FRITH RESOURCE MANAGEMENT

Joint Waste Service Review of Household waste Collection - Lichfield District Council

8-October 2019

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Executive Summary

Frith Resource Management (FRM) has been engaged to undertake a waste services review for Lichfield District Council. The review of waste collection services forms part of Lichfield's Fit for the Future programme. Lichfield District Council and Tamworth Borough Council (the Councils) deliver in-house joint waste collection services across both local authority areas.

This report summarises an evaluation of waste collection services delivery options for the Councils, and then assesses potential waste collection changes against the current service. This report complements the Round Review report issued by FRM in May 2019, and summarises the appraisal of the different service delivery options and service change options that emerged through the Service Benchmarking report issued by FRM in June.

The current shared waste service provides an alternate weekly residual and co-mingled recycling domestic collection, a charged garden collection and limited commercial (trade) waste collections. Lichfield District Council is the service provider and employs all staff, owns or leases all vehicles, and provides the depot. Lichfield District Council manages the waste collection services on behalf of both Councils. Most service levels are the same for both Councils including garden waste collection.

Observations during accompanied visits on residual and dry recyclate collection rounds suggest that the service is managed welll, with crews operating safely and efficiently. Productivity is good, but is limited by the location of the depot and tipping points, which place further constraints on the capacity of the service to deal with housing growth within the current collection rounds.

Service delivery options

The Councils wish to determine the suitable way to deliver sustainable waste collection services. Service delivery options include:

- In-house
- Outsourced
- Local Authority Trading Company (Teckal-exempt) – Lichfield & Tamworth operated (LATC (single))
- Local Authority Trading Company (Teckal-exempt) – joint venture with private sector partner (LATC (JV))

It was agreed at a Workshop in June with the Council's project team that the evaluation for service delivery options should be:

- Cost (50%)
- Flexibility to change (25%)
- Service control (25%)

Flexibility and control are evaluated and scored with consideration to a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis. This analysis shows that the Councils might have least flexibility and control over outsourced services based on these criteria, and greatest flexibility and control if the services are delivered through a LATC (single), closely followed by in-house delivery.

A bespoke Excel model has been developed to compare the current in-house costs with the same service delivered through either a LATC (single), LATC (JV) or an outsourced contract. The full service costs have been assessed according to the following headings:

- Staffing – including crew, supervision and agency costs
- Premises – relating to the depot
- Vehicles – lease, maintenance, fuel, purchase costs
- Overheads – including supplies and services
- Procurement costs – for outsourced and LATC set up
- Gate fees – for recyclate, garden waste
- Income – from recyclate, recycling credits, garden waste subscriptions, recharge to Tamworth

The in-house costs have been taken from the current budget out-turn figures for 2018/19. Some adjustments have been made for overheads not currently accounted for by the JWS budget and cross-subsidies to Lichfield's trade waste service. These adjustments are being reviewed by the JWS finance team and may be subject to change.

The net costs for the JWS[1] after income are calculated as:

- True in-house costs £2,372,000
- Outsourced service £2,316,000
- Delivery by LATC (single) £2,328,000
- Delivery by LATC (JV) £2,169,000

The cost, flexibility and control evaluation model scored and ranks the four service delivery options as:

Evaluation		In-house (true costs)	LATC (single)	LATC (JV)	Outsourced
Criteria	*Weighting*				
Cost	*50%*	45.7%	46.6%	50.0%	46.8%
Flexibility to adapt to future service changes	*25%*	15.6%	19.5%	15.6%	12.7%
Control	*25%*	20.1%	17.1%	14.1%	11.1%
Total		**81.4%**	**83.2%**	**79.8%**	**70.7%**
Rank		2	1	3	4

LATC (single) ranks ahead of in-house service with true costs, followed by LATC (JV) with outsourced the lowest scoring. The scores above could easily change with amendments to the assumptions made on the model input data. The LATC (JV) option has the lowest cost. It should be noted that the true costs for in-house all other LATC options are within 10% of each other, which is considered close to the others given some uncertainty in the modelling assumptions.

[1] Excluding Tamworth recharge

The in-house (true costs) and LATC (single) incur a cost of c.£90k for use of the existing depot (based on current arrangements), with LATC (JV) and outsourced options assumed to have a new depot at a cost of £150k per annum. The current depot arrangements does not include any rental charge to the JWS from Lichfield, so could be considered to be an artificial position. If depot costs for the in-house and LATC (single) options are increased to match the £150k per annum assumption used for outsourcing and LATC (JV) delivery, the scoring and the ranking is as follows:

Evaluation		In-house (true costs)	LATC (single)	LATC (JV)	Outsourced
Criteria	*Weighting*				
Cost	*50%*	44.6%	45.4%	50.0%	46.8%
Flexibility to adapt to future service changes	*25%*	15.6%	19.5%	15.6%	12.7%
Control	*25%*	20.1%	17.1%	14.1%	11.1%
Total		**80.3%**	**82.1%**	**79.8%**	**70.7%**
Rank		2	1	3	4

The implication of the depot costs does not affect the overall ranking of service delivery options against the criteria. The scores for in-house and both LATC options are very close but the LATC (single) remains the highest ranking option. Allowing £150k/yr rental cost for the depot increases the costs of the in-house and LATC (single) options by c.£60k, making costings for in-house, LATC (single) and outsourced to within 2% of each other. LATC (JV) has the lowest cost under both scenarios (but notably where depot costs are equalised), while outsourced has a lower cost than in-house and LATC (singe) where depot costs are equalised, but these service delivery options do not score so well against others for flexibility and control.

The Baseline (in-house true costs) has been assessed to consider the financial implications of the following service change options. The financial implications should be very similar for other service delivery options (LATC (single), LATC (JV), outsourced).

Service change options

The service change options considered are expected to increase the current cost to the JWS. Such changes are likely to be driven by legislation and national policy, and it is understood that local authorities would be compensated for additional costs should service changes be mandated through Extended Producer Responsibility (EPR).

Four service change options have been modelled using the Kerbside Analysis Tool (KAT):

- <u>Service efficiencies</u>
    - *Alternative depot location*
        - At present, 7 vehicles are required to operate the dry recycling collection service and 7 to operate the residual waste collection service. Modelling a reduction in drive time showed that incrementally one-fifth of vehicle could be saved for every 5 minutes saved on the drive time to and from the depot for the dry recycling. For the residual waste, however, changing the drive time has no material impact on the number of vehicles required to

operate the service as the number of vehicles is largely driven by the number of households required to collect from amount of waste collected on the rounds.

- The Council could consider increasing the annual charge for the subscription-based garden waste service. However, although there would be an increase in the income from the subscribed households, this could have the effect of reducing the number of households subscribing to the service which would reduce the income from the service
- Whilst relocating the depot to a more central location is unlikely to reduce the number of vehicles currently required, it will provide more capacity for collection for projected housing growth, and extend the date when additional waste collection vehicles are required.
- It is noted that current depot is unlikely to have space needed for food waste collection vehicles from 2023 as required by the national Resources and Waste Strategy. Consequently, for future waste collection requirements, a site search and viability assessment should be carried out for a more central depot.

  - *Waste minimisation (education & awareness), and reduced residual waste tonnages*
- Education and awareness of households is most unlikely to reduce residual waste vehicle numbers, but it will provide capacity for household growth and the need for more RCVs. The Councils should consider a budget and personnel for waste education and awareness.

  - *Implications of the national Resource and Waste Strategy*
- Deposit Return Scheme (DRS): for a medium projection, there would be a decrease of approximately 2,400 tonnes of dry recyclables, but 7 vehicles would still be required, although there would be greater capacity for housing growth.
- Other implications of the national Resource and Waste Strategy are covered by the service change options below.

- <u>Service Change Option A – weekly food waste collections</u>

  - Weekly food waste collections. There is no reduction in residual waste collection vehicles expected[2], and the need for at least 8 food waste collection vehicles, crews (driver and loader), kitchen and out-door caddies, and caddy liners. The kerbside recycling rate is calculated to increase from 45% to 53%.

- <u>Service Change Option B – weekly food waste collections, reduced residual waste capacity</u>

  - Reduced capacity residual collection (180litre residual bin collected fortnightly). When compared with Option A, there appears to be no further decrease in the number of vehicles required to collect residual waste, however, there is a slight increase in the amount of food waste vehicles required (from 7.1 to 7.7 vehicles, but still at least 8 vehicles). The recycling rate is calculated to increase to 55%. If residual waste collection is reduced to 3 weekly in the same bins as present, it could be c.£100k per annum less than the fortnightly collection with a smaller bin, but there is no flexibility in the vehicles to

[2] The KAT modelling estimates that a saving of one residual vehicle could be achieved. However, the Councils believe this will be operationally challenging. Therefore 7 vehicles are costed in this assessment for all options.

allow for growth. However, the process of switching to a three-weekly residual collection can be a difficult transition for householders when compared to reducing the bin size.

- Service Change Option C – weekly food waste collections, reduced residual waste capacity, twin-stream dry recycling
    - Twin-stream dry recycling (4-weekly, alternate fortnightly), fibre collected in separate bin. It is calculated that 9 food waste vehicles would be required. Six vehicles would be required to collect the paper and card recycling, and 7 would be required to collect the remaining co-mingled fraction. Overall, however a total of at least 26 vehicles are required to operate the service. This is an increase of 8 from the current service.

Waste collection services cost increases for service change Options A, B and C are calculated as follows:

Annual Collection Costs	Difference from Baseline		
	Option A	Option B	Option C
Vehicle operating costs (labour, vehicle standing, vehicle running and fuel)	£496,000	£523,000	£583,000
Vehicle capital costs	£105,000	£105,000	£118,000
Container Costs	£89,000	£89,000	£308,000
Overheads (supervision)	£60,000	£63,000	£70,000
Cost of liners (annual)	£398,000	£398,000	£398,000
Difference to adjusted Baseline	**£1,148,000**	**£1,177,000**	**£1,477,000**

These costs include £398,000 for the provision of food caddy liners by the Council to households. There is the potential to save this cost.

The additional collection costs to the JWS for service change Options A, B and C can be summarised as:

Cost item	Difference from Baseline		
	Option A	Option B	Option C
Annualised recycling collection cost	£0	£0	£218,000
Annualised organics (garden waste) collection cost	£0	£0	£0
Annualised food waste collection costs	£749,000	£779,000	£861,000
Annual cost of providing food caddy liners	£398,000	£398,000	£398,000
Annualised residual collection costs	£0	£0	£0
Total gross collection cost difference	**£1,148,000**	**£1,177,000**	**£1,477,000**
Kerbside recycling rate[3]	53%	55%	56%

The introduction of a separate food waste collection service, using the modelled assumptions, is estimated to cost Lichfield at least c.£750,000 per year more than the current service, excluding the cost of caddy liner provision. Implementing the Option C two-stream collection service will incur an

[3] Note that this is not the total Local Authority Recycling rate which also includes the performance of Bring Banks, the HWRCs and other collection activity, but is purely the performance of the main collection systems from households

additional recycling collection cost of approximately £218,000. It is assumed that the vehicles and staff will be shared across the two recycling streams. If separate vehicles were required to collect the two-stream dry recycling, the collection cost for Option C would be considerably higher.

To understand the annual whole system cost implications of service change options, the potential income revenue and gate fee costs need to be compared to the Baseline:

	Revenue assumption (£/t)	Option A	Option B	Option C
Gate fees and income, comprising:		£127,000	£164,500	-£225,000
Dry Recycling[4], of which:		*£0*	*£16,500*	*-£394,000*
Paper: Mixed papers domestic	*-£21.33*			*-£151,000*
Non-corrugated card	*-£50.76*			*-£97,000*
Co-mingled DMR[5]	*£18.00*		*£16,500*	*-£146,000[6]*
Garden Waste Composting	*£21.06*	*£0*	*£0*	*£0*
Food Waste Treatment[7]	*£26.00*	*£127,000*	*£148,000*	*£169,000*
Revenue from garden waste subscription[8]		£0	£0	£0
Recycling Credits (dry)	-£53.24	£0	-£49,000	-£49,000
Recycling Credits (organic)	-£51.58	-£252,000	-£293,000	-£334,000
Net Cost (difference to Baseline)		**-£125,000**	**-£178,000**	**-£609,000**

All options are expected to generate net income compared to the Baseline, due to the value of the recycling credit and recyclate income. Option C is expected to generate the highest net income compared to the current service. This saving is largely dependent on the JWS securing market prices for fibre that are similar to industry published averages (c.£21/tonne for paper, c.£50/tonne for cardboard). It can also be seen from these figures that the additional recycling credits more than offset the gate fees for food waste; the same applies to additional dry recycling.

A comparison of the whole system costs for delivering the service changes in Options A, B and C are summarised as:

	Option A	Option B	Option C
Collection Cost difference	£1,148,000	£1,177,000	£1,477,000
Net Cost difference	-£125,000	-£178,000	-£609,000
Whole System Cost difference	**£1,023,000**	**£999,000**	**£868,000**

These figures include the additional cost of collection as well as the net income associated with recycling credits, recycling revenue, and gate fees. These results show that when the cost of treatment and

[4] Average Let's Recycle Material Price (Jan-May 2019) minus 10% to account for smaller buying power

[5] WRAP (2018) MRF Gate Fee Report

[6] This is not a revenue. Note that there is still a cost of sending the co-mingled DMR to be recycling. However, as there is less DMR on the basis of separating the paper and card, JWS will save approximately £146,000.

[7] WRAP (2018) MRF Gate Fee Report

[8] Assumed no change to garden waste service or subscription throughout

potential income is taken into account, although Option C has the highest increase in collection costs, it results in the lowest increase from the current service. This is driven by an income of c.£250,000 for the separately collected paper and card fraction, and recycling credits for food waste. It is recommended that further research is undertaken to ensure similar gate fees could be secured should the JWS consider a two-stream dry recycling system.

Notable sensitivities include to the above costs include:

- Recycling credits

Whole System (without recycling credits) Difference			
	Option A	Option B	Option C
Difference from Baseline	£1,275,000	£1,358,000	£1,231,000

- MRF gate fee / recycling income; variance from current

	Income per tonne (£/t)	Option A	Option B	Option C
Gate Fees and income, comprising		£127,000	£181,000	-£248,000
Dry Recycling[9], of which:		*£0*	*£33,000*	*-£415,000*
Paper: Mixed papers domestic	***-£10.67***			*-£76,000*
Non-corrugated card	***-£25.38***			*-£48,000*
Co-mingled DMR[10]	***£36.00***		*£33,000*	*-£291,000*
Garden Waste Composting	*£21.06*	*£0*	*£0*	*£0*
Food Waste Treatment[11]	*£26.00*	*£127,000*	*£148,000*	*£167,000*
Revenue from garden waste subscription[12]		£0	£0	£0
Recycling Credits (dry)	-£53.24	£0	-£49,000	-£49,000
Recycling Credits (organic)	-£51.58	-£252,000	-£293,000	-£334,000
Net Cost		**-£125,000**	**-£161,000**	**-£630,000**
Annual gross collection costs		£1,148,000	£1,177,000	£1,477,000
Whole System Cost		**£1,023,000**	**£1,016,000**	**£847,000**

- Moving from 2 drivers + 1 loader, to 1 driver + 2 loaders. It is calculated that there would be an annual £44,700 cost saving by changing to 1 driver and 2 loaders. There would be an additional cost saving if drivers were currently paid industry rates.

