



# Review of Kerbside Recycling Collection Schemes in the UK in 2009/10

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## Foreword

Local authorities face continuing pressure to divert more waste from landfill, primarily through recycling. At the same time, they are having to squeeze budgets and cut services.

Against this backdrop, WYG presents its second report reviewing kerbside recycling collection systems in the UK. We know that our last report, published in May 2010, generated much interest both here and abroad.

At this stage, we should clarify – for fear of being misrepresented – that WYG believes that it is entirely the choice of local authorities as to which recycling system they choose to operate. WYG is only interested in assisting local authorities to improve service performance within affordable budgets. The purpose of this new report is to provide useful information and facts to help inform their decision-making.

WYG has a strong history of supporting local authorities in their endeavours to improve performance. This can be in a very direct hands-on fashion, designing and/or rolling out new systems. At other times, our support, for example, assists in procuring a new contract. Recent examples of WYG's work include local authorities using kerbside-sort systems (e.g. North Somerset and West Devon) and those using co-mingled systems (e.g. Surrey Heath and Tewkesbury).

Commentators who suggest that WYG has a vested interest in one system over another are misguided. We strongly believe that each case is unique and should be examined separately, and that the choice of appropriate systems must take local preferences and factors into account. In any such examination, objective facts and evidence should and must be considered, not dogma.

WYG is grateful for the financial contribution and support of Biffa. It must be stressed that this is an independent report, largely funded by WYG and with no public funding whatsoever.

We hope this report proves useful to local authorities looking to the future.

Len Attrill, Project Director



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## 0.0 Executive Summary

- 0.1.1 This report is an update to WYG's 2010 report, 'Review of Kerbside Recycling Collection Schemes Operated by Local Authorities', which analysed performance of local authorities in England in 2008/09. In this new report, we have brought the analysis up to date for the most recent full year available, 2009/10, and expanded the scope of the report to cover the whole of the UK. This year, the report's focus is on kerbside dry recycling performance, rather than overall recycling and composting or dry recycling from all sources.
- 0.1.2 In this report, comparisons are made between the UK's different nations, between different collection schemes, frequencies of residual waste and recycling collections, containers used for residual waste and recycling, and the number of materials targeted. The top 30 dry recycling performers are analysed in detail, as are the top improvers.
- 0.1.3 Analysis shows that the highest dry recycling performances are achieved with:
- 100% co-mingled dry recyclates collected fortnightly in wheeled bins, plus
  - refuse collections being made fortnightly from wheeled bins, and
  - at least the five main materials being collected for recycling: i.e. paper, card, cans, glass and plastic bottles.
- 0.1.4 Of the 13 top improving authorities in 2009/10, 11 moved to wheeled bins for co-mingled recycling collections. Wheeled bins for recycling have sufficient capacity for collections to be made fortnightly without cutting yield. Kerbside sort collections need multiple containers or weekly collections to maximise yield.
- 0.1.5 All 13 top improvers used wheeled bins for refuse, with 4 moving to smaller refuse bins and 6 moving to fortnightly refuse collections. However, 3 maintained weekly refuse collections in normal-sized bins. Wheeled bins for refuse 'squeeze' residual waste, particularly if collected fortnightly, so improving diversion. However, weekly refuse collections can be maintained without decreasing diversion by using smaller residual bin sizes, or by optimising recycling (and composting) collections, for example, by moving to co-mingled collections using wheeled bins.



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- 0.1.6 Affluence and deprivation also have an impact, but on average, co-mingled collections out-perform kerbside sort collections by a similar margin (30 – 40 kg per household per year) across the affluence/deprivation spectrum.
- 0.1.7 The analyses also show that there is a wide range of performance under different collection systems – there is no guarantee of high performance. Whatever the system, collections need to be optimised, albeit under the constraint of local authority budgets.
- 0.1.8 The need for kerbside sort collections to be made weekly (whereas co-mingled collections can be made fortnightly without reducing yield) is often **not** taken into account in cost modelling comparisons between the two systems. This has a significant impact on comparative collection costs.
- 0.1.9 The difference in yields between the two systems is also often ignored in comparative cost modelling, thus ignoring the significant differences in landfill diversion savings.
- 0.1.10 In addition, historic materials recycling facility (MRF) contract costs have often been used in modelling, rather than current costs, whereas recyclate prices for kerbside-sorted materials have often been more up-to-date. Again, this can lead to serious distortions in costs.
- 0.1.11 These factors combine to increase, unfairly, the modelled costs of co-mingled collections, which are then said to be higher than for kerbside sort. WYG believes that fair comparisons should be made using current market prices. The best cost comparison might be made by letting the market decide i.e. each tenderer proposes competitive costs based on current market prices and their own in-depth market knowledge.
- 0.1.12 Ultimately, each local authority needs to make a decision on what is best for them, for their area and residents, and under local conditions. WYG can assist local authorities in this important process, providing pragmatic guidance and insights to help achieve cost-effective performance. This report is an important contribution to that process.



## 1.0 Introduction and Background to this Report

- 1.1.1 In 2010, WYG published a report, 'Review of Kerbside Recycling Collection Schemes Operated by Local Authorities', which analysed the performance of local authorities in England in 2008/09. The aim of that report was to compare yields, costs, quality of materials and operational considerations between co-mingled and kerbside-sort collections.
- 1.1.2 In this year's report, we have brought the analysis up to date for the most recent year available, 2009/10, and expanded the scope of the report to cover the whole of the UK. The aim of this report is to highlight the characteristics of high performing kerbside dry recycling schemes in the UK. We have not revisited all our previous analyses, nor have we performed exhaustive benchmarking or regression analyses. Rather, we show the range of performances achievable under different collection systems, and focus on features that enhance yields. We believe this is of most value to local authorities, which want concise, accurate information on the practical steps they can take to improve performance while containing or reducing costs.
- 1.1.3 When we published our previous report in May 2010, Defra, WRAP, the Welsh Assembly Government (WAG) and others had stated that kerbside-sort was preferable to co-mingled collections since there was no significant difference between the amounts captured by the two systems, and that kerbside-sort was generally cheaper and the quality of recyclate better.
- 1.1.4 Our 2010 report challenged those assumptions and showed, in general, that:
- Co-mingled collections can produce higher yields than kerbside-sort schemes;
  - Comparative costs depend on local circumstances, particularly the proximity and available capacity of a suitable Materials Recovery Facility (MRF), although savings due to landfill diversion achieved by higher yields from co-mingling tend to favour co-mingling;
  - The quality of the recyclate depends on MRF set-up – newer MRFs can recover a wider range of materials and produce fewer rejects – as well as the quality of materials set out by householders. This latter aspect can be influenced by clear communications.
- 1.1.5 The report generated considerable interest, both in the UK and internationally.





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- 1.1.6 It is interesting to note that WRAP recently changed its position on the effect of different recycling schemes. WRAP's 'Analysis of kerbside dry recycling performance in the UK 2008/09' dismissed differences between co-mingled and kerbside sort systems, concluding that:

*"The difference in performance between kerbside sort and co-mingled systems is thought to be due to the larger kerbside dry containment capacity often provided with co-mingled systems."*

- 1.1.7 However, in 2011, WRAP released the report 'Kerbside Collections Options: Wales', which contained a re-analysis of the same dataset, and stated that:

*"Kerbside dry recycling yields can be expected to, on average, be lower than co-mingled recycling yields (all other factors being equal) as follows:*

*10.5% lower if kerbside dry collections are carried out weekly; and*

*18.3% lower if kerbside dry collections are carried out fortnightly."*

- 1.1.8 The same report includes a remarkable assumption that kerbside-sort schemes will have a reduced difference in yield under a 70% recycling scenario (the WAG target for 2024/25) since:

*"It has been assumed that some of the factors driving variation in yield at current performance levels would be addressed. This seems logical, as WAG and Welsh local authorities will have to achieve a significant step change in public behaviour generally, perhaps driven by a policy framework enhanced to further incentivise recycling, if the 70% target is to be met."*

- 1.1.9 This implies, since the WAG insists on kerbside-sort schemes and a 70% recycling target, that *kerbside-sort must necessarily meet the target*. This is wishful thinking, rather than an objective analysis of which collection characteristics would achieve 70% recycling – a figure that is now being approached in reality by some authorities in the UK such as South Oxfordshire, Vale of White Horse and Surrey Heath.

- 1.1.10 To estimate yield and cost differences, WRAP's report for the WAG assumes that co-mingled collections are made weekly from sacks. This narrows the differences in yield and imposes an unnecessary cost burden, as fortnightly fully co-mingled collections using a wheeled bin provide sufficient capacity and perform equally well as weekly. This appears to be an attempt to not only minimise yield differences between the two systems, but also minimise cost differences. To fairly compare real-life optimised modes of operation, comparisons need to be made between fully co-mingled collections made fortnightly and kerbside-sort collections made weekly. When this is done,



fortnightly co-mingled collections clearly require lower numbers of vehicles and crew than is the case for weekly kerbside-sort collections. In consequence, there are lower vehicle purchase or hire costs, lower fuel costs, lower maintenance costs and lower wage bills.

1.1.11 In addition, for collection systems to achieve optimum yields, they need to collect cardboard, plastic bottles and other plastic containers. Some kerbside-sort systems do manage to collect these items, but this leads to additional costs due to the need for specially designed or modified vehicles and slower work rates for crews on top of the need for kerbside sort systems to collect weekly.

1.1.12 Collections producing higher yields will result in higher residual waste diversion, leading to reduced disposal costs and reduced LATS/LAS liabilities if landfill is used. With landfill taxes increasing by £8 each year until at least 2014, this difference will become even more significant. Many studies comparing co-mingled and kerbside-sort collections fail to account for the differences in residual wastes, thus ignoring the resulting significant cost differences.

1.1.13 In comparing the schemes, MRF costs must be accounted for in co-mingled schemes. Recent studies, such as the WRAP gate fee study, report MRF costs based on surveys of rates paid in local authority contracts of various vintages. However, MRF fees have reduced massively in recent years, to the point that negative fees are becoming the norm in current procurement, even with glass included in the mix, i.e. the MRF operator pays the local authority for the co-mingled recycle, often including collection from the authority's transfer station. Local authorities deciding whether to change collection systems need to make their decisions based on current costs and likely future costs, not historic costs that happen to be paid by local authorities that have not gone to the market for some time.

1.1.14 For the reasons given above, WYG believes that, in general, co-mingled collections using modern MRFs achieve higher yields, lower collection costs, and reduced disposal costs for residual waste. However, co-mingled collections are not necessarily best or suitable for every authority, and decisions must be based on full analysis of all relevant facts and information. It is up to each local authority to decide what is best for them.

