
Waste Collections Modelling and Procurement Options

Briefing Paper Arun District Council

1. Introduction

This paper summarises the work carried out by Ricardo to explore a range of options to revise Arun's current waste collection methodology in line with the requirements of the government's Environment Act and Resource & Waste Strategy, to consider the viability of an extension to the current Biffa Contract beyond the current expiry date of February 2023, to consider the service delivery options for the provision of the Services once the current Contract expires and to assess the funding options proposed by the government in their Strategy consultation documents.

2. Outline of Project Requirements

The project considered four Options for collections methodology:

1. Moving to a fortnightly collection of residual waste
2. Introducing food waste collections
3. Fortnightly Collection of Residual waste and introducing food waste collections
4. As Option 3, but with electric vehicles
5. Three-weekly collection (1-2-3 approach) of Residual waste and Introducing food waste collections
6. As Option 3, with a larger food waste vehicle

This exercise explored the modelled cost and performance of each Option compared to the cost and performance of the current service methodology to support recommendations for decisions.

To provide a realistic context for both the Council's current services and the Options, benchmarking was carried out against Councils with similar ruralities, deprivation levels and service methodologies, both to understand the Council's current relative performance and to ensure the modelled options were based on achievable outputs. This approach allows any performance assumptions made following the introduction of a service change to be realistically modelled and measured against.

Ricardo provided a comprehensive analysis of the changes to the Council's waste collection methodologies required by the government's Environment Bill and the proposals in the Resource & Waste Strategy, as contained on the consultation documents for Collection Consistency, Extended Producer Responsibility (EPR) and Deposit Return Schemes (DRS). This analysis assessed the changes which the Council would be required to introduce to the current services, considered the compliance of the modelled Options with the government's requirements, and explored the funding streams which the government proposes to facilitate compliance with their requirements.

The Council provided extensive data regarding the operational and cost elements of the current service, which enabled the Baseline model to accurately reflect the current situation. This data included the current charges made by Biffa. This data enabled Ricardo to examine the current costs provided by Biffa and compare them with the cost outputs from the collections modelling exercise. Our proprietary collection cost model examines not just vehicles and staff costs, but also overheads and contractor-side profits; this enabled us to not only assess the current charges made by Biffa, but enables us to make an accurate prediction of the likely costs if the work was re-tendered. This analysis provided a benchmark against which Biffa's proposals for a Contract extension can be compared, enabling an assessment of the relative cost-effectiveness of their proposal.

Ricardo also provided an assessment of procurement delivery options, including a risk / benefit analysis of the service delivery options available: - procuring a new Contract, moving to a Direct Service Organisation (DSO) or adopting a Local Authority Trading Company (LATCo) approach.

3. Summary of service options modelling

The first step in the modelling process was to develop a Baseline – modelling the Council’s current service provision as closely as possible to understand the current resources, costs and performance to enable a comparative analysis against each of the options.

The Council provided extensive data regarding:

- Collected tonnages for each waste stream
- A waste composition analysis, including contamination rates
- Set-out rates for each collection service (indicating the average number of residents participating)
- Details of vehicle and staff resources, working hours, tipping points, depot locations and distances covered
- Costs for staff (by category), vehicles, containers
- Current Biffa Contract charges and details of Biffa’s proposed costings for Contract Extension

Analysis of the tonnages currently collected and the waste composition data enabled the calculation of the current capture rates in tonnages and percentages for recyclable and compostable materials. The capture rate refers to the amount of a material that is currently collected for recycling as a proportion of the total material arisings. This informs the modelling by ensuring that the performance of the Options in terms of additional recycle collected is realistic. This is shown in Table 1