The whole system cost variance for service change options is summarised as:

[9] Average Let's Recycle Material Price (Jan-May 2019) minus 10% to account for smaller buying power

[10] WRAP (2018) MRF Gate Fee Report

[11] WRAP (2018) MRF Gate Fee Report

[12] Assumed no change to garden waste service or subscription throughout

Difference from Baseline	Option A (Current service + food)	Option B (Current service + food + restricted residual)	Option C (A4WC + food, +restricted residual)
Annual gross collection costs	**£749,000**	**£779,000**	**£1,079,000**
Annual cost of food caddy liners	£398,000	£398,000	£398,000
Gate Fees for recycling	£0	£20,000	-£426,000
Garden Waste Treatment	£0	£0	£0
Garden waste Income	£0	£0	£0
Food Waste Treatment	£127,000	£148,000	£169,000
Recycling Credits (dry)	£0	-£49,000	-£49,000
Recycling Credits (organic)	-£252,000	-£293,000	-£334,000
Whole System Cost (difference from Baseline)	**£1,023,000**	**£999,000**	**£868,000**

Whole System Cost – Sensitivities			
No recycling credits	£1,274,000	£1,341,000	£1,251,000
MRF gate fee sensitivity	£1,023,000	£1,016,000	£847,000

Option C has the lowest whole system cost of all the alternative collection options. Although there is an increase in gross collection costs, the material revenue gained from a separate paper and card system and recycling credits offsets this to become the most cost-effective option (although still at increased cost compared to the Baseline). Material income revenue of £248,000 is assumed based on the high proportion of paper and card found within JWS current recycling composition.

Sensitivity analysis has shown that the JWS could incur significant cost increases should the recycling credits be withdrawn, or the MRF gate fees continue to rise. However, Option C still has the lowest whole system costs of the service change options considered once these have been taken into account.

Next steps

It is not considered appropriate, based on the cost and factors of flexibility and control that are important to the Councils, to recommend outsourcing the services in the short to medium term. If the Councils wish for the lowest cost services with the potential to make a profit, then the LATC (JV) should be investigated further, i.e. though an approach to the Norse Group in which they are asked to provide a detailed cost estimate for delivery of the services. The Council can then make a decision on a LATC (JV) when they have a costed proposal. However, should the Councils wish to retain the current level of flexibility and control, particularly with the uncertainty over the implementation of the national Resource and Waste Strategy, then the service should remain in-house or through the setting up of a Lichfield and Tamworth specific LATC. Given the proximity of the evaluation scores, it is not appropriate to make a firm recommendation on the service delivery model.

The potential cost implications of setting up a local authority trading company, meeting the requirements set out below. It is noted that some of these items may not be mandatory.

Year	Item	Cost
2020	LATC agreement, set up costs	c.£100-£150k, depending on the level of external advice sought
	New depot	To be determined
2022	Reducing garden waste collections over winter months	To be determined
2023	Weekly food waste collection	c£760k

Contents

1 Introduction

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This report complements the Round Review report issued by FRM in May 2019 as part of this project, and summarises the appraisal of the different service delivery options and service change options that emerged through the Service Benchmarking report issued by FRM in June.

1.1 Background

The review of waste collection services forms part of Lichfield's Fit for the Future programme, which is a comprehensive, corporate, cross departmental transformation programme with the following objectives:

- To embed a culture of change and continuous improvement within the organisation so that it is better placed to play its future role;
- To support the delivery of the outcomes described within the Strategic Plan 2016-20 and prepare for the 2020-2024 Strategic Plan;
- To improve the customer experience of dealing with the Council whether that be digitally or through more traditional contact routes;
- To move the Council towards becoming a more self-sufficient and sustainable organisation; and
- To nurture and support the Council's ambition to be more commercial in everything that it does.

The current shared waste service with Tamworth provides an alternate weekly residual and co-mingled recycling domestic collection, a charged garden collection and limited commercial (trade) waste collections. Lichfield District Council is the service provider and employs all staff and owns or leases all vehicles. Lichfield District Council manages the waste collection services on behalf of both Councils. Most service levels are the same for both Councils including garden waste collection.

1.2 Options appraisal objective

Local authorities in England have been exploring the most suitable ways to deliver sustainable waste collection services. The service delivery options are:

- In-house
- Outsourced
- Local Authority Trading Company (Teckal-exempt) – Lichfield & Tamworth operated (LATC (single))
- Local Authority Trading Company (Teckal-exempt) – joint venture with private sector partner (LATC (JV))

Some local authorities which had outsourced services have brought them back in-house, and some local authorities with in-sourced services have set up a LATC (single) or LATC (JV), or have outsourced the services, so all the options above have been demonstrated as being successful.

FRM's proposal to the Councils for the service delivery options appraisal was to:

- Review the waste collection services (Round Review report);
- Benchmark the Councils wastes collection services against similar authorities with LATC (single), LATC (JV), and outsourced (Service Benchmarking report);
- Workshop service delivery options evaluation criteria and service change options with the Councils Officers and Members;
- Evaluate service delivery options;
- Cost the service change options for the highest scoring service delivery option; and
- Report and present to Councils.

FRM's proposal for the evaluation of the four service delivery options was to include a strengths, weaknesses, opportunities, and threats (SWOT) analysis. FRM prepared a draft SWOT analysis for the service delivery options evaluation criteria and service change options Workshop on 7th June. It was agreed at this Workshop that the evaluation for service delivery options should be:

- Cost (50%)
- Flexibility to change (25%)
- Service control (25%)

The current waste collection service has been assessed to consider the financial implications of the following service change options:

- Service efficiencies
    - Alternative depot location;
    - Vehicle acquisition and maintenance, extended vehicle life; and
    - Waste minimisation (education & awareness), and reduced residual waste tonnages.
- Service change A
    - Weekly food waste collections.
- Service change B – as A but also
    - Reduced capacity residual collection (180litre residual bin/ fortnightly).
- Service change C - as B but also
    - Twin-stream dry recycling (4-weekly, alternate fortnightly), fibre collected in separate bin.

1.3 Report structure

Following this introduction, this report contains the following Chapters:

- Chapter 2: Collection Round Observations – summary of the observations from FRM's on-vehicle review of the residual and recyclables collection rounds;
- Chapter 3: Service Delivery Benchmarking - the summary conclusions from the Service Benchmarking report;

- Chapter 4: Service Delivery Options SWOT Analysis - a summary of the SWOT analysis of the different service delivery options and a discussion of the key issues arising;
- Chapter 5: Service Delivery Options Assessment - a description of the cost model and a comparison of the service delivery options with regards to the evaluation criteria;
- Chapter 6: Service Change Options - details of the cost implication associated with the service change options; and
- Chapter 7: Conclusions - a discussion around the key findings from the assessment.

2 Collection Round Observations

2.1 Introduction

On 16th and 17th April, Tim Byrne (B.Sc. (Wastes Management), MCIWM, ISWA IWM) undertook a review of the residual and recyclable waste collection rounds for Lichfield District Council and Tamworth Borough Council (the Councils). Tim has been both a driver and collector in the past and has c.25 years in the sector and has an expert knowledge of waste collection activities and vehicles. He is now a consultant working with Frith Resource Management (FRM).

Tim accompanied a residual waste collection crew on 16th April and a dry recyclables collection crew on 17th April, for collection from Tamworth. The objectives of the independent review were to assess the infrastructure and design of the rounds and whether they could be improved, together with the productivity and activities of the crews.

2.2 General observations

The Joint Waste Services management team manages the joint service well. If more sustainable solutions could be found for a better sited depot than Burntwood and improvements to the location of the waste transfer station infrastructure for the residual waste and dry recyclate, the overall operational element of the service will become more efficient for collection from Tamworth. This could be reduced by having two depots, one in Lichfield and one in Tamworth. The additional cost for the provision and operation of two depots against the cost reduction in vehicles and round time should be assessed. If this demonstrates that two depots provide cost advantages, then a site search should be carried out.

The Councils do not have control over the tipping location for residual waste as this is directed by Staffordshire County Council. However, irrespective that the Councils should be paid a “tipping away” payment for out of District travel costs by Staffordshire County Council, the Councils should consider a transfer station for residual waste, and potentially for dry recyclate as there is not an alternative MRF near Lichfield and Tamworth. This could be linked to the depot search.

The national Resources and Waste Strategy for England requires food waste collection by the end of 2023. We would comment that there could be sufficient space to park nine/ten 7.5 tonne food waste collection trucks at the Burntwood depot. However, space is limited, and the management team has commented that there is currently insufficient car parking space for staff at the site, something that will be further exacerbated through additional vehicles and associated staff.

Many bins were presented within the property boundary and the crews had to spend time wheeling them to the collection vehicle, often a distance of 60-80m. It is the standard requirement of outsourced waste collection contracts that the bins should be collected at the property boundary, and returned to the property boundary. This would provide more round capacity for new properties in the future. We would recommend that this practice should be employed by the Councils.

It was observed that the Tamworth residual waste bins were full indicating that there is potential for improvement in waste recycling in Tamworth. Also there were quite a number of recyclables containers cross contaminated with residual waste and the crews had to yellow-tag them to tell the resident that, he/she had put the wrong type of materials into the container. Educating the public and then enforcing bin requirement would save collection time and cost and would provide capacity in waste collection vehicles for future housing.

Further recommendations include improvement of driver communications with two-way radios, rolling out a programme of Continued Professional Development for drivers to motivate and retain staff, and recruiting loaders with a career path to becoming drivers to reduce the reliance on agency staff.

3 Service Delivery Benchmarking

3.1 Introduction

The first task of the service delivery options assessment was to benchmark the Councils' waste collection services against other authorities for delivery and performance prior to modelling service delivery options. This was done by identifying local authorities in England which provide joint waste services through three alternative delivery models: in-house, Local Authority Trading Company (LATC) (Teckal-exempt), or outsourced, and then contacting the authorities to complete a benchmarking questionnaire.

The completed benchmarking questionnaires were assessed and the overall conclusions of the benchmarking were:

- Lichfield & Tamworth JWS operation and financial performance is good when measured against similar sized authorities using a similar delivery model.
- Lichfield & Tamworth JWS operation and financial performance is good when measured against similar sized authorities using alternative delivery models.
- The main explanations for any differences between the Councils' existing performance and benchmarking findings are different demographics, service delivery methods and performance.

3.2 Benchmarking conclusions

The following issues were benchmarked:

Waste arisings

Lichfield and Tamworth are currently producing more residual waste and dry recycling than the average but slightly less garden waste. Considering the service delivery arrangements, there is insufficient data to confirm whether the delivery option (in-house, LATC or outsourced) has a direct impact on waste arisings per household, which are clearly also a bearing of the socio-demographics of the area in question. However, the authorities in this sample operating an in-house service do have slightly higher residual waste arisings, but also higher dry recycling arisings, indicating higher total waste arisings.

The type of dry recycling collection service (i.e. co-mingled, two-stream, kerbside sort) does not appear to have a direct impact on the amount of dry recycling collected per household.

Recycling rate

Lichfield and Tamworth's household waste recycling rates are just below the average in the benchmark group, based on 2018/19 data. In parallel to carrying out the benchmarking, FRM assessed waste recycling in Lichfield and Tamworth against other waste collection authorities (WCA) in England in 2017/18. The national analysis demonstrates that the Councils both performed well against others offering a similar dry recycling collection, whilst not collecting food. Most of the benchmark group (except South Staffordshire and Cannock Chase) have some form of food waste collection, so are excluded from the national data in the chart below. It should be noted that Lichfield's recycling rate has since fallen by c.2 percentage points based on current (2018/19) data, understood to be due to the introduction of charges for garden waste collection in 2018.

It is notable from the national analysis that all of the top performers in terms of recycling rate based on the analysis applied were delivered by outsourced service providers. The benchmarking demonstrates a

more mixed picture, however, with both higher and lower recycling performance via outsourced providers.

Collection performance

The number of bins collected per vehicle per round was not able to be provided by all benchmarking participants, due to the availability of data. The figures provided range from 674 households on the rural dry recycling kerbside sort rounds in West Devon to 1,406 for the mainly urban co-mingled dry recycling rounds in Lichfield and Tamworth. A good waste collection service typically collects from 1,200 households per vehicle for an 8.5 hour working day. The equates to 1,425 households per vehicle for a 9.5 hour working day which is being provided on the Councils urban round.

All but one of the eleven benchmarked authorities work on task and finish operation. There is insufficient data to confirm whether in-house delivery achieves greater service performance than outsourcing.

Missed collections

Scant information was provided on the question of missed collection, and that which was forthcoming varied significantly. Outsourced contracts are generally considered to be good if missed collections are less than 100 per 100,000 properties. The Councils have a performance of 89 missed collections per 100,000 properties and the service should therefore be considered relatively good.

Resources

Vehicles

All the authorities[13] in the benchmark group purchase their RCVs, while Lichfield and Tamworth's joint service contract hires vehicles. The operational life of RCVs varies between 7 and 9 years. Lichfield and Tamworth currently have a 6 year lease to coincide with the expiry date of the recyclables processing contract. The Councils may make cost savings in future by purchasing vehicles and retaining them for an 8 year life.

Staffing

The staffing arrangements for the benchmarked authorities varies quite significantly. Lichfield and Tamworth used, on average, 29 agency staff members a month. According to information regarding staff age profiles, Lichfield and Tamworth have a total of 72 permanent staff; this means that agency staff make up approximately 27% of total workforce. Benchmarked authorities reported to use 0% - 5%. An assessment should be made whether increasing permanent staff pay to recruit staff and reducing agency staff will save the Councils money.

The Councils have a lean staffing structure for the management of the waste collection services and communication with the public.

Service cost

The benchmarked authorities were asked to provide their waste collection service cost per household excluding any income from recyclate, garden waste subscriptions, recycling credits or trade waste. Much

[13] No information provided by Daventry (LATC Norse)

clarification was undertaken on the cost figures provided, however there may be some nuances that have not been able to be separated from the costs provided.

The cost of waste collection for Lichfield and Tamworth is one of the lowest overall and the lowest in-house benchmarked authority at just under £48/household; Cannock Chase has the lowest cost at approximately £44/household. Lichfield and Tamworth's joint service cost is approximately £10 less per household than the average across the 11 authorities (including Lichfield and Tamworth) that have provided cost data, at £58/household.

Trade waste

The approach to trade waste services varies across the benchmark group, with some of the authorities providing a trade waste service, while others do not. The income varies significantly between the authorities; the majority being under £0.5m, but South Cambridgeshire & Cambridge City generate substantial income of £3.8m.

Recyclate price management

Many of the benchmark authorities have some slight variation of a 50:50 shared benefit arrangement between themselves and a contractor with regard to recyclate income. Lichfield & Tamworth, South Staffordshire and Cannock Chase have contracts with Biffa for the management of dry recyclables. A fixed gate fee is paid (subject to CPI).

Apportionment of service costs (for joint services)

For Tamworth and Lichfield, the apportionment of service costs is typically shared according to the property count in each district. For 2018/19 the split was Lichfield 57% and Tamworth 43%. The same apportionment is applied for back-office management. For LATC and outsourced services, service costs tend to be apportioned between the authorities based on service provision.

Potential for other joint services

The majority of the benchmarked authorities acknowledged the natural synergies which can exist between waste collection and street cleansing servicing areas of similar demographic; particularly around management, operations and administrations. Where authorities did not see options for joint services, this was often due to barriers or constraints regarding district boundaries or differing demographics.

4 SWOT Analysis

4.1 Initial SWOT analysis

FRM undertook a strengths, weaknesses, opportunities and strengths (SWOT) analysis for the June 2019 Workshop. The SWOT analysis sought to identify items, and then allocate them to *more important*, *important* and *less important* categories for the evaluation of in-house, LATC (single), LATC (JV) and outsourced service delivery options. The initial SWOT analysis then sought to rank the four service delivery options. The objective of the SWOT was to evaluate service delivery options, excluding costs. Service provision costs were excluded from the SWOT analysis. The items identified for the SWOT and their categorisation was as follows:

Table 1: SWOT analysis item categorisation

More important
• Direct control
• Flexibility for service/ legislative change
• Cost control
• Opportunities for service change cost savings/ income
• All risks, including financial and service risk with Councils
• Competitive costing
• Funding for recruitment and career development, driver pay rates
Important
• Trust of the public
• Direct line management
• Procurement time and cost
• Costs transparent to the Council
• No exit limitations and costs
• Flexibility for property growth
• Lower cost for borrowing capital
• Commercial waste services development
• Opportunity to integrate other services e.g. street cleansing
• Recruitment and retention of staff, HGV 2 driver pay rates
• Buying power for service change and new infrastructure
• LGPS requirements for labour
• Provision of staff for service management
• Knowledge to innovate
• Funding for public awareness and education
• Funding for new depot and transfer station
• Potential for service provision with other authorities
• Mobilisation for service change
• Provision of maintenance of plant and equipment
Less important
• Risk of company bankruptcy
• Responsiveness to public
• Union management
• Lack of direct service expertise
• Lack of service health & safety experience and resources
• Member (political) influence and control
• Potential profit margin

The categorisation of the items in the SWOT is subjective. Further detail on the SWOT analysis for each service delivery option is presented in Appendix A.

