

APPENDIX A

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1.0 INTRODUCTION

1.1 Purpose of the Strategy

This document provides a framework for strategic decisions to be taken on the management of municipal solid waste (MSW) in Brent over the next 20 years. It adopts a flexible approach, recognising the need to respond to rapid developments of new ideas and opportunities. The strategy covers only municipal waste.

Targets set under the Government's Waste Strategy¹ require the London Borough of Brent (Brent) to improve its recycling rate from approximately 20% at present to 33% by 2015/16.

Interim targets include 18% by 2005/06 (Best Value Performance indicator, BVPI Targets) and 30% by 2010/11 (Waste Strategy 2000 targets).

Other major drivers for improvement include the annual Landfill Tax increase set at £3 per tonne as from 2005-06, which will increase Landfill Tax from its current level of £18 per tonne to at least £35 per tonne. In addition, the Government has introduced the Landfill Allowance Trading Scheme (LATS) which will significantly limit the amount of municipal waste that can be disposed of to landfill. Failure to reduce the landfilling of waste to a level within an agreed allocation could see the Waste Disposal Authority, West London Waste, and in turn Brent Council being subject to significant fines.

A separate Strategy for management of residual waste is currently being prepared by West London Waste Authority

1.2 Context of the Strategy

Brent Council have published a Baseline Assessment Report with Technical Appendices to which this Strategy document gives regard. This report may be accessed to provide additional and more detailed information on the status of waste management and options for dealing with the region's municipal waste.

The national policy objectives for waste management, which are set out in the Government's waste strategy for England and Wales, "Waste Strategy 2000", (and the Waste Strategy Unit Report "Waste Not Want Not" that builds on Waste Strategy 2000) and "Guidance on Municipal Waste Management" (March 2001), set the following broad requirements:

- To reduce the amount of waste that society produces;
- To make the best use of the waste that is produced, and
- To choose waste management practices which minimise the risks of immediate and future environmental pollution and harm to human health.

¹ Waste Strategy (2000) DETR

Fundamental to any waste strategy is the Waste Hierarchy, first put forward in the Government's Sustainable Development Strategy in January 1994. This waste hierarchy is illustrated in Figure 1.1.

Waste reduction is at the top of the hierarchy. To date in the UK the principal focus has been on the recycling of waste, however it is simply not enough merely to find different ways of dealing with the waste produced, and the priority must therefore shift to producing less waste in the first place.

Figure 1: The Waste Hierarchy



Second in the hierarchy is reuse of waste, which essentially requires using a product over and over again. If the product regarded as waste is no longer suitable for reuse, it may still contain materials of value that can be recovered through recycling, composting or treatment with energy recovery.

Only when all of the other levels of the waste hierarchy have been maximised, should disposal of material be considered. Various European Union Directives limit the amount and type of remaining material that is permitted for landfill. However, regardless of the method of waste management applied, there will always be a need for landfill for those elements of the waste stream that cannot be further re-used, recycled, composted or

otherwise treated.

2.0 BRENT IN CONTEXT

The London Borough of Brent is situated in North West London (see Figure 2) and covers an area of approximately 4,200 hectares, divided into 21 Wards. The 2001 census records a population of 261,232 residing in approximately 100,000 households at a density of 60.9 persons per hectare.

Figure 2: London Borough Map



The Borough has a diverse ethnic mix and is the second most ethnically diverse borough in the country, creating a number of distinct local communities such as Harlesden, Wembley and Kilburn. This can result in differing waste generation profiles in terms of quantity and type of waste, and the waste strategy needs to take account of this.

Almost half of Brent's population live in flats, which are either purpose built or converted. This has implications for the collection of waste from households in terms of accessibility and space, with the development of separate kerbside collections for recyclables being difficult to implement. Brent is a borough of contrasts exhibiting both wealthy suburban areas and densely populated inner city type conurbations.

Large areas of Southern Brent are deprived and many people are excluded from society. In 2000, Brent was found to have five of the 10% most deprived areas in the UK. Deprivation levels can have a significant impact on willingness to participate in recycling schemes.

The population of Brent is growing rapidly. There are a number of major developments and regeneration programmes planned within Brent over the next few years that will have implications in terms of waste generation, details of which are provided in the Baseline Assessment Report

3.0 WASTE MANAGEMENT TODAY

During 2003/04 Brent residents generated 115,597 tonnes of household waste, of which 8.6% was recycled. The household recycling and composting (BVPI) target set by the Government for 2005/06 is 18%, indicating that the recycling of household waste within Brent has to more than double in the two years following 2004. Figures for the first few months of this year indicate a recycling/composting level of around 20%.

Waste collection and related services fall within the remit of StreetCare's Waste Services Department, which assume responsibility for domestic refuse collections, bulky waste disposal, and street cleaning.

The disposal of household waste arising in Brent, in addition to the five other neighbouring London Boroughs (Harrow, Hillingdon, Ealing, Hounslow, and Richmond upon Thames) is the responsibility of the Waste Disposal Authority (WDA), West London Waste Authority (WLWA).

Table 1: Current Waste Services in Brent

<u>Bring Sites</u>	<u>116 Bring sites with provision to recycle a range of materials including aerosols, books, cans, carrier bags, glass, junk mail, paper, plastic, shoes and tin foil.</u>
<u>Kerbside Recycling</u>	<u>Weekly, 44 litre green box kerbside collection service to 73,000 households for the collection of foil, batteries, engine oil, glass, paper, shoes, textiles, tins and cans, and yellow pages.</u>
<u>Estates recycling</u>	<u>Separate recycling system for flats and other high rise residences based on 5 bins for the collection of green, clear, and brown glass, aluminium and steel cans, and newspapers and magazines.</u> <u>There are currently over 250 sites</u>
<u>Reuse & Recycling Centre</u>	<u>A new centre with the emphasis on recycling. Facilities are provided for the recycling of cardboard, garden waste, rubble, soil, scrap metal, wood, electrical equipment, mobile phones, printer cartridges, fridges, fluorescent tubes, engine oil, and car and household batteries.</u>

<u>Composting</u>	<u>60,000 properties have been supplied with a 240l capacity green wheeled bin, collections made fortnightly. Biodegradeable bags supplied to the rest of the Borough, collections by appointment.</u>
<u>Commercial waste</u>	<u>Brent Council do not operate a commercial collection service</u>
<u>Bulky household waste</u>	<u>The collection of up to 5 items, up to 3 times a year is permitted, free of charge.</u> <u>Fridges and freezers are collected free of charge</u>
<u>Clinical waste</u>	<u>Collection provided to all households that require the service</u>
<u>Flytipped waste</u>	<u>Removal takes place within 24 hours of the report</u>
<u>Hazardous household waste</u>	<u>Hazardous household waste collections are coordinated by the City of London who provide a collection service for most London boroughs</u>

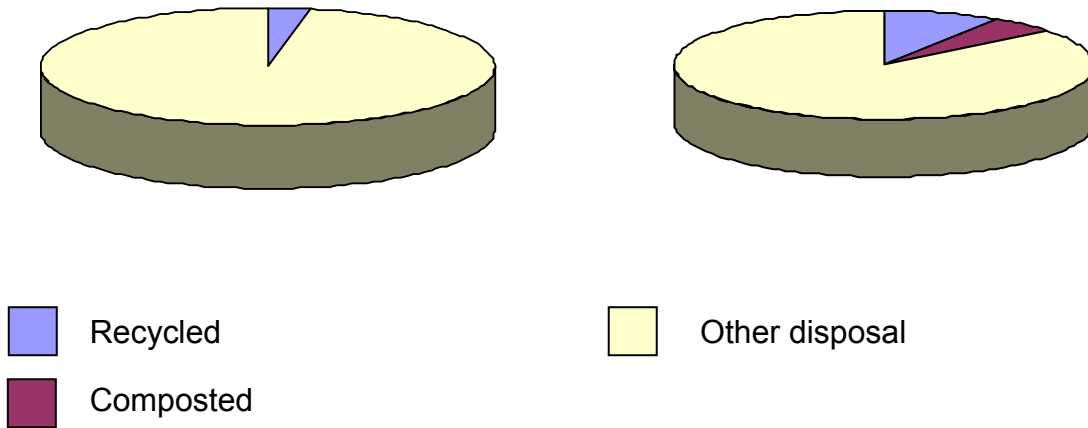
Brent Council have promoted waste awareness and waste minimisation initiatives, including home composting.

