EB 123

Managing waste in Chelmsford … today and tomorrow

A strategy and improvement plan for recycling and waste collection services in Chelmsford

Chelmsford BOROUGH COUNCIL

April 2009

CHELMSFORD TOMORROW
Our vision for the future

Contents

1 Executive summary

1 Chelmsford Borough Council is a waste collection authority with a statutory duty under the provisions of the Environmental Protection Act 1990 (as amended) to arrange for the collection of household waste in its area. The statutory duty does not prescribe the method of collection of household waste. The Council can consider options, therefore, in terms of the type and frequency of collections that are made available in the Borough.

2 In May 2007 the Government published a new Waste Strategy for England. This strategy clearly articulates that to be successful in managing resources and the environment in a more sustainable way, all parts of society will have to share responsibility to improve how waste is managed. The focus of the strategy is to ensure that at all times waste is minimised, that materials and products are able to be reused wherever possible, that they can be easily recycled at the end of their lives and where appropriate any energy resource still present is recovered. The Waste Strategy for England demands a more integrated approach for waste management, both in terms of collections and disposal and in the treatment of municipal and non-municipal waste.

3 The framework for an integrated approach to waste management and for collaborative working in Essex has been created through the development by Essex County Council of a Joint Municipal Waste Management Strategy for Essex for the period 2007 to 2032.

4 Recycling and waste collection services have an impact on every household within the Borough and accordingly have a significant influence on the reputation of the Council and the perceptions of the area, in particular the views and opinions of residents and visitors about the quality of the local environment, the perceived quality of life offered and the attraction of the place as a destination in which to live, work or visit.

5 Chelmsford Borough Council recognises that providing continuous improvement in respect of waste minimisation, reuse, recycling and composting is an important issue and key priority for local residents and this is reflected as a key priority in both the Community Plan and the Council's Corporate Plan.

6 In order to be able to respond effectively to the Waste Strategy for England and the Joint Municipal Waste Management Strategy for Essex, a new strategy and improvement plan for recycling and waste collection services in Chelmsford has been developed.

7 The strategy sets out the context, policy and long term aspirations for waste management in Chelmsford and the proposed direction and priorities for the future development of recycling and waste collection services.

8 The associated improvement plan identifies the targets for achievement and the possible short, medium and long term actions and measures that may need to be taken to deliver the strategy.

9 The development of the strategy and improvement plan has been informed by a comprehensive review of current performance, recent trends and how resources are used. An assessment of the current situation and market conditions has been carried out, together with an evaluation of the key environmental, political, economic, social and technological influences on future waste management planning. Attitudes and behaviour towards recycling and waste management activities have been investigated, waste stream material composition analysed and system design modelling undertaken to identify possible alternative recycling, composting, waste collection and disposal arrangements that would serve the Chelmsford area most effectively.

10 In policy terms, and reflecting the principles of the so-called 'waste hierarchy', the strategy for recycling and waste collection in Chelmsford sets out an approach to waste management based on a desire to:

- ⬇ Firstly reduce the amount of waste produced within the Borough
- ⬇ Then to see materials and resources reused as much as possible
- ⬇ With the majority of the waste that remains being recycled and composted

… so that the minimum amount possible is sent for disposal

11 The key targets for the next 5 years are to achieve:

- A minimum recycling and composting rate of 50% by 2013/14
- A reduction in total waste generated to no more than 980Kg per household by 2013/14 [equivalent to a 10% reduction]
- A reduction in residual waste generated to no more than 550Kg per household by 2013/14 [equivalent to a 20% reduction]

12 Three strategic drivers are identified:

- A continuing emphasis on preventing and reducing waste and encouraging further behavioural change to increase current diversion rates by 5%-6% to exceed the target set nationally to achieve 40% household re-use, recycling and composting and to generate no more than 684Kg of residual waste per household by 2010
- The need for changes in collection system design and associated infrastructure improvements to facilitate further recycling and composting activities and take advantage of more advanced disposal facilities in order to exceed the more ambitious targets set out in the national waste strategy and locally to ensure that at least 50% of household waste is re-used, recycled or composted as soon as is practically possible

- Creating new opportunities to encourage recycling by businesses, education establishments, entertainment and leisure facilities and improving the levels of recycling and composting associated with street care, grounds maintenance and related activities, reflecting the national strategy which demands that resources, the environment and waste is managed in a more integrated and sustainable way

13 The strategy advocates the following core recycling and waste collection system for Chelmsford:

- Retaining source separated collections of materials for recycling, but with some adjustments and refinement to the method of collection, frequency of collection and range of materials collected in order to simplify collection systems and further improve participation and diversion rates

- Retaining current arrangements for a separate collection of garden waste for composting, complemented by continued efforts to encourage home composting

- Introducing a separate food waste collection to all households on a weekly basis in 2011 when funding becomes available

- Following the introduction and evaluation of the impact and effectiveness of a weekly food waste collection, reviewing collection arrangements to see if further improvements in terms of waste reduction and diversion rates can be realised

- Continuing to provide assisted collections, household clinical waste collections and special / bulky waste collections including electrical equipment on a chargeable basis

14 The improvement measures identified as priorities for implementation subject to additional funding being secured or by reallocating / refocusing existing resources, are as follows:

- The promotion of home composting

- Campaigns to reduce food waste

- Targeted waste reduction and recycling promotion campaigns in low performing areas

- Extending existing recycling collections to include all plastics

- Including liquid food cartons ['tetra-pak' type] in the kerbside collection scheme

- Introducing a separate food waste collection from 2011

- Reducing the size and number of wheeled bins issued for residual waste to promote further behavioural change and encourage recycling

- Limiting the number of wheeled bins provided for garden waste collections to 2 per household [in association with the promotion of home composting]

- Introducing cardboard and paper recycling for trade customers

- Extending the range of materials for recycling that are collected from flats, in particular adding collections of plastics and cardboard

15 Consideration will also be given to the relative benefits of changing the frequency and scope of certain materials collected for recycling – for example, achieving a more consistent frequency for cardboard collections throughout the whole Borough, the possibility of collecting plastics, liquid food containers and cans on a weekly basis.

16 The outcomes from successfully implementing the strategy and improvement plan are expected to be:

- A significant reduction in the amount of waste produced, resulting in less energy and natural resources being consumed by residents in Chelmsford

- A corresponding reduction in the level of damaging greenhouse gases that are generated

- People in Chelmsford being committed and able to live more sustainably, caring for and benefiting from a local environment of high quality and enjoying the quality of life arising from it

17 In general, the majority of the strategy can be delivered from within existing resources, subject to resources being reallocated into priority areas.

18 However, the introduction of a separate food waste collection is reliant upon external investment being secured from the waste disposal authority as part of Essex County Council's commitment, described in the Joint Municipal Waste Management Strategy, to increase investment in 'front end' recycling and composting solutions in order to reduce the need for treatment and disposal later in the waste management cycle.

19 There are many variable factors associated with the planning of future waste management arrangements. The adoption of a strategy and challenging improvement plan inevitably will carry some risks as assumptions have to be made on certain factors, influences and patterns over the longer term. However, the risks of not agreeing a strategy for recycling and waste collection in Chelmsford are likely to far outweigh these, resulting in a lack of cohesion and direction to future waste management planning, an adverse impact on Chelmsford's ability to meet national targets for waste reduction and diversion of waste from disposal by landfill and potentially exposure to significant additional costs.

2 Long term aspirations

2.1 Chelmsford Tomorrow

The long term vision is for Chelmsford to become the economic, cultural, leisure and retail heart of Essex and a leading regional centre in the East of England[1]. The approach is to 'make a great place, even better; a place where people choose to live, work and visit because of the quality of life available now and the clear prospects for this to improve even more in the future.'

One of the most significant challenges to this vision is to create a way of living that is more environmentally responsible and more sustainable. It is now widely acknowledged that as a society, we are consuming natural resources at an unsustainable rate and that there is a considerable threat to the environment and to local quality of life from adverse climate change. Using the earth's resources within the limits of its eco-systems is vital to the survival, health and prosperity of future generations.

The Council's Corporate Plan[2] includes a strategic theme to ensure that a high quality public environment exists, helping to create a welcoming, pleasant and vibrant place, and working to make the area cleaner and greener. Priorities are identified to:

- Maintain high quality public places
- Reduce and mitigate the impact of climate change on the Borough, including a reduction in the Council's 'carbon footprint'
- Reduce waste and improve recycling rates, thereby minimising the amount of waste going to landfill

2.2 A strategy for managing waste

For Chelmsford Borough Council and the community it serves, dealing with the waste generated in the Borough is one of the major environmental, social and economic challenges that needs to be addressed.

The composition of household waste includes significant quantities of bio-degradable carbon based matter such as kitchen waste, garden waste, paper and cardboard. Other 'waste' products, containing plastics, glass, metal, textiles etc consume energy during the manufacturing process and when they are transported. The reduction in the amount of waste produced and the effective reuse, recycling and treatment of these materials has a direct impact on reducing their adverse environmental impact on the Borough and in particular reducing potentially damaging greenhouse gas emissions.

[1] One Vision: Chelmsford Tomorrow 2021 [Chelmsford Partnership April 2008]
[2] Chelmsford Tomorrow – Our vision for the future 2007-2011[Chelmsford Borough Council 2007]

The approach to waste management is at something of a crossroads both nationally and locally.

Key decisions are required now to allow effective planning of waste management activities for the next 15 years and beyond. These decisions will have significant environmental and economic implications over many years. The potentially adverse impact of current waste management practices can be mitigated by working collaboratively to secure the necessary investment in the infrastructure to support effective recycling and collection services and give access to more environmentally responsible methods of disposal. In this way disposal of waste to landfill can be avoided and the diversion targets set out in the Waste Strategy for England and EU Landfill Directive exceeded.

Embracing Chelmsford Borough Council's role as a community leader, the proposed strategy for recycling and waste collection services in Chelmsford seeks to build on the existing good practices and track record in recycling, composting and waste minimisation to ensure that:

- **Less waste** is produced by everyone
- There is an active **reuse** culture
- **Home composting** is 'the norm'
- Far more waste is **recycled** and **composted** than sent to landfill

Achieving the aspirations for a reduction in the amount of waste generated, together with high levels of reuse and recycling will require further changes in consumer behaviour and for local residents to commit with even greater vigour to the principles of the so-called 'waste hierarchy'. To support these behavioural changes, reliable, high quality and comprehensive collection services need to be in place so that:

- Recycling is **easy** and **accessible** to everyone within the Borough and the perceived barriers to recycling are removed
- The highest levels of **participation** and **capture** rates of materials for recycling and composting are achieved

The key outcomes of the strategy for recycling and waste collection are expected to be:

- A significant **reduction in the amount of energy and natural resources consumed** and a corresponding reduction in the level of damaging greenhouse gases that are generated by producing less waste and achieving high levels of reuse, recycling and energy recovery

- Fostering **a strong commitment and sense of responsibility within local communities to live more sustainably and protect and care for the local environment, so they can fully enjoy the quality of life arising from it** by effectively promoting the benefits, value and a variety of measures to reduce waste and increase recycling and composting

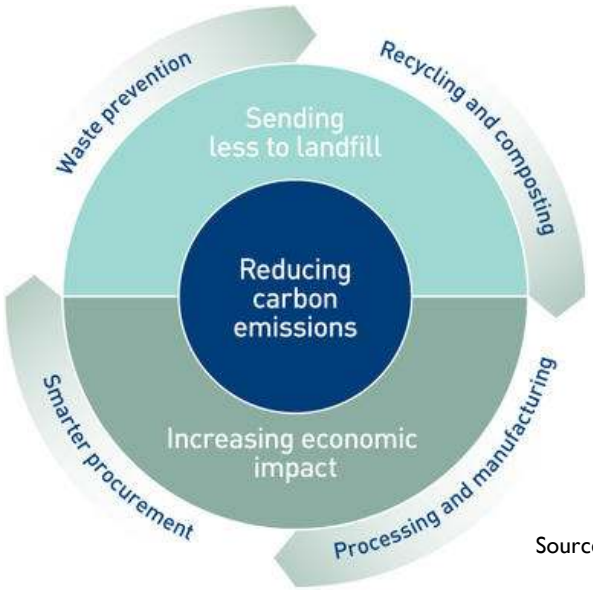
3 Context – national

3.1 Impact of climate change

It is now widely acknowledged that there is a considerable threat to the environment and to the quality of life locally from adverse climate change. The scale of the challenge means that all sectors of government, industry and the community have to be directly involved and committed to meet targets for reducing emissions and adapting to climate change. The recent Stern Review shows that the cost of tackling this threat now will be far less than the costs of damaging climate change later if prompt action is not taken.

In November 2007, Chelmsford Borough Council signalled its commitment to tackling the impacts of climate change by endorsing the Nottingham Declaration. In signing the declaration, the Council has acknowledged the increasing impact that climate change will have on our community during the 21st century and has made a commitment to help tackle the causes and effects of a changing climate on the Borough. Whilst the effects of climate change are global, to be successful solutions and measures to adapt to its impact need to be put in place at a local level.

Of all the potential contributors to climate change household waste is one of the most visible and damaging. Historically methods of dealing with waste – the infrastructure and disposal arrangements and in particularly the consequences of disposal in landfill – have been poorly considered and inadequately planned and resourced.



Source WRAP

However, adopting a more sustainable approach to waste management is quickly moving up the political agenda as continued growth, rising costs and the adverse environmental impact of greenhouse gas emissions become more evident.

Waste management processes generate carbon dioxide and methane, which are both greenhouse gases. Methane emissions from biodegradable waste in landfill account for 40% of all UK methane emissions and 3% of all UK greenhouse gas emissions. Methane is 23 times more damaging as a greenhouse gas than carbon dioxide.

Independent research has shown that in environmental terms recycling is almost always a better solution than either disposal by land fill or incineration. Waste strategies across the UK all envisage further significant increases in recycling.

Everyday household waste contains readily biodegradable carbon-based organic matter, such as kitchen waste, garden waste and paper, and slowly biodegradable organic materials, such as lignin (wood-like material). Some products such as plastics contain carbon derived from fossil fuels (oil) that are used as a feedstock. The treatment and disposal of these wastes has a direct influence on the emissions of greenhouse gases. Current UK recycling of paper, glass, plastics, aluminium and steel is estimated to save more than 18 million tonnes of carbon dioxide a year through avoided primary material production. This is equivalent to the annual use of 5 million cars or 14% of UK transport sector emissions.

In accordance with the obligations set out in the Nottingham Declaration, the Council adopted a Climate Change Strategy and associated carbon reduction plan in April 2009. This strategy proposes a proactive approach toward planning for the impact of climate change and a series of measures that will to contribute to the mitigation of climate change by reducing the Council's carbon footprint. Waste reduction is a key theme of this strategy and action plan.

3.2 Waste Strategy for England

Each year, the UK generates about 100 million tonnes of waste from households, commerce and industry. The majority of this currently ends up in landfill where the biodegradable part generates methane, while valuable energy is used in extracting and processing new raw materials to replace those buried in landfill.

In May 2007 the Government published a new Waste Strategy for England[3]. The strategy clearly articulates that to be successful in managing our resources and environment in a more sustainable way all parts of society will have to share responsibility to improve how waste is managed – ensuring that at all times waste is minimised, that materials and products are able to be reused wherever possible, that they can be easily recycled at the end of their lives and where appropriate any energy resource still present is recovered.

