



WASTE – A FUTURE RESOURCE FOR BUSINESSES:

**Developing the evidence base for a targeted market intervention strategy for
the West Midlands**



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EXECUTIVE SUMMARY

The primary focus of this study is to assess waste generated by the business sector within the region, however potential synergies in the management and treatment methods with those for municipal wastes has broadened the study scope to ensure a holistic approach to this strategy development is achieved.

The Regional Spatial Strategy forecasts over 14 million tonnes of municipal and commercial and industrial wastes will be generated by the year 2020/21. The forecasted gap in treatment capacity by the year 2020 is anticipated to be at least 3.7 million tonnes, despite an estimated current treatment capacity of 7 million tonnes across the region. District level assessment of the future capacity gap identifies the high density urban areas of Birmingham, Coventry and Solihull with the greatest forecasted waste treatment capacity need.

Converting the forecasted 3.7 million tonne capacity gap in 2020/21 into a land take requirement indicates at least 140 hectares of land will be required for development of infrastructure to manage the capacity gap. The true land take is likely to be at least double, when factoring in facilities not operating at their maximum licensed capacity, relocation of facilities currently in sensitive areas, or situated on high value land suitable for regeneration and development. Every effort therefore is required to maximise current treatment capacity and minimise the additional land take need.

The impact of regulation has been assessed through a regulatory impact assessment of C&I waste. This indicates approximately 0.8 million tonnes of waste may be diverted from landfill as a result of the packaging waste, animal by products, hazardous waste and waste electrical and electronic equipment (WEEE) directives. The regulatory drivers assessed do not in themselves serve to drive waste away from landfill. There is still therefore a need to stimulate waste treatment infrastructure. Notwithstanding, the regulations could result in a cost saving of up to £12 million to businesses by 2020 and therefore further strengthens the business case for timely intervention. In summary, current regulations in their own right will not stimulate the necessary diversion of C&I waste from landfill required to meet regional targets.

Another driver assessed in this study is waste management costs. Gate fee costs for the processing of materials through a recycling or organic treatment facility is already competitive with landfill costs, although collection costs currently act as barrier to immediate change. The future increase in the landfill tax escalator should further improve the differential away from landfill and towards the development of recycling and organic treatment infrastructure. Other treatment processes are likely to become fiscally competitive by 2015, although the exact costs will depend on technology type and scale as well as securing end use markets for many of the outlets.

Although landfill tax is a strong fiscal driver, potential savings to businesses in the region will only be fully realised if new processing infrastructure and collection systems are introduced in a timely fashion.

Together with escalated increases in landfill tax, the introduction of new processing and collection systems will help to deliver savings to businesses in the region. A recent Envirowise¹ report identifies that the cost to businesses of waste management currently account to up to 4% of annual turnover - some £40,000 for firms turning over £1 million per annum. Due to the predicted increases in the cost of waste to landfill by 2010/11, the overall cost of waste management for businesses as a proportion of turnover is forecast to rise to

¹ Envirowise. No-cost and low-cost waste initiatives fro businesses (EN509)

between 5.7% and 6.2%. This increased cost (from 4% of turnover today to up to 6.2% by 2010/11) no longer makes landfilling the only viable economic option for waste management due to comparable costs for recycling/treatment. Further predicted increases in the cost of waste to landfill by 2019/20 could bring waste management costs for businesses up to between 7.5% and 8.4% of turnover, making landfilling an economic liability for businesses. In order to avoid this increased cost of waste management inflicting upon regional businesses it is essential that action is taken to ensure that sufficient recycling and treatment facilities are available. The development of such facilities in a timely fashion will realise a potential saving for businesses of between 1.7 and 2.2% of turnover compared to a continued reliance upon landfill as a means of waste management – a saving of up to £22,000 for businesses with a turnover of £1 million.

Early debate between the waste industry and other stakeholders is likely to play a central role in assisting the regions business in preparing for, and therefore maximising benefits from, the current shift in the waste market.

Based on this study and the evidence base developed the following 11 actions have been identified for further discussion:

- Waste minimisation awareness;
- Waste minimisation action;
- Encourage landfill diversion;
- Enhance and intensify performance at existing facilities;
- Change of facility use from transfer to treatment;
- Safeguard existing waste management sites;
- Areas of opportunity mapping exercise of land for development;
- Stimulate development of organic, recycling and WEEE facilities;
- Minimise the barriers for recycling and landfill diversion by SMEs;
- Produce a directory of waste, useful organisations and waste collection and management companies for SMEs; and
- Enhance data sharing, consistency and transparency (for SME and the Waste Management industry).

It is anticipated that stimulation of debate and discussion with representatives from the waste management industry and other relevant stakeholders could be instrumental in assessing the above action list, prioritising and working towards ensuring the West Midlands has the future ability to sustainably manage the waste it produces.

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1 INTRODUCTION

1.1 Background

Advantage West Midlands (AWM) is the Regional Development Agency (RDA) for the West Midlands, established to transform the region through sustainable economic development. The role of AWM is to take a lead on the economic development of the region through working with a large range of partners (public, private and voluntary) to build on the regions strengths and address the regions unique challenges. AWM drives economic development by targeting need or investing in success.

SLR Consulting Limited (SLR) is the UK largest independently owned environmental consultancy with a strong focus on all aspects of waste management. SLR's client base includes both private and public sector, including local, regional and national government organisations. SLR has worked with various Waste Disposal / Waste Planning Authorities (WDA/WPA), the regional assembly and other organisations in the West Midlands.

SLR has recently completed (June 2007) a waste capacity study commissioned by West Midlands Regional Assembly (WMRA) on recycling and recovery infrastructure within the region. As a continuation of this earlier work AWM jointly with WMRA and part funded by Defra commissioned SLR to develop a market intervention strategy for the waste sector within the region that would have greatest benefit for the wider business community.

1.2 Scope of Study

The aim of this study was to identify areas of the waste management industry in the West Midlands region that would benefit from focused intervention to ensure the Region is in a position to sustainably manage its future waste. This summary report² contains the evidence base work and a summary of the key areas for further consideration and debate.

The objectives of this study are summarised below:

- **Review** the current information and studies published relating to waste management in the region;
- **Develop** the evidence base with respect to existing facility capacity by undertaking a survey of waste transfer facilities;
- **Refine** the waste capacity gap picture to illustrate the future forecasted need by broad facility type to a district or unitary authority level;
- **Assess** the current drivers (regulatory and fiscal) to stimulate non landfill waste facility development and the point at which landfill alternatives become cost effective;
- **Develop** an action list informed by the evidence base;

The rationale behind this study is that improved waste management serves to:

- Meet national and regional targets for waste management;
- Manages waste more sustainably;
- Generates regional excellence in technology and labour; and
- Stimulates economic growth through reducing costs to the wider business community within the region and in developing targeted infrastructure.

² AWM, on receiving the full final report, decided through discussion with the RTAB and other interested stakeholders that publication of the study and wider availability of the evidence base data would benefit the region. As such this summary report was prepared to present the baseline evidence base development and summary suggested actions for further investigation.

1.3 Structure of Report

This report summarises the methodology, actions and conclusions of developing an outline strategy for market intervention in the region. The report is presented under the following chapter headings:

Chapter 1	Introduction
Chapter 2	Developing the evidence base
Chapter 3	Current drivers for change
Chapter 4	Key findings and conclusions
Chapter 5	Recommendations for future delivery

1.4 Steering Group

This study has been supported and influenced through discussions with a steering committee. Updates and presentations have been provided to the committee throughout the development of this study. The steering group consisted of the following members:

Member	Organisation
Tim Baldwin	Advantage West Midlands
Adrian Cooper	Chair of WMRA RTAB / Shropshire County Council
Bruce Braithwaite	WMRA / Staffordshire County Council
Simone Aplin	Environment Agency
Sarah Downes	WRAP
Rebecca Gill	Government Office West Midlands

2 DEVELOPING THE EVIDENCE BASE

2.1 Summary of chapter

Waste streams considered: The primary focus of this study is to assess waste generated by the business sector within the region, however potential synergies in the management and treatment methods with those for municipal wastes has broadened the study to ensure a holistic approach to this strategy development is achieved.

Waste forecasts: The Regional Spatial Strategy forecasts over 14 million tonnes of municipal and commercial and industrial wastes by the year 2020/21. The primacy of Birmingham and the surrounding metropolitan areas within the region extends to waste generation. Birmingham will be the largest waste producer, as it contains the largest proportion of the regions households and businesses, accounting for over 15% of the regions waste.

Existing Treatment Capacity: The region currently has over 7 million tonnes of licensed waste treatment capacity (excluding transfers and landfill) with over half of the 34 districts having no licensed organic treatment capacity. All but one district have some recycling capacity with over a half having some form of residual 'other treatment capacity' (Energy from Waste, MBT, Chemical treatment).

The Capacity Gap: The current and apparent excess of treatment capacity within the region (primarily due to recycling excess offsetting the organic treatment deficit) changes to a capacity gap of 3.7 million tonnes by 2020/21. The gap in organic treatment reaches 1.3 million tonnes in 2020/21 (from 0.4 million tonne in 2007/08). A gap in recycling capacity is estimated to be approximately 2.1 million tonnes by 2020/21. District level assessment of the future capacity gap is presented within this report and identifies the high density urban areas of Birmingham, Coventry and Solihull have the greatest forecasted gap.

Potential land take need: Converting the forecasted capacity gap into landtake need indicates regional land take could exceed 135 hectares to meet the capacity gap, this need could be greater as facilities face increasing pressure from other land uses (residential and other business use) to move from their current locations to alternative sites as well as other operational constraints.

2.2 Key core reference documents

To maintain consistency of information within the region, an initial element of this study involved the review of existing reports and identification of useful and suitable data sources. The main data sources reviewed are as follows, with Table 2-1 summarising the usefulness of the report and the information extracted and utilised in the current market intervention study³:

- **Regional Spatial Strategy (RSS)** – The West Midlands RSS⁴ was published in June 2004, its purpose is to provide a long term land use and transport planning framework for the Region. It determines (amongst other things) the scale and distribution of housing and economic development across the Region, investment priorities for transport and sets out policies for enhancing the environment. At the

³ The **Regional Economical Strategy** was reviewed in addition to the main sources detailed in Table 2-1. The regional economic strategy evidence base contains a section on waste and has long term estimates for waste arisings in the region. Currently there is an inconsistency between waste projections in the Regional Economic Strategy evidence base and those presented in the RSS as the two strategies use two different models. Further discussion on this is given later in the report.

⁴ <http://www.wmra.gov.uk/page.asp?id=49>

time the Secretary of State supported the principles of the strategy but suggested several issues needed to be developed further, waste management and provision of sufficient capacity and land was one of the issues covered in Phase 2 of the revisions which are currently underway.

- **Waste treatment facilities and capacity study** – A study commissioned by the West Midlands Regional Assembly to advance and strengthen the evidence base with respect to existing recycling and recovery infrastructure⁵, its location and its capacity within the West Midlands. The study resulted in identification of the total capacity gap by waste planning authority (WPA), which was incorporated in the latest RSS revisions.
- **Study into Future Landfill Capacity** – A study commissioned by the West Midlands Regional Assembly to inform the RSS revision process. The study surveyed existing landfill sites, collating current information to improve the predictions of remaining lifetime based on a number of scenarios⁶.

Table 2-1
Summary of related documents

Reference document	Suitability to current study	Information utilised
Regional Spatial Strategy documents	✓	Waste projections, management need, housing proposals and demolitions
Waste Treatment Facilities and Capacity Study	✓	Existing licensed recycling and recovery facility location and capacity
Future Landfill Capacity Study	x	This may prove useful for future areas of search and identifying potential development sites

The outcome of this review ensures that a consistency of approach is maintained wherever possible. To aid a consistent approach the steering group recommended that analysis be based on RSS waste forecasts and need data⁷.

2.3 Contextual information

This study focuses on the municipal, commercial and industrial waste streams⁸. A particular focus is the production and subsequent existing and future capacity requirements for treatment within the West Midlands region. Drawing 2-1 and Figures 2-1 and 2-2 provides contextual information on existing district boundaries, household and business numbers to assist the reader in understanding data presentation and results in the latter chapters of this report.

⁵ <http://www.wmra.gov.uk/download.asp?id=2357>

⁶ <http://www.wmra.gov.uk/download.asp?id=2358>

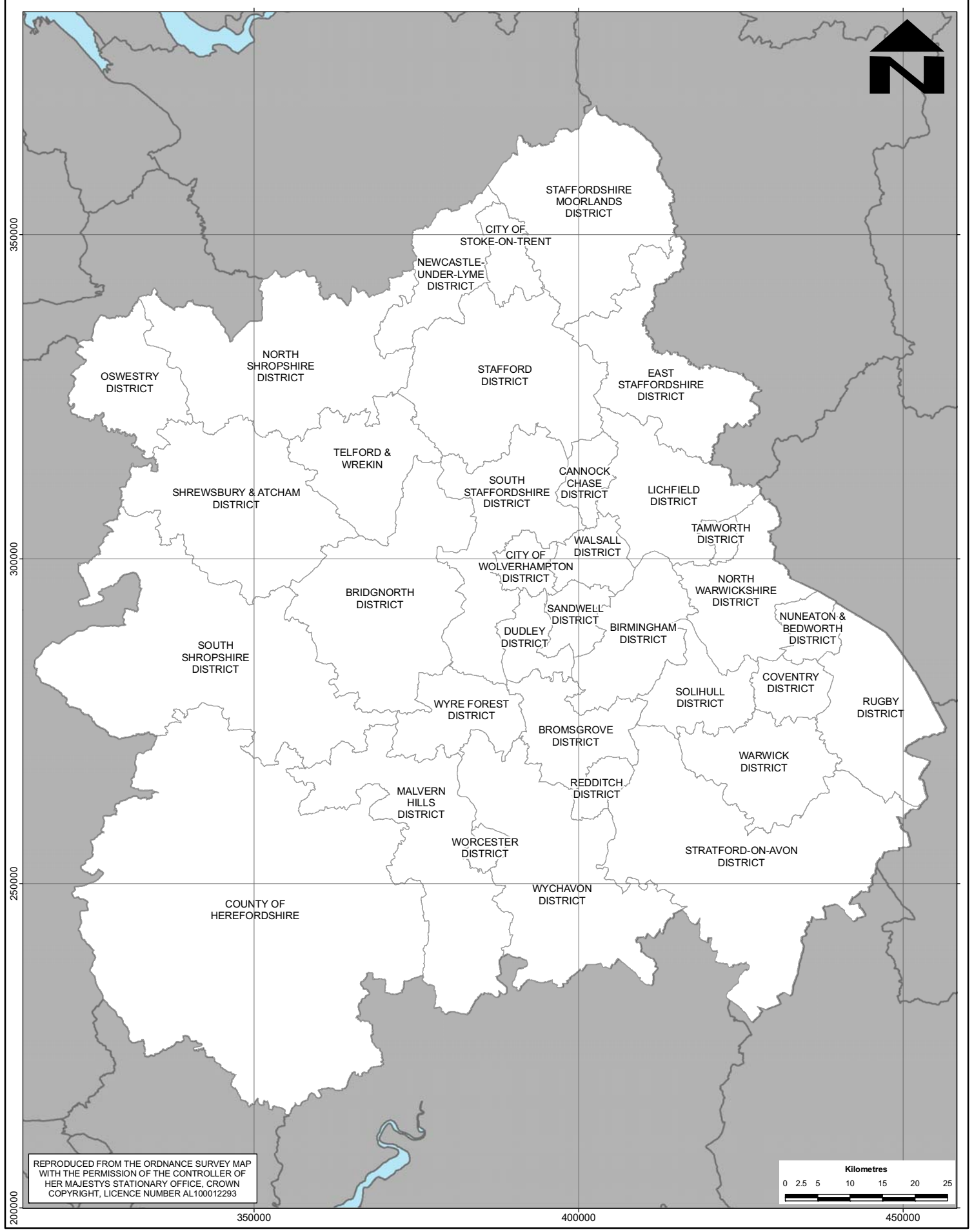
⁷ In addition, to meetings with the Steering Group a meeting was held with the West Midlands Regional Observatory (provides shared information on the region to partner organisations) to discuss potentially useful regional data. During discussions with WMRO it became apparent that the WMRO has access to the Regional Economic – Environmental Input Output (REEIO) model, which forms the basis of the waste projections within the Regional Economic Strategy. Waste projections are part of the REEIO model outputs, and currently there is some disparity between REEIO and the RSS waste projections. The steering group agreed to use the RSS data (for consistency with the RSS and the recent Waste Treatment Facilities study). An initial conclusion and future action identified within this report is to review and reconcile the existing regional waste projections (RSS and REEIO) and incorporate in future report revisions of both documents. Further details on the differences between REEIO and RSS projections can be found in Appendix 2. It should be noted that this report has since been updated with revised RSS projections – Revised 'Preferred Option, 22nd October 2007'.

⁸ Other waste streams not included within this study are agricultural, mining and quarrying, sewage sludge, dredged material and demolition and construction. MSW and C&IW consist of approximately a third of the annual waste arisings in England (source: Defra Waste Strategy for England 2007).

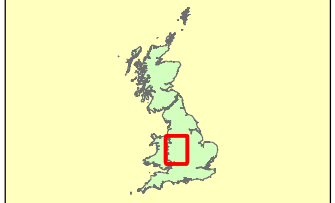
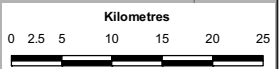
Drawing 2-1 provides an outline plan of the West Midlands region showing authority location and boundaries to a district or unitary level. The Defra definition⁹ of municipal waste is as follows *“This includes household waste and any other wastes collected by a Waste Collection Authority, or its agents, such as municipal parks and gardens waste, beach cleansing waste, commercial or industrial waste and waste resulting from the clearance of fly-tipped materials”*. The West Midlands region produced 3.1 million tonnes of municipal waste in 2006/07, with household waste constituting 2.7 million tonnes (i.e., nearly 90% of total MSW). Household waste is therefore the major component of municipal waste, and can be related to the number of households within the region. Household numbers (for 2004) are presented in Figure 2-1, illustrating that Birmingham has by far the greatest number of households (~400,000 households); Dudley has the next highest number of households (at approximately 130,000 or less than a third compared to Birmingham).

The Defra definition⁷ of commercial waste is *“Waste arising from any premises which are used wholly or mainly for trade, business, sport recreation or entertainment, excluding municipal and industrial waste”* and the definition of industrial waste is *“Waste from any factory and from any premises occupied by an industry (excluding mines and quarries)”*. The Environment Agency C&I waste survey estimated that 4.25 million tonnes of industrial waste and 3.02 million tonnes of commercial waste were produced in the West Midlands region in 2002/03. The number of businesses (in 2006) in each district / unitary authority is presented in Figure 2-2, illustrating that Birmingham has the highest number of businesses (approximately 15% of the regions business numbers).

⁹ <http://www.defra.gov.uk/environment/statistics/waste/alldefs.htm>



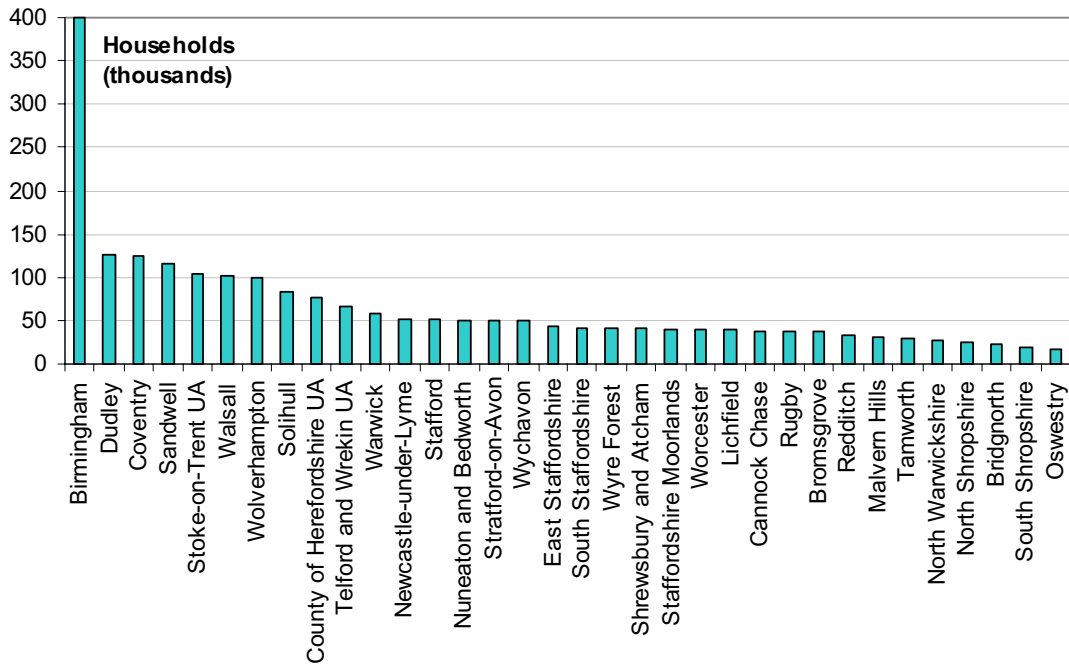
REPRODUCED FROM THE ORDNANCE SURVEY MAP WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE. CROWN COPYRIGHT, LICENCE NUMBER AL100012293



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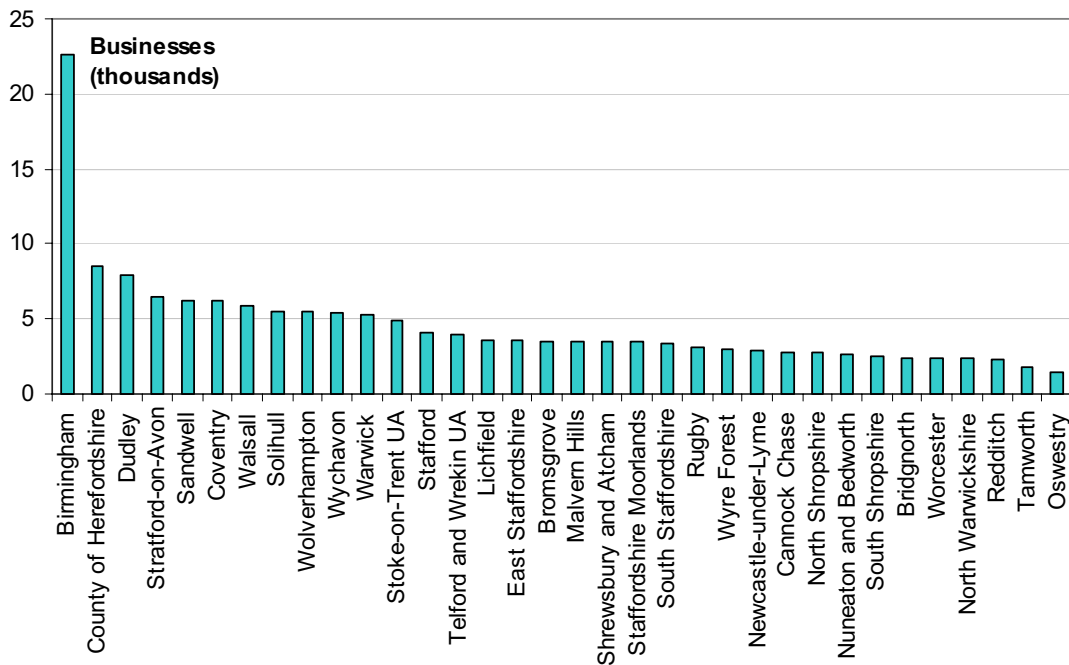
Project	WASTE CAPACITY STUDY		
Date	OCTOBER 2007	Scale	1:750,000
Drawing	District Plan		Drawing No.
			2-1

Figure 2-1
Household numbers by district / unitary authority in 2004



Source : <http://www.communities.gov.uk/index.asp?id=1156099>

Figure 2-2
Business numbers by district / unitary authority in 2006

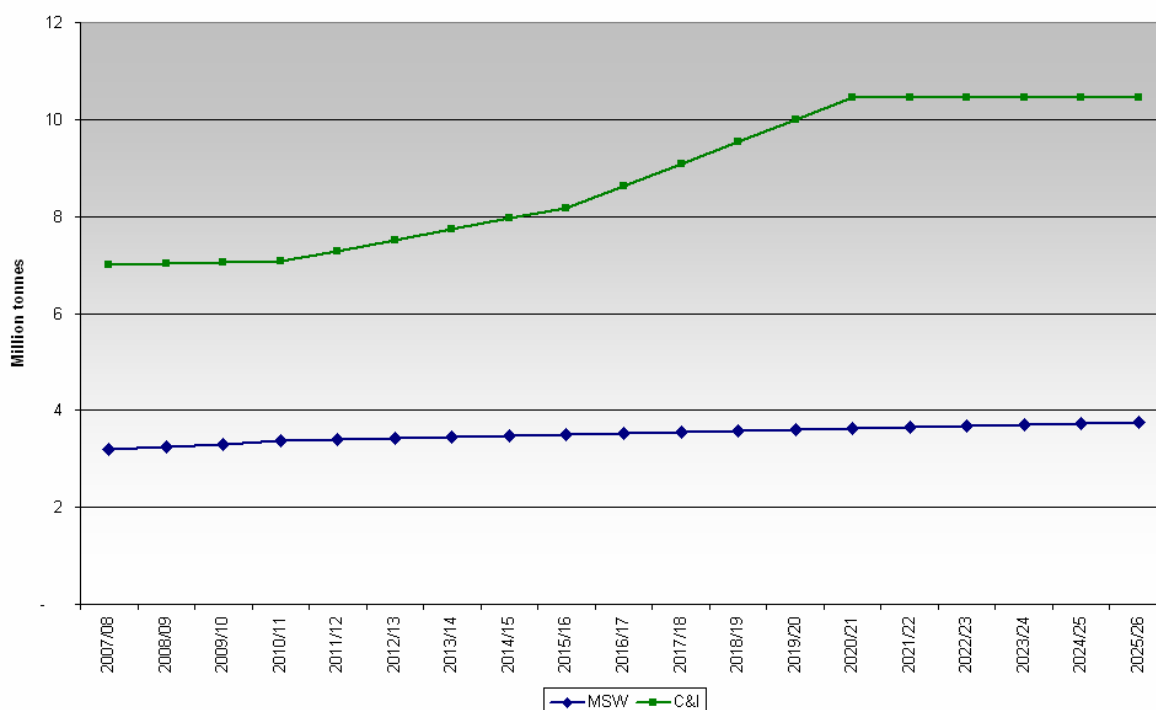


Source: <http://www.dtistats.net/smes/vat/>

2.4 Total waste arising

As discussed in Section 2.1, the data presented within this report is based on forecasts presented within the latest RSS for the West Midlands. Figure 2-3 presents the forecasted municipal and commercial & industrial waste arisings to the year 2025/26. Municipal waste is projected to increase from circa 3 million tonnes at present to circa 4 million tonnes by the year 2025/26. C&I waste is projected to increase from circa 7 million tonnes at present to circa 10.5 million tonnes by 2025/26. Total municipal, commercial and industrial arisings are forecasted to exceed 14.2 million tonnes in 2025/26.

Figure 2-3
Municipal, Commercial and Industrial Waste Forecasts

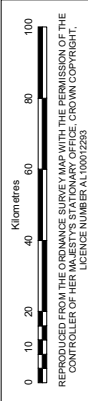
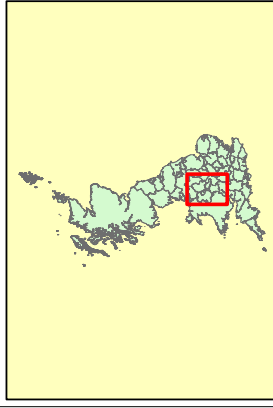


Source: RSS Phase 2 Revision: Preferred Option 22nd October 2007 (revised)

Drawing 2-2 presents municipal, commercial and industrial and total arisings for each district / unitary authority in the region for the present (2007/08) and the long term (2020/21). Short term and long term scenarios are presented throughout this report, to ensure that any market intervention identified is viable and sustainable in the long term. Arisings data from the RSS was proportioned to the district level (from the County level) using household numbers (for municipal arisings) and employee numbers (for C&I arisings).

LEGEND

- District / UA Boundaries
- Volume of Waste (000's)**
- 0 - 100
- 100 - 200
- 200 - 300
- 300 - 400
- 400 - 500
- 500 - 600
- 600 - 700
- 700 - 800
- 800 - 900
- 900 - 1000
- 1000 - 1500
- 1500+



Drawing

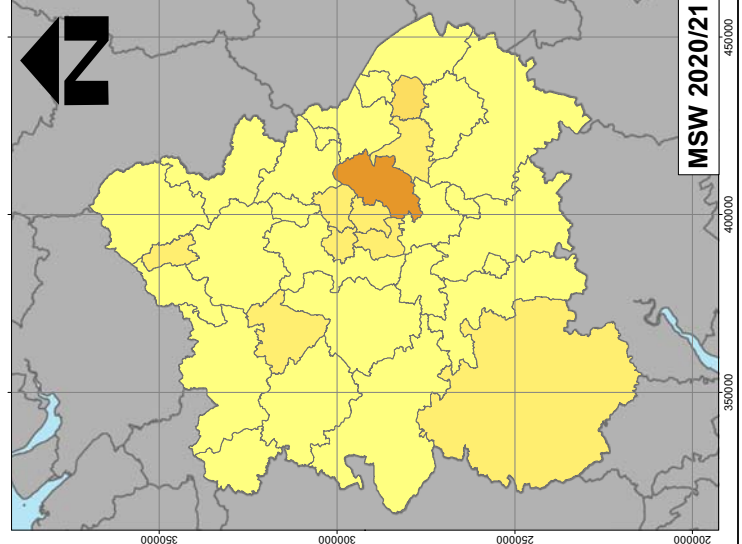
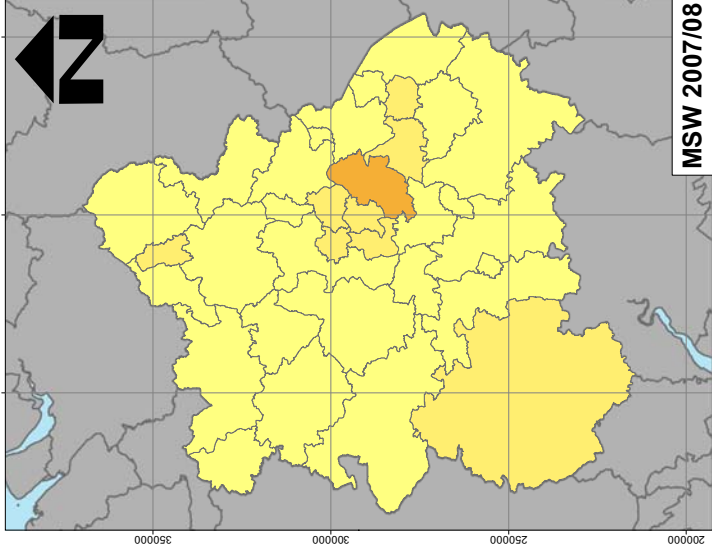
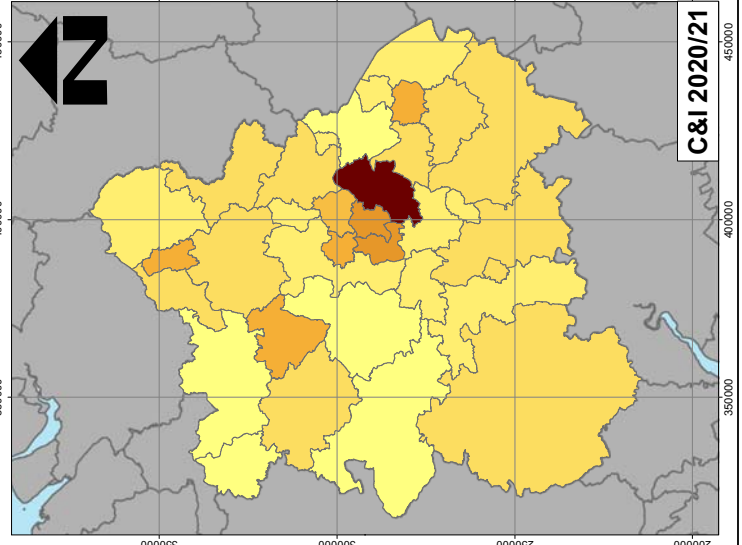
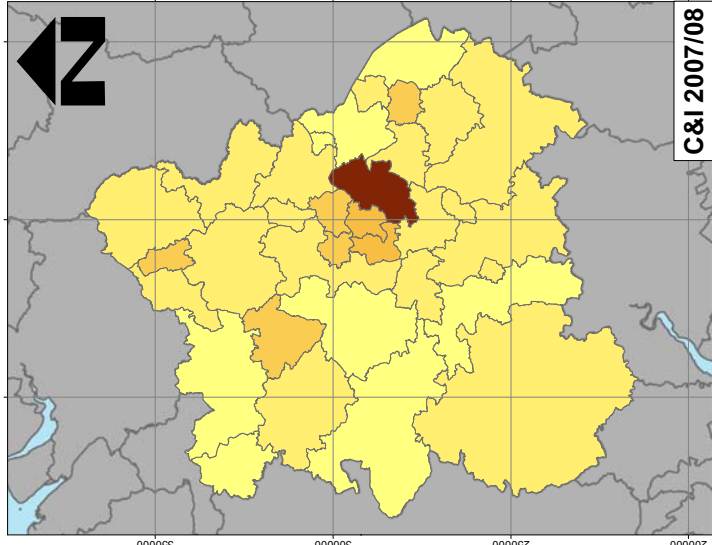
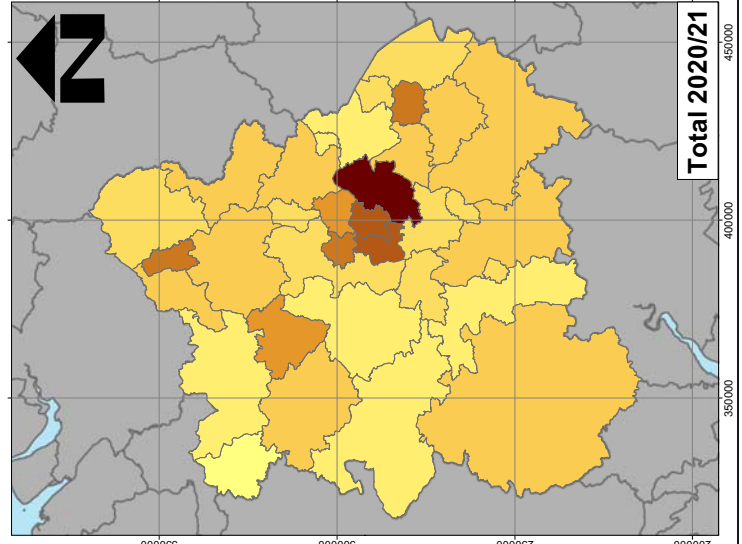
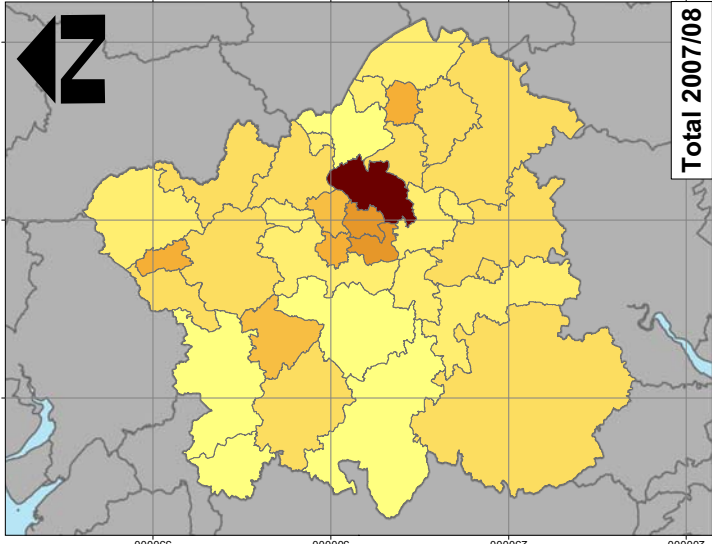
RSS Forecasted MSW & C&I Waste Generation

Project	WASTE CAPACITY STUDY	Drawing No.	2-2
Date	MARCH 2008		
Scale	1:1,500,000		

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The largest and smallest contributors to the regional total waste arisings are summarised in Table 2-3. Birmingham is the largest waste producer and Oswestry District in Shropshire County is the smallest contributor.