The SWOT analysis was briefly discussed at the Workshop on 7th June and it was agreed to evaluate the four service delivery options on:

- Cost (50%)
- Flexibility to change (25%)
- Service control (25%)

5 Service Delivery Options Assessment

5.1 Introduction

Following on from the SWOT analysis and Workshop, the four service delivery options have been evaluated bespoke Excel model according to the following criteria:

- Cost (50%)
- Flexibility to change (25%)
- Service control (25%)

5.2 Service flexibility and control

In order to assess the different aspects relating to service flexibility and control, we have identified sub-headings of each. In co-operation with the Council, each item has been weighted according to its relative level of importance: a weighting of 5 for the most important sub-criteria, a weighting of 1 for less important sub-criteria. Flexibility for service change and legislative change were weighted as the most important under the 'flexibility' criterion; service control and cost control were weighted as the most important under the 'control' criterion.

Each service delivery option has been scored according to how well it achieves each sub-criteria item: a score of 4 where the option performs well, a score of 1 where it performs least well relative to the other options.

The weightings and scores are summarised in Table 2. For each sub-criterion the score is multiplied by the weighting, then each weighted score is summed to give total weighted scores for flexibility and control. The weighted scores for each option are compared to the maximum possible score, and multiplied by the % criteria weighting (25% for each (see Section 5.1 above)) to give percentage evaluation scores for flexibility and control. These evaluation scores are then combined with the cost criterion to give the overall performance of each service delivery option.

Table 2: Flexibility and control analysis

Flexibility	**Weighting**	**In-house**	**LATC (Single)**	**LATC (JV)**	**Outsourced**
Service change	5	4	4	2	1
Legislative change	5	4	3	2	1
Personnel recruitment	3	1	3	3	4
Personnel employment	3	1	2	3	4
Capital investment	3	2	3	3	1
Competitive pricing	3	1	2	3	4
Property growth	1	1	2	3	4
Commercial services development	3	1	4	3	2
Other service integration	3	3	4	2	1
Authority partnership	3	4	3	2	1
Total flexibility score	**128**	**80**	**100**	**80**	**65**
Percentage flexibility		**15.6%**	**19.5%**	**15.6%**	**12.7%**
Control	**Weighting**	**In-house**	**LATC (Single)**	**LATC (JV)**	**Outsourced**
Service control	5	4	3	2	1
Cost control	5	4	3	2	1
Personnel management	3	4	3	2	1
Transparency	3	4	3	2	1
Financial risks	3	1	2	3	4
Service provision risks	3	1	2	3	4
Commercial services control	1	4	3	2	1
Total control score	**92**	**74**	**63**	**52**	**41**
Percentage Control		**20.1%**	**17.1%**	**14.1%**	**11.1%**
Percentage Flexibility and Control		**35.7%**	**36.7%**	**29.8%**	**23.8%**

The analysis shows that the Councils might have least flexibility and control over outsourced services based on these criteria, and greatest flexibility and control if the services are delivered through a LATC (single), closely followed by in-house delivery. The Councils have the greatest flexibility if the LATC (single) option is chosen and greatest control over in-house services. A LATC (JV) service gives flexibility on a par with in-house, but with notably lower levels of control.

5.3 Cost assessment

5.3.1 Model description

A bespoke Excel model has been developed to compare the current in-house costs with the same service delivered through either a LATC (single), LATC (JV) or an outsourced contract. The full service costs have been assessed according to the following headings:

- Staffing – including crew, supervision and agency costs
- Premises – relating to the depot

- Vehicles – lease, maintenance, fuel, purchase costs
- Overheads – including supplies and services
- Procurement costs – for outsourced and LATC set up
- Gate fees – for recyclate, garden waste
- Income – from recyclate, recycling credits, garden waste subscriptions, recharge to Tamworth

The model has been set up to include the total service cost, i.e. those costs incurred by the Council, and those costs incurred by the contractor or trading company. The cost assessment of each of the service delivery options has been undertaken on the combined total costs for that option.

5.3.2 Input data and assumptions

The in-house costs have been taken from the current budget out-turn figures for 2018/19. Some adjustments have been made in agreement with Lichfield's finance officer for the JWS to identify cross-subsidies to Lichfield's trade waste service and other overheads not currently accounted for by the JWS budget but levied by Lichfield. It should be noted that these adjustments are currently being reviewed by the finance teams within the Councils and are subject to change. These are presented as the 'true' in-house costs below:

- Depot costs – addition of £39k for depot usage
- Tamworth depot central support – removal of £68k allocated to JWS for Tamworth's depot overheads that is not actually used by the JWS
- Other overheads - £407k not currently allocated to JWS
- Trade waste subsidy – removal of £54k cross-subsidy to the JWS (detailed within the trade waste service review report)

Modelling assumptions for the outsourced and LATC options are set out in Appendix B. Key points relating to each cost heading are:

Cost heading	Comment for outsourced and LATC costs
Staffing and salaries	– Council staffing based on reduction in office / managerial staff – Contractor / LATC staffing based on reduction in team leaders per vehicle, 9.25h working day – Contractor / LATC salaries based on assumed market rates – NIC and superannuation 20% of contractor / LATC staff costs, 30% of Council staff costs – Agency staff costs reduced to 10% (outsourced and LATC (JV)) / 20% (LATC (single)) of contractor salaries – currently 40% of total staff salaries
Vehicles	– Same number of vehicles as present – Purchase of new vehicles depreciated over 8 year lifespan – Council borrowing rate 3% for LATC (single), contractor borrowing rate 6% for outsourced and LATC (JV)
Depot costs	– Same costs as 'true' in-house costs for LATC (single) – New depot at £150k per annum for outsourced and LATC (JV)

Overheads	– Similar to 'true' in-house costs, but with the removal of other overheads not currently allocated and JWS cross-subsidy – Addition of staffing overheads at 5% of contractor / LATC salaries
Procurement	– £250k council costs for procurement of outsourced contract, annualised over 8-year period – £150k Council cost for set up of LATC, annualised over 8-year period – Depends on extent of external resource
Gate fees	– Based on current gate fees and tonnage information provided
Income	– Mainly as for in-house (true cost), but figures adjusted to reflect current prices

5.3.3 Model output

The results of the cost assessment are presented in Table 3, summarised as the net cost of the JWS[14] follows:

- True in-house costs £2,372,000
- Outsourced service £2,316,000
- Delivery by LATC (single) £2,328,000
- Delivery by LATC (JV) £2,169,000

The key differences between the options are in terms of the staffing / salary costs where outsourced and LATC (JV) are lower than the LATC (single) by c.£350k, and lower than the true in-house costs by c.£250k. This is primarily due to the lower agency staffing costs and reduced NIC and superannuation costs. The balance of staffing and management overheads is different when other options are compared to the true in-house costs.

Vehicle costs are notably higher for the outsourced and LATC options. These costs have been worked up based on the current vehicle fleet being purchased and maintained by the contractor or LATC, over a vehicle life of 8 years. It is clear that the current lease costs are competitive, and there may not be any benefit in purchasing. We have made initial enquiries of the potential lease hire costs for vehicles over an 8 year period[15]. While they are quite competitive, they should be treated with caution as the costs depend on the specification of the vehicles, the terms of the lease and would be subject to competitive tendering by the Councils.

The premises costs are much higher for the outsourced and LATC (JV) options, on the basis that a LATC (single) could use the current depot under the same in-house arrangement. An outsourced contract or LATC (JV) is likely to either require an alternative depot or be charged a reasonable rent by the Council to use the current depot. This unknown cost has been dealt with by comparing the options on the same

[14] Excludes recharge to Tamworth

[15] 26t RCV - Mercedes Econic / Dennis body / Split or trade lift, £840 per week
18t RCV - Dennis chassis / Dennis body / Twin pack Split lift, £812 per week
7.5t Food waste vehicle - Isuzu with a Terberg Plastic body, £525 per week

depot costs, by assuming these are equal for each option – this adjustment is presented in the last two lines of Table 3 for comparison purposes only.

Table 3: Summary of service delivery option costs

Council costs
Contractor / LATC costs

NOTE: costs are for JWS with Tamworth Does not include costs not attributable to the JWS, Excludes trade waste costs / income	In-house (current)	In-house (at 'true' cost to Lichfield	Outsourced	LATC (single)	LATC (JV)	Comments
	2018/19 from out-turn		Total service costs, including cost to the Councils			
Staffing	***£2,618,490***	***£2,618,490***	***£2,379,300***	***£2,727,954***	***£2,349,074***	Note that calc of staff salary costs differ from budget figures
Staff salaries - council	£1,536,953	£1,536,953	£194,149	£170,872	£170,872	
Staff salaries - contractor / LATC			£1,636,300	£1,790,050	£1,636,300	
NIC & superannuation - Council	£458,841	£458,841	£57,961	£51,012	£51,012	
NIC & superannuation - contractor / LATC			£327,260	£358,010	£327,260	
Agency staff costs	£619,841	£619,841	£163,630	£358,010	£163,630	In-house calculates at 40% of staff salaries, outsourced and LATC (JV) assume 10%, LATC (single) 20% of contractor salaries
Other	£2,855	£2,855				
Premises	***£51,864***	***£90,664***	***£150,000***	***£90,664***	***£150,000***	
Depot costs	£50,280	£89,080	£150,000	£89,080	£150,000	In-house includes operating and income, no capital charges
Depot CCTV	£1,584	£1,584		£1,584		
Vehicles	***£1,243,278***	***£1,243,278***	***£1,413,621***	***£1,350,451***	***£1,413,621***	
Maintenance / running cost	£27,708	£27,708	£300,000	£300,000	£300,000	Assume same number of vehicles as present
Fuel	£401,599	£401,599	£401,599	£401,599	£401,599	Assume fuel costs will be same as at present
MOT & Licences / standing costs	£1,355	£1,355	£164,500	£164,500	£164,500	Note not all current vehicles have MOT & licences - see 'budget'
Contract hire	£800,716	£800,716				
Other transport	£11,900	£11,900				
Annualised vehicle (capital) cost			£547,522	£484,352	£547,522	
Overheads	***£785,867***	***£1,070,627***	***£796,815***	***£804,503***	***£796,815***	Assume same Council overheads apply (excl depreciation & staffing)
Supplies & services	£385,347	£385,347	£400,000	£400,000	£400,000	Gate fees stripped out, see below
Third party payments	£13,990	£13,990	£15,000	£15,000	£15,000	Bank charges and shared service agreement
Central support	£318,580	£318,580	£300,000	£300,000	£300,000	
Tamworth depot central support	£67,950					Removal of this item to be discussed
Staffing management overheads (contractor LATC)			£81,815	£89,503	£81,815	
Other overheads not currently allocated to JWS		£407,190				
Adjustment for trade service		-£54,480				Costs incurred in Lichfield's delivery of trade waste service
Total contractor / LATC costs			***£4,172,626***	***£4,346,023***	***£4,172,626***	
Profit margin retained by contractor / LATC			***£208,631***	***£0***	***£104,316***	
Procurement	***£0***	***£0***	***£31,250***	***£18,750***	***£18,750***	
Procurement & mobilisation	£0	£0	£31,250	£18,750	£18,750	Per year, spread across outsourced contract period for comparison
Gate fees	***£943,739***	***£943,739***	***£927,901***	***£927,901***	***£927,901***	Based on current gate fees
Dry recyclate	£694,814	£694,814	£678,193	£678,193	£678,193	Excludes trade waste
Garden waste	£248,925	£248,925	£249,708	£249,708	£249,708	
Income	***£4,457,489***	***£4,601,236***	***£4,598,613***	***£4,598,613***	***£4,598,613***	
Garden waste subscriptions	£1,495,179	£1,495,179	£1,495,179	£1,495,179	£1,495,179	
Recyclate income	£330,689	£330,689	£341,712	£341,712	£341,712	Recyclate income all to council, contractor won't take risk
Recycling credits	£1,619,913	£1,619,913	£1,606,267	£1,606,267	£1,606,267	
Bulky waste	£67,603	£67,603	£67,603	£67,603	£67,603	
Insurance claims	£8,584	£8,584	£8,584	£8,584	£8,584	
Four Ashes	£60,000	£60,000	£60,000	£60,000	£60,000	Tipping away payments
Stolen bins	£1,320	£1,320	£1,320	£1,320	£1,320	
Other	£11,151	£11,151	£11,151	£11,151	£11,151	Not defined
Total JWS to Lichfield (excl Tamworth recharge)	**£2,048,799**	**£2,372,359**	**£2,315,703**	**£2,328,407**	**£2,168,661**	
Total direct Council cost (excl Tamworth recharge)	£2,048,799	£2,372,359	£2,107,072	£2,328,407	£2,064,345	
Total contractor /LATC cost (for service)			£4,381,258	£4,346,023	£4,276,942	
Adjustment to 'equalise' depot costs to same as Outsourced option	*£98,136*	*£59,336*		*£59,336*		Given that the 'Premises Costs' above for inhouse and LATC(single) do not include rent / capital charges, this assumes that the depot 'rental' costs for inhouse and LATC(single) are the same as for outsourced and LATC (JV), based on a reasonable estimate of commercial prices

5.4 Results and Ranking

The outputs from the SWOT analysis and service delivery options cost model have been combined with the evaluation criteria:

- Cost (50%)
- Flexibility to change (25%)
- Service control (25%)

to score and rank the in-house, LATC (single), LATC (JV) and outsourced service delivery options. In-house without true cost allocation was not included in the ranking. The output from the service delivery evaluation model is as follows:

Table 4: Service delivery options scores

Scoring		In-house (current)	In-house (true costs)	LATC (single)	LATC (JV)	Outsourced	Max score / Min price
Criteria	*Weighting*						
Cost	*50%*	£2,048,799	£2,372,359	£2,328,407	£2,168,661	£2,315,703	£2,168,661
Flexibility to adapt to changes	*25%*		80	100	80	65	128
Control	*25%*		74	63	52	41	92

Table 5: Service delivery options evaluation results

Evaluation		In-house (true costs)	LATC (single)	LATC (JV)	Outsourced
Criteria	*Weighting*				
Cost	*50%*	45.7%	46.6%	50.0%	46.8%
Flexibility to adapt to future service changes	*25%*	15.6%	19.5%	15.6%	12.7%
Control	*25%*	20.1%	17.1%	14.1%	11.1%
Total		**81.4%**	**83.2%**	**79.8%**	**70.7%**
Rank		2	1	3	4

There is little difference in the total evaluation scores for the in-house service with true costs and the LATC (single). LATC (single) ranks ahead of in-house service with true costs, but the scores above could easily change with amendments to the assumptions made on the model input data. The LATC (JV) option has the lowest cost. It should be noted that the true costs for in-house all other LATC options are within 10% of each other, which is considered close to the others given the uncertainty of the modelling assumptions.

