



1.0 INTRODUCTION

- 1.1 North Hertfordshire District Council (NHDC) collects recycling at the kerbside in two streams, with co-mingled materials collected in a 240 litre wheeled bin and paper collected separately in a 55 litre box. Residual waste is collected in 180 litre bins and both recycling and residual waste is collected fortnightly.
- 1.2 In designing its services, NHDC was fully cognisant of the requirements of the EU Waste Framework Directive (WFD) 2008 and the Waste England and Wales Regulations 2011 that flow from it. The Regulations (which were the subject of a judicial review) include Regulation 13 regarding the collection of glass, metal, paper and plastic for recycling.
- 1.3 NHDC was therefore aware that the requirement of Regulation 13 is that these materials (i.e. glass, metal, paper and plastic for recycling) should be collected separately, but may be collected on a different basis in certain circumstances, which are where it can be shown that it is not technically, economically or environmentally practicable to collect these materials separately (TEEP).
- 1.4 In late April 2014, WRAP published the Waste Regulations Route Map. WYG was asked by NHDC to assess its current methodology on the basis of this Route Map and to accordingly provide a TEEP Assessment for the Council.



2.0 THE SYSTEM DESIGN AND OUTCOMES

- 2.1 North Hertfordshire District Council (NHDC) changed its collection system in July 2013, from collecting source-segregated recycling from a box, to two-stream collections with co-mingled materials collected in grey 240 litre bins and paper collected in a blue 55 litre box. The requirement to remove cardboard from the compostable collections was the major driver for this change in system, with this change being made so that PAS100 standards are met for composting and to satisfy the Environment Agency; but adding cardboard to the dry recyclable stream would have caused too much pressure on the recycling rounds and would have added to costs considerably if there had not been a change in system. It is worth noting that NHDC has its waste (including recyclables) collected by Veolia and the change was required mid-contract.
- 2.2 At the same time as this change from source-separated to two-stream collections for recycling, residual waste collections were switched to new 180-litre purple bins, reusing the existing 240-litre bins for the recycling collections so as to squeeze residual waste volumes and to provide additional capacity for recycling while minimising capital expenditure on bins. Garden waste and food waste is now collected fortnightly in brown 240 litre bins and with the change in recycling, cardboard was (as stated) moved from the composting collections to dry recycling. Recycling, composting and residual waste collections also remained fortnightly. The change has also allowed many other materials to be collected at the kerbside; and this enabled public bring sites to be removed from March 2013.
- 2.3 Prior to the change, paper, cans and glass were collected in three streams at the kerbside. Since July 2013, paper is collected separately, and card, cartons, cans, aerosols, foil, glass, plastic bottles and plastic containers are collected co-mingled. Collections of textiles were also introduced, collected separately in plastic bags placed alongside the bin.
- 2.4 Recycling in flats changed in September 2013, from communal 240-litre bins for cans and glass, collected separately, to a two-stream collection system. Communal 240 litre bins were provided for paper and the other bins were switched to co-mingled collections, with the same materials collected as for 'standard' properties. Weekly food waste collections were also introduced for flats (flats also receive weekly residual waste collections as part of the DCLG grant funding); but garden waste is not collected from flats, since the quantities are (predictably) extremely low. Approximately 6,000 of the households are flats.



- 2.5 Figure 1 below shows dry recycling in NHDC (excluding bulky items typically collected in special collections), many of which are re-used or recycled), in kg per household per quarter; and Figure 2 shows dry recycling in kg per household per year to date, compiled from data reported to WasteDataFlow (WDF). All sources of dry recycling are shown: materials collected by the local authority and by third parties at the kerbside and through bring sites.
- 2.6 The impact of the change in service in 2013 is clearly very significant indeed: the amounts collected in the year ending June 2014 is three times the amount collected in the year ending June 2013.
- 2.7 The waste and recycling is collected by Veolia under contracts that commenced in 2002, currently extended until 2018.
- 2.8 The dry recycling is taken to a transfer station at Radwell. Co-mingled recycling is bulked for onward transfer and sorting at the Pearce Recycling MRF in St Albans and paper is taken to UPM.

Figure 1: Dry recycling in North Hertfordshire, 2006-07 to 2014-15, kg/household/quarter