Table 2-3
Largest and smallest contributors to the regions waste arisings

	District	2007/8 Total (kt)	2020/1 Total (kt)
Five Largest Contributors	Birmingham	1,637	2,230
	Sandwell	630	881
	Dudley	624	868
	Coventry	564	792
	Stoke	544	744
Five Smallest Contributors	North Warwickshire	98	127
	North Shropshire	96	134
	Bridgnorth	86	116
	South Shropshire	74	103
	Oswestry	65	90

2.5 Forecasted total waste treatment need

Estimated future total treatment need is presented in the RSS. Total treatment need is defined as any process which diverts waste from landfill disposal (i.e. any form of recycling, organic treatment¹⁰ or residual / other treatment). Total treatment need defined at this stage is inclusive of all existing capacity (see Section 2.5). The final treatment need, or capacity gap, excluding existing capacity is estimated in Section 2.6 of this report.

To improve resolution and understanding of areas of shortfall the RSS total treatment need is proportioned to recycling, organics and other treatment. For municipal wastes the above categorisation is achieved using the proportion of recycling and organic treatment (combined) to recovery in the Waste Strategy for England 2007¹¹. The C&I need is proportioned based on the Strategic Waste Management Assessment 2002/03 published by the Environment Agency, recycling/organics compared to recovery can be identified for the region¹².

For clarity, Table 2-4 outlines the likely treatment facilities which would be included under the above recycling, organic treatment and other treatment categorisation, with Appendix 5 providing a short description of the treatment facilities and processes. The list is indicative, but not exclusive as some elements of C&I waste are unique in nature, and therefore have specific treatment solution requirements.

¹⁰ Organic treatment can also be referred to as biological treatment.

¹¹ Proportioning the recycling and organic treatment requirement on the basis of municipal waste composition. Municipal waste composition study uses Welsh Assembly Government research (December 2003).

¹² Similarly to municipal, the recycling and organic treatment need is separated on the basis of compositional information from the SWMA

Table 2-4
Indicative facility types for Recycling, Organic Treatment and Other Treatment¹³

Recycling	Organic treatment	Other treatment
Clean material recycling facilities	Open windrow composting	Autoclaving
Dirty material recycling facilities	In-vessel composting	Mechanical biological treatment
Material reprocessors	Anaerobic digestion	Gasification and Pyrolysis
		Energy from Waste

It is noted that transfer stations can provide some recycling capacity by separating materials (rubble, metals, wood etc) from mixed waste and diverting it from landfill (this is further discussed in Section 2.5). For the purpose of Section 2.4 however, the total treatment need stated here excludes all transfer station capacity and landfill requirement.

Drawing 2-3 illustrates the treatment requirement by district / unitary authority¹⁴ across the region, capacity requirement is presented by recycling, organic treatment and other treatment for the short and long terms. Table 2-5 outlines the three districts with the highest and lowest total treatment need in the short and long term, indicating Birmingham to have the greatest need in both the short and long term. The total regional treatment need in 2020/21 is 10.7 million tonnes, with over 6.6 million tonnes, 1.9 million tonnes and 2.2 million tonnes, respectively of the need estimated to be for recycling, organics and other treatment.

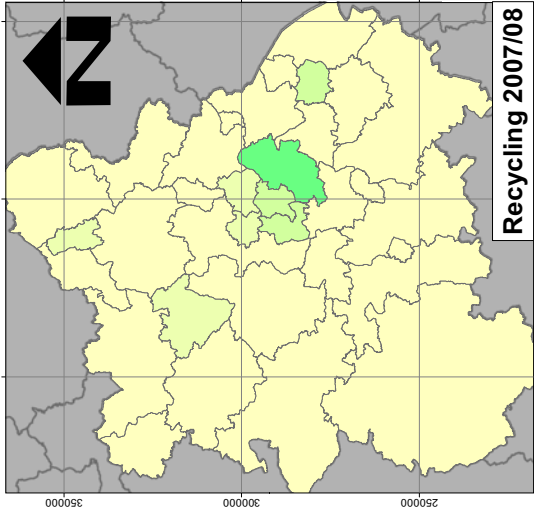
Table 2-5
Greatest and least total treatment need in the region
(i.e., recycling, organics and other treatment)

	2007/8		2020/21	
	District	Need (kt)	District	Need (kt)
Three Highest Need	Birmingham	1,174	Birmingham	1,790
	Sandwell	404	Coventry	740
	Dudley	401	Dudley	673
Three Lowest Need	Bridgnorth	47	Worcester	98
	South Shropshire	40	Malvern Hills	92
	Oswestry	36	Wyre Forest	88

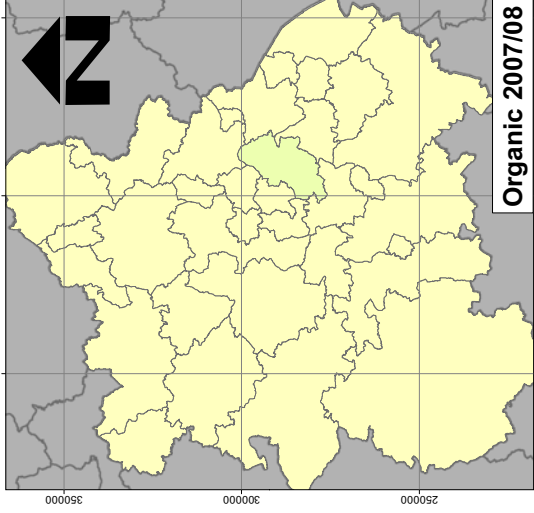
Data sheets relevant to Table 2-5 and Drawing 2-3 are included in Appendix 4 of this report.

¹³ Descriptions of the processes and facility types in Table 2-4 are provided in the Glossary of terms (Appendix 5)

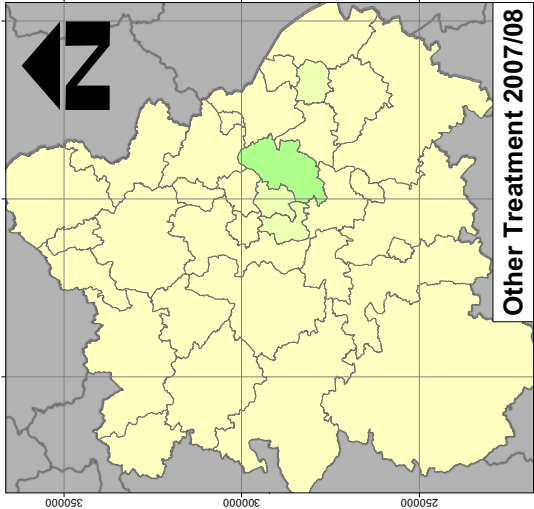
¹⁴ The RSS presents need by waste planning authority (WPA), this study has further disaggregated the need to a local authority level.



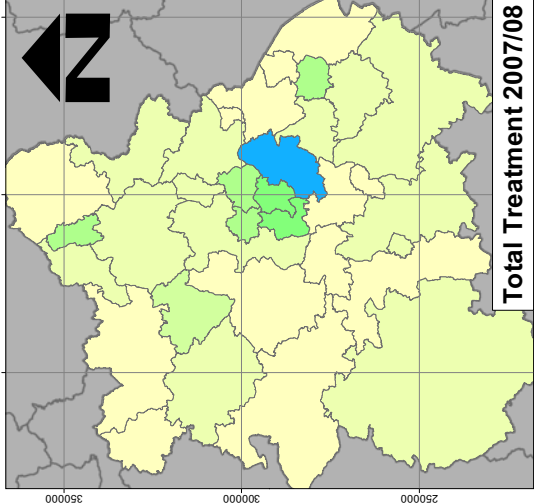
Recycling 2007/08



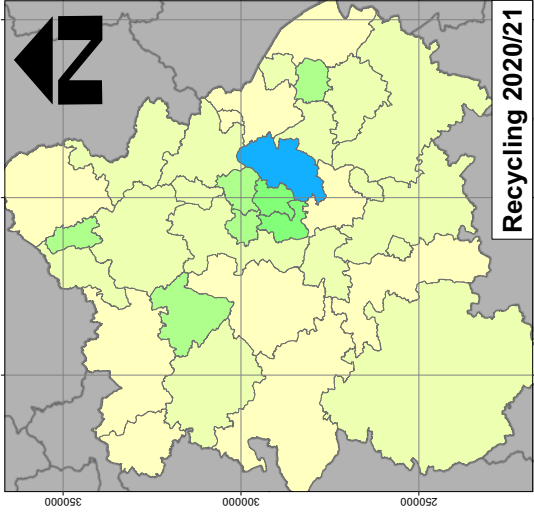
Organic 2007/08



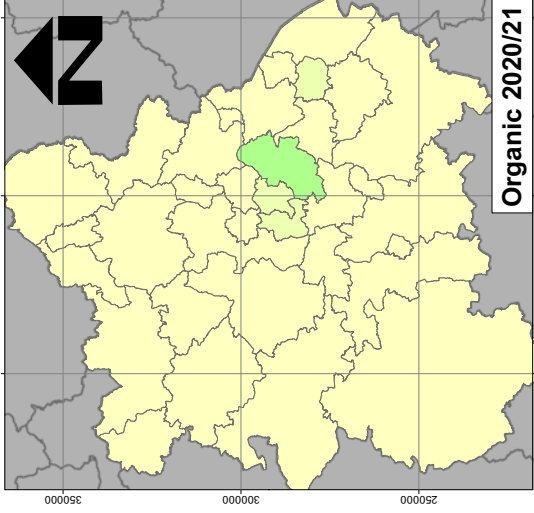
Other Treatment 2007/08



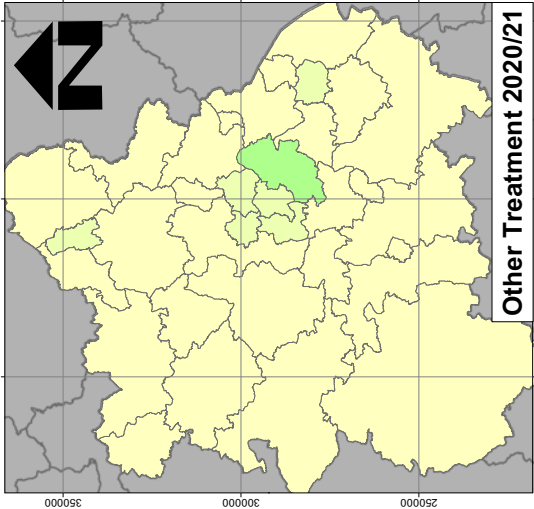
Total Treatment 2007/08



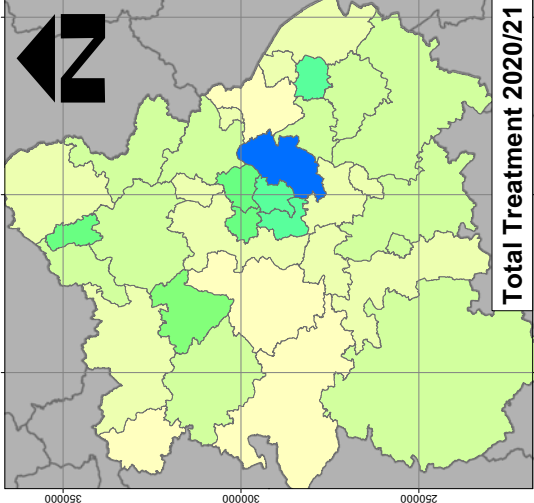
Recycling 2020/21



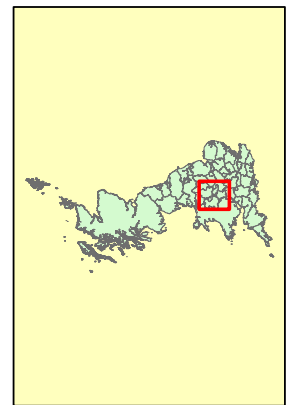
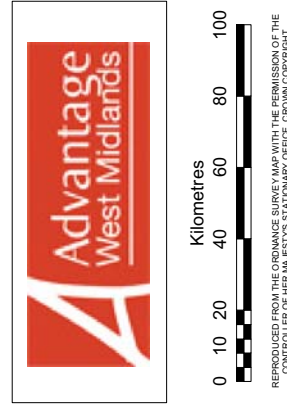
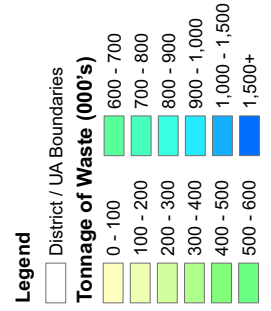
Organic 2020/21



Other Treatment 2020/21



Total Treatment 2020/21



Drawing

RSS MSW & C&I Treatment Requirement (Excluding Landfill)

Project	WASTE CAPACITY STUDY	Drawing No.	2-3
Date	MARCH 2008		
Scale	1:1,500,000		

402-1798-00001_1007_WCS_2-3_2-403CLP

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2.6 Existing capacity

2.6.1 Recycling, organic and treatment capacity

The West Midlands Regional Assembly published the results of waste treatment facilities and capacity study in June 2007 (SLR Consulting) which provided the current best understanding of licensed treatment capacity within the region. Information from the WMRA study has been represented in Drawing 2-4 to illustrate existing recycling, organic and other treatment capacity in the region to a district / unitary authority level. The region currently has in excess of 7 million tonnes of waste treatment capacity (this consists of circa 4.5 million tonnes of recycling capacity, 0.5 million tonnes of organic treatment capacity and circa 2.0 million tonnes of other treatment capacity).

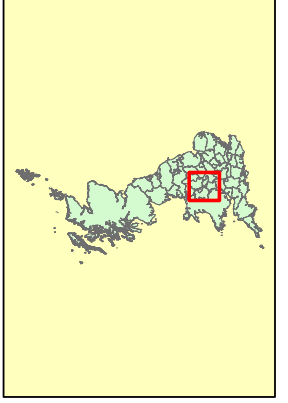
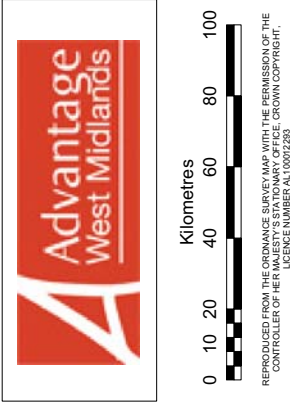
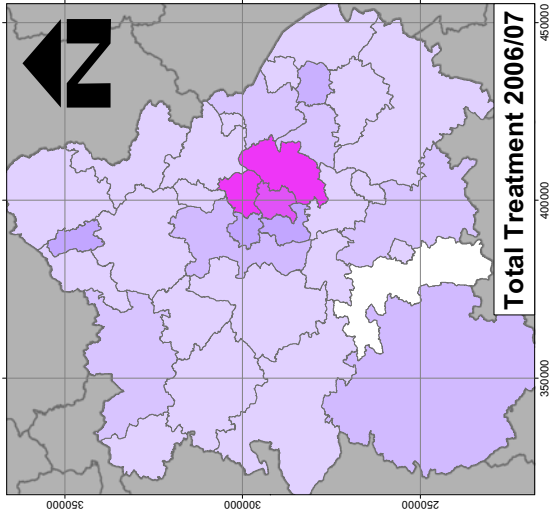
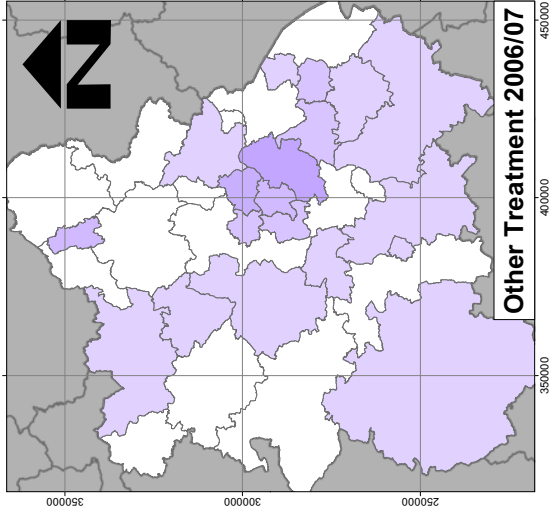
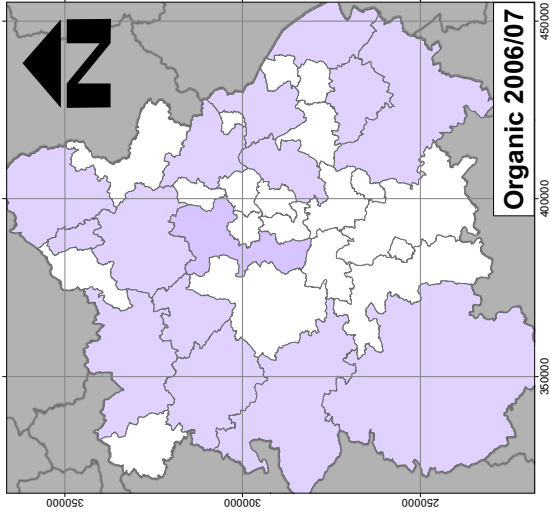
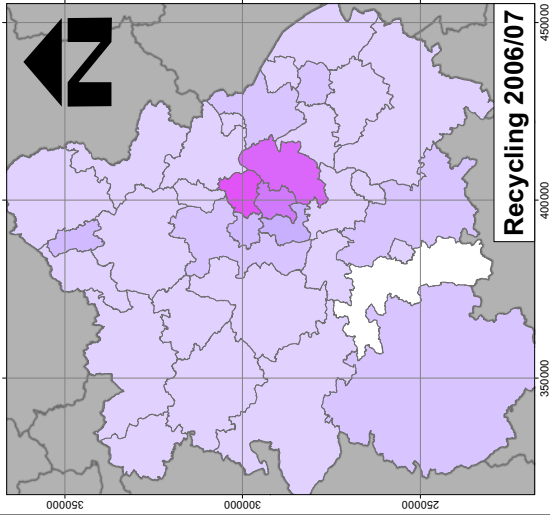
Drawing 2-4 indicates the following:

- **For recycling capacity:**
 - All but one district (Malvern Hills) has some form of existing treatment capacity, although the majority of districts / unitary authorities have less than 100,000 tonnes of total treatment capacity.
 - Recycling includes both primary recycling (or sorting) and secondary reprocessing¹⁵. This could lead to some double counting as many reprocessing facilities need materials produced from primary recycling.
 - At present there is limited understanding of the capacity split between recycling and reprocessing
- **For Organics treatment:**
 - Over half (19 No. districts) have no existing licensed organic treatment capacity
 - South Staffordshire District is the only authority with in excess of 100,000 tonnes of capacity.
 - The average existing organics capacity is approximately 16ktpa per district
- **For Other Treatment:**
 - Nearly half of all districts (15 No. districts) have no existing 'Other Treatment' capacity
 - The majority of other treatment is clustered around the metropolitan areas
 - The average existing capacity for 'Other Treatment' facilities is approximately 60ktpa per district and includes all of the large scale incinerators facilities within the region

The data associated with Drawing 2-4 is provided in Appendix 4 of this report.

A subtraction of all known existing treatment capacity estimated in this section from the total waste treatment need estimated in Section 2.4 provides an estimate of the capacity gap, which is presented in Section 2.6 of this report.

¹⁵ Refer to the glossary of terms contained in Appendix 5



Drawing

Existing Licensed Total Treatment Capacity (Excluding Transfer Stations & Landfill)

Project	WASTE CAPACITY STUDY	Drawing No.	2-4
Date	OCTOBER 2007		
Scale	1:1,500,000		

402-1796-0001_1007_WCS_2-4_1 403BS

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2.6.2 Transfer station capacity

The studies published by WMRA in June 2007 provide an understanding with regard to existing capacity for waste treatment facilities, and the situation with respect to landfill void. To complete the waste management infrastructure picture, and as a pre-cursor to the development of this market intervention strategy, was to improve the evidence base on transfer stations capacity within the region. Full details of the study methodology, results and conclusions are found in Appendix 1 to this report.

Drawings 2-5 and 2-5a present the locality and capacity information of all known operational transfer stations. The West Midlands region has an estimated total of 4.25 million tonnes of transfer station capacity¹⁶. Birmingham has the greatest capacity (at 1 million tonnes), followed by Staffordshire (at 0.5 million tonnes), and combined they account for over a third of the total existing capacity for the region.

Responses to the transfer station study indicated that approximately 70% of those facilities who responded to the survey were currently performing some pre-treatment (hand picking, automated screen, mechanical extraction, chemical extraction etc). Many existing transfer facilities currently contribute to the diversion of waste from landfill.

In terms of actual tonnage diversion, the range of responses varied from 27% to 100% of waste input, with 60% representing a common performance. Transfer station capacity throughputs range from less than 5,000 tonnes per annum to over 75,000 tonnes per annum.

However, for illustrative purposes only, transfer station capacity has the potential to provide between 0.8 to 1.8 million tonnes of diversion (recycling) capacity, based on the calculations demonstrated in Table 2-6. Further validation of these estimates using EA facility data returns may provide a more accurate estimation of current diversion rates achieved across the region, however this remains outside the remit of this study.

Table 2-6
Calculations to estimate recycling contribution from transfer stations

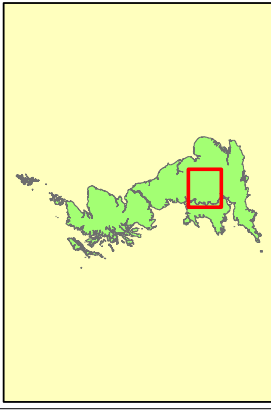
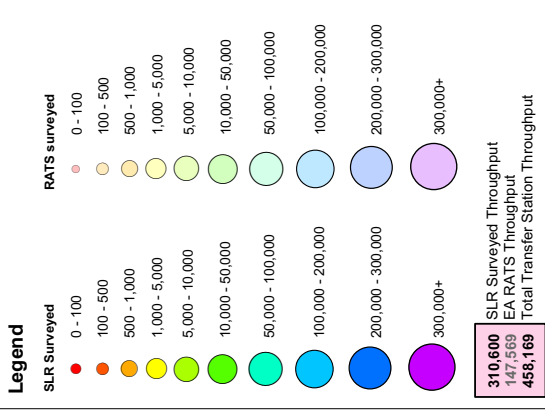
Transfer station capacity	4.25 million tpa	
Proportion of pre-treatment ¹⁷	70%	
Estimated capacity which is pre-treated	2.98 million tpa	
Indicative diversion rates from landfill	27%	60%
Potential diversion of recyclables from landfill	0.80 million tpa	1.79 million tpa

Note: Above figures are best guess estimates. Contributions from transfer stations to divert recyclables from landfill have not been included in the capacity gap calculations described in the next section.

The above estimates of the contribution transfer stations potentially provide to the region indicate that increasing diversion at these facilities could mitigate the need for future recycling infrastructure. Due to the paucity of data on the amount of actual recycling at transfer stations no account is made within the capacity gap calculations estimated in Section 2.6.

¹⁶ The capacity at waste transfer stations is a result of survey findings. Site return data from the Environment Agency (RATS database system) was validated (through telephone conversations and site visits) for those facilities contributing to a more comprehensive survey. The figure is an estimate due to the potential closure or opening of facilities, uncertainty as to whether facilities are operating at maximum capacity, changes in operations since data was collated etc.

¹⁷ Assumes that 70% of number of facilities equates to 70% of throughput, which would not be a solid assumption.



Geodetic Information
 British National Grid
 Transverse Mercator
 False Easting = 400,000m
 False Northing = 600,000m
 Central Meridian = 2° 0' 0" W
 Scale Factor = 0.9996
 Latitude Of Origin = 49°

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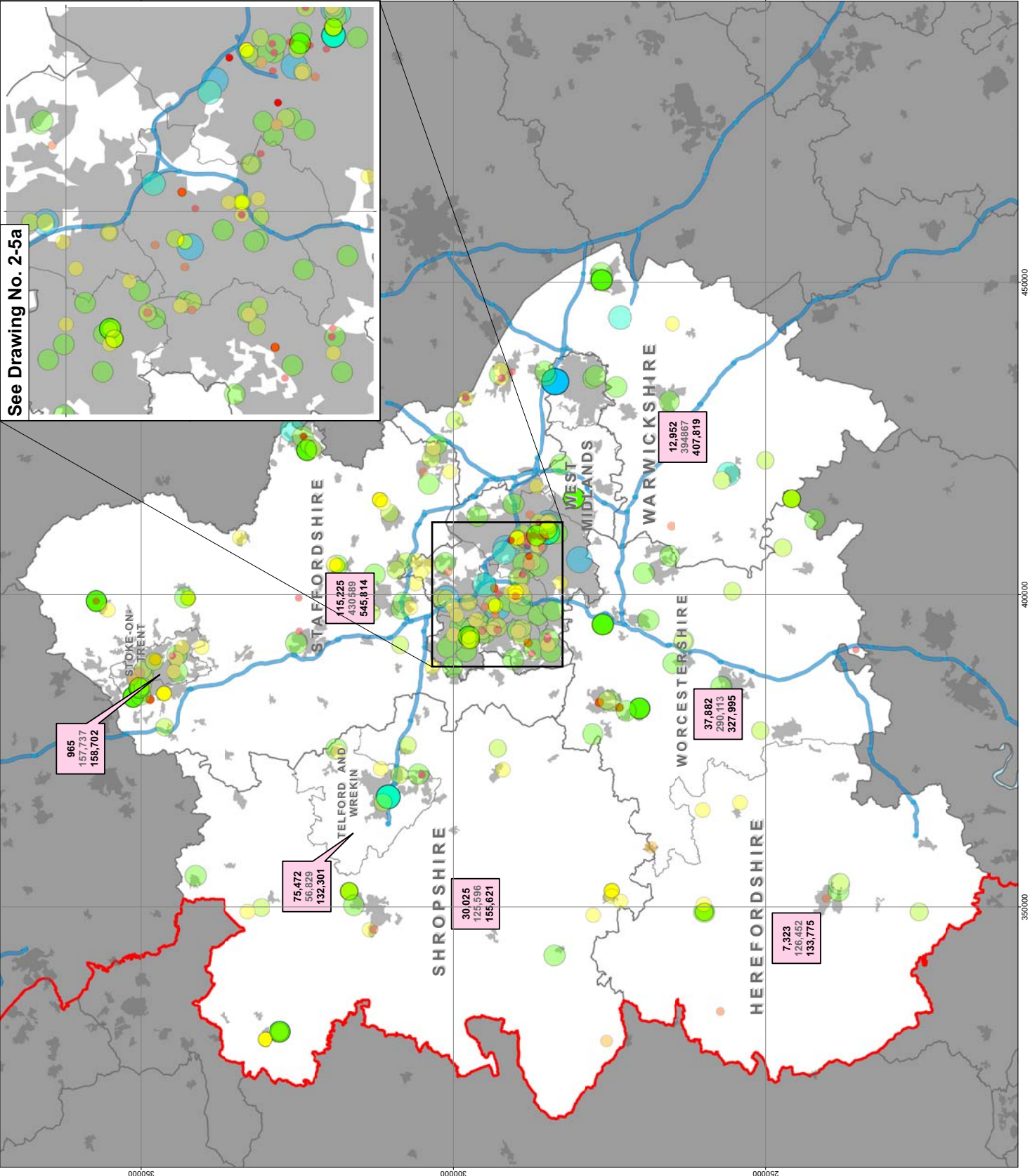
Drawing

Project	WASTE CAPACITY STUDY	Drawing No.	2-5
Date	OCTOBER 2007		
Scale	1:600,000		

402-1798-00001_1007_WCS_2-5_0_403BS

**Waste Transfer Facilities –
 SLR Surveyed and EA RATS
 Surveyed Throughput**

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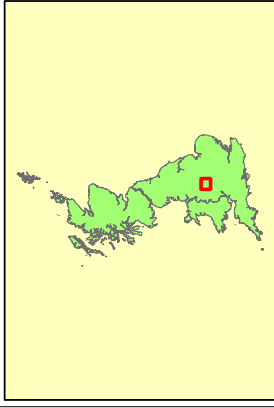
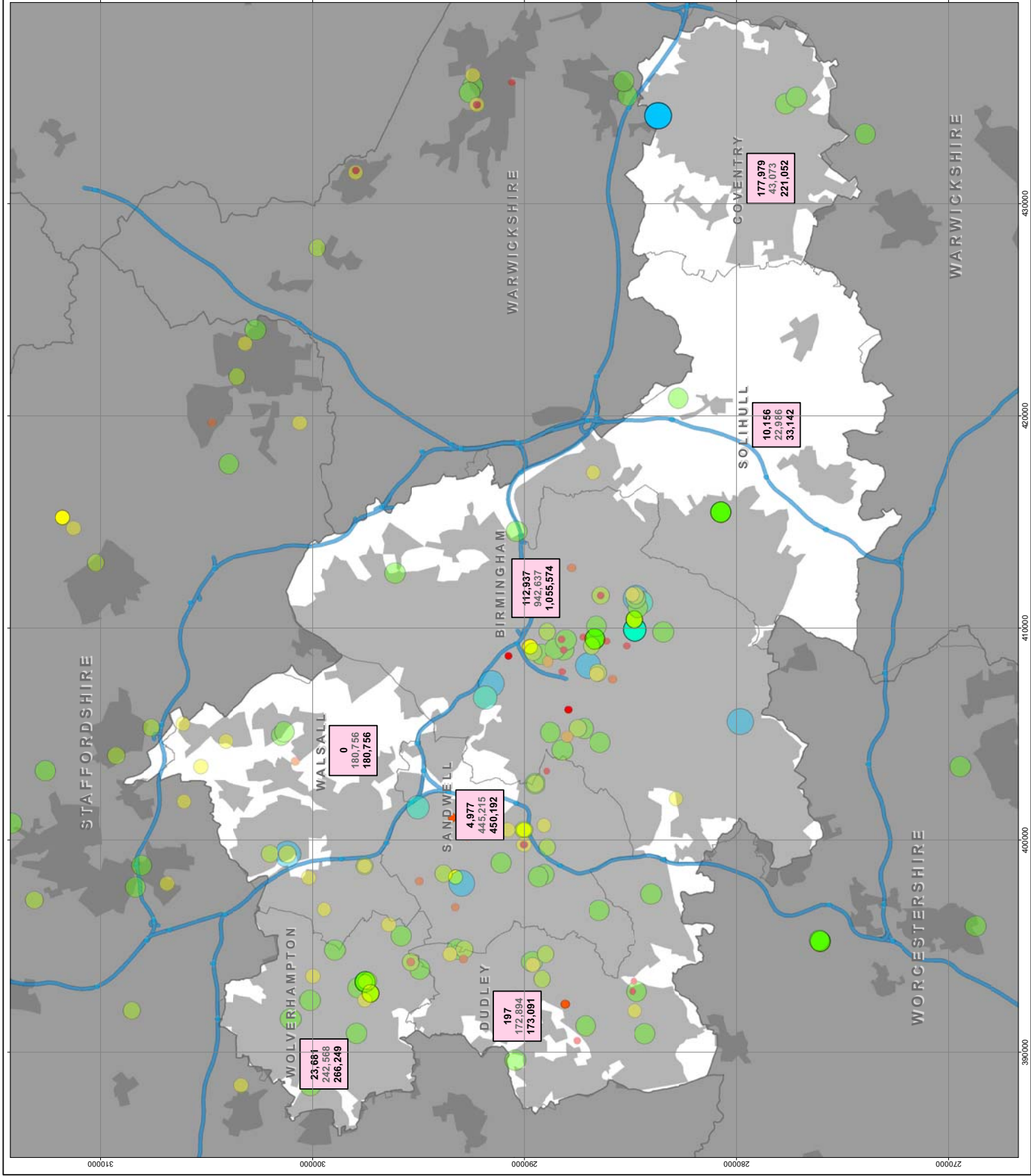
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Geographic Information
 British National Grid
 Transverse Mercator
 False Easting = 400,000m
 False Northing = 600,000m
 Central Meridian = 2°
 Scale Factor = 0.9996
 Latitude Of Origin = 49°

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**Waste Transfer Facilities –
 SLR Surveyed and EA RATS
 Surveyed Throughput**

Project WASTE CAPACITY STUDY
Date OCTOBER 2007
Scale 1:175,000

Drawing No. 2-5a
 402-1798-00001_1007_WCS_2-5a_0_403BS
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310000 300000 290000 280000 270000 400000 410000 420000

2.7 Estimating the capacity gap

The capacity gap is estimated by taking the RSS management need (identified in Section 2.4) and subtracting the existing capacity provision (identified in Section 2.5). The result is to produce the net excess or deficit in forecasted treatment requirement. In general, the need is greater in the long term than the capacity of the existing infrastructure, and therefore the difference is termed the capacity gap.

As demonstrated in Section 2.5 transfer stations could provide some capacity for diverting recyclables from landfill, however current estimates are unreliable and therefore have not been included within existing capacity estimates.

Drawing 2-6 identifies the capacity excess or deficit (gap) in the region for the short term (2007/08) and long term (2020/21), with blue shades representing an excess of capacity and red shades representing a deficit in capacity. The general trends illustrate a declining number of authorities with excess capacity (blue) and an increasing number of authorities with a deficit (red) for recycling, organics and other treatment between the year 2007/08 and 2020/21.

