South Derbyshire District Council Waste Collections Review

Collections Options for South Derbyshire District Council

Report for Adrian Lowery and Allison Thomas, South Derbyshire District Council

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Version Control Table

Version	Date	Author	Description
v1.0	18/08/2020	Alex Davies, Claire Chu	First draft issued to client
V2.0	16/09/2020	Alex Davies, Claire Chu	Second draft issued to client
V3.0	19/10/2020	Alex Davies	Final issued to client

Executive Summary

E.1.0 Introduction

Eunomia Research & Consulting Ltd. (Eunomia) is pleased to present this report to provide waste and recycling analysis and modelling support to South Derbyshire District Council (SDDC). This project considers the opportunities to increase recycling, reduce refuse and comply with potential future government legislation. This is achieved through changes we have modelled that introduce separate food waste collections and further restrict the collection of refuse. The project further considers the implications of the current recycling service, provided through a contract with Palm Recycling, which expires in October 2021.

The objectives of this project are as follows:

- explore the feasibility of separately collecting food waste from all households that currently receive a kerbside dry recycling collection service.
- review the comparative costs, anticipated performance and resource implications of a range of collection profiles that meet the requirements of predicted government legislation.
- review the options for service delivery following the expiry of the recycling contract in October 2021.

The modelling examined a range of recycling collection methodologies designed with officers and members, each with separate food waste collections. Restricted refuse capacity through alteration of container sizes and collection frequencies was also considered.

E.2.0 Modelling Results

The results of the waste flow modelling showed an increase in recycling rates for all the options compared to the baseline. This is primarily due to the increased food waste yields assumed when introducing a separate food waste collection. Dry recycling yields also increase and refuse yields decrease from the baseline in Option 1a, 2 and 3. This is due to the restricted refuse capacity modelled in these options, which drive additional recycling, and the substantial increased recycling capacity in Option 3.

The cost modelling results suggest that Option 1 would have a similar cost to the baseline, and Options 1a, 2 and 3 would all provide cost savings compared to the baseline. These savings are achieved through increased income from recycling material sales and credit. Option 1a has a lower modelled cost than the other options, attributed to lower vehicle and staff costs with moving to a four-weekly refuse collection. Option 1 had the highest modelled cost of all the options. This can be attributed to vehicle, staff and containment costs required for a separate

food waste service, without the benefits of increased dry recycling yields seen in the other options.

The results of the commissioning options appraisal demonstrate that in the future, service costs are likely to increase across all options. The cheapest option is to bring all services in-house, whilst outsourcing was modelled to lead to the greatest increase in cost. The cost to deliver services both in-house and through an outsourced contract was similar to that of the fully outsourced option, as it currently is.

There are a number of other factors that should be taken into consideration when assessing how services should be delivered, and these reflect the level of control SDDC wish to have over its services and the risk they are willing to take. SDDC has the expertise to deliver all services in-house, given that half of the services are already delivered, and have the processes in place to control budgets and manage financial risk.

E.3.0 Summary

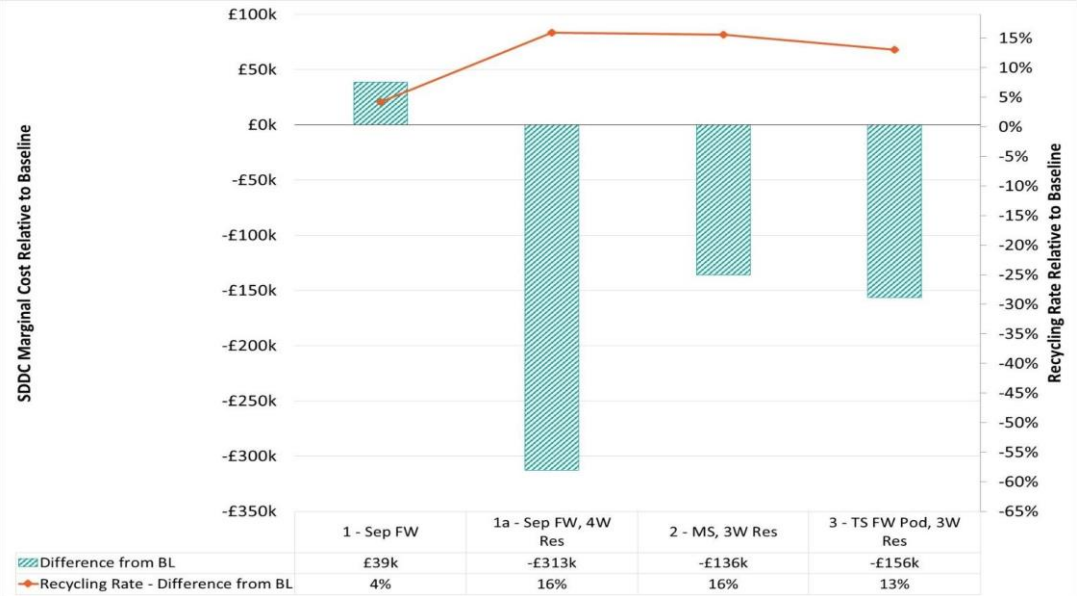
By introducing separate weekly food waste collections in compliance with potential future government legislation, SDDC's costs are modelled to increase in comparison to the baseline. However, Options 1a, 2 and 3, which introduce weekly food waste alongside changes to the recycling or refuse service, demonstrate scenarios where cost savings could be made whilst complying with potential changes in legislation.

All options modelled led to increases in the recycling rate, allowing SDDC to move towards their target of 60% recycling rate by 2024. Options 1a and 2 provided the best recycling performance, with Option 1a providing the highest recycling rate per cost.

The Environment Bill is likely to require a number of service changes in the coming years, which are not currently entirely clear. Therefore, it is likely that SDDC will want to be in a position to control how and when these changes are introduced, as well as seeking the most economically beneficial solution. Operating the services in-house, even for a short period of time, may offer SDDC this flexibility and control over service delivery.

Figure 1-1).

Figure 1-1: Total Service Costs and Recycling Rates Relative to the Baseline



Contents

1.0 Introduction

Eunomia Research & Consulting Ltd. (Eunomia) has been commissioned by South Derbyshire District Council (SDDC) to conduct a collection modelling exercise, and commissioning options review to compare a range of possible options for the future delivery of waste and recycling services.

This report presents the results of the resource modelling of a number of service configuration options that SDDC might choose to implement. This report describes the collection systems that were modelled, the likely performance of these systems (informed by the benchmarking exercises undertaken), the financial costs and benefits of each option, and any constraints identified (operational, practical, and political/reputational).

The options modelling exercise looks at a range of kerbside collection options, focussed on rolling out separate food waste collection, decreasing refuse capacity or frequency, and alternative dry recycling collection systems. Other services such as the Saturday Freighter Service, and Recycling Banks have been considered in the qualitative review.

This report further looks at the options available to SDDC for delivering the services in the future. SDDC currently operates its waste and recycling services through an in-house delivered refuse and garden waste service, and an outsourced recycling contract. The recycling contract is due to expire in October 2021. A number of future delivery methods have been considered, including operating the whole service in-house, and outsource, as well as the potentially of creating a Local Authority Trading Company (LAC).

1.1 Structure of this Report

As far as possible, technical details and statistical analyses have been placed in the appendices and referenced where necessary. The report is structured as follows:

- Methodology (Section 2.0): This section describes the approach taken in selecting service configurations and building up collection options, and the methodologies used in the modelling.
- Collection Modelling Results (Section 3.0): This section presents the results from the modelling, along with assumptions and qualifications that need to be taken into account when interpreting them.
- Contractual and Operational Implications (Section 4.0):This section provides a high- level overview of potential contractual and operational implications if changes to collection services were made.
- Evaluation (Section 0): This section uses the evaluation criteria developed with SDDC to review the options.
- Commissioning Options (Sections 6.0): This section brings together the results from the commissioning options review.
- Summary (Section 7.0): This section brings together the key results from the modelling.
- Appendices:
    - A.1.0 contains an updated version of the assumptions report, which details the operational and cost assumptions applied in the collection modelling.

- A.2.0 contains detailed collection modelling results. This includes numbers of vehicles, pass rates, cost results, and capital investments modelled for each option.
- A.3.0 contains details and results of the qualitative evaluation of the collection options.