The in-house (true costs) and LATC (single) incur a cost of c.£90k for use of the existing depot (based on current arrangements), with LATC (JV) and outsourced options assumed to have a new depot at a cost of

£150k per annum. The current depot arrangements does not include any rental charge to the JWS from Lichfield, so could be considered to be an artificial position. If depot costs for the in-house and LATC (single) options are increased to match the £150k per annum assumption used for outsourcing and LATC (JV) delivery, the scoring and the ranking is as follows:

Table 6: Service delivery option scores – equal depot costs

Scoring		In-house (true costs)	LATC (single)	LATC (JV)	Outsourced	Max score / Min price
Criteria	*Weighting*					
Cost	*50%*	£2,431,695	£2,387,743	£2,168,661	£2,315,703	£2,168,661
Flexibility to adapt to future service changes	*25%*	80	100	80	65	128
Control	*25%*	74	63	52	41	92

Table 7: Service delivery options evaluation results – equal depot costs

Evaluation		In-house (true costs)	LATC (single)	LATC (JV)	Outsourced
Criteria	*Weighting*				
Cost	*50%*	44.6%	45.4%	50.0%	46.8%
Flexibility to adapt to future service changes	*25%*	15.6%	19.5%	15.6%	12.7%
Control	*25%*	20.1%	17.1%	14.1%	11.1%
Total		**80.3%**	**82.1%**	**79.8%**	**70.7%**
Rank		2	1	3	4

The implication of the depot costs does not affect the overall ranking of LATC (single) as the highest scoring option, but it affect the rankings of the service delivery options against the criteria. The scores for in-house and both LATC options are very close. It increases the costs of the in-house and LATC (single) options by c.£60k, making costings for in-house, LATC (single) and outsourced to within 2% of each other. LATC (JV) has the lowest cost under both scenarios (but notably where depot costs are equalised), while outsourced has a lower cost than in-house and LATC (singe) where depot costs are equalised, but these service delivery options do not score so well against others for flexibility and control.

5.5 Conclusions

The outsourced option is ranked last in the evaluation. Given the uncertainty of the application of the national Resource & Waste Strategy and the low ranking, we would not recommend that the Councils outsource the waste collection services based on the above analysis.

The LATC (single) scores highest with and without the depot costs being equalised, although in-house true cost scores within 2-3% (less than £50k) of LATC (single). If the lowest cost option is preferred, then consideration should be given to a LATC (JV).

There could be management advantages to Lichfield trade waste services in setting up a LATC. However, Tamworth's trade waste services were sold to the private sector and agreement would need to be reached between Lichfield and Tamworth Councils if trade waste services are provided through a LATC.

6 Service Change Options

6.1 Introduction

This chapter presents the findings from the service change options modelling which assessed the comparative costs and anticipated performance of the following household waste collection systems. Four options were proposed for modelling, in addition to the Baseline service. These are shown in Table 8. Changes from the Baseline (current service) are highlighted in **blue and bold**.

Table 8: Outline of service change options

Scenario	Collection	Frequency	Capacity (l)
Baseline *Adjusted to assume vehicle purchase*	Residual	Fortnightly	240l wheeled bin
	Dry (Commingled)	Fortnightly	240l wheeled bin
	Food waste	*No separate food collection*	
	Garden waste (charged)	Fortnightly	240l wheeled bin
Service efficiencies	Residual	Fortnightly	240l wheeled bin
	Dry (Commingled)	Fortnightly	240l wheeled bin
	Food waste	*No separate food collection*	
	Garden waste (charged)	Fortnightly	240l wheeled bin
	The collection service configuration will remain the same, however, the following service efficiencies are assessed[16]: - A depot in Tamworth (reducing collection time) - Waste minimisation and education		
Service Change A *As current + food*	Residual	Fortnightly	240l wheeled bin
	Dry (Commingled)	Fortnightly	240l wheeled bin
	Food waste	**Weekly**	**Kitchen caddy and 23l bin**
	Garden waste (charged)	Fortnightly	240l wheeled bin
Service Change B *Reduced capacity residual + food*	**Residual**	Fortnightly	**180l wheeled bin**
	Dry (Commingled)	Fortnightly	240l wheeled bin
	Food waste	**Weekly**	**Kitchen caddy and 23l bin**
	Garden waste (charged)	Fortnightly	240l wheeled bin
Service Change C *Twin stream recycling + restricted residual + food*	**Residual**	Fortnightly	**180l wheeled bin**
	Dry (Twin Stream)	**Alternate 4-weekly**	**240l wheeled bin (paper and card)**
			240l wheeled bin (Plastic, glass, metals)
	Food waste	**Weekly**	**Kitchen caddy and 23l bin**
	Garden waste (charged)	Fortnightly	240l wheeled bin

[16] Initially it was agreed that the assessment would include vehicle acquisition (rather than lease hire) over a period of 8 years. Due to the modelling capabilities within KAT, this has not been appropriate, as summarised in Section 6.3.1.

6.2 Methodology

The Kerbside Analysis Tool (KAT) was used to provide a comparative assessment of cost and operational requirements for the Baseline (current) service and three proposed alternative collection scenarios agreed with the Council.

The three alternative collection scenarios and key assumptions were agreed with the Council in the June Workshop prior to modelling. A KAT data request proforma was originally completed by Council Officers to provide operational detail and costs to facilitate initial modelling of the current service. Further clarifications were provided by officers on request.

Key information gathered via the KAT proforma, included:

- Number and type of vehicles
- Length of working day (averaged for task and finish)
- Number of crew / driver contribution to loading
- Average time taken to drive to key points (e.g. from depot to start of round, from end of round to tip)
- Round size
- Participation and set out (usually an estimate)
- Contamination rate
- Capital costs
- Financing costs
- Driver / loader salary
- Standing costs
- Running costs
- Overheads (management / depot)

What is KAT?

The Kerbside Analysis Tool (KAT) is an Excel-based tool developed by the Waste & Resources Action Programme (WRAP) for the purposes of developing indicative and comparative costs between alternate collection systems. It is a peer reviewed model and the industry standard tool for collection systems.

FRM staff have developed >200 KAT models for some 75 different local authorities to provide comparative costs and performance of alternative collection systems. These have included all of the configurations within this project (options A, B and C set out in Table 8). KAT alone, however, requires further detail to be added to provide 'whole system costs' and to present costs in a format that are appropriate, for example, to align to budgets. FRM have therefore also applied KAT results a more comprehensive costing spreadsheet for these purposes.

The Baseline model is designed to reflect the current service operation, at time of analysis, and are therefore a modelled representation of the service. All cost elements are **annualised**, including existing bins, vehicles etc., with costs presented for a single year that cannot be projected forwards. This approach allows a 'like for like' comparison against alternative collection systems but would not be reflective of the differential capital investment required to install a new system straight away. For the purposes of evaluation, the number of vehicles required to operate a service is presented to one

decimal place, i.e. 5.5 vehicles, to show where subtle changes have been reported. In reality, this would require 6 vehicles. It has also been assumed for the KAT modelling that 2 drivers and 1 loader will operate the residual, recycling and garden systems, based on the 9.25 working day.

The model results for alternative scenarios, where local data is more limited, remain a good comparative indicator of the direction and magnitude of cost and performance change anticipated through service changes, and are based on industry experience or other guidance / models as appropriate. In order to calculate actual costs of an alternative system that takes account of existing infrastructure and vehicles a more bespoke analysis should be undertaken including practical aspects of service implementation (e.g. swapping bins for different elements of the service, transferring/ selling redundant vehicles etc.).

Please note that the costs identified by KAT for each scenario are annualised as noted above and the recycling rates outlined within this section are 'kerbside recycling rates' of the core[17] kerbside service rather than the total recycling rate of the Council[18]. KAT provides results for the current and alternative collection systems for a single year. As discussion, this allows for a 'like for like' comparison but cannot be used to project forwards. The focus of this section is on the collection of the household waste, however the costs of managing the collected waste (e.g. recycling costs / revenues and disposal costs) is reflected in the net 'total system' modelling included in Section 6.5 of this report. The implications of these costs and revenue can alter the least cost / most expensive options overall.

6.3 Service Change Options – Assessment of collection costs

The key assumptions for each of the alternative options are outlined in Appendix C. The options which have been agreed incorporate potential service changes highlighted within the recently published National Resources and Waste Strategy. Some of these changes have recently been consulted on, which include mandatory separate food waste collections and consistent recycling collections. For the purposes of this report, we are assuming that Lichfield will continue to operate a charged garden collection service.

6.3.1 Baseline (current service)

The Baseline KAT model has been compiled from assumptions provided by the Councils. The JWS currently leases vehicles over a period of 6 years and 2 months, to coincide with the end of the MRF contract. At the outset of this process and on selection of the options set out in Table 8, it was assumed that greater efficiencies may be obtained through the Councils purchasing and maintaining the vehicles rather than on a lease hire arrangement. However, the purpose of using the KAT model is to compare the costs for service change, and KAT can only do this through an annualised vehicle cost based on the purchase and depreciation of assets. For this reason, the current 'Baseline' service has been adjusted such that the costs assume vehicles are purchased with a life of 8 years – all service change options are predicated on the same basis and the costs presented are valid for comparison purposes.

[17] This does not include 'niche' elements of the collection service such as bring banks, bulky waste and certain specialist collections such as potentially from flats or clinical waste.

[18] The total Council recycling rate would also include the waste flows from the Household Waste Recycling Centres, Bring Banks and other household waste streams not collected via the standard kerbside collection service. Therefore, for example, if a system in this report shows a +5% uplift in 'kerbside recycling rate', it would be envisaged that this would be a lower uplift in the total Council recycling rate (e.g. it could be +2, + 3 or +4% depending on other factors within the Council).

Table 9: Baseline service

Scenario	Collection	Frequency	Capacity (l)
Baseline *As current*	Residual	Fortnightly	240l wheeled bin
	Dry (Commingled)	Fortnightly	240l wheeled bin
	Food waste	*No separate food collection*	
	Garden waste (charged)	Fortnightly	240l wheeled bin

The Baseline has been modelled as if the current collection service purchased the vehicles over an 8-year period, at a 3% interest rate. This allows each of the alternative options to be comparatively assessed against the 'Baseline' when discussing cost changes. The garden waste collection service has been annualised to allow for the seasonality factor. An average of 3.4 (4 vehicles) has been modelled and is represented hereafter, however it is recognised that the vehicle requirement varies throughout the year.

6.3.2 Service efficiencies

In the assessment of service efficiences, the collection service configuration will remain the same, however, a number of sensitivities have been applied to explore whether efficiencies could be achieved (i.e. a saved vehicle). For this scenario each improvement has been treated in isolation. The following service improvements have been assessed at high level:

- A depot in Tamworth (reducing collection time)
- Waste minimisation and education
  - Residual waste minimisation
  - Impact of a Deposit Return Scheme (DRS) on dry recycling

It is important to note that these considerations have been treated in isolation from the following service change Options A, B and C; the efficiences from the depot location and waste minimisation could be applied to any service change option, or indeed the current service.

Depot location

A suitable location for a depot in Tamworth is unknown at this stage. However, using the capabilities of the KAT model, we have assessed how much shorter drive times would need to be from the present depot (Burntwood), in order to save a vehicle. This is based on information provided to FRM from Lichfield as part of the KAT modelling exercise. From this the Council can then use this shorter drive time to identify potential locations.

Within KAT this was assessed by reducing the time from depot to start of run and the from unloading to depot, in intervals of 5, 10 and 15 minutes. The results of which can be seen in Table 10 below. Garden waste was not included in this assessment due to the seasonality factor.

Table 10: Service efficiency – depot location (drive time)

Scenario	Collection stream	Baseline (25 minutes)	Reduce drive time by 5 minutes (to 20 minutes)	Reduce drive time by 10 minutes (to 15 minutes)	Reduce drive time by 15 minutes (to 5 minutes)
No. of collection vehicles	Residual	6.3	6.3	6.3	6.3
	Dry (Commingled)	6.6	6.4	6.2	6.0

At present, 7 vehicles are required to operate the dry recycling collection service and an additional 7 to operate the residual waste collection service. Modelling a reduction in drive showed that incrementally 0.2 of vehicle could be saved for every 5 minutes saved on the drive time to and from the depot for the dry recycling. For the residual waste, however, changing the drive time has no material impact on the number of vehicles required to operate the service – 7 vehicles would still be required. This indicates that the number of vehicles required for this service is largely driven by the number of households required to collect from amount of waste collected on the rounds.

It is also important to consider the implications of future housing projections and population growth on the collection service. Capacity will be required within these vehicles as the number of houses (and thus serviceable properties) increases, therefore reducing the number of vehicles to below current levels is not likely to result in savings for Lichfield and Tamworth's Joint Waste Service, whereas current vehicle numbers and working patterns allow flexibility for future growth.

Waste Minimisation

Residual waste minimisation

The Councils are interested to see whether, through education and awareness raising, a reduction in residual waste arisings could be achieved. FRM therefore carried out a high-level assessment on the effect that minimisation of residual waste might have on vehicle numbers is presented in Table 11, i.e. by how much would residual waste need to decrease in order to save a vehicle. This sensitivity assumes that there is no change in the dry recycling or garden waste tonnages; the minimisation effect is on the residual waste stream only.

Table 11: Service efficiency - waste minimisation

Scenario	Collection stream	Baseline	-1,000t	-2,000t	-4,000t	-6,000t	-8,000t	-10,000t
No. of collection vehicles	Residual	6.3	6.1	5.9	5.9	5.9	5.9	5.9
	(tonnes)	*34,245*	*33,244*	*32,244*	*30,244*	*28,244*	*26,244*	*24,244*

To assimilate the minimisation of residual waste arisings, the amount of residual waste has been reduced by 1,000 tonne (per annum) increments to find the 'tipping point' (i.e. the point at which a vehicle is saved). It can be seen from the vehicle numbers in Table 11 that the residual collection round is largely driven by the demographics of the Councils, i.e. the number of households that are required to be collected from, the time taken to collect from households and the rurality of the area, rather than the

quantity of waste. Reduced quantities of residual waste (within the range tested) is not likely to result in the need for fewer vehicles, but it does allow some headroom for housing and population growth within the current fleet.

Implications of a Deposit Return Scheme

The National Resources and Waste Strategy published in December 2018 set out aims to overhaul the waste system; the potential introduction of a Deposit Return Scheme (DRS) is one measure being explored via consultation. Therefore, as an additional sensitivity, we modelled the potential implications of introducing a DRS, looking at the impacts it could have on the Council's dry recycling collection. Based on the assumption that England would follow suit in Scotland's decision to implement an 'all in' system (i.e. all drinks containers, for glass, metals and PET plastic drinks containers are in scope. HDPE containers for milk would be out of scope, as would containers smaller than 50ml (i.e. small probiotic bottles) and larger than 3litres).

The following projections have been made on the potential reduction of dry recyclate from the kerbside collections, based on assumptions determined from available data and current research. Data presented by Eunomia's 2017 report[19] suggests figures for the composition of recyclate that is beverage containers. These figures have been applied to the Baseline dry recyclate projections from the business case, alongside high and low diversion rates from kerbside collection to DRS as follows:

- High – 85%[20] of beverage container material being diverted from kerbside to DRS
- Low – 50% of beverage container material being diverted from kerbside to DRS

For this sensitivity we modelled the 'high' and 'low' projections. Table 12 shows that in the medium projection, although there would be a decrease of approximately 2,400 tonnes, 7 vehicles would still be required to operate the dry recycling collection service. In the 'high' projection however, one vehicle could be potentially saved, although impacts of housing projections are not taken into account here.

Table 12: Implications of DRS – vehicle numbers

Scenario	Collection stream	Baseline	Medium Projections	High Projections
No. of collection vehicles	Dry (Commingled)	6.6	6.3	5.9
	(tonnes)	*18,682*	*16,310*	*14,648*

6.3.3 Service Change Option A – Food waste collection

Option A considers the current collection service but with the addition of a weekly food waste collection service - each household being provided with a small kitchen caddy and a 23-litre bin. The food waste would be collected in 7.5t specialist food waste collection vehicles.

[19] Impacts of a Deposit Refund System for One-way Beverage Packaging on Local Authority Waste Services, Eunomia 2017

[20] The core assumption in the DRS consultation is for a return rate of 85% of in scope containers. Note that this assumes some of the containers not currently collected for recycling will be captured, hence this is the 'high' projection.