Although the region as a whole has sufficient capacity at present (2007/08), there is an imbalance between type of treatment; with an excess of Recycling (~1.0Mt excess¹⁸) and Other Treatment (~0.3Mt excess) capacity and a 0.4 million tonne gap for Organic Treatment capacity. Long term trends (2020/21) show a gap in capacity for all treatment types with particular short fall in the recycling (~2.1Mt deficit) and organic treatment (~1.4Mt deficit) capacities. The total long term treatment gap for the West Midlands region is 3.7 million tonnes by the year 2020/21 (Table 2-7).

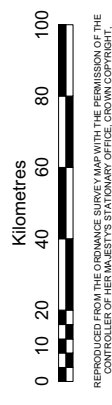
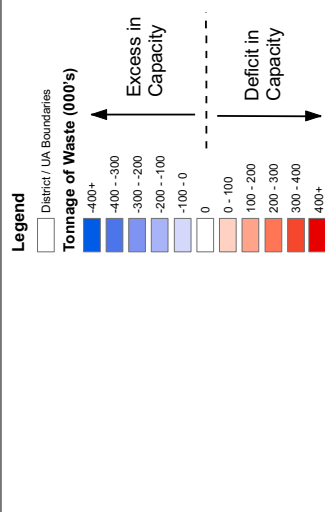
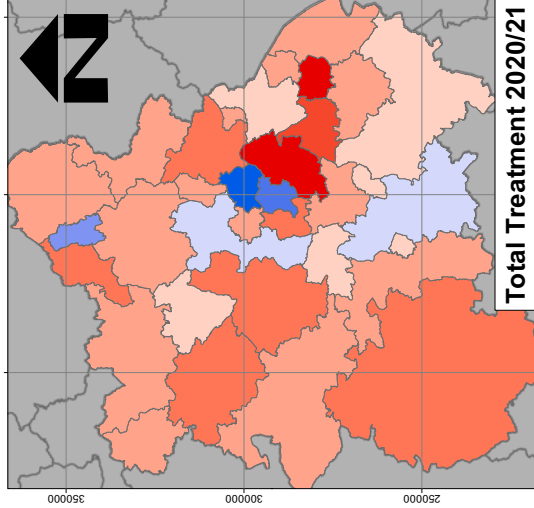
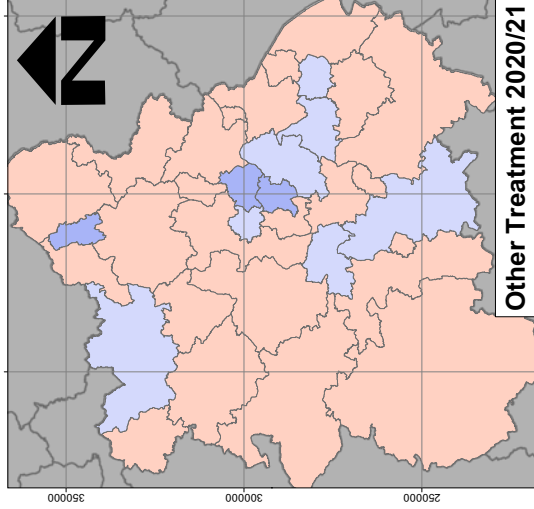
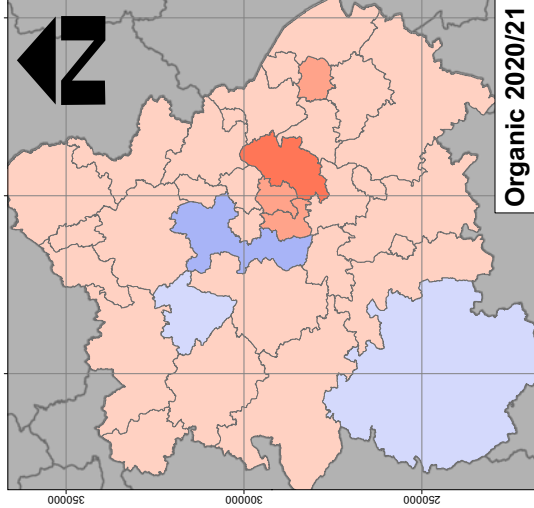
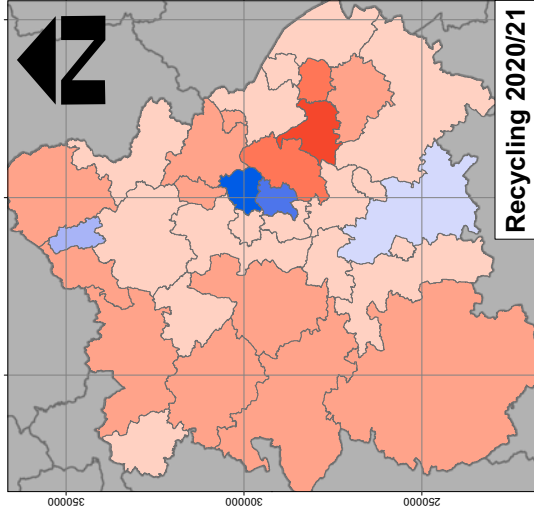
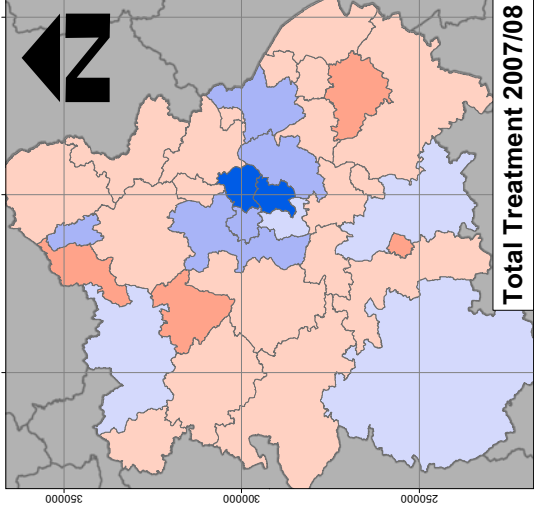
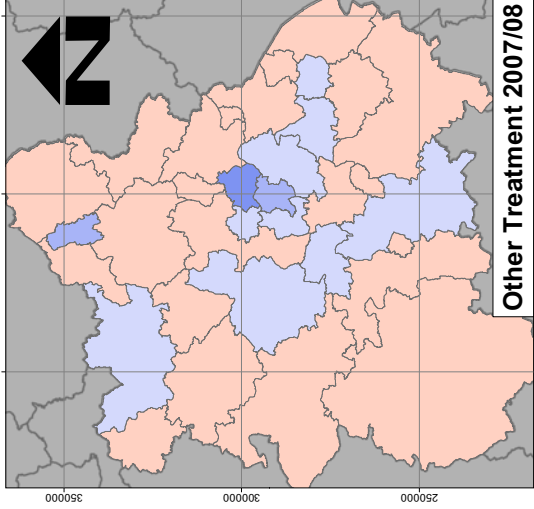
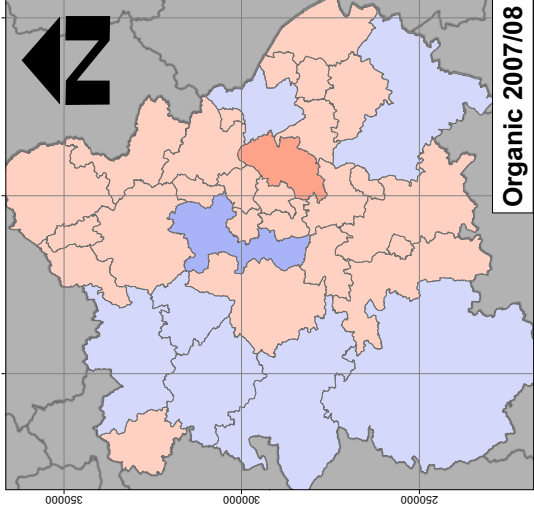
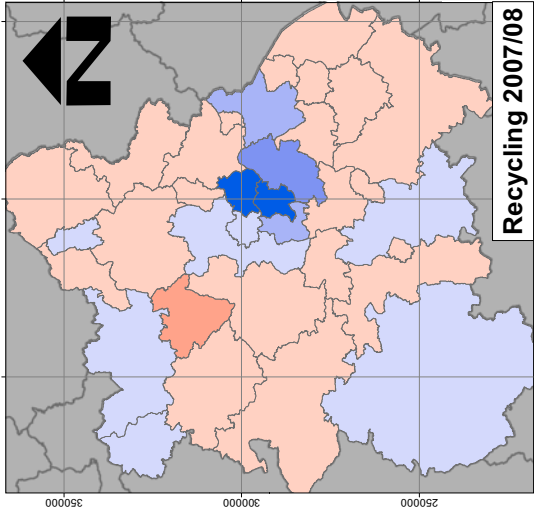
Table 2-7
Treatment gap for the West Midlands region (million tonnes)
(-ive value denotes capacity excess)

	2007/8 Gap (Mt)	2020/21 Gap (Mt)
Recycling	- 0.95	2.11
Organics	0.43	1.36
Other treatment	- 0.28	0.20
Total	- 0.80	3.66

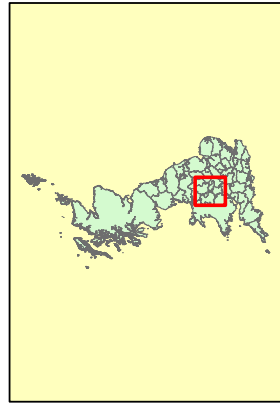
Note: Difference between the gap in the WMRA recycling and recovery facilities study and the gap for 2020/21 above are attributed to revision of the RSS waste arising and need forecast figures.

More detailed data relevant to this section is presented within Appendix 4.

¹⁸ This may be much higher due to the fact that existing recycling capacity includes both primary recycling and secondary reprocessing



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Short and Long Term MSW & C&I Treatment Gap

Drawing No. **2-6**

Project	WASTE CAPACITY STUDY
Date	MARCH 2008
Scale	1:1,500,000

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Tables 2-8, 2-9, 2-10 and 2-11 identify the three authorities with the highest gap (deficit) and lowest gap (depending on treatment type either excess or deficit) for each treatment type.

**Table 2-8
Recycling gap for the short and long term**

	2007/8		2020/21	
	District	Gap (kt)	District	Gap (kt)
Three Highest gaps	Telford and Wrekin UA	117	Solihull	309
	Solihull	97	Coventry	291
	Warwick	84	Birmingham	208
Three Lowest gaps	Birmingham	-261	Stoke-on-Trent UA	-110
	Sandwell	-509	Sandwell	-376
	Walsall	-770	Walsall	-584

**Table 2-9
Organic treatment gap for the short and long term**

	2007/8		2020/21	
	District	Gap (kt)	District	Gap (kt)
Three Highest gaps	Birmingham	146	Birmingham	289
	Coventry	63	Coventry	132
	Dudley	62	Dudley	116
Three Lowest gaps	South Shropshire	-28	Telford and Wrekin UA	-18
	County of Herefordshire UA	-75	County of Herefordshire UA	-23
	South Staffordshire	-149	South Staffordshire	-128

**Table 2-10
Other treatment gap for the short and long term**

	2007/8		2020/21	
	District	Gap (kt)	District	Gap (kt)
Three Highest gaps	Telford and Wrekin UA	50	County of Herefordshire UA	85
	Stafford	46	Shrewsbury and Atcham	54
	Newcastle-under-Lyme	41	Oswestry	50
Three Lowest gaps	Stoke-on-Trent UA	-113	Sandwell	-111
	Sandwell	-125	Stoke-on-Trent UA	-163
	Walsall	-217	Walsall	-188

Table 2-11
Total treatment gap for the short and long term

	2007/8		2020/21	
	District	Gap (kt)	District	Gap (kt)
Three Highest gaps	Telford and Wrekin UA	152	Birmingham	444
	Warwick	113	Coventry	406
	Newcastle-under-Lyme	104	Solihull	353
Three Lowest gaps	Birmingham	-172	Stoke-on-Trent UA	-268
	Sandwell	-573	Sandwell	-383
	Walsall	-940	Walsall	-675

2.8 Potential land take need to meet the gap

Based on the above assessment the West Midlands region requires an additional 3.7 million tonnes of treatment capacity (recycling, organics and other) by the year 2020/21. This requirement for additional capacity means expansion or intensification of existing facilities or provision of new facilities will be required, both of which will have a land take requirement.

The identified future capacity gap has been converted to number of facilities required and subsequently to land take requirements based on London Plan¹⁹ facility and land take size figures (as detailed in Table 2-12).

Table 2-12
Small and large facility throughputs and corresponding indicative land takes

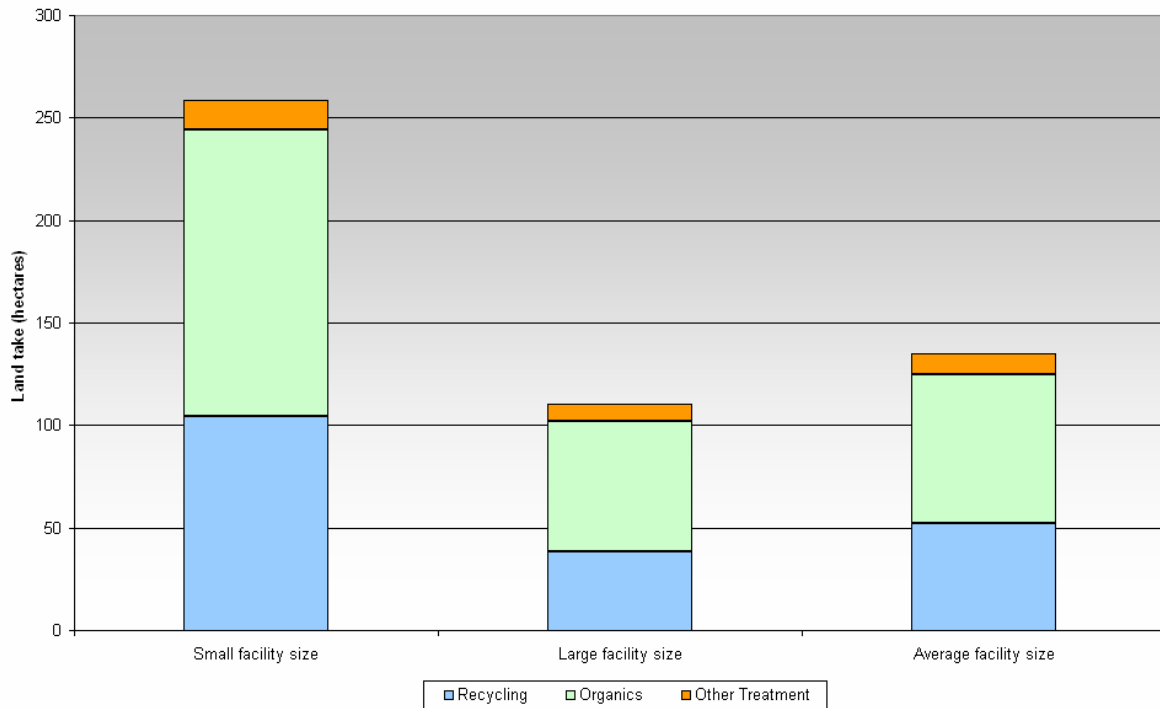
Facility Size	Recycling		Open Windrow		In-vessel		Other Treatment	
	T'put (t)	Land take (Ha)	T'put (t)	Land take (Ha)	T'put (t)	Land take (Ha)	T'put (t)	Land take (Ha)
Small	25,000	0.8	15,000	1.0	5,000	0.5	60,000	1.0
Large	85,000	1.0			60,000	2.0	250,000	2.5
Average	55,000	0.9			32,500	1.3	155,000	1.8

Using the land take estimates in Table 2-12 the West Midlands region requires an additional 135 hectares of land to locate sufficient waste facilities to manage the capacity gap²⁰. Figure 2-4 presents the range of land take required based on assuming small or large facilities which ranges between 111 and 259 hectares. The above estimates are based on facilities operating at 100% of capacity at all times, and therefore actual land take could be nearer double the above estimates.

¹⁹ <http://www.london.gov.uk/mayor/planning/strategy.jsp>

²⁰ (based on average facility sizing to account for some small scale facilities and some large scales facilities) (equivalent to 0.5% of the land area of Birmingham). Land take requirements for the gap in organic treatment is based on an assumed proportion of 25:75 open windrow to in-vessel provision.

Figure 2-4
Land take requirement to meet regional gap in treatment capacity



The land take requirement by district / unitary authority is presented in Figures 2-5, 2-6 and 2-7 for recycling, organics and other treatment respectively. The left hand axis details land take, while the right hand axis details the number of averaged sized facilities required.

Figure 2-5 illustrates that nearly all districts / unitary authorities (with a capacity gap) require at least one additional recycling facility by 2020/21, Solihull and Coventry require 5 averaged sized recycling facilities each with a land take in excess of 9 hectares in total.

Figure 2-5
Land take requirement to meet the estimated future recycling gap in 2020

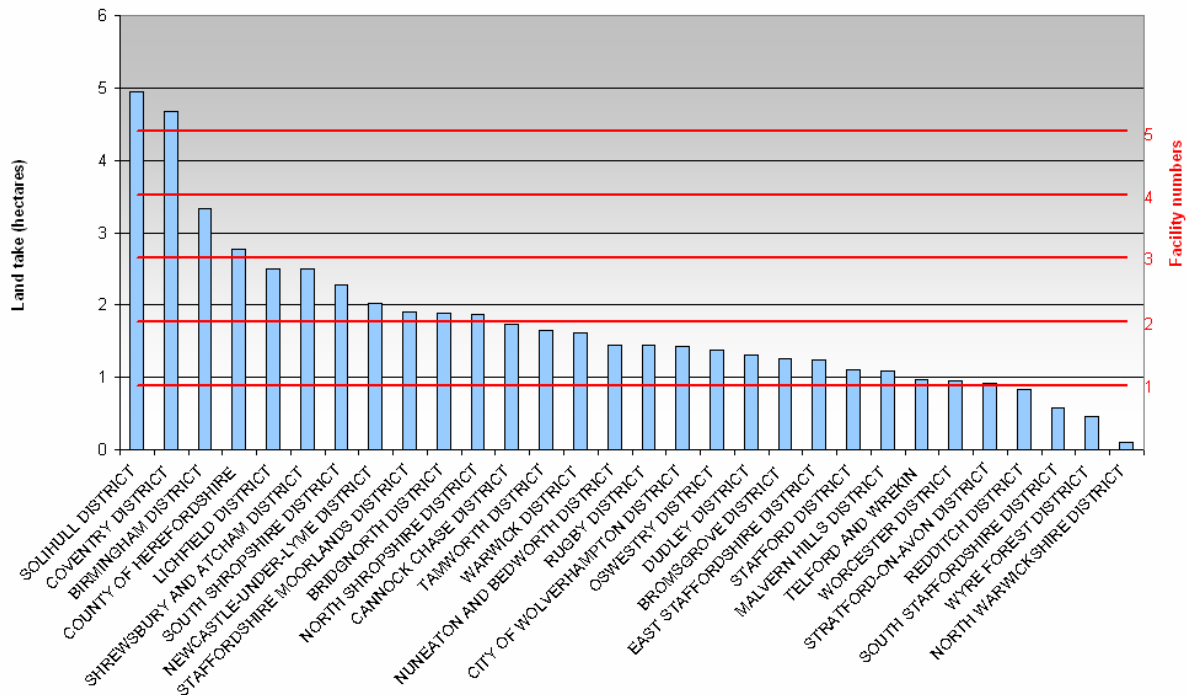


Figure 2-6 illustrates that large areas of land are required in the metropolitan area for organic treatment. Due to license restrictions, organic treatment facilities have strict operating requirements to minimise odour and other impacts and have traditionally been located in more rural locations.

Figure 2-6
Land take requirement to meet estimated Organic Treatment gap in 2020

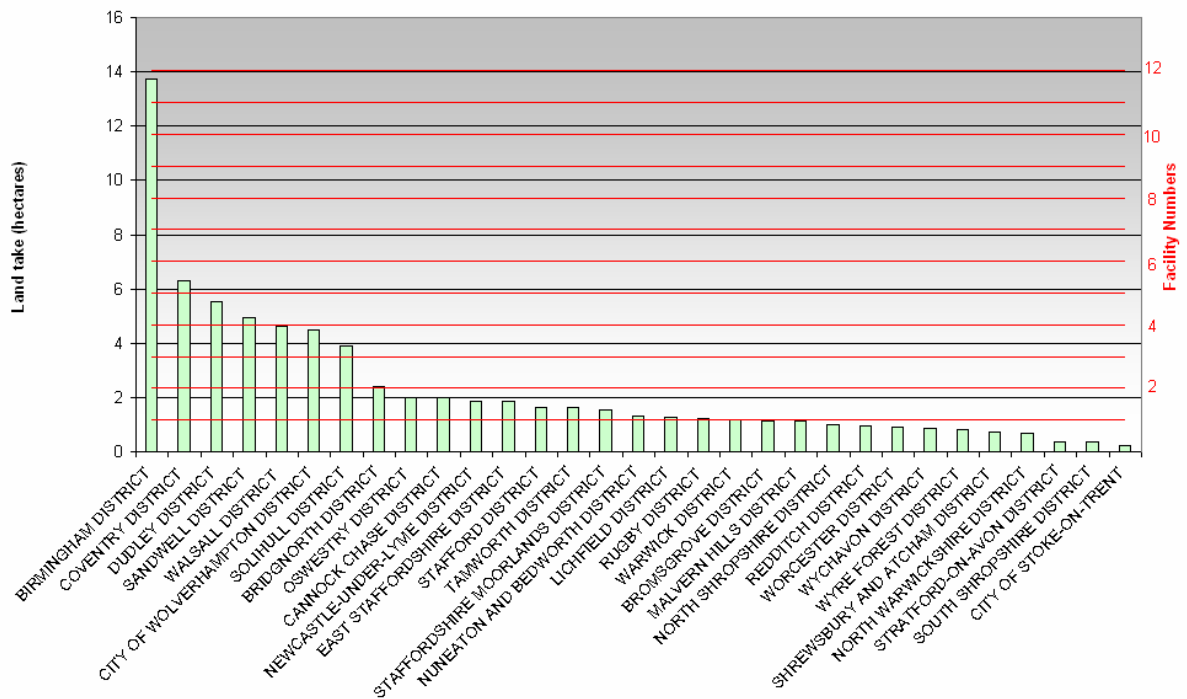
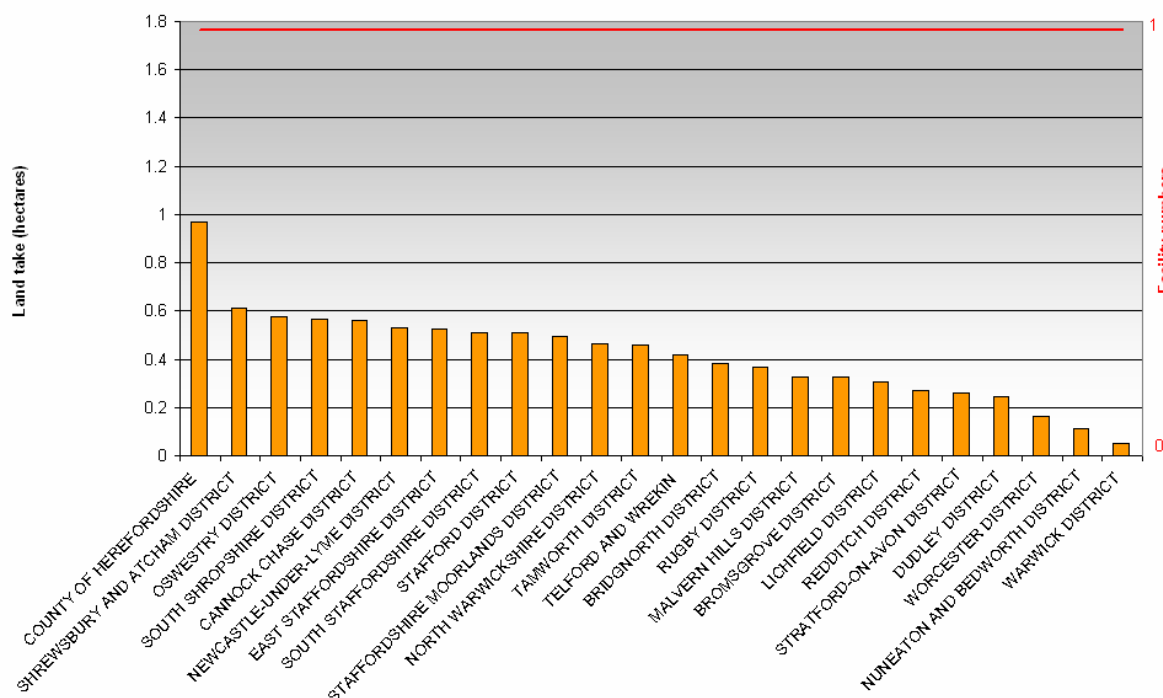


Figure 2-7 illustrates that fewer districts / unitary authorities require land take for other treatment. In addition, none have sufficient requirement for 1 averaged sized facility.

Therefore smaller facilities or a co-operative approach to provision of a shared treatment facility will be required to meet the future forecasted capacity gap.

Figure 2-7
Land take requirement to meet estimated Other Treatment gap in 2020



2.9 Material specific mapping

The material specific maps illustrated in Drawing 2-7 illustrates the total arising of certain materials in the municipal, commercial and industrial waste streams. Drawing 2-7 outlines the results of the material specific mapping exercise for Paper and Card, Plastic, WEEE, and Hazardous materials.

Paper and card and plastic generation figures were estimated based on the Welsh Assembly Government municipal waste composition for municipal arisings, and the Strategic Waste Management Assessment (SWMA) 1998/99 Environment Agency figures for the C&I waste stream. The general proportion of the C&I waste stream was further disaggregated based on waste compositions for different commercial activities²¹ applied to the business profile of the region. The estimated arisings of WEEE is based on England average generation figures for households and businesses²² applied to household and business numbers in each respective authority, while the hazardous waste produced is obtained from the Environment Agency Hazardous Waste Interrogator²³.

The generation of paper and card varies considerably across the region, from 10-20 ktpa in South Shropshire and Oswestry Districts to in excess of 100 ktpa for Birmingham, Sandwell, Dudley, Wolverhampton, Walsall, Coventry, Telford and Wrekin, and Stoke on Trent.

The generation of plastics illustrates a similar variability across the region in relation to the

²¹ Westminster Waste Analysis (SWAP, 2002).

²² Waste Strategy for England 2007

²³ http://www.environment-agency.gov.uk/commondata/103601/hazwastewm_1499477.xls

low and high generators, however at a lower magnitude. The lowest production is in the range of 0-5 ktpa and the maximum 50+ ktpa (Birmingham is the only authority to exceed 50ktpa).

The production of WEEE demonstrates less variability and range in the region, with nearly all authorities generating less than 10 ktpa. Dudley, Coventry and Birmingham are the only authorities producing in excess of 10 ktpa, with Birmingham producing the maximum amount of circa 30 ktpa.

Hazardous waste generation ranges from 0-5 ktpa to in excess of 50 ktpa. As with the generation of paper and card and plastics there is a considerable amount of variability between authorities in the region. Areas of Shropshire, Staffordshire and the southern areas of Warwickshire are generally the low hazardous waste producers. Birmingham, Sandwell and Walsall are the highest hazardous waste generating authorities. Of note is the proportionally higher levels of hazardous waste in Redditch, Rugby, North Warwickshire and Coventry compared to trends in the other materials, it is assumed that this must represent the industrial nature of those authorities.

Drawing 2-7 and the analysis above result in a common conclusion that generation of the above mentioned materials follows the general population concentration areas of the region. This is a logical conclusion, given that in general large population areas are paired with areas of high business numbers, therefore resulting in higher total waste generation, which is equated down to the material specific level.

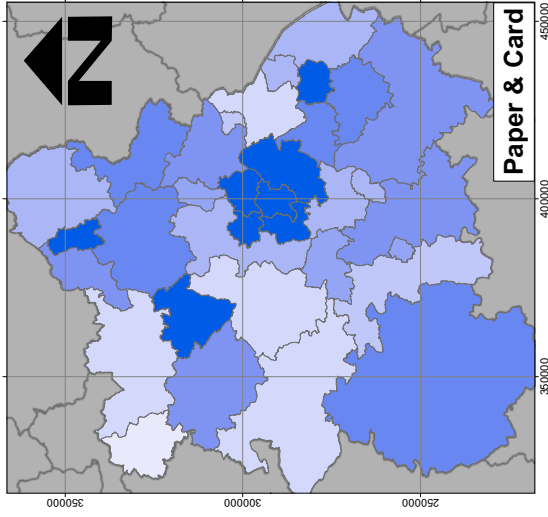
In conclusion, services or infrastructure developed around a specific material type should focus on the large population areas, which could subsequently provide services/capacity to the surrounding areas (of less generation). Clearly the material specific generation maps can not be used in isolation, comparison with infrastructure²⁴ and service provision maps are required to identify areas of greatest potential intervention.

To develop these material maps a stage further would involve a greater understanding of the C&I waste composition by sector and business size²⁵. The compositional information could be applied to the business profile for each district / unitary authority to produce greater clarity. At present data surrounding C&I waste compositions by sector is relatively poor. Based on the range of sectors and the range of business sizes within each sector, there is a considerable amount of work required to provide additional clarity on this issue. The trends illustrated in Drawing 2-7 are deemed appropriate to enable broad areas or hotspots of material generation.

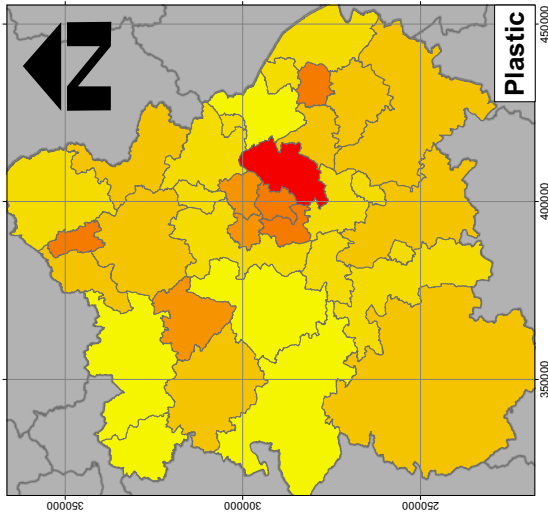
²⁴ The WMRA Waste treatment facilities and capacity study identifies accredited reprocessors (by material handled), however the report notes the difficulty in identification of materials handled by specific facilities, which therefore limits identification of the material specific gap.

²⁵ A recent study in the North West attempted to clarify composition of C&I wastes. Information from the North West study was not incorporated into this study for the following principle reasons:

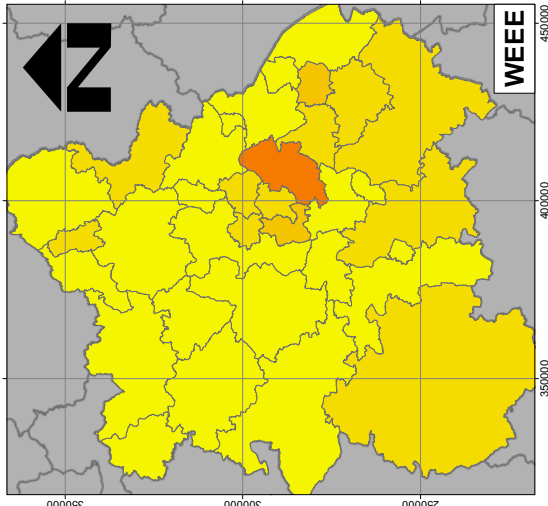
- relatively small sample number means composition by sector and size is not achievable;
- questionable sensibility in terms of transferring information from North West to West Midlands, as small changes in sector type can result in large changes to composition (local circumstances are different, for example a decline in pottery industry in Staffordshire has not resulted in a reduction of waste quantity, but has resulted in a vast change in waste composition);
- lack of compatibility with RSS projections and different size and sectors used in North West and available information in West Midlands; and
- the danger of providing unsupported detail which maybe taken as fact and influence unsupported development decisions.



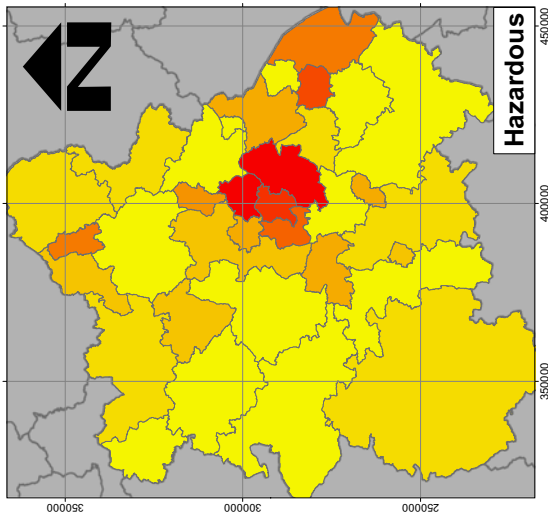
Paper & Card



Plastic



WEEE

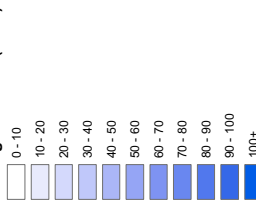


Hazardous

Legend (Paper & Card)

District / UA Boundaries

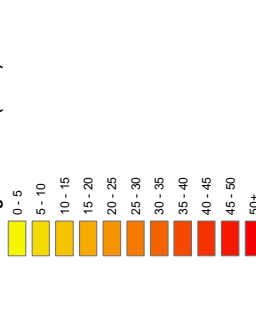
Tonnage of Waste (000's)



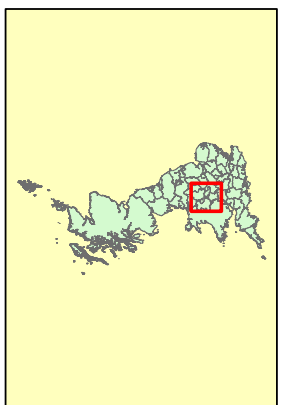
Legend (Plastic, WEEE & Hazardous)

District / UA Boundaries

Tonnage of Waste (000's)



REPRODUCED FROM THE ORDINANCE SURVEY MAP WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE. LICENCE NUMBER AL10012293.



Drawing

Material Specific Plan

Project	WASTE CAPACITY STUDY	Drawing No.	2-7
Date	MARCH 2008		
Scale	1:1,500,000		

402-1798-00001_1007_WCS_2-7_2_403CLP

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3 CURRENT DRIVERS FOR CHANGE

3.1 Summary of chapter

Regulatory impact assessment: The impact of the packaging waste, animal by products, hazardous waste and WEEE regulations is estimated to be 0.48 to 0.83 million tonnes of materials diverted from the C&IW stream by 2020. Recyclables and organics form the greatest proportions of those materials diverted for treatment as a result of the regulations.

