

APPENDIX H1 – BACKGROUND TO REVISED WASTE FLOW MODEL

This appendix details the assumptions made in the waste flow model provided to support final tenders and the FBC in the North Yorkshire County Council (NYCC) and City of York Council (CYC) PFI procurement of waste management services project. This paper supplements Appendix 15 to the Outline Business Case for the PFI project and other subsequent papers detailing revisions to the waste flow model.

The waste flow model is built up from separate models for NYCC and CYC. These separate waste flow models feed into a combined waste flow model for the combined areas.

Key assumptions made during the development of this revised waste flow model are detailed below:

Waste Flow Model Assumptions

1. Base waste tonnage information

The original waste flow model developed for the Outline Business Case was based on 2003/04 actual waste volumes. The revised model submitted to DEFRA on 9 March 2007 and used to inform discussions with Participants in the PFI contract up to February 2008 was based on 2005/06 actual waste volumes.

In February 2008 a revised NYCC waste flow model was developed based on latest available in-year projections of waste tonnages for 2007/08. This used projections of year-end performance for each district and collectively for HWRCs, based on actuals to December 2007 projected forwards using trend analysis of residual waste composting and recyclables, with adjustments and refinements to data as appropriate. A similar revised waste flow model for CYC was also developed in February 2008 based on 2007/08 projected tonnages.

The waste flow model used to inform CFT is based on 2008/09 provisional out turn data for both NYCC and CYC, dated April 2009 for NYCC and June 2009 for CYC. NB. Due to the provisional nature of this data it may not exactly match reported out turn performance for NIs or waste dataflow. A comparison of total MSW projected for 2008/09 in each of the three versions of the model is given below

Projected and Actual MSW for 2008/09			
Council	From OBC	From ISDS	From CFT
NYCC	394,719	388,693	363,135
York	123,598	120,042	112,450
Total	518,317	508,735	475,585

2. Waste composition

The original waste flow model developed for the Outline Business Case used a compositional analysis carried out by MEL Research dated January 2005. However, there were some concerns over how representative this data was and a revised composition was used in the waste flow model submitted to DEFRA on 9 March 2007 based on an adjusted national composition. The rationale for this adjustment was the comparatively high amounts of green waste being diverted at the time.

The waste composition used in the February 2008 waste flow model is derived from waste composition analysis carried out by Enviros Consulting Limited in November 2006 – ‘York and North Yorkshire Single Season Waste Composition Project’. Whilst the data is considered to be an accurate snap shot of the waste composition in North Yorkshire and York, it is clear that it is not fully representative of the annual composition as empirical evidence would suggest that some materials require adjustment to take into account a degree of seasonality. The compositional analysis was therefore adjusted to better reflect actual waste arisings and diversion performance achieved in 2006/07, as well as taking into account discussions with Waste Collection Authorities on their expected recycle tonnages in the near future.

The August 2009 version of the model now includes the output from further seasonal composition analysis carried out in February and August 2008 however, concerns about the validity and comparability of the original MEL analysis carried out in January 2005 have led to this data now being excluded from the model. Earlier adjustments to take into account differences in the actual amounts of green waste are no longer needed.

Changes in the way composition has been carried out between different surveys and the way it is presented in the models makes direct comparisons between models difficult. However, the differences between the composition for household waste used in the three version of the model is given below.

NYCC Household Composition

Waste Type	OBC	ISDS	CFT
recyclable_paper	16.01%	14.70%	19.24%
recyclable_cardboard	4.20%	4.09%	5.14%
recyclable_plastic	4.83%	5.82%	7.53%
textiles	1.96%	2.58%	4.47%
recyclable_glass	8.67%	8.54%	9.56%
miscellaneous_combustibles	12.85%	15.36%	18.52%
non_combustibles	4.54%	6.42%	6.70%
metal	2.96%	3.01%	3.19%
hazardous	0.08%	0.28%	0.37%
WEEE	0.70%	0.82%	0.76%
garden	26.45%	19.43%	1.96%
other_organic	16.74%	18.94%	22.55%

CYC Household Composition

Waste Type	OBC	ISDS	CFT
recyclable_paper	13.99%	17.79%	21.33%
recyclable_cardboard	4.93%	5.98%	4.26%
recyclable_plastic	8.83%	5.49%	8.55%
textiles	3.21%	2.17%	3.42%
recyclable_glass	8.37%	9.19%	11.00%
miscellaneous_combustibles	9.86%	11.64%	14.99%
non_combustibles	5.73%	4.79%	6.71%
metal	6.31%	5.46%	3.91%
hazardous	0.00%	0.22%	0.26%
WEEE	0.00%	1.02%	0.57%
garden	16.51%	18.44%	1.34%
other_organic	22.25%	17.80%	23.65%

Note – CFT percentages are now calculated on a very different basis, with items that distort the composition removed.

