wider health and safety issues following the collection of materials such as operations at a bulking facility or MRF (NB the latter two points could also be applied to the CHERE study, although they recognise that all steps of the collection process need to be considered).
- 5.1.4 An extensive study<sup>20</sup> carried out by the HSL on behalf of the HSE adopted an holistic approach to assess the health and safety risks of systems for collection, transfer, treatment and processing of household waste and recyclables. The project has devised a Risk Comparator Tool, an Excel-based

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<sup>17</sup> BOMEL Ltd (2004) Mapping health and safety standards in the UK waste industry, HSE Research Report, CRR 240

<sup>18</sup> HSL (2006) Manual handling in kerbside collection and sorting of recyclables (HSL/2006/25)

<sup>19</sup> CHERE (undated) A Health & Safety Study of Kerbside Recycling Schemes Using Boxes and Bags.

<sup>20</sup> HSL (2008) Collecting, transfer, treatment and processing household waste and recyclables, RR609.



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spreadsheet for local authorities to compare the level of health and safety risk for different systems across the full life cycle. This can then be used to aid the decision-making process regarding the selection of suitable collection systems for the particular local authority. The Risk Comparator Tool is currently being updated and simplified to reflect user's experiences.

- 5.1.5 While a detailed consideration of the health and safety issues surrounding kerbside collection of dry recyclables is beyond the remit of this report, it is worth highlighting that some authorities have found there to be health and safety benefits from moving from kerbside sort to co-mingled collections (e.g. Harrow and Lichfield). A letter to this effect from the Branch Secretary of Harrow Unison is included in Appendix 5.

## 5.2 Public Opinion

- 5.2.1 Successful recycling schemes are those that are simple, user-friendly, well designed and effectively communicated. Comments from the case study local authorities reinforce this view as the following indicates:

- Central Beds - Resident surveys indicate a very positive view of the recycling services provided; the food waste service is particularly liked.
- Elmbridge - Residents generally very happy with co-mingled recycling service – main complaint is that only plastics collected are bottles.
- Harrow - Positive and easy to follow.
- Somerset Waste Partnership – 87% of residents responding to a survey in the SORT IT PLUS trial area (service package 5) indicated that the collections for recycling and refuse were much better or better than the previous waste collection arrangements (i.e. with addition of cardboard and plastic collected weekly) and 83% stated they were recycling a lot more or more.
- South Bucks - A survey was sent out to all residents in July 2009 - responses showed that satisfaction with local recycling collection services was at 90% overall.
- South Oxfordshire - Many [residents] welcomed wheeled-bins and the addition of glass to the kerbside collections.
- Stratford - The increase in types of material we collect was met with a very positive response.



## Review of Kerbside Recycling Collection Schemes

5.2.2 The success of Lichfield's recycling scheme is summed up by the following comment by a resident:

"I think the blue bin is a great improvement. It means we no longer have to separate recycling or carry heavy boxes each week. At first I thought I might struggle with a collection every other week, but it has been fine, as the bin is more than big enough to take all our recycling. Another bonus is that our local streets are much tidier now that we're using the blue bins, because recycling doesn't blow away. So, it's been a really successful change all round."

*(Source: The Lichfield blog - <http://thelichfieldblog.co.uk/2009/09/10/burntwood-and-lichfield-residents-to-get-new-recycling-bins/>).*

5.2.3 The comment in the paragraph above regarding streets being cleaner when recycle is contained in a wheeled-bin concurs with evidence from a recent trial using wheeled-bins in LB Enfield (where WYG carries out NI195 inspections for the council).

5.2.4 To reiterate, successful recycling schemes of whatever design need to be simple to use and (alongside the associated communications activity) address the four key barriers to participation as suggested by WRAP:

- situational barriers including not having adequate containers, a lack of space for storage, unreliable collections, unable to get to bring sites;
- behaviour, for example not having the space or systems in place in the home to recycle, being too busy with other preoccupations, difficulties in establishing routines for sorting waste and remembering to put it out;
- lack of knowledge such as knowing what materials to put in which container, and understanding the basics of how the scheme works; and
- attitudes and perceptions such as not accepting there is an environmental or other benefit, being resistant to householder sorting or not getting a personal motivational reward from recycling<sup>21</sup>.

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<sup>21</sup> WRAP (2008) Barriers to Recycling at Home



## **Appendix 1: Methodology for WasteDataFlow Analysis**



## Methodology for Analysis of Waste DataFlow

- Downloaded Q10 kerbside recycling tonnes for English local authorities from WDF for 2008/09
  - Tonnage collected for recycling
  - Tonnage collected for recycling but actually rejected/disposed
  - Grouped data into co-mingled, kerbside sort materials and materials collected as specials – bulkies etc.
    - Total co-mingled
    - Total kerbside sort
    - Total other (e.g. fridges, furniture, wood)
  - Subtracted the rejected/disposed data from the tonnage collected for recycling
    - NB Some authorities mistakenly put their MRF reject data here, so it's important to subtract this data
  - Derived % co-mingled = total co-mingled/ (total co-mingled + total kerbside sort) = % of materials by weight collected co-mingled out of all materials collected for recycling through normal kerbside collections
- Downloaded Q58 MRF reject data
  - Tonnage input
  - Tonnes for Recycling
  - Tonnes rejected to Energy Recovery
  - Tonnes rejected to Landfill
  - Tonnes rejected
  - % for Recycling
  - % rejected
  - If % rejected = 0 and % rejected at kerbside = 0, adjust % rejected to 10% = “% rejected at MRF adjusted to 10%”
- Applied the adjusted % rejected to the net tonnage collected co-mingled at kerbside
- Derived kg/hh and kg/person for (net) co-mingled, kerbside sort and sum of these two (= kerbside recycling)
- Grouped authorities:
  - 100% co-mingled – none collected kerbside sort
  - 100% kerbside sort – none collected co-mingled
  - Derived min, max, 25<sup>th</sup>/50<sup>th</sup>/75<sup>th</sup> percentiles, weighted and unweighted averages for each of these groups and overall

