Tees Valley Joint Waste Management Strategy

Supporting Document – Waste Collection

June 2008













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Darlington, Hartlepool, Middlesbrough, Redcar and Cleveland, Stockton on Tees Borough Council

Tees Valley Joint Waste Management Strategy

Supporting Document – Waste Collection

June 2008

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Contents

1. Introduction

1.1 Background

In January 2007, the Tees Valley Joint Strategy Unit commissioned Entec to provide technical assistance in the development of its Joint Waste Management Strategy (JWMS), using funding awarded by Defra. To support the Headline Strategy, Entec has produced a series of supplementary reports which provide technical waste management information and discuss in further detail the considerations used in developing the Strategy.

This supplementary report provides an overview of collection methods and considerations, and includes:

- Overview of Legislation relating to Waste Collection;
- Collection schemes commonly operated in the UK;
- The current services provided by the Tees Valley Authorities;
- Considerations of best practice in the UK;
- Possible services that the Tees Valley Authorities could implement.

2. Legislation

2.1 Household Waste

Local Authorities must adhere to a lot of legislation when collecting and disposing of waste. Sections 45 and 46 of the Environmental Protection Act 1990 (stated below) are the core pieces of legislation that state a Local Authorities obligations with regard to waste collection.

Section 45 of the Environmental Protection Act 1990 (EPA 1990) states:

45.—

1) It shall be the duty of each waste collection authority-

a) to arrange for the collection of household waste in its area except waste — which is situated at a place which in the opinion of the authority is so isolated or inaccessible that the cost of collecting it would be unreasonably high, and as to which the authority is satisfied that adequate arrangements for its disposal have been or can reasonably be expected to be made by a person who controls the waste; and,

Section 46 defines the requirements with regard to receptacles for household waste and enables Local Authorities to specify how household waste should be presented by residents and in what containers it should be presented:

46.—

2) Where a waste collection authority has a duty by virtue of section 45(1)(a) above to arrange for the collection of household waste from any premises, the authority may, by notice served on him, require the occupier to place the waste for collection in receptacles of a kind and number specified.

3) The kind and number of the receptacles required under subsection (1) above to be used shall be such only as are reasonable but, subject to that, separate receptacles or compartments of receptacles may be required to be used for waste which is to be recycled and waste which is not.

4) In making requirements under subsection (1) above the authority may, as respects the provision of the receptacles—

a) Determine that they be provided by the authority free of charge;

b) Propose that they be provided, if the occupier agrees, by the authority on payment by him of such a single payment or such periodical payments as he agrees with the authority;

c) Require the occupier to provide them if he does not enter into an agreement under paragraph (b) above within a specified period; or

d) Require the occupier to provide them.

5) In making requirements as respects receptacles under subsection (1) above, the authority may, by the notice under that subsection, make provision with respect to—

a) The size, construction and maintenance of the receptacles;

b) The placing of the receptacles for the purpose of facilitating the emptying of them, and access to the receptacles for that purpose;

c) The placing of the receptacles for that purpose on highways or, in Scotland, roads;

d) The substances or articles which may or may not be put into the receptacles or compartments of receptacles of any description and the precautions to be taken where particular substances or articles are put into them; and,

e) The steps to be taken by occupiers of premises to facilitate the collection of waste from the receptacles.

Section 51 of the Environmental Protection Act defines the functions of Waste Disposal Authorities

(1) It shall be the duty of each waste disposal authority to arrange—

(a) for the disposal of the controlled waste collected in its area by the waste collection authorities; and

(b) for places to be provided at which persons resident in its area may deposit their household waste and for the disposal of waste so deposited;

in either case by means of arrangements made (in accordance with Part II of Schedule 2 to this Act) with waste disposal contractors, but by no other means.

(2) The arrangements made by a waste disposal authority under subsection (1)(b) above shall be such as to secure that—

(a) each place is situated either within the area of the authority or so as to be reasonably accessible to persons resident in its area;

(b) each place is available for the deposit of waste at all reasonable times (including at least one period on the Saturday or following day of each week except a week in which the Saturday is 25th December or 1st January);

(c) each place is available for the deposit of waste free of charge by persons resident in the area;

but the arrangements may restrict the availability of specified places to specified descriptions of waste.

(3) A waste disposal authority may include in arrangements made under subsection (1)(b) above arrangements for the places provided for its area for the deposit of household waste free of charge by residents in its area to be available for the deposit of household or other controlled waste by other persons on such terms as to payment (if any) as the authority determines.

(4) For the purpose of discharging its duty under subsection (1)(a) above as respects controlled waste collected as mentioned in that paragraph a waste disposal authority—

(a) shall give directions to the waste collection authorities within its area as to the persons to whom and places at which such waste is to be delivered;

(b) may arrange for the provision, within or outside its area, by waste disposal contractors of places at which such waste may be treated or kept prior to its removal for treatment or disposal;

(c) may make available to waste disposal contractors (and accordingly own) plant and equipment for the purpose of enabling them to keep such waste prior to its removal for disposal or to treat such waste in connection with so keeping it or for the purpose of facilitating its transportation;

(d) may make available to waste disposal contractors (and accordingly hold) land for the purpose of enabling them to treat, keep or dispose of such waste in or on the land;

(e) may contribute towards the cost incurred by persons who produce commercial or industrial waste in providing and maintaining plant or equipment intended to deal with such waste before it is collected; and

(f) may contribute towards the cost incurred by persons who produce commercial or industrial waste in providing or maintaining pipes or associated works connecting with pipes provided by a waste collection authority within the area of the waste disposal authority.

(5) For the purpose of discharging its duties under subsection (1)(b) above as respects household waste deposited as mentioned in that paragraph a waste disposal authority—

(a) may arrange for the provision, within or outside its area, by waste disposal contractors of places at which such waste may be treated or kept prior to its removal for treatment or disposal;

(b) may make available to waste disposal contractors (and accordingly own) plant and equipment for the purpose of enabling them to keep such waste prior to its removal for disposal or to treat such waste in connection with so keeping it or for the purpose of facilitating its transportation; and

(c) may make available to waste disposal contractors (and accordingly hold) land for the purpose of enabling them to treat, keep or dispose of such waste in or on the land.

(6) Where the arrangements made under subsection (1)(b) include such arrangements as are authorised by subsection (3) above, subsection (5) above applies as respects household or other controlled waste as it applies as respects household waste.

(7) Subsection (1) above is subject to section 77.

(8) This section shall not apply to Scotland.

Schedule 1 of the Controlled Waste Regulations (1992) defines what should be treated as household waste and Schedule 2 identifies the types of household waste collections that a Local Authority may charge for.

2.2 Commercial Waste

Under the terms of the Environmental Protection Act (EPA) 1990, commercial waste is described as *"waste from a premises used wholly and mainly for the purposes of a trade or business or the purpose of sport, recreation or entertainment"*

The EPA places businesses under a 'Duty of Care' with respect to the management of their commercial waste. Under the Duty of Care commercial waste producers must ensure that the person removing their waste is or from a licensed waste collection company. It is the responsibility of the business concerned to ensure that their waste is disposed of properly and legally, and therefore proof of registration should be sought from the waste contractor employed. The Duty of Care exists largely to prevent fly-tipping offences but a breach of the Duty of Care is also an offence in itself.

In addition to Part II, Section 45 described above, Section 47 of the Environmental Protection Act 1990 states:

"Environmental Protection Act 1990 Part II

47-

1) A waste collection authority may, at the request of any person, supply him with receptacles for commercial or industrial waste which he has requested the authority to arrange to collect and shall make a reasonable charge for any receptacle supplied unless in the case of a receptacle for commercial waste the authority considers it appropriate not to make a charge.