The strategy seeks to break the association between economic growth and waste growth and demands a more integrated approach for waste management; both in terms of collection and disposal and in the treatment of municipal and non-municipal waste. The strategy provides a framework to secure investment in the necessary infrastructure and technology to support waste minimisation and the more effective treatment of waste. The strategy sets out clear expectations from the different sectors involved:

> **Producers** will have to make products using more recycled materials and less newly-extracted raw materials. They will have to design products that are less wasteful and take responsibility for the environmental impact of their products throughout their life

[3] Waste Strategy for England 2007 [Department for Environment, Food and Rural Affairs May 2007]

Retailers will have to reduce packaging, source and market products that are less wasteful, and help their consumers to be less wasteful; as well as improving their own levels of recycling

Consumers – both businesses and individual households will have to take measures to reduce their own waste – purchasing products and services that generate less waste and separating their waste for recycling thereby reducing their environmental impact

Local authorities will have to commission or provide convenient recycling services for their residents and commercial customers and provide advice and information on how to reduce waste. Local authorities will also have to work with their communities to plan and to invest in new collection and reprocessing facilities

The **waste management industry** will have to invest in facilities to recycle and to recover waste and provide convenient waste services to their customers to recycle and to recover their waste

3.3 Waste hierarchy

The Waste Strategy for England describes a clear hierarchy for future waste management. The core aim is to reduce waste by making products with fewer natural resources in the first place and then ensure that products are re-used or their materials continuously recycled. The hierarchy demands that energy should then be recovered from any other waste products where possible, accepting that landfill will be necessary for only a very small amount of residual material.

The Waste Strategy for England highlights that the dividends of applying the waste hierarchy will not just be environmental. Money can be saved by making products with fewer natural resources and the costs of waste treatment and disposal can be reduced. Waste is a burden on the economy

and business productivity. The strategy advocates that reducing this burden by improving the way in which natural resources are used can generate new opportunities and jobs.

Figure 1: The Waste Hierarchy

Waste prevention sits at the top of the waste hierarchy because it has a direct impact on the avoidance of emissions. Avoiding unnecessary waste, for example excessive packaging, reduces the demand for raw materials that would otherwise have been extracted. Waste prevention is therefore the most important aspect of waste management in terms of greenhouse gas reduction.

Reuse is a way of prolonging the life of resources. There are many ways in which items can be reused or passed on for others to use rather than throw them away. This achieves similar benefits to those of waste reduction.

Recycling and composting can allow valuable resources to be used again and save energy in the process. For example, recycling an aluminium can requires only 5% of the energy it takes to make new aluminium and each tonne of aluminium recycled saves 11 tonnes of CO_2. In terms of glass the energy saving from recycling one bottle will power a 100 watt light bulb for almost an hour or power a washing machine for 10 minutes.

Energy recovery Recent increases in energy prices and continuing instability in a number of supplier countries underline the importance of maximising energy recovery from the portion of waste which cannot be reused or recycled. This means using the most efficient technology for the job and recovering heat as well as electricity where practicable. This is the responsibility primarily of the waste disposal authority.

Nationally the main driver for changes in the way waste is managed is the EU Landfill Directive which sets mandatory targets for the reduction of biodegradable waste sent to landfill. The Landfill Allowance Trading Scheme (LATS) which commenced on 1 April 2005 is the government's key measure to meet the demands of the European Landfill Directive in England.

Landfill allowances have been allocated by the government so that nationally, the UK reaches the targets set by the Landfill Directive for reducing the amount of biodegradable municipal waste going to landfill. The targets set out in the Directive are to reduce landfill of biodegradable waste to:

- 75% of 1995 levels by 2010
- 50% of 1995 levels by 2013
- 35% of 1995 levels by 2020

The treatment plants that provide the alternative to landfill required to meet these new targets and divert biodegradable waste from landfill will be more expensive to provide and operate than current systems. The landfill allowance trading scheme allows for fines to be imposed on waste disposal authorities for every tonne of waste above their allowance that is sent to landfill. The fine is £150 per tonne of biodegradable waste sent to landfill. The Department for the Environment, Food and Rural Affairs (Defra) has estimated that waste spending will have to more than double up to 2012/13 nationally from £2bn to £4.2bn to meet the second target year, increasing by approximately 10% each year.

To respond to this challenge local government as a whole recognises that it will need to seek innovative solutions to encourage radical change in consumer behaviour and minimise waste that is generated. Waste disposal and collection authorities will need to work together more closely to ensure that the waste collection and disposal systems being introduced to meet the challenge are efficient and are able to meet the levels of performance required, but also sustainable in nature.

The Waste Strategy for England sets targets for waste prevention, diversion from landfill for disposal authorities such as Essex County Council and increasing the proportion of waste that is recycled or composted for waste collection authorities such as Chelmsford.

The Waste and Emissions Trading Act 2003 includes a provision imposing a statutory duty on authorities in two tier areas where waste collection and disposal functions are carried out by separate authorities to draw up a cohesive integrated waste management strategy.

4 Context – Essex

In 2007/08 Essex produced some 732,400 tonnes of municipal solid waste [that is household waste and any other waste that is collected for treatment and disposal by a local authority including material taken to recycling centres for household waste]. On average each Essex resident produces over ½ tonne of waste per year. Overall Essex waste collection authorities recycle or compost just over 34% of household waste, although this varies significantly between different areas. In total, including materials taken to local recycling centres for household waste, 38% of household waste was recycled or composted in 2007/08.

Whilst Essex residents have increased the proportion of waste recycled or composted over recent years, the majority of waste is still ending up in landfill sites, which creates a significant environmental burden and also means that valuable resources are lost. As a whole, the level of waste produced in Essex, whether diverted from landfill or not, remains far too high to be sustainable.

4.1 Joint Municipal Waste Management Strategy for Essex 2007–2032

The framework for an integrated approach to waste management and for collaborative working in Essex has been created through the development by Essex County Council of a joint waste management strategy[4] for collection and disposal authorities in Essex. This strategy is for the period 2007 to 2032 and was formally adopted by Essex County Council on 15 July 2008 and subsequently supported by all but one of the waste collection authorities in Essex.

The Joint Municipal Waste Management Strategy for Essex advocates an approach to prevent and minimise the amount of waste produced through co-ordinated promotion and education work, complemented by joint investment to achieve high levels of recycling and composting across the county that exceed national targets. The strategy advocates the use of composting technologies for source separated organic [food] waste where renewable energy is recovered. The successful delivery of the strategy relies on the associated procurement of new waste management and disposal facilities, in particular mechanical biological treatment and anaerobic digestion treatment plants, to avoid, as far as possible, the disposal of residual to landfill.

In summary, the key themes of the strategy are:

- Essex [collection and disposal] authorities will seek to reduce the amount of waste produced in the first place and re-use more of the waste that is produced
- Essex will achieve high levels of recycling, with an aspiration to achieve collectively 60% recycling and composting of household waste by 2020. It is anticipated that this will be achieved through a combination of further improvement in the performance of recycling

[4] Joint Municipal Waste Management Strategy for Essex 2007 to 2032 [Essex County Council July 2008]

and composting kerbside collection schemes and the recycling centres for household waste and the recovery of further recyclable materials through new treatment plants

- Essex favours composting technologies such as anaerobic digestion (AD) as a bio treatment for source segregated organic wastes, with the gas produced being used to generate 100% renewable electricity
- Whilst seeking to reduce the amount of waste produced and recycling as much of if it as possible, the strategy recognises that there will always be some waste that still needs to be disposed of. For this waste the strategy proposes that new treatment plants be commissioned using mechanical biological treatment (MBT) to process any 'residual' waste, thereby recovering any further material for recycling, with the remaining either being manufactured into a fuel for energy recovery or sent to landfill

At Cabinet on 27 January 2009, Chelmsford Borough Council confirmed its support for the principles outlined in the Joint Municipal Waste Management Strategy for Essex, in particular:

- The vision for better and more sustainable use of resources
- The principles of the waste hierarchy, placing emphasis on prevention and reduction, then reuse, then recycling and composting ahead of any other treatment or disposal to landfill
- The themes and objectives set out in the strategy relating to waste reduction, reuse, recycling, composting, education and promotion
- More focus being placed on education and promotion
- More resources being provided to support and encourage behavioural change to achieve a reduction in the amount and nature of waste produced and greater participation in the widest range of diversionary activities

4.2 Essex Local Area Agreement 2008–2011

The Local Area Agreement is an accord between the Government and the Essex Partnership of public, private and third sector organisations intended to serve the needs of and reflect the aspirations of the communities in Essex. The Essex Local Area Agreement[5] sets out an overall vision to '*support Essex people to liberate their potential to enjoy the best quality of life in Britain*'.

The Agreement includes strategic actions relating to 'Our People', 'Our Communities', 'Our Economy' and 'Our World', which emerged as high priorities following public and stakeholder consultation. Programmes of activity are identified to address these needs. Performance targets have been set for the issues that, over the next three years, are considered the most important and urgent in turning this vision into reality.

[5] 'Liberating Potential Fulfilling Lives' [Essex Partnership July 2008]

The 'Our World' theme sets out actions to promote sustainability and protect the physical environment of Essex by:

- Reducing the domestic, business and public sector carbon footprint
- Reducing, reusing and recycling waste
- Managing the environment
- Using natural resources efficiently

The Local Area Agreement includes three specific targets, which are also national indicators, relating specifically to waste management:

- NI 186 – Per capita reduction in CO_2 emissions
- NI 191 – Residual household waste per household
- NI 192 – Percentage of household waste sent for reuse, recycling and composting

5 Context – Chelmsford

5.1 Recent trends

Chelmsford continues to grow, with a 3.7% increase in the number of residential properties [over 2,500 additional properties, averaging just over 500 per year] and a population increase of just under 6,000 people since 2003/04. Apart from the demand for increased collection capacity, many of these properties are flats and apartments, often with restricted access, needing to be served with communal facilities that present different challenges for collections systems.

The latest satisfaction survey indicates that 91% of people are satisfied overall with household waste collection services in Chelmsford, an improving trend compared to previous years. Improved reliability, a significant reduction in the number of missed collections and improvements in the way customer enquiries are handled are key factors in this regard

In Chelmsford the average quantity of waste collected from each household per year equates to almost 1,100Kg, one of the highest levels in Essex. Attention continues to be given to reducing the amount of waste generated in Chelmsford and promoting reuse, successfully reducing total waste generated, with a reduction of over 7% since 2004/05. Assuming current performance is maintained total waste generated per household will reduce by a further 2.8% in 2008/09.

In 2007/08 an average of 385Kg of total waste was diverted from landfill, the proportion of waste recycled or composted being just over 35%, the 5th highest in the County. Some 14,600 tonnes of material were recycled [19.21%] and 12,300 tonnes composted [16.16%].

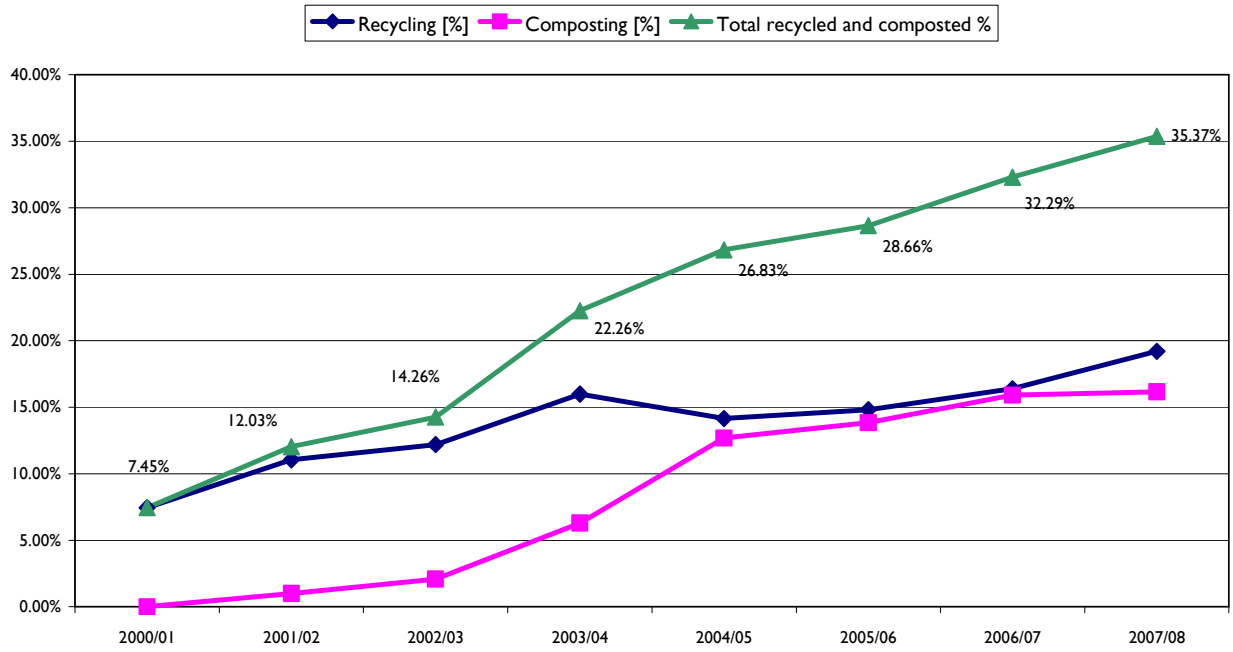
The proportion of waste recycled or composted in 2007/08 increased by 1.8% compared to the previous year. The recycling services provided in Chelmsford are comprehensive, covering all major materials, segregated at kerbside. The percentage of residents served by kerbside collection of recyclables has increased to 98.6% in 2007/8.

Trends shows a significant increase in the amount of waste diverted from landfill since 2004, but it is recognised that this may be beginning to reach a plateau and may not increase significantly without additional interventions and incentives. Whilst there has been a reduction in the total waste generated per household since 2004/05, there are concerns that this rate of reduction may not be sustained or accelerated sufficiently to meet national waste reduction targets.

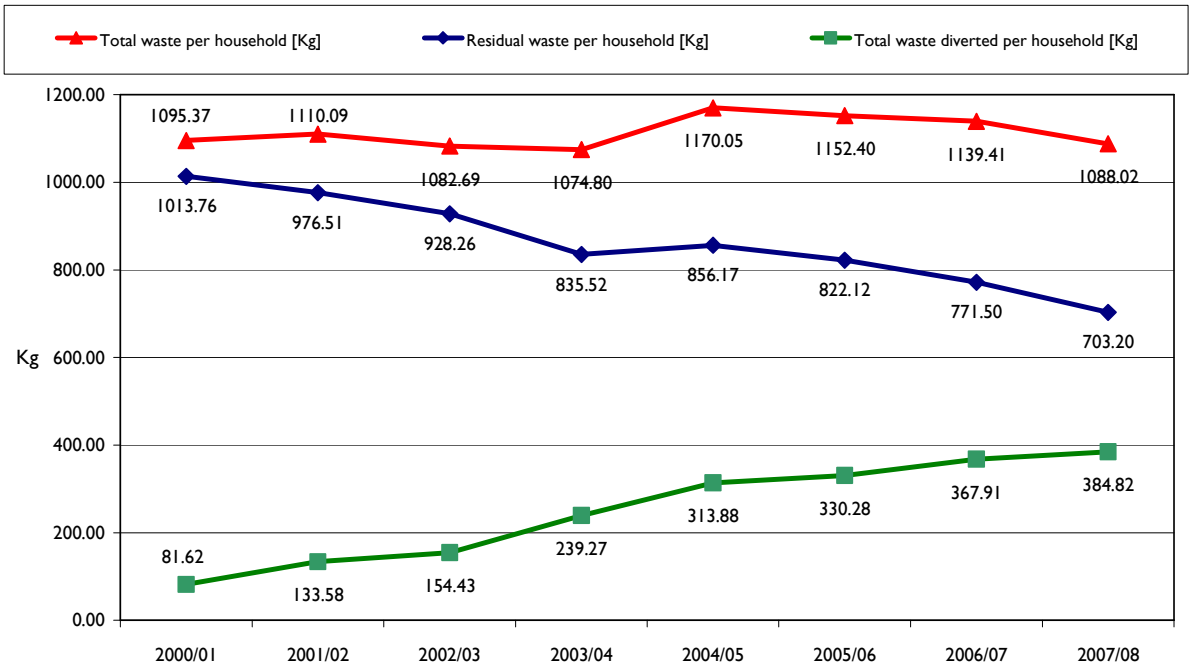
The levels of recycling and composting and the amount of waste generated per household in Chelmsford over recent years are shown in the following tables. A comprehensive review of performance and value for money of recycling and waste collection services[6] is set out in detail in a background paper supporting the strategy and improvement plan.