2.0 Methodology

This section outlines the collection options modelling methodology (Section 2.1) including a description of the options modelled (Section 2.1.1). and the commissioning options methodology (Section 2.2)

2.1 Collection Options Modelling Methodology

Eunomia's waste collection model, 'Hermes,' has been used to calculate the performance and costs associated with different kerbside waste and recycling collection scheme configurations.

A 'baseline' model is created that represents the current service. Authority-specific inputs to the baseline include information regarding geography, number and type of households, current services and service performance, resources, and waste composition. These inputs are calibrated to known outputs (which in modelling terms includes the numbers of crew and vehicles used to deliver the collection services), and factors such as productivity, pass rates, and participation rates are subsequently checked (where known) to provide a full baseline model. Put simply, the baseline model should accurately reflect:

- waste composition and tonnages;
- current participation, set out, and yields;
- authority characteristics (household numbers, population, housing types, etc.); • travel logistics (time, distance, speed, pass rate, pick up time etc.); and
- current vehicle and container types and costs.

This creates a sensible foundation from which to establish the change in resource requirements for different potential future service configuration option, ensuring that SDDC's specific constraints are properly reflected. The likely performance of each new service configuration is then driven by data available from other authorities operating similar schemes and with similar demographics. These likely changes are incorporated into the model so that typical changes that one might expect are overlaid onto the baseline model. The resulting model represents what one would reasonably expect to happen if any one of those schemes were implemented.

All cost modelling is then presented as marginal costs relative to the baseline, so indicates if each option is likely to be more or less expensive than the current operations. Calculating the overall total service costs including management and overheads, should a given option to be implemented, is beyond the scope of this project and would likely be done on a short-list of preferred options at the next stage of decision making or implementation planning. In addition, changes in cost where the service is contracted out may be subject to negotiations with contractors (as discussed in Section 4.0), and therefore may not equate directly to changes in operational costs modelled.

The modelling does not include:

- transition/implementation costs for service changes, i.e. cost of additional resources need during a mobilisation (such as additional crews), delivery of containers or internal costs (admin costs of procuring new vehicles etc.).;
- household communication costs, both on-going and in relation to service changes;
- vehicles collecting on very narrow access rounds, because they only collect from a small number of households and it is assumed these vehicles would be required in all options;
- the collection and disposal of trade waste; and • spare vehicles, supervisors, and back office staff.

2.1.1 Options Modelled

The baseline services for SDDC and the modelling options are set out in the Assumptions and Benchmarking Report, in Appendix A.1.0. These are summarised in this section for ease of reference.

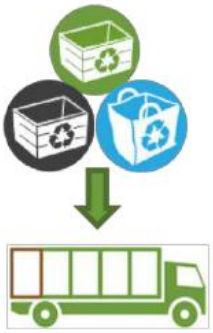
Table 2-1 summarises the combination of service configurations that are modelled and compared against SDDC's current baseline service. The options investigate different dry recycling collection methodologies, and all include rolling out separate food waste collections. Refuse collection frequency and containment capacity is also altered in each option. Across all options Garden Waste is collected in the same way that it is in the baseline.

The shorthand notation in Table 2-1 (used throughout the report to simplify tables and figures) focusses on the key changes to the service in order to differentiate between the options.

The baseline is modelled with the current organics gate fee (e.g. the current in-vessel composting (IVC)). The options modelling assume that food waste could be sent to anaerobic digestion (AD) and garden waste to open air windrow (OAW), both of which could attract a lower gate fee than the current IVC gate fee. It has been assumed in the modelling that these materials would require bulking and haulage to a treatment facility.

The cost of sorting dry recycling is modelled in the baseline as the current sorting costs of the recycling collection contract. This sorting fee has remained the same for those options where materials are collected together. Where materials are collected separately, material values have been applied. All gate fees and material values used are detailed in A.1.3.1.

Table 2-1:Options Modelled

	Current Service – for comparison	1 - sep FW	1a - sep FW, 4W Res	2 - MS, 3W 180L Res	3 - TS FW Pod, 3W Res
Recycling	Bin: Plastic, Cans & Glass Insert: Paper & Card  Twin-Stream Fortnightly	Bin: Plastic, Cans & Glass Insert: Paper & Card  Twin-Stream Fortnightly	Bin: Plastic, Cans & Glass Insert: Paper & Card  Twin-Stream Fortnightly	Box: Plastic & Cans Box: Glass Bag: Paper & Card  Kerbside Sort Weekly	Wk 1 Bin: Plastic, Cans, Glass Wk 2 Bin: Paper & Card  Twin-Stream & Food 3-Weekly
Food	 Mixed Organics Fortnightly	 Food Waste Weekly	 Food Waste Weekly	 Caddy: Food Waste	 Caddy: Food Waste Weekly  Refuse & Food 3-Weekly
Garden	 Garden Waste Fortnightly	 Garden Waste Fortnightly	 Garden Waste Fortnightly	 Garden Waste Fortnightly	
Refuse	 Fortnightly 120 litres per week	 Fortnightly 120 litres per week	 4-weekly 60 litres per week	 3-weekly 60 litres per week	 3-weekly 80 litres per week

2.2 Commissioning Options

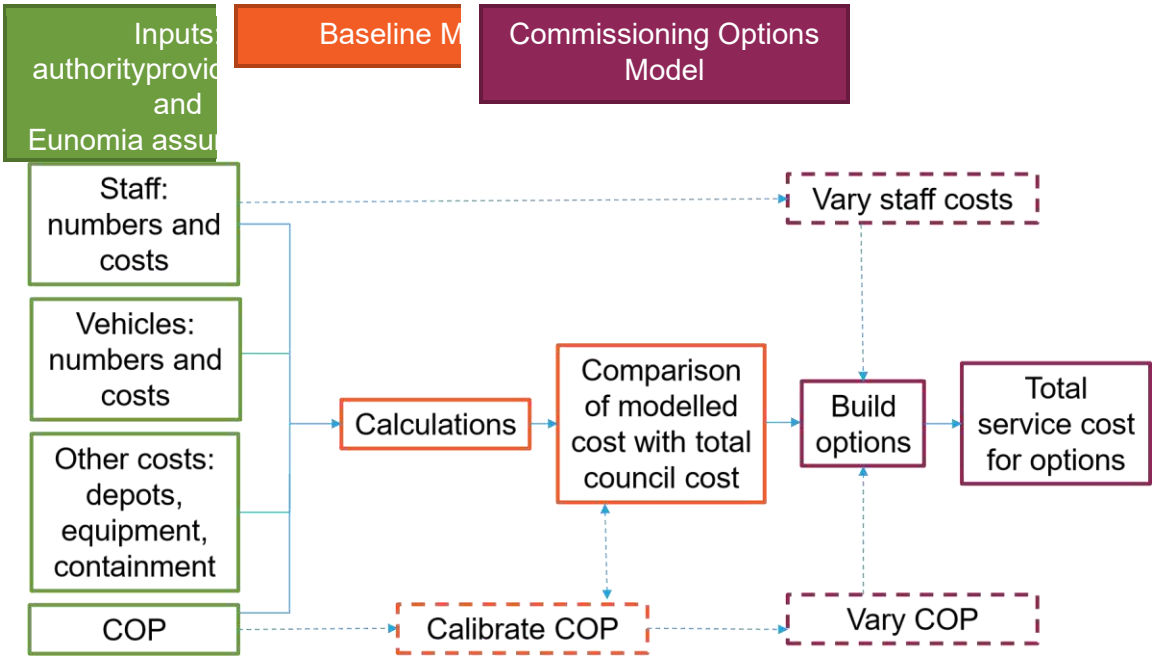
Eunomia uses commissioning option modelling to understand the relative costs and benefits associated with the different options available for delivering waste and recycling services. The options which have been explored for SDDC include:

- In-house in which all services are delivered by the authority and staff who are directly employed by SDDC;
- Outsourced in which all services are tendered through a procurement exercise which engages an external contractor to deliver the services;
- Local Authority Trading Company (LAC) in which the services are delivered through a company wholly owned by SDDC, which is allowed to operate in a more commercial minded way;
- In-house/Outsourced in which service delivery is split across both in-house for refuse and garden waste and outsourced for recycling in the same way as it is currently delivered.

Eunomia uses a financial model to build a baseline from the bottom up, to reflect the current service costs as accurately as possible. Figure 2-1 highlights a high-level flow of the data within the model., Staff and Vehicle costs are used alongside any other known costs such as cost of containers, depot costs and other overheads associated with the service. Where costs are not available assumptions are used in their place.