(2) If it appears to a waste collection authority that there is likely to be situated, on any premises in its area, commercial waste or industrial waste of a kind which, if the waste is not stored in receptacles of a particular kind, is likely to cause a nuisance or to be detrimental to the amenities of the locality, the authority may, by notice served on him, require the occupier of the premises to provide at the premises receptacles for the storage of such waste of a kind and number specified.

(6) A person who fails, without reasonable excuse, to comply with any requirements imposed under subsection (2) or (4) above shall be liable on summary conviction to a fine not exceeding level 3 on the standard scale."

On this basis it is understood that if the occupier of a commercial premises requests that an authority collects its commercial waste, then the authority has an obligation to arrange for this collection, which may include an authority arranging for a collection by a third party on their behalf. The authority is allowed to charge a reasonable amount for provision of a commercial waste collection service. Many Authorities sub-contract their work to private companies or recommend a number of private companies, however, Defra have clarified that Authorities must

still count this waste as Municipal Solid Waste (MSW) as this waste is still under local authority control as it is fulfilling local authority obligations under Section 47 of the EPA[1].

[1] http://www.defra.gov.uk/environment/waste/localauth/lats/pdf/lats-municipalwastedefine.pdf

3. Front End Systems

3.1 Introduction

Front-end systems include all the services that are provided by a local authority for the collection of waste from both householders and commercial customers. Front-end systems include the collection of materials directly from residential and commercial properties by the collection crews, materials collected by an authority through its network of bring sites and materials delivered directly to the Authorities by the public to Household Waste Recycling Centres (HWRCs).

Front-end processes also include waste reduction and minimisation techniques, however these have been described and discussed in a separate supporting document.

3.2 Bring Systems

3.2.1 Bring Sites

Authorities provide communal recycling facilities for the public to use, which supplements the recyclable material collected by kerbside schemes and that delivered to HWRCs. These facilities, referred to as bring sites, are placed at strategic points across districts to ensure that all residents are within reasonable distance for delivering material. Traditionally locations such as car parks and supermarkets have been used for placing bring sites, but the smaller wheeled bin-type facilities can be placed at the side of the road.

Figure 3.1 Bring Site

Figure 3.2 Wheeled Bin Bring Facility

Bring sites generally consist of either large containers with holes for people to drop materials into or smaller wheeled containers with holes for the same function. These sites can collect a range of materials but glass, paper, cans and textiles are most common.

3.2.2 Household Waste Recycling Centres/Civic Amenity Sites

Household Waste Recycling Centres (HWRCs) or Civic Amenity Sites (CAS), as they are often known, are provided by Authorities for residents, and sometimes commercial customers, to take additional or specific wastes as required under Section 51 of the Environmental Protection Act. These sites receive both residual and recyclable wastes and employ operatives to guide residents where to deposit materials. Recyclable materials are segregated where possible and sent for processing, contributing a significant amount to the districts overall recycling rates, whilst residual waste is sent for final disposal either to landfill or an alternative residual waste treatment facility.

Figure 3.3 Household Waste Recycling Centre

3.3 Collection Systems

3.3.1 Introduction

Currently in the UK a wide range of collection systems is available to Authorities for the collection of household and commercial waste. These systems fall into a number of main

categories which are generally classified by the receptacle used for collection, vehicle type and the frequency of collection.

3.3.2 Receptacles

Reusable Sack

Reusable sacks are often supplied to residents for the containment and collection of green waste or the collection of dry-recyclables. These sacks may also be used for the collection of paper or cardboard alongside co-mingled recyclable collections, where paper receives a higher market value as it is not contaminated by other waste streams and conforms to the voluntary British Standard EN643.

These sacks are emptied in the same way as kerbside boxes, in that either the entire contents is tipped into the collection vehicle co-mingled, or materials are separated and sorted into specified compartments on the collection vehicle. Handles on the sack make them easier to carry and some are made with handles on the base to help emptying. Figure 3.4 shows a reusable sack currently used in the Tees Valley.

Figure 3.4 A Reusable Sack Used for Paper Collections in the Tees Valley

Single Use Bags

Single use polythene bags can be supplied to householders for the collection of recyclable materials. Householders are provided with a roll of plastic bags which they can use to participate in a recycling scheme. The recyclable materials are then collected at the kerbside and the material is processed at a sorting facility to remove the recyclable materials from the collection bag. To answer concerns from local residents and to reduce the environmental impact of this service these single use bags should be recycled. Hartlepool BC and Redcar and Cleveland BC use polythene bags for the collection of plastic bottles and cardboard.

Plastic Box

Plastic boxes (Kerbside Boxes) are a common receptacle provided to householders for the containment and presentation of recyclables, with the most common size of containers being 40-55 litres. The size of these boxes may be determined by Health and Safety considerations and the type and frequency of collections. These boxes can be supplied with a separate lid if required, however for ease of use these lids are not attached to the box as shown in Figure 3.5.

Operations which collect materials using Kerbside Boxes usually require operatives to sort materials at the kerbside, placing materials into designated compartments or stillages on the collection vehicle depending upon material type and colour (in the case of glass).

Operatives are required to lift boxes to waist height where collection vehicles have hooks or rails designed to hold them. This enables operatives to empty and sort materials by hand whilst the weight of the box is supported by the vehicle.

Figure 3.5 Kerbside Box used in the Tees Valley

Wheeled Bin

Wheeled bins are the chosen method of residual waste (and recyclables) collection for many UK Local Authorities. These containers are made of a durable plastic to protect them from damage and have a handle and wheels to make manual handling easier as shown in Figure 3.6. They are built in a range of sizes from small containers (approximately 120 litres) up to larger containers in excess of 1,100 litres. The majority of Local Authorities collecting waste in wheeled bins provide residents with 240 litre containers as standard, although some Authorities have provided 140 litre wheeled bins to encourage waste minimisation. Wheeled bins are currently provided by Hartlepool Borough Council (BC), Middlesbrough BC, Redcar and Cleveland BC and Stockton on Tees BC.

Authorities which operate a wheeled bin service usually require residents to place containers at the curtilage of properties or the kerbside for collection. Elderly or infirm residents are generally offered 'assisted collections' which require collection operatives to collect and return bins from a point which the residents can access, usually by the door to properties.

Where wheeled bins are used for the co-mingled collection of recyclables this material requires to be sorted prior to recycling at a Materials Recycling Facility (MRF). The use of wheeled bin for collections may provide householders with larger recycling capacity and improve collection efficiencies but may result in higher levels of contamination, cause problems for householders with regard to space for additional containers and once sorting costs are included not realise any financial savings.

Figure 3.6 Wheeled Bin used for Green Waste Collection in the Tees Valley

3.3.3 Vehicles

Waste and recycling schemes utilise a wide range of vehicle types across the UK, dependant upon the local collection environment and the collection scheme operated. The following descriptions are for some of the more common vehicles deployed by Local Authorities, but the list is by no means exhaustive.

Compaction

Compaction vehicles are the most common method for collecting residual household waste, but they are also used to collect co-mingled dry recyclables. In general terms compaction vehicles consist of a compacting body mounted on a chassis. The chassis size and length differs between vehicles along with the size of the compacting body. Within the body is a hydraulic packing mechanism which compacts material to maximise the waste collected on each round.

These vehicles can be built with a range of additional features for example a lowered hopper for sack collections (reducing the height to which operatives are required to lift sacks), bin lifting mechanisms, split bodies for multiple material collections etc.

The compacted material is unloaded by tipping the body of the vehicle and reversing the packing mechanism so that material is ejected from the back of the vehicle. These vehicles are used to collect residual household waste or co-mingled materials, as on-board separation of materials is not possible (except with the specially designed split-body vehicles). Earlier models of these 'split body' vehicles experienced maintenance problems, mainly associated with the independent packing mechanisms, but more recent vehicle design has largely solved these problems. These vehicles may be useful for the collection of low bulk density materials, e.g. plastics, cans etc, to maximise the payload of vehicles.