1.1.15 Collections also need to be optimised to get the best performance as there are still a lot of collections that perform poorly. Target materials need to be agreed, based on MRF availability and the costs for co-mingled systems, balanced against recycle values, yields and collection costs for kerbside-sort systems. Effective procurement needs to obtain the best prices for MRF processing or sales of materials to recycle merchants and processors. Decisions must be made about the best





container choice, for instance, whether wheeled bins are suitable for both recycle and residual waste. Funding for changes in containers needs to be sought, procurement undertaken, and delivery managed, itself a large task. Vehicle routing should be optimised to minimise miles travelled, fuel costs and crew time, and to avoid congestion as much as possible. Then the new system needs to be rolled out, accompanied by an effective communications campaign that ensures maximum participation and materials capture.

- 1.1.16 WYG is able to assist local authorities with all of these elements – analyses, options appraisals, business cases, negotiations, procurement, routing, bin deliveries and roll out – and has extensive experience of each. Funding pressures will continue to squeeze local authorities, while they have to cope with fewer staff who may not previously have undertaken these activities. We are able to relieve the burden on local authority staff and often achieve major savings.
- 1.1.17 We hope that this report is of even more value than our last, of which WRAP said “...definitely contributes something to the debate and is a substantial achievement”. Since then, as noted earlier, WRAP has had to acknowledge that there is indeed a difference in performance between co-mingled and kerbside sort collections.
- 1.1.18 Local authorities can use the graphs of yield ranges in this report to benchmark their own performance. (The latest available WRAP benchmarks are for 2008/09, not 2009/10, as presented here).
- 1.1.19 We look forward to continuing to help local authorities improve performance further within their budgetary constraints.



## 2.0 Method

2.1.1 This report analyses kerbside dry recycling yields for unitary and waste collection authorities in the UK in 2009/10 and 2008/09. Yields for each local authority were calculated from WasteDataFlow figures as follows:

- Tonnages of materials collected for recycling at the kerbside were extracted from Question 10, including tonnage recorded as co-mingled;
- Materials such as garden waste, food waste and bulky materials were excluded, to leave only materials collected in kerbside dry recycling schemes (see Appendix A);
- Tonnage input to Materials Recovery Facilities (MRFs) and tonnage output for recycling were extracted from Question 58;
- A MRF recycling rate was derived for each authority (tonnage output for recycling / tonnage input), with 90% assumed if MRF tonnage figures were missing (i.e. a reject rate of 10%);
- The MRF recycling rate was applied to the co-mingled tonnage collected at the kerbside to obtain a tonnage adjusted for MRF rejects;
- The adjusted kerbside recycling tonnage was divided by the number of dwellings in the 4th quarter for the relevant year, as reported in WasteDataFlow Question 2, and multiplied by 1,000 to obtain the average yield in kg per household per year.

2.1.2 Authorities were characterised as having either 100% co-mingled kerbside collections, 0% co-mingled or 'Other', based on the percentage of kerbside tonnages that were reported as collected co-mingled over the year. This was obtained from the co-mingled tonnes reported for Question 10 divided by the total kerbside dry recycling tonnes reported for Question 10.

2.1.3 Authorities recorded as having 100% co-mingled materials collected all materials co-mingled from all households over the entire year, i.e. all materials were taken to a MRF for sorting.

2.1.4 Authorities recorded as having 0% co-mingled materials should have either operated kerbside-sort collections (with householders presenting materials in one container and operatives separating the materials into different compartments on the collection vehicle) or collected materials in separate streams from different containers, for example, paper in one sack and cans in another





(i.e. materials separated by householders). However, some authorities collecting co-mingled materials did not enter a co-mingled tonnage, instead erroneously recording tonnages under separate materials (e.g. paper, cans plastic) in Question 10, based on estimated composition. For the purposes of this study, we have had to assume that authorities recording 0% co-mingling did not collect any kerbside materials co-mingled.

2.1.5 Authorities that collected between 0 and 100% co-mingled over the course of the year are categorised as 'Other'. They either: operated a multiple stream collection (with one or more streams co-mingled and one or more materials collected separately); provided co-mingled collections to some but not all households; changed collection type during the year; or a combination of these. For the purposes of this study, we have not further analysed the nature of 'Other' collections, except in relation to particular authorities of interest.

2.1.6 The figures in this report show yield ranges for authorities in the UK. In all bar charts, the ranges are divided into:

- 'Upper quartile', the best performing 25% of authorities, shown in green;
- 'Above median', the next 25% of authorities, shown in yellow;
- 'Below median', the next 25% of authorities, shown in orange;
- 'Bottom quartile', the worst performing 25% of authorities, shown in red.

2.1.7 The numbers shown on the bars are the maxima, minima and boundaries between each quartile.

2.1.8 The figures in brackets underneath each column are the numbers of authorities included in the analysis. Authorities that did not submit the necessary data to WasteDataFlow are not included. In for 2009/10, four authorities did not submit kerbside tonnage data: Aberdeenshire, Dumfries & Galloway, Glasgow and the Isles of Scilly.



### 3.0 Results

#### 3.1 Yields for Kerbside Dry Recycling from Different Collection Systems

3.1.1 Figure 1 shows that England achieved the highest maximum kerbside dry recycling yield, followed by Wales, Scotland and Northern Ireland. However, the range of performance in each country is wide, except for Northern Ireland, where authorities achieve remarkably similar performances.

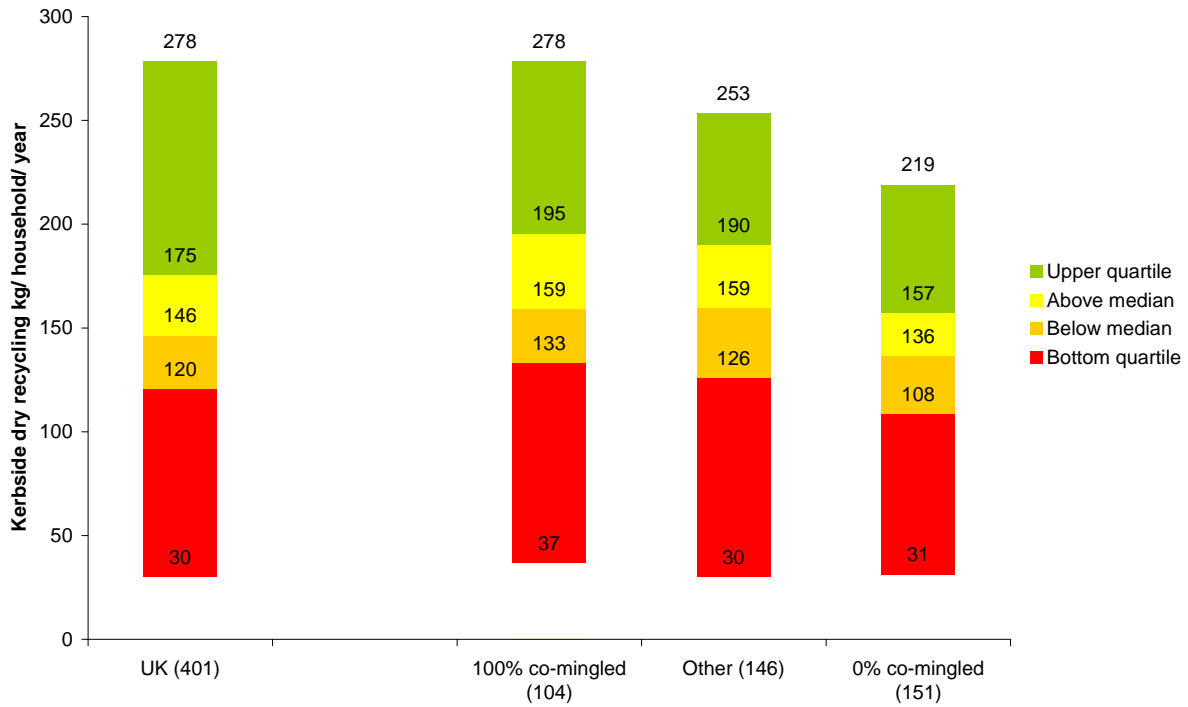
**Figure 1. Recycling Collection Yields across the UK in 2009/10**



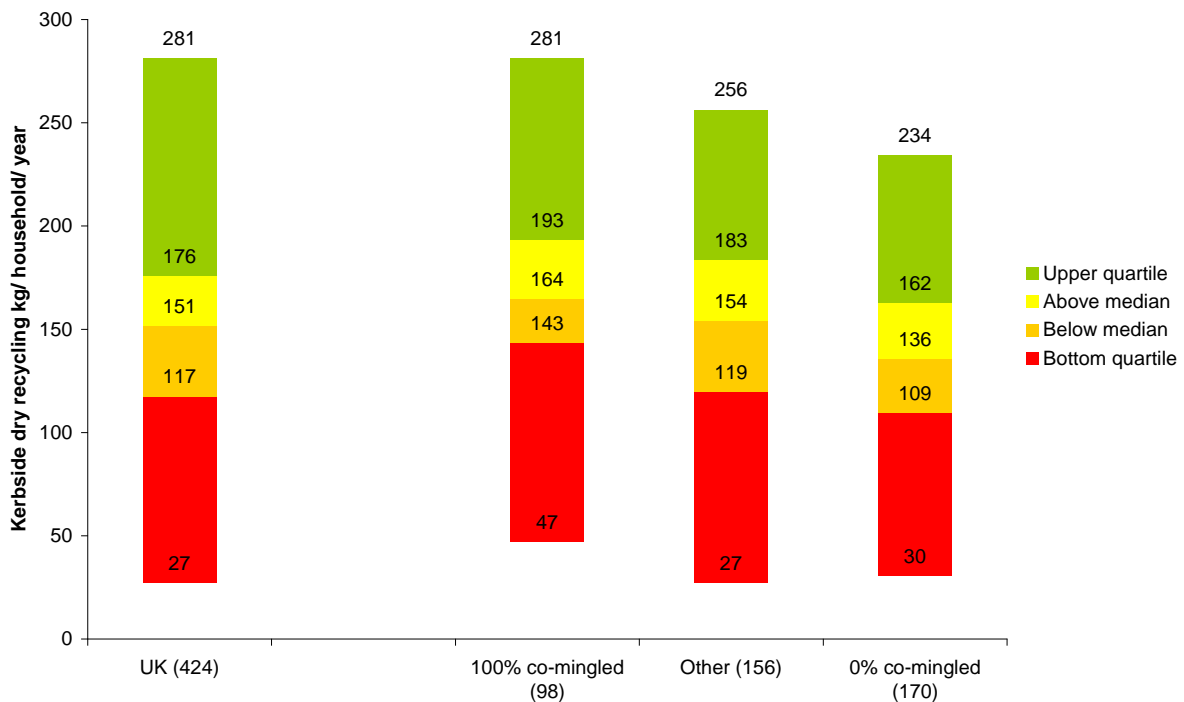
3.1.2 Yields in 2009/10 for authorities operating 100% co-mingled, 0% co-mingled and 'Other' (those collecting some but not all materials co-mingled over the year) are shown in Figure 2, and yields for 2008/09 are shown in Figure 3. Each collection type exhibits a wide degree of variation in both years. However, in each year, the highest performing authorities collected 100% co-mingled recyclate. The next best performing type is the 'Other' group, and the maximum yield is lowest for 0% co-mingled authorities. The difference in means between the 100% co-mingled and the 0% co-mingled groups is 24%, and the difference is 'very highly significant', i.e. significant at more than the 99.9% level.