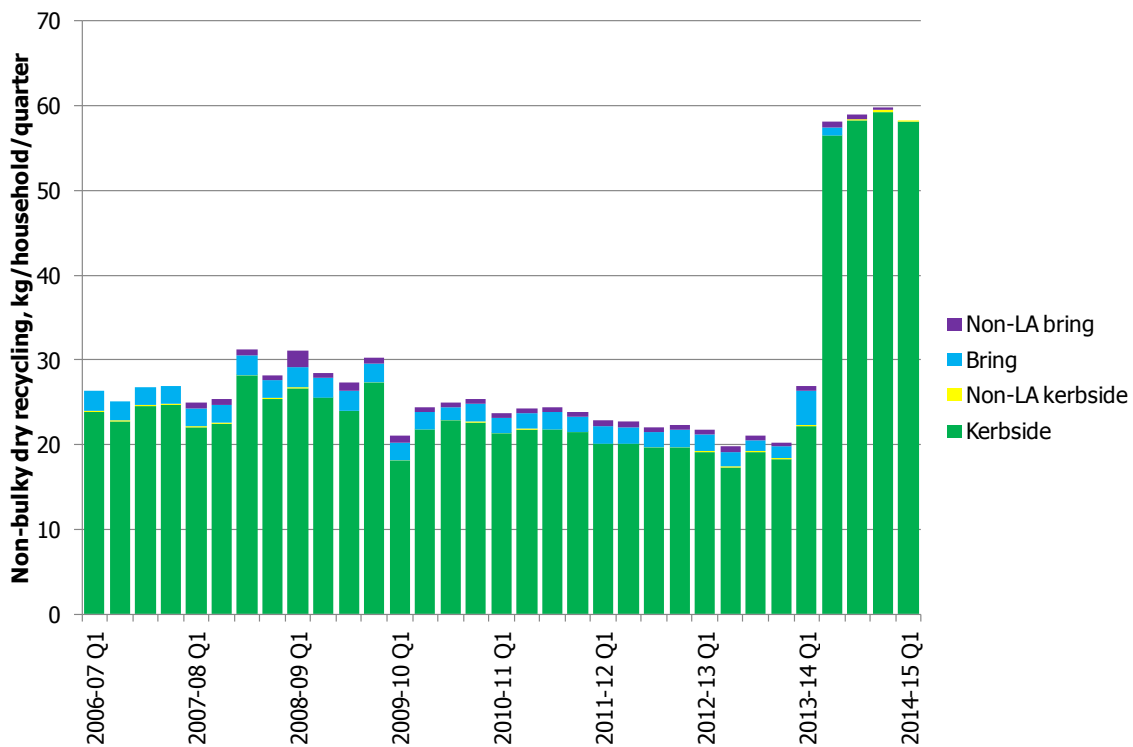
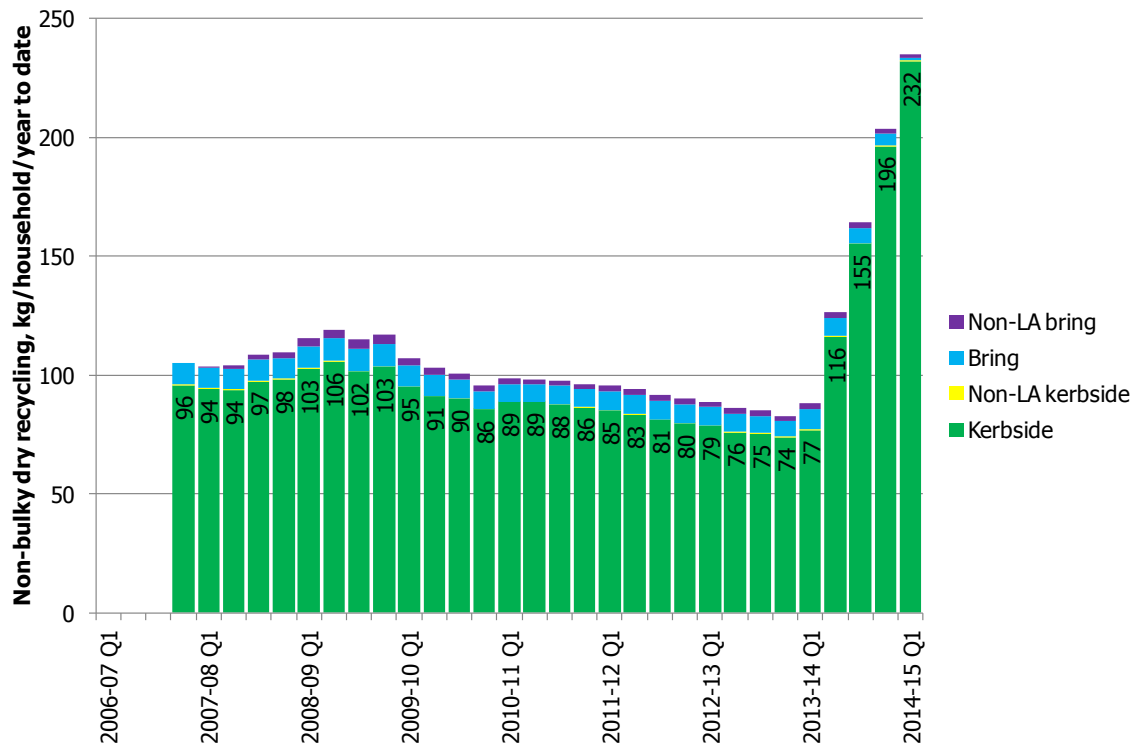




Figure 2: Dry recycling in North Hertfordshire, 2006-07 to 2014-15, kg/household/year



- 2.9 There is a joint contract for the receipt, haulage and treatment of co-mingled materials between four councils in Hertfordshire under which there is a cost sharing arrangement for the net income or cost per tonne for the processing and sale of the recyclate. Through this arrangement, NHDC received £3 to £3.50 per tonne for the co-mingled materials from July 2013 up to February 2015. However, a recent composition analysis indicates that NHDC may have to pay £5 per tonne in the future, however, the actual amount currently being paid has worked out at approximately £0.30 per tonne. An income of £98 per tonne is currently received for the separate paper from UPM; this was previously £122 per tonne.
- 2.10 Recycling credits are paid by Hertfordshire County Council (HCC), at a rate of £41.82 per tonne in 2014/15.
- 2.11 The remaining bring sites in NHDC are operated by third parties, for which there is no payment or income, except for recycling credits.
- 2.12 In summary, the collection scheme for kerbside properties is as set out in Table 1 overleaf:



Table 1: NHDC collection scheme from July 2013 and previously

	2012/13	From July 2013
Kerbside		
Recycling streams	Paper	Paper
	Cans	Card, cardboard, cartons, cans, plastic bottles and containers, glass
	Mixed glass	Textiles
Composting stream	Garden waste, food, cardboard	Garden and food waste
Flats		
Recycling streams	Cans	Paper
	Mixed glass	Card, cardboard, cartons, cans, plastic bottles and containers, glass
Composting stream	None	Food