Figure 3.7 Compaction Refuse Collection Vehicle in the Tees Valley

Stillage

Many Local Authorities deploy stillage vehicles for the collection of recyclable material. These vehicles are small and carry a payload of approximately 4 tonnes. The vehicles consist of a series of stillage compartments which can be removed from the vehicle for unloading as shown in Figure 3.8. Materials are source separated and sorted into the stillage compartments by the operatives. This method generates a high quality of material, with contamination levels generally being low.

The stillages are usually removed from the vehicle by forklift, emptied then replaced on the vehicle. This system of collection is particularly effective when used in conjunction with kerbside boxes, and is often the preferred vehicle option for kerbside boxes.

Figure 3.8 Stillage Vehicle in the Tees Valley

Kerbsider

The main body of the vehicle is split into sections by vertical dividers. On the side of the vehicle (kerbside) are a series of troughs into which operatives sort recyclable materials as shown in Figure 3.9. The compartments can be moved and therefore configured to give the optimum arrangement for the materials collected by individual Local Authorities.

Once full, the operatives engage the hydraulic lifting mechanism which lifts the troughs to the top of the vehicle where the materials are tipped into the designated compartments in the vehicle's body. No compaction occurs, although some of the glass fragments on impact.

On arrival at the disposal point, the vehicle is unloaded one compartment at a time, with all materials being tipped out of the back of the vehicle's body. This process maintains the segregation achieved by manual collection/sorting and therefore a high quality of recyclable material.

Figure 3.9 Example of a Kerbsider

Caged Vehicles

Caged vehicle chassis are generally approximately the size of a transit van. These small chassis have a caged compartment attached to them with doors for unloading as shown in Figure 3.10. Operatives generally load these vehicles using slots in the doors. Such vehicles have no compaction mechanism. Caged vehicles may be used for the collection of bulky waste streams from householders increasing the potential for these materials to be reused or recycled. These vehicles may also be used for smaller collection rounds, particularly for trade waste recycling collections, and have advantages in terms of use in urban areas.

Figure 3.10 Example of a Caged Vehicle

3.4 Bulky Waste

These services either involve the collection of bulky items (items which are too large to be collected by the standard residual waste service e.g. sofas, beds, white goods etc.) in a RCV or flat-bed/caged vehicle.

Based upon waste composition analysis studies for other Authorities, Entec has found that in general terms in excess of 50% of the bulky waste collected from residents could be recycled or reused. Until 2006/07 the Tees Valley has made some progress in recycling part of the bulky waste stream, predominantly through the identification of the waste stream through the booking system and the separate collection of this material. Historically, a significant proportion of this waste stream was be disposed of to landfill.

However, some of the Tees Valley Authorities are now working with J&B Recycling to increase the amount of waste they can reuse and recycle from this waste stream, disassembling bulky items to allow for recycling. Where reuse and recycling is not currently feasible J&B Recycling has identified ways to pre-treat waste streams prior to recovery through the Energy from Waste (EfW) facility at Haverton Hill. This has allowed these Authorities to improve levels of reuse, recycling and recovery.

Figure 3.11 Bulky Waste

Some bulky items are not suitable for reuse because they are too damaged or do not meet modern safety standards (for example flame retardant materials), however some companies and charitable organisations can recover materials from these items and recycle them, for example the wood and metal from beds and sofas. The potential for the third sector to reuse and recycle bulky items is explored more fully in the Supporting Document on Waste Awareness and Minimisation.

3.5 Litter and Other Fractions

Litter and other street sweepings contribute a significant tonnage to the waste stream and the process by which they are collected (street sweepers and litter bins) are highly visible to both residents and visitors. Visible recycling schemes such as those which target litter may contribute to raising public awareness of recycling.

Figure 3.12 Example of Litter Bins

Authorities across the UK have attempted to separate materials at source by installing segregated litter bins rather than conventional ones, in an attempt to change the public's habits. One common example of this segregation is the installation of newspaper bins outside railway and underground stations. There are also schemes which separate recyclable metal materials from the collected fraction once it is tipped at the bulking point.

The Department for the Environment Food and Rural Affairs (Defra) has recently carried out a consultation entitled 'Recycle on the Go'[2]. This paper was produced in association with Environmental Campaigns (Encams) and RecycleNow. This document proposed a voluntary code of practice and a good practice guide to encourage the provision of recycling bins in public places and to ensure increased levels of recycling are achieved.

[2] http://www.defra.gov.uk/corporate/consult/recyclebins/index.htm

4. Current Collection Systems

4.1 Collection Schemes

The Tees Valley Authorities produced a Waste Strategy in 2002, which aimed to achieve the Waste Strategy 2000 recycling and composting targets and minimise disposal to landfill. Significant progress has been made as a result of the strategy with the schemes outlined in Table 4.1 currently in operation within the Tees Valley. These kerbside collection services deliver a household kerbside recycling and composting rate up to 25%.

Table 4.1 Summary of Tees Valley Collection Schemes (May 2007)

Authority	Residual Waste Scheme	Dry-recyclables Scheme	Organics Collection?	Organics Scheme	AWC? (yes/no)
Darlington	Weekly black bag waste collections	Kerbside box and bag – Glass, cans, paper, plastics and textiles.	Yes	Separate chargeable green waste service for disposal	No
Hartlepool	240 litre wheeled-bin, fortnightly (66%)	Kerbside box & Bag & Sack - Glass, cans, paper, card and plastics and textiles	Yes	Fortnightly garden waste, 240 litre bin – split body collection with plastics	Yes
Middlesbrough	240 litre wheeled-bin, weekly	Kerbside box & Bag -Glass, cans, paper and textiles	Yes	Fortnightly garden waste collection using Hessian bags	No
Redcar and Cleveland	240 litre wheeled-bin, fortnightly	Kerbside box & Bag & Sack - Glass, cans, paper, card and plastics and	Yes	Fortnightly garden waste collection, 240 litre bin	Yes

		textiles			
Stockton on Tees	240 litre wheeled-bin, weekly	Kerbside box & Bag – Glass, cans, paper and batteries	Yes	Fortnightly garden waste , non-chargeable sack (ripped at roadside)	No

4.2 Bring Facilities

Bring facilities can contribute to the overall levels of recycling achieved within an authority area. They may supplement kerbside collection systems, either through provision of collections for additional materials or provision of recycling services for hard to reach areas. The Tees Valley currently has an extensive network of bring facilities within the sub-region. In 2006/07 4735 tonnes of recyclate was collected from these facilities.

Although the role of the bring site is likely to diminish as kerbside recycling is available to more and more households it will continue to remain a vital part of the spectrum of front end systems.

4.3 Household Waste Recycling Centres

There are currently 5 Household Waste Recycling Centres (HWRCs) within the Tees Valley sub-region. These centres provide an important service to householders, allowing them to dispose of additional waste free of charge. In 2006/07 the amount of waste collected (excluding rubble) through the HWRCs was 53250 tonnes, or 17% of the total household waste stream. Of this 53250 tonnes 26% of this waste was recycled and 23% of this waste stream was composted. The individual performance of the HWRC within the Tees Valley varies but the overall recycling performance is high, and approaches 50%.

There are currently 5 HWRCs within the Tees Valley authority area. This equates to one facility for 129,900 head of population. This suggests that there is currently a deficit in terms of HWRC within the area with current best practice standard of one facility for 90,000 head of population. In addition, the current geographic distribution of these facilities is somewhat limited as illustrated in Figure 4.1.

