



## INTRODUCTION

Uttlesford DC (UDC) collects its dry recyclables in-house. The collected materials become the property of Bywaters; and are subsequently transported and treated through a contract between UDC and Bywaters, under the terms of which Bywaters provides transfer facilities through sub-contract arrangements and also provides transport to its MRF and treatment of the materials for recycling.

In setting up these arrangements, UDC was fully cognisant of the requirements of the EU Waste Framework Directive (WFD) 2008 and the Waste England and Wales Regulations 2011 which 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.

UDC 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 (TEEP).

Accordingly, as part of the design of its recycling systems, options for collecting recyclables were considered and tested using TEEP criteria: although no official guidance as to how this was to be done was available at the time.

In late April 2014 WRAP published the Waste Regulations Route Map. WYG was asked by UDC to assess its chosen methodology on the basis of this Route Map.

## THE SYSTEM DESIGN AND OUTCOMES

The system that UDC uses is designed to maximise the recycling / composting rate at an affordable cost.

The design is as follows:

- Residual waste collected fortnightly from a 180-litre wheeled-bin;
- Dry mixed recyclables (DMR) collected fortnightly, co-mingled including glass, from a 240-litre wheeled-bin;
- Garden waste collected fortnightly during the period April to November inclusive from a 240-litre wheeled-bin on a chargeable basis; and
- Food waste collected weekly from food waste containers.

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The size of the bins is designed to reduce residual waste and encourage recycling. In terms of comparative performance outcomes, the scheme is a success: in 2012/13 (at the time of writing the most recent data available for all local authorities) UDC had the 28<sup>th</sup> highest rate for recycling / composting in England: this is out of 352 authorities meaning UDC's performance is among the highest 10% of all local authorities in England.

The design of the collection system delivers an economic solution through three specific initiatives:

- First, the use of podded vehicles, so that on one pass the householder has food waste and residual waste collected on one pass using the same vehicle: and a week later has food waste and dry recycling collected on one pass using the same vehicle. Therefore each household is passed once per week, except for those households which subscribe to the garden waste collection service.
- Second, collecting dry recycling (and food) across the whole District in one week and collecting residual waste (and food) in the other. This means that the transfer stations are only opened on an alternate-week basis; and it is easier to deal with vehicle breakdowns, missed collections etc.
- Third, only collecting from Tuesdays to Fridays. This means that Bank Holiday catch-ups are not required (save for the Christmas / New Year period) giving residents greater certainty as to collection days and saving communications costs. It also provides greater economy, since UDC is a large, rural District with consequential long travelling times: and the longer working day which this design delivers means that each round can service many more properties whilst still tipping twice per day maximum.

The resources used for collection are as follows (from 34,182 properties):

- Six rounds plus a half-round, each comprising a driver plus three loaders, which collect residual waste plus food waste on one week and dry recycling plus food waste on the alternate week; and
- One garden waste round comprising a driver plus one loader.

As stated, the service is delivered in-house: the current contract for the treatment of dry recycle (with Bywaters) runs until 2016 but there is the possibility of a one-year extension. We understand that UDC is likely, for a number of reasons, to join a consortium / framework contract covering several Essex waste collection authorities which will operate from 2015.

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In terms of volumes collected, in 2013/14 these were (from 34,182 households):

- Overall tonnages of waste: 27,481.30 tonnes
- Residual waste: 12,149.60 tonnes
- Dry recyclables: 9,457.04 tonnes (NB includes contamination)
- Compostable waste: 5,442.48 tonnes

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

Total waste: 804 kg

Residual household waste: 355 kg

Dry recycling: 277 kg (but NB this is not net of contamination)

Composting: 159 kg

This gives the following outcomes:

- Recycling rate: 35.45%
- Composting rate: 20.35%
- Combined recycling / composting rate: 55.80%

These figures are worthy of some comment. The total waste arisings per household are very low indeed – for many other Essex districts the figure is very much higher e.g. Basildon 1,005 kg; Braintree 943 kg; Brentwood 901 kg; Rochford 944 kg. The low figure for Uttlesford says much about the excellent work done in terms of designing a collection system that minimises waste.