2.13 In terms of volumes collected, in the 12 months from July 2013 to June 14 these were (from 56,150 households, including flats):

- Overall household waste: 48,557 tonnes
- Residual waste at the kerbside: 16,566 tonnes
- DMR collected at the kerbside: 13,055 tonnes
- Compostable waste collected at the kerbside: 16,287 tonnes of mixed garden/food waste and 5 tonnes of separate food waste

2.14 If measured in terms of kg per household for that year, NHDC's figures are as follows:

- Overall household waste: 865 kg
- Residual waste at the kerbside: 295 kg
- DMR collected at the kerbside: 232 kg
- Compostable waste collected at the kerbside: 290 kg of garden/food waste

2.15 This gives the following outcomes:

- Recycling rate: 27.2%
- Composting rate: 33.3%
- Combined recycling/ composting rate: 60.4%¹

¹ The year-end figure (period 01 April to 31 March) will likely slightly differ as this is a different data range.



3.0 USING THE WRAP ROUTE MAP

3.1 With the benefit of the WRAP Route Map, the following commentary works its way through the various stages.

Step 1

3.2 Here NHDC should consider the waste collections covered; and the current waste collection system.

3.3 The waste collections being covered are household waste. The current waste collection system collects the four materials (glass, metal, paper and plastic) for recycling, with paper collected separately and the other materials collected as a co-mingled waste stream together with card.

3.4 The published guidance also refers to the collection of food and garden waste; the system collects food and garden waste together, except for flats, where food waste is collected separately and no garden waste is collected.

3.5 The published guidance also refers to the collection of bulky waste and the system collects this and advocates a waste hierarchy promoting reuse and recycling (note: service is provided by third party companies).

Step 2

3.6 Here NHDC should consider how each waste stream is managed and what waste is recycled.

3.7 Residual household waste is not currently processed to extract recyclate, but is sent to a combination of landfill and waste treatment for energy recovery as organised by the County Council (WDA).

3.8 Dry recyclate collected is all recycled, except for fines and contaminants. Recent compositional analysis has shown the MRF rejects rate is circa 3.4%, which is a relatively low level indicating that very good levels of recycling are being achieved from collected co-mingled recyclates. The documentation which covers the contract between NHDC and Pearce Recycling Ltd (PRL) sets out detailed processes that are followed in respect of processing co-mingled dry recyclates. PRL are required to process the material in accordance with market requirements and to secure long-term sales channels. PRL have outlined their processes for achievement of marketable outputs and to provide detail in respect of End Destinations for recyclates. UK End Destinations are used for glass, aluminium cans and steel cans; UK or overseas End Destinations are used for paper and cardboard and plastics. MRF residues are sent to EfW facilities for energy recovery or to licensed UK landfill.



Quality requirements are clearly set out in respect of the contract which includes procedures for the receipt and processing of co-mingled materials. A description of the processes used to separate co-mingled materials is provided by PRL showing how this results in the effective separation of co-mingled dry recyclables that are then sent for re-processing.

Step 3

3.9 Step 3 relates to the waste hierarchy, which has been applied throughout the decision-making process regarding the selection of recycling methodology.

Step 4

3.10 At this stage a number of questions are asked in relation to the four dry streams of glass, metal, paper and plastic. Working through these questions:

- Does NHDC collect glass, metal, paper and plastic for recycling? Yes;
- Are separate collections in place? Yes, for paper (so likely to be compliant), but glass, metal and plastics are collected co-mingled (so necessity and practicability questions need to be answered in respect of collection of these materials);
- Are separate collections necessary to ensure that waste is recycled? No – waste collected for recycling is (apart from contaminants etc.) recycled; and
- Is there an approach to collection of the four target materials that is technically, environmentally and economically more practicable than separate collection i.e. separate collection is not TEEP? Yes – as the following tests show.

Necessity test:

3.11 Here the quality and quantity of recycling is considered.

3.12 In terms of quality, the contractor is required to set out in their tender the methodology to be used so that good quality recyclables result from the process; and this information is then incorporated into the contract.

3.13 The minimum range of materials required to be accepted through the treatment contract is as per the following list:

- All paper, card and board, including catalogues & directories (EWC 20 01 01)
- All plastic bottles (EWC 20 01 39)
- All plastic food tubs (EWC 20 01 39)
- Food/drinks cans (steel and aluminium) (EWC 20 01 40)