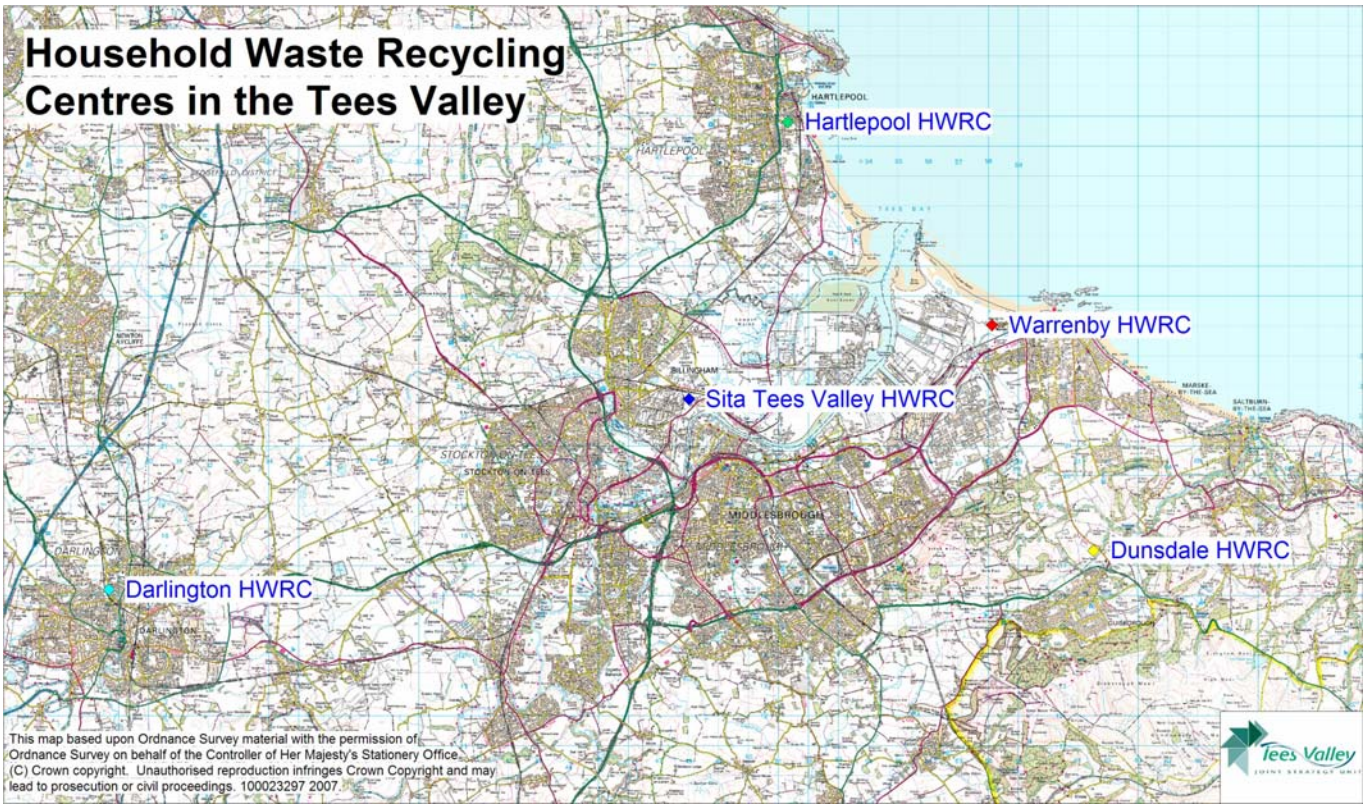
The consequences of inadequate HWRC provision are that:

- Current facilities may become congested in terms of traffic;

- Current facilities may be overused, resulting in difficulties with managing waste streams and adequate staffing levels to encourage householders to separate their waste for recycling;

- Householders may be unwilling to drive significant distances to use HWRCs, rather continuing to use their residual waste collection for the disposal of mixed waste streams.

Figure 4.1 Map of Current Household Waste Recycling Centres



5. Best Practice Assessment

5.1 Introduction

To determine what may be possible for the Tees Valley Authorities, Entec undertook a review of current best practice. This considered not only kerbside collection methods but also the other waste streams discussed above. The Case Studies are provided for information in Appendix B.

5.2 Household Collections

5.2.1 Recycling and Composting

Alternate Weekly Collections

The Chartered Institute of Waste Management (CIWM) have recently produced a position statement on Alternate Weekly Collections (AWCs). This identified as of April 2007 that 180 out of 450+ Local Authorities in England and Wales have, or are just about to introduce AWC's.

AWC is any scheme that collects one or more types of material on one week (week 1) and different types of material on the following week (week 2). AWC collections are already operated by two of the Tees Valley Authorities, Redcar & Cleveland BC and Hartlepool BC.

In most cases, AWCs have been shown proved to encourage recycling and waste minimisation. By restricting both the capacity of residual waste collections, material has been diverted to recycling schemes for collection. This is a useful way to help achieve higher recycling levels and therefore meet or exceed statutory targets. AWC can save Local Authorities money but this is dependant upon the level of service offered prior to implementation and the service alterations required to implement effective alternate AWC collections. However, the effort and the budget required for communications to ensure the acceptance of these collections by the public may outweigh any savings.

The 2004/05 Recycling and Composting Rates of the 20 highest achieving Authorities in England showed that 16 of the top 20 performing Authorities in the UK operate AWC in some form. This data has been superseded by data released by the LGA in April 2007 which shows that all of the top 10 highest performing Authorities (recycling/composting rate) operate alternate

weekly collections. In addition to this statistic, the LGA data shows that 8 of the top 10 most improving districts also provide alternate weekly collections.

According to the LGA research, the average recycling and composting rate achieved by districts which operate alternate weekly collections is 30%, with the highest performing districts achieving up to 51.5% (North Kesteven) and the entire top 10 achieving above 45%.

Whilst residual waste collection frequencies may decrease, it should be remembered that the overall tonnage of waste may not greatly alter, although this depends on policies concerning side waste and enforcement. Re-allocation of resources is possible but the set-up costs, including significant communication costs, of AWC should not be overlooked.

The largest obstacle to overcome with the introduction of AWC is public perception. In the short term public perceptions of a reduction in services may have a negative impact on householder satisfaction with the service, and an increase in the number of complaints and contamination of recycling bins received by Local Authorities. Ongoing publicity, education and customer services are essential to the success of AWC.

These issues are discussed in more detail, along with the presentation of best practice case studies, in the publication "Alternate Week Collections, Guidance for Local Authorities", written by Entec for WRAP (http://www.wrap.org.uk*)

* http://www.wrap.or.uk/downloads/alternate_week_collections_updated1.255e334a.pdf)

Box 1 Kerbside Collections – Factors For Success

In February 2007, Remade Scotland completed a study[3] on the variety of kerbside systems employed in Scotland and the ability of these schemes to deliver high levels of recyclate recovery. Remade interviewed all Scottish Local Authorities in Autumn 2006 as part of this project. The factors identified in Table 5.1 were identified as influencing high recovery rates.

Table 5.1 Factors Effecting Recovery Rates

Factor	Effect
High Recyclate Collection Frequency	Weekly collections 64% higher recovery rates than fortnightly, 96% higher than every 4 weeks.
High Collection Capacity	Weekly capacity >101 litres 56% higher recovery rates than 50-100 litres, 115% higher than <50 litres.
Number of Materials Recycled	Multi material scheme with 4 or more materials produce 137% more material than single material collection scheme
Residual Waste Collection Frequency	Schemes integrated with fortnightly residual collection recover 65% more than with weekly residual

Garden Waste Collections

The two main options for providing a green waste collection service are to operate this service independently and in addition to all other refuse and recycling services, or to integrate it into the overall scheduling. The independent service could involve the collection of disposable sacks from the kerbside or the emptying of reusable kerbside sacks, and could be provided either weekly or fortnightly depending upon the anticipated volume of material to be collected. An integrated green waste collection service would be one designed in coordination with alternate

[3] 'Kerbside Collections – Factors for Success. A Review of Scottish Kerbside Recycling Schemes To identify factors delivering high recyclate recovery. Phase 1 – Analysis of Results, February 2007, Remade Scotland.

weekly residual waste collections for example, collecting residual waste in week one and green waste in week two.