Table 13: Option A – Food waste collection

Scenario	Collection	Frequency	Capacity (l)
Option A *As current + food*	Residual	Fortnightly	240l wheeled bin
	Dry (Commingled)	Fortnightly	240l wheeled bin
	Food waste	Weekly	Kitchen caddy and 23l bin
	Garden waste (charged)	Fortnightly	240l wheeled bin

The WRAP ready reckoner for food waste yields was applied to calculate the total tonnage of food waste collected. The ready reckoner formula is based on indices of deprivation and is the most accurate data set available to estimate projected food waste tonnages. Calculations are outlined in Appendix C. For this option we assumed a 'low yield' of 4,888 tonnes per annum (an average of 1.21kg/hh/week)[21]. Based on evidence from WRAP food waste collection trials, a set out rate of 45% and a participation rate of 55% was applied. The food waste yields calculated by the WRAP ready reckoner have been cross-checked against residual waste compositional analysis data provided by Lichfield to ensure that there is sufficient food waste in the residual mix available.

The implementation of a separate food waste collection increases the 'kerbside' recycling performance from 45% to 53% as food waste is being diverted from the residual waste stream and is sent for either digestion or specialist composting. The estimated food waste yield is a factor of the residual waste capacity and socio-demographics of the authority.

For caddy liners, we have assumed a cost of 5p per liner and that each household would be provided with 2 liners a week, a total of 104 liners per year. This equates to a cost of £5.20 per household per year, a total cost of £398,300 for the year across all alternative options. This figure is included within the total collection cost reported.

In this option, it is assumed that the recycling and residual waste collection systems will operate as per the current service. There is no modelled change to the number of vehicles and collection crew required for the dry recycling or garden service. However, the number of residual waste vehicle reduces by 1, to 6. This is due to a lower residual tonnage collected as a result of the food waste collection.

Table 14: Option A - Vehicle and collection crew numbers

Collection	*Baseline*	Option A		
	No. of vehicles	No. of vehicles	No. drivers	No. loaders
Recycling	*6.6*	6.6	14	7
Garden	*3.4*	3.4	8	4
Food	-	7.1	8	8
Residual	*6.3*	5.9	12	6

[21] Research from WRAP indicates that Local Authorities introducing a food waste collection service are most likely to achieve yields equivalent to that of a 'low yield' except where restrictions are made on the residual collection stream.

As outlined in Table 14 the implementation of a dedicated food waste collection will result in the requirement of a minimum of 8 dedicated 7.5t vehicles, which will require 8 drivers, and 8 loaders[22]. There is a saving of one residual vehicle (6). This is an overall increase of 7 vehicles.[23]

Note that the KAT model does not take into account any future projected household growth in the area or the impact that would have on the waste collection service. Additionally, the Councils believe that a reduction in residual waste vehicles (from 7 to 6) would be operationally challenging, and therefore unlikely to be realised in practice. As such, in the costs presented below it is assumed that 7 residual vehicles will be needed to operate the residual waste service. Full cost implications are presented in Section 6.5.

6.3.4 Service Change Option B – Food waste collection & reduced residual waste capacity

Option B models the same collection service as Option A, however the bin capacity of the residual waste stream has been reduced from 240-litre wheeled bin to a 180-litre wheeled bin. The collection frequency of the residual is assumed to remain fortnightly.

Table 15: Option B – Food waste collection & reduced residual waste capacity

Scenario	Collection	Frequency	Capacity (l)
Option B *Reduced capacity residual + food*	Residual	Fortnightly	180l wheeled bin
	Dry (Commingled)	Fortnightly	240l wheeled bin
	Food waste	Weekly	Kitchen caddy and 23l bin
	Garden waste (charged)	Fortnightly	240l wheeled bin

Due to the residual waste capacity restriction, a 5% increase was applied to the set out and capture rate from the Baseline for the dry recycling stream. An increase of 5% was applied in terms of participation (97%), as the current participation rate for Lichfield is already particularly high (92%).

As for Option A, food waste is separately collected once a week, and it assumed that the garden waste collection service will remain as per the Baseline. However, due to the residual waste capacity restriction, a 'low-medium' yield for food waste of 5,685 tonnes per annum (an average of 1.41kg/hh/week) was assumed as per the WRAP ready reckoner. The rationale being that residents will be incentivised to participate in the food waste collection due to limited space within the residual waste bin.

When compared to Option A, there appears to be no further decrease in the number of vehicles required to collect residual waste, however, there is a slight increase in the amount of food waste vehicles required (from 7.1 to 7.7 vehicles). This is no material increase from Option A (as at least 8 vehicles would be required in both options) however it does demonstrate that the vehicles are filled more on each collection. Operationally, a minimum of 8 food waste vehicles are required through the

[22] We have assumed that the driver of the food waste collection vehicle will contribute 50% of their time to collection i.e. the number of food waste loaders is 1.5.
[23] Excluding spares vehicles

KAT model, however, in practice it may be found that additional vehicles are required. The 'kerbside' recycling rate increases from 45% in the Baseline to 55% in this Option. Overall, the vehicle requirement for Option B is the same as Option A, an increase of 7 from the Baseline for the food waste service.

Table 16: Option B – Vehicle and collection crew numbers

Collection	*Baseline*	*Option A*	Option B		
	No. vehicles	*No. vehicles*	No. vehicles	No. drivers	No. loaders
Recycling	*6.6*	*6.6*	6.6	14	7
Garden	*3.4*	*3.4*	3.4	8	4
Food	-	*7.1*	7.7	8	8
Residual	*6.3*	*5.9*	5.9	12	6

An alternative approach to restricting residual waste, improve recycling and save cost is three weekly residual waste collection. This would give similar recycling rates to the above but could save the cost of between 1 and 2 vehicles (c.£25,000 annualised capital cost of vehicles per annum) and no additional wheeled bins would need to be procured. A total of approximately £100k per year could potentially be saved on total collection costs, however there would be no additional capacity in the residual waste vehicles to allow for household growth.

Option B was therefore modelled as a restricted bin capacity fortnightly collection. It is also suggested that, in terms of collection logistics and ease for householders, it may be better suited when considering Option C, where the dry recycling moves to an alternate four-weekly collection. Householders would then be required to continue presenting residual fortnightly, alternating between the dry recycling bins.

As with Option A, although the KAT modelling identifies a potential theoretical saving in residual waste vehicles, the extent to which a vehicle may be saved is marginal. Therefore, for cost purposes it is assumed that 7 residual vehicles (as at present) will be operated, requiring 14 drivers and 7 loaders.

6.3.5 Service Change Option C – Food waste collection, restricted residual & twin stream recycling

Option C models an alternate 4-weekly collection for dry recycling. It is modelled to operate over an alternating fortnightly dry recycling stream. This means that recycling is collected every fortnight, alternating between a paper and card collection, and a comingled collection of plastics, glass and metals; i.e. paper and card is collected on week 2 and plastic, glass and metals are collected on week 4. For each dry recycling stream, a 240-litre wheeled bin has been modelled. As for Option B, food waste is collected weekly, and residual waste is collected in a 180-litre wheeled bin.

Table 17: Option C – Food waste, reduced residual waste capacity, twin stream recycling

Scenario	Collection	Frequency	Capacity (l)
Option C *Twin stream recycling + restricted residual + food*	Residual	Fortnightly	180l wheeled bin
	Dry (Twin Stream)	Alternate 4-weekly	240l wheeled bin (paper and card)
			240l wheeled bin (Plastic, glass, metals)
	Food waste	Weekly	Kitchen caddy and 23l bin
	Garden waste (charged)	Fortnightly	240l wheeled bin

No further increase was applied to the dry recycling participation rate or capture rate (see Option B), however the contamination rate was reduced from the current rate of 13% to 5% (KAT default for twin-stream). It is widely assumed that when provided with the opportunity to sort recycling at the kerbside, householders will generally sort their recycling with better efficiency, reducing the amount of non-target material entering the recycling system. For this reason, there is a slight increase in residual waste tonnage as some of the previous dry recycling 'contamination' material moves to this stream. For this same reason a slight increase in the food waste collection a 'medium' yield of 6,482 tonnes per annum has been assumed (approximately 1.61kg/hh/week).

The 'kerbside' recycling rate for Option C is modelled at 56% (an increase of 11% on the current service).

Option C requires the most number of vehicles of all the options considered. As outlined in Table 18, should Lichfield achieve the assumed food waste yield, 9 food waste vehicles would be required. Six vehicles would be required to collect the paper and card recycling, and 7 would be required to collect the remaining co-mingled fraction. It has been assumed that the RCVs would operate both recycling services, therefore no additional vehicles would be required to operate this service compared to the Baseline. As with Options A and B, a reduction in residual waste means that one vehicle could theoretically be saved here (reducing to 6 vehicles). Overall, however a total of at least 26 vehicles are required to operate the service. This is an increase of 8 from the current service.

As with Options A and B, although the KAT modelling identifies a potential saving in residual waste vehicles, the extent to which a vehicle may be saved is marginal. Therefore, for cost purposes it is assumed that 7 residual vehicles (as at present) will be operated, requiring 14 drivers and 7 loaders.

Table 18: Option C – Vehicle and collection crew numbers

Collection	*Baseline*	*Option A*	*Option B*	Option C		
	No. vehicles	*No. vehicles*	*No. vehicles*	No. vehicles	No. drivers	No. loaders
Recycling (paper and card)	*6.6*	*6.6*	*6.6*	5.2	14	7
Recycling (plastic, glass and metal)				6.8		
Garden	*3.4*	*3.4*	*3.4*	3.4	8	4
Food	-	*7.1*	*7.7*	8.7	9	9
Residual	*6.3*	*5.9*	*5.9*	5.9	12	6

6.3.6 Total Collection Costs

This section presents the total **collection costs** of each Option, when compared to the Baseline. As shown below in Table 19, the operating costs include the vehicle capital costs, vehicle operating costs (labour, vehicle standing and vehicle running costs). Collection costs also include the capital costs for containers and overheads (assumed at 12% of operating costs). Table 20 shows how the collection costs are split across each collection stream (residual, dry recycling, garden and food). Total system costs (including gate fees and income streams) are considered in Section 6.5.

The differences in collection costs for all options compared to the adjusted Baseline is summarised in Table 19, Table 20 and are included in detail in Appendix C. The implementation of a separate food waste collection has the most pronounced impact on the total collection costs, when compared to the Baseline. It should be noted that the cost of providing caddy liners to each household for the collection of food waste is not insignificant, at an additional c.£400,000 per annum. In all cases, it has been assumed that there will be no reduction in residual waste vehicle numbers and crew.

Table 19: Total operating costs – variance from Baseline

Annual Collection Costs	**Difference from Baseline**		
	Option A	**Option B**	**Option C**
Vehicle operating costs (labour, vehicle standing, vehicle running and fuel)	£496,000	£523,000	£583,000
Vehicle capital costs	£105,000	£105,000	£118,000
Container Costs	£89,000	£89,000	£308,000
Overheads (supervision)	£60,000	£63,000	£70,000
Cost of liners (annual)	£398,000	£398,000	£398,000
Difference to adjusted Baseline	**£1,148,000**	**£1,177,000**	**£1,477,000**

Option C has the highest increased collection from the Baseline. This is due mainly to the introduction of a two-stream dry recycling system, and the initial investment of 240 litre wheeled bins for each participating household. Vehicle capital costs can be minimised if the vehicles can be shared on the dry

recycling service in Option C, as has been assumed. It important to note that the vehicle capital costs would be significantly higher if vehicles cannot be shared. Note, a negative number indicates a saving compared to the Baseline, whereas a positive indicates an increased cost compared to the Baseline.

Table 20: Total collection cost: by collection stream – variance from Baseline

Cost item	Difference from Baseline		
	Option A	Option B	Option C
Annualised recycling collection cost	£0	£0	£218,000
Annualised organics (garden waste) collection cost	£0	£0	£0
Annualised food waste collection costs	£749,000	£779,000	£861,000
Annual cost of providing food caddy liners	£398,000	£398,000	£398,000
Annualised residual collection costs	£0	£0	£0
Total gross collection cost difference	**£1,148,000**	**£1,177,000**	**£1,477,000**
Kerbside recycling rate[24]	53%	55%	56%

Table 20 shows that for all Options there is an additional collection cost to JWS. The introduction of a separate food waste collection service, using the modelled assumptions, is estimated to cost Lichfield at least c.£750,000 per year more than the current service, plus the cost of caddy liner provision. There could be some saving of c.£260,000 from residual waste collection by reducing the number of residual waste vehicles from 7 to 6. However, it not deemed likely that this saving can be achieved operationally, therefore there are no savings associated with the residual waste stream across any of the Options. The main differential between Option A and B is due to slightly increased operating and overheads associated with the higher food waste yield.

Option C has the highest gross collection cost of all the alternative service change options modelled. This is partly due to the greater number of vehicles required to collect food waste, but also the purchase of new 240litre wheeled bins for the two-stream recycling stream. Implementing a two-stream collection service will incur an additional recycling collection cost of approximately £218,000. It is assumed that the vehicles and staff will be shared across the two recycling streams. If separate vehicles were required to collect the two-stream dry recycling, the collection cost for Option C would be considerably higher.

6.4 Gate Fee and Net Income

To understand the annual whole system cost implications of service change options, the potential income revenue and gate fee costs compared to the Baseline are shown in Table 21. A negative number indicates a saving compared to the Baseline, whereas a positive indicates an increased cost compared to the Baseline. The annual costs presented below were calculated by applying financial information provided by Lichfield, supplemented by industry published data on material prices and gate fees. Full assumptions are provided in Appendix C.

[24] Note that this is not the total Local Authority Recycling rate which also includes the performance of Bring Banks, the HWRCs and other collection activity, but is purely the performance of the main collection systems from households

Table 21: Gate fee and income – variation from Baseline

	Revenue assumption (£/t)	Option A	Option B	Option C
Gate fees and income, comprising:		£127,000	£164,500	-£225,000
Dry Recycling[25], of which:		*£0*	*£16,500*	*-£394,000*
Paper: Mixed papers domestic	*-£21.33*			*-£151,000*
Non-corrugated card	*-£50.76*			*-£97,000*
Co-mingled DMR[26]	*£18.00*		*£16,500*	*-£146,000[27]*
Garden Waste Composting	*£21.06*	*£0*	*£0*	*£0*
Food Waste Treatment[28]	*£26.00*	*£127,000*	*£148,000*	*£169,000*
Revenue from garden waste subscription[29]		£0	£0	£0
Recycling Credits (dry)	-£53.24	£0	-£49,000	-£49,000
Recycling Credits (organic)	-£51.58	-£252,000	-£293,000	-£334,000
Net Cost (difference from Baseline)		**-£125,000**	**-£178,000**	**-£609,000**

All options are expected to generate net income compared to the Baseline, due to the value of the recycling credit and recyclate income. Option C is expected to generate the highest net income compared to the Baseline. This saving is largely dependent on the JWS securing market prices for fibre that are similar to industry published averages (c.£21/tonne for paper, c.£50/tonne for cardboard). It can also be seen from these figures that the additional recycling credits more than offset the gate fees for food waste; the same applies to additional dry recycling. The sensitivity of these figures is tested in 6.5.1. In addition, for Option C, the lower amount of co-mingled recyclate sent to the MRF results in a saving of £146k compared to the Baseline.

[25] Average Let's Recycle Material Price (Jan-May 2019) minus 10% to account for smaller buying power

[26] WRAP (2018) MRF Gate Fee Report

[27] This is not a revenue. Note that there is still a cost of sending the co-mingled DMR to be recycling. However, as there is less DMR on the basis of separating the paper and card, JWS will save approximately £146,000.