[6] Recycling and waste collection services - review of performance and value for money [Chelmsford Borough Council January 2009]

Waste diversion rates - Chelmsford



Waste per household - Chelmsford



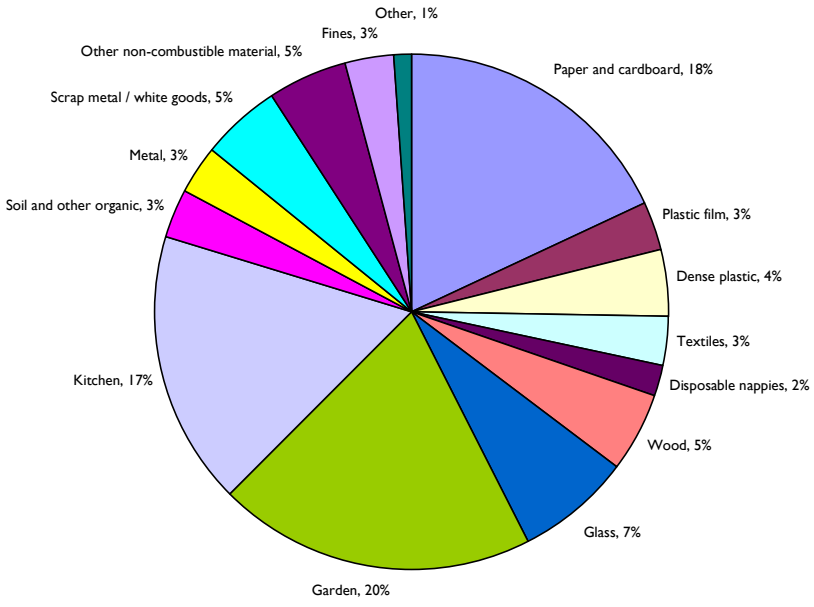
5.2 Composition of the waste stream

Developing plans and actions to improve current recycling and composting performance requires an understanding of the nature and composition of the waste stream to identify potential materials for recycling or diversion from landfill not currently being captured and to allow resources to be focused on those materials where the greatest environmental and cost benefit can be achieved.

Whilst national[7]/[8] and local[9] studies can vary somewhat in the detailed composition of household waste, all research indicates that household waste tends to be dominated by two broad categories of materials – purtrescible waste [mainly garden and food waste] and paper/card. Together these make up over 50% of total waste. The next largest components tend to be glass, plastics, metal and then textiles. Miscellaneous combustible waste [mainly furniture and carpets] also forms a relatively large proportion of waste generated, but these are usually taken for disposal to what are now known as recycling centres for household waste [formerly civic amenity sites] rather than collected directly from households at kerbside.

Household waste composition nationally

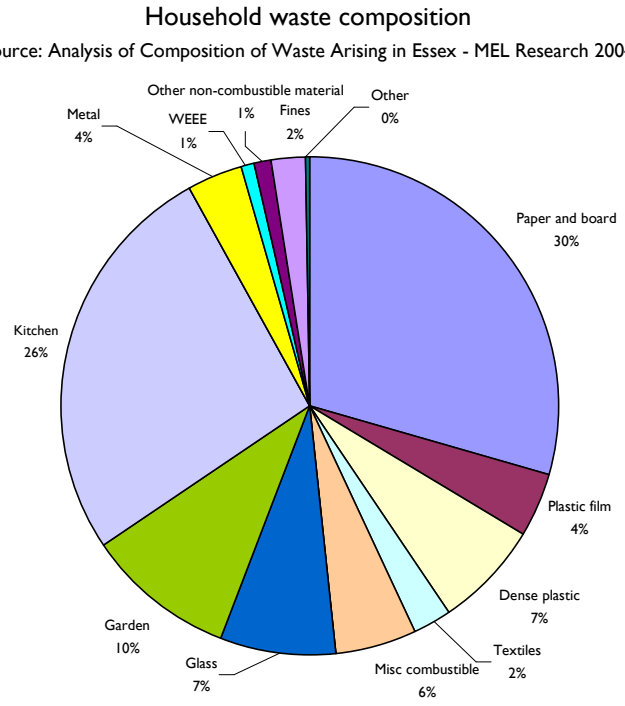
Household waste composition
[Source: Dr Julian Parfitt, Waste & Resources Action Programme, Waste Strategy for England 2007]



[7] Residual waste research [Friends of the Earth / Enviro Centre June 2007 and Parfitt J, Burnley et al and WRAP]
[8] Residual waste Research Phase II – Policy Options [Friends of the Earth, Enviro Centre and Sustainability and Resources Institute June 2008]
[9] Analysis of the composition of waste arising in Essex 2004 [MEL Research 2004]

Studies undertaken by MEL Research in 2004 identified that 56% of the municipal stream that went for disposal in 2003/04 in Essex was recyclable or suitable for composting. In addition collected food waste comprised a further 26% of which about half was considered to be compostable, suggesting that about 70% of waste is suitable for recycling or composting assuming it can be suitably separated and collected.

Household waste composition in Essex



The focus of recycling services in Chelmsford over the last few years has been on dry recyclable materials [paper, cardboard, glass, a limited range of plastics, metal, textiles] and garden waste for composting. This has been effective in diverting from landfill over one third of waste produced. By encouraging even greater participation and higher capture rates there is an opportunity to increase diversion rates further, possibly achieving a 40% diversion rate with some limited adjustment to the recycling services currently available.

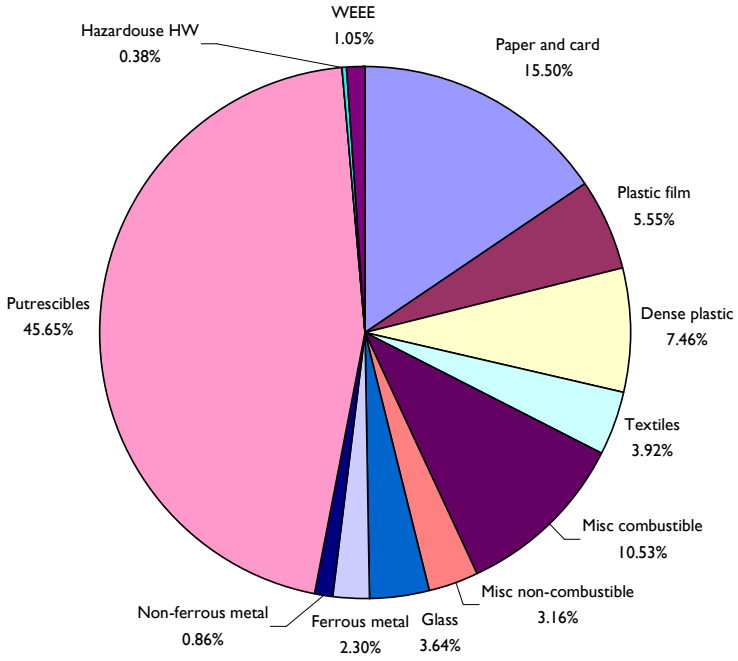
Further analysis of the composition of materials not currently being captured by the existing recycling services was undertaken in 2007[10] by MEL Research to inform future direction and service planning of recycling and composting initiatives. This research also examined any differences between socio-economic groups using the Acorn geo-demographic categorisations and any significant changes in behaviour between March [Phase 1] and September [Phase 2] of that year as set out in the following table. Essex is predominantly made up of Acorn category 1 and 3 households forming over 68% of the total. With Acorn category 5 this increases to over 95% of all households in Essex.

[10] Essex Councils Waste Composition Study [MEL Research 2008]

On average an Essex household can be expected to produce 10.42Kg of residual waste per week [with 83% participation; i.e. average set out throughout the year]. The main components of the residual waste being, on average, 66.1% biodegradable material [equivalent to 7.04Kg per week] and 15.7% packaging materials [equivalent to 1.64Kg per week].

The analysis suggested that 24.3% of this residual waste could have been recycled at the kerbside [equivalent to 2.54Kg per week] and 4.88% is garden waste that could have been composted [equivalent to 0.50Kg per week].

Composition of residual waste - Essex



On average across Essex, total food waste accounts for around 34.5% of the residual waste and for each household this amounts to approximately 3.6Kg/hh/wk. Sampling suggests that about 15.5% of this is raw food waste such as fruit and vegetables [equivalent to 1.62Kg/hh/wk] and about 19% cooked food [equivalent to 1.98Kg/hh/wk]. Even a relatively low capture rate of 25% would divert up to 8.6% or 0.9kg/hh/wk of current residual waste into recycling.

Plastics packaging makes up an average of 9% of domestic waste by weight and represents a significant and disproportionately high capacity due to its low weight to high volumes ratio[11]. The average composition is 2.4% bottles, 2.0% films, 1.3% bags, 1.9% other packaging and 1.4% non-packaging. As more materials are removed for recycling, plastic packaging is one of the most visible remaining components of household residual waste. It is estimated that, on average, plastic food packaging equates to approximately 2.5% of residual waste – equivalent of up to 0.29Kg/hh/wk.

[11] Domestic Mixed Plastics Packaging Waste Management Options [WRAP June 2008]

In Chelmsford the comparable figures range from 11% to 24%, averaging 19.74% of residual waste that it is estimated could have been recycled at the kerbside [equivalent to between 2.22Kg per household per week] and between 0.5% and 10%, averaging 2.69% of garden waste [equivalent to between 0.30Kg per household per week] that could have been composted.

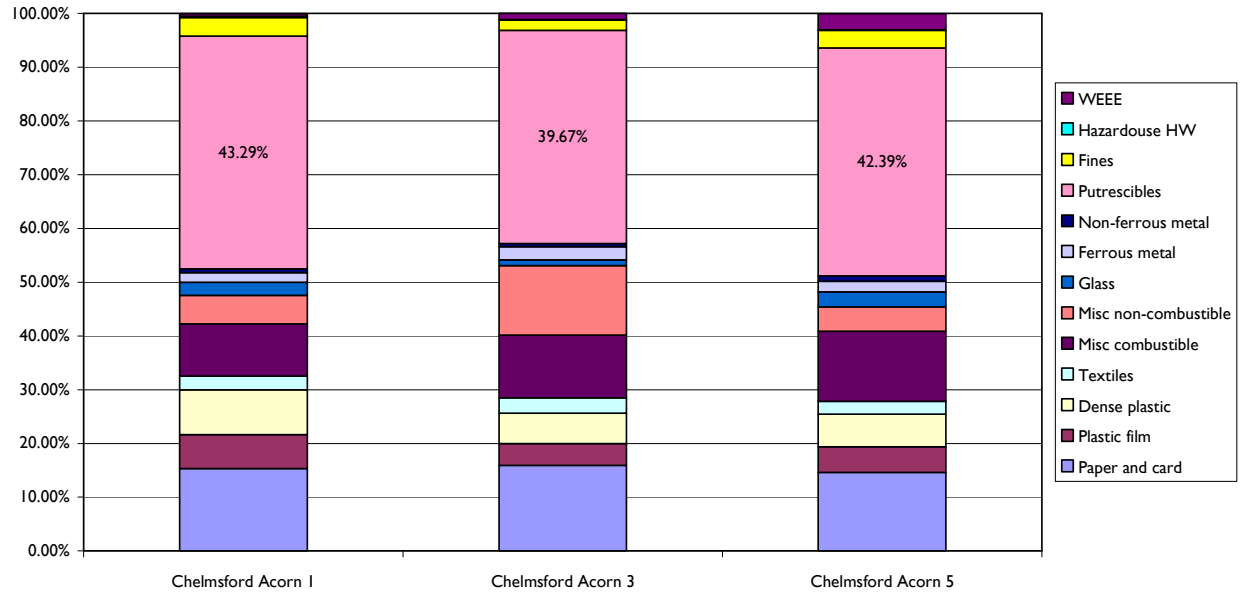
It is evident from the analysis of the composition of domestic household waste in Chelmsford that biodegradable waste forms by far the largest part [60% to 70%] of the residual waste currently collected, with packaging materials contributing a further 10% to 20%. Given the levels of participation in the existing garden waste collections and the very low levels [generally less than 3%] of garden waste in the residual waste stream, it is also obvious that the major component of biodegradable element is food waste [a combination of both raw and cooked food].

This suggests that in terms of diversion from landfill that most gains in the future will be achieved by removing food waste from residual waste stream and that any resources and investment that can be secured should be targeted as a priority towards achieving this. Research suggests that this could result in at least a 10% increase in the total proportion of material diverted from land fill, with the prospect of raising total diversion levels to well above 50%.

Residual waste composition in Chelmsford

Chelmsford Residual Waste		ACORN	PHASE 1	PHASE 2	CHANGE
KG/HH/WK		1	10.15	9.12	-1.03
		3	11.12	11.68	0.56
		5	14.00	11.66	-2.34
Set Out		1	93.0%	82.0%	-11.00%
		3	83.0%	88.0%	5.00%
		5	87.0%	92.0%	5.00%
Potentially recyclable	Total %	1	18.6%	19.6%	0.98%
		3	11.9%	23.7%	11.84%
		5	23.0%	21.9%	-1.06%
	KG/HH/KW	1	1.89	1.79	-0.10
		3	1.32	2.77	1.45
		5	3.22	2.56	-0.66
	Dry recyclable	1	17.0%	16.9%	-0.08%
		3	11.3%	23.4%	12.03%
		5	22.1%	12.2%	-9.88%
	Garden waste	1	1.6%	2.6%	1.06%
		3	0.5%	0.4%	-0.18%
		5	0.9%	9.8%	8.82%
Biodegradable		1	65.5%	69.5%	4.00%
		3	61.1%	67.3%	6.20%
		5	62.5%	72.0%	9.50%
Packaging materials		1	16.9%	13.5%	-3.40%
		3	9.6%	11.0%	1.40%
		5	14.2%	10.3%	-3.90%

Composition of residual waste - Chelmsford
[Source: MEL Research 2008]



In addition a study[12] undertaken in September 2007 on behalf of Essex County Council examining the waste composition of material taken to recycling centres for household waste indicates that between 7% to 11% of waste taken into the recycling centre for household waste at Drovers Way, Chelmsford could have been recycled using the kerbside collection schemes that are currently in place. If this material could be diverted at kerbside this would amount to approximately 650 tonnes per year, equivalent to an increase of 0.5% on the current diversion rate.

There is a growing interest in separate food waste collections across the UK as an important opportunity to divert biodegradable waste from landfill. The Waste Strategy 2007 for England identifies the diversion of food waste as a key priority in achieving a significant reduction in the quantity of residual waste requiring disposal. The Landfill Allowance Trading Scheme and the new national waste indicators for England are also focusing the attention of local authorities on the importance of collecting food waste.