Potential Costs of Regulations: Compared to the baseline (waste to landfill) the costs of WEEE and hazardous waste treatment remain high in the future, however there is a net saving for the treatment of recyclables and organics compared to landfill. In 2020 the net saving (to businesses) as a result of the regulations could be -£7.7 to -£12.3 million.

Overall regulatory stimulation: Costs savings and the number of facilities that maybe stimulated as a result of the regulations are relatively low; therefore current regulations will have minimal impact in stimulating diversion of C&IW from landfill.

The fiscal tipping point: Looking at gate fee costs alone, the processing of materials through a recycling or organic treatment facility is already competitive with the likely landfill costs, by 2015/16 the cost differential should increase such that higher segregated collection costs do not hinder diversion. Other treatment processes are likely to become preferential or competitive by 2015 due to the increase in landfill tax.

Need for additional market stimulation: Given the likely strength of landfill tax as a driver for improved C&IW management, it could be argued that little further intervention is necessary to effect change. Potential savings will only however be fully realised if new processing infrastructure and collections systems are introduced in a timely fashion. Potential facility developers are faced with the considerable challenges in proving financial cases to investors, identifying and securing appropriate sites, and obtaining planning permission. Early discussion between the waste management industry and other stakeholders is likely to play a central role in assisting the regions business in preparing for, and therefore maximising benefits from, the current shift in the waste market.

3.2 High level Regulatory Impact Assessment (RIA)

The aim of this RIA is to quantify the impact of regulatory mechanisms currently driving change in the management of commercial and industrial wastes (C&IW). Impacts considered are the total costs to West Midlands businesses, and required numbers of new facilities for alternative management. Regulatory areas considered here are:

- UK Animal By-Products Regulation (ABPR);
- EU Waste Electrical and Electronic Equipment (WEEE) Directive;
- Hazardous Waste Regulations; and
- Packaging Waste Regulations.

These mechanisms have all been introduced or came into force within the last 3 years. Key details of the four areas of regulation are given in Appendix 3. Impacts are assessed here for three future 'checkpoint' years: 2010, 2015, and 2020. This high level RIA does not account for all regulations, it aims to outline the RIA process and assess the key drivers which will drive infrastructure which is common to both C&I wastes and municipal wastes. Impacts associated with the End of Life Vehicles directive have not been assessed, as largely the

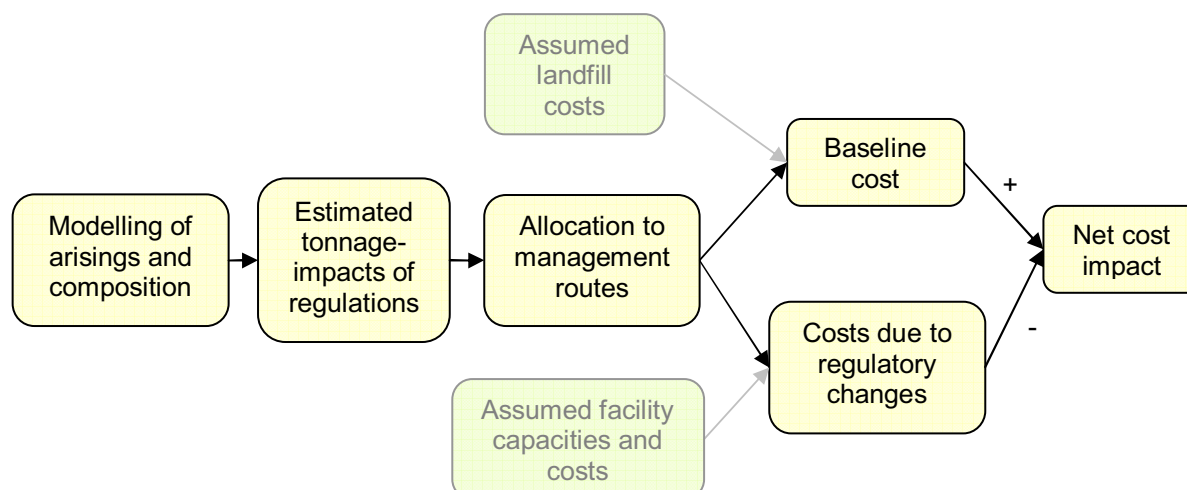
sector manages itself through demand and supply; landfill pre-treatment regulations have not been considered, although reference is drawn from the transfer station survey²⁶.

Effects of the landfill tax escalator are not included within this RIA, as these are extremely difficult to quantify in net monetary terms. Potential effects of the escalator are instead highlighted in the next section, which demonstrates a likely future ‘tipping point’ towards alternative management as landfill costs increase.

Figure 3-1 gives an overview of the assessment methodology. The starting point for the assessment is an estimate, for each checkpoint year, of C&W tonnages arisings by material type. Impacts of regulations are then approximated. The primary aim of the RIA is to estimate the net future cost impacts of recent legislation. The net impact is calculated as the cost associated with new management practices stimulated by the new regulation, less the baseline cost of managing the same waste according to traditional methods.

Stages of the assessment depicted in Figure 3-1 are explained in the following subsections.

**Figure 3-1
Overview of the RIA Methodology**



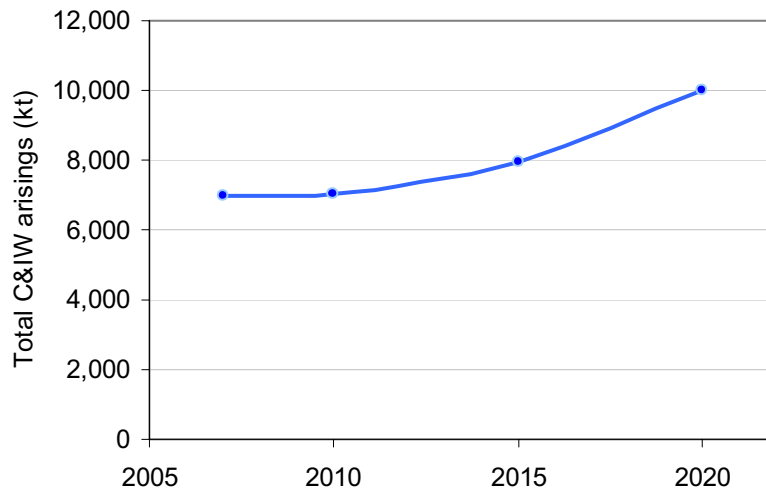
3.2.1 Modelling of Arisings and Composition

C&W arisings for the three checkpoint years are assumed to follow those predicted in the RSS, illustrated in Figure 3-2. The basis of the assumed composition for West Midlands’ C&W is the 2002/3 Environment Agency survey²⁷. For the purposes of the assessment, these results have been re-cast into seven core categories, as shown in Table 3-1. Resultant arisings by category for checkpoint years are given in Table 3-2.

²⁶ The impacts of the landfill directive pre-treatment regulations have not been considered in the RIA (although chapter 2 reviews the current pre treatment performance at transfer stations). A high level RIA could be developed, and this is something that SEPA have developed for Scotland. Similar organisations within England may be currently estimating the impact of the pre treatment regulations; similar exercises could be undertaken in the future as part of ongoing evidence base development.

²⁷ Environment Agency (2004), *Commercial and industrial waste survey 2002/3*, <http://www.environment-agency.gov.uk>

**Figure 3-2
Overview of the RIA Methodology**



**Table 3-1
Compositional Breakdown for C&IW in 2002/3**

Materials Category	Total (2002/3)	Fraction
Recyclable	2,138	29%
Organics	609	8%
Mixed residual	2,328	32%
WEEE	39	1%
Hazardous	546	8%
Inert	1,324	18%
Unclassifiable	281	4%

See below for an explanation of the categories related to the assessed regulations.

Table 3-2
C&IW Arisings by Category for Checkpoint Years (kt)

	2007	2010	2015	2020
Recyclable	2,057	2,076	2,342	2,943
Organics	585	591	667	838
Mixed residual	2,239	2,260	2,550	3,205
WEEE	38	38	43	54
Hazardous	525	530	598	752
Inert	1,274	1,286	1,451	1,823
Unclassifiable	271	273	308	387

3.2.2 *Estimated Tonnage Impacts of Regulations*

The objective of this stage of the assessment is to estimate, for each waste type, the fraction of total waste arisings that will require alternative treatment due to new regulation. Estimated impacts are listed in Table 3-3. This provides data for 2010 only, by way of example, though 2015 and 2020 have also been mapped as part of the analysis. Impacts are presented as likely ranges, as impacts cannot be stated in absolute terms with any degree of certainty.

As mentioned above, a description of each regulatory mechanism is provided in Appendix 3; hence the discussion here is limited to a summary of the specific impacts:

- **ABPR.** The ABPR regulations specify waste types which must undergo treatment prior to landfill to prevent the transmission of animal pathogens. A large part of compostable / digestible material is from industrial wastes, and with significant food and drink manufacturing in the West Midlands, it is assumed that 10-20% of this is what is known “Category 3” material²⁸, will require treatment in 2010. In 2005, however, Defra announced derogation for the treatment of “former foodstuffs” falling under the ABPR. We expect this aspect to take effect after 2010, and thus the tonnage of industrial wastes falling under the Regulations in 2015 will be much higher at 25-35%.
- **Hazardous Waste Regulations.** The hazardous waste regulations form part of the UK implementation of the Landfill Directive and result in the banning of landfill of some hazardous wastes and the requirement for pre-treatment to reduce the hazardous nature of other waste types. The analysis here assumes that these regulations will impact only upon waste which was not defined as “special” under the previous Special Waste Regulations regime. Appendix 3 gives a summary of these wastes, which we assume to make up 2-5% of the total hazardous stream and 1-2% of the Electrical and Electronic stream.
- **Packaging Regulations.** The packaging regulations aim to reduce the environmental burden of packaging by increasing the amount of recycling, with the onus on businesses to pay the costs of recycling. These regulations have been in operation for some time, but targets must still be met for a number of materials. Although much focus is now on extracting greater tonnages of recyclable materials from MSW, commercial waste also represents an untapped resource. As a result, it is estimated

²⁸ Category 3 material includes catering waste, and raw meat/fish from food manufacturers and food retailers.

that 2-5% of the recyclable / reprocessable waste type will be accessed by organisations along the recycling chain.

- **WEEE Regulations.** The WEEE regulations aim to increase re-use, recycling and recovery of WEEE and reduce the environmental impact of all those involved in the life-cycle of electrical and electronic equipment. These regulations are relatively straightforward in that they will only affect the electronic/electrical waste type. By 2010, we estimate that 80-90% of WEEE generated will be managed at WEEE licensed facilities.

It is important to note that none of the regulations impact upon the combustible / residual stream, nor upon the inert / non-combustible waste types, and thus no additional infrastructure for these categories will be stimulated by the regulation. It is also assumed there are no regulatory impacts for the composition of the unclassifiable stream, for which no compositional data exists.

Regulatory mechanism impacts set out in Table 3-3 are applied to the arisings in Table 3-2 to determine the total quantities of waste requiring management, as shown in Table 3-4.

Table 3-3
Estimated Fractions of Materials Streams Impacted by New Regulations in 2010 (%)

	ABPR		Hazardous		Packaging		WEEE	
	Low	High	Low	High	Low	High	Low	High
Recyclable	--	-	-	-	2%	5%	-	-
Organics	10%	20%	-	-	-	-	-	-
Mixed residual	-	-	-	-	-	-	-	-
WEEE	-	-	1%	2%	-	-	80%	90%
Hazardous	-	-	2%	5%	-	-	-	-
Inert	-	-	-	-	-	-	-	-
Unclassifiable	-	-	-	-	-	-	-	-

Table 3-4
Quantities of Waste Driven to Alternative Management by Regulatory Pressures (kt)

	2010		2015		2020	
	Low	High	Low	High	Low	High
Recyclable	42	104	141	351	206	441
Organics	59	118	167	233	209	293
Mixed residual	-	-	-	-	-	-
WEEE	31	35	41	44	52	55
Hazardous	11	27	12	30	15	38
Inert	-	-	-	-	-	-
Unclassifiable	-	-	-	-	-	-

3.2.3 Allocation to Management Routes

The wastes requiring alternative management in Table 3-4 are now allocated to particular technology or management routes, which include:

- processing in a specialised WEEE facility;
- separation in a materials recycling facility (MRF);
- treatment in an ABPR compliant in-vessel composter or AD facility; and
- disposal in a dedicated hazardous landfill or hazardous cell in a non-hazardous landfill.

Table 3-5 shows the split of this allocation according to the requirements of the regulatory drivers.

**Table 3-5
Allocation of Waste Types to Management Routes (2010)**

	MRF	Comp/AD	EfW/MBT	WEEE Processing	Hazardous Disposal
Recyclable	100%	-	-	-	--
Organics	-	100%	-	-	-
Mixed residual	-	-	-	-	-
WEEE	-	-	-	100%	-
Hazardous	-	-	-	-	100%
Inert	-	-	-	-	-
Unclassifiable	-	-	-	-	-

3.2.4 Baseline Cost

In calculating the baseline cost, it is assumed that all wastes are currently being disposed of to non-hazardous landfill. Typical landfill gate fees currently lie in the range £20/t to £30/t. Landfill tax must be paid in addition to these fees, and this currently stands at £24/t. The total landfill cost for delivered waste therefore currently stands at £44/t to £54/t.

In forecasting future landfill costs, it is assumed that operating costs increase at the rate of inflation (taken at 2.5%). Landfill tax is taken to increase according to the escalator. An annual increase of £8/t has been stipulated by the treasury up to 2010/11, at which point landfill tax will £48/t. Beyond 2010/11, it is judged to be highly likely that the escalator will be continued by Government to drive increasing diversion from landfill. Further annual escalation has been estimated at £5/t for years 2011/12, 2012/13 and 2013/14, and £3/t for years 2014/15, 2015/16 and 2016/17.

A further component of the baseline cost is that of collection of waste prior to landfill. This has been estimated at £15/t, with annual growth again set at an assumed rate of 2.5% inflation.

3.2.5 Costs Due to Regulatory Changes

Estimated costs associated with compliance with regulatory demands are summarised in Table 3-6. Costs presented in the table are those for collection and transfer, and recycling or

disposal, and are estimates of current merchant charges. As for the baseline costs, annual inflation at 2.5% is assumed in calculating costs for checkpoint years.

**Table 3-6
Estimated Costs for Non-Landfill Management**

	Facility Capacity (kt/y)	Collection and Transfer cost (£/t)	Cost for Recycling or Disposal (£/t)
MRF	55	£25	£40
Comp/AD	30	£30	£40
EfW/MBT	-	-	-
WEEE Processing	20	£60	£70
Haz Disposal	25	£60	£180

3.2.6 Net Cost Impact

The net cost impact is calculated as the difference, for the tonnages identified, between the costs of management required by regulatory change, and the baseline costs. Table 3-7 lists high and low estimates for each management area, and each target year.

Cost impacts for recycling and composting requirements are negative (i.e. a cost saving) due to avoided costs of landfill disposal. For WEEE processing and hazardous waste disposal, net costs are incurred, since charges for alternative management continue to exceed those for landfill.

The highest cost saving in future years is that associated with composting / anaerobic, due to the relatively high tonnage of material required to be diverted under ABPR. Hazardous waste incurs the highest future costs, due to the relative expense of hazardous waste collection and disposal.

**Table 3-7
Estimated Costs for Non-Landfill Management (£ million)
[-ive value denotes cost saving]**

	2010		2015		2020	
	Low	High	Low	High	Low	High
MRF	-0.5	-1.2	-2.4	-6.0	-3.7	-7.9
Comp/AD	-0.2	-0.4	-5.9	-10.2	-8.0	-13.1
EfW/MBT	-	-	-	-	-	-
WEEE Processing	0.9	1.1	0.6	0.6	0.9	1.0
Haz Disposal	1.9	4.7	2.1	5.4	3.1	7.7

3.2.7 Required Facility Numbers

A key area to assess for each regulation is the potential for stimulation of new infrastructure in the West Midlands. Table 3-8 draws upon tonnage data requiring management for each waste type, and upon the facility capacities set out in Table 3-6.

**Table 3-8
Estimated Facility Numbers for Non-Landfill Management**

	2010		2015		2020	
	Low	High	Low	High	Low	High
MRF	1	3	2	5	3	6
Comp/AD	6	13	26	44	34	56
EfW/MBT	-	-	-	-	-	-
WEEE Processing	2	3	3	3	4	4
Haz Disposal	1	2	1	2	1	2

3.3 The tipping point for alternative management

The RIA presented in Section 3.1 has been used to quantify the potential impact of regulations covering animal by products, packaging waste, WEEE and hazardous waste. Analysis suggests that the impact of these regulations, in terms of total annual costs incurred and required facility numbers, is relatively small.

The RIA did however demonstrated that, due to the current escalation of landfill tax at £8/t per year, recycling and composting will become a cost-saving activity by 2010. In this section, this 'tipping point' is further explored by quantifying the cost differential between landfill, on the one hand, and recycling, composting and residual treatment on the other. The focus is on gate fees paid on delivery of waste to facilities, exclusive of collection costs.

As for the case of the RIA, landfill tax is assumed to follow the trajectory illustrated in Figure 3-3. Following the rise to £48/t in 2010/11 under the current escalator of £8/t, it is suggested that landfill tax may rise by £5/t until 2013/14, then by £3/t before stabilising at £72/t²⁹. The basic landfill gate fee (that excluding tax) is assumed to currently range from £20/t to £30/t, and to be subject to 2.5% annual inflation up to 2020.

²⁹ A further increase in landfill tax beyond that already legislated is assumed on the basis that significant political pressure is likely to exist beyond to drive further material towards alternative treatment beyond 2010/11.

**Figure 3-3
Projected Landfill Tax**

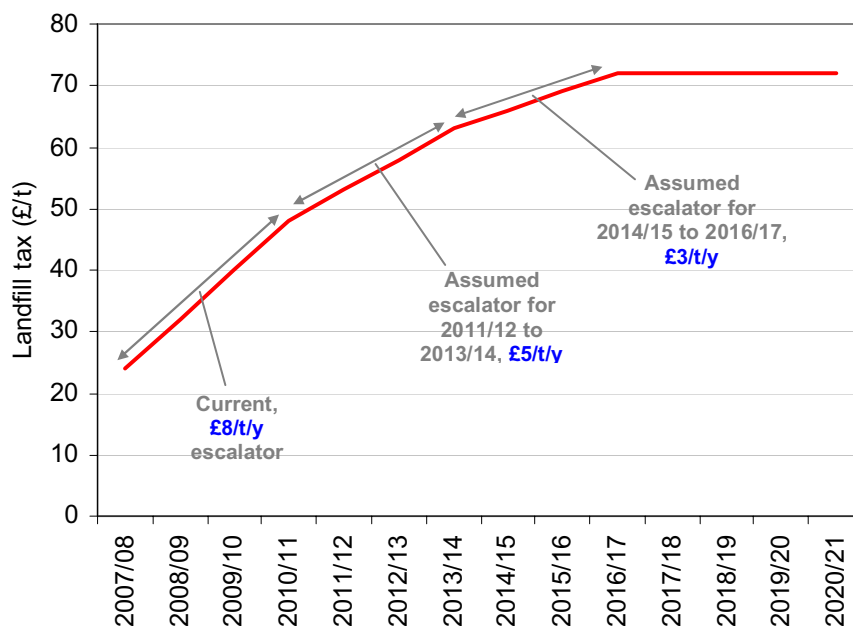


Figure 3-4, overleaf, compares the landfill gate fee thus forecasted with projected gate fees for recycling and composting. In forecasting recycling and composting gate fees, current prices ranges have been based upon estimates in Waste Strategy 2007³⁰ and these have been assumed to increase with inflation at 2.5%. Gate fees for each management option are shown as bars representing likely ranges. Options considered are processing in a materials recycling facility (MRF), open window (OW) and in-vessel (IV) composting, and anaerobic digestion.

The comparison in Figure 3-4 shows that in terms of gate fees on delivery, recycling and composting are already competitive with landfill. However, the cost of collection for segregated recyclable and compostable material exceeds that for mixed residual waste, by an estimated £10/t. As such, taking into account transport costs, landfill is currently still the cheaper option.

By 2010/11, landfill tax escalation is such that even taking into account relatively high collection costs, landfill gate fees lie towards the upper end of the price range for recycling and composting. Likely further landfill tax increases beyond 2010/11 result in landfill becoming a significantly more expensive option by 2015/16, regardless of any collection savings.

³⁰ <http://www.defra.gov.uk/environment/waste/strategy/strategy07/pdf/waste07-annexes-all.pdf>

Figure 3-4
Comparative Gate Fees for Landfill, and Recycling and Composting Facilities

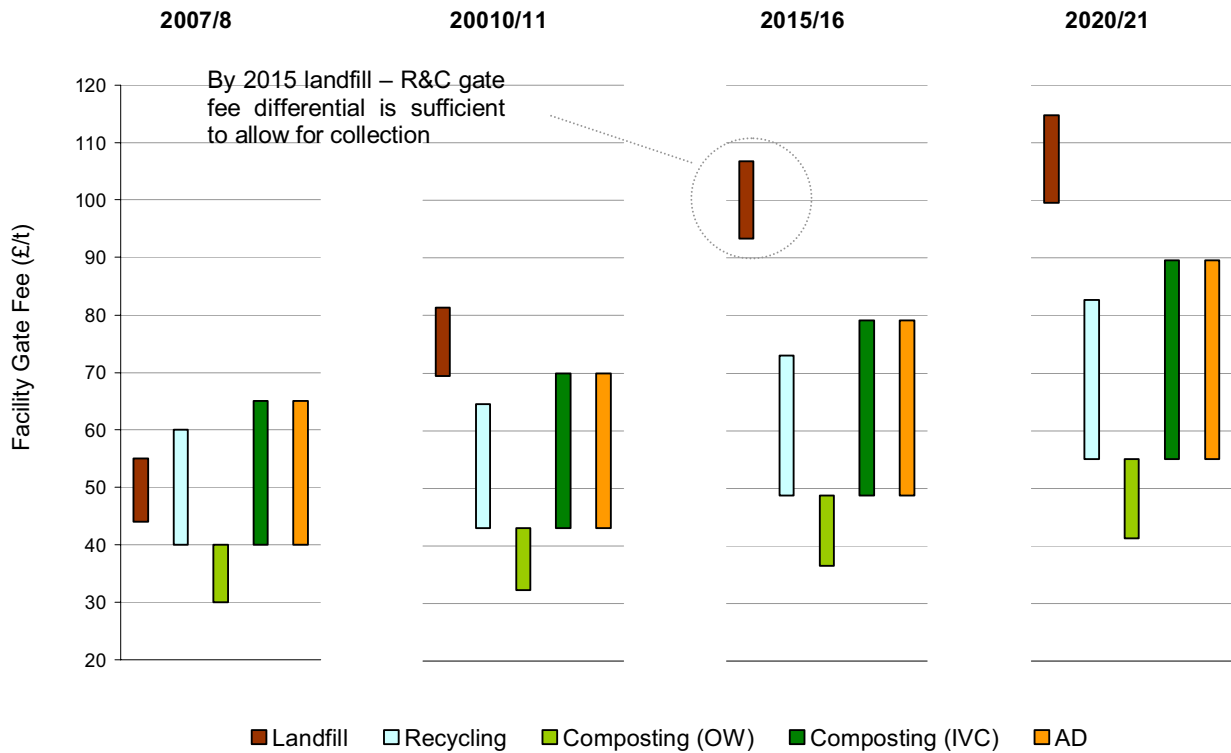
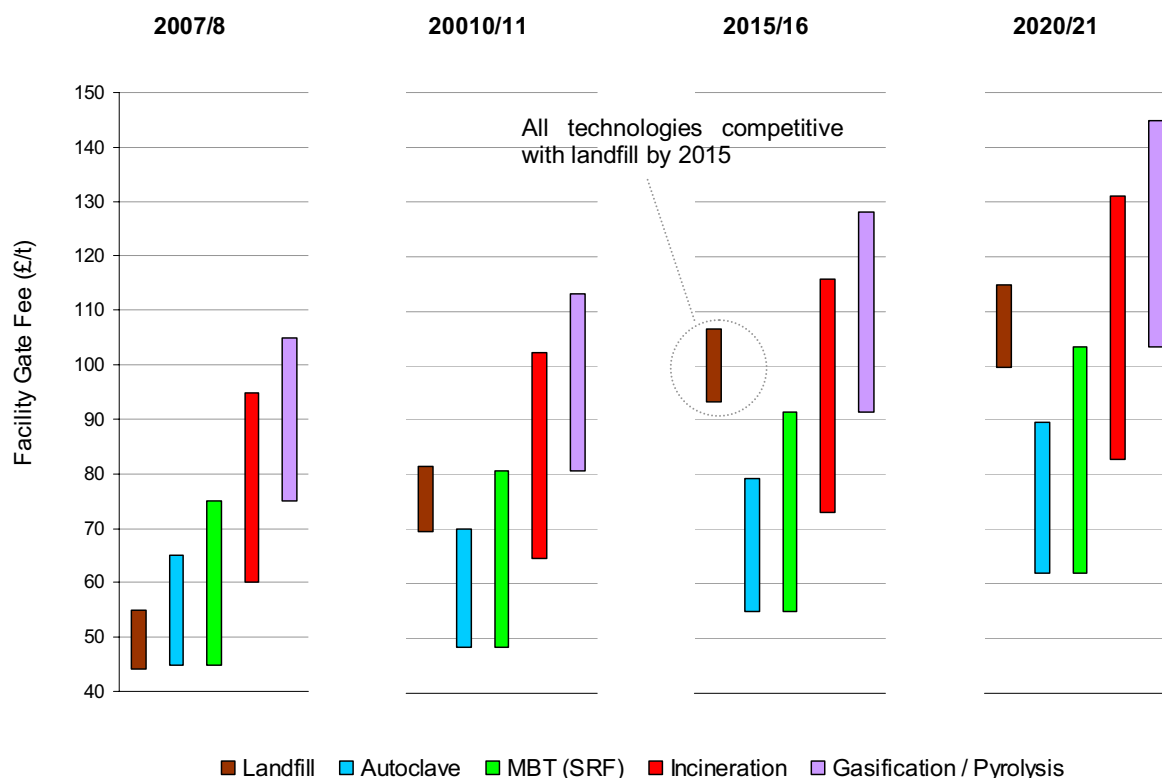


Figure 3-5, overleaf, compares projected landfill gate fees with those for the main residual treatment options currently available (autoclave, mechanical biological treatment, conventional mass-burn incineration, and ‘advanced’ gasification/pyrolysis thermal treatments). Present-day gate fees ranges for the various technologies are based on current market experience. In forecasting, inflation at 2.5% has again been assumed.

For the case of residual waste treatment, collection costs are likely to be comparable to those for landfill disposal, such that a direct comparison of gate fees for the two options is possible. Forecasts presented in Figure 3-5 show that by 2015, all major waste treatment technologies may be preferable to or competitive with landfill in terms of cost.

**Figure 3-5
Comparative Gate Fees for Landfill, and Residual Treatment Facilities**



While the overall cost implications of this tipping point for the West Midlands cannot be rigorously quantified, an order of magnitude estimate may be made for potential savings in the region. Figures from the Environment Agency’s commercial and industrial waste survey suggest that West Midlands businesses landfill approximately 1.8Mt of mixed waste annually. Assuming that in the future half of this could be diverted from landfill, at a cost saving of £10/t, savings to the region’s businesses would amount to £9M per annum. Diversion of the same quantity of waste from landfill would result in an estimated reduction of approximately 0.16 million tonnes carbon dioxide equivalent (CO₂ e) due to avoided landfill³¹

Given the likely strength of landfill tax as a driver for improved C&IW management, it could be argued that little further intervention is necessary to effect change. Potential savings will only however be fully realised if new processing infrastructure and collections systems are introduced in a timely fashion. Lead times for the construction of non-landfill options range from less than a year for smaller recycling and composting facilities, to in excess of five years for larger residual treatment facilities.

Potential facility developers are faced with the considerable challenges in proving financial cases to investors, identifying and securing appropriate sites, and obtaining planning permission. On the collection side, current systems are still heavily focussed around residual waste, and much work remains in encouraging behavioural change among waste producers.

³¹ Global warming potential (100 years) of 1 tonne of mixed waste is 0.177 tonnes CO₂ e based on a default waste composition direct to landfill (clay liner, HDPE cap) modelled in the Waste Resource Assessment Tool for the Environment (WRATE) life cycle assessment software released by the Environment Agency. Diversion of 0.9 Mt of waste results in a reduction of 159,313 tonnes of CO₂ e due to avoided landfill disposal. CO₂ e reduction is based on avoided use of landfill ONLY; estimate does not include the carbon burdens or savings associated with alternative treatment, reprocessing or secondary landfill; or the carbon burdens associated with collection, transportation and intermediate handling of waste.

Early discussion and intervention is likely to play a central role in assisting the regions business in preparing for, and therefore maximising benefits from, the current shift in the waste market.

4 KEY FINDINGS AND CONCLUSIONS

The key findings and conclusions from the study to develop the evidence base within the West Midlands are as follows:

Developing the evidence base:

- **Data inconsistencies:** There is a requirement to reconcile waste estimates between the REEIO model and the RSS model. A consistent approach should be used where possible, with new estimates incorporated as and when documents are reviewed;
- **Waste Arisings:** Total municipal, commercial and industrial waste arisings are forecasted to exceed 14 million tonnes by 2020/21; with Birmingham contributing over 15% of the regions total waste;
- **Forecasted Treatment Need:** Waste treatment need will reach 10.7 million tonnes by 2020/21, 60% of this need is for recycling capacity;
- **Existing Total Treatment:** It is estimated that currently the region has in excess of 7 million tonnes of total waste treatment capacity;
- **Existing Transfer Station Capacity:** Transfer stations provide an estimated additional 4.25 million tonnes of capacity with Birmingham and Staffordshire combined accounting for over a third of the regional capacity;
- **Pre-Treatment at Transfer Stations:** Response to the transfer station survey indicates that 70% perform some element of waste pre-treatment before onward movement to landfill;
- **Diversion at Transfer Stations:** Those facilities who pre-treat the waste quoted diversion of between 27% and 100% (general inert transfers) diversion of waste from landfill, with 60% being a common figure quoted;
- **Validation of Diversion at Transfer Stations:** The current best guess estimates for the amount of recycling activity undertaken at transfer stations could be validated through use of EA site return information;
- **Future Capacity Gap:** Currently (2007/08) the region has a 0.8 million tonne net excess of total treatment capacity, by 2020/21 the region has a capacity gap for all treatment types of over 3.7 million tonnes;
- **Future role of Transfer:** The capacity gap for organic treatment is estimated to be 1.3 million tonnes by 2020/21, with the recycling gap 2.1 million tonnes. Transfer stations could play a role in reducing the gap, however the magnitude of this assistance is still unclear;
- **The Uniqueness of Birmingham:** Currently Birmingham has the 3rd highest apparent capacity excess, although by 2020/21 it has the highest gap in total treatment capacity;
- **Future Land Take estimates:** Land take requirement to meet the regional gap amount to an additional 135 hectares of land (based on average facility capacity sizing and land takes); and
- **Specific Materials:** Material specific generation maps show production of paper and card, plastics, WEEE and hazardous wastes follow the population centres. A greater understanding of the location material specific services or waste facilities is required to refine material specific interventions, at present information relating to compositions of commercial and industrial wastes are limited.

Current drivers for change:

- **Recycling and Composting:** Cost impacts for recycling and composting (as a result of stimulation due to ABPR and Packaging Regulations) indicate a negative (i.e. a net cost saving) due to the avoided costs of landfill disposal;

- **WEEE and Hazardous:** For WEEE and hazardous waste disposal net costs are incurred, since charges for alternative management continue to exceed those costs for landfill;
- **Net Savings to Businesses:** Overall the net savings to businesses from stimulated diversion of materials from landfill amounts to -£7.7 million to -£12.3 million in the year 2020, and averages -£9 million;
- **Tipping Point for Recycling and Composting:** Tipping point analysis indicates that in terms of gate fees recycling and composting treatments are already competitive with landfill;
- **Collection Costs:** However when accounting for the additional costs associated with collection of segregated materials (compared to mixed residual) landfill still remains the cheaper option ;
- **Landfill Tax Impact:** Due to raising tax, the cost of landfill becomes significantly more expensive than recycling and composting by 2015/16, regardless of higher collection costs for waste segregation;
- **Tipping Point for Waste Treatment:** Forecasts suggest that by 2015 all major waste treatment technologies maybe preferable to or competitive with landfill in terms of cost;
- **Market Intervention:** Potential savings will only be fully realised if new processing infrastructure and collection systems are introduced in a timely fashion. Debate between key representatives from the waste industry and other interested stakeholders would be the first steps in developing the required change in the region.

5 RECOMMENDATIONS FOR FUTURE DELIVERY

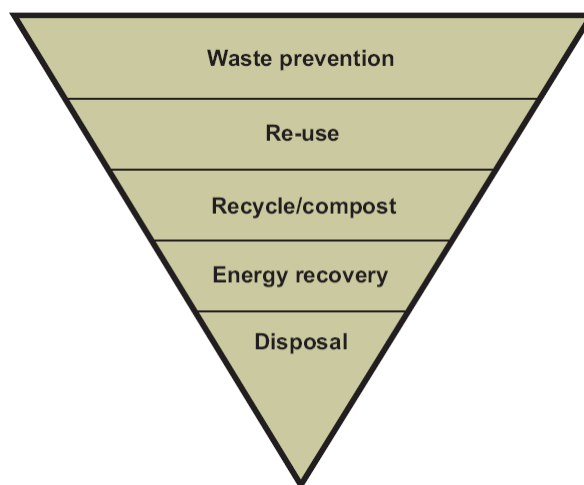
Interrogation and interpretation of the analysis documented above has resulted in a series of conclusions and potential actions for the region.

The actions outlined have regard to the waste hierarchy framework and its aim for greater sustainability in waste management. Figure 5-1 outlines the waste hierarchy from landfill (the least sustainable management method) to waste prevention (as the most sustainable action).

The actions developed are aimed at reducing the quantity of business waste sent to landfill, improving the treatment of waste, segregating materials where appropriate for recycling and re use. The actions also consider the minimisation and reduction of waste as the most sustainable action.

The movement of waste up the hierarchy not only has environmental benefits; there are opportunities to save money by making products with fewer materials and reducing the costs of waste management. In addition, more sustainable management of wastes can result in new business opportunities and job creation.

**Figure 5-1
Waste Hierarchy**



Source: Waste Strategy for England 2007 (Defra)

The list of potential actions and areas for future focus, research and discussion within the region are summarised as follows:

- Waste minimisation awareness;
- Waste minimisation action;
- Encourage landfill diversion;
- Enhance and intensify performance at existing facilities;
- Change of facility use from transfer to treatment;
- Safeguard existing waste management sites;
- Areas of opportunity mapping exercise of land for development;
- Stimulate development of organic, recycling and WEEE facilities;
- Minimise the barriers for recycling and landfill diversion by SMEs;
- Produce a directory of waste, useful organisations and waste collection and management companies for SMEs; and

- Enhance data sharing, consistency and transparency (for SME and the Waste Management industry).