These compositions do not include HWRC waste.

3. Waste growth rates

The waste growth rates used in the Reference Project and Outline Business Case were 2% to 2008/09, 1% 2009/10 to 2012/13, and 0% from 2013/14 onwards. These were repeated in the version of the model presented to DEFRA in March 2007 and gave rise to detailed discussion about whether the model adequately took future population growth into account.

NYCC and CYC commented in May 2007 that the growth forecast then reflected current guidance to waste authorities for waste growth to be decoupled from population, housing stock and other economic projections, and that the projections were prudent and based on real waste minimisation happening year on year with less arisings per household. It was proposed that whilst population will increase, it will not increase to such an extent to undermine the waste growth projections

It was pointed out to DEFRA that waste growth profiling tending to zero over time was consistent to other authorities' forecasts and in line with the Yorkshire and Humberside Regional Waste Management Strategy at the time, although it was noted that regional projections were being further revised,

It was also noted that North Yorkshire has significantly higher waste arisings per population than other WDAs, ranking 31st out of 34 at the time, with 20% higher arisings than the best performing county.

Whilst the views of the Authority as stated in May 2007 remain correct for the time, other factors and external influences mean that growth projections were revised for the February 2008 version of the model. This included and allowed for:

- Revision of Regional waste forecasts
- Identification of key influences on household waste volumes in North Yorkshire by Enviro Consulting Ltd in July 2007 [IMPLICATIONS FOR 'LET'S TALK LESS RUBBISH' FROM WASTE STRATEGY FOR ENGLAND 2007]
- Limited success of the waste partnership to reduce waste volumes in line with waste minimisation objectives
- Sustained commercial waste volumes in municipal waste (see below)

Growth for household waste was then modelled as being directly driven by population forecasts (data taken from ONS publications), and consequently increased continually year on year. However, waste growth was then disconnected from population growth by modelling a reduction per head within NYCC of 0.25% for 2009/10, 0.5% p.a. between 2010/11 to 2012/13, and 0.25% for 2013/14. This was to be delivered through effective Waste Minimisation but was not expected to continue beyond this period as opportunities for reduction were expected to be constrained.

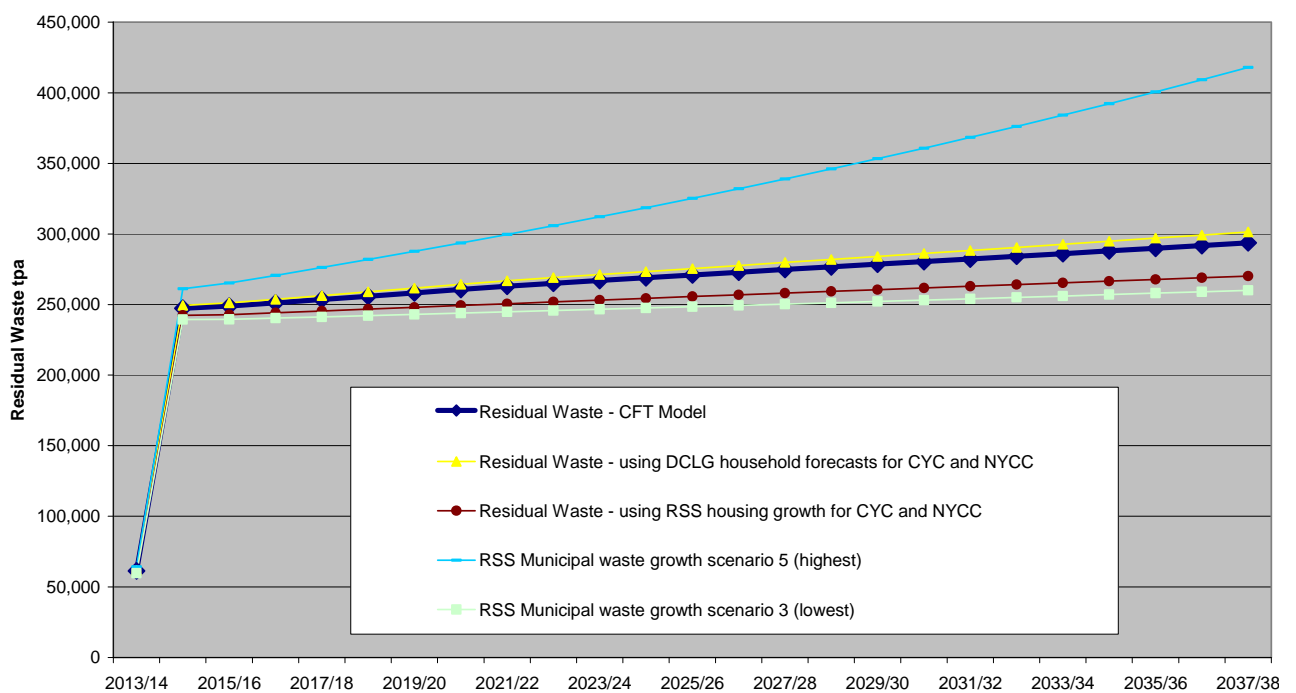
Growth for HWRC household waste in North Yorkshire was projected to follow population growth too, but without the effect of the waste minimisation as described above. However, a reduction of 5% was anticipated in 2008/09 as an effect of the implementation of new policies restricting the amounts of waste and vehicles that can be used to deliver waste to the sites. Similarly, non household waste delivered to HWRCs in North Yorkshire was anticipated to reduce by 10% in 2008/09 and 5% in 2009/10.