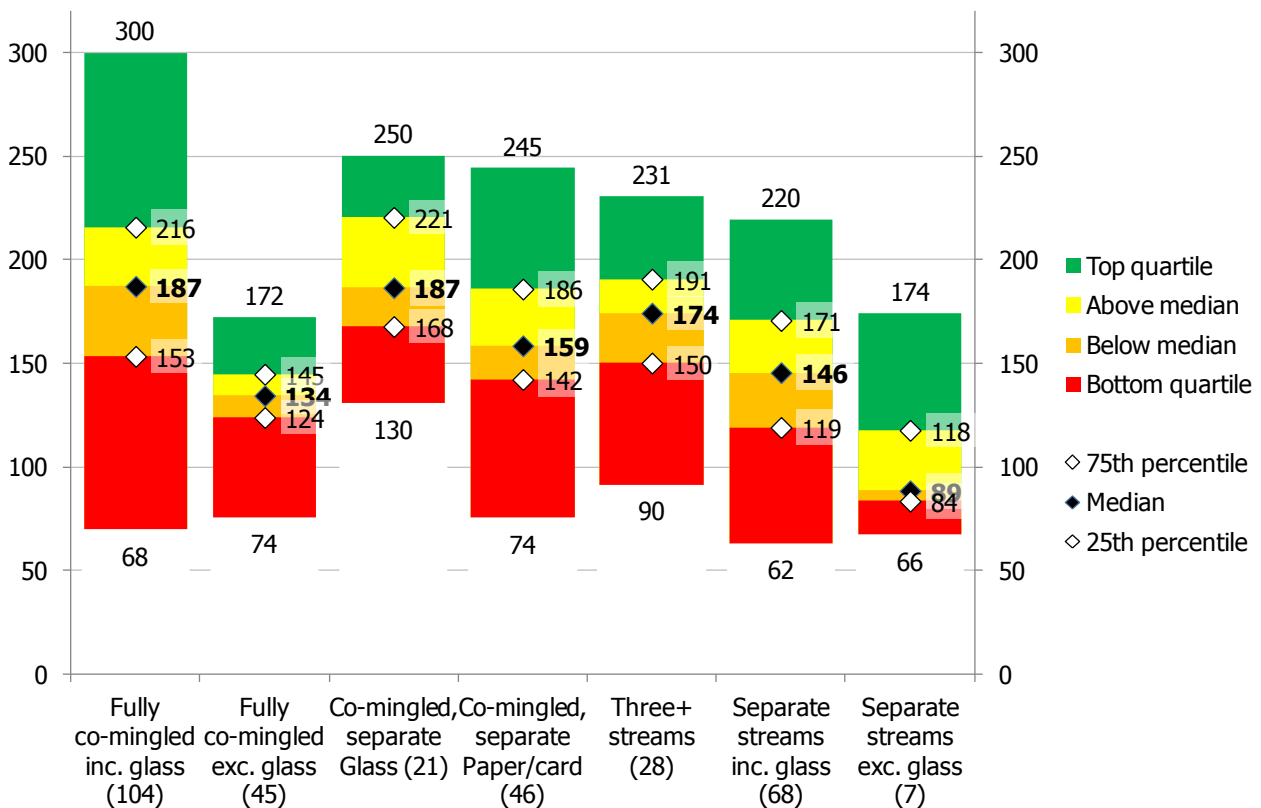
- Aerosols (EWC 20 01 40)
- Aluminium foil (EWC 20 01 40)
- Mixed glass (EWC 20 01 02)
- Waxed food & drink cartons (EWC 15 01 05)

A separate contract exists for the collection of textiles (current service provider is Cookstown Textile Recyclers).

3.14 In terms of quantity, quite apart from the exceptional increase seen since the change at NHDC, there is a good deal of evidence which shows that the chosen methodology recycles much more than could be achieved with separate collections.

3.15 Nationally, if one looks at the higher performers, then the highest performer is for a fully co-mingled service (300 kg per household per annum) followed by a two-stream service collecting glass separately (250 kg per household per annum).

Figure 3: Kerbside yields in different collection systems (2012/13)





3.16 The 2011/12 figures tell a similar story which supports NHDC's choice of system: Table 2 overleaf shows that 20 of the top 30 performers collect fully co-mingled dry recyclables, and five collect on a two-stream basis collecting glass separately, whereas only one of this top 30 (North Somerset) collects on a kerbside-sort basis.

Table 2: Collection Details for the Top 30 Kerbside Dry Recycling Authorities in 2011/12

Rank	Authority	WYG client	Kerbside Recycling kg/hh/yr	Type	% Co-mingled	Recycling				Refuse			
						Freq.	Wheeled Bins	Sacks/ Other	Kerbside Boxes	Freq.	Wheeled Bins	Sacks/ Other	Communa
1	South Oxfordshire	✓	310	C	100%	F	96%	4%		F	90%	4%	5%
2	Surrey Heath	✓	291	C	100%	F	98%	1%		F	89%	2%	8%
3	Vale of White Horse	✓	282	C	100%	F	97%	3%		F	91%	3%	7%
4	Windsor and Maidenhead		276	O	76%	W	100%			W	85%	5%	10%
5	Lichfield		267	C	100%	F	100%		0%	F	96%	1%	3%
6	Elmbridge	✓	263	C	100%	F	96%		4%	F	88%	4%	8%
7	Mole Valley	✓	263	C	100%	F	85%	16%		F	85%	10%	6%
8	Rochford		261	C	99%	F	99%			F	100%		0%
9	North Hertfordshire		258	C	100%	F	100%			F	100%		
10	North Somerset	✓	255	S	0%	W			92%	F	83%	8%	8%
11	Castle Point	✓	253	C/g	77%	F		100%	100%	F		100%	
12	Epping Forest	✓	253	C/g	78%	F	5%	95%	95%	F	91%	3%	5%
13	Tamworth		252	C	100%	F	100%			F	100%		
14	Cannock Chase		250	C	100%	F	100%			F	100%		0%
15	Rutland		249	C	100%	F	99%	1%		F	96%	1%	3%
16	Stratford-on-Avon		249	C	100%	F	96%		4%	F	94%	4%	2%
17	South Cambridgeshire		249	C/p	66%	F	100%		0%	F	95%	0%	4%
18	West Oxfordshire	✓	245	O	26%	W	5%		95%	F	94%	1%	5%
19	Basildon	✓	244	C/g	78%	F		93%	98%	W		90%	9%
20	Wychavon		241	C	100%	F	90%	10%	7%	F	90%	7%	3%
21	Huntingdonshire	✓	240	C	100%	F	88%	12%		F	92%	4%	5%
22	Woking	✓	239	C	100%	F	93%	7%		F	86%	4%	10%
23	North Kesteven	✓	238	C	100%	F	99%			F	99%		
24	Mid Sussex		237	C	100%	F	99%			F	99%		
25	South Holland		234	C	100%	W		100%		W		100%	
26	Caerphilly		232	C	100%	W	71%	1%	27%	W	98%	2%	
27	Charnwood		231	C/g	88%	F	98%	2%	98%	F	98%	2%	
28	Guildford	✓	231	O	17%	W	8%	9%	83%	F	86%	9%	6%
29	Central Bedfordshire		230	C/g	82%	F	72%	16%	12%	F	91%	5%	4%
30	Spelthorne	✓	229	C	100%	F	94%			F	89%	0%	11%