Table 1: Capture Rates by Material Stream

Material	Collected for recycling/composting (tonnes/year)	Remaining in residual (tonnes/year)	Capture rate (%)	Remaining in residual (%)	Recycled/ Composted (kg/hh/yr)	Remaining in residual (kg/hh/yr)
Recyclable paper	5,659	903	86%	14%	74	12
Recyclable card & cardboard	1,350	953	59%	41%	18	12
Non Target Paper	-	1,352	0%	100%	-	18
Non Target Card	-	-	0%	100%	-	-
Liquid cartons	-	68	0%	100%	-	1
Plastic films	-	1,869	0%	100%	-	24
Plastic bottles	1,093	456	71%	29%	14	6
PTTs	192	659	23%	77%	3	9
Other dense plastic	183	528	26%	74%	2	7
Recyclable glass	5,133	1,034	83%	17%	67	13
non-target glass	-	92	0%	100%	-	1
Ferrous	296	789	27%	73%	4	10
Non Ferrous	534	432	55%	45%	7	6
Non target metals	-	-	0%	100%	-	-
Textiles	-	1,317	0%	100%	-	17
WEEE	16	233	6%	94%	0	3
Garden waste	9,577	551	95%	5%	125	7
Food waste	-	12,194	0%	100%	-	159
Total	24,033	23,430			313	305
Overall Capture Rate	<i>(excluding food and garden)</i>		57%			

Benchmarking the current service performance against Councils with similar ruralities, deprivation levels and service methodologies assists in understanding the Council’s current relative performance and further ensures the modelled Options are based on achievable outputs.

The results of the Baseline recycling and residual waste benchmarking are presented using quartiles. The description of the quartiles is given in the table below. For recycling, the higher the tonnage of recycling collected, the higher the quartile performance, but for residual waste, the reverse is true.

Q1 Upper Limit	Performance places authority in bottom 25% of authorities
Q2 Upper Limit	Performance places authority in lower half (26%-50%) of authorities
Q3 Upper Limit	Performance places authority in upper half (51%-75%) of authorities
Q4 Upper Limit	Performance places authority in top 25% of authorities

Table 2 shows the average performance data for Arun. The results show that Arun’s performance lies within the third quartile (Q3) for card, cans, plastic bottles, and mixed plastics. This represents above average performance for these materials. However, the capture rate for card suggests that only 59% of

the available card is being captured. For paper and glass, Arun's performance lies within the second quartile (Q2), representing average performance. However, the capture rates for paper (at 86%) and glass (83%) are very high, suggesting that the service is performing well in light of the waste composition in Arun. The total tonnage of dry recyclables lies within the third quartile, again representing above average performance.

The residual waste generation lies within Q1, meaning that the Council generates less residual waste than the average of the local authorities it was benchmarked against, representing above average performance.