Where a service is currently outsourced, the costs are calibrated against the current contract value, to provide a cross reference and understanding of Corporate Overhead and Profit (COP) associated with the contract.

Figure 2-1: Commissioning Options Summary



Once the baseline model is set up and calibrated, the options are built. This involves amending specific baseline inputs based on assumptions of how costs may change under each of the options being modelled. The key assumptions that drive these differences are described below:

- Staff Costs – depending on the pension contribution under each option. Due to the Local Government Pension Scheme (LGPS) in-house services will have higher pension contributions, whereas outsourced contracts will contribute less.
- Corporate Overhead and Profit (COP) – depending on the level of overheads or profit under each option. Outsourced contracts will have additional costs built in to cover the COP of the contractor, making these options more expensive. LAC

also attract additional overheads for services such as pay roll and administration, however, do not make a profit on the services it delivers for to SDDC.

The modelling keeps all operational and productivity information the same as the baseline, so that the options accurately reflect the current service delivery and provides a comparison of the likely change in costs under each option.

3.0 Collection Modelling Results

This section presents the high-level results of the collection options modelling (Options 1-3), including the impacts of the different options on performance in terms of the recycling rate achieved, the quantity of waste generated, and the costs associated with delivering each option. Key modelling assumptions can be found in Appendix A.1.0. Details of benchmarking and waste flow modelling can be found in the previous Eunomia report for Derbyshire Waste Partnership[1]. Detailed modelling results showing the number of vehicles and crew required and pass rates for each option can be found in Appendix A.2.0

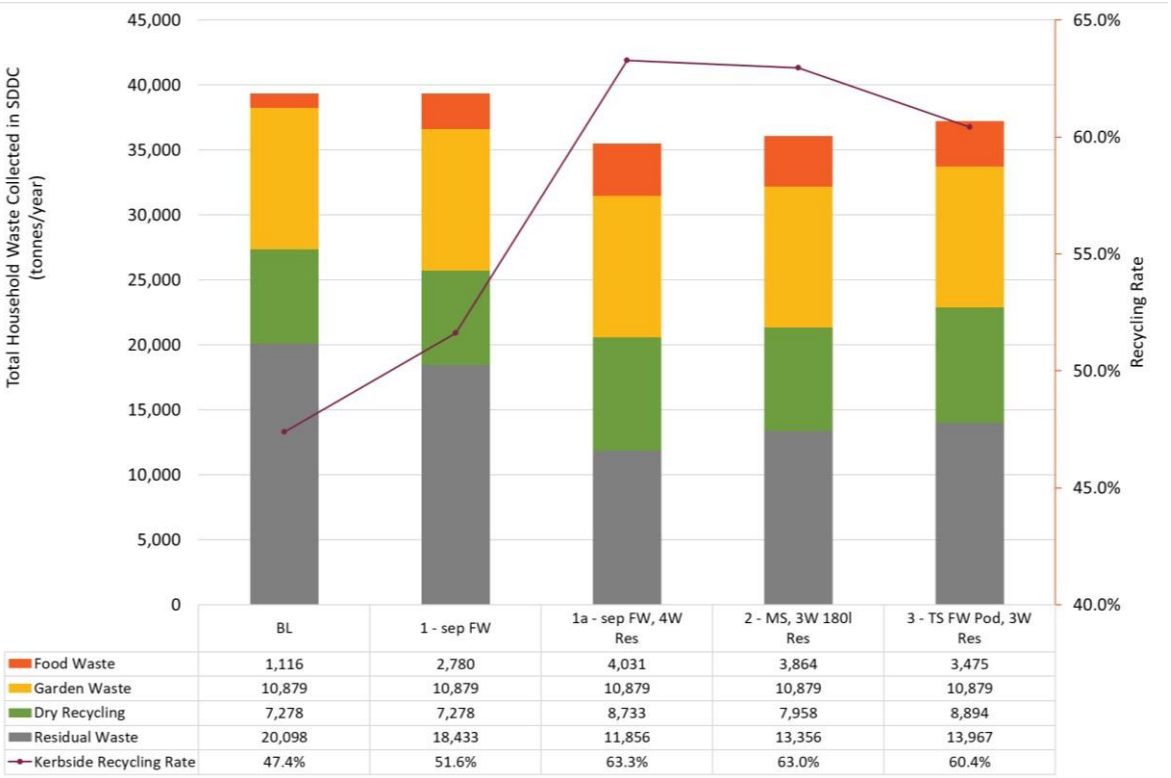
3.1 Waste Flow Modelling Results

3.1.1 Kerbside Collections

Figure 3-1 shows the waste flow modelling results for the options and current service. The baseline data shown is based on 2019/20 kerbside waste flows provided by SDDC (A.1.2.2). The chart also shows the modelled kerbside recycling rate indicating that Options 1a, 2 and 3 would provide substantial increases in recycling performance (1316%) compared to the baseline. The recycling rate does not include non-kerbside waste flows, as we assume no change in these waste flows.

[1] Eunomia Research & Consulting (2018) *Waste and Recycling Services Support to Derbyshire Dales DC, Chesterfield BC and High Peak BC*, Report for WRAP, February 2018

Figure 3-1: Waste Flow Modelling Results



	BL	1 - sep FW	1a - sep FW, 4W Res	2 - MS, 3W 180l Res	3 - TS FW Pod, 3W Res
Food Waste	1,116	2,780	4,031	3,864	3,475
Garden Waste	10,879	10,879	10,879	10,879	10,879
Dry Recycling	7,278	7,278	8,733	7,958	8,894
Residual Waste	20,098	18,433	11,856	13,356	13,967
Kerbside Recycling Rate	47.4%	51.6%	63.3%	63.0%	60.4%

Figure 3-1 presents the kerbside recycling rates, rather than NI192 equivalent recycling rates, which are report nationally through Defra. This is due to the availability of validated data at the time of modelling. Although the kerbside recycling rates for option 1a, 2 and 3 all reach 60% it is likely that only in option 1a will achieve an NI192 equivalent recycling rate which reach South Derbyshire's 60% target by 2024. Option 2 and 3 are likely to achieve roughly 58% recycling rate based on available data.

Based on Eunomia expertise and benchmarking performed for Derbyshire Waste Partnership, the change in yields for each option is shown in Table 3-1. These changes in yields have been based on the following assumptions:

- It is estimated there would be no change in the dry recycling yields in Option 1 but an increase of 20% from the baseline in the other options due to reduced refuse capacity and, for Option 3 an additional 5% of cardboard was assumed due to the provision of increased recycling capacity in this option.
- A food waste yield of 60 kg/hh/yr is estimated for Option 1, based on benchmarking results and Eunomia expertise. Further increases in food waste are estimated due to reduced refuse capacity, and this is increased further for four-weekly collections due to behavioural change.
- A reduction in refuse of 21% is assumed for a reduction in refuse collection frequency to three-weekly. This is based on benchmarking results[1] and applied to Option 3. A further 5% reduction was applied to a three-weekly collection with 180 L bins, and four-weekly collections a 31% reduction in refuse from the baseline was used.
- It is assumed that there would be no change in garden waste yields across the different options.
- Total waste arisings are reduced for Options 1a, 2 and 3 where refuse capacity has been restricted. This reduction is likely through behaviour change as the restricted

[1] Eunomia Research & Consulting (2018) *Waste and Recycling Services Support to Derbyshire Dales DC, Chesterfield BC and High Peak BC*, Report for WRAP, February 2018

capacity makes people more aware of their waste production. The reduction in kerbside yields could also be due to displacement of waste to household waste and recycling centres (HWRCs), but the effect of this on recycling performance is beyond the scope of the current project.

Table 3-1: Assumed Yield changes from the Baseline for Each Option (kg/hh/yr)

Option	Refuse	Dry Recycling	Garden Waste	Food Waste	Total Arisings
1 - sep FW	-36	0	0	+36	**0**
1a - sep FW, 4W Res	-178	+31	0	+63	**-84**
2 - MS, 3W 180L Res	-146	+13	0	+59	**-73**
3 - TS FW Pod, 3W Res	-132	+35	0	+51	**-47**

When reviewing the baseline data, a further analysis was undertaken to understand how much waste was currently produced on average, based on assumed bulk density, in relation to the size of containment provided by SDDC. It's estimated on average residents currently use 90 litres of the 120 litre weekly capacity provided.

