

Appendix B - Business Case for Waste Composition Study

1. Introduction and Summary

- 1.1. This paper sets out a business case for the NLWA to undertake an analysis of waste composition and that this is delivered in the most timely fashion in order to facilitate the best solution. It also sets out the full range of costs and benefits and potential synergies.
- 1.2. Accurate and consistent waste composition data is a prime requirement to reduce the costs of designing waste disposal facilities and facilitating risk transfer. Bidders will pass the cost of any risks associated with the composition of waste they are to manage if there is any uncertainty, so high-quality and consistent data has the capacity to create a 'level-playing field' from which the best solution can emerge.
- 1.3. A number of waste composition studies have been undertaken by the NLWA's Constituent Boroughs and one recent survey by the Authority itself. Whilst these composition surveys are informative and can add value they collectively and individually fall short of what is required to underpin the ongoing procurement process. Nevertheless, the well-designed and comprehensive analysis that is required can have benefits that extend far beyond supporting the procurement process. It can serve to underpin service efficiency in both collection and disposal functions, support partnership working and reduce the overall costs of obtaining such data to all parties.
- 1.4. In order to bring the various strands of existing data together, produce the best data possible in the time required to support the procurement and produce a set of data that will be sufficiently widely applicable to accrue the more broad set of benefits outlined in this paper for the wider partnership will cost in the region of £250K.
- 1.5. In addition to the costs element members may wish to consider other issues that could be associated with such an exercise and measures that might be taken to address them.

2. What is a Waste Composition Survey

- 2.1. Waste composition analysis is used to determine the mix and quantities of the materials that are in a given waste stream. Analyses are most commonly conducted on the residual waste elements, such as household collected bag or bin waste. It is also possible (and often desirable) to conduct analyses on material arising from other household waste streams, such as collected recycling or Household Waste and Recycling Centre (HWRC) waste.

3. Waste Composition Data and the Procurement Process

- 3.1. Accurate and consistent waste composition data is a prime requirement to reduce the costs of designing waste disposal facilities and facilitating risk transfer. Bidders will pass the cost of any risks associated with the composition of waste they are to manage if there is any uncertainty, so high-quality and consistent data has the capacity to create a 'level-playing field' from which the best solution can emerge.

- 3.2. This is supported by recently published guidance from 4Ps which states that “The Design of waste processing and treatment facilities will be dependant upon the composition of waste being handled. Waste composition analyses therefore have an important role in facilitating design risk transfer.”
- 3.3. Recent modelling work underpinning the development of the OBC and the planning of collection systems has identified that a lack of consistent waste data is a key issue going forward. If not addressed this is likely to cause further considerable delays, undermine risk transfer and increase contractor costs. To date the Authority has been reliant upon data from the previous 2004 exercise, which only provides a partial picture, and data from the individual Borough analyses, which contain significant inconsistencies due to different methodologies and sampling approaches.
- 3.4. Waste composition data that is statistically significant, seasonal and that accounts for the interaction between different waste streams and collection systems has been highlighted as a key requirement for effective waste procurement by recent guidance published by 4Ps. Whilst important, such exercises can also be expensive, and whereas desk based data analysis can prove a useful supplementary tool, the practice of manual sampling and sorting is an inevitable, if rather unpleasant and costly, practice.

4. Scope and Existing Data

- 4.1. Six of the Authority's Constituent Boroughs have recently conducted or are conducting such assessments at their own expense, albeit in most cases this has been confined to 'black bag sorts'. As the term suggests these are analyses of residual waste conducted by collection authorities primarily to determine the amounts of key materials remaining in the residual waste stream for targeting by recycling, composting and other schemes.
- 4.2. The Authority has also conducted such an analysis in 2004 to underpin its reconciliation of the household/non-household split. Whilst these composition surveys are collectively informative and can add value they collectively and individually fall short of what is required to underpin the ongoing procurement process.
- 4.3. Recent work on waste modelling has highlighted very considerable differences in the resultant data produced by many of these existing Borough-level surveys. This is to some extent a reflection of variations that might normally be expected but they appear to be greater than would normally be the case in such instances. This may be a reflection differences in methodology or the statistical significance of the Borough waste composition surveys.
- 4.4. Whilst some individual Boroughs have taken this far further to gain a full understanding of the spectrum of municipal waste that they handle or at least to encompass both kerbside collected and HWRC waste streams to underpin strategies for its management, this is not currently the norm. As diversion rates increase whilst targets become more challenging it becomes more and more essential to ensure that efforts to target the remaining materials in the waste stream are appropriately targeted and calibrated.