Figure 3 provides details of the total tonnage of waste collected from all Brent households during 1997/98 to 2004/05, indicating the proportions recycled, composted, and disposed of during each year. The results show that between 1997 and 2005 the total tonnage of household waste collected increased by 17,547t from 99,876t to 117,423t (an increase of 17.6%). However, the total disposed of has only increased by 3,693t (an increase of 3.8%). This indicates a recycling increase of 7,745t and a composting increase of 6,108t, giving a combined total of 13,853t.

Figure 3: Waste Arisings and Disposal Method

1997/98

2004/05



Historically, low levels of recycling have been achieved in Brent, with few materials being segregated for recycling, traditionally limited to glass and paper. The total tonnage of household waste recycled has increased from 2,925t in 1997 to 10,670t in 2004 (see Figure 4 below). Since the introduction of green waste collection and composting in 2002, the tonnage of household waste composted has increased from 1,084t during 2003/04 to 6,108t during 2004/05

Figure 4: Historic and Existing Recycling and Composting Performance

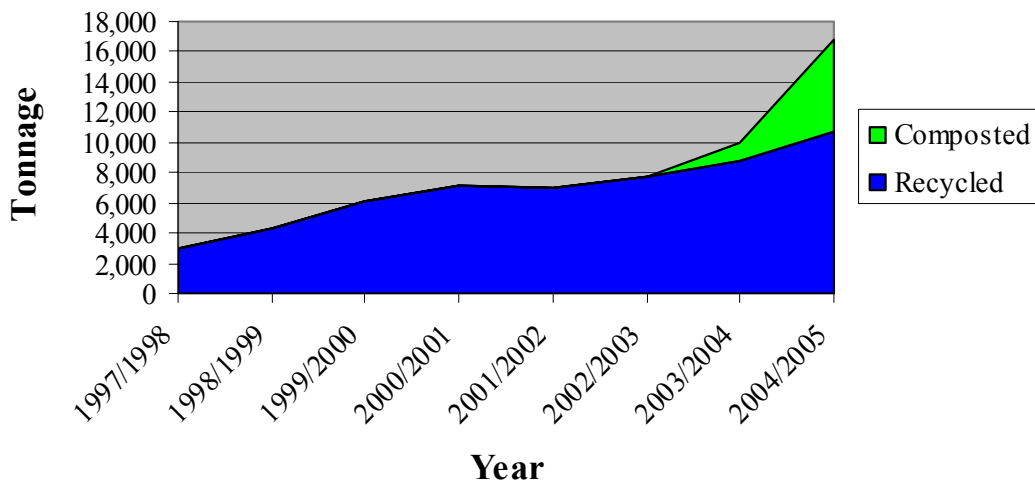


Figure 5: Waste Composition



Figure 5 displays typical household waste compositional data, indicating that over 74% of household bin waste in Brent could, potentially, be recycled. With a current recycling rate of 14%, there is clearly a high proportion of recyclable material currently being disposed of as residual waste.

Table 2 provides an overview of individual scheme figures show that on average the Borough generates 1,174 kg of waste per household. Kerbside collections of recyclables and compostables account for approximately 150 kg per household (figures based on number of household s receiving service). The estates schemes perform very poorly at an average of 7 kg per household.

Table 2: Recycling Scheme Performance (04/05)

	Overall Waste Arisings	Kerbside Putrescible	Kerbside Dry	Bring Sites	Estates Recycling
Performance 2004/5 (kg per hhold)	1,174	68	86	25	7
Performance 2004/5 (kg per site)	-	-	-	21,664	796

4.0 WHAT WILL BE REQUIRED IN THE FUTURE?

There are a number of pieces of legislation that impact on the way waste is managed. In particular, the Landfill Regulations and Waste Strategy 2000 set targets for waste management. This strategy document acknowledges these pieces of legislation, with further detail provided in the Baseline Assessment Report.

Environmental Protection Act (1990)

The Environmental Protection Act (EPA) 1990 is designed to implement an integrated approach to environmental regulation and protection, and is the principal piece of legislation dealing with the duties and responsibilities in relation to waste management.

Landfill Regulations 2002

The Landfill (England and Wales) Regulations 2002 implement the requirements of the EU Landfill Directive (1999/31/EC). Key Directive provisions for local authorities relate to the gradual reduction of biodegradable municipal waste (BMW) going to landfill and the promotion of alternatives such as recycling, composting, and energy from waste (EfW). This has implications for a WCA in terms of the separate collection of materials for recycling or recovery as they are required to contribute toward the WLWA meeting their targets. Targets include:

- Reduce the amount of BMW landfilled to 75% of that produced in 1995 by 2010;
- Reduce the amount of BMW landfilled to 50% of that produced in 1995 by 2013;
- Reduce the amount of BMW landfilled to 35% of that produced in 1995 by 2020.

Statutory Recycling and Composting Standards, Waste Strategy 2000

A series of recycling and recovery targets for household and municipal waste have been established in 'Waste Strategy 2000' in order to comply with the Landfill Directive BMW diversion targets. An essential part of achieving these targets is the drive towards greater household recycling and composting. Key national targets are as follows:

- Recycle or compost at least 25% of household waste and recover value from 40% of MSW by 2005;
- Recycle or compost at least 30% of household waste and recover value from 45% of MSW by 2010;
- Recycle or compost at least 33% of household waste and recover value from 67% of MSW by 2015.

In order to achieve the national recycling and composting level of 25% of household waste by 2005, statutory Best Value performance standards have been set for both WCAs and WDAs. The intention of these standards is to

increase the national recycling rate to 25% in 2005/06, thereby making progress toward the Landfill Directive diversion targets for 2010 and beyond.

Table 3: London Borough of Brent Recycling and Composting Targets

<u>Target Year</u>	<u>% Recycled / Composted</u>	<u>Target Source</u>	<u>Recycling and Composting Tonnage</u>
<u>2005</u>	<u>18</u>	<u>BVPI</u>	<u>21,559</u>
<u>2010</u>	<u>30</u>	<u>Waste Strategy 2000</u>	<u>39,671</u>
<u>2015</u>	<u>33</u>	<u>Waste Strategy 2000</u>	<u>48,180</u>

Waste and Emissions Trading (WET) Act 2003

The Act provides a framework for the Landfill Allowance Trading Scheme (LATS), whereby tradable landfill allowances will be allocated to WDAs each year. As a Waste Collection Authority Brent Council does not have a direct Allowance under LATS. However, as a constituent of the West London Waste Authority (the relevant Waste Disposal Authority) it is expected to contribute to meeting the Allowances set for the WDA. The West London Waste Authority (WLWA), along with the six collection authorities, has agreed to split the landfill allowances equally. Thus Brent is responsible for ensuring that sufficient municipal waste is delivered to the appropriate recycling, composting and residual treatment facilities to meet one sixth of the total landfill allowances allocated to WLWA.