It is anticipated that stimulation of debate and discussion with representatives from the waste management industry and other relevant stakeholders could be instrumental in assessing the above action list, prioritising and working towards ensuring the West Midlands has the future ability to sustainably manage the waste it produces.

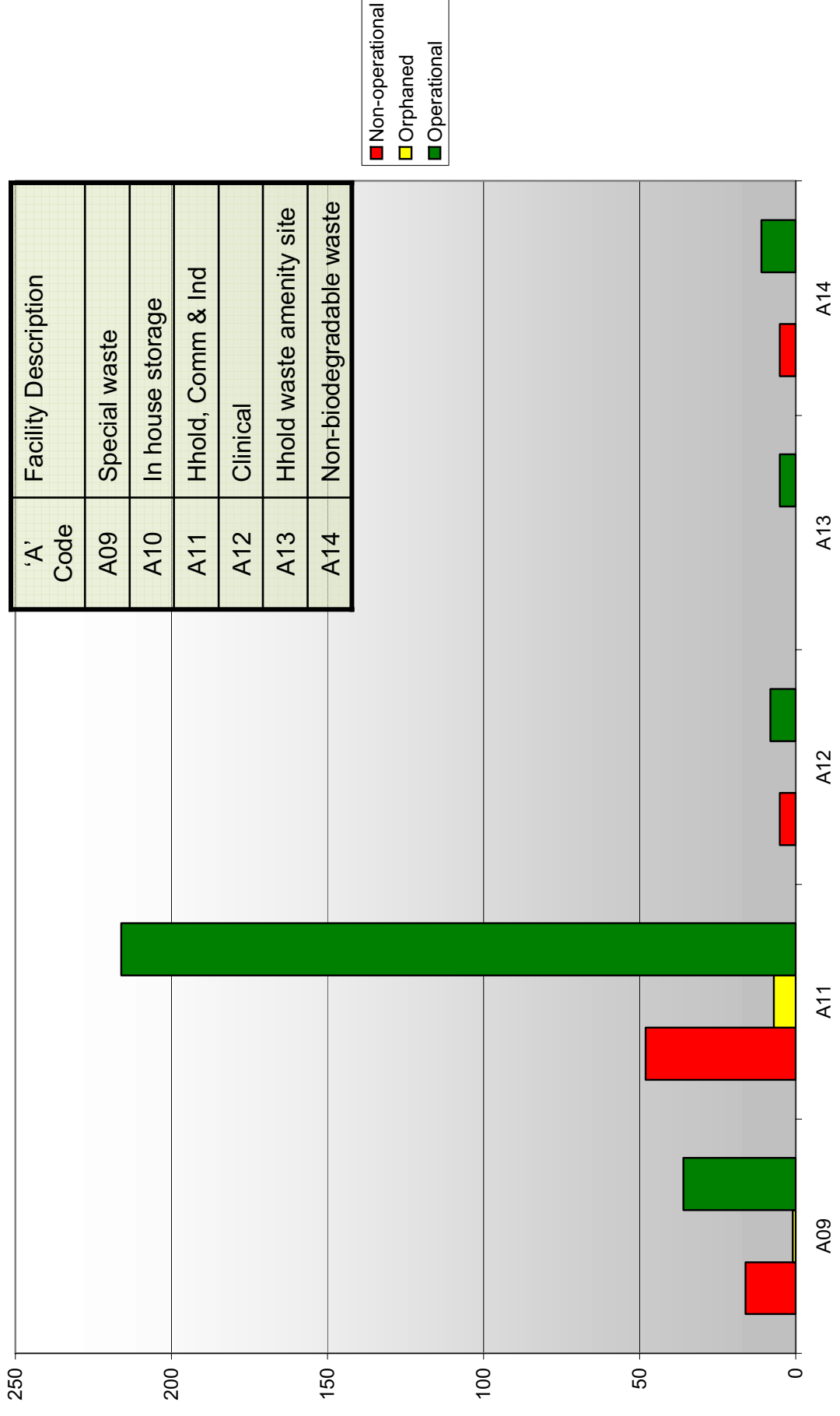
APPENDIX 1 – SUMMARY RESULTS OF TRANSFER STATIONS SURVEY

Contextual information

- **358 transfer stations** on the EA register for the West Midlands region
 - **77% classed as operational**
- Distribution of the regions transfer stations by EA ‘A’ Codes
 - **76% of facilities within the A11 category**

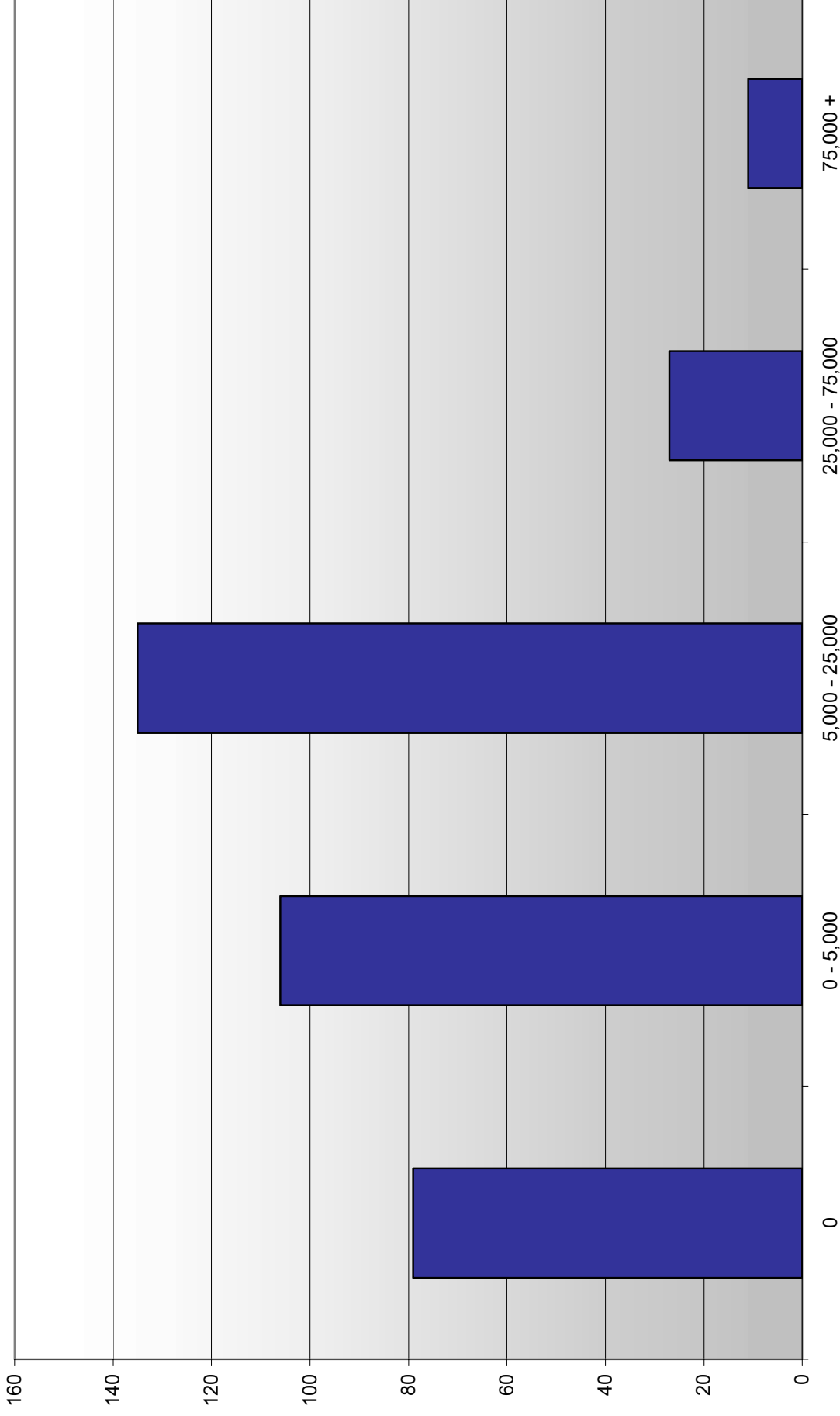
‘A’ Code	Facility Description	No. Facilities
A09	Special waste	53
A10	In house storage	0
A11	Hhold, Comm & Ind	271
A12	Clinical	13
A13	Hhold waste amenity site	5
A14	Non-biodegradable waste	16

Contextual information

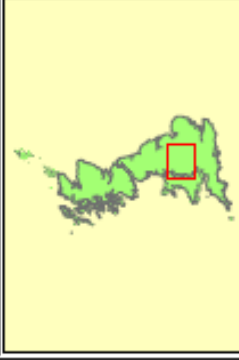


Contextual information

- Size banding based on the EA charge system (number of facilities)
 - 38% of facilities have a throughput of between 5ktpa and 25ktpa



- LEGEND**
- Operational Status
 - Operational ●
 - Orphaned ●
 - Non-operational ●
 - WPA Boundaries
 - England - Wales Border



Geographic Information

Transvision Mapmaker
 File Name: 14020001.dwg
 Central Meridian: 1° 30' 00.0000"
 Scale Factor: 0.9998
 Latitude of Origin: 52° 30' 00.0000"

0 2.5 5 10 15 20 25
Kilometres

WPA INFORMATION FOR THE CONTRACTOR SHOULD BE OBTAINED FROM THE OPERATIONS OF THE
 CENTRAL OFFICE OF WEST MIDLANDS DEVELOPMENT BOARD, GOSWOLD, COVENTRY, CV3 5EF.
 (PLEASE CONTACT THE BOARD FOR A LIST OF WPA'S)

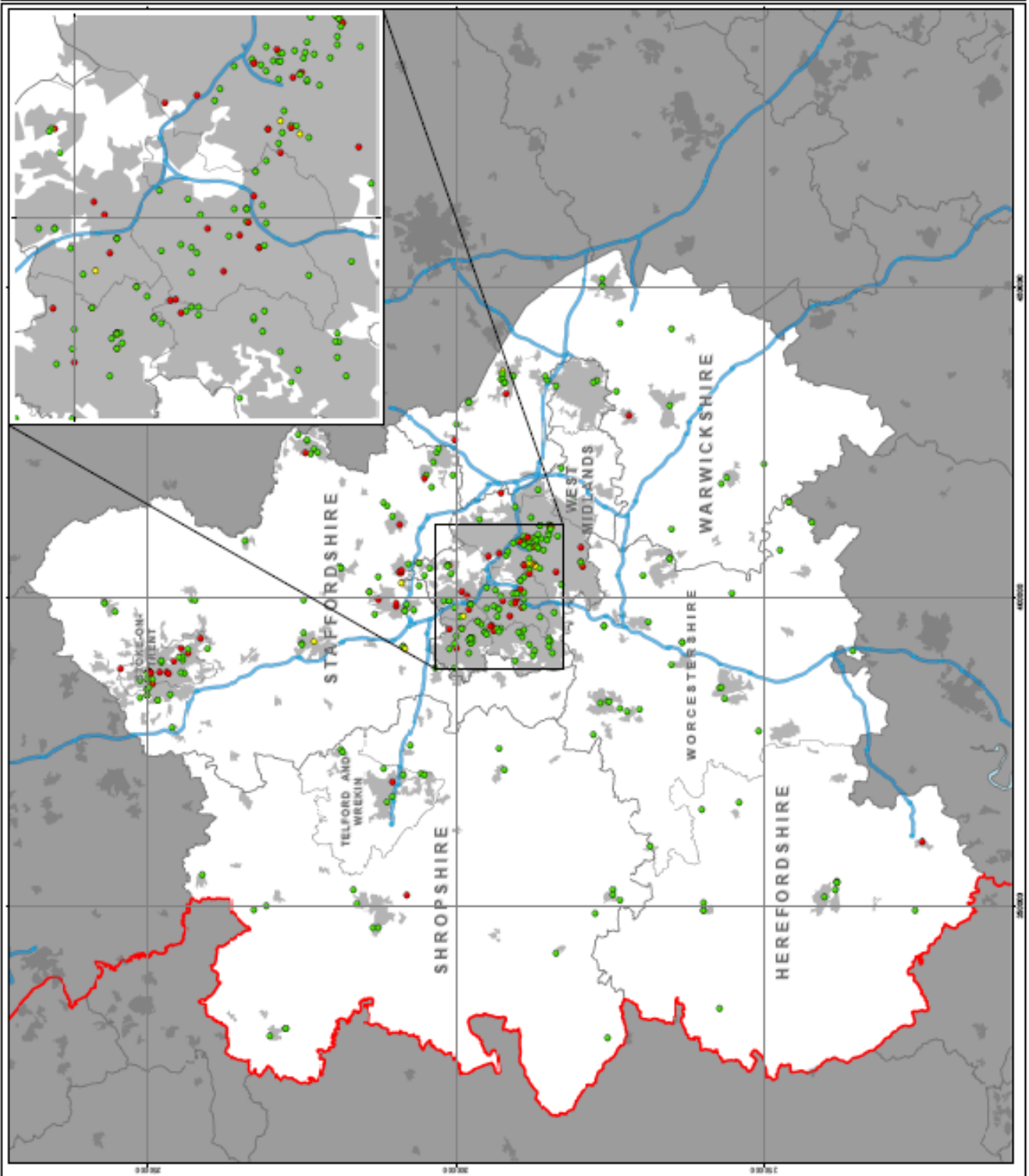
**Waste Transfer Facilities
 in the West Midlands**

Project: WASTE CAPACITY STUDY
 Date: SEPT 2007
 Scale: 1:500,000

Drawing No: 1

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TREDEWOOD HOUSE
 ROWDEN LANE
 BRADFORD ON AVON
 WILTSHIRE BA15 2JG
 T: 01225 266400
 F: 01225 266401
 WWW.SLR.CO.UK



LEGEND

- Operational Facilities**
- Facility Type**
- A09, Waste transfer
 - ▲ A11, Waste transfer
 - ▲ A12, Waste transfer
 - ★ A13, CA sites
 - ◆ A14, Waste transfer
 - WPA Boundaries
 - ▭ England - Wales Border



North Arrow

Scale: 1:50,000

0 2.5 5 10 15 20 25

Kilometres

0 2.5 5 10 15 20 25

Miles

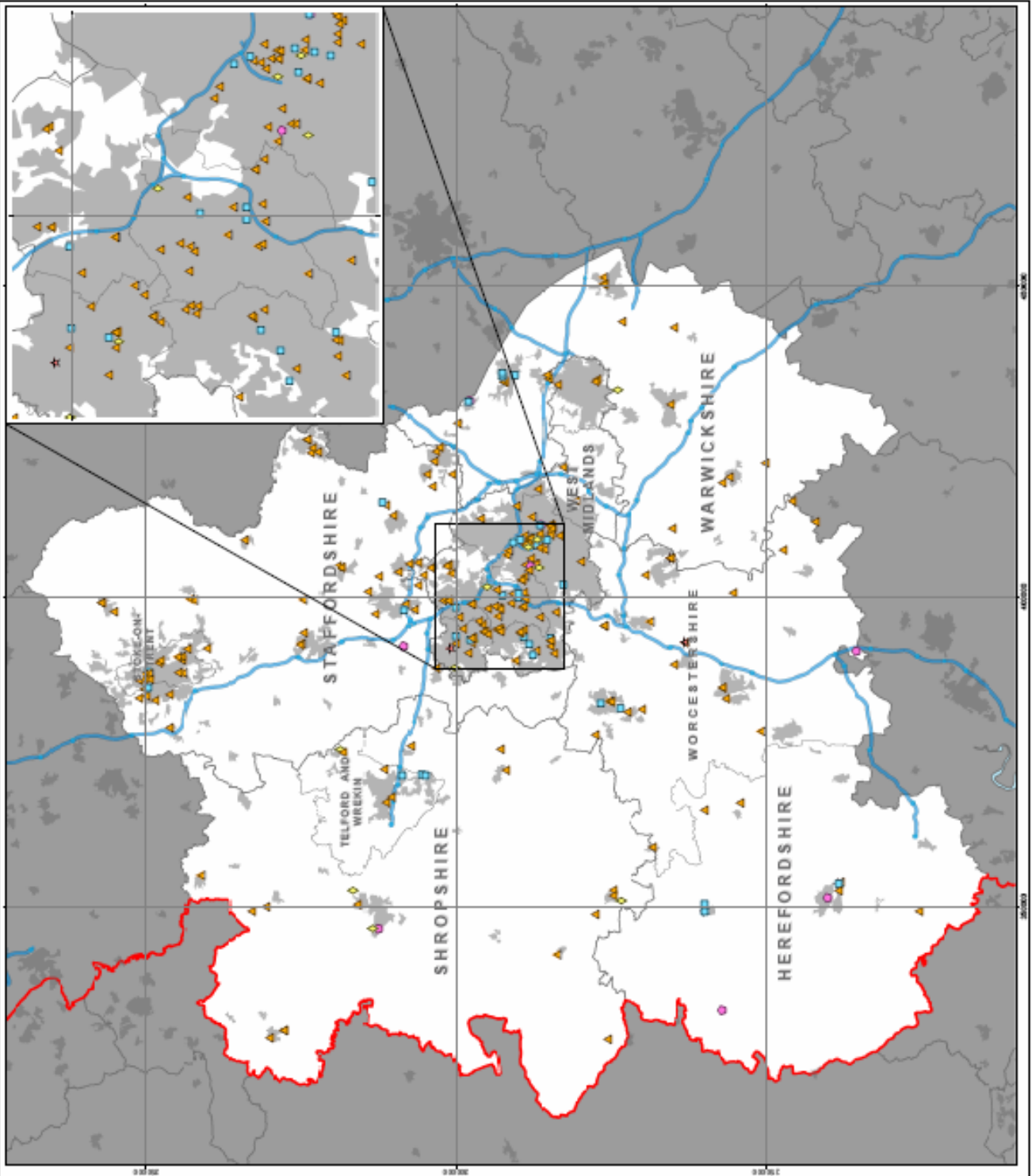
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Operational Facilities by 'A' Code

Project	WASTE CAPACITY STUDY	Drawing No.	2
Date	SEP 2007		
Scale	1:50,000		

402-1786 0001 / 5807 / 401411

THE BRACKNELL GROUP
 BRACKNELL LANE
 BRACKNELL ON AVON
 WILTSHIRE BA15 2AU
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 F: 01225 368901
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Selection of facilities for telephone survey

- Removal of all **non-operational and orphaned** facilities
- Facilities **split by size bands**
- **Random number generation** to select facilities within each band
 - Survey proportions mirror size band distribution
- Cross check to **ensure spatial coverage**
- **60 facilities selected** (as per tender submission)
- Initial response rate of 10%
 - Operations managers hard to track down (time spent in yard rather than office)
 - Too busy to participate
 - Suspicious of the survey (sometimes with an abrupt and rude response)

Selection of facilities for telephone survey

- Due to poor response
 - **additional time/resource** spent on the original selection of 60 facilities
 - a **further 30 facilities** (above the original tender submission) were selected
 - during first phase it was noted that smaller facilities were less inclined to respond
 - To ensure the survey obtained a reasonable quantity of data the additional 30 was weighted towards the larger facilities
- Total of **90 facilities contacted** (in the month of August)

Size Bracket	Total Surveyed
0	2
0 - 5,000	40
5,000 - 25,000	35
25,000 - 75,000	7
75,000 +	6
Total	90

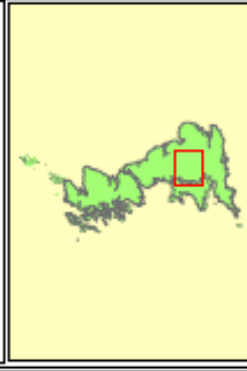
'A' code	Total Surveyed
A09	13
A11	70
A12	1
A13	2
A14	4
Total	90

Response to telephone survey

- **37 out of 90 facilities** contacted responded
- Response rate of approximately **40%**
- Excellent response rate consider the type of facilities being contacted & associated timescales
- **Additional resource** (30 extra facilities / additional attempts to make contact) had a **large impact on the final response rate**
- Proportional responses
 - Best responding size band was 25ktpa to 75ktpa with 57% response
 - Best responding 'A' code was A09 (Special waste) with 54% response

LEGEND

- Surveyed Facilities Response**
- Yes
 - No
- WPA Boundaries**
- England - Wales Border



General Information

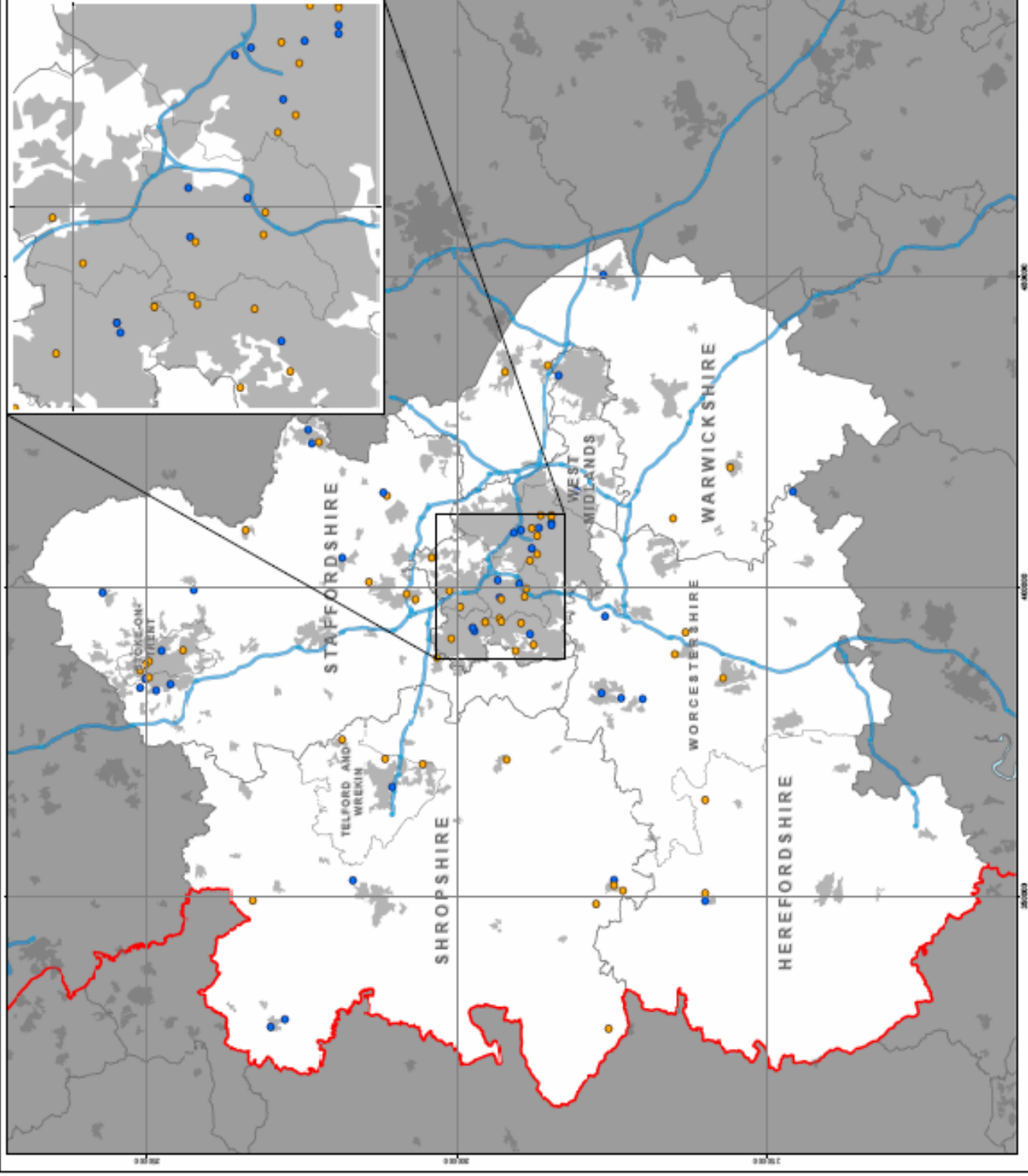
Telephone Number: 0121 755 1234
Fax Number: 0121 755 1234
E-mail: info@advantage-wm.co.uk
Web Page: www.advantage-wm.co.uk
Units: Metric
Latitude: 52° 45' 00" N
Longitude: 0° 15' 00" W

ADVANTAGE WEST MIDLANDS IS A TRADE NAME OF THE
CENTRAL OFFICE OF APPLIED STATISTICS OFFICE (CENTRAL OFFICE)

Facilities Selected for Telephone Survey and Response

Project	WASTE CAPACITY STUDY	Drawing No.	3
Date	SEPT 2007		
Scale	1:800,000		

402.1796.00001_0407_0001A
TRENWOOD HOUSE
ROWDEN LAKE
BRADFORD ON AVON
WILTSHIRE BA15 2JU
T. 01275 336600
F. 01275 336600
www.slr.co.uk

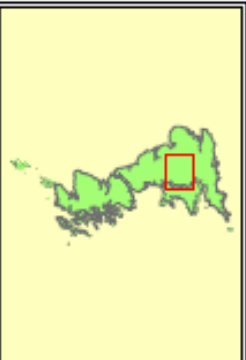


Selection of facilities for site visits

- Selection based on **experience during telephone** survey and potential to gather further priority information
- Cross check to **ensure coverage of facility sizes and geographic areas**
- List of **20 facilities short-listed**
- Aim to visit 10-12 facilities (as per tender submission)
- Due to timescales were **unable to inform operators of potential visit**
- However a **letter was prepared by AWM** and given to the operator when the team visited.

LEGEND

- Operational Facilities**
- Facility Type**
- AC9, Waste transfer
 - △ A11, Waste transfer
 - A12, Waste transfer
 - ★ A13, CA sites
 - ◇ A14, Waste transfer
- Facility Throughput**
- 0 to 5 ktpa
 - 5 to 25 ktpa
 - 25 to 75 ktpa
 - 75+ ktpa
- Site Visited**
- Yes
 - No
- WPA Boundaries**
- England - Wales Border



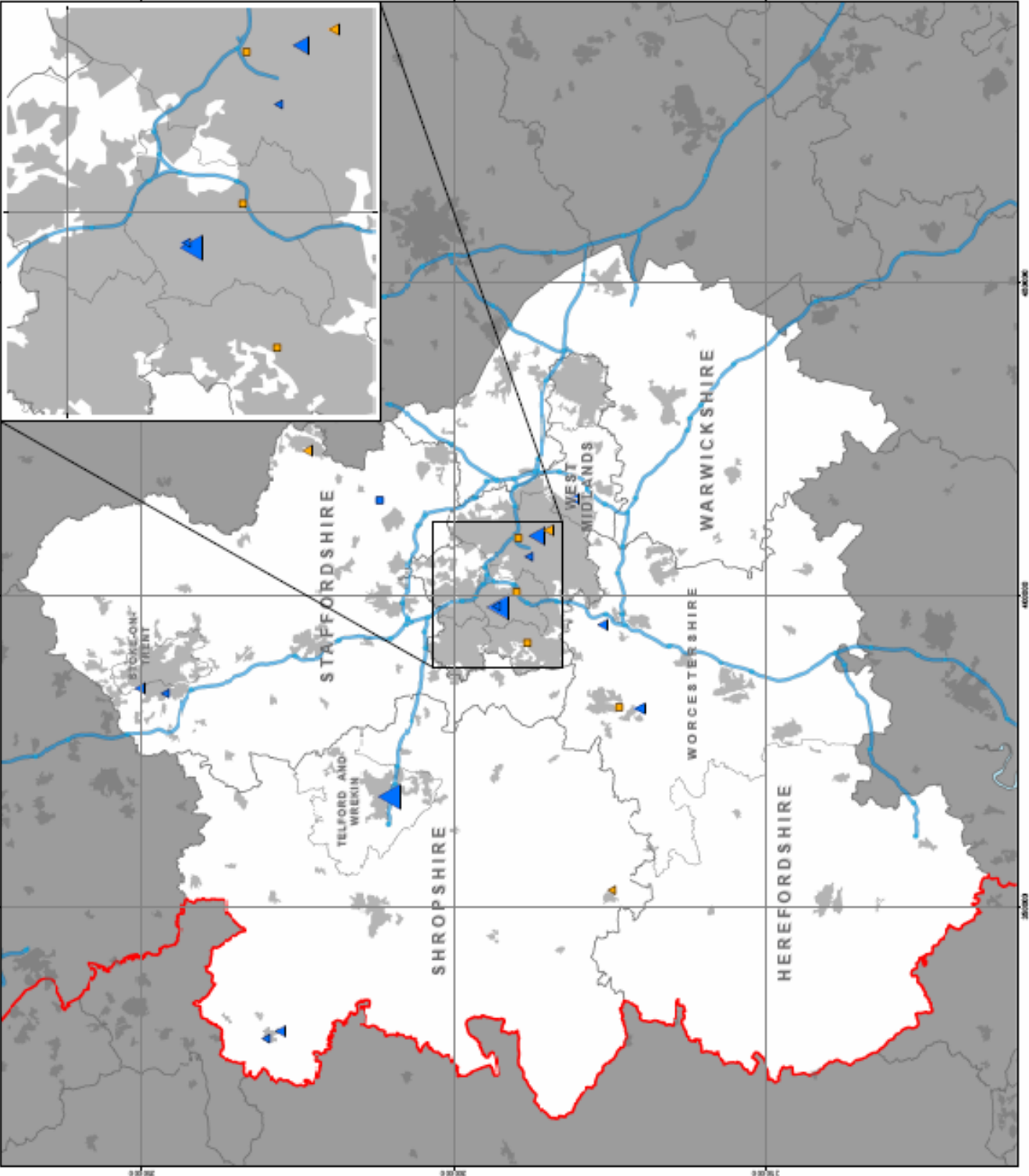
British Information
 Ordnance Survey
 Transverse Mercator
 False Easting = 400 000m
 False Northing = 600 000m
 Central meridian = 0°
 Scale Factor = 0.999 607 63
 Latitude of Origin = 49°

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Location of Facility Visits and Response Type

Project	WASTE CAPACITY STUDY	Drawing No.	4
Date	SEPT 2007		
Scale	1:800,000		

402.1796.0001_3807_001LV
 TREXWOOD HOUSE
 ROWDEN LANE
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 WILTSHIRE BA15 2AU
 T: 01225 768000
 F: 01225 768001
 www.slr.co.uk



40200

40200

40200

Response to site visits

- Facility visits undertaken week commencing 3rd September 2007
- **Total of 20 facilities visited** (8 more than bid)
- 13 of the 20 facilities granted site access to the survey team and responded to questions and discussed some of the issues
- **65% response rate** to visits
- Survey team indicate **response would not have been improved greatly** if a letter had been sent providing advanced notice of visit

Other information gathered during site visits

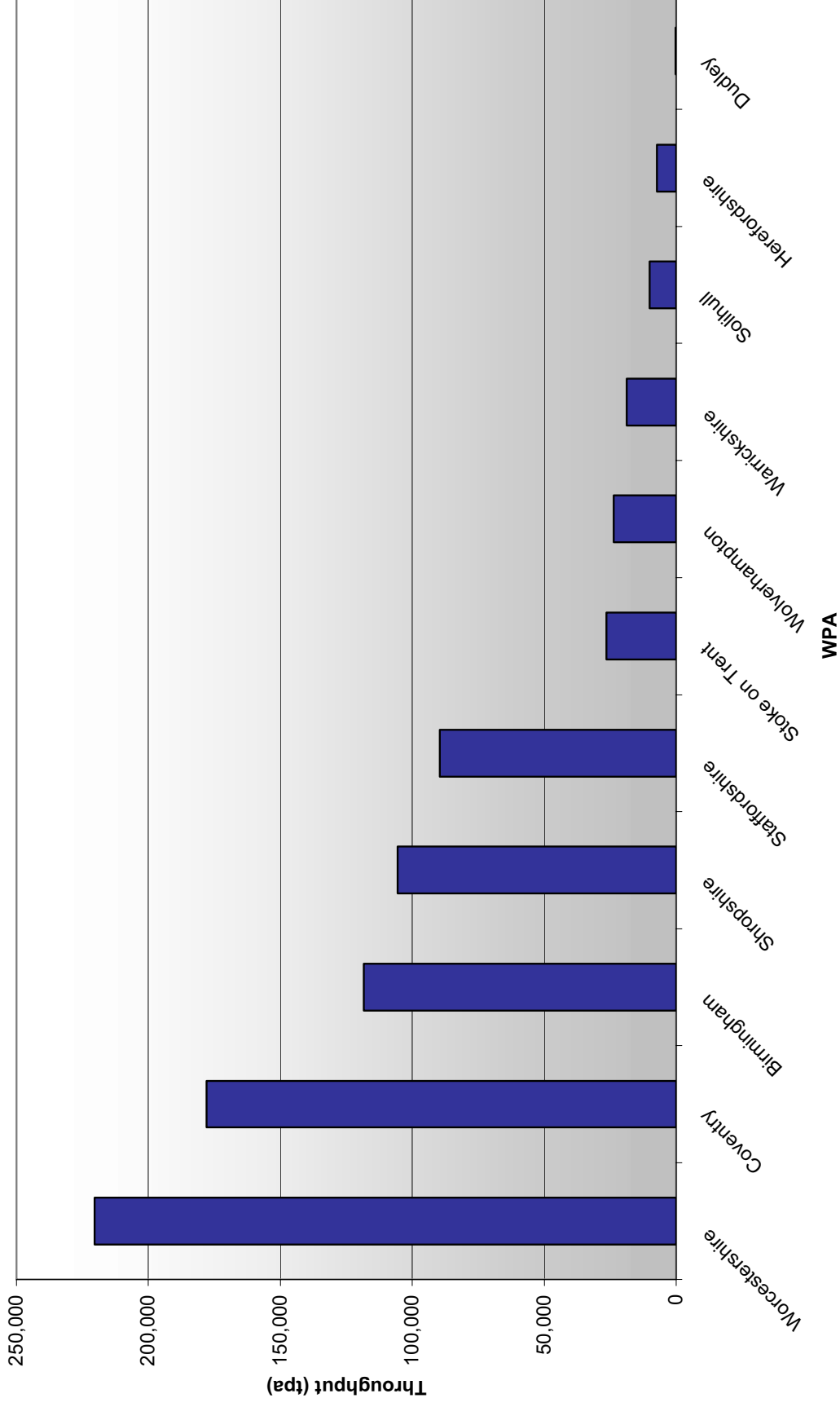
- Most facilities visited were located in **suitable areas in terms of access, road routing and surrounding land use**.
- One of the facilities visited was **located within the Jewellery Quarter of Birmingham City Centre**. This facility has been able to operate without issue, as it is **small and fully enclosed within the high site boundary walls**. They also deal with a **very low tonnage of specialised waste**, which can be delivered, stored, bailed and transported without causing any disruptions to the neighbouring area.
- Some of the facilities visited indicated they are **under pressure from residential development**. One facility is currently in the process of moving to a new site due to **complaints from neighbouring residential developments** and problems with vehicle restrictions that have been applied to the roads around the site. Another facility is under pressure as over the last 8 years the land has become increasingly valuable; this facility will not relocate until a new site has been found (new sites are currently being assessed).