Waste growth assumptions have been further revised for the August 2009 version of the model.

Household rather than population growth is now considered to be a more appropriate proxy for waste growth. Growth for NYCC is consequently now based on DCLG housing projections published in March 2009. However, DCLG forecasts are considered to over estimate likely actual future housing in York, therefore future housing numbers are derived from Regional Spatial Strategy forecasts.

This presents a potential inconsistency in the way waste flows are projected for CYC and NYCC however, analysis of the impact of the different approaches shows the impact of the different approaches on waste volumes over the life of the project to be minimal and within the tolerances of scenarios on future waste volumes presented in RSS.

Comparison of different household growth scenarios



The waste flow model for both CYC and NYCC is further adjusted to reflect the likely impact of waste minimisation and a long term drive to reduce arisings per household. This assumes a compound 0.25% p.a. reduction.

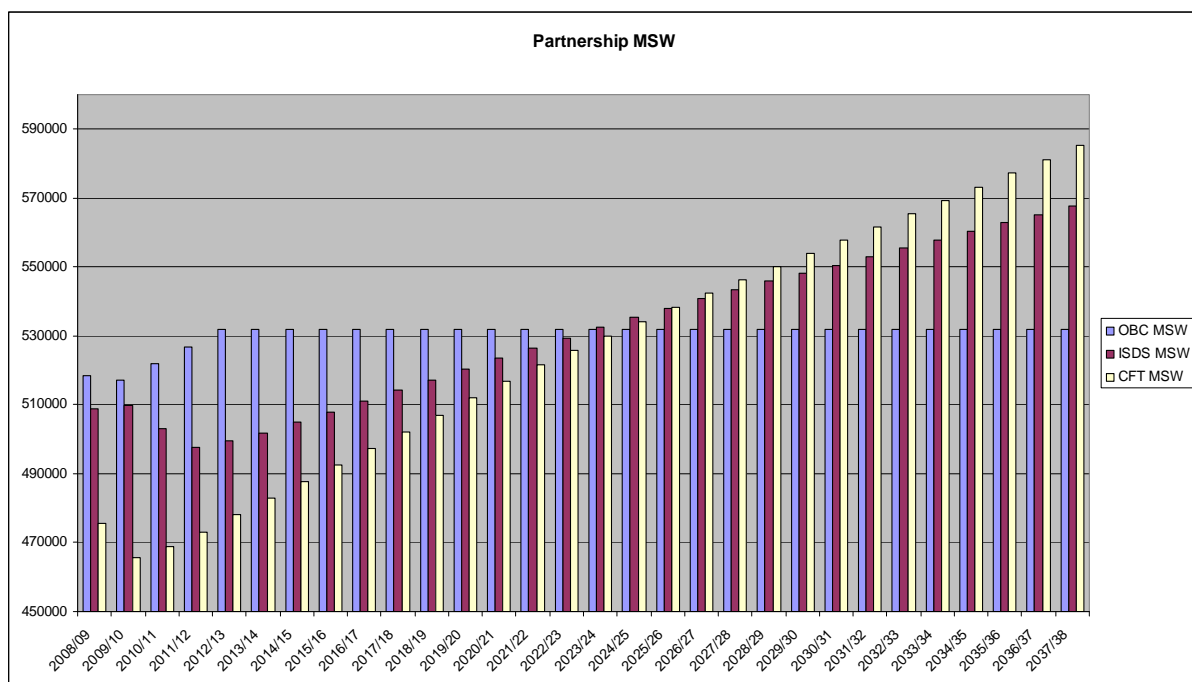
Actual waste volumes for 2008/09 were significantly lower than previous years. Whilst some of the reduction was forecast, it is clear that the recent economic downturn has had a major impact on waste production, accounting for approximately a 3% additional reduction. Whilst there is no direct link in the model between economic growth and waste growth, it is prudent to assume that for the immediate future the economic climate will continue to have some impact on waste volumes. The August 2009 version of the model therefore assumes that there is a further 'one off' reduction in household waste of 2% and 1% for 2009/10 and 2010/2011.