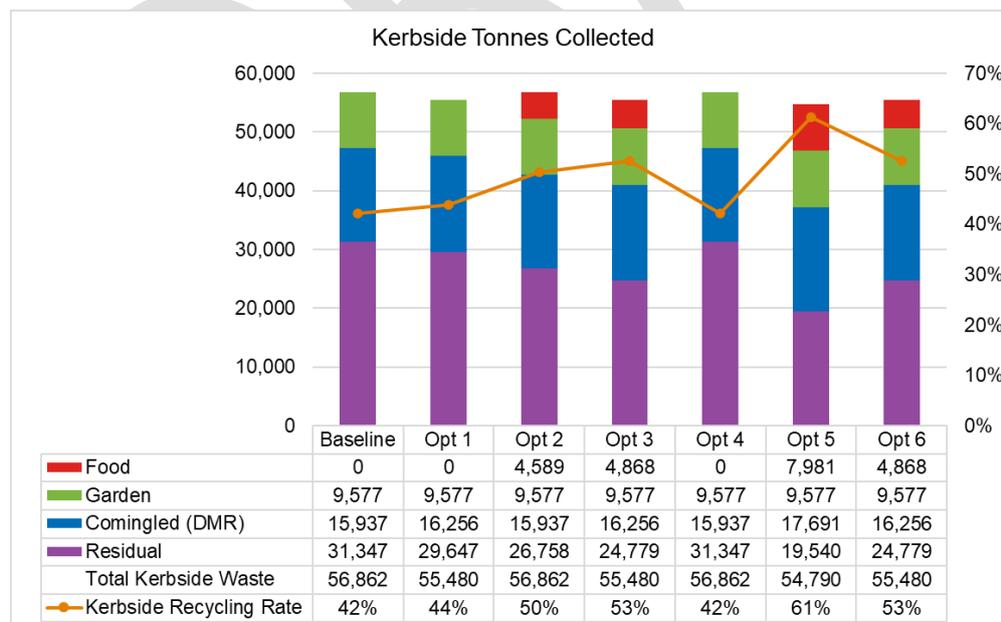
It should be noted that the benchmarking outputs are only indicative. When searching for comparators, we found only one other rurality 4 (mixed urban/rural, low deprivation) district with weekly residual and fortnightly recycling collections without separate food waste collections. In order to find sufficient comparators, we broadened the search criteria into a separate residual baseline (which included comparators that have different dry recycling schemes) and a dry recycling baseline (which included a broader range of ruralities). With only eight comparator authorities, it is thus important to also consider the current capture rates when considering the performance of the service; for example, the capture rates for cardboard, pots, tubs and trays and cans are low, whilst those for paper, glass and plastic bottles are high. This approach indicates where performance has room for improvement.

Table 2: Benchmarked Performance

Yields (kg/hh/week)	Paper	Card	Cans	Glass	Plastic bottles	Mixed plastics	Total	Residual waste
Q1 Upper Limit	77.6	27.4	8.4	39.5	12.0	4.8	170.0	403.4
Q2 Upper Limit	78.9	28.7	9.0	48.8	12.8	5.1	176.2	444.2
Q3 Upper Limit	81.1	29.3	9.6	51.0	13.0	5.1	185.5	446.6
Q4 Upper Limit	90.0	33.3	10.9	56.9	14.8	5.8	211.5	574.7
Arun	78.9	29.2	9.6	49.6	13.0	5.1	185.5	403.4

Table 3 shows the tonnages generated by each of the modelled Options, including the overall waste tonnage and the kerbside recycling rate. Note that the tonnages refer to kerbside collections only, excluding other waste generated (ie street sweeping).

Table 3: Tonnage Impact of Options



4. Summary of Cost Modelling

The data from the Options modelling is entered into our in-house Gross Collection Cost Model. This model combines the resourcing and tonnage information along with cost assumptions (utilising information provided by the Council where available, otherwise using a combination of internally agreed and industry standard costs) to generate the collection costs. The model outputs include vehicle costs, crew costs, container costs, and annual gross and net costs. This shows the estimated annual cost of each Option, enabling comparison with current costs (Baseline).

These outputs also provide data to inform key quantitative criteria used in the options appraisal further on in the process. The Baseline costs from this exercise also provide the basis for analysing the costs of the proposed Biffa extension, by illustrating the anticipated market price if the existing service were to be re-tendered on a like-for-like basis. This will enable decisions about future service provision to be undertaken with a clear understanding of what the “business as usual” model would look like. This would also allow an assessment of the appropriateness of Biffa’s current and proposed service charges.

- Option 1 provides an annual cost saving of £415, 598, but only increases the recycling rate by 2%
- Option 2 increases the annual cost by £1,432,068, but increases the recycling rate by 8%
- Option 3 increases the annual cost by £971,661, but increases the recycling rate by 11%
- Option 5 increases the annual cost by £901,651, but increases the recycling rate by 19%

However, if the government provides New Burden Funding for the cost of operating the Food Waste service, the additional annual costs for Options 2, 3 and 5 are reduced by £1,481,394.

This leaves Options 3 and 5 as the preferred options with annual savings compared to the Baseline of ~£510k and ~£580k respectively and recycling rates of between 53% and 61%.