Other information gathered during site visits

- One site visited is planning to **close in the next 2 years**; the site and the industrial estate it is located within is going to be redeveloped and the planned **Metro Line 1** will run through the current site. The remaining land has been earmarked for the **development of a large transfer station and recycling facility**.
- One of the facilities with the most extensive future expansion plans are developing an **'eco park' within the disused quarry** that they are located next to. This development will consist of a larger **MRF** and **transfer station** and also an **AD facility**. The development will increase the throughput threefold, and will boost diversion from 60% to 80%.
- Information collated from telephone survey and site visits to produce a completed database. Summary information from responses is presented in the following slides.

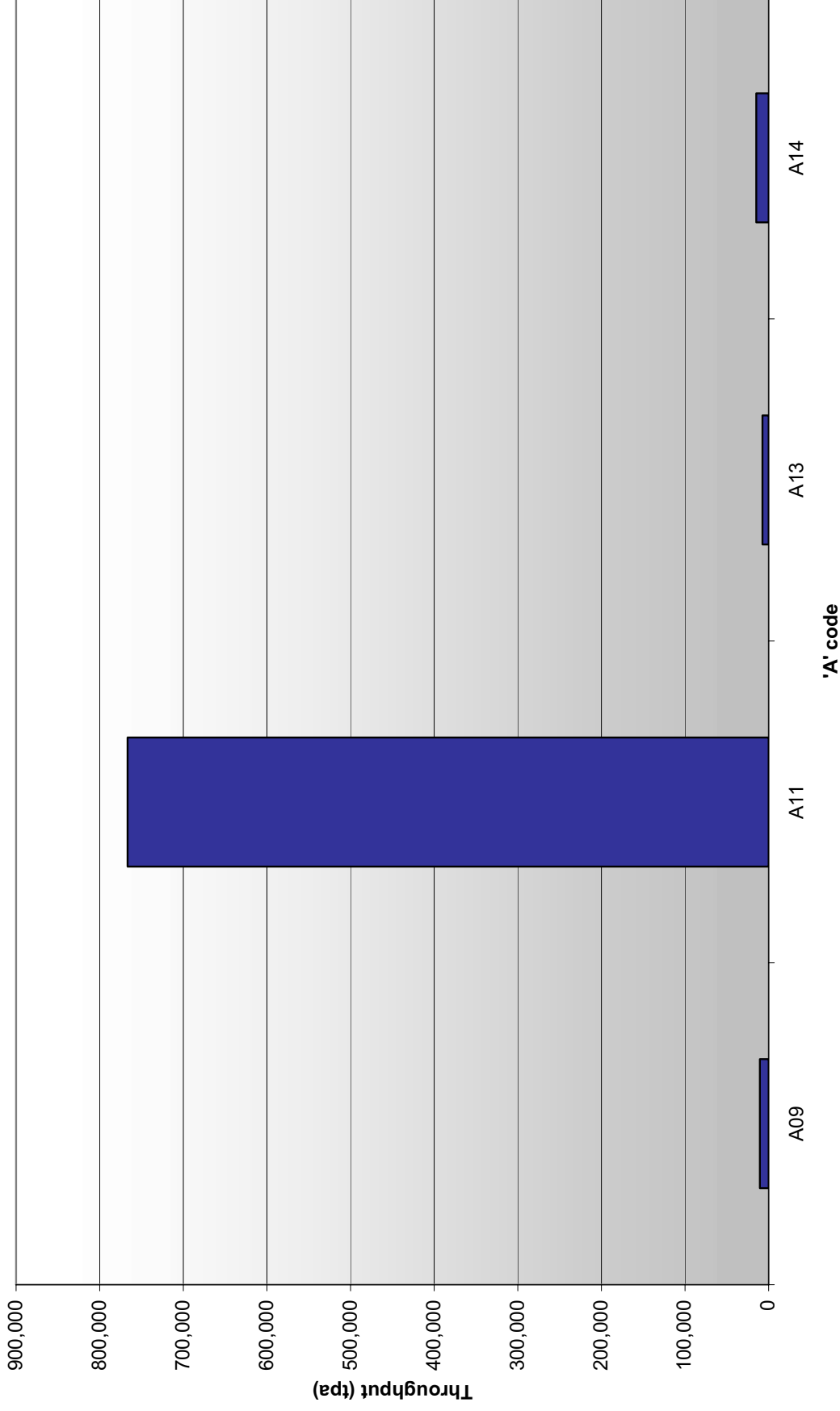
Throughput of the surveyed facilities

- Largest surveyed throughput – Worcestershire
- Lowest surveyed throughput - Dudley



Throughput of the surveyed facilities

- **Largest surveyed throughput – A11 (Hhold, Comm & Ind Transfer)**
- **Lowest surveyed throughput – A13 (Hhold amenity centre)**



Source of waste handled by the surveyed facilities

- **Municipal sources are the most common** by number of facilities
- Closely followed by Commercial sources

Source of Waste	No. of Facilities
Municipal	19
Commercial	17
Industrial	10
Other	1 (construction)



solutions for today's environment

Types of waste handled by the surveyed facilities

- Primary material handled – Top 5 by number of facilities

Material (Primary)	No. of Facilities
General waste	7
Wood	4
Soil	4
Hardcore	3
Asbestos	3

- All materials identified – Top 5 by number of facilities

Material (Primary)	No. of Facilities
General waste	14
Wood	12
Metal	11
Hardcore	11
Soil	10

- **Limited information on tonnages / proportions of specific materials**, therefore difficult to identify the main materials in tonnage terms.

Pre-treatment activities at the surveyed facilities

- **26 out of 38 facilities** are currently performing some pre-treatment (approximately 70%)

Form of Pre-treatment	No. of Responses
Hand picking	19
Trommel / Automated Screen	10
Mechanical	9
Chemical extraction	1
Segregated at collection	1
Segregation of empty oil and waster containers	1

- **Hand picking** is the most common form of pre-treatment
- Some facilities employ more than one method

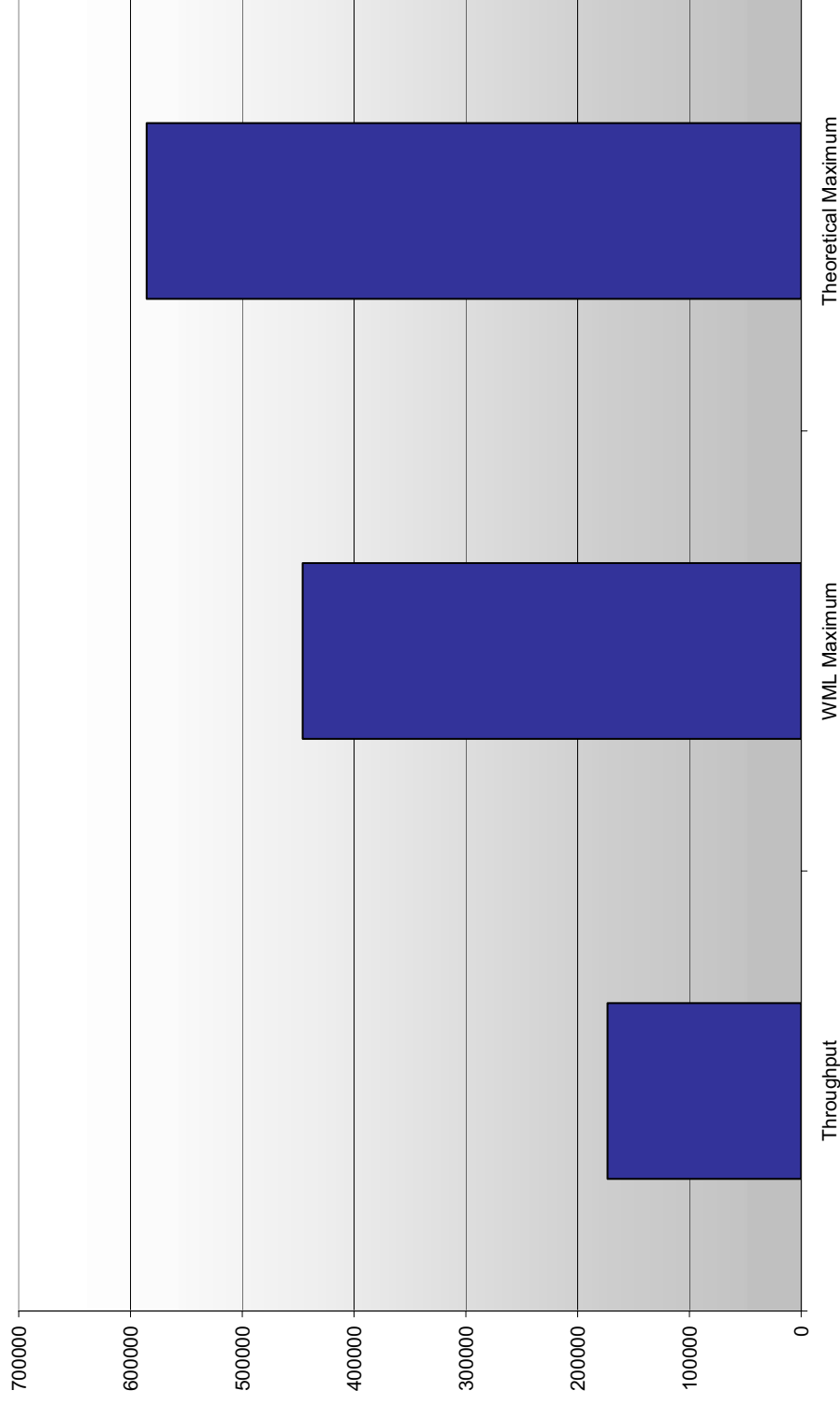
Pre-treatment activities at the surveyed facilities

- Most common materials segregated (by number of facilities)
- Little information regarding tonnages for specific materials
- Not all facilities could provide information on diversion rates
- Range from 27% to 100% (for specific materials)
- **60 – 85% appears to be a common figure** provided

Material removed	No. of Facilities
Wood	13
Hardcore	11
Soil	9
Metal	8
Cardboard	7
Paper	7
Green Garden	6
Plastics	4
WEEE	2
Glass	1

WML Max / Theo Max at the surveyed facilities

- 12 facilities answered throughput, WML maximum and theoretical maximum questions
- Theoretical maximum is more than 3 times the existing throughput
- Existing throughput less than half of licence limit
- Some disparity between license maximums quoted by facility and those held by Environment Agency



environment

Constraints on operations at surveyed facilities

Constraint	No. of Facilities
Availability of waste (including increases in recycling reducing mixed wastes)	12
Infrastructure	7
Labour (limited by number of employees)	6
Speed of processing	4
Space / storage area	6
Licence restrictions	3
Residential location	2
Market forces / competition	2
Access to facility	1
Costs	1
Plastics problem	1



Potential future of the surveyed facilities

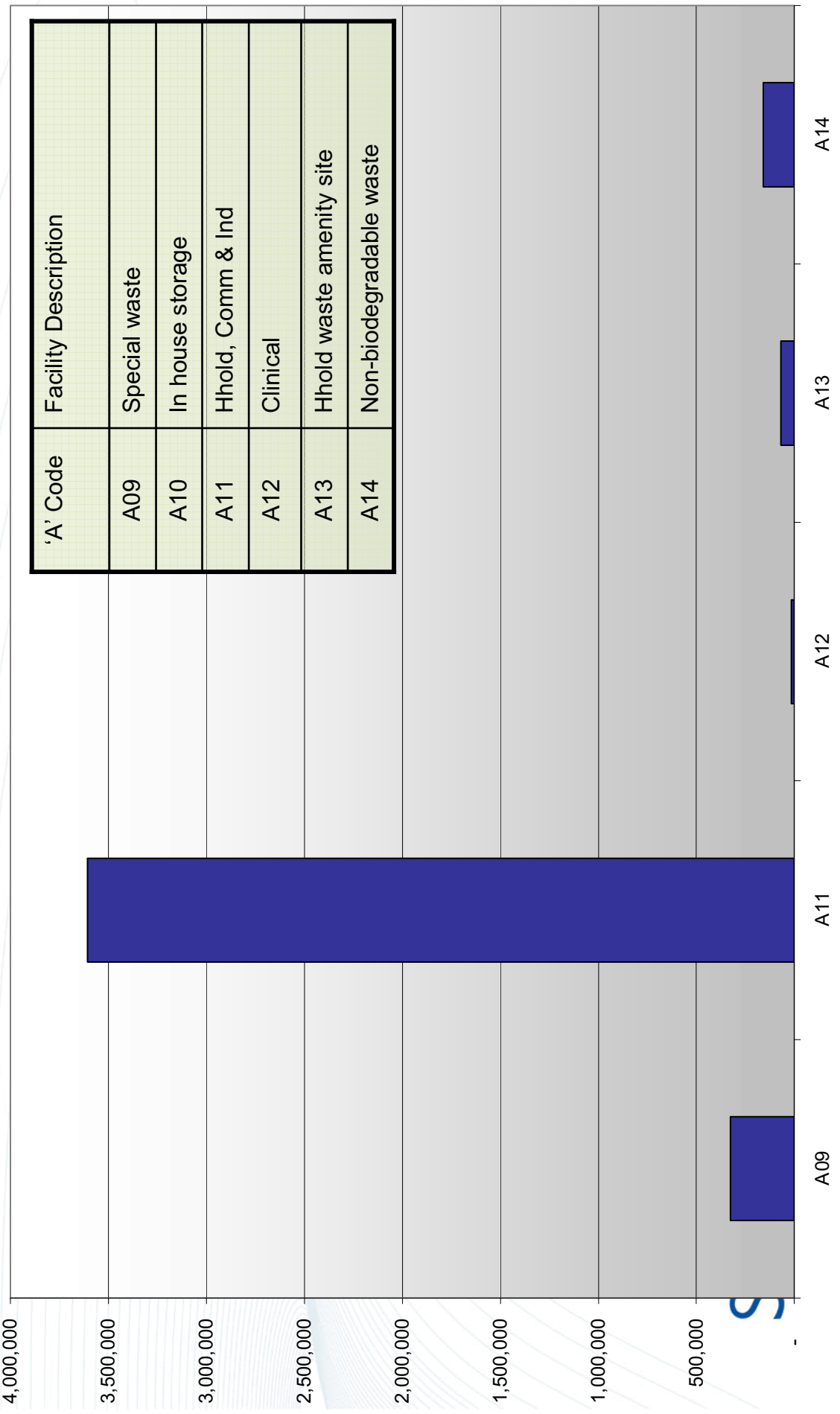
- Potential for facility to pre-treat (if not already pre-treating)
 - Yes - 1
 - No - 8
 - Not answered - 3
- Future potential for facility to change use
 - Yes – 20 – possible uses include materials recovery, oil reclamation, AD, thermal
 - No - 11
 - Not answered - 7

Potential future of the surveyed facilities

- Future potential for facility to expand
 - Yes – 19 (50%)
 - No - 13
 - Not answered – 6
- **3 facilities already granted planning** for expansion / change of use
 - Transfer station change of use to **HWRC**
 - Expand transfer station (**double existing throughput**)
 - Transfer station change of use to **MRF**

Transfer capacity of all (operational) facilities in region

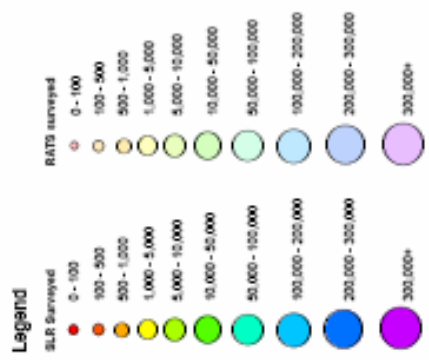
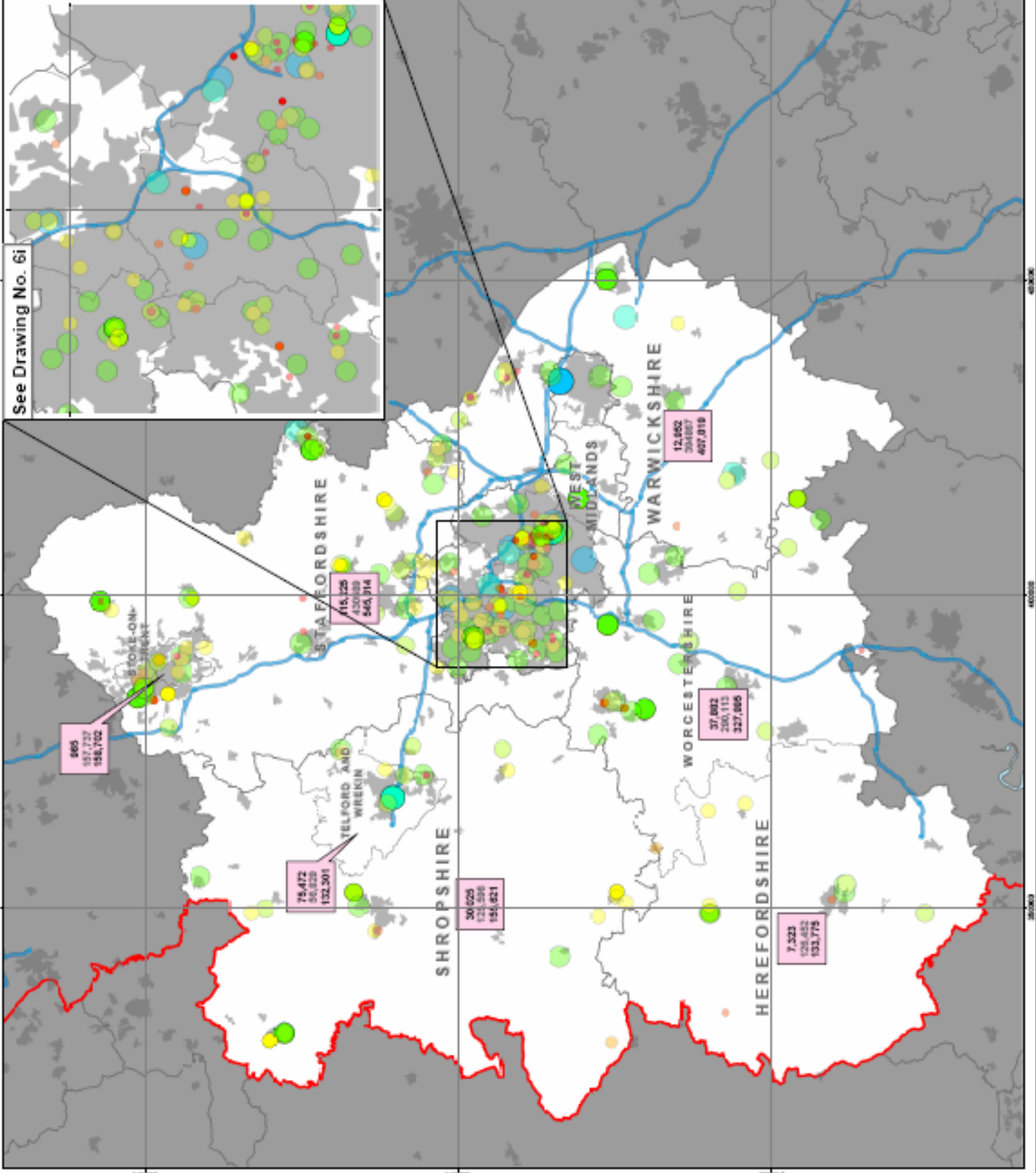
- Regional transfer capacity of **4.25 million tonnes**
- **85%** of capacity is from A11 facility types



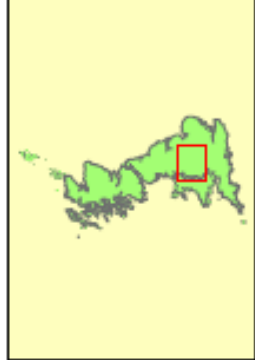
Transfer capacity of all (operational) facilities in region

- Three highest and lowest transfer capacity by WPA
- Together **Birmingham and Staffordshire** comprise over a third of total capacity

WPA	Million Tonnes (Mt)
Three Highest	
Birmingham	1.06
Staffordshire	0.55
Sandwell	0.45
Three Lowest	
Herefordshire	0.13
Telford and Wrekin	0.13
Solihull	0.03



310,000 SLR Surveyed Throughput
 347,269 EA RATS Throughput
 458,169 Total Transfer Station Throughput



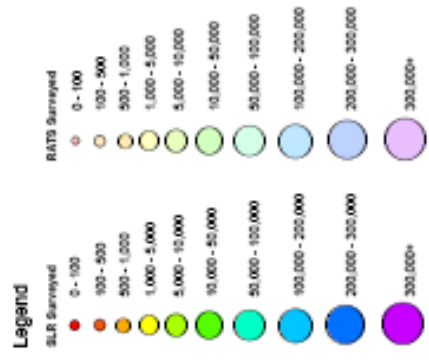
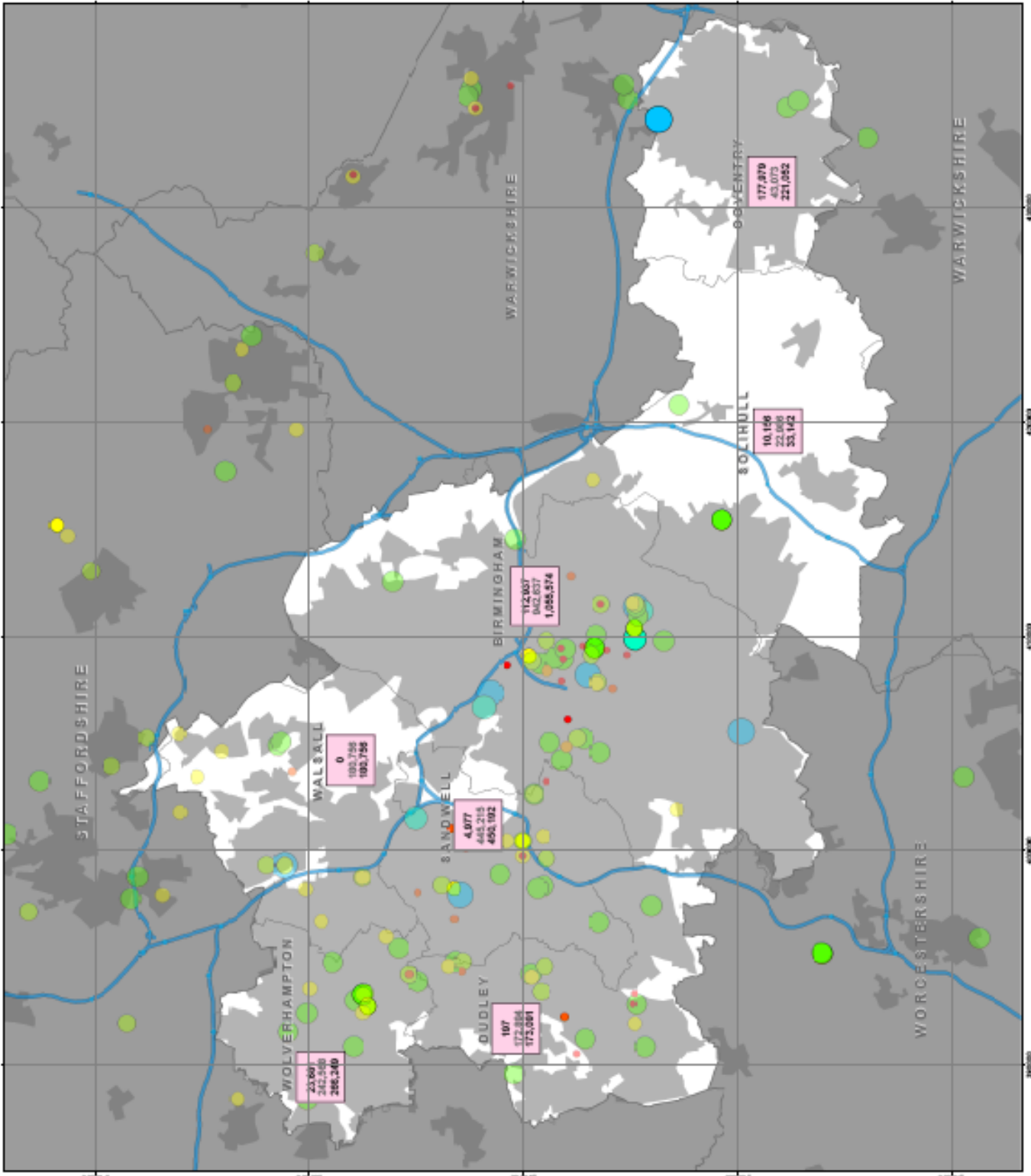
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**Waste Transfer Facilities –
 SLR Surveyed and EA RATS
 Surveyed Throughput**

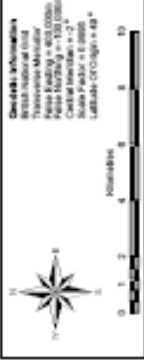
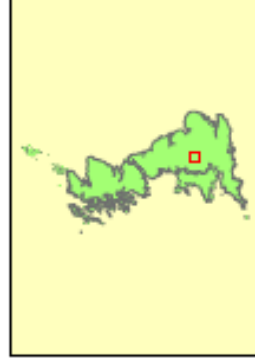
Project	WASTE CAPACITY STUDY	Drawing No.	6
Date	OCTOBER 2007		
Scale	1:500,000		

400-1706-0031, 007-1602-0-0-0000

 TREKWOOD HOUSE
 BROADFORD ON AVON
 WILTSHIRE BA15 2AU
 T. 01225 268001
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310,000 SLR Surveyed Throughput
 147,500 EA RATs Throughput
 450,100 Total Transfer Station Throughput



Drawn by: **SLR**
 Checked by: **SLR**
 Approved by: **SLR**

**Waste Transfer Facilities –
 SLR Surveyed and EA RATs
 Surveyed Throughput**

Project	WASTE CAPACITY STUDY	Drawing No.	61
Date	OCTOBER 2007		
Scale	1:175,000		

400-1758-0000 / 007-0652-8-0-4000
 THREMSICK ROAD
 ROWDEN LAKE
 BRADFORD ON AVON
 WILTSHIRE BA15 2AL
 T: 01225 266600
 F: 01225 266600
 www.slr.co.uk

Transfer capacity – potential contribution to recycling need

- 70% of survey responses indicated some pre-treatment currently
- Diversion of waste from landfill (through pre-treatment) was in the range 27 - 100% (60% diversion common response from those pre-treating)
- Application of the above to the transfer capacity provide an illustrative range of potential recycling achieved 0.8 – 1.8 Mt
- Due to the paucity of the data, these estimates should not be discounted from the need until further validation (with EA data returns) is undertaken.

Transfer station capacity	4.25 Mt	
Proportion of pre-treatment	70%	
Estimated tonnage pre-treated	2.98 Mt	
Indicative diversion rates from landfill	27%	60%
Potential diversion of recyclables from landfill	0.80 Mt	1.79 Mt

APPENDIX 2 - RSS WASTE AND HOUSING FORECASTS

RSS Waste Forecasts

RSS Phase 2 Review: Calculation of Landfill Diversion tonnages by WPA area for Municipal and Industrial & Commercial Waste Streams

Municipal Waste Assumptions:

In preparing projections of the future generation and management of MSW, the following assumptions have been made:

Waste Quantity:

- The number of new dwellings which are expected to be built in each WPA on the basis of the preferred options draft RSS, have been converted to numbers of new households for each Strategic Planning Authority for each of the 3 current growth options by making an allowance for demolitions and unoccupied dwellings;
- The average number of new households over the forecast period (2001 – 2025) is then converted into an average annual household growth rate (by WPA and growth option) by dividing average annual growth into the number of households in 2003 (taken from 2006 Government projections);
- Since the generation of municipal waste is closely related to the number of households, these average annual household growth rates are taken as a proxy of the rate of growth of municipal solid waste (MSW). The growth rates are therefore applied to the latest household waste data (2002-3) in order to generate annual projections of the quantity of MSW;
- Since the quantity of MSW is currently growing faster than the number of households, it has been assumed that MSW will grow at the annual household growth rate in each area (& for each option), plus 1% for the period until 2010/11.
- From 2011, waste growth is assumed to fall to a level consistent with the household growth rate;
- The projections assume 68% of municipal waste is biodegradable (for consistency with the Waste and Emissions Trading Act);

Waste Management:

- Waste composted is based on actual data for the latest year available (2002/03), followed by incremental increases to 50% of recycling targets by 2010. Composted waste is assumed to be 100% biodegradable;
- Waste recycled is based on actual data where available, increased to reach 50% of recycling targets by 2010. Recycled waste is assumed to be 50% biodegradable;
- The projections assume that the targets for recycling set out in "Waste Strategy 2000" and that Best Value performance standards, along with any 'stretch targets' that apply following a Public Service Agreement between individual local authorities and central Government will be met; The projections do not apply national recovery targets, but assume that Landfill Directive targets for biodegradable municipal waste (taken from provisional LATS allowances prepared by DEFRA in July 2004) will be met;
- The level of municipal waste requiring diversion away from landfill has been calculated from the combined requirements of national recycling targets and LATS allowances for biodegradable municipal waste;

- The capacity required to attain these standards is based on an assumption that the quantity of waste diverted represents 80% of throughput for recycling and 70% of throughput for other forms of waste treatment;
- The quantity of residual waste which will require further management or disposal to landfill has been calculated by deducting the quantity requiring diversion from the total arising for that year;

Industrial & Commercial Waste Assumptions:

In preparing projections of the future generation and management of Industrial & Commercial waste, the following assumptions have been made:

Waste Quantity:

- The 2002 base quantities for each Strategic authority area are derived from the WMRA Phase 2 Capacity Study (excluding 'Special waste' arising) and not from EA survey data for 2002/03 because this was not available broken down into individual WPA areas. There is a 0.3mt difference between the two sources for the region as a whole for this year (the EA survey data is higher, but this may reflect the fact that they were measuring how waste was managed in these areas, rather than where it was generated).
- The quantities of waste indicated in the table for the years from 2002 have been calculated using the assumptions adopted by the Government in the National Waste Strategy Review (Feb 2006), which reflect predicted economic growth and changes in the sectoral mix of the UK economy. The quantity of waste has not been included as a variable and therefore remains constant for all three performance based options;
- The projections assume that 1998-99 imports and exports as shown in the Environment Agency's 'Strategic Waste Management Assessment' remain unchanged, with a reduction to allow for Special Waste movements in 1998;

Waste Management:

- The level of municipal waste requiring diversion away from landfill for each of the three performance options has been calculated using the performance standards shown in the table below:

Diversion from Landfill as a % of total commercial and Industrial waste	Existing Performance 2002* %	2010 %	2015 %	2020 %	2025 %
Low	58	59	60	61	61
Medium	58	63	64	65	65
High	58	65	70	75	75

* Existing Performance measured using average quantity of I&C waste landfilled in the region (EA SWMA Update 2002-03) as a proportion of the projected quantity of I&C waste arising in the region (Phase 2 Capacity Report)

- The capacity required to attain these standards is based on an assumption that the quantity of waste diverted represents 80% of throughput for recycling and 70% of throughput for other forms of waste treatment;
- The quantity of residual waste which will require further management or disposal to landfill has been calculated by deducting the quantity requiring diversion from the total arising for that year;

**Cumulative Requirement for Municipal Commercial & Industrial (MCI) Waste:
Assumptions:**

- The cumulative quantity of landfill required for each strategic authority area for the period 2004 – 2026 has been calculated by combining the quantities of residual Municipal and Industrial and Commercial waste;
- The 'Best Case' combines 'Business as Usual' for Municipal waste and 'High Diversion' for Industrial & Commercial waste; The 'Middle Case' combines 'Managed Growth for Municipal waste and 'Medium Diversion' for Industrial & Commercial waste; The 'Worst Case' combines 'Growth at all Costs' for Municipal waste and 'Low Diversion' for Industrial & Commercial waste.