Figure 6: Brent's LATS Allocations

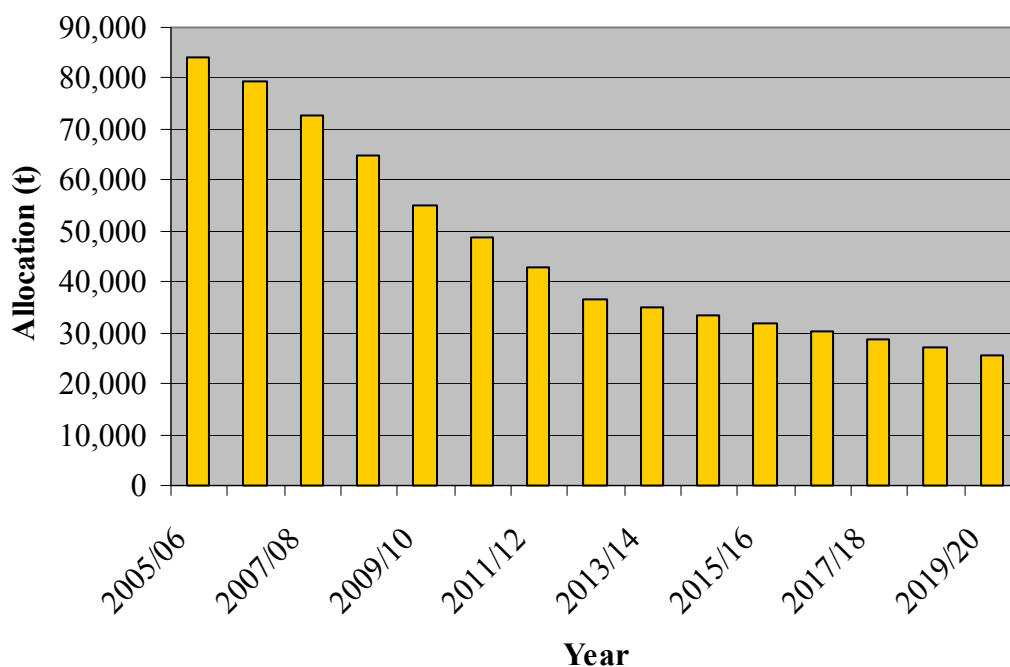


Table 4: Other Legislation Particularly Relevant to Brent Council

Legislation	Description
Waste Minimisation Act 1998	Provides Local authorities with Powers to implement waste minimisation initiatives.
Local Government Act 1999	Sets the Best Value targets for Brent of 18% recycling and composting by 2005.
Household Waste Recycling Act 2000	Requires that Local Authorities introduce separate collections for a minimum of two materials for recycling by the 31 st December 2010
Animal By-Products Regulations 2003	Sets requirements for the composting of waste animal by-products including kitchen waste.

Additionally, there are a number of pieces of emerging legislation that will have an impact on the collection and management of municipal waste and have been detailed in the Baseline Assessment Report.

Waste Growth

Predicting future waste growth can be very difficult due to a range of socioeconomic and demographic factors. Six future waste growth scenarios have been considered and are detailed in the Baseline Assessment Report. The 'historic 3 year growth rate scenario' was chosen as that most likely to reflect forecasted waste arisings within the WLWA's Joint Municipal Waste Management Strategy, and is the scenario chosen to reflect Brent's forecasted MSW arisings. This scenario takes into account the more recent data set available and reflects changes in new policies and services. As such, the forecast is thought to best reflect current and future practices with regards waste management.

This scenario suggests an average 2% annual growth rate, which implies that waste arisings within Brent will increase from 117,404t during 2004/05 to around 161,171t during 2020/21, an increase of 43,767t.

5.0 WHAT CHANGES/ IMPROVEMENTS DO RESIDENTS WANT?

Residents and interested stakeholders were invited to a community workshop on 26th May 2005 to discuss the Municipal Waste Strategy. The aim of the workshop was to present the reasons behind the development of the Waste Strategy, the current situation in Brent with regards to waste management, and the potential future waste management options that are being considered to meet targets. The workshop also sought to discuss residents concerns and elicit views from stakeholders on current waste management schemes and elements of a future waste strategy that they consider to be important.

Table 5: Stakeholders Views

<i>What level of recycling should Brent be aiming for?</i>
All attendees agreed that Brent should be aiming to achieve a higher recycling rate than the local and national targets.
<i>Should every property have a doorstep collection service?</i>
Yes, but only if it is convenient for residents. Additionally attendees noted that: <ul style="list-style-type: none"> • some residents find it difficult to carry green boxes (the current system) out to the kerbside. • Not all residents will participate even if the service is available.
<i>What materials should be collected for recycling?</i>
Attendees would like to see the following materials collected <ul style="list-style-type: none"> • Plastic • Cardboard • Kitchen waste • Wood. <p>It was noted that there is a limit to how many materials should be separated for recycling when compared with the cost of transporting each material to different treatment facilities.</p>
<i>How should materials be collected? (e.g. box/bag/bin)</i>
<ul style="list-style-type: none"> • Non-recyclables should be collected less frequently than recyclables, and the relative size of boxes for each should be reversed, i.e. whereas currently non-recyclables are placed in a large wheelie bin, and recyclables in a small green box; recyclables should have a larger box or bin, and non-recyclables the smaller box. • However, it was noted that residents would need to be educated about what waste to put in each receptacle as trials elsewhere in the country have shown that people will put non-recyclable waste into the larger container that is collected more frequently, even if it is supposed to only be for recyclable materials.

- There should be more bring banks at supermarkets throughout the Borough as it is convenient for most people to take their recycling in the car with them when they go to the supermarket. Also, no one wants bring banks outside their house.
- Separate containers for recyclable materials should be provided on streets, instead of just general waste bins.

Should kitchen waste be collected to help achieve composting targets?

- Yes, provided it is safe to collect it separately and compost it without risk to public health. The difficulty of deciding what kitchen waste included was noted. E.g. some people may think that a yoghurt pot or takeaway carton was kitchen waste.

Should residents be fined for not composting/recycling?

- Attendees felt that residents should be fined for not recycling/composting. The London Borough of Barnet was cited as an example where fines had been brought in and it was also noted that recycling systems work well in Ireland, Australia and USA, due to fines being imposed.

Other comments

Waste minimisation

- Producers should be more responsible for packaging waste.
- There are other avenues that should be explored before recycling everything. E.g. waste exchanges, databases of organisations and charities that re-use goods. Brent should advertise these avenues to the public.

Recycling incentives

- Bottle return schemes should be brought back.

Public participation

- The problem of improving public participation in recycling schemes was recognised. It is difficult to know how to 'sell' recycling to people that do not already recycle their waste.
- There is a significant transient population within Brent in rented accommodation (the example of Somali residents was given) who do not always understand how important recycling is, or which waste collection schemes are available to them as residents.
- It was commented that there are a number of rented properties within Brent, and that estate agents and landlords should be targeted to take responsibility for informing tenants as to how they should be dealing with their waste, and even including participation in recycling schemes being included in the tenancy agreement.
- The image of recycling needs to be improved and better marketed in an upbeat, trendy way in order to appeal to young people.
- Advertising on television could raise the profile of recycling.
- Recycling should be part of education in schools.
- Town Centre Wardens should be given powers to tell people off for littering.

Waste collection companies

- Waste collectors need to set a good example by not discarding plastic bags which recyclables are put out in.

Waste management in Brent Council offices

- Brent Council offices should be recycling centres where separate bins for all recyclable materials are installed in the offices (not just paper). If staff got into the habit of recycling at work, then they would be more likely to continue recycling at home. *Recycling in the Brent House office has started, and external containers will soon be installed.*

Brent Council are in the process of ongoing consultation with stakeholders.