As described previously, green waste can be collected by wheeled bin, disposable sack or reusable sack. One of the main decisions to be made by Authorities is whether to charge residents for the collection of this material. Authorities have the powers to charge for the collection of green wastes through Schedule 2 of the Controlled Waste Regulations. Studies have shown that providing a free green waste collection service can significantly increase the tonnage of green waste collected and in some studies increased the green waste constituent of the waste stream by up to 100%. This influx of material can largely be attributed to material which was previously either disposed of to HWRCs or didn't enter the waste stream at all (remaining in residents gardens for home composting).

Kitchen Waste Collections

Districts across the country have implemented kitchen waste collection schemes, many more districts may be considering these schemes but are largely restricted by the availability of compliant composting facilities to receive the material. Facilities must receive approval from the State Veterinary Service (SVS) for the treatment of Animal By-Products, in addition to waste licensing requirements.

The collection of kitchen waste is regarded as an important factor for many Authorities to achieve recycling and composting rates in excess of 40% and up to 50%.

Box 2 Somerset Waste Partnership
The Somerset Waste Partnership for example, has implemented a weekly collection of food waste using a wheeled bin and kitchen caddy. This material is collected separately from green waste and delivered to a composting facility which is licensed to receive it. The scheme has enabled the Partnership to achieve levels of recycling in the region of 45-50%, which is a dramatic increase from the 14-18% performance being achieved prior to the roll-out of the scheme as it has increased all types of recycling.

A number of the higher performing Authorities in the country are able to achieve approaching 50% without collecting kitchen waste. However, these tend to be districts which can achieve these levels by maximising the amount of green waste collected, and are largely rural districts with a large percentage of green waste to target.

Kitchen waste can be collected in the same bin as current green waste collections, although this combination requires delivery to approved in-vessel composting facilities therefore increasing significantly associated treatment costs. Kitchen waste naturally compacts during collection and is therefore suitable for collection using a stillage vehicle, whereas green waste streams require compaction. This may therefore increase the costs associated with the collection of a mixed organic waste stream.

When modelling scheme performance, higher performing (45-50%) figures assume that kitchen and green waste are collected weekly, separately and using wheeled bins/caddies and combined with fortnightly residual collections. Schemes which achieve lower performance are generally a weekly kitchen waste collection but without a kitchen caddy, separate green waste collection using either a sack or bin. The performance of these schemes is predicted to be lower due to residents preferring what is seen to be the optimum collection regime for residents.

WRAP has recently published two reports into Sustainable ways of dealing with household food and green waste in the UK. These generally concur with the conclusions provided above and provide a Preferred System for kitchen waste collection based upon environmental performance and minimising the costs of both collection and treatment. This was:

- Home composing will be actively promoted and supported;
- The collection system will seek to avoid attracting additional or new green waste into the collection system (principally so as to constrain system costs), either through limiting the volume provided for collection or where the service is charged for;
- The collection system will target food waste as a separate fraction, with the collection frequency weekly so as to achieve high capture of food waste;
- The treatment of the collected biowaste will include AD (principally because of the environmental benefits).

Bin vs Box

The most common methods for collecting dry recyclable materials in the UK are by wheeled bin (co-mingled materials) and by kerbside box (materials sorted at the kerbside). All the Tees Valley Authorities collect dry recyclables by way of a kerbside box and one or more sacks.

Wheeled bin schemes generally achieve a higher participation rate, with schemes commonly achieving in excess of 80% for example at Mole Valley (86%) in Surrey and Belfast in Northern Ireland which achieves approximately 82%, and the highest performing ones achieving in

excess of 90%. Kerbside box schemes generally perform slightly less well with good schemes achieving between 45 and 60% (Slough currently achieves 60% for example), and the highest achieving Authorities achieving in excess of 75%. There are believed to be a number of reasons for this difference:

- Placing mixed dry recyclables in a wheeled bin requires the minimum amount of effort by residents;
- Wheeled containers are more obvious so remind residents of the service;
- Wheeled containers can't be used for any other purpose by residents so are always available for the service;
- Wheeled bin services are usually rolled out to all households at the same time, whether they have requested a container or not and are therefore supported by targeted publicity campaigns.

The debate about wheeled bins compared with kerbside boxes is one which continues in the waste industry and no official study has been commissioned or endorsed which proves which method of collection is the highest performing. Other than the general participation and material yield rates described above there are also a number of operational considerations which affect the debate:

- Manual handling best practice is certainly a consideration. Boxes require operatives to lift fairly heavy loads (especially when filled with glass) and this can have result in musculoskeletal injuries or the selection of smaller containers, whilst wheeled bins can be fairly awkward to move during collection;
- Facilities are required for the delivery of recyclable material. Kerbside sorted material is generally taken to a bulking facility where it is sent for reprocessing without the need for further sorting. Wheeled bin recyclables require sorting so MRF facilities are required. MRF facilities can increase the cost of a wheeled bin service significantly.
- The quality of material collected by kerbside sort collections is generally better than that collected by wheeled bin operations. Kerbside sort operations require operatives to sort materials at the kerbside so contaminants are excluded at that point, and residents can be educated through leaflets. Wheeled bin services largely remove contaminants via the MRF rather than at source, which may be as high as 20%.

5.3 Bring Sites

Box 3	Bristol City Council
Bristol City Council has a series of bring sites for householders to use for recycling plastic bottles which they have continued to invest in addition to increasing other kerbside recycling schemes. These banks have proved very successful and have allowed 29 tonnes of plastics to be recycled in one month with the new banks. The Council has employed innovative systems for storing and transporting of this waste stream which is traditionally more expensive to handle. The council have employed the RECRESCO system which has an innovative collection system whereby a lorry sucks bottles out of the bank and chips them up. This saves time and fuel as the lorry needs to empty its load less often.	

5.4 Household Waste Recycling Centres

The HWRCs provided by the Tees Valley Authorities are currently achieving a recycling rate of between 55 and 60% which is considered to be good performance. Rates of up to 80% have been quoted but it is unclear how much this is possible to achieve on a wide scale and there is insufficient evidence to support how this is possible.

5.5 Bulky Waste

Based upon waste composition analysis studies undertaken elsewhere, Entec has found that in excess of 50% of the bulky waste collected from residents could be recycled or reused. Much of this material in is currently sent to landfill rather than being recycled or reused, this is largely due to a lack of available facilities to deal with the material.

The Authorities could investigate the potential for developing either local or sub regional wide reuse scheme for bulky waste as this represents a significant tonnage within the waste stream which could be diverted from landfill. This would both reduce disposal costs but also provide a valuable service to some community groups.

Some bulky items are not suitable for reuse because they are too damaged or do not meet modern safety standards (for example sofas), however some companies and charitable organisations can recover materials from these items and recycle them, for example the wood and metal from beds and sofas. Currently there are few companies available which provide this

service, this is an area which could be investigated to supplement the kerbside recycling services.

5.6 Litter and Other Fractions

The Government has issued a consultation document entitled 'Recycling on the Go' concerning the recycling of material from the litter fraction. Litter and other street sweepings contribute a significant tonnage to the waste stream, and the process by which they are collected (street sweepers and litter bins) are regularly seen by residents and commercial visitors.