Over 100 local authorities in the UK are now providing a food waste collection service to their residents in one form or another, ranging from small-scale trials to collections across a whole county. This number can be expected to grow rapidly in the near future as local authorities face more challenging recycling and landfill diversion targets.

[12] Recycling Centre for Household Waste Composition Study [MEL Research September 2007]

When analysing waste stream composition, the important contribution of home composting needs to be taken into account. In many circumstances and for certain a materials such as garden waste and uncooked kitchen waste treatment at source through home composting is the most cost effective and environmentally sustainable of all treatment options. Supporting home composting can be achieved at less than half the cost of windrow composting and less than a quarter of the cost of disposal to landfill.

Determining the level of participation in home composting in an area and accurately assessing the impact of this in terms of material diverted from other forms of treatment is quite difficult as comprehensive data is not readily available. However, it is generally accepted that an average of 220kg of material is composted per household per year. Research suggests that on average home composted material comprises 29% uncooked kitchen waste, 3% paper /card and 68% garden waste.

Assuming that participation in home composting in Chelmsford reflects the national average of 34% of total households, using the standard multiplier, this means that it is likely that over 5,000 tonnes of garden and kitchen waste is diverted into home composting per year in Chelmsford, equivalent to 6% of total waste. At the present time home composting does not contribute towards recycling targets however it is a important way of driving down the total amount of waste collected.

5.3 Attitudes and behaviour

Preventing and reducing waste and easy access to recycling services and composting facilities are important issues for local residents, consistently highlighted in research and surveys as key priorities.

Chelmsford Borough Council recognises that it cannot achieve the ambitions set out for waste management in the area without the support of others. This is reflected in a commitment to joint working with a wide variety of stakeholders, including Essex County Council as waste disposal authority and perhaps, most importantly, the residents of the Borough, who are the source of the materials collected and whose attitudes, behaviour and levels of participation in recycling and composting activities will drive the success or otherwise of the strategy.

In 2004 the Waste and Resources Action Programme [WRAP] launched the 'Recycle Now' campaign with a target to increase the level of participation in recycling activities and the proportion of waste diverted from landfill by encouraging 'more people to recycle more things more often'. In the last ten years recycling rates have increased from 7% to 33% nationally and two thirds of households are now committed to some degree of regular recycling. However, even with this progress, current waste management arrangements are unsustainable and more effort is needed to increase levels of participation further.

In autumn 2007 WRAP commissioned MEL Research to undertake a study[13] to identify and gain more understanding of what prevents householders from achieving higher levels recycling, with a view towards addressing these barriers. The study found that the following potential barriers may exist and in some cases the impact in terms of participation and capture rates can be significant:

Physical	– where containers for collecting recycling are unsuitable; when there is no space for storage, where collections are unreliable; when people have no way of getting to recycling sites
Behavioural	– if people are too busy; if they struggle with establishing a routine for sorting out recycling; if they forget to present materials for collection at the right time
Lack of knowledge	– not knowing which materials can be recycled; not understanding how their local collection scheme works
Attitudes and perceptions	– not believing recycling is good for the environment; not wanting to sort waste; not feeling personally rewarded for recycling

[13] Barriers to recycling at home [MEL Research / WRAP August 2008]

In their research, WRAP found that very different messages and actions are needed by local authorities to overcome these barriers. These include as priorities:

- Improving recycling collection services
- Providing better information and practical advice on how to use the services
- Presenting convincing information as to why taking part is worthwhile

Significantly, even for current recyclers (94% of the sample), there were significant barriers that prevented them recycling as much as they could. For example:

- 52% of current recyclers said they would recycle more if they had collections of a wider range of materials
- 48% of current recyclers still disposed of items because they were not sure they could be recycled
- Only 48% of recyclers understood 'very well' what they were supposed to use their recycling containers for
- 86% of recyclers would be encouraged to recycle more by seeing the practical impact of their recycling in their local area

It is clear from this research, therefore, that whilst effective communication about the availability of recycling services is vital this will not persuade people to use recycling services which are unreliable or too complicated.

Interpretation and translation of these findings to the situation and circumstances in Chelmsford[14] informs future system design of collection services and helps to highlight priorities for improvement planning. From this evaluation it would appear that the following issues warrant consideration and further consultation:

- Extending collections to include all types of plastic
- Introducing a separate food waste collection [on weekly basis]
- Where possible, simplifying collection rounds so that collections from a household take place on the same day of the week
- Increasing activities [such as targeted 'door-stepping' campaigns] to encourage participation and remove any outstanding barriers to participation
- Improving the awareness and understanding of the local benefits of recycling

[14] Perceived barriers to recycling in Chelmsford [Chelmsford Borough Council November 2008]

5.4 Participation rates

A key factor in realising the ambitions of the strategy will be a commitment from everyone in the Borough to minimise their waste, reuse materials wherever possible and to regularly participate in recycling and composting, including home composting, schemes. Complementing this will be the ability of the collection system to capture as much of the waste presented with as little contamination as possible in order to maximise the proportion recycled or composted.

The usual definitions of participation, capture and contamination rates are as follows:

Participation rate	The number of households who set out their container(s) at least once in three consecutive collection opportunities as a percentage of the total number of households provided with the service
Capture rate	The amount of a targeted material collected from participating households as a percentage of the total amount of the targeted material available from those participating households
Contamination rate	The amount of non-targeted materials collected as a percentage of the total quantity of recyclable material collected or sorted

Assessing current and forecasting future participation and capture rates is notoriously difficult and complex, being dependent on a number of highly variable factors including:

- The collection system design
- The effectiveness and reliability of the collection service
- Socio-economic and demographic profile of the area
- Seasonal factors
- Differences in urban and rural areas
- The effectiveness of communication, education and promotion activities

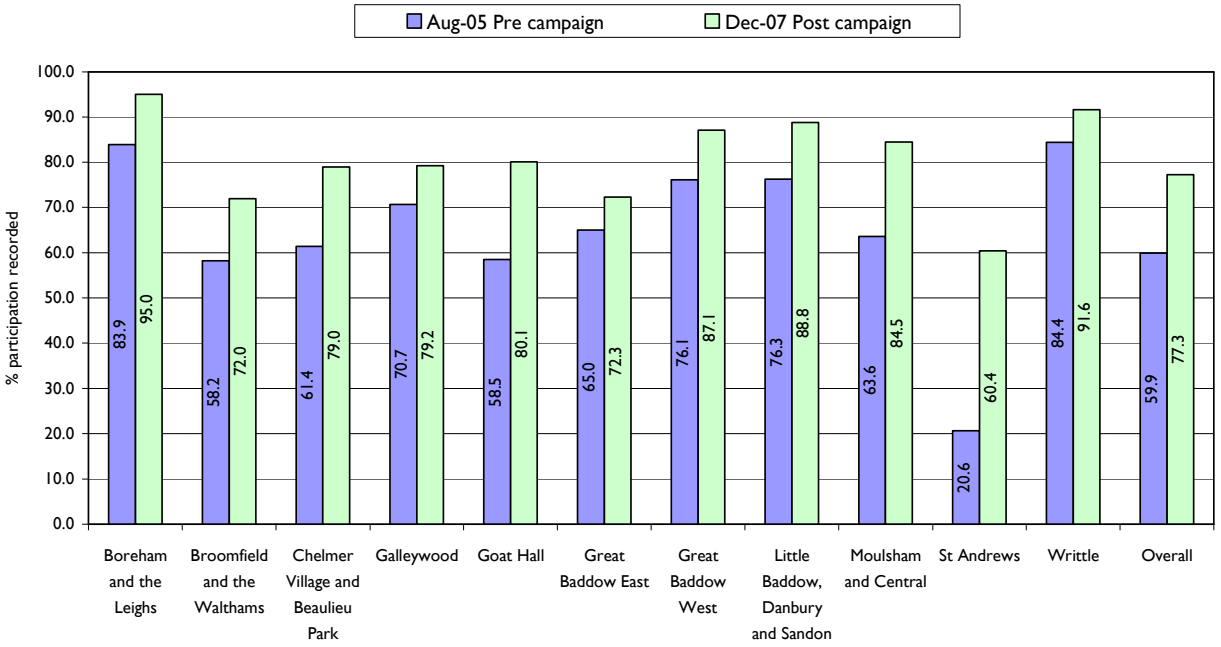
Research undertaken nationally in 2004 identified that even good quality, comprehensive and reliable kerbside recycling collection schemes often not did attract more than 60% regular participation and a typical recycling scheme often attracted as little as 30% participation.

Undoubtedly the levels of participation in the kerbside recycling schemes in Chelmsford have increased since 2004 as collection systems have become more extensive and more reliable. It is recognised that many residents of the Borough are already committed to doing all they can to recycle and compost their waste. Assessment suggests that the average participation rate in kerbside recycling and composting services is between 60% and 70%. However, levels of participation do vary significantly across the Borough.

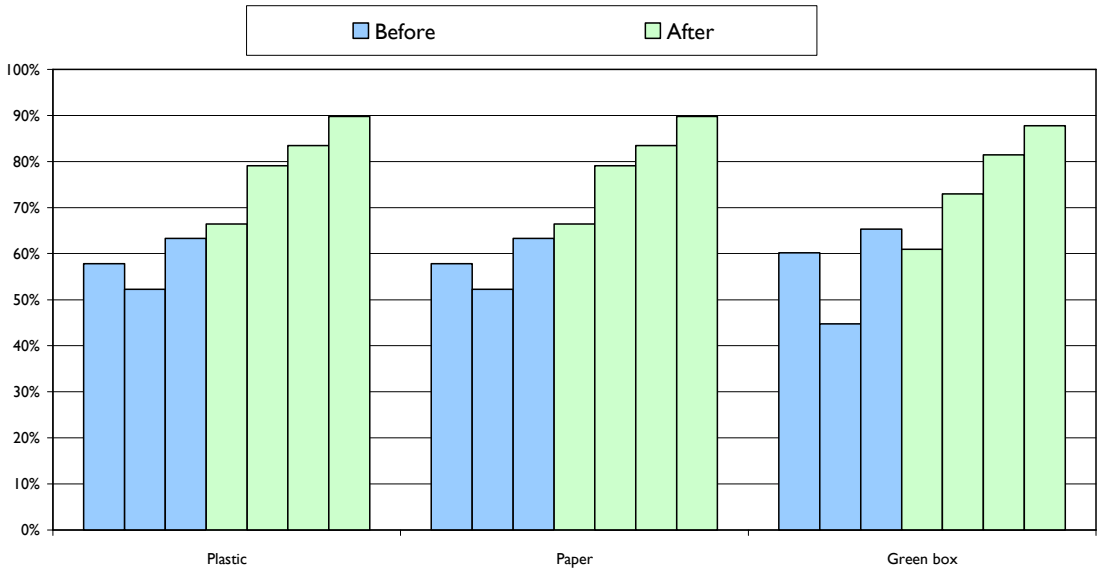
The 'Win with Waste' initiative that took place between 2005 and 2007 provided sampling data from various areas of the Borough indicating participation rates ranging from as low as 20% in some area to 85% in other areas before the campaign work. Participation rates increased to between

60% and 95% post campaign, with the average participation levels overall increasing from 60% to 77% post campaign. In 2008 recycling promotion campaigns in the Beaulieu Park area increased recycling participation levels from less than 60% to over 80%.

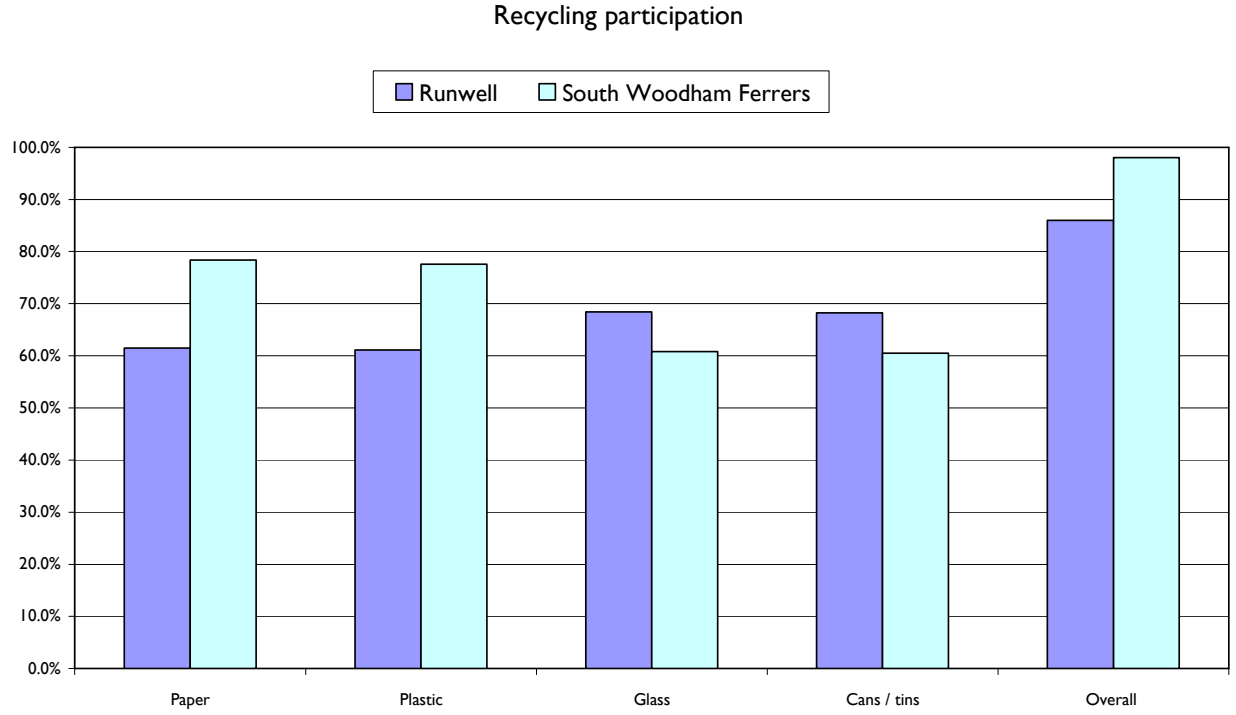
Recycling Participation Rates - Win with Waste Project 2005-2007



Participation in recycling schemes
[impact of recycling promotion campaign at Beaulieu Park]



The most recent 'Waste Watch' campaigns in South Woodham Ferrers and Runwell indicate recycling participation rates between 85% and 98%, but material capture rates are relative low, with about 50% of those recycling classified as being low to medium recyclers in terms of the proportion of material actually presented for collection. However, this is steadily increasing.



It is recognised that more work is required to systematically analyse participation rates in all areas in order to shape collection systems and to effectively target promotional and education activity in low performing areas to encourage the highest possible levels of participation in recycling activities.