6.0 SUSTAINABLE WASTE MANAGEMENT / IMPROVING RECYCLING

6.1 Introduction

As a result of the stakeholder workshop, a number of issues have been highlighted where improvements could be made with regards to waste management.

Kerbside recycling should be extended to every property. However, limitations were noted in the fact that not every resident is physically able to carry their green box out for collection, and that it is difficult to engage full public participation.

Fines were highlighted as a good idea and should be introduced across the Borough for those residents not recycling / composting. This would also have the benefit of publicising recycling.

Residents were also keen that additional materials be introduced to the kerbside collection service. However, Brent council officers highlighted the fact that there is a limit as to how many materials should be separated for recycling when compared to the cost of transporting each material to different treatment facilities. It was noted that landlords and estate agents could do more to encourage tenants to recycle, including awareness raising, or even including it within the tenancy agreement.

There are issues in terms of the location of additional waste management facilities, with residents recognising the need for them, but are generally unsupportive of this type of development that may impact on their living environment. This creates a paradox in that any such development is likely to impact on receptors to a certain extent.

It was considered that residual waste should be collected less frequently than recyclables, and that the larger container should be provided for recyclables and the smaller container for residual waste. However, it was noted that residents would need to be informed and educated regarding the types of material to be put into each receptacle.

Additionally, residents thought that there should be more bring banks at supermarkets throughout the Borough, as this seems to be a convenient location for the majority of people, and smaller, separate containers for recyclable materials should be provided on streets instead of sole general waste bins.

Additional receptacles for the separate collection of recycling were supported, either at supermarkets, or smaller receptables on streets in addition to waste bins.

6.2 Current Action Plans

Brent Council has developed a number of action plans focusing on waste management. In summary these include:

- Extend the 'green box' dry recyclables service, including additional properties and also seeking to increase participation rates for areas of the Borough already receiving the service;
- Expand the estates focused collection schemes;
- Identify appropriate collection systems for those properties currently considered to be unsuitable for both the green box and estates services;
- Expand the existing green waste collection service to include kitchen derived organic waste and cardboard;
- Explore the potential to improve facilities at 'Bring Banks';
- Maximise the recycling potential of the new Re-use and Recycling Centre; and
- Continue to promote the purchase and use of subsidised home composters.

The waste strategy for Brent encompasses these agreed actions, all of which should lead to an increase in recycling and composting levels.

6.3 How can Waste be Managed more Sustainably?

6.3.1 Waste Minimisation

Waste minimisation is at the top of the waste hierarchy and is vital in reducing the growth in waste arisings. The Waste and Resources Action Programme (WRAP) launched a Waste Minimisation Programme in 2003, working to stem the growth in household waste. In addition, the West London Waste Authority (WLWA) is considering options to promote general re-use of materials and utilising outlets such as charity shops and car-boot sales etc. whilst also recognising the fact that there are additional job creation and training opportunities. It must be recognised, however, that there are limits to amount of waste that can be diverted for reuse, and that the public can view second hand goods in a negative way.

Some other initiatives which can reduce and minimise waste are outlined below.

Home Composting

Promotion of home composting is considered to be one of the easiest means of reducing waste arisings. It is also the best example of the 'proximity principal' being applied, since it deals with waste as close to the point of production as possible, at the household itself. With up to 30% of the household waste stream typically being garden or putrescible waste, high participation in home composting can have a significant impact on waste arisings. However, case-studies indicate that individual households can only realistically compost between 100–200kgs per year, with many potentially compostable materials being otherwise disposed of.

Home composting is only suitable for properties with gardens and sufficient space to house the composter; inappropriate use can lead to pest problems, although this can be minimised by avoiding certain food types.

Brent Council is supporting the option of home composting with the sale of subsidised home composting bins.

Reuseable Nappies

It is estimated that, on average 3-4% of household waste arisings comprises of disposable nappies. Nappy waste can be reduced by encouraging mothers to use reusable nappies. This has additional benefits in terms of the use of laundry services stimulating the local economy, whilst at the same time resulting in cost savings to parents. Many Authorities in the UK sponsor 'Real Nappy' campaigns and nappy laundering services. However, the support of key organisations and individuals is required and take-up of reusable nappies services is variable.

6.3.2 Improving Collection of Recyclables

'Bring Banks'

The Council currently operates a network of 116 'Bring Banks' throughout the Borough.

Brent Council is seeking to reduce the number of 'Bring Banks' in favour of the provision of recycling sites at housing estates (particularly those areas that are subject to flytipping and vandalism).

Policy Guidance to Developers should encourage the provision of 'Bring Banks' or recycling sites in new residential and retail developments. 'Bring Banks' are often opposed due to their unsightly nature and potential to attract vandalism. The Council should therefore give consideration to alternative designs (for example, special housings or underground banks).

Household Waste Recycling Centres

There are a number of containers for recyclables provided at the new Re-use and Recycling Centre located in Park Royal. Brent Council is aiming to maximise the potential of the Re-use and Recycling Centre by publicising the new Centre and providing clear signage to direct residents to the site. The Council is also seeking to identify charities that would be willing to work in partnership with the Council and the WLWA to encourage the recycling and reuse of furniture and other bulky household goods.

Kerbside Mixed Waste Collections

Some Authorities adopt a 'survival bag system' approach whereby kerbside recyclables and 'residual' household waste are both collected from the kerbside and deposited into the same vehicle, either mixed or in separate compartments in the same vehicle. This has the effect of reducing the time spent collecting waste and recycle, and also reduces the number of vehicles required. The load is then deposited at a transfer station or MRF where the survival bags are separated and then opened for sorting. Experience has shown that the use of 'dirty' Materials Recycling Facilities of this type result in the production of low grade materials for recycling, and this can impact on their value and usability.

New technology developments are making mixed waste collections more viable. For example, autoclaving, which cooks the mixed waste with steam, allows the efficient recovery of separated clean recyclables and a high biomass product which is suitable for a range of uses including as a fuel for electricity generation.

Kerbside Sort Collections

This is the approach currently employed by ECT Recycling in partnership with Brent Council. Householders are requested to place particular materials into a plastic box for ease of sorting at the kerbside. Whilst this approach does result in higher collection costs it does produce a much better quality and higher value recycle than other collection schemes. An increase in the range of materials targeted by Brent Council will require some modifications to the existing vehicles.

The WLWA has considered recycling and composting options for paper and has concluded that the performance of the kerbside sort collection schemes is much better than that achieved through the use of 'Bring Banks' or Household Waste Recycling Centres.

Kerbside Co-Mingled Collections

This method of collection is more time efficient than the kerbside sort system, whilst giving rise to a relatively high quality recycle. In this approach the mixed (or co-mingled) dry recyclables are collected from the kerbside and emptied into a dedicated vehicle. The materials are then delivered to a 'clean' MRF for separation and bulking up. This approach requires a more sophisticated MRF, and therefore the overall costs for the system tend to be similar to the kerbside sort option.

Should the Council consider replacing the existing kerbside sort scheme with co-mingled collection scheme then use of a MRF with the capability of accepting mixed recycle would need to be procured.

Of relevance to all collection methods is the choice of collection receptacle, receptacle volume and collection frequency. Where receptacle volumes are undersized, this can limit the quantity of recyclables that householders

segregate. There is anecdotal evidence to suggest that householders are selective about the types of waste placed in the collection receptacle; for example plastic bottles will be consigned to the recycling box at the expense of other materials such as cardboard and tins. It is therefore important to ensure adequate space for recyclables in the collection receptacle.

The frequency of collection is also an important consideration. Recent experience indicates that the collection of recyclable materials on a weekly basis is preferred, with the collection of 'residual' waste being changed to fortnightly. The implications of such changes do, however, need to be considered very carefully before being implemented.