[28] WRAP (2018) MRF Gate Fee Report

[29] Assumed no change to garden waste service or subscription throughout

6.5 Whole System Costs

A comparison of the whole system costs for delivering the service changes in Options A, B and C are summarised in Table 22. These figures include the additional cost of collection as well as the net income associated with recycling credits, recycling revenue, and gate fees. The variation in gate fees for residual waste has not been included as this is paid by the County; it has also been assumed that there is no change in the performance or cost of the current garden waste collection.

Table 22: Whole system cost – variation from Baseline

	Option A	Option B	Option C
Collection Cost difference	£1,148,000	£1,177,000	£1,477,000
Net gate fee / income difference	-£125,000	-£178,000	-£609,000
Whole System Cost difference	**£1,023,000**	**£999,000**	**£868,000**

These results show that when the cost of treatment and potential income is taken into account, although Option C has the highest increase in collection costs, it results in the lowest increase from the Baseline. As demonstrated in Table 21, this is driven by an income of c.£250,000 for the separately collected paper and card fraction, and recycling credits for food waste. It is recommended that further research is undertaken to ensure similar gate fees could be secured should the JWS consider a two-stream dry recycling system.

Similarly, Option B has a higher collection cost when compared to Option A, however, the increased income from recycling credits for the greater amount of food waste and dry recycling outweighs the additional collection costs.

6.5.1 Sensitivity analysis

Sensitivity analysis on the whole system costs presented in Table 22 have been undertaken to demonstrate the sensitivity of factors on the preferred alternative option. Notable sensitivities include:

- Recycling credits
- MRF gate fee / recycling income
- Moving from 2 drivers + 1 loader, to 1 driver + 2 loaders

The gate fees for AD treatment of food waste are well-established and therefore no sensitivity analysis has been undertaken on this.

<u>Recycling Credits</u>

The Councils currently receive recycling credits for the co-mingled dry recycling and garden waste collected by the JWS. Increasingly, Waste Disposal Authorities are removing the incentive of recycling credit payments to Waste Collection Authorities due to austerity measures and budget cuts. A sensitivity analysis has been carried out to explore the potential impact on the total costs of the options compared to the Baseline should the recycling credits be withdrawn. It should be noted that the Baseline figures have also had recycling credits removed, so a direct comparison between the options and the Baseline is possible.

Table 23. Sensitivity Analysis: removal of recycling credits – variance from Baseline

Whole System (without recycling credits) Difference			
	Option A	Option B	Option C
Difference from Baseline	£1,275,000	£1,341,00	£1,251,000

Option C is still the most cost-effective option of the service change options modelled, however the whole system costs have increased by £380,000 to reflect the value of the recycling credits withdrawn. Without recycling credits, Option B incurs the highest additional cost compared to the Baseline.

MRF Gate Fee / Recycling Income

Recent procurement exercises suggest that an upward trend in the costs for sorting dry mixed recycling can be expected. The Councils currently have competitive gate fees for dry recyclables though the contract with Biffa at the Aldridge MRF to 2022 (approximate £18/t net gate fee). Therefore, a sensitivity analysis on the co-mingled MRF gate fee and income from separately collected fibre was undertaken. In this sensitivity, the co-mingled MRF gate fee is increased by 100% (doubled) and the market value of separately collected fibre is reduced by 50%. It should be noted that the Baseline figures have also had the MRF gate fee increased, so a direct comparison between the options and the Baseline is possible.

Table 24: Sensitivity Analysis: MRF gate fees – variance from Baseline

	Income / cost per tonne (£/t)	Option A	Option B	Option C
Gate Fees and income, comprising		£127,000	£181,000	-£248,000
Dry Recycling[30], of which:		*£0*	*£33,000*	*-£415,000*
Paper: Mixed papers domestic	***-£10.67***			*-£76,000*
Non-corrugated card	***-£25.38***			*-£48,000*
Co-mingled DMR[31]	***£36.00***		*£33,000*	*-£291,000*
Garden Waste Composting	*£21.06*	*£0*	*£0*	*£0*
Food Waste Treatment[32]	*£26.00*	*£127,000*	*£148,000*	*£167,000*
Revenue from garden waste subscription[33]		£0	£0	£0
Recycling Credits (dry)	-£53.24	£0	-£49,000	-£49,000
Recycling Credits (organic)	-£51.58	-£252,000	-£293,000	-£334,000
Net Cost (difference from Baseline)		**-£125,000**	**-£161,000**	**-£630,000**
Annual gross collection costs (difference from Baseline)		£1,148,000	£1,177,000	£1,477,000

[30] Average Let's Recycle Material Price (Jan-May 2019) minus 10% to account for smaller buying power

[31] WRAP (2018) MRF Gate Fee Report

[32] WRAP (2018) MRF Gate Fee Report

[33] Assumed no change to garden waste service or subscription throughout

Whole System Cost (difference from Baseline)		**£1,023,000**	**£1,016,000**	**£847,000**

Table 24 shows that if the co-mingled MRF gate fee is increased to £36 (doubled), the overall net cost (income) difference for Option B increases by c.£17,000, but still higher than the Baseline by c.£161,000. In Option C, however, the net cost (income) difference increases by c.£19,000. This is primarily driven by the high proportion of paper and card in Lichfield recycling composition and reduction in tonnage collected as co-mingled DMR. Therefore, although they will receive less income for the paper and card fraction (reduced by 50%), the lower amount of co-mingled recyclate sent to the MRF results in a saving of c.£291,000 compared to the Baseline for MRF gate fees – this figure is twice that under the standard assumption at the current gate fee.

Changing from 2 drivers + 1 loader to 1 driver + 2 loaders

Currently the service is delivered with a crew arrangement of two drivers and one loader. Savings could be made on the staffing costs if the crew configuration was reduced to one driver and two loaders, as set out in Table 25.

Table 25: Sensitivity analysis: Comparison of driver numbers – variance from Baseline only

		Reduction to 1 Driver + 2 loaders
Annual vehicle operating costs	Dry recycling	-£15,500
	Dry recycling	-
	Garden waste	-£8,900
	Food waste	-
	Refuse	-£15,500
Annual overheads	Dry recycling	-£1,900
	Dry recycling	-
	Garden waste	-£1,100
	Food waste	-
	Refuse	-£1,900
Annual gross collection cost	**Dry recycling**	**-£17,400**
	Dry recycling	**-**
	Garden waste	**-£9,900**
	Food waste	**-**
	Refuse	**-£17,400**
	Total	**-£44,700**

It can be seen that changing the vehicle crew configuration from two drivers and one loader to one driver and two loaders has the potential to save almost £45k per year in staffing costs. The Council

would need to consider the health and safety implications of this, taking into account the long working day.

6.5.2 Garden waste collection

In each of the options presented it is assumed that the garden waste collection service remains the same. At present, the Councils operate a subscription-based collection service which collects over approximately 50 weeks of the year. So far, the Councils have received good levels of interest in the service, with a comparatively good percentage (approx. 52%) of households subscribed to the service.

However, when assessing opportunities for efficiencies, it may be appropriate for the Councils to consider reducing the operational weeks of the service. It is quite common for Local Authorities across the UK to shorten the collection period for garden collection (to approx. 36 weeks per year) as seasonality can have a pronounced impact on the amount of garden/organic waste presented at the kerbside during the winter months. Approximate savings are difficult to determine without a more detailed understanding of the impact that reducing the collection weeks would have on the garden waste tonnage.

Additionally, the Council could consider increasing the annual charge for the subscription-based service. However, although there would be an increase in the income from the subscribed households, this could have the effect of reducing the number of households subscribing to the service which would reduce the income from the service

6.6 Recycling rate

Table 26 below illustrates the total tonnages collected across each service change option, and the corresponding recycling rate. Option C results in the highest recycling rate, this is because the residual waste capacity has been restricted from 120 litre a week to 90 litre a week (equivalent to 180litre wheeled bin collected fortnightly). This is expected to increase the capture of dry recyclables and food waste; the total amount of waste sent for recycling (including food and organics) increases from 30,600 tonnes in the current service to 38,000 tonnes in Option C.

Table 26: Kerbside tonnages and recycling rate

Tonnes	Baseline (Adjusted)	Option A	Option B	Option C
Total Dry Recycling	18,700	18,700	19,600	19,600
Total Garden	11,900	11,900	11,900	11,900
Total Food	0	4,900	5,700	6,500
Total Contamination	2,500	2,700	2,900	1,400
Total Residual	34,000	29,000	27,000	28,000
Total	**67,300**	**67,300**	**67,300**	**67,300**

Kerbside Dry Recycling Rate	28%	28%	29%	29%
Kerbside Recycling Rate	45%	53%	55%	56%

6.7 Summary of Service Change Options

The summary table below (Table 27) shows a comparison of the results across all options. All service change options have a greater total cost than the Baseline. This is mainly due to the introduction of a dedicated food waste collection in all options. It should be noted that while the figures presented include an uplift on management and supervision costs, there may be some additional costs associated with all options for further support in the roll-out of new collection arrangements.

There are other areas where costs could potentially be reduced:

- Bin presentation at the property curtilage (kerbside). This is common practice in other local authority areas, however we understand that this in not a option that Members currently wish to pursue;
- Other shared services, e.g. street cleansing and grounds maintenance. There are localised services and the savings from shared services is not likely to be significant.

Table 27: Whole System Costs – variance from Baseline

Difference from Baseline	Option A (Current service + food)	Option B (Current service + food + restricted residual)	Option C (A4WC + food, +restricted residual)
Annual gross collection costs	**£749,000**	**£779,000**	**£1,079,000**
Annual cost of food caddy liners	£398,000	£398,000	£398,000
Gate Fees for recycling	£0	£20,000	-£426,000
Garden Waste Treatment	£0	£0	£0
Garden waste Income	£0	£0	£0
Food Waste Treatment	£127,000	£148,000	£169,000
Recycling Credits (dry)	£0	-£49,000	-£49,000
Recycling Credits (organic)	-£252,000	-£293,000	-£334,000
Whole System Cost (difference from Baseline)	**£1,023,000**	**£999,000**	**£868,000**

Whole System Cost – Sensitivities			
No recycling credits	£1,274,000	£1,341,000	£1,251,000
MRF gate fee sensitivity	£1,023,000	£1,016,000	£847,000

The Baseline has the lowest net collection cost. This is because at present the JWS does not collect food waste.

The service efficiency analysis shows that there is limited potential to reduce costs through vehicle numbers as a result of the depot location or waste minimisation activities. However, reducing residual waste arisings does increase the flexibility of the existing fleet to cope with growth due to households.

Option A is most expensive relative to the Baseline. It also has the lowest recycling rate of the service change options. While Option A has the lowest collection cost increase of the alternative options, as a result of the recycling capture rate and lower food waste yield, the amount of recycling credits received is the lowest, outweighing the savings made on collection of residual waste.

Option B has the second highest cost when compared to the Baseline. Slightly higher recycling credits are achieved than in Option A due to the higher recycling capture and low-medium food waste yield. However, as the dry recycling material is collected co-mingled the gate fee for treating the recycling is higher than for Option C where increased recyclate income is assumed.

Operating a two-stream dry recycling system with weekly food (Option C) results in the highest recycling rate of the Options. In this option, the levels of contamination are also lowest (see Table 26). This is because it is generally assumed that as householders are provided with more choice as to which bin they place their recycling, they become more efficient at recycling the target materials.

Option C has the lowest whole system cost of all the alternative collection options. Although there is an increase in gross collection costs, the increased diversion from the residual waste and material revenue gained from a separate paper and card system and recycling credits offsets this to become the most cost-effective option (although still at increased cost compared to the Baseline). Material income revenue of £248,000 is assumed based on the high proportion of paper and card found within JWS current recycling composition.

Sensitivity analysis has shown that the JWS could incur significant cost increases should the recycling credits be withdrawn, or the MRF gate fees continue to rise. However, Option C still has the lowest whole system costs of the service change options considered once these have been taken into account.

7 Summary and Conclusions

7.1 Council challenges

The Councils identified the following challenges at the start of this waste collection services delivery study. FRM's consideration to these waste collection services challenges are given below:

Implementation of the Resource and Waste Strategy for England (the Strategy)

There were four Strategy consultation documents. The main changes to Councils' waste collection services will result from "Consultation on consistency in household and business recycling collections in England". This will:

- Provide consistent collection of six dry recyclable materials. The vast majority of these recyclables are currently collected by the Councils, and there should be no additional collection cost to the Councils in providing consistent co-mingled dry recyclables collection. There will be additional cost the Council from the expiry of its Biffa Aldridge MRF processing contract in 2022 resulting from:
  - Net increase in recyclable materials processing cost and reduction is overseas demand (sales price) against the current Biffa contract. This is beyond the scope of the current study; and
  - The need to keep fibre (paper and cardboard) separate from glass. The options of separate fibre and glass collection has been costed in this study.
- Require food waste collection by the end of 2023. The cost for household food waste collection to the Councils has been assessed;
- Potentially provide household garden waste to be collected free. The cost of free garden waste collection to the Councils has not been assessed in this study, as the Councils have only recently moved to a charged service in the last few years so already have a good understanding of the implications of it reverting to a 'free' service.

Defra also has Strategy consultation documents on "Consultation of reforming the UK packaging producer responsibility system" (i.e. Extended Producer Responsibility (EPR) for packaging), and Introducing a Deposit Return Scheme (DRS) in England, Wales and Northern Ireland. HM Treasury has Strategy consultation documents on "Plastic packaging tax". The EPR scheme should result in the Councils receiving income for the collection of dry recyclable wastes. However, the amount and payment method for this income is uncertain. The implications of the DRS and plastic tax on waste arising and Councils income is uncertain.

MRF considerations

- The Joint Councils' contracted cost for Materials Recovery Facility (MRF) processing of co-mingled collected recyclate. This is beyond the scope of this study and should be separately assessed.
- The Chinese and Malaysian ban on dry recyclable imports with enhanced contamination thresholds. This is a challenge to be addressed with the re-procurement of a MRF contract in 2022. The Councils already have low contamination levels and this will be reduced by separating fibre from mixed dry recyclables.

Workforce issues

- The reduction in bin collection productivity resulting from fixed hour working replacing task and finish in 2013. Waste collection is trialling task and finish and productivity of bin collection has significantly improved to the national average (i.e. 1,425 bins for 9.25 hour working day urban collections).
- The national shortage of qualified LGV Category 2 drivers for refuse collection vehicles at the Joint Councils pay rates. This will not be addressed until the Councils pay a competitive wage for drivers (+£25k against the £21k paid). The Council could save costs by having a single driver per RCV (there are two drivers per RCV at present) and paying them an industry average wage. There is the issue that two drivers on a RCV work five 9.25 hour days and changing driver practice would need to be negotiated with the Unions.
- The lack of pay differential in the current job grading structure. This is acting as a barrier to recruiting Team Leaders. The Council should pay industry rates to attract and retains staff.
- The heavy reliance on agency support because of difficulties in recruiting staff and a high sickness level. The over-reliance on agency staff can cause service delivery problems and results in higher costs. The in-house service delivery option has a higher employee cost due to the high percentage of agency staff. The Councils would lose the agency cost risk under a LATC delivery option.
- The lack of Officer resource in Lichfield to develop trade waste services, in the context of a greater commercial aspiration. This is subject to a separate trade waste study.
- The permanent use of Saturday working over the Christmas period to catch up would need to be agreed with the Unions.
- Missed bins over Christmas should be electronically recorded but the collection manager should be able to decide whether to follow up on or not. If it is an individual bin then a decision can be made not to follow up, but if it is a number of houses together along a length of street then it should be followed up.