The capture rate of dry recycling as a percentage of total waste arisings is significant. Again, looking at some other Essex authorities the figures are: Basildon 27.46%; Braintree 27.11%; Brentwood 32%; Rochford 27.9%. Additionally, it is worth noting (as discussed later as a major part of the TEEP test) that the authorities in Essex collecting recyclables in separate streams collect even less than these figures, whether as a percentage or in terms of kg per household.

## USING THE WRAP ROUTE MAP

With the benefit of now having the WRAP Route Map to hand, the following commentary works its way through the various stages.



## Step 1

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

The waste collections being covered are household waste. The current waste collection system does collect the four materials (glass, metal, paper and plastic) for recycling; but these are not collected as separate waste streams.

It is worth noting that UDC delivers a recycling service (as well as a residual waste service) to schools. This includes the collection of food waste and the collection of dry recycling to the same specification as for households.

The published guidance also refers to the collection of food and garden waste: the system collects these on a separate basis, with garden waste collections on a chargeable basis.

The published guidance also refers to the collection of bulky waste and the system collects this and applies a waste hierarchy promoting reuse and recycling.

## Step 2

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

Residual household waste is not currently recycled: but there will be recovery and some recycling through the new MBT facility at Basildon (run on behalf of Essex County Council, the Waste Disposal Authority for HDC).

Dry recyclate collected is all recycled, except for fines and contaminants. The contract between UDC and Bywaters is based on a contamination rate of 5% or below: and the contract documentation sets out detailed processes that are followed to determine the make-up of the recyclate and managing contamination.

Food and garden waste is treated through composting. Bulky waste is also recycled where it can be.



## Step 3

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

## Step 4

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 UDC collect glass, metal, paper and plastic for recycling? Yes
- Are separate collections in place? No (so necessity and practicability questions to be answered)
- Are separate collections necessary to ensure that waste is recycled? No – waste collected for recycling is (apart from contaminants etc.) recycled
- Is there an approach to separate collection that is technically, environmentally and economically practicable? No – as the following tests show

Necessity test:

Here the quality and quantity of recycling is considered.

In terms of quality, the contract documentation requires that at least 95% of collected material shall be recycled. Further, 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.

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

- Newspaper, magazines, (EWC 20 01 01)
- Shredded paper (EWC 20 01 01)
- Office paper, white and coloured (EWC 20 01 01)
- Other paper including clean paper bags (EWC 20 01 01)
- Greeting cards (EWC 20 01 01)
- Envelopes including window type (EWC 20 01 01)
- Telephone directories inc. Yellow Pages and other catalogues (EWC 20 01 01)
- Wrapping paper (EWC 20 01 01)



- Junk mail (EWC 20 01 01)
- Cardboard (EWC 20 01 01)
- Egg boxes card based (EWC 20 01 01)
- Cans (steel and aluminium) (EWC 20 01 40)
- Aluminium foil (EWC 20 01 40)
- Aerosols (EWC 20 01 40)
- Glass (EWC 20 01 02)
- Plastic Bottles (EWC 20 01 39)
- Mixed Plastics (EWC 20 01 39)

Additionally, Bywaters tender submission stated that they also accepted Tetrapak, bubble wrap, DVD cases, textiles and shoes. This is a wide range of recyclables: and this has enabled UDC to remove the bring sites service, delivering greater economy.

UDC has done a good deal of work in attempting to reduce contamination: in October 2013 WYG undertook an analysis of collected dry recyclate, which found that ca. 9% of the recyclate sampled was either untargeted materials, contaminants or fines (i.e. targeted material smaller than 45 mm in size, typically glass shards). Since then UDC has engaged with residents to improve contamination: and more recent independent analysis has been undertaken by Biffa and Viridor, with their findings showing levels of 9% and 7% respectively.

UDC is currently considering joining a framework contract (involving other Essex authorities, with Basildon acting as lead) for the treatment of dry recyclables to replace the current contract with Bywaters. This new arrangement will have more detailed information as to contamination processes: for now, UDC and Bywaters are discussing a variation which will reward low contamination rates through the contract price.