Another key difference between the options is the amount of contamination being collected. Where dry recycling is mixed together in the containers (i.e., two-stream in the baseline and Options 1, 1a, and 3), there are more non-targeted materials (i.e. contamination) collected than where dry recycling is separated at the kerbside(Option 2).

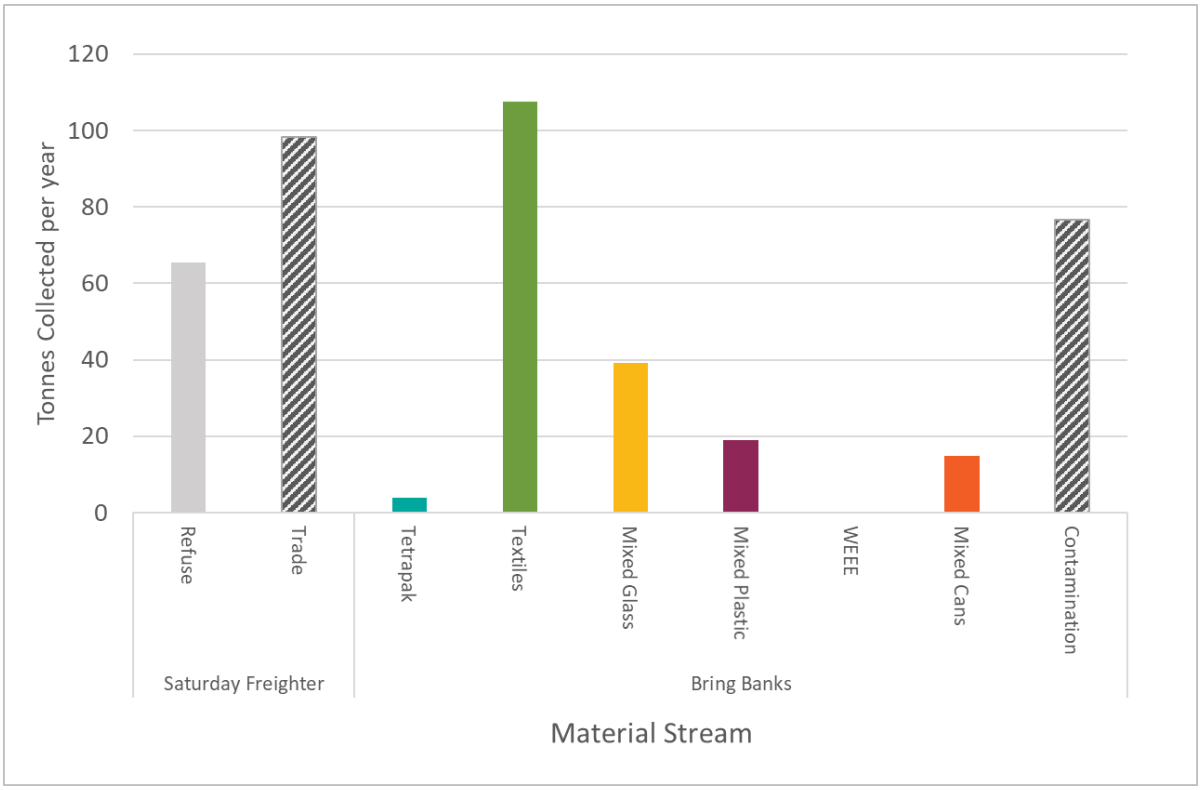
More details on the waste flow modelling assumptions can be found in Appendix A.1.2.2.

3.1.2 Saturday Freighter and Bring Bank Service

Figure 3-2 shows the results of the analysis undertaken on the Saturday freighter and bring bank service based on data provided for 2019/20. The impact of these services on performance has not been included within the kerbside recycling rate provided in Figure 3-1. However, the impact on the recycling rate is expected as:

- The Saturday freighter service reduces the recycling rate by approx. 0.18%,
- The bring bank service increases the recycling rate by approx. 0.16%,
- Due to the amount of contamination collected within the bring banks this is lower than the potential 0.25% without such high level of contamination.

Figure 3-2: Saturday Freighter and Bring Bank Service Waste Flow



Although reliable data isn't available for the Saturday freighter service, operational assessments have been made which estimates that approx. 60% of the material collected on this service is likely to be from traders who are taking advantage of a free service.

The contamination levels within the bring bank service has also been based on current operational assessments, which estimate that approx. 50% of bring bank collections of mixed glass, mixed plastic and mixed cans are contaminated are collected as refuse. All of which are available for collection through the kerbside service where contamination is significantly lower.

3.2 Cost Modelling Results

3.2.1 Kerbside Collections

Figure 3-3 shows the overall cost modelling results for the options when compared with the baseline costs. Option 1 show an increase in cost, the primary reason for this is the addition of food waste collections without substantial increases in income through improved recycling. All other options (Options 1a, 2 and 3) showed cost savings compared to the baseline, with Option 1a showing the greatest level of savings.

Figure 3-3: High Level 'Whole System' Cost Modelling Results Relative to the Baseline

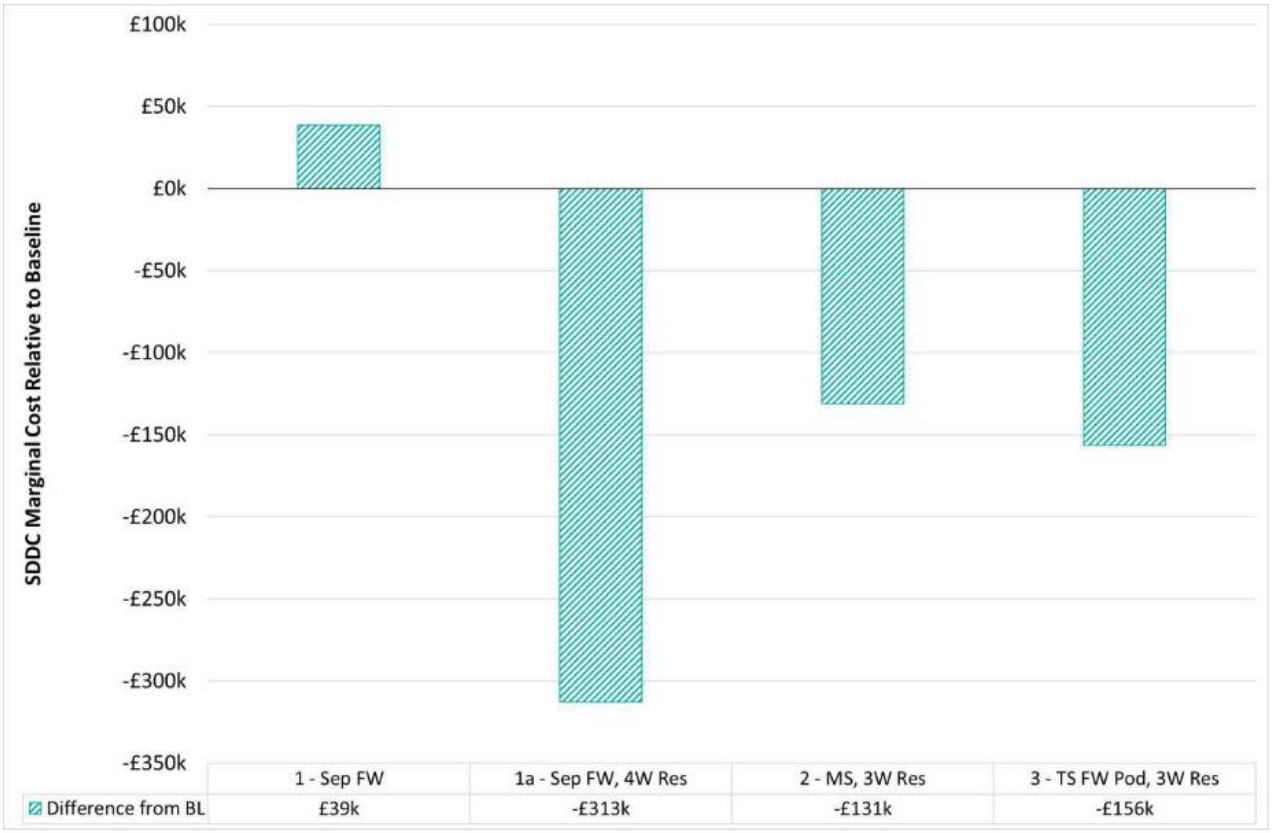


Figure 3-4 and Table 3-2 show a detailed breakdown of the cost modelling results shown in Figure 3-3.