**Figure 2. Comparison between Recycling Collection Systems across the UK in 2009/10**



**Figure 3. Comparison between Recycling Collection Systems across the UK in 2008/09**





### 3.2 Changes in Yield

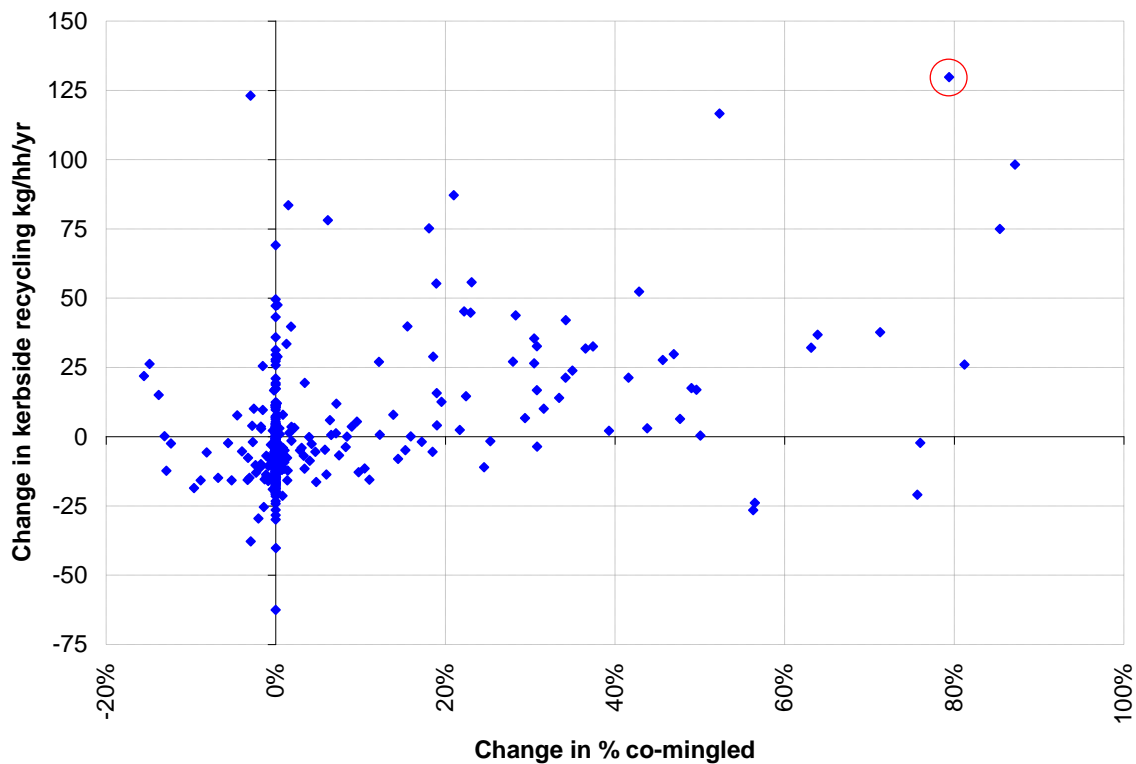
3.2.1 Figure 4 compares the change in kerbside recycling yield with the change in the percentage of materials collected co-mingled for each authority between 2008/09 and 2009/10:

- Authorities to the right of the vertical axis increased the amount collected co-mingled; those on the left decreased the amount collected co-mingled;
- Authorities above the horizontal axis increased yields, those below decreased yields.

3.2.2 It can be seen that many authorities increased the amount collected co-mingled and increased yields (the top right quadrant).

3.2.3 For instance, Surrey Heath, the highest improver (shown circled in Figure 4), increased its yield by 130 kg/household between 2008/09 and 2009/10. It changed from 0% co-mingled in 2008/09 to 100% co-mingled by the end of 2009/10, averaging 79% co-mingled over 2009/10.

**Figure 4. Changes in Yield Compared with Changes in Percentage Collected Co-mingled**





- 3.2.4 Authorities that increased the percentage of materials collected co-mingled on average increased yields by 12 kg/hh/yr, with those increasing co-mingling by more than 50% increasing yields by an average of 37 kg/hh/yr. Authorities that decreased the percentage collected co-mingled on average decreased yields by 3 kg/hh/yr.
- 3.2.5 Many authorities remained either 100% co-mingled or 0% co-mingled, so did not change the percentage collected co-mingled. These authorities are shown clustered on the vertical axis. Further analysis was made for these authorities.
- 3.2.6 For the 80 authorities that operated 100% co-mingled collections in both years, yield decreased by an average of 5 kg/hh/yr, and three-quarters had falls in yields.
- 3.2.7 For the 133 authorities operating 0% co-mingled collections in both years, the average decrease was also 5 kg/hh/yr, and three quarters again had falls in yield.
- 3.2.8 From inspection of collection tonnages for each material, falls tended to be caused by a drop in paper tonnages, which is likely to be due to fewer people buying newspapers and magazines in the recession and a reduction in the number of freesheets, pages and inserts, due to a drop in advertising. Yields of glass, plastics and cans appear to be maintained, although rolling out collections of these materials to more households may have compensated for drops in yields per household served.



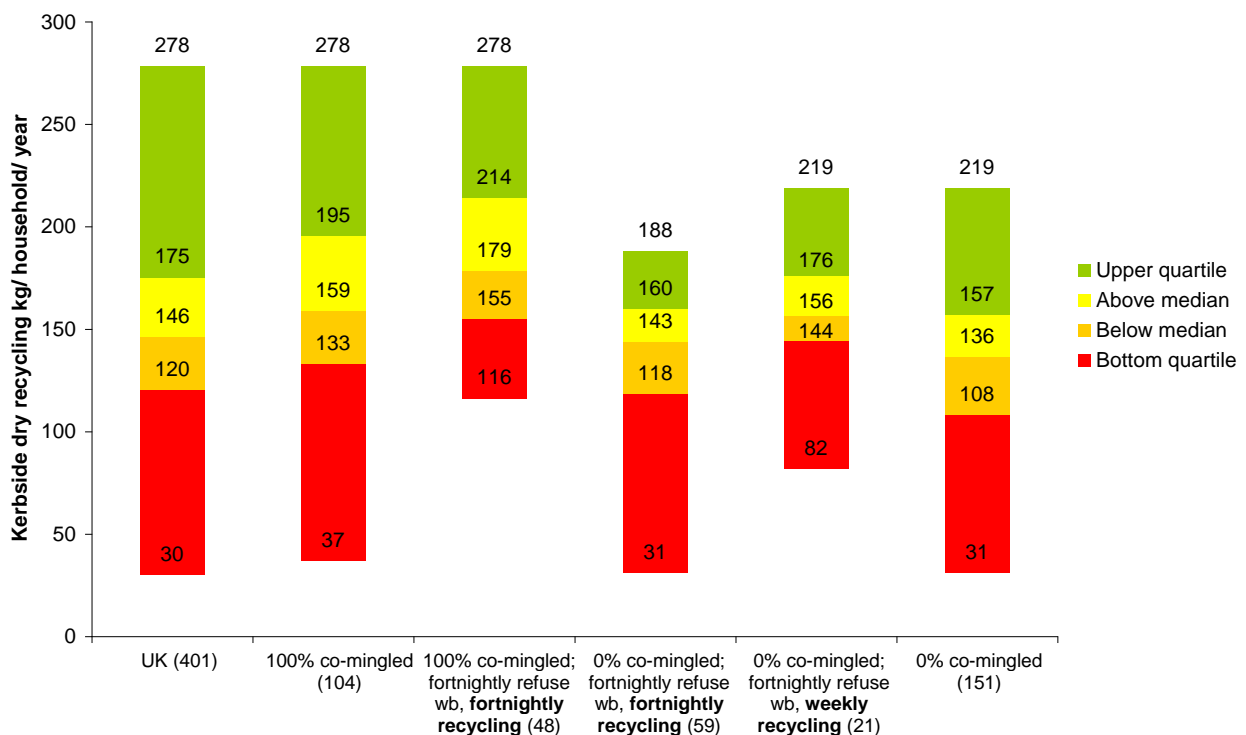


### 3.3 Factors affecting recycling performance

- 3.3.1 Analyses were also undertaken of yields for other variations in waste collection schemes: collection frequencies, containers or target materials, and the resulting graphs are shown in Appendix B. The graphs illustrate that the highest performances are found for authorities with fortnightly refuse and recycling collections from wheeled bins, with 100% co-mingled recycling.
- 3.3.2 As mentioned previously, the latest WRAP report on kerbside recycling using the 2008/09 dataset found that, all other factors being equal, kerbside-sort schemes collected fortnightly can be expected to achieve 18.3% less than co-mingled schemes, with the difference reduced to 10.5% if the collections are made weekly. Stated the other way round (since authorities tend to move from kerbside sort to co-mingled), co-mingled collections achieve 22.4% more than kerbside sort for fortnightly collections or 11.7% for weekly collections, all other factors being equal.
- 3.3.3 Our analyses found that the difference in mean performance between 100% co-mingled and 0% co-mingled schemes in 2009/10 was 24%. Some of the difference could be due to factors in addition to the recycling collection type, and these are discussed further below and in Appendix B.
- 3.3.4 Some commentators have suggested that higher yields for fully co-mingled collections are due to these schemes tending to use wheeled bins for recycle. This does not however negate the advantage of co-mingling: co-mingled collections can use wheeled bins and kerbside-sort schemes cannot. Wheeled bins are simple for householders to use: recycling is as easy to dispose of as refuse; the contents are not visible to others and do not blow down the street. The capacity of a 240-litre wheeled bin is 4 to 5 times larger than typical kerbside boxes, so kerbside-sort schemes need to collect recycling weekly and/or provide multiple boxes to provide the same capacity as co-mingled collections using wheeled bins. The latter system can use fortnightly collections without a reduction in yield compared to weekly collections (see Appendix B).
- 3.3.5 Commentators also suggest that higher yields for fully co-mingled collections are due to the predominance of alternate weekly collections, with refuse also collected fortnightly in wheeled bins. To control for the effect of the refuse collection system, analysis was made only of authorities collecting refuse fortnightly in wheeled bins and comparison was made between 100% co-mingled recycling collections made fortnightly and 0% co-mingled collections made fortnightly or weekly. Figure 5 shows the ranges for these collection systems together with the general ranges for 100% and 0% co-mingled schemes and all collections in the UK. The figure illustrates that collecting

refuse fortnightly in wheeled bins does tend to improve performance for 100% co-mingled collections, even with recycling collected fortnightly, but to achieve maximum yields, 0% co-mingled schemes need, in addition, to collect recycling weekly.