The strategy for recycling and waste collection in Chelmsford, therefore, places equal emphasis on supporting people and encouraging the changes required in behaviour that will drive further increases in the level of participation in reuse and recycling services and to improve capture rates. Accordingly improvement planning will be focused on:

- Increasing wherever possible opportunities for existing and new residents to reuse, recycle and compost materials
- Making it is as easy as possible for all residents to access and use these facilities
- Providing up-to-date, consistent and easily accessible information and advice on how to minimise waste, opportunities for reuse and on what can be recycled and composted
- Targeting areas of low participation with educational and promotional campaigns and if necessary introducing incentives to encourage participation

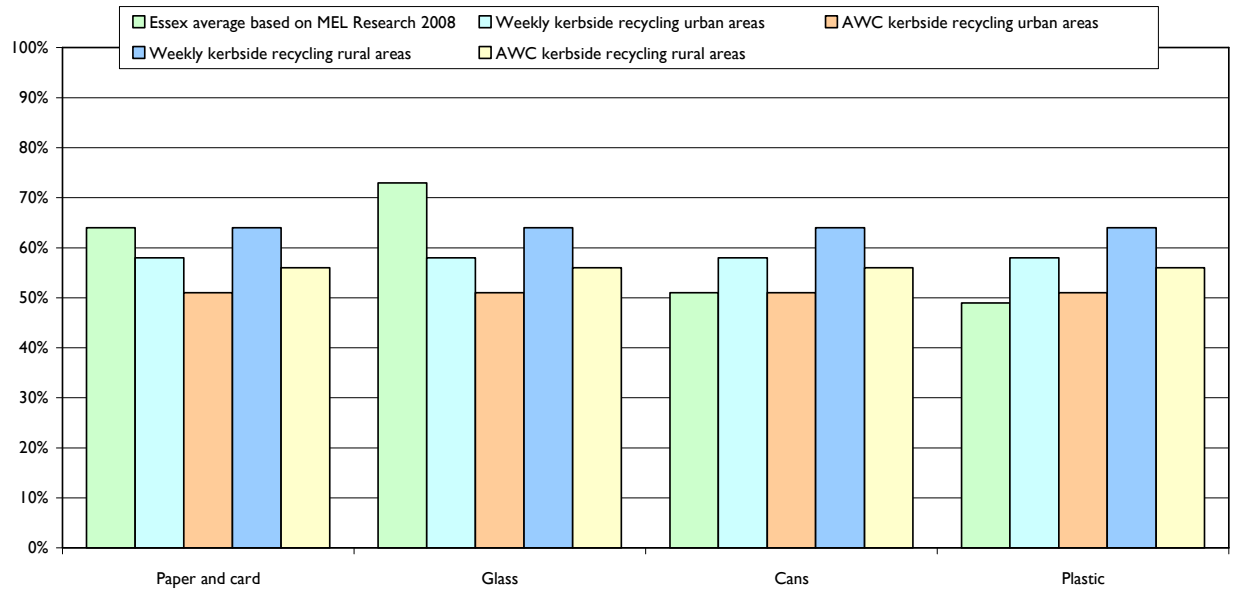
5.5 Capture rates

Waste composition research undertaken in 2007 indicated that on average each Essex household can be expected to place around 3.47Kg of materials at the kerbside for recycling per week.

Capture rates for the main recycling materials showed that overall the majority of paper and card [64%] and glass [73%] is being captured, whilst only half the metal [51%], just less than half of recyclable plastics [49%] and just 10% of recyclable textiles are being diverted. However, this research also indicates capture rates of up to 80% for paper and card and 90% for recyclable glass being achieved in some areas.

Improvements in recycling efficiency, therefore, can be achieved by improving the capture rates of the materials that are already collected or by introducing new materials into the kerbside recycling scheme. Paper, cardboard and glass are particularly important in this regard as these items form the bulk (by weight and volume) of all the materials collected for recycling and therefore even small increases in the efficiency of capture can have significant effects upon overall diversion rates.

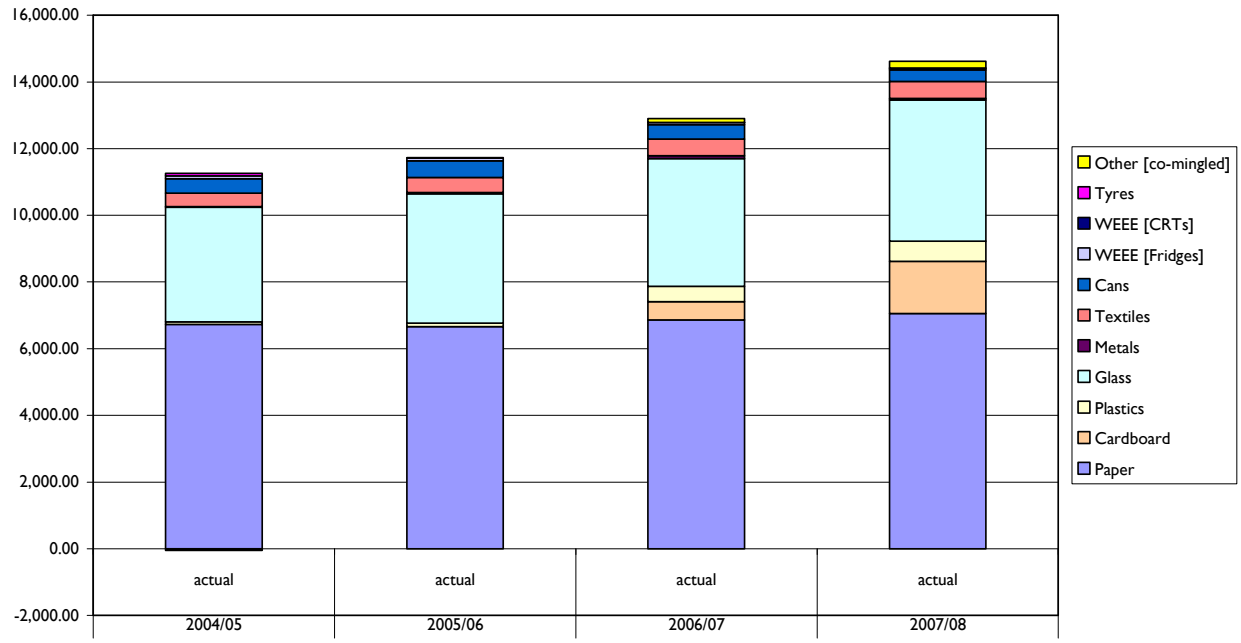
Essex - anticipated average capture rates with weekly collection of residual waste



On average contamination levels of dry recycling materials is Essex is 6.8% - 7.44%

The trends for capture of materials for recycling in Chelmsford since 2004 are shown in the following chart. The increase in plastics and cardboard captured follows the introduction of these recycling streams in 2006.

Chelmsford - materials recycled

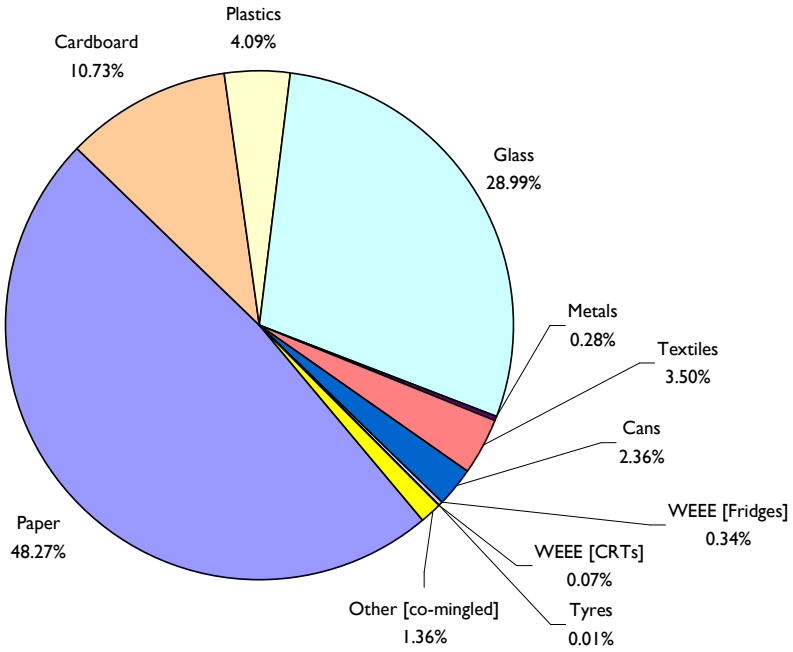


In Chelmsford in 2007/08 the main materials [by weight] diverted from landfill were paper and cardboard [59%], followed by glass [29%], plastics [4%], textiles [3.5%] and cans [2.4%]. In comparison the proportion of material recycled per household annually nationally is 55% paper and card, 25% glass, 11% plastic 7% steel and 2% aluminium.

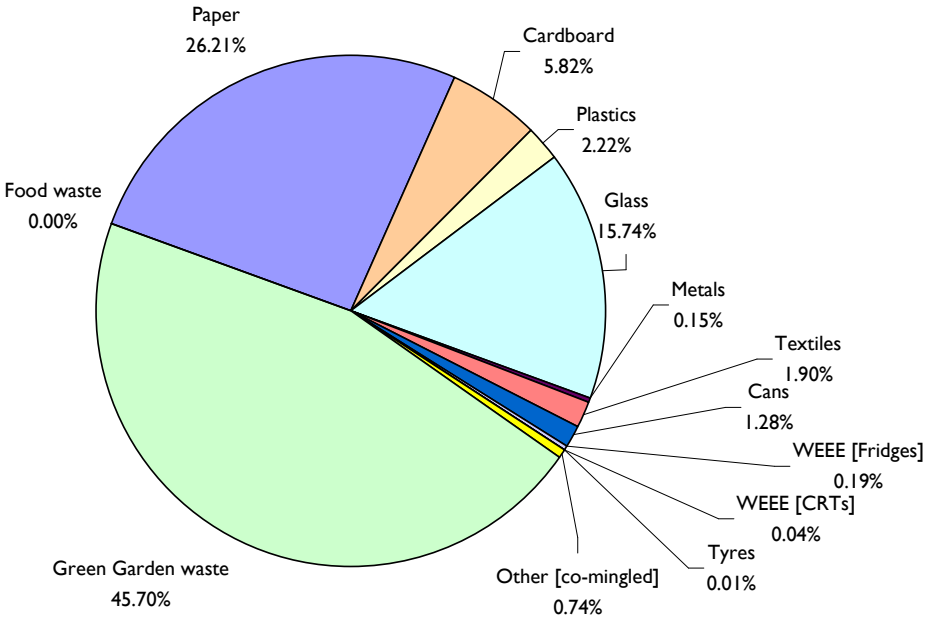
In Chelmsford, when the proportion of materials collected is re-profiled to include all materials diverted from landfill, green waste for composting equates to 46% of total materials diverted.

Research suggests that the frequency of the recycling collection has a significant impact on capture rates – weekly collections appearing to increase rates by about 10%. The frequency of the residual waste collection also has a significant impact on capture rates – in general weekly collection of residual waste appearing to reduce recycling capture rates on average by 15%. This suggests that weekly collection of recycling materials in concert with alternative weekly collection of residual waste will deliver the highest performing recycling services with an increased capture rate of perhaps 20% anticipated, compared to weekly residual waste and alternative weekly collection of materials for recycling.

Recycling materials diverted from landfill in Chelmsford [2007/08]



All materials diverted from landfill in Chelmsford [2007/08]



6 Collection system design

6.1 Current service profile

Collection arrangements in Chelmsford are currently based on a comprehensive alternatively weekly kerbside collection of source separated recyclable materials, a separate fortnightly kerbside collection of garden waste for compostingand a weekly residual waste collection as follows:

- fortnightly collection of glass, steel, aluminium and textiles [presented in a returnable green box]
- fortnightly collection of paper [presented in a separate returnable poly sack]
- 4 weekly [in some areas fortnightly] collection of cardboard [presented in a separate returnable poly sack]
- fortnightly collection of plastics, currently limited to PET and HDPE types [presented in a non-returned plastic bag]
- fortnightly garden waste collection for windrow composting [presented in brown wheeled bin]
- weekly residual waste collection, including food waste [presented in black wheeled bin]

Recycling services are also available to people living in flats through communal facilities. However, the range of materials currently collected for recycling is limited to cans, glass and paper.

Assisted collections covering all recycling and waste streams are offered for those people who are unable to present their waste for collection due to either temporary or permanent incapacity. Typically between 5-10% of properties on a domestic waste collection round have some special requirements.

Special [bulky waste] collections and collection of electrical and electronic equipment covered by WEEE regulation can be arranged for which a charge is made. Currently approximately 1,850 items are collected each year, mainly fridges and freezers. Special collections for clinical waste [including needles, syringes, and incontinence materials] are offered through an independent contractor, currently servicing approximately 800 customers

There is a network of over 50 recycling 'banks' in communal locations across the Borough where materials can be deposited for collection. The materials collected from these sites include glass, cans, paper, textiles, plastics and liquid food cartons ['Tetra Pak' type containers].

Recycling and waste collections are made from 70,000+ properties in total. This equates to over 11m individual collections per year – over 200,000 collections each week or approximately 40,000 collections each working day. The percentage of residents served by kerbside or communal collection of materials for recycling in 2007/8 was 98.6%.

Total household waste collected is in the order of 76,000 tonnes each year – with residual waste comprising 49,000 tonnes, dry recyclable materials 14,500 tonnes and organic material for composting 12,300 tonnes

6.2 Review of recycling collection systems

A comprehensive study[15] into different household recycling systems and collection methods across Essex was undertaken by the Waste and Resources Action Programme [WRAP] over the period September 2007 to May 2008.

The study examined different methods and approaches for the provision of recycling services and the relative costs and performance of these. The kerbside collection systems reviewed were:

- kerbside separated, where different types of materials such as glass and plastic bottles are put into separate compartments of a collection vehicle
- single stream co-mingled, where all materials are collected together in one vehicle and are then sorted at a materials recovery facility (MRF)
- two stream partially co-mingled, where householders separate recyclables into two categories, usually fibres (paper and card) and containers (glass, cans and plastic bottles)

The research found that in the current market, kerbside sort schemes tend to be more cost effective in general than single stream co-mingled. However, two stream co-mingled collections where paper is kept separate, tend to have similar net costs to kerbside sort schemes. Co-mingled schemes had generally been assumed to be cheaper to run, but the research indicated that co-mingled schemes are less cost effective than anticipated when the additional cost of sorting the material at a materials recovery facility is taken into account.

The research also found that contrary to the general assumption that co-mingled collections are more successful in collecting recyclable materials, what actually determines the level of recycling is the size and suitability of the container[s] issued. Earlier research by WRAP found that kerbside sort schemes achieve higher quality recyclable materials than co-mingled collections, as there is less risk of non-recyclables being included.

The research acknowledges that different areas have different needs and there is no such thing as a 'one size fits all' best scheme. It was also apparent from this research that collection scheme costs are sensitive to many variables, such as the price which can be achieved for material for recycling. However, access to new technology means material sorted by MRFs is likely to improve in quality, although higher levels of contamination will remain. The report concludes that whilst, in the past, it has been suggested that the optimum collection system is a 3 wheeled bin system with fortnightly collection of residual waste, it would be wrong to assume that one type of collection scheme is always going to be cheaper or produce better quality material than another or deliver higher levels of performance.

[15] Kerbside Recycling: Indicative Costs and Performance [WRAP June 2008]

6.3 System design modelling

Over the last three years a comprehensive study[16] into different household recycling systems and collection methods across Essex was undertaken by the AEA Group in association with WRAP, Rotate, Essex County Council and the waste collection authorities in Essex.

Two models have been used to assess the likely performance and whole system costs of household waste collection, treatment and disposal options. The Kerbside Analysis Tool (KAT) managed by WRAP was used to model the kerbside collection costs of household waste. The outputs from the KAT model were then fed into AEA's proprietary 'Wasteflow' model and the overall costs of the whole waste management system to the waste disposal authority and waste collection authorities were then calculated from a base position in 2005/6 through to 2038/39, the assumed contract period for new treatment and disposal facilities to be procured.