Figure 3-4: Detailed Breakdown of Cost Modelling Results Relative to the Baseline

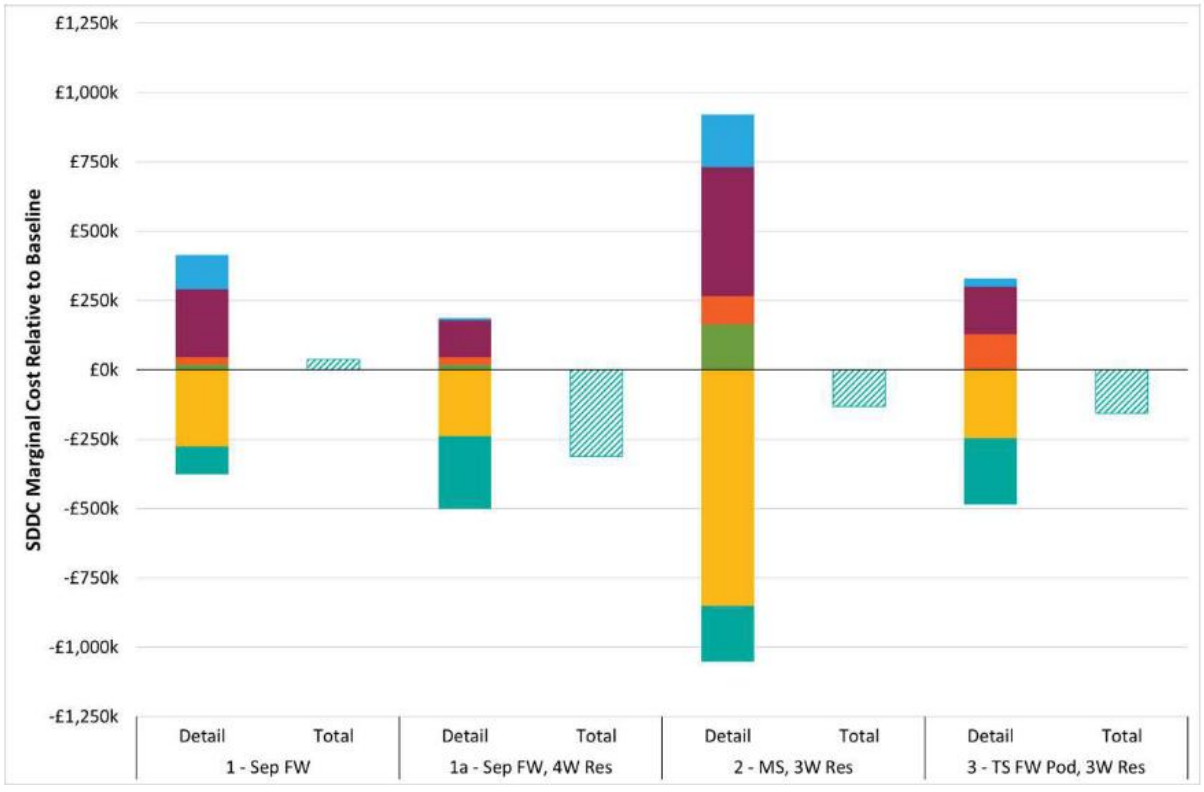


Table 3-2: Details of Annual Costs Relative to the Baseline

	1	1a	2	3
Vehicles	£126k	£9k	£191k	£30k
Staff	£244k	£133k	£465k	£171k
Containers	£26k	£26k	£100k	£123k
Recycling Credits	-£100k	-£261k	-£202k	-£239k
Recycling Treatment	-£277k	-£238k	-£851k	-£247k
Depot Works	£20k	£20k	£165k	£5k
Total	**£39k**	**-£313k**	**-£131k**	**-£156k**

Vehicle costs

Cost of vehicles is highly variable, and are higher than the baseline in all options. Table 3-3 provides a breakdown of the number of vehicles required in each option.

Table 3-3: Number of Vehicles Modelled

Service	Baseline	1 - Sep FW	1a - Sep FW, 4W Res	2 - MS, 3W Res	3 - TS FW Pod, 3W Res
Dry Recycling	4.0	4.0 *(0)*	4.2 *(+0.2)*	15.0 *(+11)*	5.0 *(+1)*
Food Waste	-	5.0 *(+5)*	5.8 *(+5.8)*	-	-
Garden Waste	4.5	4.5 *(0)*	4.5 *(0)*	4.5 *(0)*	4.5 *(0)*
Refuse	4.5	4.5 *(0)*	2.4 *(-2.1)*	3.0 *(-1.5)*	3.2 *(-1.3)*
Total	**13.0**	**18.0 *(+5)***	**16.8 *(+3.8)***	**22.5 *(+9.5)***	**12.8 *(-0.2)***

Options 1 and 1a require additional vehicles to collect food waste separately, Option 1 has no further changes so there is no offset to the additional cost. However, as Option 1a has a reduction of 2.1 refuse vehicles, this offsets the cost of the additional 5.8 food waste vehicles required.

Due to the nature of the collection methodology of Option 2 which requires sorting materials at the kerbside, and providing a weekly service using Resource Recovery Vehicles (RRV), this option requires the highest number of vehicles. However, there are no additional requirements for a separate food waste vehicle as this is collected on the RRV.

The most efficient fleet design is Option 3, where pod vehicles are used to collect food waste alongside recycling and refuse. The pod on the vehicle can limit the capacity for the recycling and refuse, and this can lead to additional vehicles being needed. However, this is offset by not requiring additional food waste vehicles. Despite this, vehicle costs for Option 3 are higher than the baseline due to the increased cost of pod vehicles compared to standard refuse collection vehicles (RCVs).

Staff costs

The cost of staff is highly dependent on the number of vehicles modelled for each scenario, and how these vehicles are crewed. In all scenarios there is an increase in the number of staff compared to the baseline.

- This is due to the introduction of food waste in Options 1, 1a and 3 as even when not using a separate vehicle an additional crew member is needed.
- Option 2 has fewer crew members per vehicle than the baseline, due to the weekly collection. However, the high number of vehicles and time spent sorting materials onto the vehicle means this option has the highest additional staff costs.

(details of staff and vehicle numbers in each option can be found in Appendix A.1.0)

Containers

Each option will require a different combination of new containers for residents, this includes food waste caddy for Options 1, 1a, 2 and 3, new recycling boxes and bags for Option 2 and for Option 3 an additional 240 litre bin. These costs are annualised over 10 years. Where containers are changed and the existing containers are no longer required these can be recycled, for which SDDC will able to receive an income based.

Material treatment costs

Material treatment costs include both gate fees for organic waste, as well as material incomes and sorting costs from dry recycling.

- Options 1, 1a, 2 and 3 all have a decrease in treatment costs due to the reduced gate fees associated with collecting separate food and garden waste compared with mixed organics.
- However, this is slightly offset in Options 1a and 3 by the additional cost of sorting dry recycling, whereas in Option 1 there is no improvement in dry recycling so no additional costs associated with this.
- Option 2 shows the lowest costs compared to the baseline for dry recycling treatment. This is due to improved revenues for separately collected materials and avoidance of any sorting fee;

Recycling credits

As recycling credits are paid to SDDC regardless of the treatment cost, or material income, all options present a cost saving due to the additional food waste collected. For Options 1a, 2 and 3 the additional dry recycling collected leads to a large increase in recycling credits paid to SDDC. These credits are able to offset the additional cost of operating the service in these options, as discussed above.

Due to the small increase in additional recycling from the separate food waste collection in Option 1, the additional income to SDDC does not offset the additional operational costs.

Depot Works costs

For each of the options, an assessment has been carried out to determine works that may be required within the depot and to develop waste transfer stations (WTS). Options 1, 1a and 2 are assumed to require additional land to park additional vehicles. However, depot works are much larger for Option 2, which requires additional equipment and development of WTS to offload the RRVs, as well as land to park the additional vehicles. These costs have been included within the model are detailed in A.1.3.

3.2.2 Saturday Freighter and Bring Bank Services

The annual operational cost of the Saturday freighter and bring bank services are shown in Table 3-4.