Authorities across the UK have attempted to separate materials at source by installing segregated litter bins rather than conventional ones, in an attempt to change the public's habits. One common example of this segregation is the installation of newspaper bins outside railway and underground stations. There are also schemes which separate recyclable metal materials from the collected fraction once it is tipped at the bulking point.

Visible recycling schemes such as those which target litter, are also a method for raising public awareness of recycling.

5.7 Commercial Recycling

A recent composition study of commercial waste arisings, undertaken by Entec for other Authorities, indicated that as much as 50% of business wastes could be recycled, with most of this being paper and cardboard. It would therefore appear to be beneficial to provide recycling services to commercial premises, charged at a rate appropriate to encourage recycling as an alternative to disposal. These services could be provided as a kerbside collection service or through allowing charged access to HWRCs and may be eligible for funding through, amongst others, the Business Resource Efficiency and Waste (BREW) Programme.

Many businesses also dispose of equipment, furniture and other items whilst they are still useable or in a restorable condition, largely due to the purchase of new or more up to date equipment. The Authorities could encourage reuse schemes from local businesses or even help to facilitate the setting up of reuse centres to divert items from the commercial waste collection system.

In addition, the Authorities may usefully link with other organisations to provide advice and support to the commercial sector in minimising and recycling their waste stream. This includes a Recycle at Work North East advisor who is available to;

- Visit businesses and help identify waste that could be recycled;
- Point to providers of recycling services;
- Help set up in-house schemes to start recycling.

6. What could be Achieved?

6.1 Introduction

At this stage of the strategy development we have modelled the current waste management infrastructure and collection systems operated by the Tees Valley Authorities along with what we believe could be the best performing system for the Authorities. This takes into account the performance of schemes we are aware of, national guidance/best practice and the preferences of the stakeholders. The Kerbside Analysis Tool (KAT) has been used for modelling. The options have been categorised into those which provide improvements to current services and those which optimise the systems through extensive change to allow best performance. In terms of collection systems, the performance of each of these categories is discussed.

6.2 Kerbside Analysis Tool (KAT)

The KAT model has been designed by WRAP and allows Authorities to model different collection systems and to identify the potential affect on the amount of recycling and composting in line with targets and also identifies the comparative costs of introducing new services. This model uses the current services and costs as the baseline for future projections and also uses authority specific waste composition data.

KAT is a useful tool that allows for specific collections to be modelled. However, it considers kerbside collection systems only. The potential for improving and maximising the amount of waste recycled through bring sites and HWRC's is addressed through using the Mass Flow model rather than through KAT. It has been assumed that 60% recycling from HWRCs equates to maximised recycling through these facilities. These are levels of HWRC recycling that are currently achieved by Darlington BC, Middlesbrough BC, Stockton on Tees BC and Redcar and Cleveland BC.

6.3 Modelled Performance Levels

Options for improving and maximising waste collections have been identified through a series of discussions with the individual Authorities. This allowed the Authorities to steer the process and allowed them to include local aspirations in regards to collection systems.

Modelling for improving current levels of performance, through increasing participation in current collection services, by increasing the range of dry recyclables that may be collected from the kerbside and by introducing Alternate Weekly Collections for residual waste (which in turn will increase the potential participation levels in recycling services) has indicated that the maximum percentage of recyclate and compost that may be diverted through these kerbside only systems is in the region of 25%. However, it is recognised that Redcar and Cleveland BC is currently achieving a kerbside recycling and composting rate of 32% and that best practice Authorities, as identified in Appendix A, are achieving significantly better recycling rates with these types of systems. The reason that KAT underestimates the potential recycling rate that may be achieved is significantly affected by the kerbside composition data that is currently available. The kerbside composition data was obtained in 2005 and has a noticeably small proportion of green waste within it as it predates the introduction of any kerbside green waste collection scheme. Prior to the introduction of green waste collection schemes householders dealt with their green waste through a variety of other schemes, including through Household Waste Recycling Centres, opt in charged for council collections and through increased home composting.

KAT has also been used to model optimised collection services which are assumed to include food waste collections (either on their own on a weekly basis or fortnightly combined with green waste), improved dry recyclables collection and an alternate weekly collection of residual waste where this is not currently undertaken. The percentage that may be diverted through such a waste collection service was modelled to be 43%.

The effect of encouraging participation in recycling schemes to influence the success of such schemes should not be underestimated. High levels of participation will be required to achieve high levels of diversion no matter the type of waste collection system employed.

6.4 Contract Integration

Urban Mines were commissioned in 2005 to explore options for joint working between the partner Authorities[4]. The following scenarios were developed and explored through a workshop with the Tees Valley Authorities;

[4] '*Tees Valley Waste Management Joint Venture Final Report'*, Urban Mines. March 2006.

- Scenario 1 – As baseline with joint management and provision of HWRCs, and joint management structure for delivery of recycling and waste minimisation services (including a joint identity);

- Scenario 2 – Joint management, procurement and provision of recycling and waste minimisation services, with joint management and provision of trade and bulky waste services and HWRCs. With residual collection and management of closed landfills to be delivered separately;

- Scenario 3 – Comprehensive joint provision of waste management services, including refuse collection, unified branding, provision of litter bins and management of old landfill sites. Authorities to separately manage council generated wastes, including street cleansing and servicing of litter bins.

This project recognised that although there was strong support for increased partnering and joint working significant concern was expressed by individual Authorities, particularly in relation to the management of change and the potential impact on current council employees.

A potential step towards joint working is the development of a working group which could investigate the possibilities of joint working. This could result in the pooling of ideas in advance of contract renewal dates, so that ideas are at an advanced stage when documents start to be produced.

6.4.1 Benefits of Co-ordinating Contract Timing

Contract Price

The main benefit of coordinating the timing of renewal dates for contracts is that costs can potentially be reduced. The most obvious cost saving is that Local Authorities can jointly procure services and resources, thus benefiting from discounts that contractors would offer. The tendering process is expensive for contractors to go through, so they prefer to gain a small number of large contracts rather than a large number of smaller contracts. In addition there should be economies of scale associated with larger contracts.

Shared Resources

Authorities would also reap the benefits, financially, of awarding larger market share to contractors, along with the likelihood that contractors will develop shared resources across collection boundaries and reflect these efficiencies in contract prices and response times to emergencies and unforeseen breaks in service.

Procurement Costs

Authorities could also reduce the costs of the procurement process by coordination. The process of procurement requires a significant input of resources to facilitate and guide it, often including expert external help from procurement consultants and lawyers. These costs could potentially be reduced by the production of one set of documents, especially the common documents such as the Invitation to Tender (ITT) and Conditions of Contract (CoC). This process would still require each Local Authority to produce individual Specification documents based upon local requirements and standards but some of the common costs could be shared.

DSO Efficiencies

The Authorities which have not awarded contracts to the private sector and continue to operate DSOs could also benefit from coordinating contract periods. They would not enter into the same process of producing documentation but could jointly procure equipment with individual or multiple partners.

On a smaller scale, but one which could result in significant savings for participating Local Authorities, joint working could be used to purchase hardware and equipment in bulk. Items such as PPE equipment, workwear and spare parts for vehicles are all items which operations teams are required to purchase on a regular basis so could be bought through shared contracts with suppliers. Other considerations could be container supply, servicing and cleaning bring banks and some street cleansing services.