- 4.5. It is, however, from the Authority's perspective important that any analysis does encompass the 'whole system'. This is supported by the 4Ps guidance which states that "the quality and composition of other waste streams [i.e beyond residual household waste] should thus be taken into account in assessing the composition of the whole waste stream which will be fed into the project". Such an all-encompassing survey would also be critical to ensuring that wider benefits are able to be brought to bear, not least in applying the data to build up a picture of the waste composition in individual Boroughs.
- 4.6. Time constraints in bringing data forward for bidders are likely to force the Authority to rely upon a mixture of physical analysis and data modelling, rather than any greater physical sampling element across the four seasons of the year to fully reflect seasonal variations. Nevertheless officers believe that it is important to maintain as great an emphasis upon physical sorting as possible. Whilst more expensive than desk-based modelling or other techniques such as visual inspection this is vital to obtaining as accurate a picture as possible of municipal waste in north London and significant differences from the composition in other areas from which data might be available.
- 4.7. Furthermore it is felt that it is important to reflect temporal factors such as seasonality and longer terms trends by considering repeating the exercise in future years. In this regard the guidance states that "where waste composition analysis have been undertaken, careful consideration should be given to their use taking into account the age and quality of data. For example, if data are only a "one-off" measurement, these are unlikely to be significantly significant and if analyses were undertaken before or during a period of significant change in the collection system they may not be statistically accurate"

5. Wider benefits

- 5.1. Some of the wider benefits of the proposal across the Authority and Constituent Boroughs are set out below:
- Reducing duplication between such exercises in the NLWA and providing consistent data to all constituent Boroughs to assist them in most cost-effectively pursuing higher waste management performance levels.
 - Assisting operational management of collection systems and wider waste minimisation/education programmes. For example the data can be used to determine which materials might be best targeted by measures to increase their capture rates, hone compulsion measures to target key groups/geographical areas or even underpin the calibration of rounds to reduce operational costs.
 - Underpinning work to identify the most ideal collection system or systems across the Authority area which can simplify the collection/disposal interface and reduce costs overall.
 - Assist with apportionment of costs between boroughs, particularly in relation to HWRC's, and the development of the emerging IAA. For example, a visitor survey has been incorporated into the proposed analysis of waste from HWRC's to inform baseline apportionment of costs if necessary in the future.
 - A single set of data can prevent duplication within the Authority and reduce the need for 'one-off' analyses that have limited use beyond their original purpose.

Such a dataset could assist the Authority in a wide range of activities such as strategy development, apportionment/levying and, of course, procurement.

- To monitor contamination in the commingled waste stream and link this to its source so that it can be reduced.
- Period sampling can identify trends in waste composition alongside the drivers behind them and enable planning to react to them. 'Snapshot' analysis would clearly not be able to do this.
- To bring waste composition data in line with national standards and that of other similar authorities to facilitate benchmarking and comparison.
- To act as an educational and communications tool to stakeholders, not least the public, that can underpin the increasing efforts.
- To enable bidders to bring forward proposals that are most closely aligned with the waste they are to manage, thus reducing costs, in addition to giving them confidence and facilitating effective risk transfer.
- By linking detailed analysis data to socio economic, housing and demographic groups, as these change the data can be adjusted without the need to re-sample the data.