The system design modelling was used to calculate outputs at key points in time. These points correspond to potential introduction of changes in waste management infrastructure. The baseline year for input data was 2005/6 and the costing base 2008/09. Key milestones were identified where major system changes are expected to occur as follows:

- 2013/14 when 'in-county' mechanical biological treatment plants (MBT), material recycling facilities (MRF) and anaerobic digestion plants (AD) become operational
- 2014/15 when it is presumed that a solid recovered fuel plant becomes operational

The system design modelling allows relative performance and costs to be evaluated, but not absolute costs as the baseline input data and cost base differ and assumptions had to be made regarding certain cost parameters such as gate fees in advance of the procurement of such facilities. In practice these will vary from those used in the model.

It should be recognised that modelling is only indicative, but can be useful in comparing relative performance. However, collection system design decisions will be informed by many different considerations. The modelling provides an indication of the recycling rates that it is projected could be achieved in Chelmsford by employing different collection systems and the potential relative cost effectiveness of these systems. The costs generated are comparative, rather than absolute costs.

System design modelling was carried out examining four broad options. All options assumed change in disposal arrangements in 2013/14. A 'do nothing' option was also modelled assuming no change in either collection or disposal arrangements. The four options examined were as follows – all based on alternative weekly collection systems for ease of comparison. They cannot be directly compared, therefore, to systems based on weekly collections.

[16] Chelmsford System Design Modelling [AEA August / September 2008]

	Collection system	Treatment
Option 1:	▪ AWC kerbside sorted dry recyclables ▪ AWC garden ▪ AWC refuse [residual waste] ▪ Separate weekly kitchen collection	*Direct to merchant* *Windrow composting* *Mechanical biological treatment* *Anaerobic digestion [AD]*
Option 2:	▪ AWC kerbside sorted dry recyclables ▪ AWC mixed organics [kitchen and garden] ▪ AWC refuse [residual waste]	*Direct to merchant* *In-vessel composting or AD* *Mechanical biological treatment*
Option 3:	▪ AWC co-mingled dry recyclables ▪ AWC garden ▪ AWC refuse [residual waste] ▪ Separate weekly kitchen collection	*Material recycling facility* *Windrow composting* *Mechanical biological treatment* *Anaerobic digestion*
Option 4:	▪ AWC co-mingled dry recyclables ▪ AWC mixed organics [kitchen and garden] ▪ AWC refuse [residual waste]	*Material recycling facility IVC or* *In-vessel composting or AD* *Mechanical biological treatment*

[Kitchen waste refers to food waste, such as vegetable & fruit peelings and raw and cooked meat, which has to be treated via In-Vessel Composting (IVC) or Anaerobic Digestion (AD) in compliance with the provisions of the Animal By-Products Regulations]

A fifth option was specifically modelled for Chelmsford as follows:

Chelmsford Option 5:	▪ AWC kerbside sorted dry recyclables ▪ Weekly mixed organics [kitchen & garden] ▪ AWC refuse [residual waste]	*Direct to merchant* *In-vessel composting or AD* *Mechanical biological treatment*

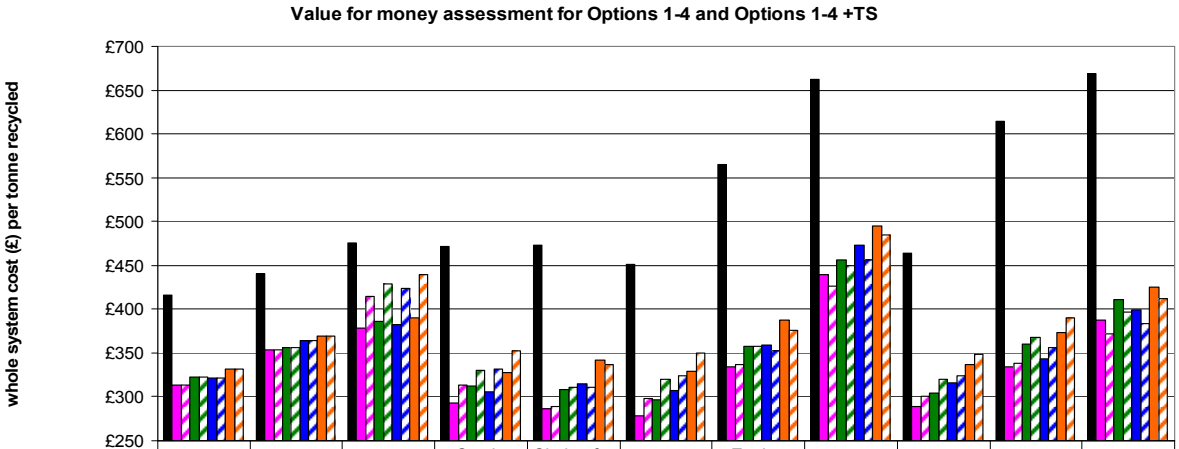
Overall conclusions of system design modelling for Essex suggest that:

- At an Essex-wide taxpayer level, all options modelled will offer better value for money than carrying on with the baseline systems
- All options were based on alternate weekly collections (AWC) and therefore deliver better value for money
- At an Essex-wide taxpayer level, in value for money terms, it doesn't matter if waste collection authorities collect food waste separately or mixed with garden waste [*however, separate food and garden waste collections are likely to achieve higher recycling rates at a higher cost]*
- At an Essex-wide taxpayer level, (using an equal risk position), collection of dry recyclables through a co-mingled system with a materials recycling facility offers better value for money for certain waste collection authorities (but not Chelmsford) compared to kerbside sort systems

- At an Essex-wide taxpayer level, (using an equal risk position to that assumed in the kerbside sorted options), collection of dry recyclables through a co-mingled system with a materials recycling facility offers similar value for money for certain authorities (including Chelmsford) compared to kerbside sort systems

The system design modelling also examined options for the use of a transfer station[17] for the bulking up of materials for delivery to disposal facilities or onward transfer to merchants or materials re-processors. This was intended to reveal whether the use of a transfer station would reduce both collection and whole system costs. The modelling assumed that the transfer station was located within in the borough of Chelmsford and for economy of scale, would have the capacity to handle the household waste generated by both Chelmsford and Maldon.

Waste Strategy Project



	Basildon	Braintree	Brentwood	Castle Point	Chelmsford	Colchester	Epping Forest	Harlow	Maldon	Rochford	Tendring
Baseline	415.8	441.2	475.8	471.9	472.4	451.4	564.7	662.7	463.7	614.4	668.6
Option 1	313.0	353.2	378.9	292.9	286.5	279.1	334.5	439.8	288.9	333.8	387.2
Option 1+TS	313.0	353.2	414.7	313.8	289.1	297.9	337.4	427.0	300.1	338.1	371.5
Option 2	322.1	356.1	386.0	311.8	308.3	296.7	358.0	455.9	304.8	360.4	410.2
Option 2+TS	322.1	356.1	428.9	329.9	310.4	319.6	358.1	449.3	320.5	367.6	396.8
Option 3	321.0	364.3	382.0	306.1	315.3	306.4	359.2	473.3	316.5	344.0	399.1
Option 3+TS	321.0	364.3	423.3	332.3	310.4	323.7	352.4	455.9	324.1	356.9	383.8
Option 4	331.9	369.5	390.2	328.2	342.0	328.9	387.3	495.6	337.1	373.6	425.0
Option 4+TS	331.9	369.5	439.7	352.0	336.4	350.3	376.3	484.1	348.7	389.7	412.2

KEY: Option 1 = KO, GO & K/Sort Option 2 = Mixed K&G & K/Sort Option 3 = KO, GO & Co-min Option 4 = Mixed K&G & Co-min

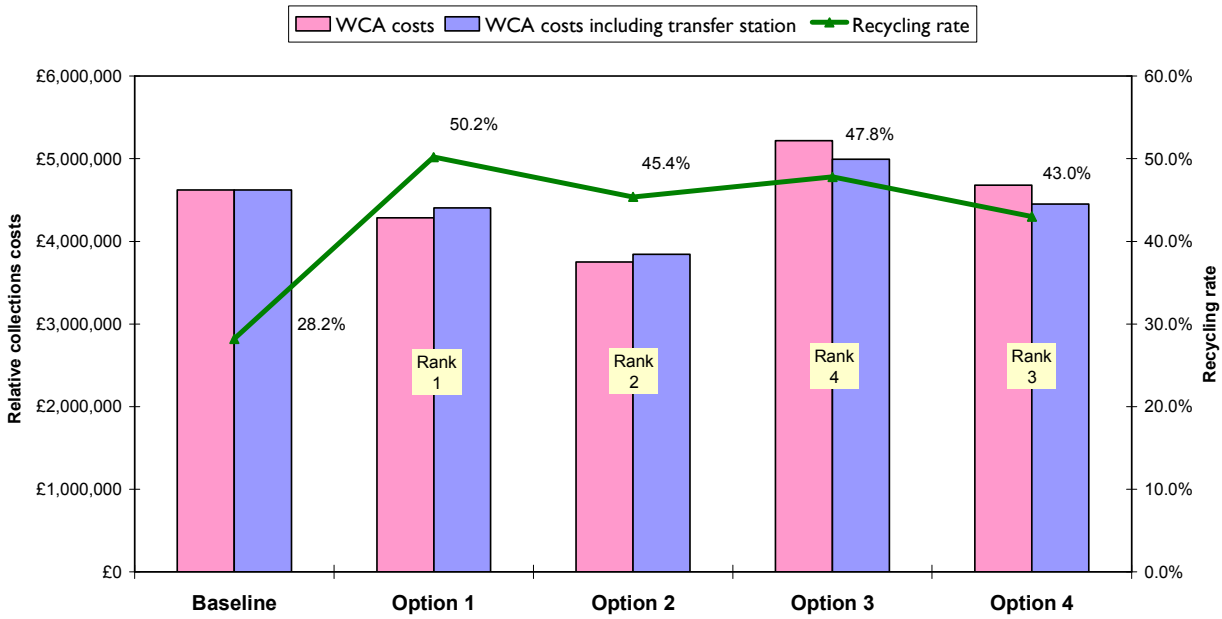
In comparison, the conclusion of the system design modelling for Chelmsford suggests that:

- Option 1 [involving a kerbside sorted dry recyclables collection and a separate kitchen and garden collection] is likely to be the highest performing system and has a mid-range cost profile

[17] Assessment of the impact of using a local transfer station for the districts of Essex [Essex County Council 2008]

- Option 2 is likely to be the least expensive collection system as it does not involve any weekly collection and is based on mixed kitchen and garden collections but is unlikely to exceed a 45% recycling rates
- Option 3 is likely to be the most expensive option and is also unlikely to meet a 50% recycling target
- Option 4 is likely to be mid range in cost terms [similar to Option 1] but is likely to be the lowest performing achieving a recycling rate of less than 45%

Chelmsford - costs and performance comparison of options
[with and without transfer station]



- In Chelmsford Option 1 is the only collection system likely to achieve 50%+ recycling rates based on this modelling
- Collection system designs with separate kitchen and garden waste collections appear to have the highest potential recycling rates
- Lower recycling performance is anticipated from options with co-mingled dry recyclable collections due a higher contamination and rejection rate of the materials processed through material recycling facilities compared to kerbside sorted collections
- Lower participation and performance is likely from a system with alternative weekly collection of mixed organics [kitchen and garden waste together], as householders ar more likely to put kitchen waste into the residual bin on the week when there is no organics collection. This practice is likely to be particularly prevalent in the summer months when there can be an issue with kitchen waste decomposing more quickly in the hot weather

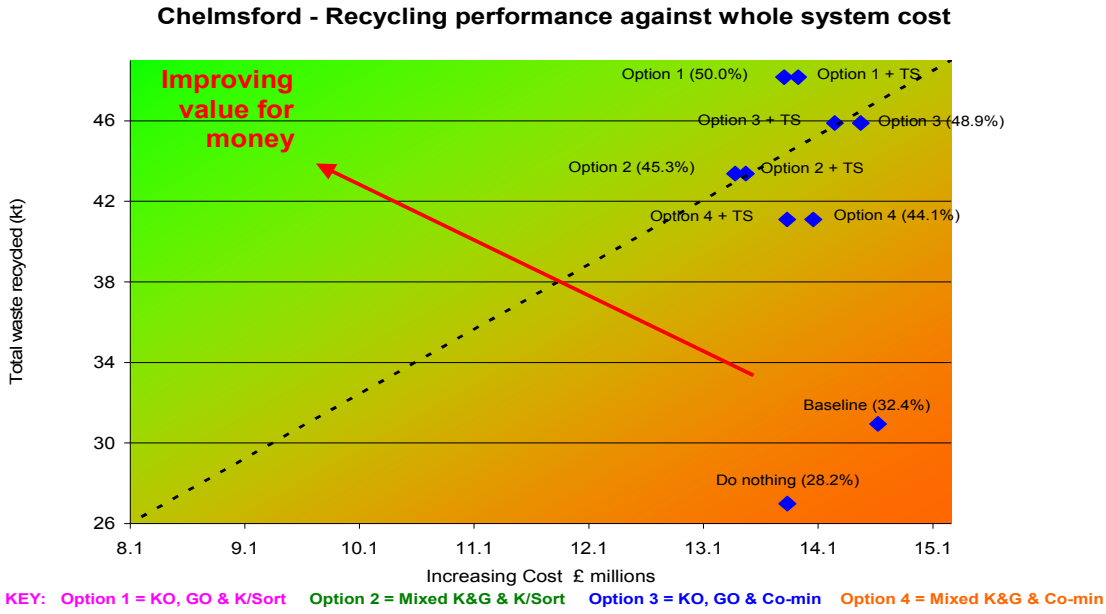
The system design modelling suggested that the use of a third party transfer station was likely to marginally increase [by 2-3%] the costs of options 1 and 2, but was likely to reduce [by 4-5%] the costs of the most expensive options 3 and 4. However, even by using a transfer station, the costs

of options 3 and 4 are still likely to remain higher than options 1 and 2. In conclusion, therefore, there is not a particularly strong case for use of a transfer station unless the distance to the 'delivery point' increases from that currently modelled [Rivenhall]. In summary the relative ranking is as follows:

	Lowest cost	*Highest performing*	*Highest statutory funding*
⇧	Option 2	**Option 1**	**Option 1**
	Option 1	Option 3	Option 3
	Option 4	Option 2	Option 2
	Option 3	Option 4	Option 4
	Highest cost	*Low performing*	*Lowest statutory funding*

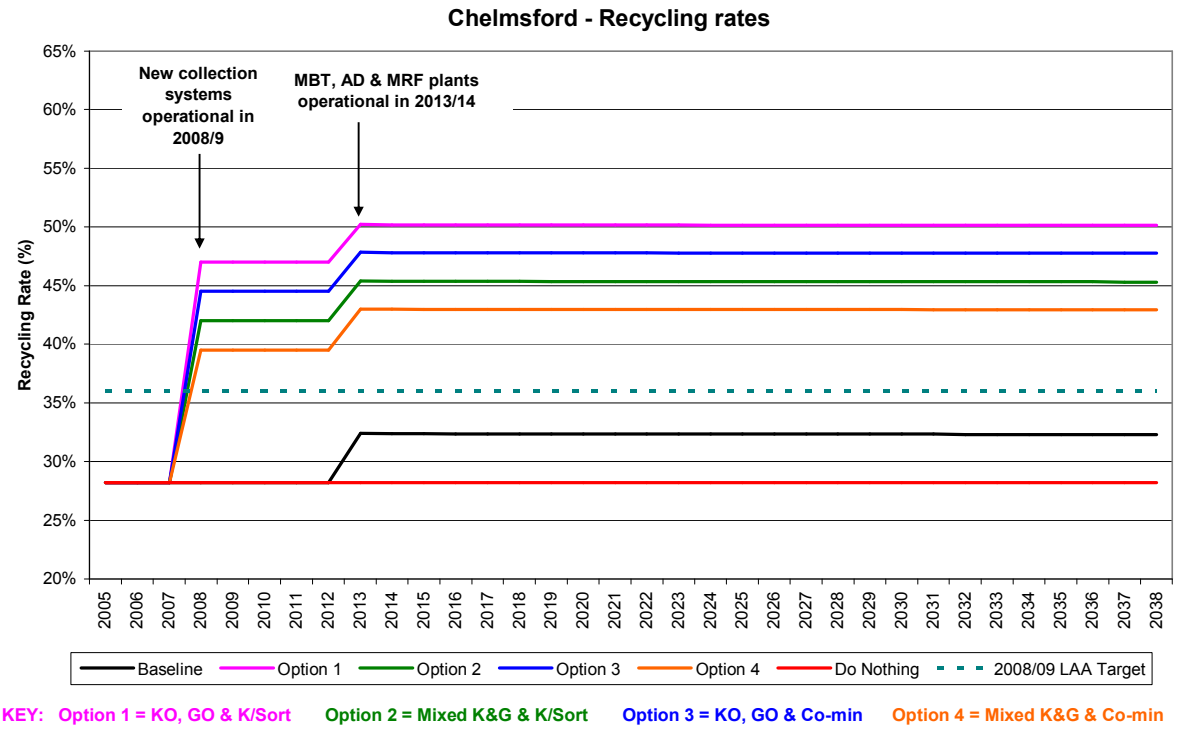
A comparison of cost and performance – both weighted equally – of the different options [with and without the use of a transfer station] is illustrated in the chart below. System options located towards the top left of the graph [into the green shaded area] result in a better cost : performance ratio and therefore represent better value for money than those located towards the bottom right of the graph [into the orange/red shaded area]. The dotted line signifies points of equal cost and performance. The four options using a transfer station are always located on the same horizontal plane as the non transfer station options because they have the same recycling performance. For Chelmsford, the transfer station options are to the right of the non transfer station Options for Options 1 and 2 indicating they are higher in cost. For Options 3 and 4 they are marginally lower in cost.