Other issues

- The location and lack of future capacity of the Burntwood depot. The cost implications of the location of the Burntwood depot are assesses in above service change options.
- Future demand on the services from permitted housing developments. Tasks and finish allows greater flexibility for permitted housing development. The Councils also have a tool for round balancing which is helping to allocate permitted housing development to existing rounds. We understand however that the Councils have started another round for permitted housing development; and
- Transport management of the 23 waste vehicles. 95% of JWS HGVs are RCVs yet they are managed by Transport Services and not Waste Services. We would comment that most local authorities transport services departments are a separate function to waste management. Transport Services lease the vehicles to Waste Services either directly or through their arms-length service partner such as SFS, Go Plant etc. The waste collection vehicles are covered on the transport/fleet managers 'O' licence. This has been the normal practice for local authorities since the DSO days. The disadvantage to Waste Services operating the vehicles directly would be

that they would have to include maintenance and depreciation costs for vehicles directly owned by waste services from their current budgets. If Waste Services also operated the vehicles directly, they would have to apply for a separate 'O' licence and have a separate transport manager to manage these vehicles. Waste Services could always sub-contract maintenance back to transport at a fixed hourly, daily or weekly rate.

The brief for the fundamental waste collection services review stated that it needed to consider the above, and in particular assess:

- How the current operational and financial performance of the service compare when measured against similar sized authorities using a similar in-house delivery model – this has been detailed in the Services Benchmarking report;
- How the current operational and financial performance of the service compares when measured against similar sized authorities operating using alternative delivery models e.g. wider shared services e.g. street cleansing; arms' length trading company (i.e. Teckal company); and out-sourced services – this has been detailed in the Services Benchmarking report;
- The main explanations for differences between the Council's existing performance and the benchmarking findings – this has been detailed in the Services Benchmarking report;
- Options for improvements in service delivery and the optimal delivery option for the Council – this is studied in the service delivery options and service change assessments in this report;
- The key steps and timescales in adopting the optimal delivery model – commented upon below (see Section 7.2.3);
- The estimated financial implications of adopting the recommended delivery model, which may be remaining in-house and improving, both in terms of one-off costs and ongoing revenue implications – commented upon below (see Section 7.2.3); and
- The likely impact on the customer experience of the recommended delivery model – commented upon below (see Section 7.2.3).

7.2 Summary of potential changes

7.2.1 Service delivery options

The conclusions of the delivery options cost and SWOT evaluation is that the LATC (JV) gives a marginally lowest cost for the delivery of a comparable service, however, the differences between the costs of all options is very close, and certainly within the levels of uncertainty of the modelling assumptions. Taking the other criteria of flexibility and control into account alongside cost, the highest-ranking option is LATC (single), closely followed by in-house where the true costs are represented.

To put the level of cost assumptions into context, if the cost of the LATC (single) option were to increase by c. £50k, this could shift the evaluation results to in-house service at true cost being the highest ranking option (assuming no change to the flexibility and control scoring).

Under the current arrangements, Lichfield does not charge any rent to the JWS for the use of the depot, and it is assumed that this would also continue under a LATC (single) delivery. This could be considered to be an artificial position, so comparison of the costs and overall evaluation has also been undertaken whereby the in-house and LATC (single) options incur the same depot charges as for the outsourced and

LATC (JV) options. Under this equalisation of the depot costs across all options, there is no change to the top ranking of LATC (single), and LATC (JV) continues to have a lower total cost.

Based on the appraisal of service delivery options, the evaluation of in-house service at true cost and LATC (single) come close, so we do not consider there to be any advantage to the Council in setting up a LATC for the delivery of the Joint Waste Service at this stage.

7.2.2 Service change options

The service change options considered are expected to increase the current cost to the JWS. Such changes are likely to be driven by legislation and national policy, and it is understood that local authorities would be compensated for additional costs should service changes be mandated.

Of the three service change options considered, the arrangement of weekly food waste collections, two-stream dry recycling and reduced residual waste capacity has the lowest additional service cost, but still amounting to c.£900k-£1m over and above current service costs. Introducing food waste collections will require additional vehicles, and the current depot may not be sufficient to house the additional vehicles as well as car parking for additional crew.

Some flexibility in vehicle numbers (and hence the cost of collection) to allow for growth could emerge through waste minimisation efforts or through a lower drive time (depot location), but such changes are not expected to have a noticeable effect on the vehicle numbers required.

7.2.3 Effect of changes

Key steps and timescales

If the Councils select a LATC option (JV) in December, then it is recommended to obtain a detailed cost proposal from the Norse Group by the end of end of March if the JV option is preferred (Norse requires 3 months to prepare a detailed proposal with due diligence). Detailed costings and structure of the service through a LATC (single) will need to be developed if this option is selected. This may be assessed and reported to Scrutiny by the end of April and the Councils in May. If the Councils agree to the LATC service delivery then it will take 3 months to set up the company and transfer staff. A LATC could be set up by September 2020. Professional legal advice should be sought.

If the waste collection services continue to be provided in-house, there are no stepped changes. The main items on the timescale are seeking industry standard wages for drivers and supervisors, and agreement from Unions to changes in driving arrangements for single drivers. We would also recommend some soft market testing in 2020 with the other WCAs in Staffordshire for a new MRF processing contract. When the soft market testing has been carried out, decisions can be made on dry recyclable service provision. New RCV fleet can then be procured (lease or purchase) in 2021.

Changes as a result of the Strategy requirements can be expected to take place from 2022 or 2023.

Cost implications

The potential cost implications of setting up a local authority trading company, meeting the requirements set out in the Strategy are set out in Table 28. It is noted that some of these items may not be mandatory.

Table 28: Potential cost implications of changes

Year	Item	Cost
2020	LATC agreement, set up costs	c.£100-£150k, depending on the level of external advice sought
	New depot	To be determined
2022	Reducing garden waste collections over winter months	To be determined
2023	Weekly food waste collection	c£1m net cost
	Reduced residual waste capacity	No additional net cost (new bins will be needed)
	Alternate fortnightly mixed dry recycling and fibre	No additional net cost (new bins and new vehicles will be needed)

To this should be added the cash flow implications of a new depot if selected, and a new MRF contract in 2022.

If services are retained in-house, the cost of setting up the LATC and TUPE transfer can be avoided.

Customer experience

If the waste collection services are maintained in-house, then adequate staff should be engaged to maintain customer satisfaction rates.

The delivery of waste collection services through a LATC should not alter the customer experience. The LATC should be required to maintain and improve upon customer satisfaction rates. Any changes to the services should be approved by the Councils.

7.3 Conclusion

It is not considered appropriate, based on the cost and factors of flexibility and control that are important to the Councils, to recommend outsourcing the services in the short to medium term. If the Councils wish for the lowest cost services with the potential to make a profit, then the LATC (JV) should be investigated further, i.e. though an approach to the Norse Group in which they are asked to provide a detailed cost estimate for delivery of the services. The Council can then make a decision on a LATC (JV) when they have a costed proposal. However, should the Councils wish to retain the current level of flexibility and control, then the service should remain in-house or through the setting up of a Lichfield and Tamworth specific LATC. Given the proximity of the evaluation scores, it is not appropriate to make a firm recommendation on the service delivery model.

The cost of introducing food waste collections and changing the dry recycling collection to twin stream have been summarised. There is expected to be a net cost increase with the introduction of weekly food waste collections of around £1m per year. This is due to the additional vehicle and crew requirements, and associated operating costs. The additional costs could be reduced by c.£300k if the Councils do not provide caddy liners to householders. Restricting the capacity of the residual waste in addition to collecting food waste weekly has a slightly lower tonnage in comparison to current levels, however there are no significant cost savings associated with this reduction. Combining weekly food

waste collections and restricted residual waste capacity with a two-stream dry recycling collection is expected to cost around £870k per year more than at present. This figure is the lowest additional cost of the service change options considered due to increased value of recyclate (from separately collected paper), lower MRF gate fees for co-mingled material, and increased recycling credits. Without the value of the recycling credits, and with higher MRF gate fees and lower recyclate revenue, the service change option with food waste, restricted residual and two-stream recycling still offers the least additional cost compared with the current service.

Appendix A – SWOT Analysis on Service Delivery Options

Note: Cost has been excluded from the SWOT analysis

In-house

Strengths
- Direct control
- Flexibility for service/ legislative change
- Cost control
- Trust of the public
- Direct line management
- No procurement time and cost
- Costs transparent to the Council
- No exit limitations and costs
- Flexibility for property growth
- Lower cost for borrowing capital
- No risk of company bankruptcy

Weaknesses
- All risks, including financial and service risk with Councils
- Lack of competitive costing
- Recruitment and retention of staff, HGV 2 driver pay rates
- Buying power for service change and new infrastructure
- LGPS requirements for labour
- Provision of staff for service management
- Knowledge to innovate
- Funding for public awareness and education
- Funding for new depot and transfer station

Opportunities
- Opportunities for service change cost savings/ income
- Commercial waste services development
- Opportunity to integrate other services e.g. street cleansing
- Responsiveness to public

Threats
- Mobilisation for service change
- Provision of maintenance of plant and equipment
- Union management
- Lack of direct service expertise
- Lack of service health & safety experience and resources
- Lack of capacity for staff training and CPD
- Member (political) influence and control

LATC Single

Strengths
- Flexibility for service/ legislative change
- Indirect cost control
- In-direct control
- No procurement time and cost
- Costs transparent to the Council
- Financial risk for agreed services taken by LATC
- Avoided LGPS requirement for new employees (3)
- Control of Member (political) influence and control
- Lower cost for borrowing capital
- Flexibility for property growth
- Public trust

Weaknesses
- Lack of competitive costing
- Financial risk ultimately with the Councils
- Limit to direct line management, blurred line between client and service delivery
- Knowledge and resources to set up LATC single
- Lack of buying power for contract variation
- Flexibility in service change
- Knowledge to innovate
- Council control over decision making
- Third party waste limitation
- No VAT recovery on trade waste

Opportunities
- Opportunities to include other services e.g street cleansing
- Flexible pay rates for recruitment and staff development, driver pay rates
- Funding of public education and awareness
- Commercial opportunities, 20% of services cost
- Increased profit margin
- Responsiveness to public

Threats
- Provision of capital for depot and transfer station
- Competitive cost for service change
- Less direct service expertise than private sector
- Less service health & safety experience than private sector
- Less capacity for staff training and CPD than private sector
- Set up risk of challenge including state aid
- Risk of LATC bankruptcy

LATC JV

Strengths

- Financial risk for agreed services taken by LATC
- Funding for recruitment and career development, driver pay rates
- Flexibility for service/legislative change
- No procurement time and cost
- Expertise in innovation
- Greater control over service performance - but no PMF (Performance
- Avoided LGPS requirements for new employees
- Lower cost for borrowing capital
- Control of Member (political) influence and control
- Costs transparent to the Councils
- In-direct control

Weaknesses

- Lack of competitive costing
- Limited cost control
- Limit to direct line management, blurred line between client and service delivery
- LATC selection process and set up LATC JV time and cost
- Lack of cost control for contract variation
- Council control over decision making
- Very limited market place for LATCs JVs)
- Ultimate financial risk partly held by Council
- Third party waste income limitation
- No VAT recovery on trade waste
- Cost for property growth

Opportunities

- Opportunity to include other services e.g street cleansing
- Commerical opportunties, 20% of services cost
- LATC JV Agreement can be designed to be flexible
- Contractor delivery of public awareness and education
- Responsiveness to public
- Potential profit margin
- Union management
- Responsiveness to public

Threats

- Provision of capital for depot and transfer station
- Flexibility for property growth
- Competitve cost for service change
- Less service health & safety experience than private sector
- Less capacity for staff training than private sector
- Less staff continuing professional development than contractors
- Set up risk of challenge including state aid
- Less direct service expertise than private sector
- Risk of company backruptcy

Outsourced

Strengths

- Financial risk for agreed services taken by contractor
- Competitive contract pricing
- Service and performance - Contractor cost though PMF
- Buying power for service provision
- Avoided LGPS requirements for new employees (3)
- Service set up and mobilisation
- Recruitment, training and retainment of staff, driver pay rates
- Potential depot and transfer station development
- Lack of Member (political) influence and control
- Contractor innovation

Weaknesses

- Not direct control
- No cost control
- Flexibility for service/ legislative change
- Profit to Contractor
- Cost, time and management of procurement
- No direct third party income relating to commercial waste
- Ways and cost to exit
- Higher capital cost unless Council prudential borrowing
- Little flexiblity for property growth

Opportunities

- Potential contract procurement with South Staffordshire
- Establish trade waste business for Council ownership
- Provision and maintenance of plant and equipment
- Potential to procure other services e.g. street cleansing
- Contract Agreement can be designed to be flexible
- Contractor delivery of public awareness and education
- Union management
- Health & safety experience and resources

Threats

- Costs not transparent to the Council
- Trust of the public
- Uncertain market interest in procurement
- Competitve cost for service change
- Risk of company backruptcy
- Responsiveness to public

Appendix B – Service Delivery Option Assumptions

	Assumption	Source / comment
General		
Bulky waste income per year	£60,000	2019-2020 Joint waste service review template final
Garden waste subscriptions	£1,442,196	Specification and property numbers for waste collection service / 2018 data
GW properties Lichfield	26,244	
GW properties Tamworth	14,232	
Combined % of properties	53%	
Annual subscription	£36	
Total number of households	77,366	Benchmarking form
Number of wheeled bins per household	3	Residual, recycling, garden waste
Total number of bins	195,208	Based on GW participation, note that all properties have a bin and those not used weren't collected when service became chargeable
Purchase price per bin	£25	
Outsourced contract duration (years)	8	
Vehicle life (years)	8	For purchase, Assume straight line depreciation
Arisings (tonnes) 2018/19:		KAT proforma
Residual	36,731	Includes bulkies
Dry recyclate	18,683	
Garden waste	11,857	
Trade recycling	271	Email from Nigel dated 17/06/19
Trade refuse	1,070	
MRF / recyclate costs:		
MRF gate fee 2018/19 (previous)	£31.30	Emails from Jane Irving 30/04/19 & 01/05/19
MRF gate fee 2018/19 (increase due to Chin	£36.30	
Average dry recyclate income / rebate per t	£18.29	
Income from sales 2018/19	£343,274	
Gate fee (at partially higher rate)	£703,300	
Income from recyclate credits (est) 2018/19	£1,009,201	
Garden waste gate fee	£21.06	Cost of green waste, row 103
Recycling credits	*Organic*	*Emails from Jane Irving 30/04/19 & 01/05/18*
2018/19	£51.58	
2019/20	£45.08	
2020/21	£38.58	
2021/22	£32.08	
2022/23	£25.58	
	Dry recycling	
2018/19	£53.24	Inflationary increase, assume 2.5%
2019/20	£54.57	
2020/21	£55.94	
2021/22	£57.33	
2022/23	£58.77	

Vehicles		***Capital cost per vehicle***		***Standing cost***		***Running costs***		***Comment***
Vehicle numbers (current service)		*Per veh*	*total*	*per veh*	*total*	*per veh*	*total*	Operating costs in 'Vehicle data request.xls' differ from budget figures; Capital / lease costs from 'vehicle data request.xls; other costs from KAT assumptions; Fuel as per current service for all vehicles
6	Refuse RCV	£175,000	£1,050,000	£8,400	£50,400	£15,500	£93,000	
5	Garden RCV	£165,000	£825,000	£7,900	£39,500	£14,500	£72,500	
7	Recycling RCV	£175,000	£1,225,000	£8,400	£58,800	£15,500	£108,500	
2	Other refuse	£125,000	£250,000	£5,900	£11,800	£10,500	£21,000	Estimate
2	Box van (JWS deliveri	£25,000	£50,000	£2,000	£4,000	£2,500	£5,000	Estimate

Vehicle Crew Structure

Current in-house + LATC(single)		***Per vehicle***			***Total***			***Comment***
Number of vehicl	*Vehicle*	*Team leade*	*Driver Loade*	*Loader*	*Team lead*	*Driver Loa*	*Loader*	
5	Refuse RCV	1	1	1	5	5	5	
1	Refuse RCV scatter	1		1	1	0	1	
6	Recycling RCV	1	1	1	6	6	6	
1	Recycling RCV scatter	1		1	1	0	1	
4	Garden RCV	1	1	1	4	4	4	
1	Garden RCV scatter	1		1	1	0	1	
1	General operatives		0.2	0.5	0	0.2	0.5	
1	Back up	0.2	0.2	0.2	0.2	0.2	0.2	
2	Deliveries		1		0	2	0	
	Total				***18.20***	***17.40***	***18.70***	Note this does not match current staff positions
9.25h day multipl	*1.25*				*22.75*	*21.75*	*23.38*	