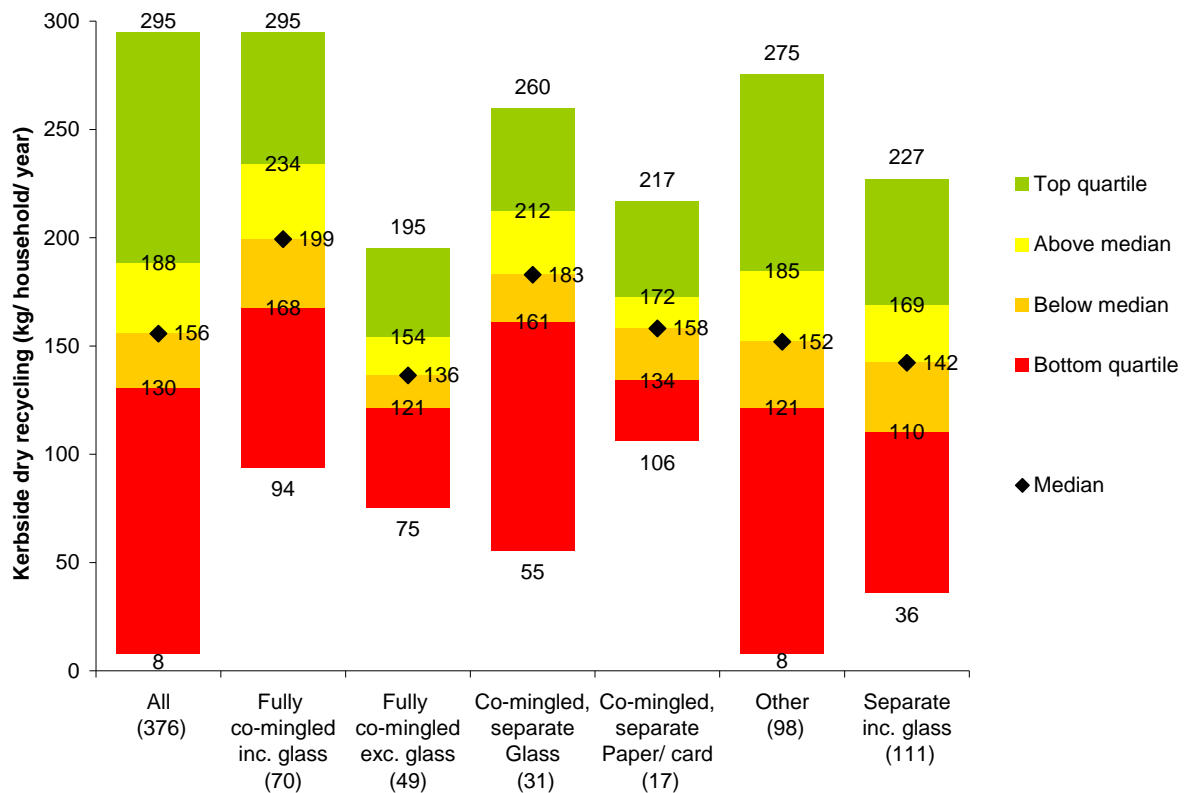
The new arrangement referred to above will also include clear requirements regarding end markets. The current contract Under the current contract Bywaters operate an open-book policy on end markets with clear audit trails (they were required to send an example of this with their tender) and they submit quarterly reports. They like to work with closed-loop processors where possible. Currently ca. 54% of product goes to the UK, 43% elsewhere in the EU and the balance to Asia. Rejects are used in EfW plants.

In terms of quantity, there is a good deal of evidence which shows that the chosen methodology recycles much more than could be achieved with separate collections.



Nationally, if one looks at the higher performers, then the highest performer is for a fully co-mingled service (295 kg per household per annum) followed by a two-stream service collecting glass separately (260 kg per household per annum). This position does not just hold for the highest performers: it is also true at all quartiles, as shown in Figure 1 below (showing 2010/11 figures):

**Figure 1**



The 2011/12 figures tell a similar story which supports HDC's choice of system. Table 1 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.

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**Table 1: 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	Communal
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	South Kesteven		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%



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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.

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.

Second, a pattern whereby higher capture results from either fully co-mingled or two-stream systems can be seen in Table 2 below, which looks at the capture rate at the kerbside for Essex authorities in 2012/13.