### **All LAs: Recyclate collected in kg/household:**

Minimum: 0

25th percentile: 121

50th percentile: 155

Average (unweighted): 154

**Average (weighted): 145**

75th percentile: 184

Maximum: 285



**100% co-mingled: Recyclate collected in kg/household:**

Minimum: 63

25th percentile: 144

50th percentile: 171

Average (unweighted): 174

**Average (weighted): 163**

75th percentile: 196

Maximum: 285

**100% kerbside sort: Recyclate collected in kg/household:**

Minimum: 49

25th percentile: 107

50th percentile: 140

Average (unweighted): 139

**Average (weighted): 131**

75th percentile: 166

Maximum: 239



## **Appendix 2: Survey Sent to Local Authorities**

# Review of Kerbside Recycling Collection Schemes



Authority:		Completed by:	
<b><u>General</u></b>			
1	What is the total number of households in the district/borough?		
2	What was the overall tonnage of household waste collected in 2008/09, and for year to date?		
3	What was the overall tonnage of recyclate collected in 2008/09, and for year to date?		
4	What was the overall tonnage of composting collected in 2008/09, and for year to date?		
5	If you have changed your refuse/recycling collection system in the last few years please state when you changed systems and what the change was (e.g. weekly residual to AWC).		
6	What feedback have you had from residents regarding the kerbside recycling service (positive and negative)?		
<b><u>Residual Waste Collection</u></b>			
7	What is the frequency of residual waste collection?		
8	What container type, if any, is provided by the Council?		
9	Where is residual waste disposed of to – landfill, energy from waste?		
10	What was the annual tonnage of residual household waste in 2008/09, and year to date 09/10?		
<b><u>Compostables</u></b>			
11	Do you collect food waste?	Yes	No (if no, go to Q18)
12	How many households do you collect food waste from?		
13	How frequently do you collect food waste?		
14	Is food waste collected separately or mixed with garden waste?		

## Review of Kerbside Recycling Collection Schemes



15	What type, and size, of container is food waste collected in?	
16	Is food waste collected on the same vehicles as residual/recycling/garden waste vehicles (e.g. either a podded vehicle or split-bodied – please specify which)	
17	What was the annual tonnage of food waste in 2008/09 (if separate collection) and year to date 09/10?	
18	Do you collect garden waste from properties?	Yes <span style="margin-left: 100px;">No (if no, go to Q20)</span>
19	Please describe the service, including whether it is a free or chargeable service, and frequency of collection, type of container.	
<b><u>Kerbside recycling collection</u></b>		
20	How many households are served by the property recycling scheme?	
21	What is the frequency of recycling collection?	
22	What container type (including size), if any, is provided by the Council?	
23	Please list the materials collected – are these collected co-mingled, partial sorted or kerbside sorted?	
24	What types of vehicles are used to collect kerbside recycle (e.g. standard RCV, kerbsider)?	
25	Please describe the service provided to multi-occupancy properties. Do you collect the same range of materials?	
26	What was the annual tonnage of kerbside recycle in 2008/09 and for the year to date?	
27	If materials are partial sorted or kerbside sorted, please provide the annual tonnage in 2008/09, and for the year to date, for each material type.	
<b><u>Processing of recycle</u></b>		
28	What happens to the kerbside recyclable material once it has been collected? Do you use a MRF? Where is the bulking facility and/or MRF located?	
29	What level of contamination do you experience on average? (whether kerbside sort material or using a MRF)	



## **Appendix 3: Letter from Harrow Unison**

## Review of Kerbside Recycling Collection Schemes



*Harrow L.G. Branch  
The UNISON Office  
Central Depot, Forward Drive  
Harrow, Middlesex  
UK  
HA3 8NT*

*Tel: 020 8424 1795  
Fax: 020 8424 1835  
Email: [info@harrow-unison.org.uk](mailto:info@harrow-unison.org.uk)*

*Branch Secretary: Gary Martin*

26<sup>th</sup> January 2010.

Dear Mr Brown,

Further to our brief conversation regarding the use of a Multi Recycling Facility (MRF) and the co-mingled collection method, I can confirm that Harrow Unison LG supported this method of collection. This method removed the Kerb side Box collection which we as a branch viewed as a major Health and Safety issue that would impact on our members RSI and MSD over a sustained period of time.

I hope this provides clarity regarding the stance that this local government Branch of unison has adopted.

Kind Regards  
G. Martin  
Branch Secretary  
Harrow Unison LG