6.3.3 Improving Collection of Organic Wastes

Garden Waste

The Council currently operates a free green waste collection service. Free services tend to maximise participation, although they can lead to increases in waste arisings and also divert materials from other management routes (such as home composting and Household Waste Recycling Centres).

Brent Council has concluded that garden waste collections will need to be continued in order to achieve weight based recycling and composting targets.

The Council may wish to consider introducing a charging regime for green waste collection services to help control the volume of green waste deposited by householders and to encourage the use of other, more appropriate and sustainable management options.

Kitchen and Putrescible Waste

Whilst the Council may be able to achieve their 18% statutory recycling target for 2005/06 from the diversion of dry recyclables and green waste alone, higher recycling rates are only likely to be feasible by introducing arrangements for the separate collection of kitchen derived organic waste. This is reflected in the fact that one of Brent Council's priorities for 2005/06 is the introduction of an organic waste collection including cardboard and kitchen derived waste for centralised (in-vessel) composting. A kitchen waste collection trial is due to commence during June 2005, from 800 properties within the Borough. It is intended that this will be an extension to the existing garden waste collection service, and would principally be taken up by those householders who currently do not compost their own kitchen waste.

6.3.4 Novel Collection Options

Alternative waste collection options, particularly for high rise residences, are being considered for use at a number of new development sites in London where traditional collection methods can prove difficult. This includes use of vacuum removal systems, which have been used extensively in a number of countries (e.g. Spain and Sweden).

In such systems the waste, either dry recyclables or residual waste, is placed in a colour coded bag and then deposited by householders at the system inlet; the waste is then sucked under vacuum through a network of underground pipes to a central terminal station where it is automatically compacted in containers prior to dispatch to a MRF or landfill.

The main advantages include the avoidance of vehicle movements on site, the avoidance of open air storage of putrescible waste and the encouragement of greater segregation of materials for recycling.

6.3.5 Street Waste

One option which can be effective in increasing the tonnage of recyclables collected is to target street waste arisings. Recycling bins can be clearly labelled and located at strategic locations either alongside normal litter bins, or as a direct replacement. Segmented bins can also be used as an alternative that allows the collection of mixed litter and a variety of dry recyclable materials. Alternatively, the bins can be stored underground, with deposit points easily visible and located above ground. Both of these options have implications in terms of new infrastructure requirements, and the possible need for modifications to collection vehicles.

6.4 What Options are Available for Recycling?

A detailed assessment has been undertaken to determine how Brent Council might be able to achieve the various recycling and composting targets. The following improvements to the schemes have been considered:

- Improvements to reuse and recycling centre performance through better signage and more personnel to encourage members of the public to separate out their waste for recycling;
- Collecting additional materials, plastic and cardboard, in the kerbside collection scheme;
- Increasing bring bank provision from the current level of 1 per 862 households to 1 per 500 households;
- Expansion of the kerbside collection service to 100% of properties;
- Collection of kitchen derived organic (putrescible) waste; and
- Improvement to participation and material capture rates through enhanced and continued awareness programme and other measures

Twelve recycling options were modelled in the baseline assessment to predict the recycling and composting levels. The results of the modelling, for those options that achieve the 2005 target are shown below.

The 2005 target (18%) could be achieved through a number of changes and enhancements to the recycling and composting schemes. However, in order to meet the 2010 and 2015 targets of 25% and 33% recycling the Council has two options:

- Aim for a gradual increase in performance, utilising Options 2b or 3 to meet the 2005 targets, further developing kerbside collections in line with Option 7a to meet the 2010 target, then building on this in line with Option 7b so as to meet the 2015 target. To achieve this Brent Council will need to secure maximum public participation and capture rates (of around 80%) from the outset, whilst progressively introducing additional materials to the collection scheme; or
- Expand materials collection at an earlier stage to include kitchen derived organic waste, plastic bottles, and cardboard and paper packaging, whilst securing maximum participation and capture rates (of around 80%) over a 10 year period.

Figure 7: Option Modelling Results

Recycling Option	Materials				Participation & Capture				Options to meet targets		
	Current materials	100% household coverage	Additional materials - cardboard & plastic	Additional materials - kitchen waste	Average participation levels	Average material capture rate (50%)	Maximum participation levels (80%)	Maximum capture rate (80%)	2005	2010	2015
2b		★	★		★	★			★		
3				★	★	★			★		
4	★						★	★	★		
5			★				★	★	★		
6				★			★	★	★		
7a				★			★	★	★	★	
7b			★	★			★	★	★	★	★

All of the options identified have implications in terms of the need for collection vehicle modifications, additional collection crews or time spent sorting at the kerbside, and possible transport implications in delivering materials to different handling facilities; all of these will have the potential for additional costs, although these will be partially offset by savings made in diverting waste from landfill.

7.0 HOW MUCH WILL WASTE MANAGEMENT COST IN THE FUTURE?

The financial costs of waste management have risen significantly over recent years, driven largely by the introduction of new and more stringent environmental controls and regulation (at European and National level). In general terms, options that are considered to be higher up the 'waste management hierarchy' (for example, recycling and energy recovery) are more costly than those that are lower down (for example, landfill). Government has sought to redress this balance to a certain degree through the introduction of fiscal measures such as the Landfill Tax. It is fair to assume, however, that the costs of all waste treatment and disposal technologies are likely to increase over time.

In order to identify Brent's preferred waste strategy it is important to consider the costs of managing waste in the future. Section 6 identifies that substantial improvements and enhancements of Brent's recycling and composting schemes will be required if the Council is to achieve future recycling and composting targets. However, there are other potential solutions open to the Council that could be more cost effective than enhanced recycling and composting levels. To understand the future costs of waste management, an economic assessment of a range of future waste options has been carried out. The following options have been considered:

Option 1: Maintenance of current schemes, all residual waste to landfill. Payment of LATS fines for failure to meet targets

Option 2: Maintenance of current schemes, sufficient residual waste to alternative treatment to meet LATS allowances. Remaining waste to landfill.

Option 3a: Enhanced recycling by extending and modifying existing collection schemes to achieve 25% target. Sufficient residual waste to alternative treatment to meet LATS allowances. Remaining waste to landfill.

Option 3b: Enhanced recycling based on an alternative kerbside collection scheme to achieve 25% target. Sufficient residual waste to alternative treatment to meet LATS allowances. Remaining waste to landfill.

Option 4a: Enhanced recycling based on an alternative kerbside collection scheme to achieve 33% target. Sufficient residual waste to alternative treatment to meet LATS allowances. Remaining waste to landfill.

Option 5: No recycling or composting with all waste sent to alternative residual treatment.

Option 5a: No recycling or composting with sufficient waste sent to alternative residual treatment to meet LATS allowances. Remaining waste to landfill.

The total costs associated with a waste management operation are comprised of a number of elements including:

Cost of refuse collection;

Cost of kerbside collection;

Cost of putrescible collections;

Cost of other collection schemes (bring banks, HWRC sites);

Cost of material recycling facilities;

Cost of composting facilities;

Cost of landfill including tax; and

Cost of residual treatment. This will vary depending on the treatment technology. For this analysis, autoclaving has been assumed as the technology generates good quality recyclate and could be deemed as an alternative to kerbside collected recyclables. Autoclaving also produces a biomass product which can be used as a replacement fuel for energy production.

A kerbside assessment tool developed by the Waste Resources Action Programme (WRAP) has been used to calculate the costs of kerbside, putrescible and refuse collections. Other cost elements have been developed based on SLR's technical expertise. The current costs associated with the Council's collection schemes, excluding waste disposal are as follows:

Table 6: Current Costs

Residual Collections	£2.8 million
Kerbside Dry	£1.28 million
Kerbside Organic	£985,000
Estates Recycling	£99,000
Total	£5.164 million

Set out in Table 7 are the predicted costs for each of the future waste options for the year 2010. It should be noted that these figures are for comparative purposes and do not represent actual contract costs.