Table 4: Cost Impact of Options

		Baseline	Fortnightly Residual	Weekly FW (Weekly Residual)	Fortnightly Residual + Weekly FW	Electric Fleet	Three-weekly Residual + Weekly FW	Fortnightly Residual + Weekly FW (12t FW Vehicle)
Cost Area	Line Item	Baseline	Opt 1	Opt 2	Opt 3	Opt 4	Opt 5	Opt 6
Vehicles	Front line Vehicles	£1,158,450	£946,235	£1,450,108	£1,231,398	£2,330,918	£1,175,269	£1,385,397
	Ancillary and Spare Vehicles	£66,000	£66,000	£66,000	£66,000	£195,485	£66,000	£66,000
Staff	Drivers	£719,388	£588,590	£1,046,383	£915,585	£719,388	£915,585	£915,585
	Loaders	£963,092	£787,985	£1,400,862	£1,225,754	£963,092	£1,225,754	£1,225,754
	Ancillary Staff	£738,960	£681,360	£892,421	£800,972	£738,960	£800,972	£800,972
Containers	Container Capex	£0	£176,504	£47,373	£223,877	£0	£223,877	£223,877
	Container Replacement	£46,801	£82,102	£59,118	£94,419	£46,801	£94,419	£94,419
Overheads	Contract Operating Costs	£245,910	£214,324	£339,509	£305,585	£297,628	£299,015	£311,694
	Central Support Charges	£198,698	£178,602	£267,594	£245,370	£266,388	£238,060	£253,375
Total Gross Costs		£4,137,300	£3,721,702	£5,569,368	£5,108,961	£5,558,662	£5,038,951	£5,277,074
Difference from Baseline (Gross Costs)		£0	£-415,598	£1,432,068	£971,661	£1,421,362	£901,651	£1,139,774
New Burdens Funding (Food Waste Collections)		£0	£0	£-1,481,394	£-1,481,394	£0	£-1,481,394	£-1,481,394
Total Net Costs		£4,137,300	£3,721,702	£4,087,974	£3,627,566	£5,558,662	£3,557,557	£3,795,679
Difference from Baseline (Net Costs)		£0	£-415,598	£-49,326	£-509,734	£1,421,362	£-579,743	£-341,621
Kerbside Recycling Rate		42%	44%	50%	53%	42%	61%	53%

Note: The New Burdens Funding is based on an estimate of the operational costs of the service, including containers. For each option, the additional Contract Operational Costs are excluded from the potential government funding.

5. OPTIONS APPRAISAL

An Options Appraisal enables comparison of the current residual and recycling collection service models against the modelled options, using an agreed suite of evaluation criteria to include political risks, public acceptability, ease of implementation etc.

To assist the identification of preferred options, we have developed an interactive excel spreadsheet, which enables each criterion to be compared and if requested weighted, enabling the relative importance of each criterion to be calibrated. The tool provides transparent and auditable decision-making. Undertaking a full options assessment provides the Council with a clear picture of not only the

cost and recycling performance of the different options but also takes into account the risks and opportunities enabling the options to be understood in terms of the Council's risk appetite and local context.

Table 5 shows the results of the options Appraisal carried out for this project, utilising weightings agreed with Council officers. Note that Options 4 and 6 have not been evaluated at this stage, as they don't impact on the criteria utilised.

Table 5: Weighted Options Appraisal

Criteria		Scale	Baseline	Opt 1	Opt 2	Opt 3	Opt 5	Out of:
			Baseline	Fortnightly Residual	Weekly FW (Weekly Residual)	Fortnightly Residual + Weekly FW	Three-weekly Residual + Weekly FW	
Recycling rate	Relative scale		0.0	2.1	10.6	13.6	25.0	25.0
Cost (Collection)	Relative scale		0.0	20.4	2.4	25.0	25.0	25.0
Deliverability	Absolute scale		20.0	10.0	14.0	16.0	8.0	20.0
Future proofing (Alignment with R&WS)	Absolute scale		3.0	3.0	18.0	24.0	18.0	30.0
Total Weighted Score			23%	35%	45%	79%	76%	100%
Ranking			5	4	3	1	2	
Ranking (exc. Baseline)				4	3	1	2	