6. Criteria

6.1. Officers have approached Technical Advisors ENTEC to produce a proposal that meets the following criteria:

- Encompasses modelling work initially to bring data currently available together and to refine this as new analysis data becomes available to feed into the Authority's waste flow models and inform ongoing collection modelling work.
- Encompasses each of the main elements of the whole municipal waste stream.
- Produces statistically significant analysis data at Authority level that can be modelled to produce a picture of composition at Borough-level.
- Produces data that can be modelled to reflect changes in the proportion of each element making up the municipal waste stream (notably trade waste) and changes in the housing and social make up of the Authority area.
- Encompasses samples across each of the four seasons of the year to take into account seasonal variations in waste streams (notably with regards garden waste) and produce a statistically-significant and complete picture.
- Ensures that this is made available in a timely fashion and at key stages in the procurement process.
- Includes the option to calculate the garden material currently presented for waste collection and the total potential yield.
- Includes analyses of all materials collected from sampled households (including materials presented for recycling and/or composting).
- Includes the option for individual Boroughs to 'buy-into' the process and obtain samples specific to their Borough reflecting any Borough-by-Borough differences within broad socio-economic/housing groups surveyed and any grouping statistically significant at the Borough level but not at the Authority level.

7. Cost Breakdown

Table 1.

Stage	Cost
Inception meeting	£2,241
Existing data modelling	£3,341
Potential garden waste yield study	£1,071
Kerbside collected household waste composition analysis	£149,731
Waste composition reporting	£13,659
Trade waste analysis	£10,134
Bulky waste & fly tip analysis	£4,659
Street Sweeping and Litter Bin Analysis	£4,659
HWRC composition analysis and visitor survey	£41,766.75
EXTERNAL TOTAL	£231,262
Budget for sample collection staff and vehicle	£20,000
TOTAL	£251,262

- 7.1. The budget for the staff and vehicle may be reduced if the Authority is able to obtain this resource from Constituent Boroughs.
- 7.2. ENTEC have costed a Borough-specific additional analysis at £43,340 if individual Boroughs wish to make that contribution.

8. Timescales

- 8.1. The four seasonal waste compositional analysis' are proposed to take place in:

- February 2009- Winter;
- May 2009- Spring;
- August- Summer; and
- October 2009- Autumn

- 8.2. Based upon the current project plan this would make the following seasonal samples available at the following stages in the procurement process.

- Issuing of Invitation to Participate in Dialogue (ITPD) and Invitation to Submit Outline Solutions (ISOS) documents – **1 seasons (Winter) waste composition results;**
- Issuing of tender documents for interim procurement – **2 seasons (Winter and Spring) waste composition results;**
- Invitation to Submit Detailed Solutions stage begins (ISDS) – **2 seasons (Winter and Spring) waste composition results-** August results could be made available before the return of the ISDS submission.

- Invitation to Submit Refined Solutions (ISRS) stage begins – **4 seasons (Winter, Spring, Summer and Autumn) waste composition results;**
- Call for Final Tenders Issued – **4 seasons (Winter, Spring, Summer and Autumn) waste composition results**

9. Alternatives

9.1. Reduced Seasonal Samples

9.1.1 Green waste generation peaks in around April/May and again in August. It may be possible to undertake two, rather than four, samples in March and September/October whilst garden waste production is part way to its peaks and then averaging these results to produce an annual result.

9.1.2 This would reduce the cost of the analysis by approximately half but would also:

- Reduce the statistical significance of the data below the commonly accepted norm, that which bidders would normally expect and against which bids would normally be evaluated;
- Not provide information on the peak levels of garden and other wastes in the system which can be important to facility design; and
- Not be designed to even partially account for other seasonal variations in the waste stream other than garden waste;

9.2. Reduced Scope in Terms of the Number of Socio-Economic/Housing Groups Sampled from or Waste Streams

9.2.2 It may be possible for the Authority to commission work that involved 'bulk sampling' of all of the waste collected in the Authority or through a co-collection round, analyse this together and present it as statistically representative of the area from which it is drawn. This could reduce costs to some extent. However, it would not:

- Enable a Borough-specific picture to be modelled;
- Enable changes to the levels of specific waste streams (notably trade waste) or socio-economic/housing groups over time to be modelled in adjusting the composition. If one part of the wider municipal waste stream was reduced, without an indication of the composition of the waste that was no longer there it would reduce the value of all of the composition data by not allowing the change to be modelled; and
- Allow facilities that manage different waste streams (such as bulky waste and fly tips) to be best designed for the management of those streams.