Table 3-4: Cost of Saturday Freighter and Bring Bank Services

	Saturday Freighter	Bring Banks
Vehicles	£9,501	£6,485
Staff	£7,782	£5,188
Recycling Credit	£0	-£10,698
Net Cost	£17,486	£2,272

Costs are calculated based on the operational costs to provide the Saturday Freighter service, and the contract costs to collect bring banks, however, these costs do not take into account the additional expense to SDDC to collect contaminated bring banks. Bring banks for textiles are operated through charity schemes, for which SDDC does not pay for collections. As with all cost modelling, the costs presented are only those applicable to SDDC, and not the cost of disposal for which Derbyshire County Council holds responsibility.

4.0 Contractual and Operational Implications

This section presents the results of a qualitative review of the options modelled, taking into account the both contractual and operational implications. This review is important, as it considers the practical suitability of each option and the factors which need to be taken into account when considering the overall suitability of the preferred option. These are considered during the qualitative review in Section 0.

4.1 Contractual Implications

4.1.1 Current Contract

SDDC currently operates split service delivery across an in-house refuse and garden waste collection service, and outsourced recycling collection service. This review does not consider the impact of changing how services are delivered (i.e. providing a complete in-house service), which is covered as part of the review of Commissioning Options (Section 6.0). The current recycling collection service contract is due to expire in October 2021, and as such this should be a consideration when reviewing the options.

For Options 2 and 3, it is likely that any service change will lead to negotiations with the current contractor. However, with the contract expiring within approx. 12 months of a decision being made, it is likely that any change to the service could be postponed until the end of the contract.

Options 1 and 1a, would only require a change to the collection methodology for the services which are currently operated in-house, and therefore, these changes could be made quicker, without any need for negotiations.

Consideration should also be given to the options should a similar arrangement continue in the future. Option 3 would require food waste to be collected across both refuse and recycling vehicles, which could lead to confusion in regards to material ownership, responsibility for complaints and missed collections, and other operational issues. It is likely that Option 3 would require a standard approach, to either bring the services entirely in-house, create a Local Authority Company or to outsource them all to a contractor.

One of the benefits of Option 3 is the use of a standard vehicle across the fleet. Some of the advantages of this (which are captured within the Evaluation Section 0), would be lost as the contractual implications of sharing a fleet would become difficult.

4.1.2 Material Sales

Currently SDDC pays a fixed cost for the treatment of materials collected under the existing contract, the risk associated with the materials is held by the contractor and not SDDC. This protects SDDC from any variability in the value of material collected. At the expiry of the current contract, SDDC will have to negotiate a new contract for the treatment and sales of materials. Based on the current market position, it is likely that following the contract expiry, SDDC will be required to take on a large proportion, if not all, risk associated with the sale of material.

Due to restrictions in place for exporting recyclate into Asia, and the unknowns of Brexit, and COVID-19 the current market is volatile, with Material Recycling Facility (MRF) gate fees increasing and the value of material decreasing. This modelling does not take into consideration the changes in the market and follows the baseline gate fees so that the change in operation costs can be evaluated.

4.2 Operational Implications

4.2.1 Fleet

A significant cost within a collection service is the vehicles used to deliver it. When operating a fleet, it is essential to ensure sufficient spare capacity is available to avoid disruption when vehicles breakdown or are unavailable due to scheduled maintenance. The requirement for spare vehicles depends entirely on the operations, size of fleet and variation of vehicles within the fleet. Therefore, spare vehicles are not taken into account within the modelling work.

The options modelled use a range of vehicles from the current fleet of split back RCVs, to separate specialised food waste vehicles and resource recovery vehicles (RRVs). Generally, the fewer vehicle types used within a service, the more efficient that service can be with spares, as well as maintenance. At the same time, the fewer specialist vehicles operated the easier it is to provide maintenance, as well as to find additional hire vehicles should this be required. Table 4-1 provides a summary of the vehicles used across each option.

Table 4-1: Vehicles used in each option

Option	Refuse	Dry Recycling	Garden Waste	Food Waste
1 - sep FW	RCV	RCV – Split back	RCV	7.5t RCV
1a - sep FW, 4W Res	RCV	RCV – Split back	RCV	7.5t RCV
2 - MS, 3W 180L Res	RCV	RRV	RCV	RRV
3 - TS FW Pod, 3W Res	RCV - Pod	RCV - Pod	RCV	RCV - Pod

Option 1 and 1a provide a similar vehicle configuration as the current service, but with the addition of a separate food waste vehicle. Although this set up has the biggest variation of vehicles, it provides the simplest and most common vehicle types currently available.

Option 2 uses RRVs to collect recycling and food waste together, with RCVs collecting both refuse and garden waste. An RRV is a specialised vehicle, and is provided through a limited number of suppliers. Although narrow access versions are available, these may not be suitable for some of the narrowest roads across SDDC. For this modelling exercise this has not been taken into account.

Option 3 provides a standard vehicle across three of the four services; an RCV with a pod will be used to collect refuse and recycling, and food waste at the same time. This will provide a consistent vehicle across the fleet for refuse and recycling collections. Having this one vehicle across these services will allow for fewer spares overall, and will give operational flexibility. However, being fairly specialised, they are not as common as other vehicles such RCVs or Twin Pack RCVs, and as such sourcing spares becomes a challenge. It is also widely recognised that the maintenance of these vehicles becomes more costly and complicated due to the additional mechanisms and hydraulics used.

When reviewing the fleet, electrification and decarbonisation should be considered, this has not been taken account for in the modelling. Currently, there is only one purpose built electrified waste collection vehicle available commercially, this is a 26t RCV. The cost of this electrified collection vehicle is double that of a standard RCV, but with lower operating costs. Although well tested, it is not yet clear how well these vehicles would work in a number of different settings including the rural areas of South Derbyshire.

It is possible to retrofit existing vehicles with electric engines, although this can be costly and has not be tested as thoroughly as a full production vehicle. This area is continuously changing and developing however all options are currently costly. It is likely that more specialised vehicles, such as RCVs with pods, split-back RCVs and RRVs, will take longer to develop as a full production electrified vehicle as there is less of a demand for these types of vehicles. The climate impacts of the options are considered further under section 4.2.3.

SDDC are currently exploring the option of purchasing vehicles which use electric bin lifts, these systems are quieter, and reduce emissions of the vehicle between 8 and 14% compared with a normal RCV.

4.2.2 Depot and Transfer Stations

Currently, SDDC operates the refuse and garden waste service out of one depot, with recycling operating out of a separate depot operated by the contractor. This set up is in relation to the current contract arrangements (discussed in Section 4.1), although some of the options modelled may have an impact on this. This section will discuss the depot logistics required for each option, however does not take into account the implications of the current contract arrangement in which refuse and garden operate from a separate depot to recycling.

The main factor being considered is the potential increase in vehicles across Options 1, 1a and 2. This will require additional parking space, which is not currently available within the current depots. A nominal amount has been included within the modelling to account for this, but further consideration is required into the options for depots.

Consideration should also be taken into the unloading of food waste, and locations for crews to tip. It has been assumed that food waste will be tipped into a sealed container at relevant tipping locations, or at the depot in each option. Should food waste be tipped at the depot, additional permits may be required for this.

Option 2 provides the biggest challenge for depots and transfer stations, firstly it requires the greatest number of additional vehicles, and as such a large amount of additional parking would be required to accommodate these vehicles. Secondly, these vehicles require a transfer station with bays sufficient to store the separated materials. Due to the current collection method there is currently no facility in which to do this, and a new transfer station would be required. Costs have been included within the modelling to accommodate this; however more detailed work would be required should this option be considered moving forward.

4.2.3 Climate Impact

SDDC declared a climate emergency in 2019, this means that the District is taking its impact on the environment seriously. Therefore, there will be a requirement in the future to minimise the emissions from and the climate impact which of SDDC's operations.

In order to fully understand the impact of each option would require detailed carbon modelling, which takes into account the impact of material treatment, vehicle emissions and other operational factors on emissions. This project does not evaluate the performance of these options in this detail, and further detailed modelling could be undertaken to assess the climate impacts of each option. Generally, the biggest climate impact of a collection service is the treatment of materials, contrary to the popular belief that this is emissions from vehicles.