**Figure 5. Recycling Yields for Different Collection Systems in 2009/10**



3.3.6 Commentators have also suggested that the increased yield from 100% co-mingled collections could be due to these collections being more prevalent in more affluent areas. It is true that more affluent areas tend to produce higher recyclate yields; more affluent householders tend to generate more waste materials, particularly paper and glass, and tend to participate more in recycling than less affluent householders, who may have less storage space for recycling and other priorities.

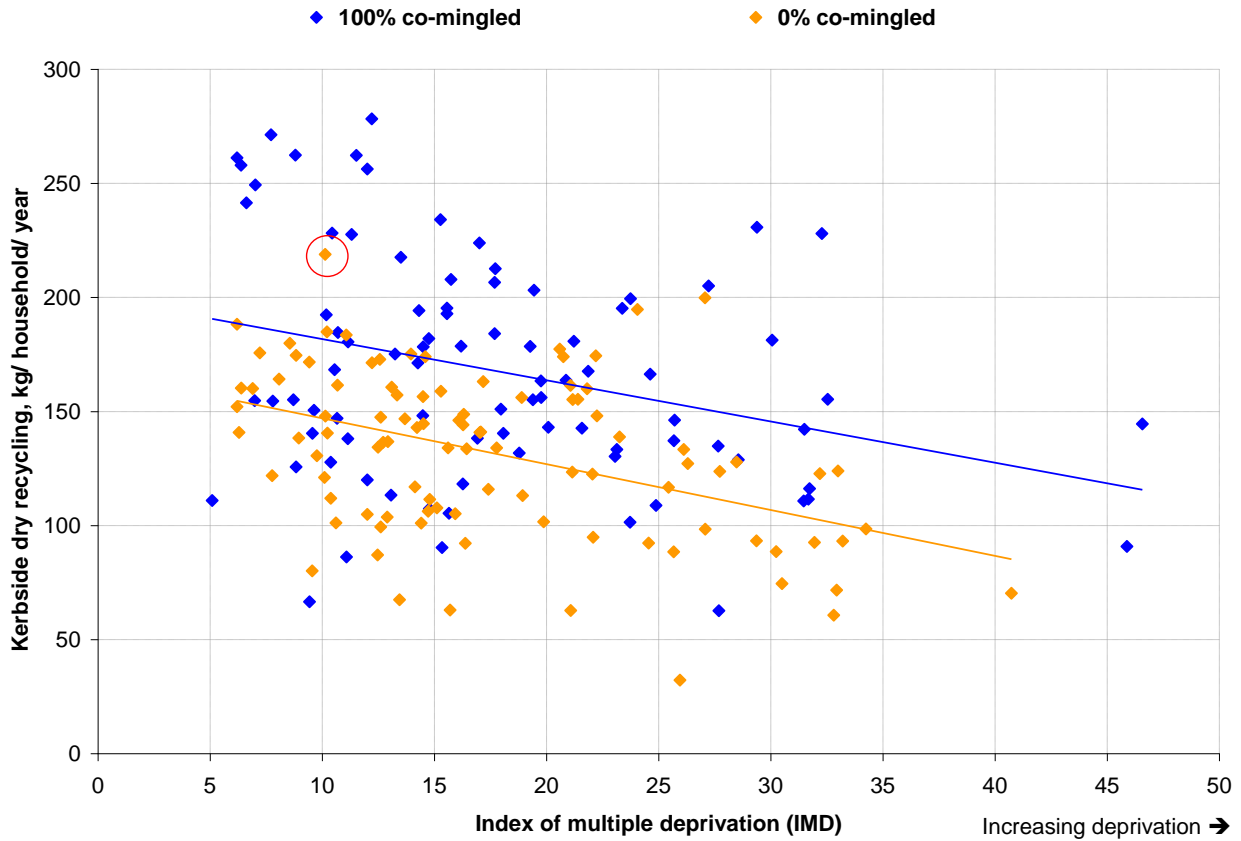
3.3.7 Figure 6 compares yield with deprivation for both 100% co-mingled and 0% co-mingled collections in England. The deprivation measure is the Index of Multiple Deprivation (IMD)<sup>1</sup>; a low IMD indicates a relatively affluent authority and a high IMD a relatively deprived authority. The blue

<sup>1</sup> Figure 6 shows yields for English authorities only, plotted against Index of Multiple Deprivation (IMD). Other nations could not be included as each uses a different method to calculate their indices. The IMD values are for 2007, as reported in WasteDataFlow.



diamonds indicate 100% co-mingled collections and the yellow diamonds 0% co-mingled collections. Linear regression lines are also shown, in corresponding colours.

**Figure 6. Correlation between Yield and Deprivation Index for English Authorities in 2009/10**



3.3.8 The figure indicates that, on average, 100% co-mingled collections outperform 0% co-mingled collections across the spectrum of deprivation by 30 to 40 kg/hh/yr. There is, however, a range of yields for each collection type.

3.3.9 Only one 0% co-mingled authority, Melton (circled on the figure), exceeded 200 kg/hh/yr; it is relatively affluent, with an IMD value of 10. In contrast, 26 fully co-mingled authorities exceeded 200 kg/hh/yr, including Walsall and Blackburn-with-Darwen, which are significantly more deprived than Melton.





## 4.0 Top Performing Authorities in 2009/10

- 4.1.1 Table 1 shows yields for the Top 30 authorities and the percentage of materials collected co-mingled. All Top 30 authorities are in England. Of the Top 30, 23 collected 75% or more of their materials co-mingled. The bottom two authorities collected 0% and 2% co-mingled.
- 4.1.2 The frequencies of refuse and recycling collections and containers used are also shown. The frequencies are those provided to the majority of households in the last quarter of 2009/10, as reported in Questions 4 (for refuse) and 5 (for recycling) of WasteDataFlow. Fortnightly collections are highlighted to aid differentiation. The percentage of households provided with each type of container is shown, based on the number of households reported in Question 4 (for refuse) or Question 5 (for recycling) and the number of dwellings reported in Question 2. Percentages greater than 50% are highlighted to indicate the containers provided to the majority of households.
- 4.1.3 For some authorities, the sum of the percentages of refuse or recycling containers is slightly larger or smaller than 100%; this is because dwelling stock is pre-filled in WasteDataFlow but authorities often use their own figures for households. Some authorities provided more than one type of recycling container to some or all households, in which case the sum of percentages for recycling may be significantly more than 100%. For example, Castle Point provided both boxes and sacks for recycling to 95% of households, and both wheeled bins and sacks for recycling to 5% of households.
- 4.1.4 Of the Top 30, 21 collected refuse fortnightly, 23 collected recycling fortnightly, and 17 collected both refuse and recycling fortnightly, including all of the Top 10.
- 4.1.5 Wheeled bins were provided for refuse in 26 of the Top 30 authorities and for recycling in 20 out of the Top 30 authorities.
- 4.1.6 Table 2 shows materials collected at the kerbside for each of the Top 30 authorities. All authorities collected the 5 main materials – paper, card, cans, glass and plastic bottles – denoted as 'All 5'. Fifteen authorities collected other plastic containers in addition to plastic bottles, 10 collected textiles, 22 aerosols, 16 foil and 10 waxed cartons.





**Table 1. Average Frequencies of Refuse and Recycling Collections and Containment Provided**

Rank	Authority	Kerbside Recycling kg/hh/yr	% Co-mingled	Refuse				Recycling			
				Freq.	Wheeled Bins	Sacks/ Other	Com-munal	Freq.	Wheeled Bins	Kerbside Boxes	Sacks/ Other
1	South Kesteven	278.3	100%	F	100%		0.8%	F	100%		
2	South Oxfordshire	271.3	100%	F	90%	4%	5%	F	95%		4%
3	Stratford-on-Avon	262.4	100%	F	101%	5%	1.4%	F	95%	5%	
4	North Kesteven	262.3	100%	F	100%			F	100%		
5	Mole Valley	261.2	100%	F	83%	10%	6%	F	83%		16%
6	Mid Sussex	258.0	100%	F	100%			F	100%		
7	Lichfield	256.3	100%	F	99%	0.8%		F	99%	0.8%	
8	Epping Forest	253.3	78%	F	91%	3%	5%	F	5%	91%	95%
9	Elmbridge	249.3	100%	F	86%	4%	10%	F	96%	4%	
10	Rochford	245.5	98%	F	90%	0.1%	10%	F	98%		
11	Trafford	242.5	43%	W	96%	0.3%	4%	F <sup>2</sup>	100%		
12	Rutland	241.5	100%	F	96%	0.5%	3%	F	99%		0.5%
13	Castle Point	238.9	76%	W		100%		F	5%	95%	100%
14	Woking	238.4	99%	F	80%	10%	10%	F	90%		10%
15	Brentwood	235.8	75%	W		86%	14%	F			100%
16	South Holland	234.1	100%	W		100%		W			100%
17	Walsall	230.8	100%	W	94%	0.1%	6%	F	100%		0.2%
18	Epsom and Ewell	228.3	24%	F	96%	0.5%	3%	W	88%	86%	
19	Spelthorne	228.2	100%	F	81%	2%	17%	F	88%		
20	Blackburn with Darwen	228.0	100%	W	96%	2%	3%	F	98%		2%
21	Wychavon	227.6	100%	F	91%	8%	0.7%	F	91%	8%	9%
22	Guildford	225.5	10%	F	84%	10%	7%	W	3%	90%	9%
23	Rugby	224.8	97%	F	94%	0.9%	4%	F	98%		
24	Gedling	224.4	76%	F	97%	0.1%	3%	F	100%	100%	0.1%
25	Adur	223.9	100%	W	100%			F	100%		
26	Bexley	221.7	25%	F	81%	7%	11%	W	11%	84%	
27	Charnwood	220.3	75%	F	94%	6%		F		94%	100%
28	Windsor and Maidenhead	218.9	34%	W	85%	5%	9%	W	20%	79%	
29	Melton	218.9		F	96%	4%	0.6%	W		100%	
30	Tandridge	217.9	2%	W		94%	6%	W	3%	97%	97%

<sup>2</sup> Trafford collects from two bins in alternating fortnights: each bin is collected every 4 weeks but a recycling collection is provided each fortnight