Outsourced & LATC JV		***Per vehicle***			***Total***			
Number of vehicl	*Vehicle*	*Team leade*	*Driver Loade*	*Loader*	*Team lead*	*Driver Loa*	*Loader*	
5	Refuse RCV		1	2	0	5	10	
1	Refuse RCV scatter	1		1	1	0	1	
6	Recycling RCV		1	2	0	6	12	
1	Recycling RCV scatter	1		1	1	0	1	
4	Garden RCV		1	2	0	4	8	
1	Garden RCV scatter	1		1	1	0	1	
1	General operatives		0.2	0.5	0	0.2	0.5	
1	Back up	0.2	0.2	0.2	0.2	0.2	0.2	
2	Deliveries		1		0	2	0	
	Total				***3.2***	***17.4***	***33.7***	
9.25h day mulitpl	*1.25*				*4.00*	*21.75*	*42.13*	

Staffing	Staff numbers (excluding trade service)				Salary				Total staff salaries				
	In-house (current)	Outsourced	LATC (single)	LATC (JV)	In-house (FTE)	Outsourced	LATC (single)	LATC (JV)	In-house	Outsourced	LATC (single)	LATC (JV)	Comment
Council staff									*£1,806,367*	*£194,149*	*£170,872*	*£170,872*	
General Manager	1	0.5	0.5	0.5	£55,475				£55,475	£27,738	£27,738	£27,738	
Operations / Contract Manager	1	1	0.5	0.5	£46,554				£46,554	£46,554	£23,277	£23,277	
Customer Relations and Performance Manager	1				£39,088				£39,088	£0	£0	£0	
Supervisor	4				£27,905				£111,620	£0	£0	£0	
Business Support Officer	2	1	1	1	£21,589				£43,178	£21,589	£21,589	£21,589	
Team Leader	19.85				£21,589				£428,542	£0	£0	£0	KAT average salary £24.2k
Recycling Officer	2	2	2	2	£24,799				£49,598	£49,598	£49,598	£49,598	KAT average salary £18.8k
Driver Loader	24				£21,589				£518,136	£0	£0	£0	
Loader	23.5				£19,554				£459,519	£0	£0	£0	
Administration Officer	0.6	0.5	0.5	0.5	£10,985				£6,591	£5,493	£5,493	£5,493	
Yardsman	0.5				£9,777				£4,889	£0	£0	£0	
Call Centre Operators	2	2	2	2	£21,589				£43,178	£43,178	£43,178	£43,178	
Contractor staff										*£1,636,300*	*£1,790,050*	*£1,636,300*	
General Manager													
Contract Manager		1	1	1		£50,000	£50,000	£50,000		£50,000	£50,000	£50,000	
Customer Relations and Performance Manager													
Supervisor		4.0	4.0	4.0		£30,000	£30,000	£30,000		£120,000	£120,000	£120,000	
Business Support Officer													
Team Leader		4.00	22.75	4.00		£27,000	£27,000	£27,000		£108,000	£614,250	£108,000	
Communications officer		1	1	1		£22,000	£22,000	£22,000		£22,000	£22,000	£22,000	
Driver Loader		22	22	22		£24,200	£24,200	£24,200		£526,350	£526,350	£526,350	
Loader		42.1	23.4	42.1		£18,800	£18,800	£18,800		£791,950	£439,450	£791,950	
Administration Officer		0.5	0.5	0.5		£18,000	£18,000	£18,000		£9,000	£9,000	£9,000	
Yardsman		0.5	0.5	0.5		£18,000	£18,000	£18,000		£9,000	£9,000	£9,000	
Call Centre Operators													
Non-operational staff	*13.6*	*13.5*	*13.0*	*13.0*									
Operational staff	*67.85*	*68.4*	*68.4*	*68.4*									
Total staff	*81.5*	*81.9*	*81.4*	*81.4*									

Other assumptions	***Inhouse***	***Outsourced***	***LATC (single)***	***LATC (JV)***	***Comment***
Vehicle purchase borrowing rate		6%	3.0%	6.0%	
Staffing overheads		5%	5%	5%	From Norse, 2018
Agency staff costs (as % of staff salaries)		10%	20%	10%	
NIC & superannuation multiplier on salaries	30%	20%	20%	20%	Employers pay Class 1 NICs of 13.8% on all earnings above the secondary threshold for almost all employees
Procurement & mobilisation costs	£0	£250,000	£150,000	£150,000	Total cost estimate, divide by contract duration
Profit margin (on total costs)		5%	0%	2.5%	

Appendix C – KAT Modelling Assumptions

Baseline Assumptions

Alternative scenario	As per proforma	Assumptions
• **General**	• Vehicles 6 x RCV, 1 x scatter	• Working hours (time spent on rounds): 9.15 hours • Assume 2 driver + 1 loader due to length of working day.
• **Residual**	• Annual refuse tonnage – 36,731 • Crew: 2.1	• 36,731 • Hours worked: 9.15 hours • 95% set out • Full compaction • Crew: 2.0
• **Dry**	• Set out 92% (KAT models in rounds of 5) • Crew: 2.1	• Partial compaction • Percentage set out: 90% • Participation: 92% • Contamination 13% • Hours worked: 9.15 hours • Crew: 2.1 • 7 vehicles
• **Garden**	• Varies according to time of year • Crew: 2.1	• No compaction • 70% set out • Participation: 100% • Modelled over 36 weeks using KAT guidance to calibrate vehicles • Hours worked: 9.15 hours • Crew: 2.0 • Contamination 0.5%

Alternative Scenario Assumptions

Alternative scenario	Assumptions
Service efficiencies • Collection service as per current	**A depot in Tamworth –** sensitivity on reduction in collection time **Waste minimisation (education and awareness) –** sensitivity of residual waste reduction
Option A – • Dry recycling- as per current service • Residual- as per current service • Food - **weekly** collection	**Dry recycling** – as per Baseline (commingled) **Residual** – as per Baseline (fortnightly, 240l), reduced tonnage **Food waste** • Low yield as per WRAP ready reckoner (4,888 tonnes/annum)[34].

[34] The WRAP ready reckoner for food waste yields[34] was applied to calculate the total tonnage of food waste collected. The ready reckoner formula is based on indices of deprivation and is the most accurate data set available to estimate projected food waste tonnages

• Garden- as per current collection	• Dedicated 7.5 tonne food waste vehicles • Set out – 45% [35] • Participation – 55%[36] • Assume 1 crew member • 23l bucket and kitchen caddy (inc. annual provision of compost sacks) • No compaction **Garden waste** – • As per Baseline
Option B – • Dry recycling - as per current service • Residual- **Reduced capacity residual collection** • Food - **weekly** collection • Garden- as per current service	**Dry recycling** • As per Baseline (commingled) • +5% participation (97%) • Increase dry recycling capture by 5% **Residual** – reduced capacity residual • 180l wheeled bin (tonnage reduced) **Food waste** • Low-to-Mid yield as per WRAP ready reckoner (5,684.5 tonnes/annum) see details below. • Dedicated 7.5 tonne food waste vehicles • Set out – 50% • Participation – 60% • Assume 1 crew member • 23l bucket and kitchen caddy (inc. annual provision of compost sacks) • No compaction **Garden waste** • As per current collection
Option C - • Dry recycling- **Twin stream (4-weekly, alternate fortnightly, fibre out)** • Residual- **reduced capacity residual collection** • Food - **weekly** collection • Garden- As per current service	**Dry recycling** • Single bodied vehicle as per Baseline 22m3 • 2 x 240l wheeled bin • Alternate fortnightly collection • Paper and card collected separately in a 240l wheeled bin • Plastic, glass, metals collected separately in a 240L wheeled bin • Increase dry recycling capture by + 5% • +5% participation (97%) • Contamination: 5%. • Full compaction **Residual** – as per Option B **Food waste** – Medium yield as per WRAP ready reckoner (6,482tonnes/annum) see details below. • Dedicated 7.5 tonne food waste vehicles • Set out – 55%

[35] Set out is the percentage of households putting out receptacles on a typical collection day

[36] Participation is the percentage of households participating over three collection cycles, i.e. those using the system. These estimates are informed by WRAP food waste collection trials.

	• Participation – 65% • Assume 1 crew member • 23l bucket and kitchen caddy (inc. annual provision of compost sacks) • No compaction **Garden waste** • As per current collection

Food

Lichfield & Tamworth WRAP Food Waste Ready Reckoner[37]

For areas with fortnightly residual waste collection (i.e. alternate weekly collection): = ***2.1614 – (% Social Groups D and E X 2.2009) ± 0.40 kg***/hh/week.

Calculation for expected yield of food waste (kg/hh/week).

					Kg/hh/week			
	A	B	C	D	Medium	High	Mid-Low	Low
LA		Social Groups D & E 2011 (%)		= A – (B x C)	D	D+0.4	D-0.2	D-0.4
Lichfield	2.1614	19.9	2.2009	1.7236421	1.7236	2.1236	1.5236	1.3236
Tamworth	2.1614	30.2	2.2009	1.496728	1.4967	1.8967	1.2967141	1.0967
Average					*1.6101*	*2.01015*	*1.41015705*	*1.21015*

Tonnage collected per annum

LA	Number of households	Medium	Mid-High	High	Mid-Low	Low
Lichfield	43,783	3,924.15	4,379.49	4,834.83	3,468.81	3,013.46
Tamworth	32,866	2,557.96	2,899.74	3,241.52	2,216.13	1,874.30
Lichfield & Tamworth	76,596	**6,482.10**	7,279.23	8,076.36	**5,684.93**	**4,887.76**

[37] Household food waste collections guide, Section 3: How much food waste can be collected for recycling? WRAP 2016

KAT Outputs

		Baseline (Adjusted)	Scenario 1	Scenario 2	Scenario 3
Type of collection	Dry recycling	Kerbside co-mingled or single stream	Kerbside co-mingled or single stream	Kerbside co-mingled or single stream	Kerbside co-mingled or single stream
	Dry recycling	select from list	select from list	select from list	Kerbside co-mingled or single stream
	Garden waste	Kerbside co-mingled or single stream	Kerbside co-mingled or single stream	Kerbside co-mingled or single stream	Kerbside co-mingled or single stream
	Food waste	select from list	Kerbside co-mingled or single stream	Kerbside co-mingled or single stream	Kerbside co-mingled or single stream
	Refuse	Refuse collection	Refuse collection	Refuse collection	Refuse collection
Collection frequency	Dry recycling	every fortnight	every fortnight	every fortnight	every fortnight
	Dry recycling	select from list	select from list	select from list	every fortnight
	Garden waste	every fortnight	every fortnight	every fortnight	every fortnight
	Food waste	select from list	once a week	once a week	once a week
	Refuse	every fortnight	every fortnight	every fortnight	every fortnight
Collection Vehicle	Dry recycling	RCV, 24m3	RCV, 24m3	RCV, 24m3	RCV, 24m3
	Dry recycling	select from list	select from list	select from list	RCV, 24m3
	Garden waste	RCV, 20m3	RCV, 20m3	RCV, 20m3	RCV, 20m3
	Food waste	select from list	Dedicated food 7.5T GVW	Dedicated food 7.5T GVW	Dedicated food 7.5T GVW
	Refuse	RCV, 20m3	RCV, 20m3	RCV, 20m3	RCV, 20m3
Collection crew size including driver	Dry recycling	3	3	3	0
	Dry recycling	#DIV/0!	#DIV/0!	#DIV/0!	3
	Garden waste	3	3	3	3
	Food waste	#DIV/0!	2	2	2
	Refuse	3	3	3	3
Number of households served	Dry recycling	76596	76596	76596	76596
	Dry recycling	0	0	0	76596
	Garden waste	40457	40457	40457	40457
	Food waste	0	76596	76596	76596
	Refuse	76596	76596	76596	76596
Percentage set out	Dry recycling	90%	90%	90%	90%
	Dry recycling	select from list	select from list	select from list	90%
	Garden waste	70%	70%	70%	70%
	Food waste	select from list	45%	50%	55%
	Refuse	95%	95%	95%	95%

Percentage set out (2nd stream)	Dry recycling	select from list	select from list	select from list	select from list
	Dry recycling	select from list	select from list	select from list	select from list
	Garden waste	select from list	select from list	select from list	select from list
	Food waste	select from list	select from list	select from list	select from list
Average participation	Dry recycling	92%	92%	97%	97%
	Dry recycling	100%	100%	100%	97%
	Garden waste	100%	100%	100%	100%
	Food waste	100%	55%	60%	65%
Average capture	Dry recycling	91%	91%	91%	91%
	Dry recycling	100%	100%	100%	104%
	Garden waste	216%	216%	216%	216%
	Food waste	100%	61%	65%	68%
Tonnes collected excluding contamination	Dry recycling	18682	18682	19600	9008
	Dry recycling	0	0	0	10592
	Garden waste	11857	11857	11857	11857
	Food waste	0	4888	5685	6482
	Refuse	34245	29112	27237	27968
Tonnes of contamination collected	Dry recycling	2429	2429	2548	450
	Dry recycling	0	0	0	530
	Garden waste	59	59	59	59
	Food waste	0	244	284	324
Tonnes of biodegradable material collected	Dry recycling	8597	8597	9008	9008
	Dry recycling	0	0	0	0
	Garden waste	11857	11857	11857	11857
	Food waste	0	4888	5685	6482
Number of collection vehicles required	Dry recycling	6.6	6.6	6.6	5.2
	Dry recycling	0.0	0.0	0.0	6.8
	Garden waste	3.4	3.4	3.4	3.4
	Food waste	0.0	7.1	7.7	8.7
	Refuse	6.3	6.3	6.3	6.3
Collection limited by weight or volume	Dry recycling	volume	volume	volume	volume
	Dry recycling	volume	volume	volume	volume
	Garden waste	volume	volume	volume	volume
	Food waste	volume	weight	weight	weight
	Refuse	weight	weight	weight	weight
Number of loads collected per vehicle per day	Dry recycling	2.1	2.1	2.3	1.5
	Dry recycling	1.0	1.0	1.0	3.0
	Garden waste	3.9	3.9	3.9	3.9

	Food waste	1.0	0.9	1.0	1.0
	Refuse	2.0	1.8	1.7	1.7
Number of households passed per vehicle per day	Dry recycling	1,157	1,157	1,157	1,466
	Dry recycling	0	0	0	1,119
	Garden waste	1,191	1,191	1,191	1,191
	Food waste	0	2,170	2,002	1,756
	Refuse	1,221	1,307	1,307	1,307
Number of households collected from per vehicle per day	Dry recycling	1,041	1,041	1,041	1,319
	Dry recycling	0	0	0	1,007
	Garden waste	834	834	834	834
	Food waste	0	977	1,001	966
	Refuse	1,160	1,241	1,241	1,241
Pass rate	Dry recycling	231	231	231	231
	Dry recycling	0	0	0	224
	Garden waste	255	255	255	255
	Food waste	0	283	316	277
	Refuse	253	212	212	212
Productive time	Dry recycling	300	300	300	380
	Dry recycling	365	365	365	300
	Garden waste	280	280	280	280
	Food waste	365	460	380	380
	Refuse	290	370	370	370
Non productive time	Dry recycling	255	255	255	175
	Dry recycling	115	115	115	255
	Garden waste	275	275	275	275
	Food waste	115	95	175	175
	Refuse	265	185	185	185
Percentage of targeted materials collected	Dry recycling	97%	97%	102%	106%
	Dry recycling	0%	0%	0%	101%
	Garden waste	216%	216%	216%	216%
	Food waste	0%	33%	39%	44%