Trade waste reductions previously predicted have not been experienced. There is an inevitable connection between demand for the trade waste collection service and price, but cost increases already passed on have not had the expected reduction in volumes. However, a number of district councils have indicated their intention to explore the wholesale disposal of their trade waste businesses from as early as 2010.

The waste flow model used for CFT therefore assumes trade waste volumes for NYCC remain at the 2008/09 out turn level. However trade waste volumes for CYC are predicted to reduce by 20% in 2009/10 to reflect known loss of business, but thereafter are modelled as remaining static. The possible loss of trade waste volumes is then taken into account in sensitivity modelling as part of the tender evaluation process.

In addition to the other growth factors, both NYCC and CYC continue to predict a further reduction in HWRC waste for 2009/10 as a consequence of the introduction of new policies. This is estimated to be 5% and 10% respectively for NYCC and CYC and reflects the different timings of introduction.

The outcome of these changes is presented below as a comparison to earlier versions of the model.



A summary of the growth assumptions used for CYC and NYCC is given below

Waste Growth Assumptions for CFT waste Flow Model				
	Kerbside collected Household Waste	HWRC Household Waste	HWRC non Household Waste	Collected Commercial Waste
NYCC Base Assumption	DCLG household forecasts March 2009		Zero growth from 2008/09 base	Zero growth from 2008/09 base
CYC Base Assumption	RSS Household Growth		Zero growth from 2008/09 base	Zero growth from 2008/09 base
NYCC	-2% and -1% reduction for 2009/10	-5% reduction	-5% reduction	None

Adjustment	and 2010/11 respectively -0.25% compound reduction in all years for collected household waste	2009/10	2009/10	
CYC Adjustment	-2% and -1% reduction for 2009/10 and 2010/11 respectively -0.25% compound reduction in all years for collected household waste	-10% reduction 2009/10	-10% reduction 2009/10	-20% reduction 2009/10

4. Kerbside collections of dry recyclables

Assumptions on recycling and composting performance in the original waste flow model were estimates based on an assumption that collection systems would normalise around a co-mingled system during 2010. Performance would also normalise around this time, and would increase over the next 5 years or so towards high, but achievable, levels of separation. This was consistent with discussions within the waste Partnership at the time.

The waste flow model was revised at ISDS to reflect the following developments:

- Development of WCA 5 year recycling plans 2008/09-2012/13
- Completion of the Local Area Agreement and Service Level Agreement with associated commitments by NYCC and the District Councils to minimum levels of recycling performance
- A change of approach to recyclables collection methodology in most WCAs away from commingled.
- No assumed contribution towards recycling and composting from residual waste treatment

The recycling and composting assumptions in the waste flow model are now driven by the WCA 5 year waste recycling forecasts, adjusted where appropriate to normalise waste growth assumptions. The model then assumes selected incremental increases in performance for some WCAs beyond the 5 year plan period to normalise performance towards high but achievable levels. Forecast recycling performance by WCAs was updated in June 2008. Overall recycling and composting performance are presented below for the three versions of the model. Variations are due both to changes in capture and coverage, but also by changes in the composition.

	09/10			12/13			19/20		
	OBC	ISDS	CFT	OBC	ISDS	CFT	OBC	ISDS	CFT
Kerbside %	35.06%	33.35%	41.87%	36.32%	33.84%	43.63%	37.97%	35.52%	43.61%
Hhld Total %	43.44%	43.95%	46.98%	44.48%	44.37%	48.40%	48.7%	45.58%	48.78%