## Review of Kerbside Recycling Collection Schemes in the UK in 2009/10

**Table 2. Materials Collected at the Kerbside for Top 30 Authorities in 2009/10**

Rank	Authority	Kerbside Recycling kg/hh/yr	% Co-mingled	All 5	Other plastics	Textiles	Aerosols	Foil	Cartons	Material separation/ co-mingling
1	South Kesteven	278.3	100%	✓		✓	✓	✓	✓	Co-mingled (Paper, Card, Cans, Glass, Plastic bottles, Textiles & Shoes [bagged], Aerosols, Foil, Cartons)
2	South Oxfordshire	271.3	100%	✓	✓		✓	✓		Co-mingled (Paper, Card, Cans, Glass, Plastic containers, Aerosols, Foil)
3	Stratford-on-Avon	262.4	100%	✓	✓			✓	✓	Co-mingled (Paper, Card, Cans, Glass, Plastic containers, Foil, Cartons)
4	North Kesteven	262.3	100%	✓	✓	✓	✓	✓	✓	Co-mingled (Paper, Card, Cans, Glass, Plastic containers, bags & film, Textiles & Shoes [bagged], Aerosols, Foil, Cartons)
5	Mole Valley	261.2	100%	✓						Co-mingled (Paper, Card, Cans, Glass, Plastic bottles)
6	Mid Sussex	258.0	100%	✓			✓	✓	✓	Co-mingled (Paper, Card, Cans, Glass, Plastic bottles, Aerosols, Foil, Cartons)
7	Lichfield	256.3	100%	✓		✓	✓	✓	✓	Co-mingled (Paper, Card, Cans, Glass, Plastic bottles, Aerosols, Foil, Cartons) + Textiles
8	Epping Forest	253.3	78%	✓	✓		✓	✓		Two stream: Glass; Co-mingled (Paper, Card, Cans, Plastic containers, Aerosols, Foil)
9	Elmbridge	249.3	100%	✓				✓		Co-mingled (Paper, Card, Cans, Glass, Plastic bottles, Foil)
10	Rochford	245.5	98%	✓	✓	✓	✓	✓	✓	Co-mingled (Paper, Card, Cans, Glass, Plastic containers, Aerosols, Foil, Cartons) + Textiles, Shoes
11	Trafford	242.5	43%	✓			✓	✓		Two stream: Paper, Card; Co-mingled (Cans, Glass, Plastic bottles, Aerosols, Foil)
12	Rutland	241.5	100%	✓			✓	✓		Co-mingled (Paper, Card, Cans, Glass, Plastic bottles, Aerosols, Foil)
13	Castle Point	238.9	76%	✓	✓	✓	✓			Three stream: Glass; Textiles & Shoes; Co-mingled (Paper, Card, Cans, Plastic containers, Aerosols)
14	Woking	238.4	99%	✓	✓	✓				Co-mingled (Paper, Card, Cans, Glass, Plastic containers)
15	Brentwood	235.8	75%	✓	✓		✓			Two stream: Glass; Co-mingled (Paper, Card, Cans, Plastic containers, Aerosols)
16	South Holland	234.1	100%	✓	✓	✓	✓	✓	✓	Co-mingled (Paper, Card, Cans, Glass, Plastic containers, Aerosols, Foil, Cartons, Textiles & Shoes)



## Review of Kerbside Recycling Collection Schemes in the UK in 2009/10

Rank	Authority	Kerbside Recycling kg/hh/yr	% Co-mingled	All 5	Other plastics	Textiles	Aerosols	Foil	Cartons	Material separation/ co-mingling
17	Walsall	230.8	100%	✓	✓		✓			Co-mingled (Paper, Card, Cans, Glass, Plastic containers, Aerosols)
18	Epsom and Ewell	228.3	24%	✓		✓	✓			Two stream: Kerbside-sort (Paper, Cans, Glass, Textiles, Aerosols, Batteries), Co-mingled (coloured Paper, Card, Plastic bottles)
19	Spelthorne	228.2	100%	✓						Co-mingled (Paper, Card, Cans, Glass, Plastic bottles)
20	Blackburn with Darwen	228.0	100%	✓	✓		✓		✓	Co-mingled (Paper, Card, Cans, Glass, Plastic containers & bags, Aerosols, Cartons)
21	Wychavon	227.6	100%	✓	✓		✓		✓	Co-mingled (Paper, Card, Cans, Glass, Plastic containers, Aerosols, Cartons)
22	Guildford	225.5	10%	✓		✓				Kerbside sort: Paper, Card (1 <sup>st</sup> box); Cans, Glass, Plastic bottles, Batteries (2 <sup>nd</sup> box); Textiles & Shoes (bag). Co-mingled collections for approx. 10% households.
23	Rugby	224.8	97%	✓	✓		✓	✓	✓	Co-mingled (Paper, Card, Cans, Glass, Plastic containers, Aerosols, Foil, Cartons)
24	Gedling	224.4	76%	✓	✓		✓			Two stream: Glass; Co-mingled (Paper, Card, Cans, Plastic containers, Aerosols)
25	Adur	223.9	100%	✓			✓	✓		Co-mingled (Paper, Card, Cans, Glass, Plastic bottles, Aerosols, Foil)
26	Bexley	221.7	25%	✓			✓	✓		Three stream: Paper & Card; Glass; Co-mingled (Cans, Plastic bottles, Aerosols, Foil)
27	Charnwood	220.3	75%	✓	✓	✓	✓	✓		Three stream: Glass; Textiles; Co-mingled (Paper, Card, Cans, Plastic containers, Aerosols, Foil)
28	Windsor and Maidenhead	218.9	34%	✓			✓			Two stream: Paper & Card; Co-mingled (Cans, Glass, Plastic bottles, Aerosols) (+ RecycleBank fully co-mingled trial in 6% of households)
29	Melton	218.9		✓		✓				Kerbside-sort: Paper, Card, Cans, Glass, Plastic bottles, Textiles
30	Tandridge	217.9	2%	✓						Kerbside-sort: Paper, Card, Cans, Glass, Plastic bottles



4.1.7 For each of the Top 30 authorities, Table 3 lists the service provider and notes whether the authority is a WYG client. This year, the Top 30 includes a good number of externally delivered services whereas previously the high performers table was much more dominated by Direct Service Organisations (DSOs); and we know that several recent procurement exercises have assisted with a step change in performance.

**Table 3. Service Providers and WYG Clients for Top 30**

Rank	Authority	Service Provider	WYG Client
1	South Kesteven	DSO	
2	South Oxfordshire	Biffa	✓
3	Stratford-on-Avon	Biffa	
4	North Kesteven	DSO	
5	Mole Valley	Biffa	✓
6	Mid Sussex	Serco	
7	Lichfield	DSO	
8	Epping Forest	Sita	
9	Elmbridge	Veolia	✓
10	Rochford	Sita	
11	Trafford	Veolia	
12	Rutland	Cory	
13	Castle Point	DSO	✓
14	Woking	Biffa	✓
15	Brentwood	DSO	✓
16	South Holland	DSO	
17	Walsall	DSO	
18	Epsom and Ewell	DSO	✓
19	Spelthorne	DSO	✓
20	Blackburn with Darwen	Biffa (Recycling), DSO (Refuse)	
21	Wychavon	Focsa	
22	Guildford	DSO	✓
23	Rugby	DSO	
24	Gedling	DSO	
25	Adur	DSO	
26	Bexley	Serco	
27	Charnwood	Serco	
28	Windsor and Maidenhead	Veolia	
29	Melton	Biffa	
30	Tandridge	Biffa	



## 5.0 Authorities with the Largest Changes in Yield in 2009/10

5.1.1 Thirteen authorities in the UK achieved changes in yield of more than 1 kg/household per week, or 52 kg/hh/yr, between 2008/09 and 2009/10. The changes in these authorities are summarised in Table 4, which is sorted by the size of the change. The recycling yield for 2008/09 is shown followed by the yield for 2009/10, and then the change in yield is given in square brackets. The percentages collected co-mingled are shown in a similar manner. Refuse and recycling containers and frequencies are shown, **with changes indicated in bold**. An overview of the changes is also provided, based on WasteDataFlow figures, council websites and local knowledge.

5.1.2 It can be seen that there were a wide variety of changes, and generally multiple changes were made at the same time. In overview:

- 11 moved to wheeled bins for co-mingled recycling (2 kept sacks in addition, 1 used a box and a sack in addition, and 1 used a caddy insert, for other recycling streams);
- 6 reduced refuse collections from weekly to fortnightly;
- 7 kept refuse collections weekly, with 4 changing to smaller wheeled bins for refuse (three using 140-litre bins and one using a 120-litre bin);
- 2 reduced recycling collections from weekly to fortnightly (in conjunction with moving to a bin from a sack or a box);
- 1 increased recycling collections from fortnightly to weekly.

5.1.3 The final configuration for these 13 authorities was:

- 12 collected co-mingled recyclables, either single stream or with separately collected materials;
- 11 authorities used wheeled bins for recycling collections;
- 10 provided fortnightly recycling collections;
- All 13 used wheeled bins for refuse;
- 7 provided weekly refuse collections, 4 of these in a small wheeled bin; the other 6 provided fortnightly refuse collections;





## Review of Kerbside Recycling Collection Schemes in the UK in 2009/10

**Table 4. Authorities Achieving Increases of Yield above 1 kg/Household/Week**

Authority	Recycling Yields (kg/hh/yr)	% Co-mingled	Refuse Collections	Recycling Collections	Overview of Changes
Surrey Heath	48.3 ⇒ 178.0 [+129.8]	0% ⇒ 79% [+79%]	Weekly sacks ⇒ <b>Fortnightly bin</b>	Weekly sacks ⇒ <b>Fortnightly bin</b>	Changed to 100% co-mingled AWC with wheeled bins for both refuse and recycling by quarter 4, from weekly refuse sacks and weekly two-stream recycling sacks for paper and cans.
Rugby	101.6 ⇒ 224.8 [+123.1]	100% ⇒ 97% [-3%]	Weekly bin ⇒ <b>Fortnightly bin</b>	Fortnightly box ⇒ <b>Fortnightly bin</b>	Changed to fortnightly from weekly refuse and changed from boxes to bins for recycling with addition of card, plastic containers and waxed cartons (remained fortnightly and approximately 100% co-mingled).
Walsall	114.2 ⇒ 230.8 [+116.6]	48% ⇒ 100% [+52%]	Weekly bin ⇒ Weekly <b>140-l</b> bin	Fortnightly box ⇒ <b>Fortnightly bin</b>	Completed move to 100% co-mingled recycling using wheeled bins from kerbside-sort using boxes, and changed to smaller, 140-litre, bin for refuse.
Denbighshire	112.4 ⇒ 210.7 [+98.2]	13% ⇒ 100% [+87%]	Weekly bin or sacks ⇒ <b>Fortnightly bin</b> or sacks	Fortnightly box + sack ⇒ <b>Fortnightly bin or sack</b>	Changed to 100% co-mingled using wheeled bin or sacks, from co-mingled in box or two-stream using sacks, also changing refuse from weekly to fortnightly.
Trafford	155.4 ⇒ 242.5 [+87.1]	22% ⇒ 43% [+21%]	Weekly bin ⇒ Weekly <b>140-l</b> bin	Fortnightly box ⇒ <b>Fortnightly bins</b> (alternating)	Changed from recycling using boxes to two-stream recycling using wheeled bins, collected in alternate fortnights (paper & card/ glass, cans, plastic bottles), and changed to smaller, 140-litre, wheeled bin for refuse.
Barrow-in-Furness	78.7 ⇒ 162.2 [+83.5]	0% ⇒ 1% [+1%]	Weekly bin ⇒ Weekly <b>120-l</b> bin	Fortnightly box + sack ⇒ <b>Fortnightly box + 2 sacks</b>	Moved to three-stream recycling with glass and cans in a box, paper in a non-reusable sack or a second box, and cardboard and plastic in a reusable sack. Change allowed addition of cardboard and plastics. Also changed to a smaller, 120-litre, wheeled bin for refuse.
Caerphilly	122.9 ⇒ 201.1 [+78.2]	94% ⇒ 100% [+6%]	Weekly bin	Fortnightly box ⇒ <b>Weekly bin or box</b>	Changed to weekly 100% co-mingled recycling in wheeled bins or boxes, from fortnightly recycling in boxes.
East Staffordshire	137.1 ⇒ 212.3 [+75.2]	55% ⇒ 73% [+18%]	Weekly bin ⇒ <b>Fortnightly bin</b>	Fortnightly box + sack ⇒ <b>Fortnightly bin + Sack</b>	Changed to fortnightly from weekly refuse; recycling remained two-stream fortnightly with sack collection of paper, but changed from boxes to bins for co-mingled recycling with additional materials.
North Tyneside	95.0 ⇒ 170.0 [+75.0]	12% ⇒ 98% [+85%]	Weekly bin	Fortnightly box ⇒ <b>Fortnightly bin + caddy insert</b>	Changed to collecting co-mingled recycling in wheeled bin with caddy insert for glass and batteries, from kerbside-sort using boxes; all collection frequencies remained the same.