Removing materials such as plastic from the refuse stream, which is sent for incineration, is considered as the biggest improvement that can be made. When these materials are burnt, they release their carbon elements, which is more harmful than the process required to collection, treat and recycle these products. Options 1a, 2 and 3 all remove large quantities of recycling from the refuse stream by reducing the frequency of refuse collection.

Improving the treatment of food waste also supports this. The process of anaerobic digestion (AD) used to treat food waste captures gases that are released during the decomposition process and uses them to generate electricity, with other outputs being used for land improvements (depending on the quality). Option 1a captures the highest amount of additional food waste, through the reduction in frequency of refuse collection, with Options 2 and 3 capturing slightly less, but overall, still more than double that which is currently collected.

Tail pipe emissions vary largely depending on the vehicle size and type, but also in the area in which they operated. Detailed modelling is required to accurately estimate the emissions from these options. However, the fewer vehicles operating can usually point to fewer emissions.

Option 1 and 1a, require additional food waste vehicles to operate the food waste collection service, however these vehicles are much smaller, lighter and therefore more efficient than larger vehicles such as RCVs. In Option 1, there is no reduction in requirements for other vehicles and so overall, this service would create higher emissions than the current service. Option 1a has a reduction of 2 vehicles on the refuse service, which slightly offsets the additional food waste vehicles.

Option 2 and 3 both collect the food waste on the same vehicle as recycling, and for Option 3, recycling and refuse. Despite this, Option 2 has the largest increase in vehicles due to the collection methodology, although there are additional vehicles required these emissions are likely offset by the improvement in quality of recycling. Option 3 has no increase in vehicle requirements, and so it is expected that emissions would remain the same as current.

4.2.4 Saturday Freighter and Bring Bank Service

These services are provided to residents on top of their regular kerbside collections. The Saturday freighter service provides an additional collection of refuse on a rotating weekly basis across areas of South Derbyshire. This is on top of the charged bulky waste collection service which is available to all residents, and the household waste recycling centre (HWRC) in Swadlincote. The Saturday freighter service could be seen to be undermining the bulky waste service, by providing some residents with a free collection, where other residents are required to pay for this additional service or make arrangements to transport their waste to the HWRC.

The bring bank service which is operated by SDDC provides recycling for glass, cans and plastic; the core materials which are accepted within the kerbside service. Other services such as Tetra-Pak and textiles are provided by third-parties.

There are currently large amounts of contamination collected from this service, which has an operational impact for SDDC. Veolia, who are contracted to collect these materials, are unable to collect contaminated banks and instead SDDC resources are diverted to empty these containers as refuse. This impacts the efficiency of the service as SDDC are paying Veolia to deliver this service and then emptying these containers anyway. Due to the levels of contamination the bring bank service has very little impact on the overall NI192 recycling rate.

It is likely that, as these materials are conveniently collected on the kerbside, those who use this service are either producing larger amounts of recycling and therefore could instead be provided with additional capacity at their property, or the material is not coming from households, and therefore should not be placed into these banks.

It is commonly known that services like the Saturday freighter and bring bank service are highly abused by traders, who are looking for cheap ways to dispose of their waste. In the analysis of the Saturday freighter service a conservative approach was taken to estimate the levels of waste disposed of illegal by traders. Traders using this service are having an unfair impact on the value provided to residents, as well as putting additional refuse waste into SDDC's waste, and affecting the NI192 recycling rate. Although SDDC don't pay for the cost of disposing this waste, there is also an impact on Derbyshire County Council who will be paying to dispose of this waste.

It is recommended that due to the inefficiencies around both of these services, that their withdrawal will support SDDC in achieving higher recycling rates, and cost savings. By withdrawing these services SDDC are also stopping traders, and other illegal dumping of waste.

5.0 Evaluation

This section explores the results of the evaluation undertaken for each option, across a number of set criteria. This provides a balanced review of each option to support the decision of which option provides the best solution of SDDC. Each option is scored 1 – 5 for each criterion. Qualitative Scoring took into account the factors as discussed in 4.0 and was awarded on a scale of 1 – 5:

- 1 – a negative change to the current service.
- 3 – no/limited change to the current service.
- 5 – positive change to the current service.

Each score was weighted based on SDDC priorities, so that criteria which were more important to SDDC have a higher influence on the outcome of the total score. The weighted score is shown in Table 5-1, the raw score and evaluation is provided in Appendix A.3.0.

Quantitative analysis was also carried out on service cost and recycling rate to provide a weighted score. Service costs were evaluated based on an increase or decrease in costs over a threshold, whilst recycling rate was calculated based on the estimated NI192 for each option achieving SDDCs 60% target in 2023. These are shown in Table 5-1.

Table 5-1: Results of Evaluation

	Weight	Option 1 Sep FW	Option 1a Sep FW, 4W Res	Option 2 MS 3W Res	Option 3 TS FW Pod 3W Res
Qualitative					
Alignment with Environment Bill	20%	12	12	20	12

Resident Acceptability	10%	6	4	4	6
Implementation / Deliverability	10%	6	4	2	4
Impact on Recycling Market	5%	3	2	5	4
Climate Change Impact	15%	6	12	12	12
Quantitative					
Recycling Rate	25%	20	24	24	23
Service Cost	15%	9	15	12	12
Total	**100%**	**62**	**73**	**79**	**73**

Overall, the results of the evaluation place Option 2 as the preferred option for SDDC, however Options 1a and Option 3 remain close behind in joint second. The largest influence on this result is the importance of the future options aligning with the future Environment Bill. As this is not yet completely defined, it is worth continuing to consider Option 3 until further information is available.

There are still considerations that need to be taken account when deciding preferred options, including; how these services may be implemented, and when they could be implemented taking into consideration the timeline for the Environment Bill, but also the implications of the current contract expiring in October 2021.

It has been made clear that the Government will need to support Authorities with any additional costs associated with meeting the requirement of the Environment Bill, to ensure there is no additional burden. It has not been made clear as to whether this support would be available should SDDC make changes ahead of a published Environment Bill.

It is usually recommended that a decision is made on the collection options, before proceeding with any decision to bring service in-house or undertake a procurement exercise. However, with the up-coming legislative changes due between now and 2023 it is recommended that SDDC wait before moving forward with a decision on collection services.

6.0 Commissioning Options

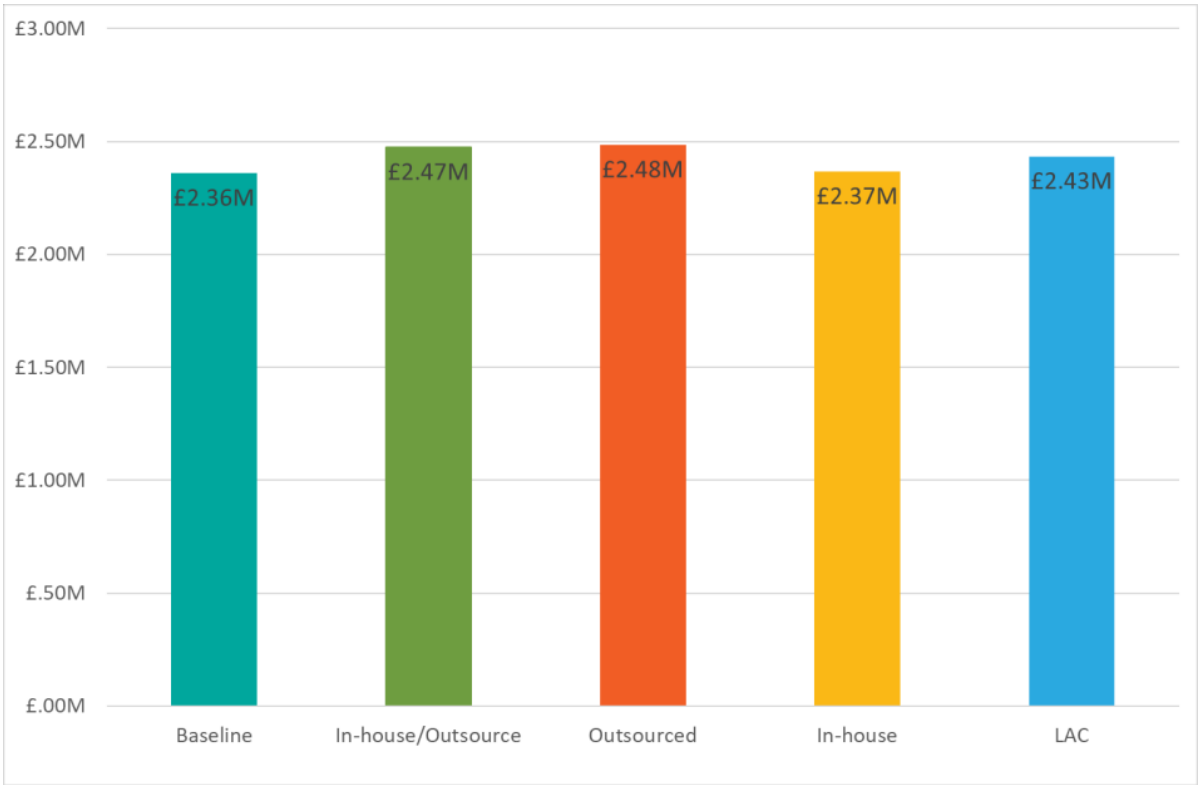
This section presents the results of a high-level quantitative review of the commissioning options available to SDDC to delivery services following the expiry of the current recycling contract in October 2021.