Summary of recycling performance against whole system cost in 2014/15



The comparative recycling rates of the four options, projected over a 25 year period to illustrate the key milestone step changes are shown below:

Recycling Performance



KEY: Option 1 = KO, GO & K/Sort Option 2 = Mixed K&G & K/Sort Option 3 = KO, GO & Co-min Option 4 = Mixed K&G & Co-min

A key influence and driver for recycling performance is the relative participation and capture rates that can be achieved through different collection systems. The system modelling for Chelmsford indicates that participation levels are likely to be equivalent for kerbside separated and comingled collections of dry recyclables at an average of 85% with capture rates also similar at 75%. For garden only collections, participation rates are likely to average 85%, with capture rates averaging 75%. For kitchen only collections participation is likely to average 65% with capture rates of 75%. However, with options involving the collection of mixed organics, participation rates are likely to reduce to 75% and 40% respectively, albeit with slightly higher capture rates of that material which is presented.

The system design modelling also suggests that if weekly collection of residual waste is retained the rate of participation in kerbside sorted collection systems tends to fall to about 65% [i.e. by about a quarter] and participation in separate kitchen waste collection are likely to reduce by about 50%.

Modelling suggests that collection system design will have an influence on likely participation and capture rates as follows:

	Average rates assuming AWC of residual waste		Average rates assuming weekly collection of residual waste	
Collection system	participation	capture	participation	capture
AWC kerbside sorted recycling materials	85%	75%	65%	75%
AWC garden	85%			
Weekly collection kitchen waste [separate]	65%	75%		
AWC mixed organics [garden element]	75%		70%	100%
AWC mixed organics [kitchen element]	40%	75%	20%	75%
AWC co-mingled recycling materials	85%	75%	65%	75%

7 Targets

The Government has set out new national targets in the Waste Strategy for England as below:

	2005	2010	2015	2020
Household waste after re-use, recycling and composting (million tonnes-mt) (percentage reduction from 22.2 mt in 2000) *equivalent per person figures (percentage reduction from 450kg per head in 2000)*	18.6 mt (16%) *370 kg (18%)*	15.8 mt (29%) *310 kg (32%)*	14.3 mt (35%) *270 kg (40%)*	12.2 mt (45%) *225 kg (50%)*
Household re-use, recycling and composting	27%	40%	45%	50%
Municipal waste recovery[78]	38%	53%	67%	75%
Source: Defra				

The Local Area Agreement 2008-2011 includes performance targets and action plans for the next three years. The targets agreed in the LAA are based around the new national indicators effective from April 2008 which replace the previous Best Value Performance Indicators. The targets for Chelmsford over the period of Local Area Agreement are set out below:

Chelmsford Borough Council LAA2 targets	**2008/09**	**2009/10**	**2010/11**
Recycling rate	20.00%	21.00%	22.00%
Composting Rate	16.00%	17.00%	18.00%
Total Diversion (NI192)	36.00%	38.00%	40.00%
Residual waste per Household Kg (NI191)	729Kg	706Kg	684Kg

It is anticipated that implementation of the strategy and improvement plan for recycling and waste collection services in Chelmsford will allow more ambitious targets to be achieved for waste reduction and waste diversion in Chelmsford as below:

A minimum **recycling and composting rate of 50%** by 2013/14
A reduction in **total waste generated** to no more than **980Kg per household** by 2013/14 [10% reduction]
A reduction in **residual waste generated** to no more than **550Kg per household** by 2013/14 [20% reduction]

8 Strategy and improvement planning

8.1 Key principles and approach

To successfully implement the proposed strategy and associated improvement plan Chelmsford Borough Council will need to exhibit strong community leadership to create an integrated solution for waste management in the Borough that is sustainable in the long term, finding an acceptable balance between environmental and financial objectives, whilst exceeding the national targets set in respect of waste reduction and diversion of waste from landfill.

The Council will need to communicate in a persuasive way to encourage and support behavioural changes within the community that will reduce the quantity of waste generated and further increase recycling and composting rates. The Council will need to maintain efficient and reliable customer focused collection services and secure investment in the necessary infrastructure to support effective waste handling and transfer arrangements.

The core principles of the waste hierarchy will underpin the strategy for recycling and waste management in Chelmsford. In policy terms, the approach advocated is to:

- **Firstly reduce the amount of waste produced within the Borough**
- **Then to see materials and resources reused as much as possible**
- **With the majority of the waste that remains being recycled and composted**

…So that the minimum amount possible is sent for disposal

The business premise, therefore, is:

- **Limit the total amount of material collected** by encouraging waste reduction and re-use on the basis that high rates of recycling need to be accompanied by lower levels of total waste generated to achieve an environmentally sustainable and cost effective solution
- **Promote home composting** of green waste wherever possible to avoid unnecessary transport impacts, collection and processing costs
- **Increase the proportion of waste that is recycled and composted** or otherwise diverted from landfill; as landfill disposal costs are geared under the EU Landfill Directive to increase disproportionately compared to other costs
- **Use the revenue from recycling and compost credits to offset the higher unit cost of recycling collections** compared to general waste collection, recognising that in the future treatment costs of residual waste will increase to higher levels anyway
- Given that the market for the sale of materials for recycling is volatile, **do not rely on income from sales to support core collections systems** as potentially this can be disruptive to service delivery as markets fluctuations occur, but use additional income

from more buoyant market periods for targeted one-off investment in service improvements instead

- Acknowledging that achieving the highest waste diversion rates are predicated on **high rates of participation and materials capture and low levels of contamination**, ensure that recycling schemes are easy to use and that sufficient emphasis and adequate resources are attributed to education and promotion activities to encourage the necessary behavioural changes to achieve this

The system design principles at an operational level are:

- **Separation of materials should occur at the earliest possible stage in the process** to achieve the highest quality of materials for recycling and reuse with the lowest environmental impact and cost
- **Incentives may need to be put in place to encourage home composting** as the most environmentally responsible and most cost effective solution for green waste
- **Collection systems should be kept as simple and as easy to use as possible** – with same day collection for all materials wherever possible and the minimum number of service changes
- **Appropriate containers should be supplied with adequate collection capacity** to match frequency and volumes, replacing damaged or lost containers free of charge and with the minimum inconvenience to end users
- **Consistent, reliable and safe collection services should be maintained, thereby** minimising missed collections to avoid unproductive costs and with the ability to achieve quick and effective recoveries if system failure does occur
- **Collection services should be sufficiently flexible to adapt to local circumstances and demand** recognising different needs of urban and rural areas and different socio-demographics characteristics within local communities
- **Collection arrangements need to be effectively communicated and understood** providing relevant information with clear instructions, taking into account feedback received to improve system efficiencies, support by effective IT and customer service systems
- **Plans need to be in place to accommodate changes in demand over time**

8.2 Improvement planning - strategic drivers

Over the last 8 years the overall diversion rate of materials for recycling and composting in England has increased from 7% to 27%. In Chelmsford recycling and composting rates have increased from 12% to 35% in the same period. However, despite the significant improvement in these rates, more than 62% of all municipal solid waste [MSW] generated in England is disposed to landfill.

European and national legislation and evidence from both national and local studies clearly indicate that the most significant challenge, but also potentially the greatest benefit in terms of cost and increased recycling and composting rates, centre on successfully diverting the remaining

biodegradable component of municipal waste away from landfill[18]. Future plans, therefore, need to give the highest priority to the collection and treatment of biodegradable waste.

There are a number of key elements that influence diversion rates. These include:

- The coverage of kerbside collection schemes [expanding collections to more households; for example to include all materials form all flats and apartments blocks]
- Collecting more recyclable and compostable material streams [such food waste]
- Increasing householder set-out and participation rates
- Reducing the level of contamination in the materials collected
- Maximising the capture rate [increasing the proportion of a particular material collected]

The key strategic drivers for recycling and waste collection in Chelmsford are considered to be:

Driver A:	A continuing emphasis on preventing and reducing waste and encouraging further behavioural change to increase current diversion rates by 5%-6% to exceed the target set nationally to achieve 40% household re-use, recycling and composting and to generate no more than 684Kg of residual waste per household by 2010
Driver B:	The need for changes in collection system design and associated infrastructure improvements to facilitate further recycling and composting activities and take advantage of more advanced disposal facilities in order to exceed the more ambitious targets set out in the national waste strategy and to locally achieve at least a 50% household, re-use, recycling and composting rate as soon as is practically possible
Driver C:	Creating new opportunities to encourage recycling by businesses, education establishments, entertainment and leisure facilities and improving the levels of recycling and composting associated with street care, grounds maintenance and related activities, reflecting the national strategy which demands that resources, the environment and waste is managed in a more integrated and sustainable way

[18] Introductory Guide to Options for the Diversions of Biodegradable Municipal Waste from Landfill [DEFRA 2007]

8.3 Future collection arrangements for Chelmsford

Chelmsford Borough Council already operates a comprehensive kerbside collection of what are commonly known as 'dry recyclable materials', including paper and cardboard, glass, cans and foil, plastic and textiles, as well as an extensive garden waste collection service to divert green waste for composting. Whilst capture rates of these materials could undoubtedly be improved, the main focus for planning future waste management arrangements is likely to focus on removing the considerable volume of biodegradable that remains in the mixed residual waste stream and is currently disposed of through landfill arrangements.

Nationally, on average it is estimated that more than 50% of all waste is biodegradable. The types of materials that make up biodegradable waste are principally food or kitchen waste, garden waste, paper, card, wood and some textiles. The diversion of food waste from disposal by landfill is a priority nationally, as this method of disposal is a significant source of potentially damaging green house gases.

Analysis of the waste composition in Chelmsford reveals that biodegradable waste comprises on average 60% to 70% of the residual waste stream and that the majority of this is food waste, making this material an obvious target for separate collection and treatment.

The Waste and Resources Action Programme has recently published the findings of two studies[19] into the management of household biodegradable waste examining the cost and benefits of different approaches to bio waste collection and treatment and the cost and environmental implications of different methods for collecting and treating food waste.

The main findings of this work is that there are real benefits in terms of cost and capture of biodegradable if both the collection and processing costs are considered together. Mixing food waste with garden waste in kerbside collections should be avoided if possible as it adds significant processing costs and may not result in significantly higher diversion rates if collected on a fortnightly basis.

Chelmsford is at a crossroads in respect of its approach to waste management and in particular its responsibilities as a waste collection authority. The Council already operates a comprehensive range kerbside separated recycling services and an extensive collection service for garden waste composting. Chelmsford is also the only waste collection authority in Essex with its own materials sorting facility, albeit on a relatively small scale targeting a selected range of materials for further sorting. The collection services provided are reliable and of good quality and are generally well regarded and popular, despite being perceived as being a little complicated in their structure.

However, total waste generated by Chelmsford households continues to be above average, despite recent year on year reductions and trends suggest that diversion rates, particularly in respect of the proportion of materials diverted for recycling, are beginning to reach a plateau. Whilst recycling and composting levels are expected to exceed Local Area Agreement targets for 2008/08, 2009/10

[19] Evaluation of Separate Food Waste Collection Trials [WRAP September 2008]

and 2010/11, the more ambitious diversion targets set out in the Waste Strategy for England and the Joint Municipal Waste Management Strategy for Essex are unlikely to be met without some changes in the range of materials [particularly food waste] that are collected for recycling and composting or changes in the method of treatment or disposal.

Chelmsford, therefore, is faced with important strategic choices. A number of options could be considered. Given current financial constraints options to be taken forward may need to be limited to those that have no net cost or those where external funding and investment can be secured. The main alternatives are:

1. Retaining the status quo – but this would mean allowing the biodegradable waste remaining in the residual waste stream to continue to be disposed of by landfill or to be treated by large scale mechanical and biological treatment plants. It is unlikely that the more ambitious national recycling and composting targets could be met without composting of food waste

2. Substantially retaining arrangements for recycling and garden waste composting services, but looking at alternative ways to divert a significant proportion of the biodegradable waste [mainly food waste] from the residual waste stream

3. Whether to retain kerbside source separated collection systems or to change to a co-mingled collection of dry recyclable materials or variations of such

4. Whether to change to a mixed organics collection of garden and food waste, which although lower performing and requiring a more expensive method of treatment, may be less expensive to collect

A more detailed analysis of these options is summarised in the background papers [20] [21] supporting the strategy.

The design of the collection system also needs to take into account:

- The disposal options that are actually available at any particular time
- Any 'direction' that may be received from Essex County Council under their powers as the waste disposal authority
- The need to offer cost effective, good quality, reliable and easily accessible solutions that demonstrate a high regard for the environment
- The need to systematically remove perceived barriers to recycling to encourage the necessary behavioural change to maximise participation and capture rates

[20] Co-mingled and source segregated recycling collection schemes [Essex County Council August 2008]
[21] Collection system design – analysis of alternatives [Various sources 2008]

The following core collection system is envisaged in the medium term:

[1] **Kerbside separated collection of materials for recycling,** generally on an alternative weekly basis, of steel, aluminium, foil, paper, cardboard, glass and plastics for transfer direct to a merchant or materials re-processor

[2] **Separate collection of garden waste** for windrow composting on an alternative weekly basis

[3] **Separate collection of food waste** on a weekly basis for treatment by anaerobic digestion through new facilities to be procured by Essex County Council [A]

[4] **Collection of mixed residual waste** for treatment as directed by Essex County Council, but presumed to be at new mechanical biological treatment facilities to be procured by Essex County Council

It is anticipated that these core collection systems would be supplemented by:

- **Assisted collections** covering all recycling and waste streams offered to those who are unable to present their waste for collection due to either temporary or permanent incapacity
- **Special bulky waste collections** remaining as a pre-arranged and chargeable service
- **Collection of waste electrical and electronic equipment**
- **Collections of clinical waste** including needles, syringes, incontinence materials, continuing to be undertaken by a specialist contractor
- **Trade waste collection** as a chargeable service, but placing greater emphasis on switching to collection of materials for recycling wherever possible
- **Collection of recycling materials from schools, other education establishments and arts, entertainment and leisure venues**
- **A network of recycling bring banks** focusing on materials not in regular kerbside separated collections and as communal collection points where kerbside collections are not possible
- **Arrangements for the collection of textiles** predominantly for reuse or if this is not possible recycling
- **Facilities for 'recycling on the go'** as part of a national campaign to increase opportunities for recycling away from the home or 'on the move'

[A] Following the introduction and evaluation of the impact and effectiveness of a weekly food waste collection, it is anticipated that a review of collection arrangements will be undertaken to see if further improvements in terms of waste reduction and diversion rates can be realised

8.4 Waste minimisation, recycling development, education and promotion

Historically municipal solid waste has grown by around 1.5% every year, although most recently there has been a noticeable reduction in the rate of growth and in certain areas, such as Chelmsford, a fall in the total amount of waste generated. It is uncertain as yet whether this is a result of successful waste prevention initiatives or due to other external factors, such as a fall in economic growth.