## Review of Kerbside Recycling Collection Schemes in the UK in 2009/10

Authority	Recycling Yields (kg/hh/yr)	% Co-mingled	Refuse Collections	Recycling Collections	Overview of Changes
South Oxfordshire	202.2 ⇒ 271.3 [+69.1]	100% ⇒ 100% [+0%]	Weekly sacks ⇒ <b>Fortnightly bin</b>	Weekly box ⇒ <b>Fortnightly bin</b>	Changed to AWC with wheeled bins from weekly refuse sacks and weekly recycling boxes (was already 100% co-mingled).
Epsom and Ewell	172.6 ⇒ 228.3 [+55.7]	1% ⇒ 24% [+23%]	Weekly bin ⇒ <b>Fortnightly bin</b>	Weekly box + sack ⇒ Weekly <b>180-l bin</b> + box + sack	Added wheeled bin for fortnightly co-mingled collection of plastic bottles, cardboard and coloured paper, in addition to existing kerbside-sort using a box for glass, cans, household batteries and textiles and paper optionally in a reusable sack or in the box. Also changed refuse from weekly to fortnightly.
Barking and Dagenham	64.2 ⇒ 119.4 [+55.2]	70% ⇒ 89% [+19%]	Weekly sacks ⇒ Weekly <b>140-l bin</b>	Weekly sacks	Moved from co-collection of refuse and recycling, with recycling in a 'survival bag', to separate collections, and changed refuse from sacks to 140-litre wheeled bins.
Wigan	57.0 ⇒ 109.3 [+52.3]	15% ⇒ 58% [+43%]	Weekly bin	Fortnightly sacks ⇒ Fortnightly <b>bin</b> + sack	Finished change from collecting only paper in sacks to addition of co-mingled collection from wheeled bins of glass, cans and plastic containers.



## 6.0 Achieving Change

### 6.1 Factors that Enable Change

6.1.1 As illustrated in this report, and in previous studies, significant increases in yield can be achieved by:

- Collecting recyclate co-mingled;
- Increasing the recycling container capacity by use of a wheeled bin;
- Increasing the range of materials collected at the kerbside, e.g. glass, cardboard, plastic bottles and other plastic containers;
- Reducing the residual waste volume by reducing frequency or container or both;
- Increasing the recycling collection frequency (for kerbside-sort schemes; there is no advantage for 100% co-mingled schemes);

6.1.2 An Alternate Weekly Collection system with all five main materials collected fully co-mingled in wheeled bins, and with refuse in 180-litre or 140-litre wheeled bins, achieves all of these, except for the last point, which is not necessary for co-mingled schemes. However, this system is not necessarily appropriate for all authorities. Urban authorities with large numbers of terraced houses without gardens or yards may face issues with wheeled bins, and those with large numbers of flat blocks will need to provide appropriate solutions, generally involving communal containers. In addition, authorities will need ready access to a MRF or a suitable transfer station.

### 6.2 Achieving Change through Procurement

6.2.1 For outsourced services, re-procurement provides the opportunity to consider major changes and challenge the waste industry to provide step change or better value solutions. Significant increases in yields can be achieved, often with cost savings either directly through reduced numbers of vehicles or crew, lower mileage or smaller MRF fees, or indirectly through savings from landfill diversion or increased income from recycling credits or sale of recyclate. There can also be significant carbon savings due to reduced mileage, increased recycling and reduced landfill.



## Review of Kerbside Recycling Collection Schemes in the UK in 2009/10

- 6.2.2 WYG has extensive experience in assisting local authorities to achieve step changes in performance and/or cost reductions through re-procurement, for example at Surrey Heath, Elmbridge, Woking, West Devon and North Somerset.
- 6.2.3 WYG worked with Surrey Heath in 2008-09 to re-design its recycling service, including assisting with the roll-out. Surrey Heath moved from weekly two-stream recycling using sacks for paper and cans and weekly refuse using sacks to AWC using wheeled bins with 100% co-mingled recycling, alongside weekly food waste and a fortnightly chargeable garden waste service. Dry recycling yield increased from 48 kg/hh/yr to 178 kg/hh/yr, the highest increase for any authority in 2009/10, even though the results are for only six months of the scheme.
- 6.2.4 WYG's involvement at South Oxfordshire was extremely limited and involved assistance in the procurement process. South Oxfordshire was already collecting 100% co-mingled but moved to fortnightly recycling using wheeled bins from weekly recycling using boxes. It also moved to fortnightly wheeled bin refuse collections from weekly refuse sack collections. The alternate weekly collections using wheeled bins achieved a yield of 271 kg/hh/yr, an increase of 69.
- 6.2.5 WYG also assisted in the procurement process at Elmbridge and at Woking, where the councils have introduced (like Surrey Heath) an AWC scheme using wheeled bins with 100% co-mingled recycling combined with weekly food waste and a fortnightly chargeable garden waste service). Both have seen increases in performance combined with a reduction in costs.
- 6.2.6 WYG also assisted in the procurement process at West Devon. The council moved to a scheme where all households receive a fortnightly collection of residual waste using sacks alongside a weekly kerbside-sort collection of dry recyclables and food and a fortnightly garden waste service. The true increase in performance will not be shown until the 2010/11 figures are available, but costs have reduced by c. £8 per household, a very considerable achievement.
- 6.2.7 WYG's involvement at North Somerset has been rather more extensive. In addition to assisting with the procurement of a new contract, WYG has assisted in rolling out the new scheme whereby all households receive a fortnightly collection of residual waste using wheeled bins alongside a weekly kerbside-sort collection of dry recyclables and food and a fortnightly garden waste service. As with West Devon, the true increase in performance will not be shown until the 2010/11 figures are available, but it would appear likely that North Somerset will be the top performing kerbside-sort authority.



6.2.8 It is worth noting that, as part of many procurement processes, extensive modelling is carried out pre-procurement in order to choose the collection system to be procured. An alternative option is to allow the market to propose the most cost-effective system through Competitive Dialogue. This does not preclude the local authority from having a preference but allows the market to provide up-to-date cost comparisons to enable informed decisions. WYG has been involved in several procurement exercises on this basis; the Oxford City procurement resulted in a co-mingled system and the West Devon procurement resulted in kerbside sort.

### **6.3 Achieving Cost Savings - Collections**

6.3.1 Councils served by private contractors do not have a monopoly in achieving improved performance for reduced costs: and WYG is delighted to have assisted the DSOs at, for example, Guildford and Tewkesbury. Guildford operates a fortnightly collection of residual waste using wheeled bins alongside a weekly kerbside-sort collection of dry recyclables and food, and a fortnightly chargeable garden waste service. Tewkesbury operates an AWC scheme using wheeled bins with 100% co-mingled recycling combined with weekly food waste and a fortnightly chargeable garden waste service. Re-routing at both Guildford and Tewkesbury assisted the councils in achieving optimum use of vehicles and crew numbers, together with reduced overall mileage, leading to reduced fuel and reduced maintenance costs.

### **6.4 Achieving Cost Savings - MRFs**

6.4.1 In the past year, WYG has carried out procurement exercises for MRF capacity in London, the South East, the South West, the North West and Eastern regions. Negative gate fees are being achieved in many procurement exercises undertaken by WYG, even for recyclate including glass.

6.4.2 This is counter to the figures currently being used by WRAP and WAG to model relative costs of co-mingling and kerbside-sort systems. WRAP uses a survey of historical prices for MRF costs, obtained by asking local authorities what they are paying under contracts that could be many years old, rather than referring to prices in current procurements to provide real-time market costs for authorities considering change. In contrast, prices for sale of recyclate are often based on more up-to-date figures such as WRAP's Materials Pricing Report. Of course, historic figures and trends have a role in predicting future prices, but are not reliable indicators of costs for new contracts. Modelling co-mingled costs by using historic figures can significantly mislead procurement choices.





- 6.4.3 For example, WRAP's 2010 'Gate fees report' provides a median price for a MRF not including glass in the mixture of £33 per tonne, with a range of -£5 to £42. The WRAP 2011 report for WAG assumed a MRF gate fee of £27 (including glass). Previous WRAP reports had assumed £33 (in 2009, for Wales) and £28 (in 2008, for England). These figures were used in modelling that concluded that co-mingled schemes were more expensive than kerbside sort schemes.
- 6.4.4 In contrast, local authorities that have recently procured MRF facilities have achieved significant savings through low or negative gate fees, as low as -£30 per tonne, for fully mixed dry recyclables including glass. A recent press release from Basildon Council said that negative prices obtained through procurement of MRF facilities has contributed to savings that are expected to reach £1 million a year, in conjunction with changes to the collection system.