- 3.17 Conversely (as noted in WYG’s report available via the WYG website) among the bottom 30 performers the reverse is true: 25 out of 30 practice a form of kerbside-sort. It is worth noting also that a number of these bottom performers have since moved to either a two-stream or fully co-mingled system (e.g. Ashford, LB Brent, Eastbourne, Isle of Wight, Rother and Wealden have since abandoned kerbside-sort and report significantly higher capture rates).
- 3.18 In terms of volume, then, the argument runs in favour of moving away from kerbside-sort and toward some degree of co-mingling, either as a two-stream service or a fully co-mingled service.
- 3.19 Secondly, one can look at wider benchmarks: these are detailed in the modelling which follows.

Kerbside recycling yields for Nearest Neighbours

3.20 Table 3 below shows the kerbside yields in 2012/13 in kg/household (kg/hh) for NHDC and its CIPFA Nearest Neighbours (NN). The yield for NHDC between July 2013 and June 2014 is also shown, because the new collection system had changed from kerbside sort to co-mingled with separate paper for this (full year) period (this is the existing collection system). The Nearest Neighbour number is shown in the first column; the lower the number, the more similar it is to North Hertfordshire. The table also shows the collection system used for dry recyclables, the container and the frequency of recycling and residual waste collections.

Table 3. Kerbside Recycling Yields of Nearest Neighbours in 2012/13

NN	Authority	Yield kg/hh	Collection system for dry recyclables	Recycling collections	Residual collections
	N. Herts 2012/13	132	Separate streams inc. glass	Fortnightly box	Fortnightly w/bin
	N. Herts Jul'13-Jun'14	232	Co-mingled + sep. paper	Fortnightly w/bin, box	Fortnightly 180l w/bin
15	Vale of White Horse	279	Co-mingled inc. glass	Fortnightly w/bin	Fortnightly 180l w/bin
13	Rugby	210		Fortnightly sack	Fortnightly w/bin
6	Braintree	162			
7	Maidstone	146			
5	Test Valley	142	Co-mingled exc. glass	Fortnightly w/bin	
3	Epping Forest	250	Co-mingled + sep. glass	Fortnightly box, sack	Fortnightly 180l w/bin
14	Welwyn Hatfield	172	Co-mingled + sep. paper/card	Fortnightly w/bin, box	Fortnightly w/bin
9	Hertsmere	165			Weekly w/bin
12	Stroud*	173			
8	Taunton Deane	170	Separate streams inc. glass	Weekly box	Fortnightly 180l w/bin
11	Colchester	165		Fortnightly box, sack	Weekly sack
1	Dacorum	147		Weekly box	Fortnightly w/bin
2	Tunbridge Wells	136	Separate streams exc. glass	Fortnightly box	Weekly sack



NN	Authority	Yield kg/hh	Collection system for dry recyclables	Recycling collections	Residual collections
4	Ashford	62	Paper, cans, glass only (no card or plastic)		
10	Tonbridge and Malling	66	Paper and cans only (no glass, card or plastic)		Fortnightly w/bin

* Stroud changed from separate materials to co-mingled with separate paper and card in summer 2012.

3.21 There is a lot of evidence to show that the key factors in determining the volumes of dry recyclables collected are:

- (a) Choice of system for collecting dry recyclables;
- (b) Type of residual waste service; and
- (c) The degree of affluence.

3.22 It can be seen from Table 3 above that in making the change from kerbside sort to co-mingled with separate paper that NHDC has increased its dry recyclates yield at kerbside by 100 kg/household/year (77% increase in yield). Similarly, for its Nearest Neighbours, the highest performers collect recyclables on a co-mingled basis. NHDC collects some 232 kg/household/year and this is significantly more than any other Nearest Neighbour collecting on a kerbside-sort basis.

3.23 Table 4 below shows estimates of dry recycling yields and tonnages if NHDC moved to collecting recyclables in separate streams.

Table 4. Actual NHDC yields and tonnages achieved under current collection system and estimates for yields and tonnages under a kerbside sort regime.

North Hertfordshire	Collection type	Recycling frequency	Residual frequency	kg/hh	Tonnes	Households
Kerbside dry recycling, July 2013 - June 2014	Co-mingled with separate paper	Fortnightly	Fortnightly	232	13,055	56,150 (2013/14)
Alternative collections, est. dry recycling yield	Separate streams inc. glass	Fortnightly	Fortnightly	179	10,070	
Change				-53	-2,985	

3.24 It is assumed that if NHDC changed to collecting dry recyclables separately, residual waste would continue to be collected fortnightly in wheeled bins and dry recyclables would be collected fortnightly in boxes and possibly also sacks.



- 3.25 Benchmark authorities were chosen from among authorities in the same ONS Group as NHDC, i.e. Prospering UK. These were then filtered to those that collected residual waste fortnightly in wheeled bins and collected separated recyclables fortnightly in boxes and/or sacks. The authorities were then further refined to select those with similar indices of multiple deprivation.
- 3.26 The benchmark data on kg/household/year, tonnes and numbers of households is derived from WasteDataFlow entries for 2012/13. Yields for NHDC are shown for the first full year that the new collection scheme had been in place (July 2013 to June 2014). Estimated yields are based on the average among the benchmark authorities.
- 3.27 It should be clear that NHDC has considered the quality and quantity of recycled material arising most carefully. A key point to note is that, in choosing to keep paper separate, NHDC has followed the advice given in Lord de Mauley's letter.