Table 7: Economic Performance of Waste Management options

	Waste Management Options 2010						
	1	2	3a	3b	4a	5a	5b
1. Overall Tonnage Performance							
Annual Tonnage	129,644	129,644	129,644	129,644	129,644	129,644	129,644
Recycling tonnage	11,444	11,444	19,447	19,447	28,003	0	0
Composting tonnage	6,903	6,903	12,964	12,964	14,779	0	0
Residual treatment tonnage ¹	0	30,439	13,465	13,465	2,607	129,644	51,953
Landfill tonnage	111,298	80,858	83,768	83,768	84,254	0	77,691
BMW Diversion requirement	33,250	33,250	33,250	33,250	33,250	33,250	33,250
BMW penalty tonnage	19,481	0	0	0	0	-49,722	0
2. Individual Scheme Tonnages							
Bring sites	2,775	2,775	2,775	2,775	2,775	0	0
HWRC sites	3,229	3,229	3,229	3,229	3,229	0	0
Kerbside dry	6,698	6,698	13,244	13,244	21,800	0	0
Kerbside Putresible	5,445	5,445	12,964	12,964	14,779	0	0
Flats recycling ²	199	199	199	199	199	0	0
3. Scheme Costs							
Bring sites ³	£13,873	£13,873	£13,873	£13,873	£13,873	£0	£0
HWRC sites ³	£16,147	£16,147	£16,147	£16,147	£16,147	£0	£0
Kerbside dry	£1,434,542	£1,434,542	£2,019,613	£1,709,383	£2,287,522	£0	£0
Kerbside Putresible	£977,607	£977,607	£1,719,818	£1,719,818	£1,792,429	£0	£0
Flats recycling ⁴	£99,367	£99,367	£99,367	£99,367	£99,367	£0	£0
Residual collection ⁵	£3,116,332	£3,116,332	£2,722,524	£2,722,524	£2,432,121	£3,630,032	£3,630,032
Landfill	£6,455,258	£4,689,787	£4,858,540	£4,858,540	£4,886,738	£0	£4,506,071
Residual Treatment ⁶	£0	£2,587,328	£1,144,530	£1,144,530	£221,627	£11,019,740	£4,416,016
LATS income ⁷	£0	£0	£0	£0	£0	£-3,977,773	£0
LATS penalties ⁸	£2,922,159	£0	£0	£0	£0	£0	£0
Total	£15,035,285	£12,934,983	£12,594,412	£12,284,182	£11,749,824	£10,671,999	£12,552,118
Collection costs	£5,657,867	£5,657,867	£6,591,342	£6,281,112	£6,641,459	£3,630,032	£3,630,032
Residual treatment costs	£0	£2,587,328	£1,144,530	£1,144,530	£221,627	£11,019,740	£4,416,016
Landfill costs	£6,455,258	£4,689,787	£4,858,540	£4,858,540	£4,886,738	£0	£4,506,071
LATS costs	£2,922,159	£0	£0	£0	£0	£-3,977,773	£0

Notes

¹ Recycling assumes 60% biodegradable, Residual 64% biodegradable

² Flats recycling, cost = 99,000

³ Assumed £5 / tonne costs

⁴ Assumed at £500/t

⁵ Assumed at £28/t

⁶ Assumed at £85/t

⁷ Assumed at £80/t (BMW)

⁸ Assumed £150 / tonne costs

The costs show a difference of almost £5 million ranging from £10.67 million for the cheapest option, Option 5a, to over £15 million for the most expensive, Option 1. All options are shown to be more cost effective than current waste management practices (Option 1). Option 5a, the no recycling option is significantly cheaper than the high recycling options, although this is largely due to the expected income from sale of excess LATS allowances. Without this income, despite lower collection costs, Option 5a is more expensive than the high recycling options.

The overall costs are highly sensitive to the unit costs assumed for the individual waste treatment technologies particularly for Options 5a and 5b where the majority of waste is treated through a residual treatment facility. A

conservative figure of £85 per tonne for treatment has been assumed, however treatment costs for the modelled technology, autoclaving, could be as low as £65 per tonne in which case the overall costs for Option 5a would fall to £8.1 million (£11.7 million excluding LATS income). Similarly the cost for Option 5b falls to £11.5 million making it cheaper than the high recycling options, options 3 and 4.

Comparison of options 3a and 3b indicates that a cost saving could be realised if the kerbside collection system was switched from sort at kerbside to a co-mingled collection. In order to achieve the higher recycling targets, a change in collection system is likely to be required anyway.

It can, therefore, be concluded, from the options considered that the most cost efficient collection system is likely to be a combination of medium to high recycling with sufficient waste sent to residual treatment to achieve LATS targets. Although, not considered, there may be added economic advantage, particularly from the generation of excess LATS allowances, by treating all remaining residual waste through a residual treatment facility.

8.0 WHICH OPTION MINIMISES ENVIRONMENTAL IMPACTS

The preceding section considers the costs of different waste management approaches. However cost is only one of the criteria that needs to be considered when evaluating a preferred waste management option; in particular, the environmental impacts should be considered.

An environmental assessment of the different options identified above has been undertaken. The assessment concentrates on the environmental impacts of the individual waste management processes excluding any differences in transport generated impacts which will be minor in comparison.

Environmental impacts have been calculated using the Environment Agency's Life Cycle Assessment tool, WISARD. Six indicators have been used to assess the environmental performance as follows:

- Air acidification – measures the emissions of acid gases such as nitrogen oxides, sulphur oxides and hydrochloric acid all of which give rise to acid rain which can lead to acidification of soils and damage to building;
- Water Pollution – provides a measure of pollutants that give rise to eutrophication (over-enrichment of lakes and rivers with nutrients, usually phosphorus, leading to excessive growth of algae and other aquatic plants). of freshwater;
- Human toxicity – emissions of chemicals that are known to have a toxic effect on human and animal life;
- Depletion of non-renewable resources – measures the rate of depletion of non-renewable resources such as coal, oil, gas and mineral reserves
- IPCC Greenhouse effect – measures the emissions of greenhouse gases which give rise to global warming, such as carbon dioxide and methane.
- Depletion of the ozone layer – measures the emissions of ozone-destroying substances such as chloro-fluoro carbons

The assessment process measures the life cycle impacts for a particular option, which comprises the following elements:

- Impacts associated with construction (and deconstruction) of waste management facilities;
- Direct Impacts associated with operating the facility including electricity, fuel, water and materials;
- Environmental savings associated with the recovery of materials for recycling; and
- Environmental savings associated with fuel use and subsequent displacement of fossil fuel energy.

The results across these impact categories are indicated below.