## 6.5 Achieving Cost Savings – Landfill Diversion

- 6.5.1 Many studies fail to account adequately for savings from landfill diversion due to increased recycling yields. This is particularly the case for recent WRAP reports, which subtracted a notional 10% from all co-mingled yields due to MRF rejects, and then concluded that the yield is not significantly different from kerbside-sort systems.
- 6.5.2 WRAP has, however, recently conceded that kerbside-sort schemes can be expected to achieve 18.3% lower yields than co-mingled schemes, with fortnightly recycling collections and all other factors being equal.
- 6.5.3 An 18.3% reduction from co-mingled to kerbside sort is equivalent to a 22.4% increase from kerbside sort to co-mingled. To obtain ballpark figures of the increase in landfill diversion due to co-mingled collections, an uplift of 20% can be used. Consider an authority with fortnightly refuse collections in wheeled bins and fortnightly recycling collections using kerbside-sort achieving a yield of 160 kg/hh/yr (approximately the 75<sup>th</sup> percentile level that we found for the UK for this scenario). If the authority changed to co-mingled collections, it could be expected to increase the yield by 20% or 32 kg/hh/yr, to 192 kg/hh/yr. Across 100,000 households this would achieve additional landfill diversion of 3,200 tonnes per year. For a landfill gate fee of £24 per tonne and landfill tax at the current level of £56, the saving from landfill diversion would be £256,000 – a significant amount.
- 6.5.4 Thus, disregarding differences in yield as 'insignificant' could overlook huge potential savings. In a two-tier situation, these savings should be discussed with the waste disposal authority, as the WDA



could provide a diversion credit or sponsor the change directly, by investing in transfer facilities or paying for roll-out of wheeled bins, and still achieve savings in their costs. With landfill tax increasing, the savings from landfill diversion will increase further.





## Appendices



## **Appendix A – Kerbside Dry Recycling Materials**



## Kerbside Dry Recycling Materials

A.1.1 Table A1 provides a list of kerbside dry recycling materials from WasteDataFlow, arranged according to type – co-mingled, paper, card, cans, glass, plastic, textiles and other dry. Garden waste, food waste and bulky materials are excluded. The list was used for classification of tonnage as kerbside dry recycling (or not) and to check whether the main 5 types of materials – paper, card, cans, glass, plastic – are collected in a scheme, and whether textiles or additional ‘Other dry’ materials are collected.

**Table A1. Materials Recycled at the Kerbside**

Type	Material
Co-mingled	Co-mingled materials
Paper	Paper
Paper, Card	Mixed paper & card
Card	Card
Cans	Aluminium cans
	Mixed cans
	Steel cans
Glass	Brown glass
	Clear glass
	Green glass
	Mixed glass
Plastic	HDPE [2]
	LDPE [4]
	Mixed plastic bottles
	OTHER PLASTICS [7]
	PET [1]
	Plastics
	PP [5]
	PS [6]
	PVC [3]
Textiles	Textiles & footwear
Other Dry	Aerosols
	Aluminium foil
	Books
	Cardboard beverage packaging
	Post consumer, non automotive batteries
	Yellow Pages



## **Appendix B – Factors Affecting Kerbside Dry Recycling Performance**





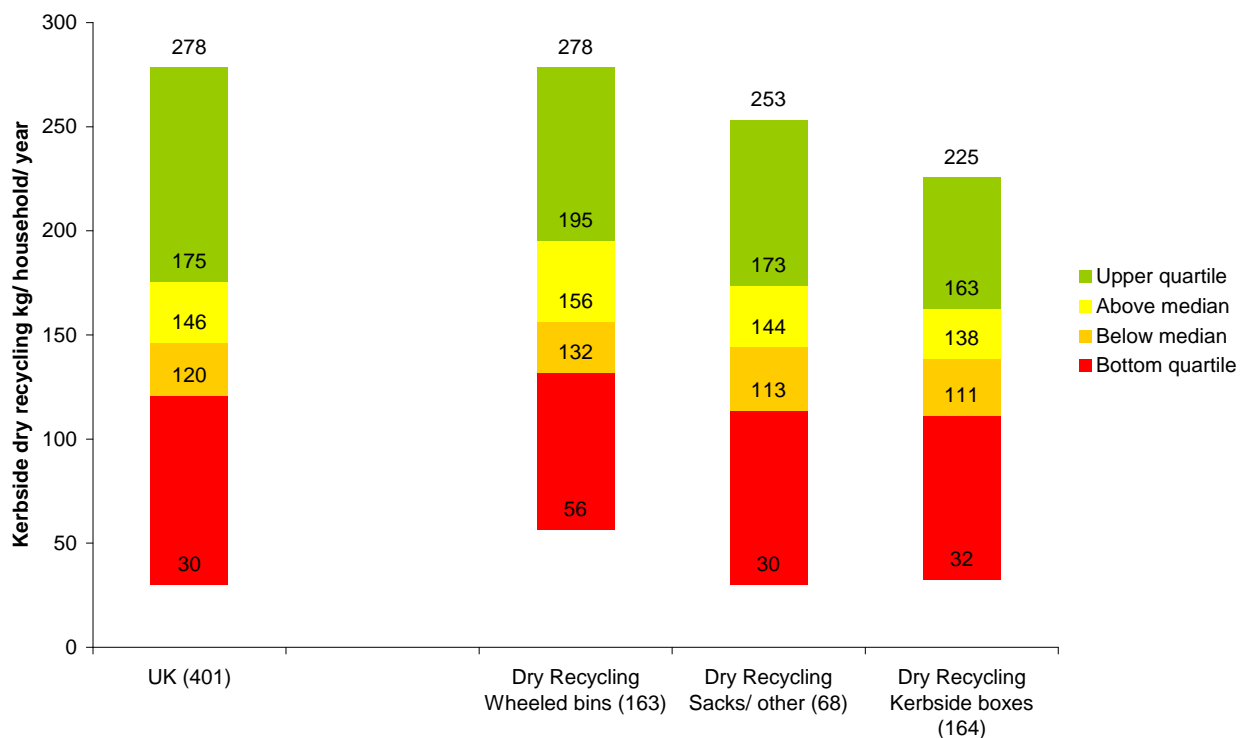
## Factors Affecting Kerbside Dry Recycling Performance

B.1.1. This Appendix shows the results of analyses of kerbside dry recycling yield for different residual waste and recycling collection frequencies and containment and numbers of materials targeted for recycling. Yields were obtained using the method described in Section 2.0, with additional analyses of scheme type as described below. All graphs follow the conventions described in Section 2.0.

### Recycling Container

B.1.2. The recycling yields for authorities with different recycling containers are shown in Figure B1. Authorities were categorised as wheeled bin, sack/other or kerbside box, based on the container type provided to the majority of households in the last quarter of 2009/10 as reported in Question 5 of WasteDataFlow.

**Figure B1. Recycling Yields for Different Recycling Containers in 2009/10**



B.1.3. The highest performers used wheeled bins; this is likely to be due to the relative volume of a bin compared to a box, as well as the fact that a co-mingled collection is likely to have been provided,

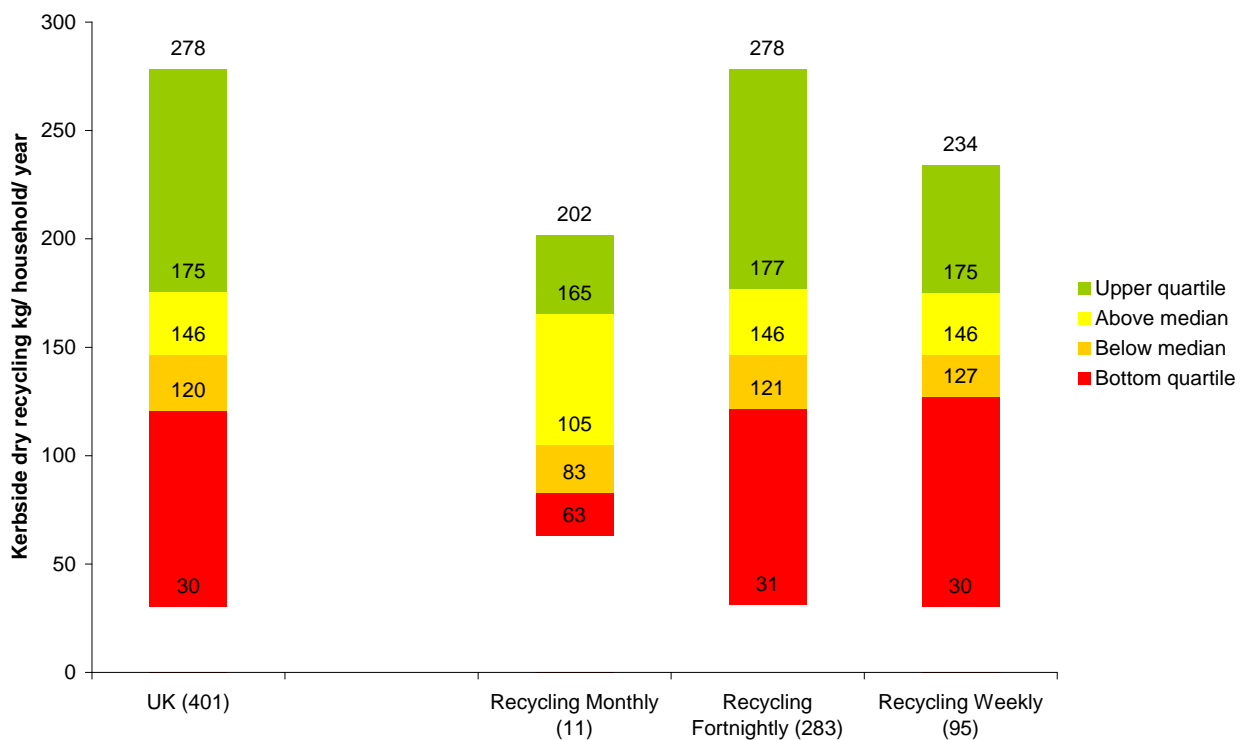


which generally allows a wide range of materials and provides ease of use for residents. There was a wide range of yields, indicating that recycling containers are only one factor affecting performance.

**Recycling Collection Frequency**

B.1.4. Figure B2 shows the yields for authorities with different recycling collection frequencies. Authorities were categorised into monthly, fortnightly or weekly recycling collections based on the frequency provided to the majority of households in the last quarter of 2009/10 as reported in Question 5 of WasteDataFlow. (The one authority that collects more frequently than weekly, City of London, was discounted, as were authorities that did not specify frequencies.)