Practicability test:

- 3.28 Here the three areas to be addressed are: is the separate collection of each material stream economically, environmentally or technically impracticable?
- 3.29 It should be clear from the analysis above that the chosen system is more environmentally practicable: it recycles significantly more than a system which collects material streams separately.
- 3.30 There is also an economic benefit to recycling at this level: both to NHDC in terms of recycling credits and overall cost of the service; as well as to the disposal authority, Hertfordshire County Council (HCC) over and above the payments made to NHDC.
- 3.31 As part of this TEEP assessment, WYG has undertaken an assessment of what costs might be if the materials were collected separately. In such a scenario, the volume of dry recyclables collected at the kerbside would drop sharply (as can be seen from Table 4 above).
- 3.32 Dry recycle is currently collected on the following basis: 5 x 26t split-back RCVS plus 1 x 26t RCVs for mainly flats: all used Monday to Friday which means there are 60 rounds in one full collection cycle (10 days). All the vehicles have a driver plus 2 loaders: this is an average pass-rate of 936 properties per day per collection round, which is a reasonable productivity rate.
- 3.33 Detailed collection modelling has been completed using authentic data accrued from NHDC in respect of the existing waste management service in order to fully appraise current costs and this has been repeated for the scenario of separate collection of the four target materials. It is



important to note that it would be completely impracticable, uneconomic and non-environmentally sound to implement a new source-separated service using the same RCV vehicles currently employed for the collection of dry recyclates on an alternate weekly basis. Therefore, any change of collection methodology will require new vehicle types and this has been duly captured through the modelling on a unit cost basis. The Council is currently contracted to Veolia for its recycling collection and any change would require the Council to vary the contract, or, cancel the contract and re-procure services – all would be very expensive options for the Council. The figures presented below are based on the current system (i.e. actual costs) and the modelled costs for separate collection for 2015/16. Negative values are shown in brackets: Note – the net cost of the service in both instances *is shown as negative* due to the generous alternative funding model (AFM) provided to NHDC by Hertfordshire County Council (HCC).

Cost for current system: collect dry recycling on a co-mingled basis (fortnightly)

- Annual cost of recycling drivers and loaders: £531,150
- Annual cost of recycling vehicles: £371,794
- Annual cost of recycling containers: £89,212
- Annual income from collected materials, including recycling credits: (£959,021)
- Additional funding from HCC (Alternative Funding Model (AFM)): (£605,674)

Total net cost: (£572,538)

Cost for new system, collect dry recycling as separate streams (fortnightly)

- Annual cost of recycling drivers and loaders: £654,775
- Annual cost of recycling vehicles: £309,114
- Annual cost of recycling containers: £61,335
- Annual income from collected materials, including recycling credits: (£820,662)
- Additional funding from HCC (Alternative Funding Model (AFM)): (£466,242)

Total net cost: (£261,679)

3.34 Please note that as part of the modelling work, an optimised current collection system was also modelled, which indicated even more significant savings might be possible versus a kerbside sort system; however, for the purpose of this comparison, only *actual costs* for the current system are compared with modelled separate collection system costs i.e. even under the non-optimised current co-mingled collection system compared with an optimised separate collection system the former is still less expensive.



- 3.35 This differential in cost is not just high in percentage terms: but is significant in absolute terms. To change systems would effectively cost NHDC ca. £311,000 more per annum, in addition to any one-off costs for changing.
- 3.36 NB these costs are just net costs to NHDC: there are further savings to Hertfordshire County Council (HCC) in respect of the current co-mingled collection system due to the additional volumes diverted from residual waste. If separate stream collection was introduced, then, a lower total recycling credit and AFM funding would be paid by HCC to NHDC (due to lower volumes of recyclates collected), but HCC would incur additional disposal costs (due to increased volumes of residual waste).
- 3.37 A further factor is that with the current system a significant range of materials can be recycled at the kerbside with significant capacity (240 litres per fortnight) for each household; and this has enabled NHDC to dispense with bring sites. A kerbside sort system would almost certainly not collect such a range and give each household such capacity: meaning that there would also be additional costs from providing a bring site service.
- 3.38 Taking into account the higher level of recycling and the relative costs as noted above, it should be clear that the current system has been chosen by NHDC because it is seen as more technically practicable, environmental and economic than collecting the four materials separately.

Step 5

- 3.39 At this stage sign-off is required.
- 3.40 We recommend that this assessment should be formally approved by the appropriate Council Committee; and retained as a formal record.
- 3.41 In terms of a review (Step 6 in the Route Map), we believe that should the Council decide to change its method of collection for recyclables, then a new TEEP Assessment will be required prior to the introduction of any new collection regime.

LA/JE/ZG/WYG/05.15

NOTE FOR NORTH HERTFORDSHIRE DISTRICT COUNCIL:

TEEP ASSESSMENT



Appendices



Appendix A:

Kerbside recycling yields for Nearest Neighbours

Table A1 shows the kerbside dry recycling yields in kg/household for North Hertfordshire and its CIPFA Nearest Neighbours (NN), listed in order of collection system then decreasing yields. Yields are based on tonnages derived from WasteDataFlow data for 2012/13. The Nearest Neighbour number is shown in the first column; the lower the number, the more similar it is to North Hertfordshire. The table also shows the recycling and residual waste containers and frequencies of collections. For comparison, the yield under the new collection scheme is also shown, for the period July 2013 to June 2014.