RSS MUNICIPAL WASTE PROJECTIONS AND TREATMENT REQUIREMENT

2007/8		2008/9		2009/10		2010/1		2011/2		2012/3		2013/4									
Quantity	Diversion	Landfill	Quantity	Diversion	Landfill	Quantity	Diversion	Landfill	Quantity	Diversion	Landfill	Quantity	Diversion	Landfill							
Municipal Waste Arising																					
WEST MIDLANDS REGION	3,235,223	1,950,298	1,284,925	3,293,976	2,056,698	1,237,277	3,353,795	2,193,157	1,160,638	3,414,701	2,339,806	1,074,894	3,442,565	2,405,364	1,037,202	3,470,658	2,552,853	917,805	3,498,979	2,597,747	901,232
Birmingham	573,867	514,923	58,945	583,245	525,216	58,028	592,375	536,432	56,342	602,462	548,577	53,885	606,282	583,092	53,190	610,126	557,724	52,402	613,995	562,474	51,520
Coventry	190,382	164,115	26,266	194,837	171,341	23,495	199,366	178,873	20,522	204,062	186,722	17,340	206,796	189,883	16,913	209,567	193,115	16,452	212,375	196,418	15,957
Black Country	612,774	429,490	183,283	623,125	452,589	170,536	633,651	479,243	154,407	644,354	503,732	140,622	648,795	503,001	145,794	653,266	521,188	132,078	657,769	531,255	126,514
Herefordshire	104,529	29,288	75,241	106,701	30,943	75,758	108,919	32,676	76,243	111,182	50,091	61,091	112,360	55,517	56,863	113,592	60,675	52,917	114,816	62,977	51,839
Shropshire	182,451	76,629	105,822	186,213	85,658	100,555	190,053	95,026	95,026	193,972	108,595	85,376	196,032	117,433	78,599	198,114	188,114	10,000	200,217	190,217	10,000
Solihull	104,362	89,871	14,491	105,889	91,796	14,093	107,439	93,872	13,567	109,011	96,100	12,911	109,516	96,873	12,643	110,024	97,861	12,362	110,533	98,466	12,067
Staffordshire & Stoke-on-Trent	683,349	402,957	280,392	695,331	422,520	272,811	707,523	442,861	264,661	719,928	463,996	255,932	725,352	471,610	253,742	730,817	479,339	251,479	736,323	487,183	249,140
Borough of Telford & Wrekin	97,075	30,093	66,982	99,995	33,998	65,996	103,002	44,012	58,990	106,100	51,980	54,119	106,230	58,153	50,077	110,403	64,646	45,757	112,619	67,804	44,816
Warwickshire	318,427	111,608	206,819	321,612	125,771	195,841	324,828	147,672	177,155	328,076	166,981	161,095	328,076	180,507	147,569	328,076	194,798	133,278	328,076	198,892	129,184
Worcestershire	326,912	101,343	225,569	332,771	116,766	216,005	338,735	142,489	196,246	344,806	163,031	181,775	347,538	179,296	168,241	350,291	195,593	154,698	353,066	202,059	151,006
Staffordshire	463,357	269,287	194,070	471,776	286,050	185,726	480,348	303,375	176,973	489,076	321,276	167,799	493,071	327,805	165,266	497,100	334,428	162,672	501,161	341,145	160,016
Stoke-on-Trent	145,274	133,670	11,603	147,523	136,470	11,053	149,806	139,486	10,320	152,125	142,720	9,405	152,959	143,805	9,154	153,797	144,911	8,887	154,640	146,038	8,602
City Region	1,626,658	1,362,163	361,570	1,654,617	1,411,410	343,202	1,683,066	1,471,919	314,149	1,712,014	1,529,831	288,282	1,724,348	1,544,806	287,772	1,736,781	1,579,246	267,937	1,749,312	1,602,455	259,476
Shire Area	1,567,470	588,135	979,335	1,595,100	645,188	949,912	1,623,252	721,238	902,014	1,651,938	809,975	841,963	1,664,648	860,568	804,091	1,677,494	973,807	703,887	1,690,477	995,291	685,186

Prof Option 22 Oct 2007

2014/5		2015/6		2016/7		2017/8		2018/9		2019/20		2020/1									
Quantity	Diversion	Landfill	Quantity	Diversion	Landfill	Quantity	Diversion	Landfill	Quantity	Diversion	Landfill	Quantity	Diversion	Landfill							
Municipal Waste Arising																					
WEST MIDLANDS REGION	3,527,531	2,642,580	884,951	3,585,317	2,685,744	899,573	3,585,337	2,732,588	831,874	3,644,090	2,833,399	810,691	3,673,827	2,884,806	789,221	3,703,806	2,913,257	790,549	3,730,806	2,943,257	791,549
Birmingham	617,888	567,343	50,545	621,806	572,330	49,476	625,749	577,437	47,054	633,717	582,663	47,054	637,728	593,478	44,250	641,772	599,067	42,705	645,772	599,067	42,705
Coventry	215,221	199,794	15,427	218,105	202,193	15,912	221,028	204,678	16,349	223,989	207,251	16,739	226,991	209,911	17,080	230,033	212,862	17,370	233,115	215,504	17,611
Black Country	662,302	540,060	122,242	666,866	549,556	118,310	671,462	558,440	113,022	676,090	568,416	107,674	680,749	578,486	102,264	685,441	588,848	96,793	690,165	596,647	94,518
Herefordshire	116,054	65,006	51,048	117,305	67,339	49,966	118,569	69,391	49,178	119,847	71,453	48,394	121,139	73,528	47,612	122,445	75,611	46,834	123,755	76,618	47,147
Shropshire	202,344	192,344	10,000	204,493	194,493	10,000	206,664	196,664	10,000	208,859	198,859	10,000	211,077	201,077	10,000	213,319	203,319	10,000	215,584	205,584	10,000
Solihull	111,046	99,287	11,758	111,560	100,125	11,435	112,077	100,979	11,098	112,597	101,850	10,747	113,118	102,737	10,381	113,643	103,641	10,002	114,169	104,561	9,608
Staffordshire & Stoke-on-Trent	741,871	495,145	246,726	747,460	503,224	244,236	753,092	512,470	240,622	758,765	524,604	234,161	764,482	536,815	227,667	770,242	549,101	221,141	776,045	549,676	226,369
Borough of Telford & Wrekin	114,880	71,296	43,584	117,186	74,555	42,632	119,539	78,162	41,376	121,939	81,832	40,107	124,367	85,567	38,820	126,884	89,368	37,516	129,431	92,161	37,270
Warwickshire	328,076	203,749	124,327	328,076	207,843	120,233	328,076	212,698	115,378	328,076	217,552	110,524	328,076	222,404	105,672	328,076	227,254	100,821	328,076	228,846	99,230
Worcestershire	355,863	208,557	147,306	358,682	215,065	143,617	361,524	221,647	139,876	364,368	228,240	136,147	367,274	234,866	132,409	370,184	241,525	128,659	373,116	245,594	127,522
Staffordshire	505,255	347,958	157,297	509,383	354,968	154,415	513,544	362,923	150,621	517,740	373,945	143,895	521,969	384,823	137,147	526,234	395,853	130,380	530,533	395,152	135,380
Stoke-on-Trent	155,488	147,196	8,302	156,340	146,356	7,984	157,197	149,547	7,650	158,059	150,759	7,299	158,925	151,993	6,932	159,796	153,247	6,549	160,672	154,523	6,149
City Region	1,761,945	1,624,966	251,858	1,774,678	1,646,116	245,749	1,787,513	1,669,244	237,808	1,800,451	1,692,771	229,619	1,813,493	1,716,703	221,177	1,826,640	1,741,044	212,480	1,839,893	1,761,463	207,861
Shire Area	1,703,599	1,017,614	685,985	1,716,861	1,039,628	677,233	1,730,266	1,063,323	666,943	1,743,815	1,089,949	653,866	1,757,510	1,116,696	640,814	1,771,353	1,143,662	627,791	1,785,345	1,151,794	633,551

RSS COMMERCIAL AND INDUSTRIAL WASTE PROEJCTIONS AND TREATMENT REQUIREMENT

Pref Option 22 Oct 2007

	2007/8		2008/9		2009/10		2010/1		2011/2		2012/3		2013/4	
	Diversion	Residual	Diversion	Residual	Diversion	Residual	Diversion	Residual	Diversion	Residual	Diversion	Residual	Diversion	Residual
I&C Waste														
Birmingham	659,060	403,940	671,580	394,420	684,160	384,840	698,100	375,900	731,280	376,720	765,140	376,860	799,680	376,320
Coventry	231,880	142,120	236,250	138,750	240,640	135,360	245,700	132,300	257,400	132,600	269,340	132,660	281,520	132,480
Dudley	235,600	144,400	240,030	140,970	244,480	137,520	249,600	134,400	261,360	134,640	273,360	134,640	285,600	134,400
Sandwell	348,440	213,560	355,320	208,680	362,240	203,760	367,900	198,100	385,440	198,560	403,340	198,660	421,600	198,400
Solihull	106,640	65,360	108,990	64,010	111,360	62,640	111,150	59,850	116,160	59,840	121,270	59,730	126,480	59,520
Walsall	236,840	145,160	241,290	141,710	245,760	138,240	250,900	135,100	262,680	135,320	274,700	135,300	286,960	135,040
Wolverhampton	194,060	118,940	197,820	116,180	201,600	113,400	205,400	110,600	215,160	110,840	225,120	110,880	235,280	110,720
Met Area Total	2,012,520	1,233,480	2,051,280	1,204,720	2,090,240	1,175,760	2,128,750	1,146,250	2,229,480	1,148,520	2,332,270	1,148,730	2,437,120	1,146,880
Shropshire	226,920	139,080	231,210	135,790	235,520	132,480	240,500	129,500	252,120	129,880	263,980	130,020	276,080	129,920
Telford & Wrekin	213,280	130,720	217,350	127,650	221,440	124,560	225,560	121,450	236,280	121,720	247,230	121,770	258,400	121,600
Staffordshire & Stoke-on-Trent	933,720	572,280	951,930	559,070	970,240	545,760	986,700	531,300	1,033,560	532,440	1,081,380	532,620	1,130,160	531,840
Warwickshire	380,060	232,940	387,450	227,550	394,880	222,120	401,700	216,300	420,420	216,580	439,520	216,480	459,000	216,000
Worcestershire	474,300	290,700	483,210	283,790	492,160	276,840	503,100	270,900	526,680	271,320	550,740	271,260	575,280	270,720
Herefordshire	105,400	64,600	107,730	63,270	110,080	61,920	109,860	59,150	114,840	59,160	119,930	59,070	125,120	58,880
Shire & Unitary Authorities Total	2,333,680	1,430,320	2,378,880	1,397,120	2,424,320	1,363,680	2,467,400	1,328,600	2,583,900	1,331,100	2,702,780	1,331,220	2,824,040	1,328,960
West Midlands Region Total	4,346,200	2,663,800	4,430,160	2,601,840	4,514,560	2,539,440	4,596,150	2,474,850	4,813,360	2,479,620	5,035,050	2,479,950	5,261,160	2,475,840

Pref Option 22 Oct 2007

	2014/5		2015/6		2016/7		2017/8		2018/9		2019/20		2020/1	
	Diversion	Residual	Diversion	Residual	Diversion	Residual	Diversion	Residual	Diversion	Residual	Diversion	Residual	Diversion	Residual
I&C Waste														
Birmingham	834,900	375,100	869,400	372,600	930,810	380,190	993,600	386,400	1,057,770	391,230	1,123,320	394,680	1,191,000	397,000
Coventry	293,940	132,060	305,900	131,100	327,310	133,690	349,200	135,800	371,570	137,430	394,420	138,580	419,250	139,750
Dudley	298,080	133,920	310,800	133,200	332,990	136,010	355,680	138,320	378,870	140,130	402,560	141,440	426,000	142,000
Sandwell	440,220	197,780	458,500	196,500	491,320	200,680	524,880	204,120	559,180	206,820	594,220	208,780	628,500	209,500
Solihull	131,790	59,210	138,600	59,400	148,390	60,610	158,400	61,600	168,630	62,370	179,080	62,920	189,750	63,250
Walsall	299,460	134,540	312,200	133,800	334,410	136,590	357,120	138,880	380,330	140,670	404,040	141,960	427,500	142,500
Wolverhampton	245,640	110,360	255,500	109,500	273,350	111,650	291,600	113,400	310,250	114,750	329,300	115,700	350,250	116,750
Met Area Total	2,544,030	1,142,970	2,650,900	1,136,100	2,838,580	1,159,420	3,030,480	1,178,520	3,226,600	1,193,400	3,426,940	1,204,060	3,632,250	1,210,750
Shropshire	288,420	129,580	299,600	128,400	320,920	131,080	342,720	133,280	365,000	135,000	387,760	136,240	410,250	136,750
Telford & Wrekin	269,790	121,210	280,700	120,300	300,330	122,670	320,400	124,600	340,910	126,090	361,860	127,140	384,750	128,250
Staffordshire & Stoke-on-Trent	1,179,900	530,100	1,229,200	526,800	1,316,340	537,660	1,405,440	546,560	1,496,500	553,500	1,589,520	558,480	1,683,750	561,250
Warwickshire	478,860	215,140	500,500	214,500	536,050	218,950	572,400	222,600	609,550	225,450	647,500	227,500	686,500	228,500
Worcestershire	600,300	289,700	626,500	268,500	670,950	274,050	716,400	278,600	762,850	282,150	810,300	284,700	858,000	286,000
Herefordshire	130,410	58,590	136,500	58,500	146,260	59,740	156,240	60,760	166,440	61,560	176,860	62,140	186,750	62,250
Shire & Unitary Authorities Total	2,947,680	1,324,320	3,073,000	1,317,000	3,290,850	1,344,150	3,513,600	1,366,400	3,741,250	1,383,750	3,973,800	1,396,200	4,209,000	1,403,000
West Midlands Region Total	5,491,710	2,467,290	5,723,900	2,453,100	6,129,430	2,503,570	6,544,080	2,544,920	6,967,850	2,577,150	7,400,740	2,600,260	7,841,250	2,613,750

RSS Housing Forecasts

Housing Proposals

Planning Area	Proposal Total (Net) 2006 - 2026	Indicative annual average 2006 - 2026
Birmingham	50,600	2,530
Coventry †††	33,500	1,675
Black Country	61,200	3,060
Solihull	7,600	380
Metropolitan Area Total	152,900	7,645
Shropshire	25,700	1,285
Bridgnorth	2,500	125
North Shropshire	6,100	305
Oswestry	4,000	200
Shrewsbury & Atcham	8,200	410
of which Shrewsbury	6,200	310
South Shropshire	4,900	245
Telford & Wrekin	26,500	1,325
of which Telford	24,000	1,200
Staffordshire	54,900	2,745
Cannock Chase	5,800	290
East Staffordshire	12,900	645
of which Burton upon Trent	12,000	600
Lichfield	8,000	400
Newcastle-under-Lyme	5,700	285
of which Newcastle urban area	4,600	230
South Staffordshire	3,500	175
Stafford	10,100	505
of which Stafford town	7,000	350
Staffordshire Moorlands	6,000	300
Tamworth	2,900	145
Stoke on Trent	8,400	420
Warwickshire	41,000	2,050
North Warwickshire	3,000	150
Nuneaton and Bedworth	10,800	540
Rugby	10,800	540
of which Rugby town	9,800	490
Stratford-on-Avon	5,600	280
Warwick	10,800	540
Worcestershire	36,600	1,830
Bromsgrove)	2,100	105
Redditch ††)	6,600	330
of which in & around Redditch	6,600	330
Malvern Hills*	4,900	245
Worcester City ††† *	10,500	525
Wychavon*	9,100	455
Wyre Forest	3,400	170
Herefordshire	16,600	830
of which Hereford City	8,300	415
Shire and Unitary Authorities	209,700	10,485
Major Urban Areas †	165,900	8,295
Other Areas	196,700	9,835
West Midlands Region	362,600	18,130
† Includes the Newcastle urban area		
†† Redditch Figure of 6,600 includes 3,300 in Redditch and 3,300 adjacent to Redditch town, Bromsgrove or Stratford upon Avon Districts		
††† Of the figure of 10,500 for Worcester; 3,200 will be within Worcester City and 7,300 will be adjacent to the City within the surrounding Malvern Hills and or Wychavon		
†††† Dependant upon the capacity in Coventry and the outcome of further studies some of the location could be made adjacent to Coventry with distribution in Nuneaton & Bedworth and Warwick.		

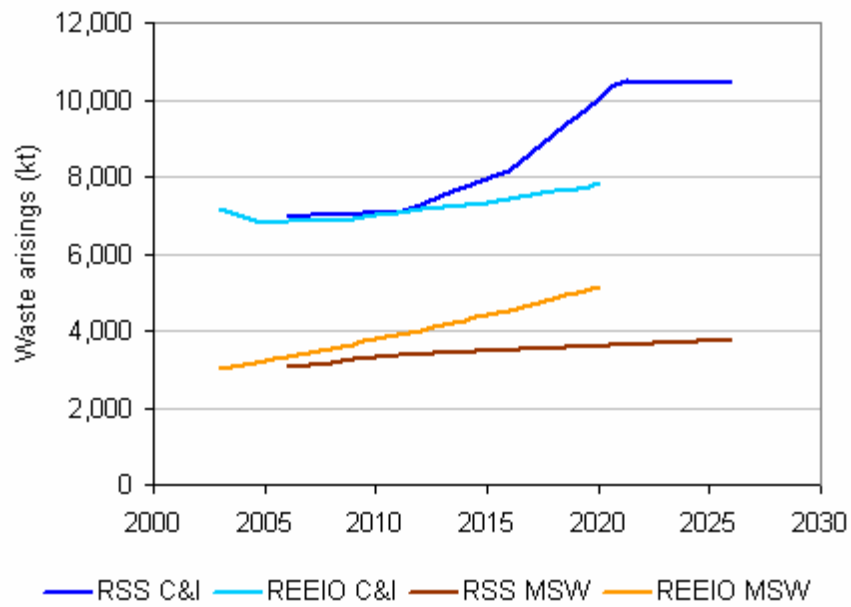
Housing Demolitions

Planning Area	Annual Demolitions 2006 - 2026	Total 2006 - 2026
<i>Birmingham City Council</i>	1,345	26,900
Black Country	1,290	25,806
<i>Coventry CC</i>	105	2,097
<i>Solihull MBC</i>	227	4,539
Metropolitan Area Total	2,967	59,342
Shropshire	18	351
<i>Bridgnorth</i>	4	87
<i>North Shropshire</i>	4	76
<i>Oswestry</i>	1	14
<i>Shrewsbury and Atcham</i>	6	115
<i>South Shropshire</i>	3	59
Telford and Wrekin	10	202
Staffordshire	106	2,116
<i>Cannock Chase</i>	29	588
<i>East Staffordshire</i>	1	28
<i>Lichfield</i>	4	72
<i>Newcastle under Lyme</i>	49	976
<i>South Staffordshire</i>	12	242
<i>Stafford</i>	8	150
<i>Staffordshire Moorlands</i>	3	60
<i>Tamworth</i>	0	0
Stoke on Trent	275	5,500
Warwickshire	102	2,030
<i>North Warwickshire</i>	13	251
<i>Nuneaton and Bedworth</i>	22	448
<i>Rugby</i>	26	517
<i>Stratford-on-Avon</i>	33	668
<i>Warwick</i>	7	146
Worcestershire	66	1,329
<i>Bromsgrove</i>	10	205
<i>Malvern Hills</i>	15	295
<i>Redditch</i>	2	30
<i>City of Worcester</i>	0	0
<i>Wychavon</i>	24	471
<i>Wyre Forest</i>	16	328
Herefordshire	25	500
Shire and Unitary Authorities	601	12,028
Major Urban Areas	3,291	65,818
Other Areas	278	5,552
WEST MIDLANDS REGION	3,569	71,370

Notes: Taken from the Regional Housing Land Study 2007

REEIO and RSS waste forecasting

The findings in this study are based on the latest Regional Spatial Strategy (RSS) waste projections. As noted in footnote 4 (Chapter 2) there is currently some disparity between the RSS projections and the REEIO model outputs. The chart below summarises the waste projections for municipal waste and C&I wastes for the two different approaches.



Based on the above chart, there is clearly a need to review and reconcile the existing regional waste projections. Consistent projections could be incorporated into future revisions of the RSS and RES, therefore providing more clarity to the issue of future regional predictions.

APPENDIX 3 – FURTHER REGULATORY IMPACT ASSESSMENT DETAILS

Summary of Regulations Considered

The following subsections summarise key features of the regulatory mechanisms considered in the regulatory impact assessment (RIA).

UK Animal By-Products Regulation (ABPR)

Animal by-products are defined as entire bodies, parts of animals or products of animal origin that are not intended for human consumption. These will typically arise from manufacturing, distribution, wholesale, retail and catering premises.

The regulations categorise animal by-products into three categories, according to risk.

- category 3 – catering waste, and raw meat/fish from food manufacturers and food retailers (the lowest risk category);
- category 2 – condemned meat, fallen stock, manure, digestive tract content (high risk material); and
- category 1 – animals suspected or confirmed as being infected by a TSE (Transmissible Spongiform Encephalopathy, e.g. BSE), animals killed in the context of TSE controls, Specified Risk Material and international catering waste (very high risk material).

Permitted outlets for disposal vary by category, and include:

- incineration in accordance with Waste Incineration Directive;
- treatment in an approved rendering plant or technical plant;
- use as raw material for pet food; and
- transformation in an approved composting or biogas plant.

Material potentially falling under ABPRs will generally be

- raw meat and fish;
- former foodstuffs; or
- catering waste.

ABPR regulations require all raw meat and fish within commercial and industrial waste streams to be pre-treated³² prior to landfill. In determining which products may be disposed of to landfill without risk to public or animal health, it was concluded that the greatest risk is from animal pathogens which might be spread if birds or vermin transfer the material from the landfill site to fields where livestock are present. Thus it is not considered that it is safe to landfill meat, fish and eggs that have not undergone a heat treatment resulting in a physical change, as the treatment may not have been sufficient to inactivate serious animal pathogens.

Some exemptions exist for material falling into the category 'former foodstuffs', three separate cases being identified:

³² At a minimum temperature of 70°C for at least 1 hour and at a maximum particle size of 12mm to ensure the required degree of pathogen destruction

- former foodstuffs that were previously permitted to go to landfill, but which member States consider to pose a risk to public and animal health if they are disposed to landfill – these will continue to be covered by the ABPR and have to be disposed of in the same way as raw meat and fish;
- former foodstuffs which the member state considers can be safely disposed of to landfill; and
- former foodstuffs which the member state considers can be safely disposed of to landfill or by other means, and which can also be safely fed to animals.

Former foodstuffs which can be disposed of to landfill will largely be taken outside the scope of the Animal By-Products Regulation. However, they will remain subject to waste management controls. It is necessary to keep former foodstuffs of animal origin which are intended for landfill separate from those animal by-products which cannot go to landfill. If they are not kept separate they must all be dealt with as category 3 ABPs.

Catering waste is defined as “all waste food including used cooking oil originating in restaurants, catering facilities and kitchens, including central kitchens and household kitchens”. Catering waste must not be fed to livestock and in addition to other disposal methods, catering waste may continue to be disposed of to landfill, although it is possible that alternative treatments such as composting and biogas treatment will be increasingly used.

UK Waste Electrical and Electronic Equipment (WEEE) Regulations

The EU WEEE directive (2003) sets stringent targets for the reuse, recycling and recovery of WEEE. In the UK, the WEEE directive is implemented via the WEEE regulations, which took effect from July 2007. The regulations have a direct impact on organisations involved in manufacturing, selling, distributing, recycling and treatment of electrical and electronic equipment. WEEE categories include:

- household appliances;
- IT and telecommunications equipment;
- audiovisual equipment;
- lighting equipment;
- electrical and electronic tools;
- toys;
- leisure and sports equipment;
- medical devices; and
- automatic dispensers.

The intention of the WEEE directive is to reduce the waste arising from electrical and electronic equipment, and improve the environmental performance of all those involved in the life cycle of electrical and electronic products.

Under the UK implementation, EEE producers and distributors are responsible for taking back and recycling electronic equipment. The UK system for compliance with the EU WEEE Directive has two distinct components: that for household waste, and that for business to business (B2B) waste. Figures A9-1 and A9-2 summarise the compliance systems for each case.

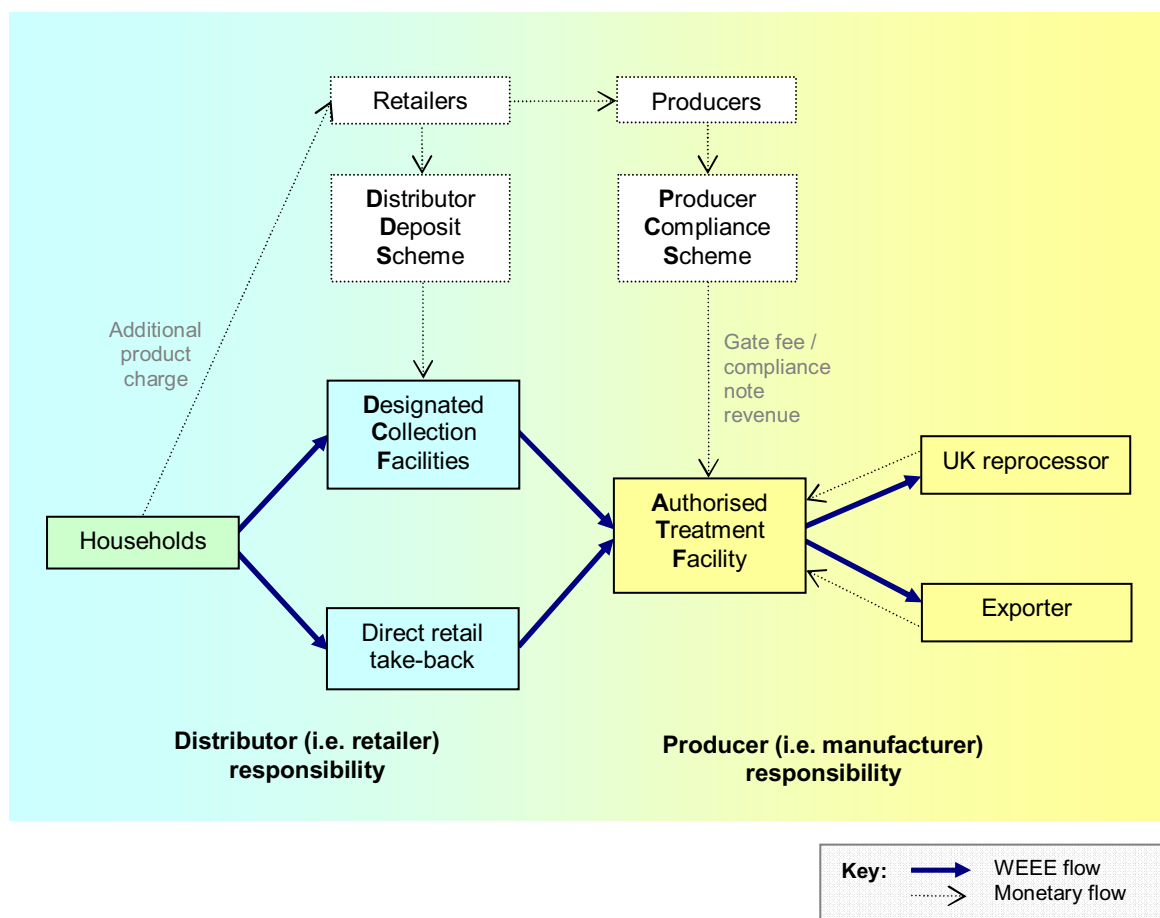
For each WEEE item purchased by a householder, distributors are required to provide means for customers to dispose of an equivalent WEEE item. The physical flow for household WEEE proceeds as shown in Figure A9-1.

The responsibility for the first stage in the WEEE recycling chain – collection of WEEE from householders – falls to distributors; the remaining stages are the responsibility of producers.

Producers discharge their responsibility through membership of a producer compliance scheme (PCS). Distributors may discharge this responsibility by:

- collecting items directly, either on delivery of new items, or in-store; or
- by joining a distributor deposit scheme (DDS).

Figure A9-1
Overview of UK Household WEEE Producer Responsibility Arrangements



It is expected that the majority of electrical goods retailers will fulfil their responsibilities through registration with a DDS.

Figure A9-2 illustrates mass and monetary flows associated with the recycling of UK business to business (B2B) WEEE. The B2B system broadly mirrors that for household WEEE, with some important differences.

Responsibility for the entire B2B recycling process falls to producers. Producers must make provision for collection of WEEE from business EEE users, and the treatment and reprocessing of that WEEE.

Producers are responsible for WEEE falling into two specific categories:

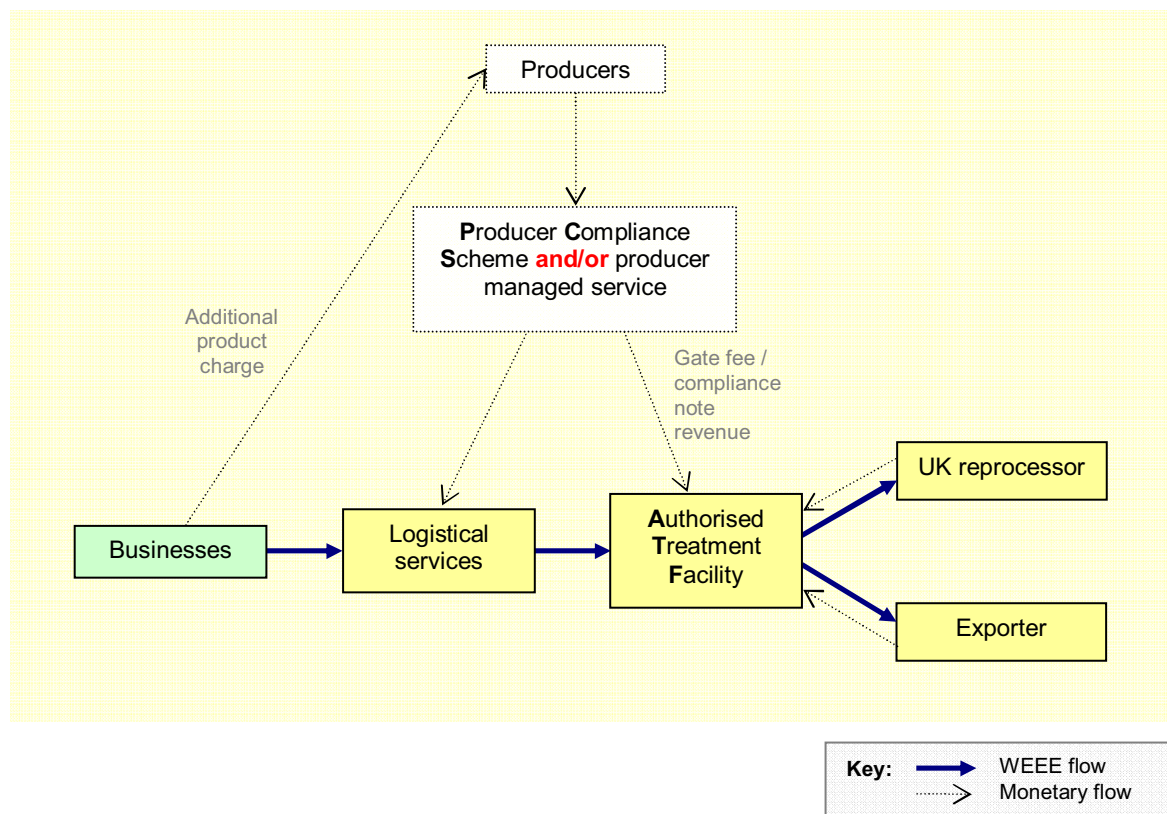
- that arising from B2B EEE placed on the market after August 2005; and

- that arising from B2B EEE placed on the market before August 2005, which is being replaced on a like for like basis or with an item of similar use.

The responsibility for handing all other WEEE placed on the market before August 2006 falls to the business end user.

Producers can either make their own arrangements to discharge their responsibilities, or join a producer compliance scheme. As in the case of household WEEE, compliance schemes are likely to be the preferred route for most producers.

Figure A9-2
Overview of UK Business to Business WEEE Producer Responsibility Arrangements



UK Landfill Regulations (including Hazardous Waste Regulations)

The EU Landfill Directive aims to reduce reliance on landfill as a disposal option, minimise the impacts of landfill on the environment and human health, and ensure consistent standards across the EU. The Directive requires that individual landfills accept only hazardous waste or non-hazardous waste / inert waste, and hence ended the process of co-disposal (in 2004 in the UK. The Directive also requires that;

- biodegradable waste is progressively diverted away from landfills;
- pre-treatment of wastes prior to landfilling becomes mandatory; and
- landfill of certain hazardous and other wastes, including liquids, is prohibited.

The move to dedicated landfills for hazardous waste has dictated tighter controls over site engineering and 'quality' of the waste going into the sites.

The Hazardous Waste Regulations form part of the UK implementation of the Landfill Directive. They came into effect on 16 July 2005, and resulted in the revoking of the Special Waste Regulations 1996. Although the definitions of 'hazardous' and 'special' differ, the vast majority of wastes previously defined as special waste are also hazardous wastes. Key wastes now classed as hazardous which were not previously defined as special include;

- fluorescent tubes;
- televisions;
- computer monitors;
- undepolluted end of life vehicles; and
- dental amalgam.

The landfilling of certain waste types has been banned or is being phased out. These include;

- liquids (including waste waters but excluding sewage sludge and subject to a transition timetable);
- whole and shredded used tyres, excluding bicycle tyres, or tyres with an outside diameter above 1.4 metres (e.g. larger agricultural and earthmover tyres) – whole tyres can still be used for landfill engineering purposes;
- hospital and other clinical waste arising from medical or veterinary establishments; and
- waste that may be explosive, corrosive, oxidising, flammable or highly flammable under landfill conditions.

In accordance with the Landfill Regulations, all waste will have to be treated prior to landfilling to reduce its environmental impact in landfill to the lowest level that is achievable.

Exceptions to this requirement are;

- waste that is inert and for which treatment is not technically feasible; and
- waste other than inert for which treatment would not reduce its quantity or its hazard to human health and the environment.

UK Producer Responsibility (Packaging Waste) Regulations 1997

The UK Producer Responsibility (Packaging Waste) Regulations (Packaging Waste) implement the EU Directive on Packaging and Packaging Waste in the UK.

The legislation aims to minimise the impact of packaging waste on the environment by increasing the amount of recycling undertaken within the UK. This is achieved by putting the onus on UK businesses who handle packaging to pick up the cost of recycling.

Packaging is defined as "any material used for the containment, protection, handling, delivery and presentation of goods". The Regulations identify 3 main groups of packaging;

- Primary or Point of Sale (POS) – packaging which forms the actual sales unit for the end user;
- Secondary or Grouped – packaging that contains a collection of the sales units; and
- Tertiary or Transport – packaging that groups together secondary packaging, for ease of handling and transportation

Businesses must comply with the regulations if they fall under the following definitions:

- they are a UK business that performs an activity on packaging;
- they have a turnover greater than £2 million in last year's audited accounts; and
- they handle more than 50 tonnes of packaging per year, excluding any packaging subsequently exported.

The Regulations share the responsibility for recycling packaging waste between different participants in the packaging chain. The participants are grouped into five categories and a percentage of responsibility is placed on each group. The categories and associated responsibilities are;

- manufacturer of raw material (6%);
- converter of raw material (9%);
- packer/filler (37%);
- seller (48%);
- end user (0%).

The Regulations require companies to recycle a proportion of the packaging they introduce into the UK. This packaging may take the following forms;

- imported packaging added to goods or packaging around products received into the UK (including components and raw materials);
- UK packaging added to goods or any packaging around products purchased in the UK and passed to the end user of that packaging.

In practice, companies are not required to physically recycle themselves, but to purchase Packaging Recovery Notes (PRNs) as evidence that approved recycling has been performed on their behalf in the UK.

PRNs are the only form of tradable evidence that recycling has taken place and can only be issued at the point where packaging waste is recycled. The revenue that the re-processors obtain from the sale of PRNs is reinvested into new plant and collection schemes to improve the recycling volumes and infrastructure in the UK.

The obligations companies have are annual and based upon the packaging handled in the previous calendar year. In order to comply with the Regulations, companies must;

- apply the Regulations to their business;
- obtain the necessary data regarding the packaging handled;
- calculate their obligation;
- complete a data submission form;
- register with the Environment Agency; and
- acquire Packaging Recovery Notes (PRNs) to discharge their obligation.

Further Regulatory Impact Assessment Details

The regulatory impact assessment (RIA) presented in the main body of this report presents estimates for the impacts of the above regulations in terms of cost, and required facility numbers. Estimates presented in the main body assume intermediate-scale facilities, whereas in the assessment itself, calculations have been carried out for two separate cases:

- treatment in small, local facilities; and
- treatment in large, regional facilities.

Tables A9.1 and A9.2 below respectively list facility capacities and costs associated with the local and regional cases. Consequent net cost impacts are then listed in Tables A9.3 and A9.4, while numbers of required facilities are listed in Tables A9.5 and A9.6.