**Figure B2. Recycling Yields for Different Recycling Collection Frequencies in 2009/10**



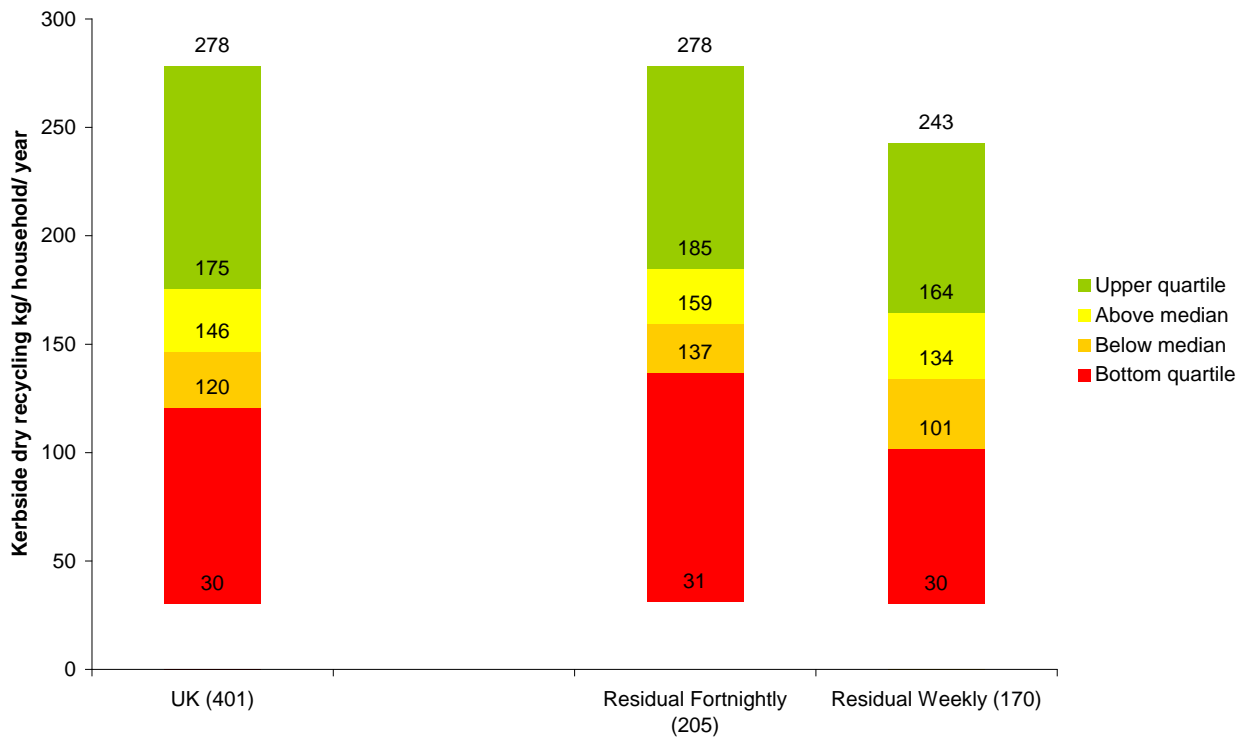
B.1.5. Interestingly, the highest performing authorities collected recycling fortnightly, not weekly. These authorities mostly collected co-mingled materials in wheeled bins and many also collected refuse fortnightly.



**Residual Waste Collection Frequency**

B.1.6. The ranges of yield for authorities with different residual waste collection frequencies are shown in Figure B3. Authorities were categorised into fortnightly or weekly residual waste collections based on the frequency provided to the majority of households in the last quarter of 2009/10 as reported in Question 4 of WasteDataFlow. (The four authorities collecting the majority of their refuse more frequently than weekly are not shown, nor are authorities that did not specify frequencies.)

**Figure B3. Recycling Yields for Different Residual Waste Collection Frequencies in 2009/10**



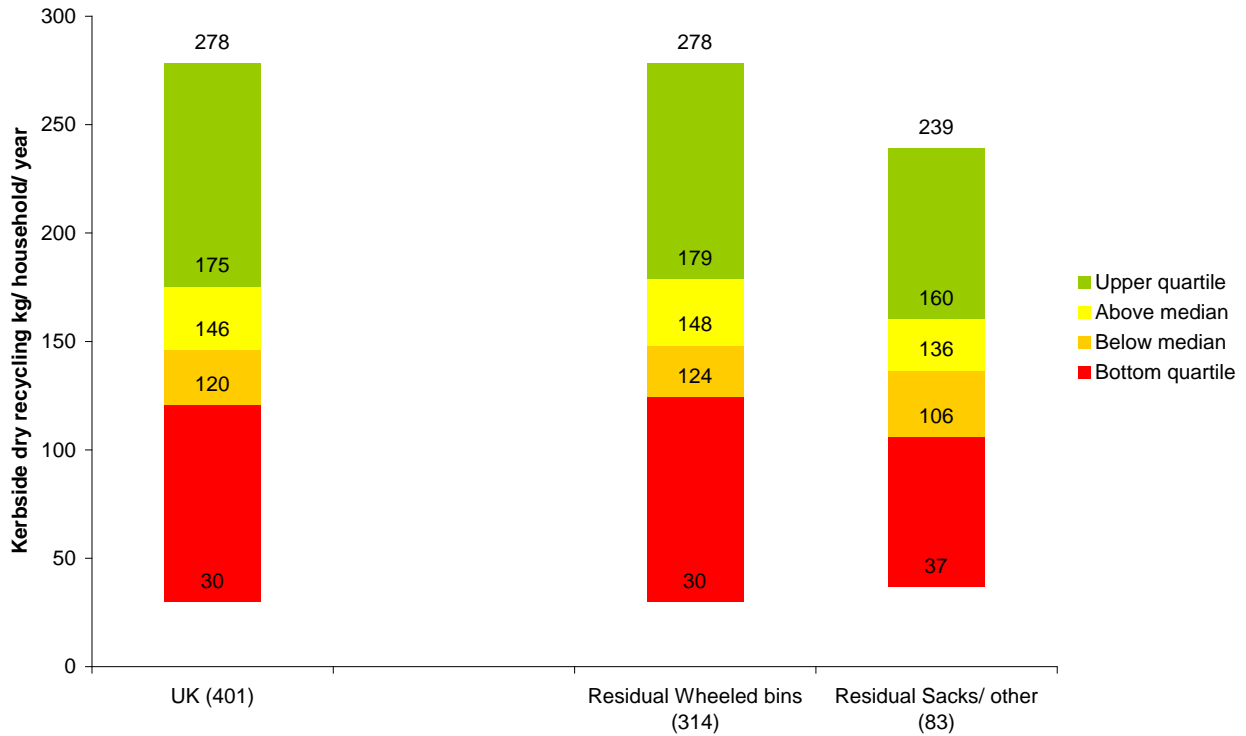
B.1.7. The highest performing authorities collected residual waste fortnightly, although there was a wide range of performance for each frequency of refuse collection.

**Residual Waste Container**

B.1.8. The recycling yields for authorities with different residual waste containers are shown in Figure B4. Authorities were categorised as wheeled bin or sack/other based on the container type provided to the majority of households in the last quarter of 2009/10 as reported in Question 5 of WasteDataFlow.



**Figure B4. Recycling Yields for Different Residual Waste Containers in 2009/10**



B.1.9. The highest performers used wheeled bins for residual waste. Wheeled bins can limit the amount of residual waste, particularly if collected fortnightly and/or if smaller size bins are used (e.g. 180, 140 or even 120 litre bins). Sack collections of residual waste were made weekly (except for one authority, Mid Devon, which collected fortnightly<sup>3</sup>) and it can be harder to limit the waste put out in sacks, unless only a limited supply of pre-printed sacks is allowed per household.

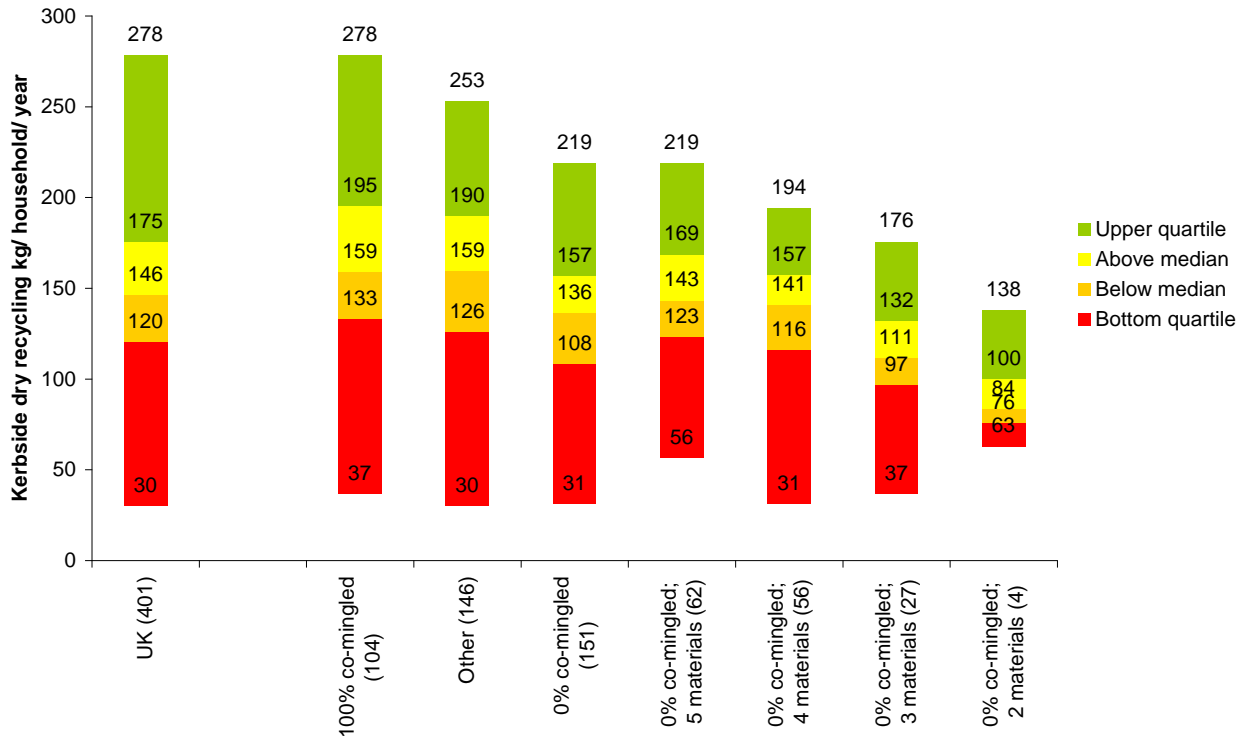
**Number of Materials**

B.1.10. The yields for authorities targeting different numbers of materials for recycling are shown in Figure B5. The number of materials in 100% co-mingled and 'Other' collections cannot easily be derived from WasteDataFlow, so the overall ranges are shown for each of these, for comparison with 0% co-mingling with different numbers of materials.

<sup>3</sup> Other authorities including West Devon have moved to fortnightly sack collections for refuse since 2009/10.



**Figure B5. Recycling Yields for Different Numbers of Materials Targeted in 2009/10**



B.1.11. Particular care must be taken in interpreting this graph, as the range of performance will tend to reduce with fewer authorities in a category. However, it can be seen that highest performances increased with the number of materials targeted. This is to be expected – additional materials allow additional tonnages to be collected. Previous studies have also found that additional materials encourage an increase in tonnages of existing materials, as people notice the items left in the residual waste bin. For example, addition of plastics to a collection can lead to increases in other materials, particularly other containers such as cans or glass. However, the graphs also show that collecting a lot of materials is not a guarantee of a high performance.