Table 8: Environmental Performance of Waste Management Options

Overall Performance	Option1	Option2	Option3	Option4	Option 5a	Option 5b
Air Acidification (NOx, SOz, HCl)	-2.166E+06	-3.406E+06	-8.423E+05	-1.502E+05	-8.597E+06	-3.190E+06
Water Pollution,Eutrophication (g eq. PO4)	1.526E+07	1.377E+07	6.536E+04	1.553E+04	4.557E+05	5.289E+06
Human Toxicity (g)	-7.998E+07	-1.225E+08	-1.810E+08	-2.261E+08	-3.110E+08	-1.144E+08
Depletion of non renewable resources (yr-1)	-3.744E+05	-8.652E+05	-8.286E+05	-1.111E+06	-9.042E+05	-2.880E+05
IPCC-Greenhouse effect (direct, 20 years) (g eq. CO2)	6.934E+10	4.944E+10	4.995E+10	4.204E+10	-9.635E+09	4.829E+10
Depletion of the ozone layer (average) (g eq. CFC-11)	309.24	3996.05	72.76	309.44	10.18	415.19

Valued Performance	Option1	Option2	Option3	Option4	Option 5a	Option 5b
Air Acidification (NOx, SOz, HCl)	0.24	0.39	0.08	0.00	1.00	0.36
Water Pollution,Eutrophication (g eq. PO4)	0.00	0.10	1.00	1.00	0.97	0.65
Human Toxicity (g)	0.00	0.18	0.44	0.63	1.00	0.15
Depletion of non renewable resources (yr-1)	0.10	0.70	0.66	1.00	0.75	0.00
IPCC-Greenhouse effect (direct, 20 years) (g eq. CO2)	0.00	0.25	0.25	0.35	1.00	0.27
Depletion of the ozone layer (average) (g eq. CFC-11)	0.92	0.00	0.98	0.92	1.00	0.90
TOTAL	1.27	1.62	3.40	3.90	5.72	2.33

RANK	6	5	3	2	1	4

The results indicate the performance of each option against the various criteria (overall performance). Positive numbers indicate that the option has a detrimental impact on the environment whereas negative figures show that the option leads to an overall improvement in the environment. The negative scores are normally linked to recycling of materials such as glass, metals and plastics which are known to lead to environmental savings due mainly to the avoided burden of mining or extracting raw materials.

Options 3a and 3b will exhibit similar environmental performance and as such have been modelled as a single option 3.

A problem with the performance scores is the different units for each criteria which makes it difficult to make an overall comparison between the options. Valued performance scores place the overall performance scores on a scale of 0 to 1, where '0' is the worst performing and '1' is the best performing. The valued performance scores may be summed together to give a total score which can be used to compare the overall performance of the options.

The results show that for 4 of the 6 environmental criteria, Option 5a, the non recycling option exhibits the lowest environmental impact. This is due primarily to the fact that 100% of waste is diverted from landfill, not because residual treatment is more environmentally friendly than recycling and composting. The results for option 5b which has comparable landfill diversion performance to option 4 and 3 indicates that high recycling and composting is more environmentally beneficial than relying wholly on residual treatment.

It can therefore be concluded, that based on the chosen environmental criteria, high recycling options, options 3 and 4 are the most environmentally friendly.

9.0 WASTE MANAGEMENT FOR THE FUTURE

9.1 The Council's Preferred Strategy

The results of the economic and environmental assessment indicate that the preferred waste strategy for the Council to pursue is based on a combination of medium (25%) to high recycling (33%) with sufficient waste sent to residual treatment to achieve LATS targets.

Improving Brent's performance is crucial to the Council's ambition to be an "excellent" Authority under the Government's Comprehensive Performance Assessment (CPA). In 2003 a Waste Management Inspection was carried out in Brent by the Audit Commission which resulted in a rating of One Star (a Fair Service), with promising prospects for improvement.

Targets set under the Governments Waste Strategy² require the London Borough of Brent to improve its recycling rate from approximately 14% at present to 33% by 2015/16. Interim targets include 18% by 2005/06 (Best Value Performance indicator, BVPI Targets) and 30% by 2010/11 (Waste Strategy 2000 targets).

9.2 Waste Minimisation, Awareness and Education

Waste minimisation and awareness raising are fundamental to the success of the waste strategy. It is anticipated that the quantity of waste generated in Brent will continue to rise over the next few years due to a range of socioeconomic factors. A growth rate of 2% has been assumed in the strategy development. However, if waste arisings grow at a faster rate, then this will create significant economic problems for the Council, which will ultimately be reflected in higher council tax charges.

It is often difficult for Councils to influence waste growth, as the household waste generation profile is largely dictated by commercial factors outside the area of influence of the Council. Recognising the impact that packaging has on household waste arisings, WRAP is currently funding a range of national projects to encourage producers to improve the sustainability of product packaging through initiatives such as lightweighting and improving recyclability.

Brent Council will actively promote a range of waste minimisation and awareness raising programmes including:

Home composting through the supply of subsidised home composters;

Support to Real Nappy campaigns to encourage parents to replace disposable nappies with reuseable alternatives;

Promotion of, and support to, initiatives that encourage the reuse of waste including waste exchanges and Furniture Reuse schemes;

² Waste Strategy (2000) DETR

Encourage Bag for Life schemes to educate the public in conjunction with the supermarkets about methods they can adopt for reducing waste volumes when they go shopping;

Developing a resource pack for schools;

Draw up new and improved Green Contracts for Waste Management and encourage a green procurement scheme within all aspects of the council's workings;

Introduce and improve recycling provision at Council offices;

Campaign to encourage householders to contact the 'Mail Preference Service' to reduce Junk Mail;

Develop a 'buy-recycled' campaign;

Undertake waste audits across all Council buildings;

Set up a waste minimisation website (both internal and external) and promote waste minimisation to all employees of the Council as well as to the general public;

Develop an education booklet for distribution by property letting companies to inform new tenants on the waste services operated by the Council; and

Consider using Town Centre wardens to promote recycling, litter avoidance and general sustainable waste issues.

9.3 Recycling Improvements

The results of the economic and environmental assessment indicate that the preferred waste strategy for the Council to pursue is based on a combination of medium (25%) to high (33%) recycling and composting with sufficient waste sent to residual treatment to achieve LATS targets.

Brent's current performance is approximately 14% and therefore substantial improvements both in recycling and composting performance will be required to achieve these higher recycling/composting targets.

Householders are encouraged to recycle through a number of schemes as follows:

Bring Banks

Kerbside Collection

Estates Recycling

Reuse and Recycling Centre

Moving forward, the Council will need to build and improve on these schemes and in some cases replace existing schemes with more efficient collection options.

9.3.1 *Bring Banks*

The Council currently operates 116 Bring sites, equating to approximately 1 per 863 households. These sites are well used generating on average 21 tonnes per site each year. However, bring bank sites can be unsightly and attract unsocial behaviour and as such are often opposed by residents. For these reasons, it is unlikely that the number of bring bank sites will increase significantly. However, bring sites provide an important route for recycling and in some areas they may be the only viable solution for recyclate collection. As such the Council will continue to identify suitable sites for location of bring banks and encourage provision of such sites in new developments.

9.3.2 *Kerbside Collection*

For most councils, kerbside collection schemes will be the major source of dry recyclables and the most significant contributor to recycling performance. Analysis presented in the Baseline Assessment Report (Table 8.2) identified the need for a doubling in kerbside performance to achieve the 33% recycling level. Achieving the 25% target would also require significant improvement in overall performance. A proportion of the required increase could be delivered through targeting additional materials. Brent is planning to collect cardboard and plastic and this will assist in raising recycling performance.

However, the 33% target and to a lesser extent, the 25% target will only be achieved through significant improvements in householder participation and material capture rates. Fundamental to this need is the question of whether the existing kerbside collection service is capable of delivering the required 80% participation and capture rates. Throughout the UK, kerbside sort systems provide a cost effective method of recovering recyclable materials. However, due to space and time limitations it is unclear whether such collection systems can accommodate the significant improvements in performance required.

The alternative to a kerbside sort scheme is co-mingled collection, whereby dry recyclables are collected mixed at the kerbside and transferred to a materials recycling facility (MRF) for subsequent sorting. Historically MRFs have not always operated efficiently due to high reliance on manual sorting. However sorting technology has developed significantly over the past few years such that if required, facilities can be fully automated with minimal manual sorting.