Appendix A
2005/06 Recycling and Composting Rates of the 20 Highest Achieving Authorities in England

WCA	Recycling and Composting Rate Achieved in 2005/06	Schemes and Measures Contributing to High Performance
North Kesteven District	51.5%	Alternate weekly collection for residual waste and dry recyclables/ green waste Paper, card, mixed cans, plastic bottles and containers and textiles can be set out for the dry recyclables collection service Glass bottles and jars can be placed with the green waste (green and kitchen) for collection
Rushcliffe Borough	49.9%	Alternate weekly collection for residual waste and green waste (green only) Fortnightly collection for dry recyclables including paper, card, mixed cans, plastic bottles, aerosols and foil
South Cambridgeshire	49.4%	Alternate weekly collection for residual waste and recyclables/ green waste Recyclables collected from the kerbside include paper, card, mixed cans, glass bottles and jars, aerosols and foil Green and kitchen waste collected at the kerbside Promotion of alternate weekly collection and home composting
St Edmundsbury Borough	48.6%	Alternate weekly collection for residual waste and organic waste (green and kitchen) Fortnightly collection of dry recyclables (blue wheeled bin for plastics, paper, foil, cans, cardboard) Involvement of residents and local businesses in

WCA	Recycling and Composting Rate Achieved in 2005/06	Schemes and Measures Contributing to High Performance
		waste management planning
Huntingdonshire	48%	Alternate weekly residual waste collection and green and food waste collection Fortnightly collection of dry recyclables in bins, boxes and sacks (paper, cardboard, plastic bottles, cans and tins)
Melton Borough	47.1%	Alternate weekly residual waste collection and green waste collection Weekly dry recyclables collection (paper, textiles, plastic bottles, cans and glass)
Waveney	46.6%	Alternate weekly residual waste collection with recycling and composting collections. Fortnightly dry recyclables collections in wheeled bin.
Forest Heath District Council	46.1%	Alternate weekly residual and organic waste collections (green and kitchen waste) Fortnightly dry recyclables collections in wheeled bin.
Lichfield District	45.4%	Alternate weekly collection for residual waste and green waste Weekly dry recycling collection for paper, card, textiles, glass, plastic bottles, cans (two box sizes) Special kerbside collections in rural areas Kerbside recyclables collection from multi-occupancy estates “mini recycling units” or “Eco-boxes” Segregated paper collection from schools Recycling education aimed at residents and schools e.g. organised trip to local paper reprocessor Resident involvement in kerbside collection plans via a face-to-face survey

WCA	Recycling and Composting Rate Achieved in 2005/06	Schemes and Measures Contributing to High Performance
Teignbridge	45.4%	Alternate weekly collection with residual and recycling collections. Green wheeled bins for the collection of green, kitchen and thin card waste. Recycling boxes for glass, phones, cartridges, batteries, plastics, paper, tins and cans.
Daventry District	44.6%	Alternate weekly collection for residual waste and green waste (green and kitchen) Weekly dry recycling collection for (red 35l box for paper and textiles and 55l box for glass, plastic bottles , cans and aerosols) Surveyed residents for feedback regarding existing kerbside collections and future plans to increase recycling rates Promotion of recycling schemes included the 'Slim Your Bin' roadshow, newspaper articles, school talks and the "Family of the Week" campaign.
Harborough District	44.3%	Alternate weekly collection for residual waste and green waste (green and kitchen) Weekly dry recyclables collection for paper, glass bottles and jars and mixed cans. Waste awareness was promoted through a series of promotional road shows
Cambridgeshire County	43.5%	Alternate weekly residual waste and dry recyclables/ green waste (green and kitchen) Dry recyclables collected from the kerbside include paper, glass jars and bottles, plastic bottles and mixed cans Run a number of waste awareness campaigns across the County
Broadland District	43.4%	Alternate weekly residual waste and dry recyclables collection Dry recyclables collected include paper, card,

WCA	Recycling and Composting Rate Achieved in 2005/06	Schemes and Measures Contributing to High Performance
		mixed cans and aerosols A chargeable green waste scheme. Residents that pay an annual subscription fee for this service receive a wheeled bin and 25 green waste collections
Cherwell District	43.3%	Alternate weekly collection for residual waste and dry recyclables/green waste (green only) Paper, mixed cans, card and plastic bottles and containers can be set out for the recyclables collection service
Ryedale District Council	42.8%	Alternate weekly collection for residual and recycling collections. Wheeled bin for green waste collections. Kerbside box and bag for recyclables – glass, cans and paper.
Oswestry Borough Council	42.6%	Wheeled bin for green waste collections Three recycling boxes – cans, paper and glass. Alternate weekly collection for residual collections.
Vale Royal Borough	41.9%	Alternate weekly collection for residual waste and dry recyclables/green waste (green only) Paper, glass bottles and jars, textiles and mixed cans can be set out for the recyclables collection service
Canterbury City Council	41.7%	Alternate weekly collection for residual waste and recyclables Clear recycling sacks for the collection of paper, cardboard, plastic and cans. Green waste collections through both wheeled bin and sacks
Suffolk County	40.7%	Co-ordination of individual District and Borough residual waste and dry recyclable collections Operates a number of county-wide waste awareness initiatives including a Schools waste

WCA	Recycling and Composting Rate Achieved in 2005/06	Schemes and Measures Contributing to High Performance
		education programme and sustainable shopping.
Top Performers Average	45.3%	

Appendix B
Case Studies

Box 4 Surrey Council

Surrey Council has commissioned work by both Entec and Eunomia, Research and Consultancy to investigate the potential effects of introducing new recycling and composting schemes. All of the options that were modelled for Surrey were based upon AWC of residual waste using a 240l bin as the Surrey Council's wanted to achieve a significant recycling rate (in the region of 50% of the waste stream). Eunomia modelled a limited list of options using a generic authority to determine the potential effect of introducing a variety of front end schemes both in terms of the amount of material that may be recycled, the potential impact on the total waste arisings and the percentage diversion of the biowaste stream from landfill. The results of this initial modelling are provided in Table 1.2 below. This shows that with a fortnightly collection of the residual waste stream all of these methods have the ability to reach significant levels of front end recycling, with this recycling rate supplemented further by recycling from bring and Household Waste Recycling Centres (HWRCs).

Table B1.1 Modelling Results as Identified by Eunomia Research for a Generic Authority

Option	Recycling Service	Composting Service	Total System Cost per HH	Recycling Rate	Arisings Growth	Biowaste Diversion
1	Weekly box and bag recyclable, kerbside sort	Fortnightly kitchen and green WB scheme	£110.27	43%	11%	50%
2	Weekly box and bag recyclable, kerbside sort	Weekly kitchen and green WB scheme	£121.25	51%	13%	62%
3	Weekly box and bag recyclable, kerbside sort	Fortnightly green waste WB and weekly kitchen WB	£118.1	51%	11%	62%
4	Weekly box and bag recyclable, kerbside sort	Fortnightly charged green WB scheme and weekly kitchen WB scheme	£97.44	44%	0%	52%
5	Weekly box and bag recyclable, kerbside sort	Weekly kitchen, green and card collection WB scheme	£120.45	52%	13%	63%
6	Weekly box and	Fortnightly charged	£97.03	44%	0%	52%

	bag recyclable, kerbside sort	green WB scheme and weekly kitchen and card WB scheme				
7	Weekly box and bag recyclable, kerbside sort	Fortnightly green sack and weekly kitchen	£110.91	47%	4%	56%
8	Weekly box and bag recyclable, kerbside sort	Fortnightly kitchen and green WB with caddy	£115.54	47%	11%	60%
9	Weekly box and bag recyclable, kerbside sort	Weekly kitchen and green WB with caddy	£127.76	55%	13%	63%
10	Weekly Multiple containers for recycling, kerbside sort	Fortnightly charged green WB scheme and weekly kitchen and cardboard WB scheme	£105.19	39%	0%	46%
11	Weekly Multiple containers for recycling, kerbside sort	Fortnightly green waste WB and weekly kitchen WB	£126.23	49%	11%	60%
12	Weekly Co-	Fortnightly charged green WB scheme	£112.59	46%	8%	56%