6. Summary of Procurement Delivery Options

The current Contract will expire in February 2023. This review explores the risks, benefits and cost implications for the delivery of the services when the current Contract expires. The options under consideration are:

- Bringing the Cleansing Services in-house (as a DSO – Direct Services Operation)
- Procuring a new Contract for the provision of the Cleansing Services through a procurement exercise
- Utilising a 'Teckal' approach (possibly through Norse Commercial Services Ltd (Norse Commercial Services are a Teckal company wholly owned by Norfolk CC Norse Commercial Services (part of the Norse Group, which is wholly owned by Norfolk County Council)) to provide the Cleansing Services.

Summary Conclusions: Overall Costs

The primary factors leading to differences between the costs of each service delivery option are:

- The private sector will include both corporate overheads and a profit margin in their tendered costs; this is generally in the region of 10% of Contract costs. This adds an additional cost burden to the services but does provide access to external expertise and contingency.
- No equivalent profit margin is required for the DSO option.
- The requirement for a limited company to achieve a profit means that a LATCo must be funded appropriately, and cannot be run at a loss.
- Pension costs will be the primary driver of differing cost implications for each of the delivery options. The Services are all heavily labour intensive; as a result, the higher level of LGPS pension contributions adds significantly to the DSO costs for direct labour and to the support services provided by the Council:
 - at 3% and NI at current rates for Contracted Out and LATCo;
 - at 20% and NI at current rates for DSO;

- The cost of support services (wider support from HR, IT, H&S, Finance etc departments) should be included for the DSO option, and depending on the structure, may need to be included for the LATCo option.

A key element of the consideration of Service Delivery options is the assessment of risk. Ricardo's experience of recent procurements suggests that the current marketplace for contracted out services may lead to an ineffective procurement exercise. A combination of an evolving market, the uncertainty created by the Environment Act and the Resource & Waste Strategy, staffing constraints and international supply line issues may limit the number of bidders, leading to an inefficient procurement. Current issues include:

- R&W Strategy uncertainty: the government's Resource & Waste Strategy proposals have created a climate of uncertainty regarding the operational requirements which will need to be considered when bidding for Contracts. The uncertainty regarding recycling collections means that the most effective collection methodology cannot be confidently predicted. It is likely that Bidders will need to price up a variety of options with varying resource levels based on their understanding of the likely Strategy outcomes.
- Lack of competition: after a period of expansion, the private sector appears to be retrenching. Companies such as Urbaser who were expanding rapidly through extremely competitive bidding appear to be consolidating current contracts rather than bidding for more. The proposed merger between Veolia and Suez appears to be constraining their bidding activities. The lack of new entrants into the sector continues.
- Vehicles: The provision of vehicles represents a major capital cost for bidders. Private sector preference is for Councils to fund / provide vehicles, with contractors providing maintenance and repair. Lead times for vehicles are lengthening, due to world trading conditions. Due to the R&W Strategy, decisions on vehicles are subject to uncertainty.
- Containers: The statutory duty to collect food waste is likely to create bottlenecks in the supply of dedicated containers (caddies), particularly as many suppliers are in the EU.
- Staffing: The private sector continues to experience difficulties in the recruitment and retention of drivers. The issue is now impacting on loaders and street cleansing staff, due to the expansion of jobs in warehousing and distribution companies.
- Indexation: the issues with staff retention, fuel prices, capital costs and increasing interest rates are leading bidders to propose more complex price indexation, made up of appropriate dedicated indices. The flexibility of this approach is proving more expensive than the previous approach of RPI or CPI indexation.
- Margins: The industry has a history of pricing extremely competitively to maximise market share. However, this led to many contracts being let with tight margins, leading to contractors achieving very low profit margins and often making overall losses on contracts. As a result, bids over the last three years have focussed on achieving acceptable returns, with a combined overhead and profit margin of 10% appearing to be a requirement for bidding teams.