The Waste Strategy for England and the Joint Municipal Waste Management Strategy for Essex both include as core objectives targets to reduce the amount of waste generated.

As set out in the national strategy the responsibility for preventing and reducing waste is widely shared between producers, retailers and their supply chain and consumers, with a variety of agencies, including waste disposal and collection authorities carrying a significant responsibility for education and awareness and the development and promotion of reuse and recycling activities.

There are a range of measures which can be used to promote changes in householder behaviour in order to reduce waste; for example by promoting the purchase of products with less packaging, encouraging the use of alternatives which reduce the amount of material entering the waste stream such as providing compost bins to householders with gardens. Initiatives such as developing home composting will tackle directly the organic, biodegradable components of municipal waste. The promotion of services to reduce unwanted direct mail and the quantity of paper packaging used within products will also reduce the levels of biodegradable materials in municipal waste.

Examples of schemes encouraging reuse include those involving furniture reuse, renovation of discarded electrical goods, bicycles which are repaired or refurbished for use by another consumer. Community and charity groups often fulfil their social and environmental aims through the reuse of waste, providing useful items to those most in need in their local area. Clothing reuse is most often carried out via charity shops and larger charity organisations such as the Salvation Army. Households can also reuse materials to avoid or delay them entering the waste stream, for example by reusing glass jars and plastic carrier bags.

For the strategy to be effective, therefore, sufficient focus and investment needs to be given to the prevention of waste, the further development of recycling services and a range of education and promotion activities to encourage participation. Four principle roles are identified which need to be integrated with and complement collection systems – particularly any changes planned:

- Waste reduction and prevention activities, including educational work and investment in future waste minimisation initiatives
- Research and data collection to inform service planning and identify priorities for improvement and to allow development and promotional activities to be effectively targeted
- Development of recycling services and activities
- Promotion of recycling and composting services and activities

A sufficient 'on-street' presence is also considered essential to encourage, educate and if necessary 'enforce' recycling development and operational activities.

It is anticipated that the strategic focus for service development, education and promotional activities will be:

Research

- Analysis of collection data to identify key trends and base information for the design and implementation of system changes
- Local surveys to identify low performing areas and barriers to participation
- Attaining and evaluating customer feedback, opinions and satisfaction levels

Waste reduction, awareness and education

- Promotion of home composting
- Promotion of waste reduction initiatives – for example 'real nappy' campaign
- Supporting re-use organisations / charity shops
- Waste minimisation advice for businesses
- Promoting mail preference services
- Lobbying for reduction in packaging and encouraging reusable bags
- Attendance at local fairs, exhibitions, road shows and other promotional events
- Education visits and talks to local groups and societies
- Advice on waste minimisation initiatives within Chelmsford Borough Council

Development of recycling services and activities

- Extension of the recycling schemes for flats
- Introduction of trade recycling collections
- Communication and promotion of new collection arrangements
- Extension of 'recycling on the go' facilities

Promotion of recycling services and activities

- 'Door-stepping' campaigns to encourage participation and improve capture rates in low performing areas
- Local delivery of national promotional campaigns
- Local recycling development initiatives
- Communications of recycling and composting plans
- Further development and adoption of the Eco-Schools programme

8.5 Improvement plan

The strategy is intended to set out the context, policy and long term aspirations for waste management in Chelmsford and the proposed direction and priorities for the future development of recycling and waste collection services. The improvement plan identifies the targets for achievement and the possible short, medium and long term actions and measures that may need to be taken to deliver the strategy. The improvement plan also includes an outline of potential resource implications and key risk considerations, so that a view can be taken on the relative priorities, impact and cost benefit of those actions, to help determine which should be taken forward for implementation.

The improvement plan to support the delivery of the strategy is set out in the accompanying document.

9 Resources

9.1 Economics

Following recent changes in legislation, new controls on the collection and disposal of waste and the need to meet landfill diversion targets it is widely predicted that waste management costs nationally will more than double over the next 10 years, if the current approach and arrangements are maintained. Despite adopting a more integrated approach to waste reduction and waste management as advocated in the Joint Municipal Waste Management Strategy for Essex, significant cost increases are still likely.

It is generally acknowledged that investing in new waste collection, treatment and disposal arrangements usually means paying a higher price now for a higher quality service with less financial risk in the future and lower environmental impact at the point of disposal.
Some of the key assumptions that underpin economic considerations for waste management solutions include:

- In-vessel composting and anaerobic digestion facilities will have significantly higher processing costs compared to 'windrow' composting facilities.
- There is a reduced market for compost that contains kitchen waste
- Contamination rates for material rejected from kerbside sorted recyclables averages 2% compared to an average of 10% of materials rejected from co-mingled collections processed at a materials recycling facility
- Rejection rates of 1% from windrow composting facilities and 10% from in-vessel composting and anaerobic digestion facilities are anticipated – meaning that 'cleaner' waste streams will be vital to the underlying economics of the treatment facilities
- A third party materials recycling facility operator will take a significant share of any revenue from the sale materials for recycling
- Around 70 per cent of household waste is readily recyclable but the nearer to that limit reached, the greater the marginal costs involved in increasing recycling rates further. The value of the additional material recovered may also be less
- There will be a point where promoting further recycling becomes less cost effective than treatment of residual waste, especially where the treatment method recovers energy that has an economic and environmental benefit
- Waste collection authorities are not allowed to charge for general household waste, but can limit the amount that is collected free of charge. This limit can only really be set by the size of the waste container, where this is provided by the Council

9.2 Operational costs

In 2007/08 gross costs for recycling and waste collection activities in Chelmsford totalled some £6.438m, with combined income from recycling and composting credits and the sale of materials for recycling of £1.765m, resulting in a net cost of the service of £4.673m.

Locally, it is anticipated that waste collection costs in Chelmsford could increase by 30% compared to the current baseline unless different collection and disposal arrangements are adopted. System design modelling suggests that the option providing best value for money is likely to reduce this increase to approximately 20%. The lowest cost option, but also lowest performing option, is likely to reduce this increase to 5% to 10%.

Whilst comparative costs of different waste collection options have been attained through system design modelling, these are not absolute costs. If the mid cost, highest performing system is implemented then it is anticipated that recycling and waste collection costs will increase by approximately £1.4m.

The strategy and improvement plan for recycling and waste collection in Chelmsford seeks to mitigate these costs as far as possible through collaborative working using the framework provided by the Joint Municipal Waste Management Strategy for Essex and the Essex Waste Partnership.

The bulk of the anticipated additional costs relate to the introduction of a separate collection of food waste. It is estimated that this service will cost in the order of £1.2m per year, with one-off set up costs in the region of £500,000. Additional investment, therefore, will be required to introduce and to support on an ongoing basis a separate food waste collection. It is expected these costs will be offset by additional capital investment and ongoing revenue support secured from Essex County Council, in their role as waste disposal authority. This is part of their commitment described in the Joint Municipal Waste Management Strategy, to increase investment in 'front end' recycling and composting solutions in order to reduce the need for treatment and disposal later in the waste management cycle. This should allow a comprehensive food waste collection to be introduced into Chelmsford from 2011 onwards.

It is expected that the majority of the rest of the strategy can be delivered from within existing resources, if the Council is prepared to reallocate resources into priority areas. This will be conditional upon sufficient integration being achieved in the approach and the changes planned and sequenced with realistic timescales, so as to free up resources from lower priority activities to be redirected elsewhere.

Some capital investment will be needed to improve the infrastructure to support recycling and waste collection services, including upgrading the capacity of the existing material recycling facility and to increase the capacity of the transfer station at Drovers Way. A particular priority is to be able to bulk up green waste prior to delivery for windrow composting which would significantly improve operating efficiency.

The generally accepted target for investment in education and promotion activities is in the order of £3.50 per household, with an assumed 50:50 split of responsibility between waste disposal and waste collection authorities. Given the number of household in Chelmsford this would equate to approximately £250,000 per year. Current investment from Chelmsford Borough Council is in the region of £136,000, broadly in line with recommendations, assuming the waste disposal authority is making an equivalent commitment.

It is assumed in the strategy and improvement plan that the current level of investment in education and promotion activities to support the achievement of waste reduction and diversion targets will be maintained. However, targeted one-off investment to support specific campaigns in low performing areas will be needed. Additional investment averaging about £20,000 per year is likely to be needed

9.3 Managing risks

The strategy also highlights the need to give sufficient attention to managing and mitigating potential risks that may exist. The main risks identified include:

- The prospect of significantly increased costs for both collection and disposal activities
- The threat of financial penalties being passed down to local authorities for not meeting landfill diversion targets imposed through the EU Landfill Directive
- Changes in the proportion of costs currently being met by the waste disposal authority compared to the waste collection authorities. As the balance between the proportion for materials disposed of through landfill compared to those being recycled or composted changes so will the distribution of cost between collection authorities and disposal authorities. Without some compensation payment to redress this, the costs borne by Chelmsford Borough Council will tend to increase compared to the costs incurred by Essex County Council as the waste disposal authority
- The proposed inter-authority agreement will be legally binding. Whilst the risk profile [i.e. who takes what risks] has been carefully negotiated to remove liability to waste collection authorities for most of the variables some risks remain, particularly in respect of failure by a waste collection authority to achieve their service delivery plan
- The market for recycling materials is still under-developed and can be volatile and price sensitive. There is a constant risk, therefore, to income streams
- The most appropriate waste management solutions vary between areas and there is no predetermined best practice model. Balanced judgements have to be made, therefore, on selecting which options are likely to be highest performing, most cost effective and will satisfy public expectations
- All waste management solutions tend to generate significant local interest and opinion. Proposed solutions, therefore need to be carefully timed and accurately and effectively communicated
- Collection system changes have high degrees of public sensitivity
- Opinions on and levels of satisfaction with waste collection services have a direct and significant influence on the reputation and perception of the Council as a whole
- Failure to reduce waste and increase diversion rates may have a significant adverse impact on future climate change
- Possible adverse public reaction to limitations on bin size or number of bins

The design of collection services is proven to directly influence people's behaviour. However, changes need to be introduced with care and sensitivity because they rely on public cooperation. Introducing changes to waste collections can test the strength of the Council's community

leadership. Experience suggests that the way a system is introduced can be as important as the system itself.

It is now widely accepted that larger bins tend to encourage people to throw away more and recycle less. Historically and prior to the introduction of a comprehensive kerbside collection scheme, Chelmsford has issued large [240 litre] wheeled bins for collection of residual waste and generally has not imposed a limit on the number of bins. This has created a legacy of comparatively high volumes of total waste generated and at times has probably discouraged the separation of dry recycling materials. The strategy, therefore, advocates a reduction in the size and number of wheeled bins for residual waste when issued or replaced.

It remains the Council's policy to retain direct control over and delivery of waste collection services.

10 Monitoring and review

The strategy and improvement plan will be subject to regularly review. Performance generally will be reviewed against:

- The targets set by the Waste Strategy for England
- The targets set by the Joint Municipal Waste Management Strategy for Essex
- The specific National Indicators relating to waste management
  - NI 191 Residual household waste per household
  - NI 192 Percentage of household waste sent for reuse, recycling and composting

These national indicators and those relating to the impact of climate change are also included in the Local Area Agreement for Essex, with specific targets for the Chelmsford area.

Assuming the Council enters into the inter authority agreement for the Essex Waste Partnership, this also includes included provisions for an annual review of service delivery arrangements.

The quality of service delivery will be reviewed through periodic satisfaction surveys and the 'place survey' associated with the national indictors and through continuous monitoring of missed collections and complaints and complements received, including the national indictor relating to avoidable contacts.

The impact of promotional activities will be measured and evaluated through continued assessment of participation levels and capture rates, supported by periodic analysis of waste composition.

Benchmarking comparisons will be undertaken as appropriate to inform performance and value for money reviews.

11 References

1.	One Vision: Chelmsford Tomorrow 2021	Chelmsford Partnership	April 2008
2.	Chelmsford Tomorrow – Our vision for the future 2007-2011	Chelmsford Borough Council	2007
3.	Waste Strategy for England 2007	Department for Environment, Food and Rural Affairs	May 2007
4.	Joint Municipal Waste Management Strategy for Essex 2007 to 2032	Essex County Council	July 2008
5.	'Liberating Potential Fulfilling Lives' – Essex Local Area Agreement	Essex Partnership	July 2008
6.	Recycling and waste collection services - review of performance and value for money	Chelmsford Borough Council	January 2009
7.	Residual waste research	Friends of the Earth, Enviro Centre, WRAP	June 2007
8.	Residual waste Research Phase II – Policy Options	Friends of the Earth, Enviro Centre, Sustainability and Resources Institute	June 2008
9.	Analysis of the composition of waste arising in Essex 2004	MEL Research Ltd	2004
10.	Essex Councils Waste Composition Study	MEL Research Ltd	2008
11.	Domestic mixed plastics packaging waste management options	WRAP	June 2008
12.	Recycling Centre for Household Waste Composition Study	MEL Research Ltd	September 2007
13.	Barriers to recycling at home	MEL Research / WRAP	August 2008

14.	Perceived barriers to recycling in Chelmsford	Chelmsford Borough Council	November 2008
15.	Kerbside Recycling: Indicative Costs and Performance	WRAP	June 2008
16.	Chelmsford System Design Modelling	AEA	August / Sept 2008
17.	Assessment of the impact of using a local transfer station for the districts of Essex	Essex County Council	September 2008
18.	Introductory Guide to Options for the Diversion of Biodegradable Municipal Waste from Landfill	Department for Environment, Food and Rural Affairs	2007
19.	Evaluation of Separate Food Waste Collection Trials	WRAP	Sept 2008
20.	Co-mingled and source segregated recycling collection schemes	Essex County Council *[internal not for distribution outside the Essex Waste Partnership]*	August 2008
21.	Collection system design – analysis of alternatives	Various sources	October 2008

Other sources not directly referenced in the strategy

22.	Well disposed – responding to the waste challenge	Audit Commission	Sept 2008
23.	Sorting Residual Waste	Friends of the Earth	June 2008
24.	Alternative weekly collections guidance	WRAP	July 2007
25.	Choosing and improving your glass collection service	WRAP	
26.	Home composting – opportunity or threat for producers	WRAP	
27.	Kitchen waste composting trial	Preston City Council	June 2006
28.	Outline Business Case Essex	Waste Management Partnership PFI	April 2008