It is important to note that the four highest performing Councils in England (St Edmundsbury, Eastleigh, Harborough and Daventry) all rely on co-mingled collections of recyclables. However, collection operatives at Daventry sort materials at the kerbside, similar to Brent's current system. All achieve in excess of 20% recycling through kerbside collected material alone.

It would therefore appear that whilst improvements in the existing kerbside scheme can deliver improvements in performance, largely through the

inclusion of additional materials, to achieve the targets in the medium to long term the existing scheme will need to be replaced by a co-mingled collection.

The success of such a system will depend on the ability to procure a suitable materials recycling facility to take the materials to. Examples of suitable MRFs already exist in London, for example; Bywaters (Leyton and Stratford), Cleanaway (Greenwich) and Grundons (Colnbrook). With most waste management companies having access to, or future plans for advanced MRFs, provision of a suitable sorting facility should not pose a significant problem.

9.3.3 Estates Recycling

There are currently 250 Estates Recycling sites throughout the Borough providing a valuable recycling resource for residents of high rise developments. Unfortunately, the sites do not appear to be well used, yielding an average of 7-8 kg per residence based on total number of high rise developments. Not all flats have access to estates recycling facilities and as such this figure is slightly pessimistic.

Approximately 27% of residences are high rise and although this is not a high proportion compared to other London Boroughs, low recycling performance from estates schemes can only be counteracted by improved performance elsewhere. This places additional pressures on the council's other recycling schemes.

Recycle Western Riverside has recently published a research report³ on options for Estates Recycling. The report considers three main collection options; door-to-door collections; chute recycling systems; and bring-banks. The research concludes that door-to-door collection systems collect the greatest amount of recyclables, followed by chute recycling and then bring sites. Although cost per household can be relatively high compared to bring systems, average costs for a door-to-door collection system based on single use sacks are shown to be as low as £141 per tonne.

Performance of the various options in terms of kg recyclate per household per year is indicated below.

Table 9: Performance of Estates Recycling Schemes

	Performance	
	Range	Mean
	kg/hh/yr	kg/hh/yr

³ Recycle Western Riverside (May 2005) Estates Recycling Research.

Door-to-door schemes		
Basket & Boxes	44-84	64
Carrier Bags (detail from 1 Authority)		128
Single Use sacks (data from 1 Authority)		236
Chute Systems		
Trisort (based on 3 Tokyo sites)		142
Bring Banks		
Separate	0-202	33
Co-mingled	14-221	58

Table 9 clearly shows the improved performance that can be achieved from door-to-door collection schemes. Costs for door-to-door schemes are typically £30 per residence per year. Based on this figure, introduction of a similar scheme to all high-rise residences in Brent would cost £801,900, considerably higher than the current estates recycling costs of £99,000.

The existing estates scheme is performing significantly below the mean performance identified in Table 9, indicating the potential for improving the current recycling performance. Options for improving performance include:

Location of additional estates recycling sites;

Better information to residences on the importance of recycling; and

Involvement of caretakers and concierges to encourage residents to segregate materials.

In conclusion, in the short term Brent Council will introduce initiatives to improve the performance of the existing estates recycling scheme. However, in the longer term and depending on finances, the Council will consider replacement of the existing collection scheme with a door-to-door collection. A trial system will be introduced initially to assess the performance and success of alternative collection schemes.

9.4 Composting Improvements

The council currently collects green waste from households using wheeled bins or sacks. Whilst this collection scheme delivers high quantities of material, achieving the recycling and composting targets will require collection of kitchen waste also.

Some councils in the UK have opted not to collect kitchen waste due to the relative complexity, the concerns of householders and the lack of markets for the resulting compost product. However, without this material it will be impossible to achieve recycling targets and as such the council will need to consider its introduction.

There are few examples, as yet in the UK, of kitchen waste collections, and as such it is difficult to identify the most cost-effective approach.

There are, however, a limited number of ways of collecting this material, namely:

Co-mingled with green waste in bags or bins

Separate collection of kitchen waste in bags or bins.

The preferred option for Brent Council is not readily identifiable and different collection receptacles may need to be used in different parts of the borough. Kitchen waste must be composted in an in-vessel composting facility, therefore introduction of collection schemes can be constrained if a suitable facility is not available.

In the short term, the Council will introduce a trial collection scheme to identify a preferred method or methods for eventual rollout to all or most of the borough.

9.5 Collection Frequency and Receptacle Volume

Traditional household waste has been collected on a weekly basis, however, with increasing costs of waste management, councils around the UK are looking carefully at collection frequencies for residual waste. This is particularly important in high performing areas where diversion of up to 50% of the waste stream to recycling and composting means that residual waste bins are rarely full on collection day. Moving to a fortnightly collection of residual waste leads to significant economic savings as fewer vehicles are required. Together with careful consideration of receptacle sizes, alternate weekly collections can encourage householders to recycle more of their waste.

Traditionally, householders are provided with a 240 litre bin for collection of waste. Based on weekly collection of recyclables, fortnightly organics and weekly residual, a 33% recycling level (21% recyclables, 18% putrescibles) would require the following average receptacle volumes:

- Dry recyclables – 65 litres
- Putrescibles – 40 litres
- Residual – 150 litres

These are average figures and consequently, larger families may require additional receptacles. However reducing the volume of the residual bin can encourage householders to recycle. Therefore the following receptacle sizes as an average should be considered:

Dry recyclables – 100 litres (weekly collection)

Putrescibles – 140 litres (alternate weekly)

Residual – 140 litres (alternate weekly)

The type of receptacle and, therefore, numbers of receptacles will depend on the collection systems implemented. For example, based on the existing collection scheme two boxes would be required. Alternatively the required volume could be provided with a single wheeled bin.

The issue of fortnightly (alternate weekly collections) is a difficult decision to make and it may not be feasible in many areas. However it is likely that delivering high recycling performance will only be possible if alternate weekly collections are introduced.

9.6 Recycling Improvements

The results of the economic and environmental assessment indicate that the preferred waste strategy for the Council to pursue is based on a combination of medium (25%) to high (33%) recycling and composting with sufficient waste sent to residual treatment to achieve LATS targets.

Brent's current performance is approximately 14% and therefore substantial improvements both in recycling and composting performance will be required to achieve these targets.

10.0 CLOSURE

Brent Council is responsible for the collection of household waste in the London Borough of Brent which includes provision of recycling and composting services. The council is committed to improving its recycling performance and achieving national targets for recycling levels. The current recycling and composting systems have allowed the Council to achieve a recycling level of 14%. This means that 86% of waste generated by Brent households still goes to landfill. This situation must be improved upon. Recycling and composting are important elements of a sustainable waste management system and the council intends to increase the quantity of household waste that is recycled and composted.

The council already provide recycling and composting services. In the short term the council will concentrate efforts on improving the performance of these schemes through better public participation, introducing additional materials and maximising accessibility.

However, it is unlikely that the services currently provided will be capable of diverting a sufficient quantity of materials to achieve more onerous recycling targets. As such the council will need to consider introduction of alternative collection schemes that are more cost effective and encourage greater public participation. This will require introduction of a kerbside collection scheme based on collection of co-mingled materials for the majority of households.

Approximately 30% of residences are high-rised and these require a different collection regime to the kerbside collection scheme. The council has introduced an Estates recycling scheme for high rise residences, however the performance of this scheme needs to be greatly improved. It may be necessary to implement an alternative scheme to deliver the required tonnages of recyclables.

The council will need to consider introducing a collection scheme for kitchen waste; this could be combined with the green waste collection service or be provided as a separate collection scheme.

Underpinning the waste strategy is waste minimisation and waste awareness. The council will continue and build on the work already undertaken to encourage all who live and work in the Borough to become more responsible in dealing with their waste. Only with the support of its residents will the Council be able to manage waste more sustainably.