From the Council's perspective, a contracting out procurement exercise will require significant commitment for the Council; the uncertainty regarding the constraints the government may impose will increase the complexity of the process, which may require a longer timescale than previous experience would suggest. Considering these potential constraints and the tight timescale for procurement, with the current Contract ending in February 2023, an extension to the current Contract may prove a pragmatic approach. This is an approach currently being followed by a number of Ricardo client authorities.

7. Environment Bill and Resource & Waste Strategy

An initial public consultation on the R&W Strategy was carried out in 2019, separately considering Collection Harmonisation, Extended Producer Responsibility for packaging and options for Deposit Return Schemes. Following assessment of the feedback, the Environment Bill 2020 was published by the Government, and further consultations on EPR, DRS and Collection Harmonisation were published between March and May 2021.

Eventually published in March 2022, Defra's response to the Extended Producer Responsibility (EPR) consultation confirms how the government intends to deliver their proposals to move the full cost of dealing with packaging waste from households away from local taxpayers and Councils to the packaging producers, applying the 'polluter pays principle'. The response also touched on elements from the Collection Harmonisation, Extended Producer Responsibility for packaging and options for Deposit Return Schemes.

Some elements of the R&W Strategy were incorporated in the Environment Act 2021, granted Royal Assent in November 2021. However, whilst certain elements of R&W Strategy are set out in the Act (*Section 45A: recyclable household waste must be collected separately from other household waste for recycling or composting, recyclable streams must be collected separately, food waste must be collected weekly*) the majority of the proposals in the R&W Strategy consultation will be implemented through secondary legislation

Whilst focussed predominantly on EPR, the consultation response also confirms the government's considerations on elements from the remaining consultations.

These clarifications include actions to:

- ensure producers pay the full net costs of disposal or recycling of packaging they place on the market by extending producer responsibility;
- introduce a consistent set of recyclable materials collected from all households and businesses, and consistent labelling on packaging so consumers know what they can recycle, to drive-up recycling rates;
- ensure weekly collections of food waste, which is often smelly and unpleasant, for every household;
- introduce a deposit return scheme to increase the recycling of single-use drinks containers including bottles, cans, and disposable cups filled at the point of sale; However, the EPR consultation response confirmed that glass will be excluded from the scope of DRS in England. This means that the levels of glass collected through kerbside and bring bank schemes is likely to be unaffected.

KERBSIDE DRY RECYCLING

The consultation confirms that *"Payments to local authorities for the cost of managing packaging waste generated by households, both packaging waste that is collected for recycling and packaging waste disposed of in residual waste, will be made under the packaging Extended Producer Responsibility scheme"*.

This aspect of the proposals covers household collection services, both kerbside dry recycling collections and residual collections, which deal with packaging waste. This means that the cost of collecting and reprocessing recyclable packaging waste will be covered by the EPR scheme. EPR will also cover the cost of managing (ie collecting and disposing of) packaging waste remaining in the residual stream.

Collections from "Street Bins" ie litter bins are included within collection schemes (described as on-the-go packaging). However, any costs of litter collection are not included.

TIMELINES

The response document confirms that Defra will implement EPR in a phased manner from 2024 (rather than 2023 as originally proposed).

This will focus on payments for household packaging waste and packaging in street bins managed by local authorities, with such payments being determined from 1 April 2024. EPR will subsequently be implemented in full in 2025.

ADDITIONAL MATERIAL STREAMS – IMMEDIATE INCLUSION

The consultation proposed that Plastic film and flexible packaging should be included in kerbside collections from 2027. The EPR response confirms that this will be required.