Table A1: Kerbside Recycling Yields of Nearest Neighbours in 2012/13

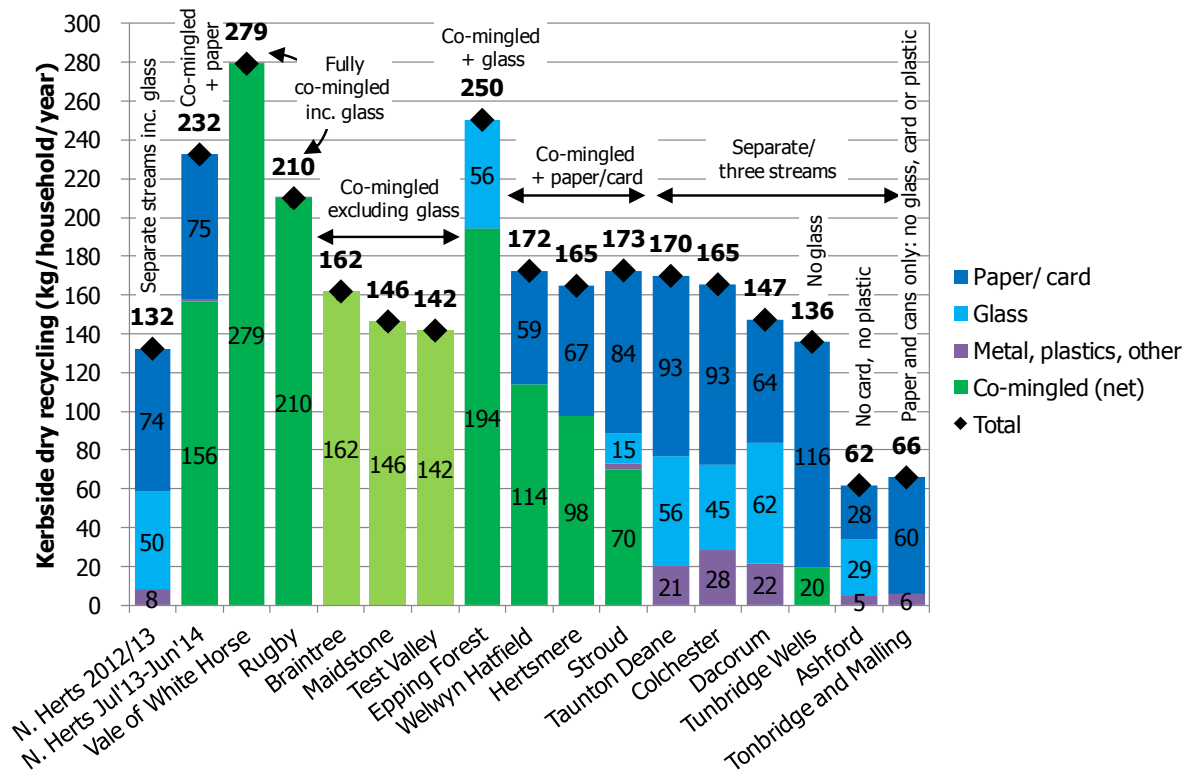
NN	Authority	Yield kg/hh	Collection system for dry recyclables	Recycling collections	Residual collections
0	N. Herts 2012/13	132	Separate streams inc. glass	Fortnightly box	Fortnightly w/bin
0	N. Herts Jul'13-Jun'14	232	Co-mingled + sep. paper	Fortnightly w/bin, box	Fortnightly 180l w/bin
15	Vale of White Horse	279	Co-mingled inc. glass	Fortnightly w/bin	Fortnightly 180l w/bin
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6	Braintree	162	Co-mingled exc. glass	Fortnightly sack	Fortnightly w/bin
7	Maidstone	146		Fortnightly w/bin	
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3	Epping Forest	250	Co-mingled + sep. glass	Fortnightly box, sack	Fortnightly 180l w/bin
14	Welwyn Hatfield	172	Co-mingled + sep. paper/card	Fortnightly w/bin, box	Fortnightly w/bin
9	Hertsmere	165			Weekly w/bin
12	Stroud*	173			Fortnightly 180l w/bin
8	Taunton Deane	170	Separate streams inc. glass	Weekly box	Fortnightly 180l w/bin
11	Colchester	165		Fortnightly box, sack	Weekly sack
1	Dacorum	147		Weekly box	Fortnightly w/bin
2	Tunbridge Wells	136	Separate streams exc. Glass	Fortnightly box	Weekly sack
4	Ashford	62	Paper, cans, glass only (no card or plastic)		
10	Tonbridge and Malling	66	Paper and cans only (no glass, card or plastic)		Fortnightly w/bin

* Stroud changed from separate materials to co-mingled with separate paper and card in summer 2012.

Figure A1 below illustrates these figures and provides a breakdown by material type.



Figure A1: Kerbside Recycling Yields in Nearest Neighbours in 2012/13



Estimated yields based on benchmarks

Table A2 and Figure A2 show the kerbside dry recycling yield in kg/household for North Hertfordshire in 2012/13 and from July 2013 to June 2014, and the benchmark yields for the following recycling collection systems (each with fortnightly recycling and fortnightly residual waste, except where stated):

1. Fully co-mingled including glass;
2. Two stream: co-mingled with separate glass;
3. Two stream: co-mingled with separate paper and/or card;
4. Separate streams including glass
 - a. With fortnightly recycling and fortnightly residual waste;
 - b. With weekly recycling and fortnightly residual waste.