**Table 2**

<b>Authority</b>	<b>Kg / household</b>	<b>Collection system for Dry Recyclables</b>	<b>Notes</b>
Epping Forest	250	Two-stream: glass separate	Sack for DMR, fortnightly
Castle Point	249	Two-stream: glass separate	Sack for DMR, fortnightly
Rochford	243	Co-mingled	W/bin for DMR, fortnightly
Uttlesford	243	Co-mingled	W/bin for DMR, fortnightly
Basildon	233	Two-stream: glass separate	Sack for DMR, weekly
Brentwood	231	Two-stream: glass separate	Sack for DMR, weekly
Harlow	210	Co-mingled	W/bin for DMR, fortnightly
Chelmsford	178	Kerbside sort	Weekly
Maldon	176	Three-stream	Weekly
Colchester	165	Kerbside sort	Weekly
Braintree	162	Co-mingled but glass not collected	Sack collection fortnightly*
Tendring	100	Kerbside sort but glass not collected	Weekly*

\* We do not have full figures for Tendring; but in the case of Braintree, if glass collected at bring sites were added, the figure rises to ca. 210 kg / household / year.

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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.

In Essex the highest performers collect recyclables on either two-stream or fully co-mingled basis, with more affluent districts as well as those with fortnightly residual waste collections at the higher end of the spectrum for weight of recyclables collected per household.

Third one can look at wider benchmarks: these are detailed in the modelling which follows.



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## Uttlesford Yield and Tonnage Estimates for TEEP Analysis

Uttlesford is in the Prospering Southern England ONS group within the Prospering UK Supergroup and has an IMD of 7.94.

It collects recycling fully co-mingled including glass fortnightly from wheeled bins and residual waste fortnightly from wheeled bins.

If Uttlesford moved to collecting recycling *weekly* in separate streams we believe the estimated yields would reduce from 243 to 179 kg/hh/year, meaning some 2,154 tonnes would not be recycled – and this for a weekly collection system:

Uttlesford	Collection type	Recycling container	Residual container	Recycling frequency	Residual frequency	IMD	% rank in collection type	kg/hh	Tonnes	House-holds
2012/13 collections and dry recycling yield	Fully co-mingled inc. Glass	Wheeled bin	Wheeled bin	Fortnightly	Fortnightly	7.94	88%	243	8,200	33,690
Proposed collections and estimated dry recycling yield*	Separate streams inc. Glass	Box	Wheeled bin	Weekly	Fortnightly	13.64	78%	179	6,046	
<b>Change</b>								<b>-64</b>	<b>-2,154</b>	

This is based on the following Prospering UK benchmark authorities with IMD < 16 that collect recycling weekly in separate streams from boxes and residuals fortnightly in wheeled bins.

Authority	ONS Group	IMD	% rank in collection type	Total (net)
North Somerset	Prospering Smaller Towns	15.18	100%	<b>220</b>
Mendip	Prospering Smaller Towns	15.66	95%	<b>190</b>
South Somerset	Prospering Smaller Towns	14.41	85%	<b>180</b>
Daventry	Prospering Smaller Towns	12.06	61%	<b>160</b>
Dacorum	Prospering Southern England	10.90	52%	<b>147</b>



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If Uttlesford moved to collecting recycling *fortnightly* in separate streams, we estimate the estimated yields would reduce from 243 to 158 kg/hh/year, meaning 2,870 tonnes would not be recycled:

Uttlesford	Collection type	Recycling container	Residual container	Recycling frequency	Residual frequency	IMD	% rank in collection type	kg/hh	Tonnes	House-holds
2012/13 collections and dry recycling yield	Fully co-mingled inc. Glass	Wheeled bin	Wheeled bin	Fortnightly	Fortnightly	7.94	88%	243	8,200	33,690
Proposed collections and estimated dry recycling yield*	Separate streams inc. Glass	Box	Wheeled bin	Fortnightly	Fortnightly	9.31	62%	158	5,330	
<b>Change</b>								<b>-85</b>	<b>-2,870</b>	

This is based on the following Prospering Southern England benchmark authorities with IMD < 16 that collect recycling fortnightly in separate streams from boxes and residuals fortnightly in wheeled bins.

Authority	ONS Group	IMD	% rank in collection type	Total (net)
Three Rivers	Prospering Southern England	9.66	91%	<b>182</b>
East Hertfordshire	Prospering Southern England	7.84	59%	<b>160</b>
North Hertfordshire	Prospering Southern England	10.43	36%	<b>132</b>

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It should be clear that UDC has considered the quality and quantity of recycled material arising most carefully.

Practicability test:

Here the three areas to be addressed are: is the separate collection of each material stream economically, environmentally or technically impracticable?