	mingled bag	and weekly kitchen WB scheme				
13	Weekly Co-mingled bag	Weekly kitchen, green and card collection WB scheme	£133.59	52%	13%	63%
14	Fortnightly co-mingled wheeled bin	Weekly kitchen and green WB scheme	£129.23	46%	13%	58%
15	Fortnightly co-mingled wheeled bin	Weekly kitchen and green WB scheme	£126.49	46%	11%	59%
16	Fortnightly co-mingled wheeled bin	Weekly kitchen, green and card collection WB scheme	£129.74	47%	13%	59%
17	Fortnightly co-mingled wheeled bin	Fortnightly green waste WB and weekly kitchen WB	£118.90	41%	4%	52%
18	Fortnightly paper and card and fortnightly containers (i.e.	Fortnightly green waste WB and weekly kitchen WB	£127.93	46%	11%	57%

	bottles and cans)					
19	Monthly paper and card and weekly containers (i.e. bottles and cans)	Fortnightly green waste WB and weekly kitchen WB	£120.83	53%	11%	64%

Kitchen Waste Recycling in Somerset

Somerset Waste Partnership (SWP) comprises of six Authorities in Somerset. These Authorities provide weekly recycling and food waste collections with fortnightly refuse collection and an optional charged green waste collection. The improved service was possible due to a grant of £5.5 million from Defra[5] for the purchasing of vehicles and containers.

- Weekly Collection of the Kerbside box – including paper, glass, cans & foil, textiles and shoes (depends on authority area);
- Weekly collection of food waste in specially designed kitchen waste containers – residents provided with two containers. One for weekly food waste collection and one smaller kitchen caddy to collect food waste each day and transfer it to the larger container. The collection container may be locked to prevent access;
- Fortnightly, charged for, collection of green waste;
- Fortnightly collection of general refuse.

The introduction of this collection scheme has allowed kerbside recycling yields to increase by between 44-86% to an average of 3.3 kg per household per week from all households served (equivalent to 170 kg per household per year). The scheme has achieved food waste yields of 1.8 kg per household per week (equivalent to 93 kg per household per year) and refuse put out for disposal has been reduced by half (43-52% reduction)[6].

Overall recycling rates have more than trebled in the collection areas from 14-18% to 45-50%, with a quarter of this contributed by food waste. Somerset's household waste composition is 27% food waste, more than paper and card (25% of household waste).

Collections of combined green and food waste were found to be prohibitively expensive by the Partnership as all of this material needed to be treated within In-Vessel Composting (IVC) systems. Separately collecting food and green waste means that the green waste may still be

[5] http://www.mendip.gov.uk/NewsArticle.asp?id=SX9452-A7817DE7

[6] Food Waste Action Guide, Friends of the Earth

treated through cheaper windrow facilities. The partnership also reported that the separate collection of food waste resulted in a reduced need for expensive compaction vehicles as food waste compacts itself. The provision of weekly food waste collections increased the acceptance of a fortnightly residual collection.

Box 5 Multi occupancy Recycling Schemes – Tower Hamlets

Tower Hamlets has 82.5% flats as a proportion of the total dwellings. They have introduced recycling schemes to enable residents living in multi-occupancy and high-rise buildings to participate in recycling schemes. This service was initially provided as a green box scheme which incorporated bar codes but has recently changed to a pink sack scheme[7]. The council will also collect materials that are presented in other containers as long as these are clearly identified as containing recycling. Prior to the introduction of the scheme Tower Hamlets invested in a GIS survey of every block of flats, mapping block layouts, household totals, phone entry systems, vehicle access points, incidents of anti-social behaviour and to identify housing and care-taking contacts.

The scheme is provided by a number of contractors and allows residents to recycle glass, cans and paper. Most properties receive a doorstep collection unless these are not practical or have been refused. Where door to door collections are not provided wheeled bins are provided for the same recyclable materials. Defra's Recycling from flats document provide details on how this service is provided[8]. These materials are emptied into durable woven bags by waste collection operatives. These bags are transferred to street level by either lift or stairs. Bags are then loaded onto a vehicle for transfer to a local sorting facility. This scheme incorporates an incentive whereby 25 correctly participating residents receive a prize on a monthly basis.

Tower Hamlets Recycling Consortium organises estate and block meetings with tenants associations, tenants management organisations and housing associations. The contractor works within the requirement to be 'sensitive to the needs of the cultural diversity of the community it serves'. This includes requirements for translating leaflets into minority languages, obliging operatives to dress and behave appropriately and recruiting local operatives for the communities they serve.

The Defra report identified that there had been a small number of fires within boxes and acts of vandalism. Results within the same report state that within Bethnal Green an average of 67kg of recyclable material per annum was collected, equivalent to a 7% recycling rate with a resultant decrease in the amounts of residual waste collected. The Tower Hamlets website reports recycling rates reaching 11.4% in February 2006 coinciding with a major publicity campaign (no more up to date information is available).

[7] http://www.towerhamlets.gov.uk/data/environment/data/recycling-rubbish-litter/recycling/data/how-to-recycle-tower-hamlets.cfm

[8] Recycling for Flats, WasteWatch for Defra, 2004.

Box 6 Multi occupancy Recycling Schemes – Recycling in Flats Everyday (RIFE) Bristol City Council

15% of Bristol City's households are made up of flats or similar properties not suitable for kerbside collection. These properties range from high to low rise blocks and include city apartments and sheltered housing. Bristol is developing a network of on-site Recycling Centres to, reporting 250 on-site Recycling Centres on their website[9] with an aim to double this to 500 in 2007. This project is managed by The Recycling Consortium (TRC) as the Recycling in Flats Everyday (RIFE) scheme.

These enable residents to recycle paper, cans and glass and provides residents with reusable recycling bags for storing and transporting materials to the on-site Recycling Centres. This project has worked using community involvement with residents, caretakers, scheme managers, housing officers and agents encouraging residents to use the Recycling Centres.

Bristol City Centre produce a Flats Recycling League Table to inform residents on the success of individual Recycling Centres based on a calculated kg per household as a running total. This has adopted a format similar to Football league tables including 8 different divisions with a huge range in the amount of materials being recycled.

[9] http://www.recyclingconsortium.org.uk/

Box 7 Edinburgh City Council

City of Edinburgh Council have introduced recycling schemes to allow residents in multi-occupancy households. This was introduced through a Multi-occupancy trials funded by the Scottish Executive. The scheme provided 2 1280 litre bins, the blue lidded bin was for the collection of paper materials and the green lidded bin for the co-mingled collection of cardboard, cans, plastic bottles and tetra-pak. Bins were provided on streets and to serve in the region of 100 households. Collections are once or twice a week and are carried out by RCV. The pilot scheme reported recycling tonnages that equated to 1.36kg/hh/wk. A scheme cost of £803 per tonne recyclate collected is reported within the feasibility study[10] and 68% participation rate as identified by Scottish Waste Aware Group (SWAG).

Box 8 Bristol City Council

Bristol City Council has a series of bring sites for householders to use for recycling plastic bottles which they have continued to invest in, in addition to increasing other kerbside recycling schemes. These banks have proved very successful, the schemes having collected 29 tonnes of plastics to be recycled in one month. The Council has employed innovative systems for storing and transporting of this waste stream which is traditionally rather difficult to handle. The Council has employed the RECRESCO system which has an innovative collection system whereby a lorry sucks bottles out of the bank and chips them up. This saves time and fuel as the lorry needs to empty its load less often.

[10] Multi-Occupancy Property Recycling Feasibility Project, Scottish Executive, March 2006.