The estimated yields are the average of yields in 2012/13 for benchmark authorities with:

- indices of multiple deprivation (IMD) within +/-5 of that for North Hertfordshire, 10.43 (or up to 17 to provide sufficient benchmark authorities);
- in the ONS supergroup 'Prospering UK';



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- fortnightly recycling including card, plastic bottles (and in many cases plastic containers) as well as paper, cans and glass; and
- fortnightly collections of residual waste from smaller wheeled bins, of between 140 and 190 litres, for at least half of households.

An additional benchmark is also provided for weekly collections of separate materials with fortnightly residual waste. The benchmark authorities were chosen with smaller residual waste bins for comparison with the current system in North Hertfordshire. For illustration, Figure A3 also shows the benchmarks for authorities with 240 litre residual bins. Since there were no benchmark authorities that used smaller bins for residual waste as well as collecting co-mingled with paper/card separate, the benchmark average for authorities with standard sized bins is shown in Table A2.

For each system, textiles and/or batteries may also be collected as additional streams. Authorities collecting mainly separate materials may collect some materials co-mingled, e.g. plastics and cans.

Table A2 also shows the tonnes per year for North Hertfordshire for 2012/13 and July 2013 to June 2014, and the equivalent benchmark tonnes obtained by multiplying the benchmark yields in kg/household by the number of households in North Hertfordshire, 55,850 in 2012/13, and dividing by 1000. Each is compared with the estimated yield and tonnage under the new collection scheme.

Table A2: Kerbside Recycling Benchmarks (benchmarks for small residual bins*)

Collection type	Recycling containers	Residual container	Benchmark yield kg/hh	Change in kg/hh from new service	Benchmark tonnes	Change in tonnes from new service
North Hertfordshire 2012/13	Fortnightly box	Fortnightly w/bin	132	-100	7,389	-5,668
North Hertfordshire June 2013 – July 2014	Fortnightly w/bin + box	Fortnightly 180l w/bin	232	0	12,987	0
Co-mingled inc. glass	Fortnightly w/bin	Fortnightly 180-190l w/bin	261	29	14,584	1,597
Co-mingled + sep. Glass	Fortnightly box or w/bin	Fortnightly 140-180l w/bin	250	18	13,981	995
Co-mingled + sep. paper/card	Fortnightly box or w/bin	Fortnightly 240l* w/bin	216*	-16*	12,091*	-896*
Separate streams inc. glass (F/W)	<i>Fortnightly box</i>	Fortnightly 140-180l w/bin	178	-54	9,948	-3,038
Separate streams inc. glass (W/F)	Weekly box	Fortnightly 180l w/bin	198	-34	11,085	-1,901

* No benchmark authorities use small bins for residual waste as well as collecting recycling co-mingled with paper/card separate, thus the average for authorities with standard sized bins is shown.



Figure A2: Kerbside Recycling Benchmarks (benchmarks for small residual bins only)

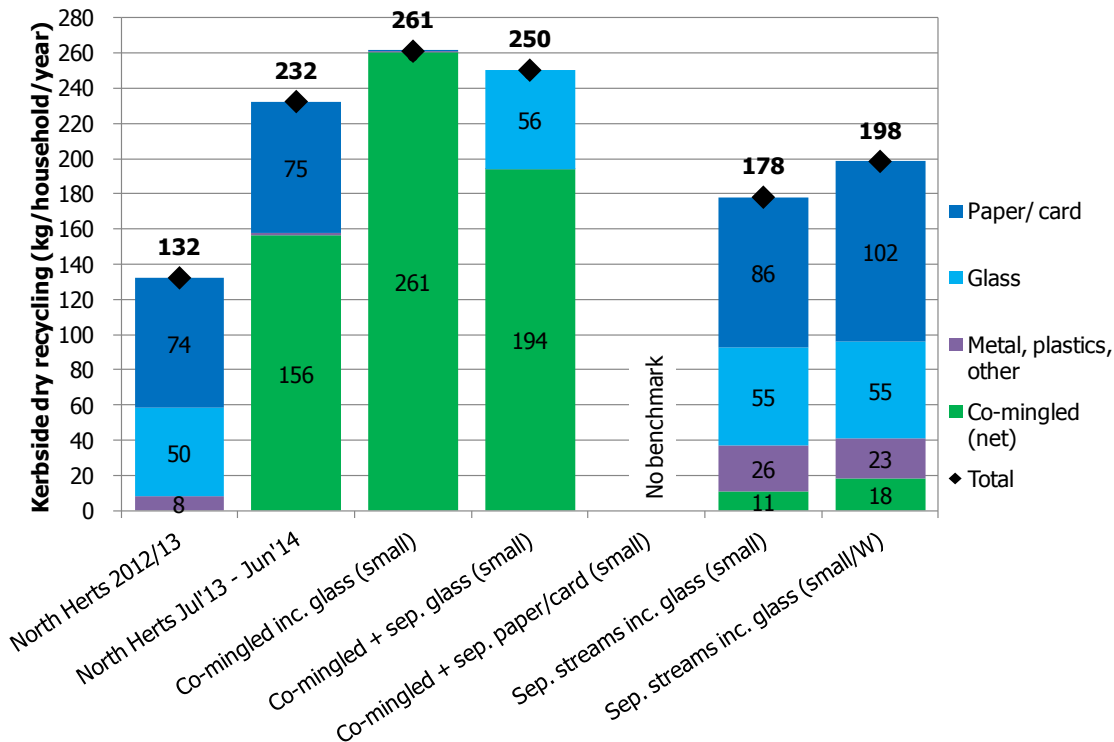


Figure A3: Kerbside Recycling Benchmarks (benchmarks for small and large residual bins)