Tables A9.1
Estimated Costs for Non-Landfill Management – Small, Local Facilities

	Facility Capacity (kt/y)	Collection and Transfer cost (£/t)	Cost for Recycling or Disposal (£/t)
MRF	25	£20	£45
Comp/AD	5	£25	£50
EfW/MBT	-	-	-
WEEE Processing	8	£50	£80
Haz Disposal	10	£50	£200

Tables A9.2
Estimated Costs for Non-Landfill Management – Large, Regional Facilities

	Facility Capacity (kt/y)	Collection and Transfer cost (£/t)	Cost for Recycling or Disposal (£/t)
MRF	85	£30	£35
Comp/AD	60	£35	£35
EfW/MBT	-	-	-
WEEE Processing	30	£70	£55
Haz Disposal	40	£70	£160

Tables A9.3
Net Cost Impacts – Small, Local Facilities (a -ve Value Indicates a Cost Saving)

	2010		2015		2020	
	Low	High	Low	High	Low	High
MRF	-0.5	-1.2	-2.4	-6.0	-3.7	-7.9
Comp/AD	-0.1	-0.1	-5.2	-9.0	-6.9	-11.4
EfW/MBT	-	-	-	-	-	-
WEEE Processing	1.0	1.2	0.7	0.7	1.1	1.2
Haz Disposal	2.0	5.0	2.3	5.7	3.3	8.2

Tables A9.4
Net Cost Impacts – Large, Regional Facilities (a -ve Value Indicates a Cost Saving)

	2010		2015		2020	
	Low	High	Low	High	Low	High
MRF	-0.5	-1.2	-2.4	-6.0	-3.7	-7.9
Comp/AD	-0.4	-0.8	-6.6	-11.4	-9.1	-14.9
EfW/MBT	-	-	-	-	-	-
WEEE Processing	0.9	1.0	0.4	0.5	0.8	0.8
Haz Disposal	1.8	4.4	2.0	5.0	2.9	7.2

Tables A9.5
Estimated Required Numbers of Treatment Facilities – Small, Local Facilities

	2010		2015		2020	
	Low	High	Low	High	Low	High
MRF	2	4	3	7	4	9
Comp/AD	12	24	47	82	62	103
EfW/MBT						
WEEE Processing	4	4	5	5	6	7
Haz Disposal	1	3	1	3	2	4

Tables A9.6
Estimated Required Numbers of Treatment Facilities – Large, Regional Facilities

	2010		2015		2020	
	Low	High	Low	High	Low	High
MRF	0	1	1	2	1	3
Comp/AD	1	2	4	7	5	9
EfW/MBT						
WEEE Processing	1	1	1	1	2	2
Haz Disposal	0	1	0	1	0	1

APPENDIX 4 - DATA TABLES FOR DRAWINGS

**Drawing 2-2
RSS Forecasted Total Waste Arisings by District (MSW and C&I)**

2007/08

AUTH_DISTRICT	MSW_0708	C&I_0708	Total_0708
BIRMINGHAM DISTRICT	573,867	1,063,000	1,636,867
COVENTRY DISTRICT	190,382	374,000	564,382
DUDLEY DISTRICT	173,895	450,586	624,481
SANDWELL DISTRICT	161,474	468,461	629,935
WALSALL DISTRICT	140,772	327,905	468,677
CITY OF WOLVERHAMPTON DISTRICT	136,632	390,049	526,681
SOLIHULL DISTRICT	104,362	172,000	276,362
COUNTY OF HEREFORDSHIRE	104,529	170,000	274,529
BRIDGNORTH DISTRICT	32,850	52,815	85,665
NORTH SHROPSHIRE DISTRICT	36,335	60,006	96,341
OSWESTRY DISTRICT	24,219	40,937	65,155
SHREWSBURY AND ATCHAM DISTRICT	61,748	165,488	227,236
SOUTH SHROPSHIRE DISTRICT	27,300	46,755	74,054
CANNOCK CHASE DISTRICT	58,947	127,336	186,283
EAST STAFFORDSHIRE DISTRICT	69,301	182,007	251,308
LICHFIELD DISTRICT	60,891	159,906	220,797
NEWCASTLE-UNDER-LYME DISTRICT	80,294	153,184	233,478
SOUTH STAFFORDSHIRE DISTRICT	64,768	113,164	177,932
STAFFORD DISTRICT	81,093	192,991	274,084
STAFFORDSHIRE MOORLANDS DISTRICT	62,118	100,200	162,318
TAMWORTH DISTRICT	46,350	92,677	139,027
CITY OF STOKE-ON-TRENT	159,587	384,535	544,122
TELFORD AND WREKIN	97,075	344,000	441,075
NORTH WARWICKSHIRE DISTRICT	37,036	60,496	97,532
NUNEATON AND BEDWORTH DISTRICT	71,941	108,238	180,179
RUGBY DISTRICT	55,014	97,996	153,010
STRATFORD-ON-AVON DISTRICT	71,177	157,266	228,442
WARWICK DISTRICT	83,260	189,004	272,264
BROMSGROVE DISTRICT	51,620	107,746	159,366
MALVERN HILLS DISTRICT	43,667	89,205	132,872
REDDITCH DISTRICT	46,715	123,093	169,808
WORCESTER DISTRICT	56,978	154,043	211,021
WYCHAVON DISTRICT	69,209	165,940	235,149
WYRE FOREST DISTRICT	58,724	124,972	183,696
WEST MIDLANDS TOTAL	3,194,128	7,010,000	10,204,128

2020/21

AUTH_DISTRICT	MSW_2021	C&I_2021	Total_2021
BIRMINGHAM DISTRICT	641,772	1,588,000	2,229,772
COVENTRY DISTRICT	233,115	559,000	792,115
DUDLEY DISTRICT	195,858	672,438	868,295
SANDWELL DISTRICT	181,868	699,114	880,982
WALSALL DISTRICT	158,551	489,353	647,905
CITY OF WOLVERHAMPTON DISTRICT	153,888	582,095	735,983
SOLIHULL DISTRICT	114,169	253,000	367,169
COUNTY OF HEREFORDSHIRE	123,765	249,000	372,765
BRIDGNORTH DISTRICT	36,671	78,934	115,605
NORTH SHROPSHIRE DISTRICT	43,908	89,681	133,589
OSWESTRY DISTRICT	29,234	61,181	90,415
SHREWSBURY AND ATCHAM DISTRICT	72,464	247,328	319,792
SOUTH SHROPSHIRE DISTRICT	33,307	69,877	103,183
CANNOCK CHASE DISTRICT	67,379	189,820	257,199
EAST STAFFORDSHIRE DISTRICT	86,259	271,318	357,578
LICHFIELD DISTRICT	72,242	238,373	310,614
NEWCASTLE-UNDER-LYME DISTRICT	89,281	228,351	317,633
SOUTH STAFFORDSHIRE DISTRICT	71,446	168,694	240,140
STAFFORD DISTRICT	95,575	287,693	383,268
STAFFORDSHIRE MOORLANDS DISTRICT	71,462	149,369	220,831
TAMWORTH DISTRICT	51,722	138,154	189,876
CITY OF STOKE-ON-TRENT	170,678	573,228	743,906
TELFORD AND WREKIN	129,431	513,000	642,431
NORTH WARWICKSHIRE DISTRICT	36,636	90,201	126,837
NUNEATON AND BEDWORTH DISTRICT	75,439	161,387	236,826
RUGBY DISTRICT	59,691	146,115	205,805
STRATFORD-ON-AVON DISTRICT	70,131	234,488	304,618
WARWICK DISTRICT	86,180	281,810	367,990
BROMSGROVE DISTRICT	55,474	161,127	216,601
MALVERN HILLS DISTRICT	49,735	133,399	183,135
REDDITCH DISTRICT	54,745	184,077	238,822
WORCESTER DISTRICT	69,117	230,360	299,477
WYCHAVON DISTRICT	80,075	248,151	328,225
WYRE FOREST DISTRICT	63,970	186,886	250,857
WEST MIDLANDS TOTAL	3,625,238	10,455,000	14,080,238

**Drawing 2-3
RSS Forecasted Total Waste Treatment Need (Excluding Landfill and Transfer)**

2007/08

AUTH_DISTRICT	TOTAL TREATMENT REQUIREMENT	RECYCLING_REPRO CESSING	ORGANIC_TREATMENT	OTHER_TREATMENT
BIRMINGHAM DISTRICT	1,173,983	597,752	187,937	388,294
COVENTRY DISTRICT	395,995	205,770	62,924	127,301
SANDWELL DISTRICT	403,622	233,147	61,489	108,987
DUDLEY DISTRICT	401,246	227,718	61,585	111,943
CITY OF STOKE-ON-TRENT	332,517	191,699	50,699	90,120
CITY OF WOLVERHAMPTON DISTRICT	337,595	194,530	51,484	91,581
WALSALL DISTRICT	301,968	168,371	46,687	86,910
TELFORD AND WREKIN	243,373	157,091	35,209	51,073
SOLIHULL DISTRICT	196,511	98,465	31,638	66,408
STAFFORD DISTRICT	167,473	96,367	25,555	45,551
EAST STAFFORDSHIRE DISTRICT	153,709	89,755	23,307	40,647
WARWICK DISTRICT	146,365	89,678	21,717	34,970
NEWCASTLE-UNDER-LYME DISTRICT	142,322	78,990	22,046	41,286
LICHFIELD DISTRICT	135,048	78,857	20,477	35,713
COUNTY OF HEREFORDSHIRE	134,668	81,465	20,100	33,104
SHREWSBURY AND ATCHAM DISTRICT	128,537	78,622	19,087	30,828
WYCHAVON DISTRICT	124,338	77,625	18,286	28,427
STRATFORD-ON-AVON DISTRICT	122,452	74,796	18,195	29,461
CANNOCK CHASE DISTRICT	113,708	64,437	17,463	31,808
WORCESTER DISTRICT	113,170	71,460	16,552	25,158
SOUTH STAFFORDSHIRE DISTRICT	108,354	59,209	16,889	32,256
STAFFORDSHIRE MOORLANDS DISTRICT	98,754	53,175	15,482	30,097
WYRE FOREST DISTRICT	95,687	59,006	14,155	22,527
NUNEATON AND BEDWORTH DISTRICT	92,323	53,620	14,032	24,671
REDDITCH DISTRICT	90,799	57,200	13,295	20,304
TAMWORTH DISTRICT	84,792	47,440	13,091	24,261
BROMSGROVE DISTRICT	82,805	50,954	12,261	19,589
RUGBY DISTRICT	80,040	47,602	12,039	20,399
MALVERN HILLS DISTRICT	68,844	42,263	10,206	16,376
NORTH SHROPSHIRE DISTRICT	52,464	30,067	8,019	14,378
NORTH WARWICKSHIRE DISTRICT	50,488	29,673	7,634	13,182
BRIDGNORTH DISTRICT	46,542	26,561	7,127	12,854
SOUTH SHROPSHIRE DISTRICT	40,454	23,315	6,169	10,970
OSWESTRY DISTRICT	35,553	20,449	5,426	9,678
WEST MIDLANDS TOTAL	6,296,498	3,557,127	968,262	1,771,109

2020/21

AUTH_DISTRICT	TOTAL TREATMENT REQUIREMENT	RECYCLING_REPRO CESSING	ORGANIC_TREATMENT	OTHER_TREATMENT
BIRMINGHAM DISTRICT	1,790,067	1,066,794	330,172	393,101
SANDWELL DISTRICT	593,532	366,546	103,769	123,217
COVENTRY DISTRICT	739,840	450,790	132,066	156,984
DUDLEY DISTRICT	673,363	418,630	116,488	138,245
STAFFORDSHIRE MOORLANDS DISTRICT	192,982	119,308	33,682	39,992
CITY OF WOLVERHAMPTON DISTRICT	552,063	344,995	94,714	112,355
WARWICK DISTRICT	169,700	100,110	31,755	37,834
WALSALL DISTRICT	566,759	354,028	97,302	115,429
LICHFIELD DISTRICT	222,433	139,724	37,840	44,869
SOLIHULL DISTRICT	489,311	309,830	82,146	97,335
NORTH WARWICKSHIRE DISTRICT	163,612	106,495	26,179	30,938
CANNOCK CHASE DISTRICT	233,221	148,325	38,864	46,032
COUNTY OF HEREFORDSHIRE	443,633	286,504	71,988	85,140
SHREWSBURY AND ATCHAM DISTRICT	258,853	159,660	45,345	53,849
BRIDGNORTH DISTRICT	250,740	164,497	39,546	46,697
WYRE FOREST DISTRICT	87,993	48,542	17,963	21,487
NORTH SHROPSHIRE DISTRICT	245,360	158,612	39,745	47,003
TAMWORTH DISTRICT	163,156	102,765	27,633	32,758
REDDITCH DISTRICT	103,295	61,108	19,253	22,934
EAST STAFFORDSHIRE DISTRICT	239,877	148,860	41,618	49,399
STRATFORD-ON-AVON DISTRICT	152,534	91,558	27,843	33,133
SOUTH STAFFORDSHIRE DISTRICT	223,376	140,556	37,894	44,925
MALVERN HILLS DISTRICT	91,937	54,184	17,227	20,526
WORCESTER DISTRICT	97,902	54,426	19,801	23,676
OSWESTRY DISTRICT	239,235	158,639	36,980	43,616
RUGBY DISTRICT	153,663	94,589	27,002	32,071
BROMSGROVE DISTRICT	136,564	84,214	23,931	28,419
NUNEATON AND BEDWORTH DISTRICT	192,786	118,554	33,930	40,303
WYCHAVON DISTRICT	120,358	67,901	23,901	28,555
STAFFORD DISTRICT	253,809	156,567	44,453	52,789
SOUTH SHROPSHIRE DISTRICT	218,512	142,958	34,639	40,914
CITY OF STOKE-ON-TRENT	241,932	131,887	50,091	59,954
NEWCASTLE-UNDER-LYME DISTRICT	239,104	147,661	41,804	49,639
TELFORD AND WREKIN	213,006	120,514	42,147	50,345
WEST MIDLANDS TOTAL	10,754,507	6,620,333	1,889,713	2,244,461

**Drawing 2-4
Existing Licensed Total Treatment Capacity (Excluding Landfill and Transfer)**

AUTH_DISTRICT	TOTAL	RECYCLING	ORGANICS	RESIDUAL TREATMENT
BIRMINGHAM DISTRICT	1,345,889	858,692	41,535	445,662
BRIDGNORTH DISTRICT	40,180	13,747	0	26,433
BROMSGROVE DISTRICT	5,771	5,771	0	0
CANNOCK CHASE DISTRICT	41,022	41,022	0	0
CITY OF STOKE-ON-TRENT	461,150	229,145	29,301	202,704
CITY OF WOLVERHAMPTON DISTRICT	443,788	255,775	0	188,014
COUNTY OF HEREFORDSHIRE	208,643	113,272	95,314	57
COVENTRY DISTRICT	334,309	159,309	0	175,000
DUDLEY DISTRICT	453,572	336,787	0	116,785
EAST STAFFORDSHIRE DISTRICT	70,777	70,777	0	0
LICHFIELD DISTRICT	36,257	2,757	13,500	20,000
NEWCASTLE-UNDER-LYME DISTRICT	38,611	38,611	0	0
NORTH SHROPSHIRE DISTRICT	116,720	40,313	23,541	52,866
NORTH WARWICKSHIRE DISTRICT	156,476	136,476	20,000	0
NUNEATON AND BEDWORTH DISTRICT	24,696	1,236	0	23,460
OSWESTRY DISTRICT	34,352	34,352	0	0
REDDITCH DISTRICT	2,096	2,096	0	0
RUGBY DISTRICT	6,060	4,936	1,124	0
SANDWELL DISTRICT	976,917	742,517	0	234,400
SHREWSBURY AND ATCHAM DISTRICT	33,698	4,034	29,664	0
SOLIHULL DISTRICT	136,758	1,236	0	135,522
SOUTH SHROPSHIRE DISTRICT	39,600	5,300	34,300	0
SOUTH STAFFORDSHIRE DISTRICT	270,515	104,533	165,982	0
STAFFORD DISTRICT	73,974	70,374	3,600	0
STAFFORDSHIRE MOORLANDS DISTRICT	44,674	39,674	5,000	0
STRATFORD-ON-AVON DISTRICT	75,070	45,070	20,000	10,000
TAMWORTH DISTRICT	15,207	15,207	0	0
TELFORD AND WREKIN	91,053	39,781	50,000	1,272
WALSALL DISTRICT	1,241,864	938,300	0	303,564
WARWICK DISTRICT	33,515	5,262	1,820	26,433
WORCESTER DISTRICT	9,671	1,236	0	8,435
WRECSAM - WREXHAM	65,000	0	0	65,000
WYCHAVON DISTRICT	166,378	128,118	0	38,260
WYRE FOREST DISTRICT	65,609	25,347	0	40,262
TOTAL	7,159,873	4,511,064	534,681	2,114,129

**Drawing 2-5 and 2-5a
Surveyed and EA RATS Transfer Station Capacity**

AUTH_WPA	TOTAL CAPACITY	SURVEYED	EA RATS
BIRMINGHAM	1,055,574	112,937	942,637
COVENTRY	221,052	177,979	43,073
DUDLEY	173,091	197	172,894
SANDWELL	450,192	4,977	445,215
WALSALL	180,756	0	180,756
WOLVERHAMPTON	266,249	23,681	242,568
SOLIHULL	33,142	10,156	22,986
HEREFORDSHIRE	133,775	7,323	126,452
SHROPSHIRE	155,621	30,025	125,596
STAFFORDSHIRE	545,814	115,225	430,589
STOKE-ON-TRENT	158,702	965	157,737
TELFORD AND WREKIN	207,773	75,472	132,301
WARWICKSHIRE	407,819	12,952	394,867
WORCESTERSHIRE	327,995	37,882	290,113
TOTAL WEST MIDLANDS	4,317,555	609,771	3,707,784

Drawing 2-6 Short and Long Term Treatment Capacity Gap (Excluding Transfer)

2007/08

AUTH_DISTRICT	TREATMENT_GAP_0708	RECYCLING_REPROCESSING	ORGANICS_TREATMENT	OTHER_TREATMENT
BIRMINGHAM DISTRICT	-171,907	-260,940	146,402	-57,368
COVENTRY DISTRICT	61,686	46,461	62,924	-47,699
DUDLEY DISTRICT	-52,327	-109,069	61,585	-4,842
SANDWELL DISTRICT	-573,295	-509,370	61,489	-125,413
WALSALL DISTRICT	-939,896	-769,929	46,687	-216,654
CITY OF WOLVERHAMPTON DISTRICT	-106,193	-61,245	51,484	-96,432
SOLIHULL DISTRICT	59,753	97,229	31,638	-69,114
COUNTY OF HEREFORDSHIRE	-73,974	-31,807	-75,214	33,047
BRIDGNORTH DISTRICT	6,362	12,815	7,127	-13,579
NORTH SHROPSHIRE DISTRICT	-64,256	-10,245	-15,522	-38,489
OSWESTRY DISTRICT	1,200	-13,904	5,426	9,678
SHREWSBURY AND ATCHAM DISTRICT	94,839	74,588	-10,577	30,828
SOUTH SHROPSHIRE DISTRICT	854	18,015	-28,131	10,970
CANNOCK CHASE DISTRICT	72,686	23,415	17,463	31,808
EAST STAFFORDSHIRE DISTRICT	82,932	18,978	23,307	40,647
LICHFIELD DISTRICT	98,791	76,100	6,977	15,713
NEWCASTLE-UNDER-LYME DISTRICT	103,711	40,379	22,046	41,286
SOUTH STAFFORDSHIRE DISTRICT	-162,161	-45,324	-149,093	32,256
STAFFORD DISTRICT	93,500	25,993	21,955	45,551
STAFFORDSHIRE MOORLANDS DISTRICT	54,080	13,501	10,482	30,097
TAMWORTH DISTRICT	69,585	32,233	13,091	24,261
CITY OF STOKE-ON-TRENT	-128,633	-37,446	21,398	-112,584
TELFORD AND WREKIN	152,320	117,310	-14,791	49,801
NORTH WARWICKSHIRE DISTRICT	-105,988	-106,803	-12,366	13,182
NUNEATON AND BEDWORTH DISTRICT	67,627	52,384	14,032	1,211
RUGBY DISTRICT	73,980	42,666	10,915	20,399
STRATFORD-ON-AVON DISTRICT	47,382	29,726	-1,805	19,461
WARWICK DISTRICT	112,850	84,416	19,897	8,537
BROMSGROVE DISTRICT	77,034	45,183	12,261	19,589
MALVERN HILLS DISTRICT	68,844	42,263	10,206	16,376
REDDITCH DISTRICT	88,703	55,104	13,295	20,304
WORCESTER DISTRICT	103,499	70,224	16,552	16,723
WYCHAVON DISTRICT	-42,041	-50,493	18,286	-9,833
WYRE FOREST DISTRICT	30,078	33,658	14,155	-17,735
WEST MIDLANDS TOTAL	-798,375	-953,937	433,581	-278,019

2020/21

AUTH_DISTRICT	TREATMENT_GAP_2021	RECYCLING_REPROCESSING	ORGANICS_TREATMENT	OTHER_TREATMENT
BIRMINGHAM DISTRICT	444,177	208,102	288,637	-52,561
TELFORD AND WREKIN	78,646	60,329	-18,245	36,562
COVENTRY DISTRICT	405,531	291,481	132,066	-18,016
WARWICK DISTRICT	130,098	101,233	24,359	4,505
SHREWSBURY AND ATCHAM DISTRICT	225,155	155,626	15,681	53,849
STAFFORD DISTRICT	148,459	69,350	34,240	44,869
WORCESTER DISTRICT	93,624	59,872	19,253	14,499
NEWCASTLE-UNDER-LYME DISTRICT	212,129	125,886	39,546	46,697
EAST STAFFORDSHIRE DISTRICT	162,443	77,547	38,864	46,032
LICHFIELD DISTRICT	209,103	155,855	26,245	27,003
DUDLEY DISTRICT	219,791	81,843	116,488	21,460
REDDITCH DISTRICT	95,806	52,329	19,801	23,676
STRATFORD-ON-AVON DISTRICT	88,085	57,694	7,633	22,758
NUNEATON AND BEDWORTH DISTRICT	127,838	90,322	27,843	9,673
CANNOCK CHASE DISTRICT	198,855	107,838	41,618	49,399
RUGBY DISTRICT	147,603	89,653	25,878	32,071
SOLIHULL DISTRICT	352,553	308,594	82,146	-38,187
BROMSGROVE DISTRICT	130,793	78,443	23,931	28,419
MALVERN HILLS DISTRICT	120,358	67,901	23,901	28,555
TAMWORTH DISTRICT	177,580	103,347	33,930	40,303
STAFFORDSHIRE MOORLANDS DISTRICT	194,562	118,966	31,980	43,616
WYRE FOREST DISTRICT	26,328	28,837	17,227	-19,736
CITY OF STOKE-ON-TRENT	-268,168	-109,837	4,381	-162,712
CITY OF WOLVERHAMPTON DISTRICT	108,275	89,220	94,714	-75,659
WYCHAVON DISTRICT	-78,386	-79,576	17,963	-16,773
BRIDGNORTH DISTRICT	201,752	118,141	50,091	33,520
COUNTY OF HEREFORDSHIRE	234,990	173,233	-23,326	85,083
SOUTH SHROPSHIRE DISTRICT	199,504	142,361	7,504	49,639
OSWESTRY DISTRICT	178,654	86,162	42,147	50,345
NORTH SHROPSHIRE DISTRICT	137,089	116,254	20,912	-77
NORTH WARWICKSHIRE DISTRICT	62,036	6,482	14,639	40,914
SOUTH STAFFORDSHIRE DISTRICT	-47,140	36,023	-128,088	44,925
SANDWELL DISTRICT	-383,385	-375,970	103,769	-111,183
WALSALL DISTRICT	-675,105	-584,272	97,302	-188,134
WEST MIDLANDS TOTAL	3,659,634	2,109,270	1,355,032	195,333

Drawing 2-7
Material specific mapping for paper & card, plastics, WEEE and hazardous materials

District	Paper and card (kt)	Plastics (kt)	WEEE (kt)	Hazardous (kt)
BIRMINGHAM DISTRICT	449	81	30	65
BRIDGNORTH DISTRICT	23	4	2	5
BROMSGROVE DISTRICT	44	8	3	3
CANNOCK CHASE DISTRICT	52	9	3	24
COUNTY OF HEREFORDSHIRE	74	14	8	8
COVENTRY DISTRICT	155	28	10	37
DUDLEY DISTRICT	176	29	10	31
EAST STAFFORDSHIRE DISTRICT	71	12	6	7
LICHFIELD DISTRICT	62	10	4	5
MALVERN HILLS DISTRICT	37	6	3	4
NEWCASTLE-UNDER-LYME DISTRICT	64	11	4	11
NORTH SHROPSHIRE DISTRICT	26	5	3	10
NORTH WARWICKSHIRE DISTRICT	26	5	2	16
NUNEATON AND BEDWORTH DISTRICT	49	9	4	5
OSWESTRY DISTRICT	18	3	1	1
REDDITCH DISTRICT	48	8	3	18
RUGBY DISTRICT	42	8	3	30
SANDWELL DISTRICT	178	29	9	41
SHREWSBURY AND ATCHAM DISTRICT	64	11	4	2
SOLIHULL DISTRICT	75	14	7	9
SOUTH SHROPSHIRE DISTRICT	20	4	2	5
SOUTH STAFFORDSHIRE DISTRICT	49	9	4	11
STAFFORD DISTRICT	77	13	4	4
STAFFORDSHIRE MOORLANDS DISTRICT	44	8	4	10
CITY OF STOKE-ON-TRENT	152	26	6	27
STRATFORD-ON-AVON DISTRICT	63	11	6	4
TAMWORTH DISTRICT	38	7	2	3
TELFORD AND WREKIN	127	20	5	13
WALSALL DISTRICT	131	22	8	67
WARWICK DISTRICT	76	13	5	4
CITY OF WOLVERHAMPTON DISTRICT	149	24	6	16
WORCESTER DISTRICT	60	10	3	13
WYCHAVON DISTRICT	66	11	5	6
WYRE FOREST DISTRICT	51	9	3	16
Total	2,834	491	182	528

APPENDIX 5 – GLOSSARY OF TERMS

Anaerobic digestion – a process where biodegradable material is encouraged to break down in the absence of oxygen, in an enclosed vessel. It produces carbon dioxide, methane and solids/liquors known as digestate, which can be used as fertiliser and compost. Methane is recovered and used in a gas turbine engines to produce electricity

Autoclave – is the most common form of Mechanical Heat Treatment (MHT). Autoclave uses a combination of mechanical and thermal (steam processing in a vessel under the action of pressure) processes to separate a mixed waste stream into component parts with further options of recycling and recovery. Different systems can be employed to meet various outputs, but in general the outputs will include one or more of the following: organic rich component for subsequent biological treatment (end use example – low grade soil conditioner); segregated high calorific value waste (RDF, end use example – use in process to capture energy potential); extract materials for recycling (typically glass and metals, potentially to capture plastics and ‘fibrous’ organic material and paper).

Biodegradable – material which is capable of being broken down by plants (including fungi), and animals (including worms and micro-organisms). In municipal solid waste, the property is generally attributed to the following fractions: paper and card, kitchen (food) and garden waste, wood, fines and miscellaneous combustible waste.

Biological Treatment – any biological process that changes the properties of waste (e.g., anaerobic digestion, composting). Biological treatment includes land spreading activities that are licensed (See land spreading) (source EA, SWMA).

Central composting – large-scale schemes which handle garden waste and kitchen waste from households and which may also accept suitable waste from parks and gardens.

Civic amenity (CA) site – often used as a generic term for a facility provided by the local authority which receives household waste normally delivered by the public direct to sites. Wastes handled include bulky items such as furniture, white goods, garden waste, and general household wastes as well as recyclables. Some CA sites have facilities to receive certain hazardous household wastes, e.g. Lead acid batteries and oil. The term civic amenity site originally referred to facilities established under the Civic Amenities Act 1967, which was repealed and replaced by section 2 of the Refuse Disposal (Amenity) Act 1978, which has since been repealed. The term household waste amenity site (used in Waste Management Paper 4) is a more correct term for facilities provided under the Environmental Protection Act 1990, however ‘civic amenity site’ is still widely used. Such sites now tend to be called Household Waste and Recycling Centres as is the case in Nottingham City.

Composting – the controlled biological decomposition and stabilisation of organic substrates (e.g. garden and kitchen waste), under conditions that are predominantly aerobic. It results in a final product that has sanitised and stabilised, is high in humic substances and is of such a quality that it can be used as a soil improver, as an ingredient in growing media, or blended to produce other marketable products (that meet recognised industry standards).

Compost plant – a facility for carrying out composting. Large scale schemes may handle kitchen and garden waste collected directly from households and civic amenity sites and may also accept suitable waste from municipal parks and gardens.

Controlled waste – comprises household, commercial, and industrial waste. The main exempted categories comprise of mine, quarry and farm wastes. Radioactive and explosive wastes are controlled by other legislation and procedures.

Energy from waste – includes a number of established and emerging technologies to recover energy from waste. Some of these are direct through ‘mass burn’ incineration (where waste is directly combusted without pre-treatment) whereas others are indirect; where the waste is processed into a fuel before energy is recovered (e.g. conversion into

refuse derived fuel, or gasification or pyrolysis). Many wastes are combustible, with relatively high calorific values – this energy can be recovered through (for instance) incineration with electricity generation.

Gasification – the heating of organic materials with air, steam or oxygen to produce gaseous fuels, ash and tar.

Greenhouse gas – one of a number of gases (including methane and carbon dioxide) that can contribute to climate change via the 'greenhouse' effect when their atmospheric concentrations exceed certain levels.

Hazardous wastes – the most harmful wastes to people and the environment, and defined according to properties listed in Annex III to Council Directive 91/689/EEC on hazardous waste.

Household waste – includes waste from household collection rounds, from services such as street sweepings, bulky waste collection, litter collection, hazardous household waste collection and separate garden waste collection. Also includes waste from civic amenity sites and source segregated wastes collected for recycling or composting through bring or drop-off schemes, kerbside schemes and at 'civic amenity sites'.

Household Waste Recycling Centre (HWRC) – see Civic Amenity sites

Incineration – is the controlled burning of waste, either to reduce its volume, or its toxicity. Energy recovery from incineration utilises the calorific value of the waste. Current flue-gas emission standards are very high. Ash residues still tend to be disposed of to landfill (although bottom ash can be recycled).

Inert Waste – waste which, when deposited into a waste disposal site, does not undergo any significant physical, chemical or biological transformations and which complies with the criteria set out in Annex III of the EC Landfill Directive.

Land Recovery – the application of waste onto land for improvement. Typical examples of this include the spreading of organic wastes for agricultural benefit, use of inert waste for land reclamation or improvement, or the use of inert waste for construction purposes (as defined by the EA).

Landfill site – is defined in the Council Directive 1999/31/ec on the landfill of waste meaning "...a waste disposal site for the deposit of the waste onto or into land...". The definition includes sites where the producer of the waste is landfilling at the place of production of the waste and any site established for over a year, where waste is temporarily stored. Landfill sites are often located in disused quarries or mines. In areas where there are limited, or no ready-made voids, the practice of land raising is sometimes carried out, where some or all of the waste is deposited above ground, and the landscape is contoured.

Landfill tax – a tax intended to address the environmental costs of landfilling by encouraging the diversion of waste from landfill.

Metals Recycling – a facility that recovers scrap metal from waste for recycling (Source EA, SWMA).

Mechanical Biological Treatment (MBT) – may be used as pre-treatment to stabilise residual wastes prior to landfilling. A combination of mechanical and biological processes are employed to achieve stabilisation of the wastes. Typical plants generate three material streams; recyclable material comprising mainly ferrous and non-ferrous metals; a bio-stabilised stream suitable for landfill cover and a residual stream that can either be landfilled or converted into a secondary fuel.

Municipal wastes – the Landfill (England and Wales) Regulations 2002 defines it as "...waste from households as well as other waste, which, because of its nature or composition, is similar to wastes from households." In Part Two of Waste Strategy 2000,

municipal waste is defined as “...all waste under the control of local authorities or agents acting on their behalf” and is the definition used in the Waste Strategy for England and Wales.

Packaging Wastes – defined as ‘all products made of any materials of any nature to be used for the containment, protection, handling, delivery, and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer.

Physico-chemical treatment – treating waste by one of a combination of physical (filtration, settlement etc.) and chemical (eg, neutralisation) methods to recover it and/or to produce a less harmful waste for disposal (Source EA, SWMA).

Pyrolysis – the heating of organic materials in the absence of air, causing the volatilisation of combustible gases. Also produced is a combustible char, a mixture of oils and liquid effluent.

Recycling – involves the reprocessing of wastes, either into the same product or a different one. Many non-hazardous industrial wastes such as paper, glass, cardboard, plastics and scrap metals can be recycled. Special wastes such as solvents can also be recycled by specialist companies, or by in-house equipment.

Reprocessing - Treatment of material reclaimed from a waste stream to make new material or products.

Re-use – using a product again for the same or a different purpose. Furniture and some electrical goods are often capable of being re-used and many community and voluntary sector groups are actively involved in facilitating re-use of such items. It can be practiced by the commercial sector with the use of products designed to be used a number of times, such as re-useable packaging. Householders can purchase products that use refillable containers, or re-use plastic bags. The processes contribute to sustainable development and can save raw materials, energy and transport costs.

Separate collection – kerbside schemes where materials for recycling are collected either by a different vehicle or at a different time to the ordinary waste collection.

Source segregation – involves the segregation at source of waste into individual materials. In the case of household waste, this source segregated waste would include recyclable and compostable materials collected separately at the kerbside or taken to civic amenity and bring sites.

Special waste – the term special waste is now obsolete in England and Wales as of July 2005 when the new hazardous waste regime replaced the special waste regime. Refer to hazardous waste.

Strategic Waste Management Assessment (SWMA) – produced by the Environment Agency to provide consistent, comprehensive, local information about the amounts and types of wastes produced and how they are managed.

Sustainable development – development that can meet the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable waste management – requires that waste management should be carried out in a way that does not place undue social, economic, or environmental burdens on either present or future generations and that ensures social equity, effective protection of the environment, the prudent use of natural resources and the maintenance of high and stable economic growth and employment. The aim is to de-couple waste production from economic growth.

Transfer – a waste transfer station is a facility to which waste is delivered for separation or bulking up before being removed for recovery and/or disposal (source: EA, SWMA).

Treatment – physical, thermal, chemical or biological processes, including sorting, that change the characteristics of the waste in order to reduce its volume and hazardous nature, facilitate its handling or enhance recovery.

Unitary Authority – a local authority that has the responsibilities of waste planning, collection and disposal.

Waste – is defined in Council Directive 75/442/EEC on waste as meaning “...any substance or object in the categories set out in Annex I which the holder discards or intends or is required to discard.” Annex I of the Directive lists 16 categories of waste, including ‘agricultural, household, office, commercial and shop discards’. Waste defined by the Directive is referred to as ‘Directive Waste’.

Waste arisings – the amount of waste generated in a given locality over a given period of time.