It should be clear from the analysis above that the chosen system is more environmentally practicable: it recycles significantly more than a system which material streams separately) by an estimated 2,870 tonnes per annum if fortnightly collections remain or 2,154 tonnes per annum if weekly collections were introduced.

There is also an economic benefit to recycling at this level: both to UDC in terms of recycling credits (up to an additional £174,180 per annum based on £60.69 per tonne) and additional payments in terms of the overall recycling / composting rate; as well as to the disposal authority Essex CC (calculated as up to a further £85,000 per annum over and above the payments made to UDC).

Further: at present UDC collects dry recyclate from its 34,182 properties on a fortnightly basis using six-and-a-half rounds with a driver plus three loaders, but also collecting food waste, over a four day cycle (1,315 properties per day). If this were expressed at current (September 2014) rates the cost for collection and treatment could be expressed as:

- Six-and-a-half rounds of driver plus three loaders:
  - 6.5 drivers at £27,000 per annum: £175,500 per annum including all overheads
  - 19.5 loaders at £22,000 per annum: £429,000 including all overheads
  - 6.5 podded vehicles at £85,000 per annum: £552,500
- 9,457 tonnes of dry recyclate at £15 / tonne gate fee (including transfer station): £141,855
- Recycling credits: 9,457 tonnes @ £60.69 per tonne: £573,945
- Net cost of collection and treatment: £724,910

If the recyclate was collected as separate streams, and there were still fortnightly collections, UDC would require an arrangement whereby those rounds continued to collect food waste: generally speaking such arrangements (whereby kerbside-sorted materials are collected along with food waste) have a much lower productivity rate because of vehicle capacity; and we would expect the costs to be:

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- 12 rounds of driver plus three loaders:
  - 12 drivers at £27,000 per annum: £324,000 per annum including all overheads
  - 36 loaders at £22,000 per annum: £792,000 including all overheads
  - 12 kerbsider vehicles at £55,000 per annum: £660,000
- Income from sale of recyclables:
  - Paper and card: 3,255 tonnes @ £50 per tonne = £162,750
  - Cans / plastic: 1,020 tonnes @ £35 per tonne = £35,700
  - Glass: 2,312 tonnes at £20 per tonne = £46,240
- Recycling credits: 6,587 tonnes @ £60.69 per tonne: £399,765
- Net cost of collection and treatment: £1,131,545

This increase in cost is stark: an increase in costs of over £400,000 per annum (56%).

Additionally, Essex CC would make further savings (estimated at up to ca. £85,000 per annum) through the greater diversion from residual waste. Thus the overall saving to the Essex taxpayer from the current system is almost £500,000: as well as diverting significantly more material for recycling with obvious environmental benefits.

However in order to meet UDC's commitments under the IAA it is more likely that weekly collections would be needed; if that were the case then productivity in the week when food waste is collected by the crews collecting residual waste would be such that only two loaders per round would be required in that week, so we would expect the costs to be as follows:

- 24 rounds of driver plus two or three loaders:
  - 24 drivers at £27,000 per annum: £648,000 per annum including all overheads
  - 60 loaders at £22,000 per annum: £1,320,000
  - 24 kerbsider vehicles at £55,000 per annum: £1,320,000
- Income from sale of recyclables:
  - Paper and card: 3,609 tonnes @ £50 per tonne = £180,450
  - Cans / plastic: 1,131 tonnes @ £35 per tonne = £39,585
  - Glass: 2,563 tonnes at £20 per tonne = £51,260
- Recycling credits: 7,303 tonnes @ £60.69 per tonne: £443,219
- Net cost of collection and treatment: £2,573,486

This increase in cost is even more stark: an increase in costs of over £1.8 million per annum, excluding further increases to the Essex taxpayer from lower recycling levels than at present.

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It should be clear that the current system has been chosen because it is seen as more technically practicable, environmental and economic than collecting the four materials separately.

## **Step 5**

At this stage sign-off is required.

We recommend that this assessment should be formally approved by the appropriate Council Committee or other authority; and retained as a formal record.

In terms of a review (Step 6 in the Route Map), we believe that this TEEP test is appropriate for the new treatment contract UDC is considering entering into (a framework contract, facilitated by Basildon BC, starting in May 2015); but a review should take place just prior to the end of that contract (expected to be May 2019) or whenever waste services are generally reviewed, whichever is the earlier.

LA/WYG/9.14