FOOD WASTE

The Environment Bill requires (Section 45A) all Waste Collection Authorities (WCAs) in England to arrange for the collection of food waste, separately and at least once a week for recycling or composting.

The consultation states that “Government wants to ensure that householders are not inconvenienced by being able to get rid of putrescent or smelly waste weekly or having insufficient capacity to recycle or to remove residual waste”. The consultation notes that weekly separate food waste collection will be mandated.

The consultation states that this requirement will be initiated from 2023/4. “Given the additional costs involved in separate food waste collection, Government will ensure that local authorities are resourced to meet any new burdens arising from this policy, including up front transition costs and ongoing operational costs.”

GARDEN WASTE

Garden waste is included in the Environment Bill as one of the six recyclable waste streams to be collected from households in England for recycling. Like food waste, it must be collected separately from other household waste and from other recyclable waste streams.

The consultation thus proposes that all local authorities will have to arrange for the universal separate collection of garden waste for recycling in the 2023/24 financial year.

Defra has not yet decided whether local authorities will be allowed to continue to charge for garden waste collections as permitted under The Controlled Waste (England and Wales) Regulations 2012. At present, 65% of local authorities operate a chargeable system.

MINIMUM SERVICE STANDARDS

Defra state that they will be seeking views on including this in the proposed statutory guidance on minimum service standards for rubbish and recycling, and that they will assess the costs for this when consulting on statutory guidance. Defra “*will consider whether a recommended minimum service standard of alternate weekly collection for residual waste (alongside weekly food waste collection) might be appropriate, subject to an assessment of affordability and value for money*”. The consultation also states that “*They specifically note that local authorities that currently collect residual waste on a fortnightly basis should not need to reduce their capacity of collection or frequency further as a result of consistency measures*”.

8. Conclusions

The Options appraisal exercise indicates that the most suitable Option is Option 3 – fortnightly residual waste and the introduction of food waste collections. This is less complex than Option 5 – three-weekly residual waste and the introduction of food waste collections, with Option 3 entirely in line with the current iteration of government guidance, based on the consultation documents issued by Defra (ie Defra’s suggestion that three-weekly residual collection may not be permitted).

However, uncertainty surrounds the government's likely requirements; the Government's response to the Consistent Collection consultation is unlikely to be released before June. This creates uncertainty regarding the flexibility regarding residual collection frequencies, the future of garden waste charges and the requirements for separate collection of recycling streams.

The potential funding streams, through New Burden and EPR funding have been confirmed. However, of particular importance is the uncertainty regarding whether food waste collection schemes introduced before the methodology for New Burdens Funding is confirmed will qualify for such payments. The Consistency consultation states that the requirement for Councils to provide food waste collections requirement will be initiated from 2023/4; it is thus advised that the introduction of any food waste scheme is phased in over the first 12 months of the new / extended contract post February 2023.

This uncertainty extends to the potential approach to procurement, with all service delivery options subject to the simple issue of a lack of clarity regarding exactly what services the Council is required to procure.

In light of this uncertainty, many authorities are looking to extend their collection contracts until the government has provided certainty regarding both collection service requirements and constraints and funding arrangements.

Ricardo's modelling suggests that the current Biffa contract represents good value to the Council, in that their current charges are less than our modelling suggests would be an appropriate market charge; this is likely due to the indexation over time falling short of the additional costs Biffa have incurred during the contract period. Biffa's proposal for an extension represents an increase on their current price; however, in light of the current market issues due to the uncertainty created by the Environment Act and the Resource & Waste Strategy, staffing constraints and international supply line issues, the Council may consider the option of extending the current contract until the government clarifies their intentions as an approach which would minimise the risk of procuring in an evolving and uncertain marketplace. This approach would also enable certainty regarding the requirement to replace the current vehicle fleet, as the current uncertainty regarding the government's preferred collection methodology, and thus the type of collection vehicles required, should be resolved by the government's final statutory guidance.