6.1.1 Cost Modelling Results

Figure 6-1 presents the results of the high-level cost modelling, showing the annual cost for each commissioning option. This table includes the total operational costs of each option, but does not consider the one off costs required in each option. The chart shows that:

- All future options show an increase on the current cost of providing services. It is anticipated that under the current contract arrangements, the contractor does not make profit on this contract, which it offsets through the sale of material and use of SDDC's paper and card within its own paper mill.
- Delivering services in-house offers the lowest modelled solution for running refuse, recycling and garden waste services. This is primarily due to not having additional profit margins and overheads to cover. Although some staff are transferred into the Local Government Pension Scheme (LGPS), this is a relatively low proportion of the overall workforce.
- The LAC option does not deliver the lowest modelled solution for running refuse, recycling and garden waste services. Although it is assumed that staff do not receive LGPS when transferring from the existing contract, all staff subject to TUPE from SDDC would still receive the same pension. Operating a LAC attracts additional overheads needed to cover costs such as HR and payroll, health and safety and other corporate overheads.
- Operating a split delivery system across in-house refuse and garden waste services and an outsource recycling service is more expensive than operating all services in-house. Although all costs are the same, the modelling has taken into account additional corporate overheads and profit that would be placed on a new contract.
- A fully outsourced solution for running refuse, recycling and garden waste services has the highest modelled cost. However, is very similar to the inhouse / outsource option. This is again due to the additional corporate overheads and profit that would be placed on a new contract. Staff transferring from the current in-house option would still be entitled to pension contributions in line with SDDC's LGPS through TUPE therefore there are no staff cost savings.

Figure 6-1: Annual Cost of each Commissioning Option



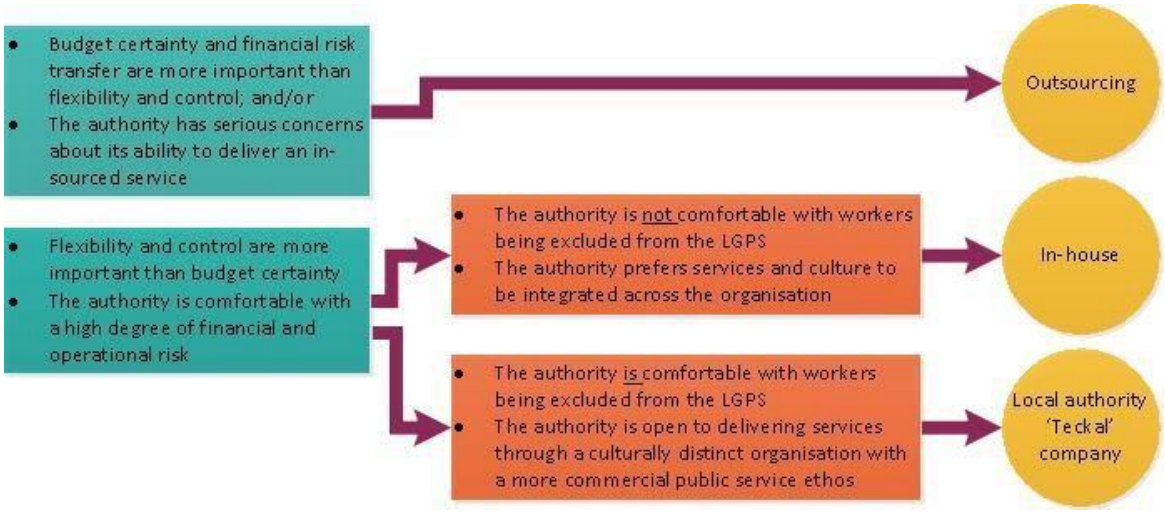
When reviewing different commissioning options consideration should be given to the one-off costs that go alongside each of these options. These include the cost to run a procurement process, or the costs of additional support to mobilise an in-house service or the cost of setting up a LAC. These costs have not been included within the results, as they often vary depending on the support required, for example as SDDC already has a strong in-house operation support the required support is less than the specialist support that would be required to move the service into a LAC.

6.1.2 Quality and Risk

Determining which option is the "best", means looking at the wider picture than the associated costs. This work has not included a detailed Quality and Risk assessment, but provides a high-level understanding of the risk associated with the commissioning options. Each of the options presented provide the Authority with different benefits and risk. There are decisions that need to be made in order to ensure that the option selected meets the ambitions and expectations of SDDC. The decision-making process outlined in Figure 6-2 was also developed to support officers to think about the appetite for the following key strategic risks:

- budget certainty and financial risk;
- flexibility and control; and
- pension contribution and pension scheme provided to the workforce.

Figure 6-2: Decision-Making Process



Following the workshop with SDDC members on 3 September 2020, the outcome of the decision-making process was conclusive that SDDC wants to have flexibility and control over their services, reflecting the impact of the upcoming Environment Bill. Knowing that there is operational expertise in-house, it was also reflected that SDDC would be willing to take on the operational risks, associated with these services. At a high-level this points to delivering services in-house, even if just in the medium-term whilst the Environmental Bill is finalised, and further information is available. However, this solution would have cost implications on future outsource options. As the staff who are brought in-house would be enrolled within the LGPS, which when outsource again they would be entitled to, therefore increasing costs.

Further details of the risks that should be considered are explored below:

- Budget Certain and Financial Risk: For the outsource option, the contractor bears overspend risks. Management in the in-house option may not be subject to the same commercial pressures to manage budgets and deliver profits, and in any event the Council bears the overspend cost risk. For the LAC option, whilst the Council still bears the overspend risk, the LAC management and commercial mind-set may be more likely to keep costs in check.
- Flexibility and Control: Service change in the outsource option would involve contract negotiations, whereas in the other options, change would be easier to implement, although considerable flexibility can be built into contracts.
- Performance: The outsource option may be more suffer poor performance since the Council has less direct control over the delivery of the services and the contractor is motivated by profit as well as customer service.
- Operational Risks: The contractor largely bears operational risks in this option, but for the LAC and in-house options, operational risks are ultimately the responsibility of the Council.
- Expertise acquisition: The outsource option would involve selecting a contractor with the relevant experience. For the in-house option it would be necessary to recruit highly experienced management which could presents a risk (however SDDC already holds this experience in-house); a LAC may be a somewhat more attractive proposition for experienced candidates.
- Best Value: For the contracted out option, it is assumed that the competitive tender process would result in a contract price that demonstrably provides Best

Value to the Council through market testing, while the LAC and in-house options do not undergo a procurement process and are therefore less certain to represent best value.

7.0 Summary

7.1 Collection Options

Each of the options modelled provides improvements to the kerbside recycling rate, compared with the baseline. Options 1a, 2 and 3 all achieved a kerbside recycling rate above 60% through the increase in food waste, and diverting recyclable material into the recycling stream through the reduction in refuse capacity.

Overall Option 1a provides the lowest cost service, primarily due to the reduction in the refuse vehicles required and the lower cost to purchase and operate food waste vehicles. The reduction in residual frequency pushes recycling and food waste out of the refuse collection which reduces the gate fee applicable. The small increase in operational costs required to operate the food waste service is offset by both reduction in refuse resources and the benefit of lower gate fees. Options 2 and 3 provide similar costs; both have additional operational costs compared with the baseline, however based on the transfer of material into recycling and food waste the reduction in gate fees, these costs are largely offset.

The evaluation of the options against SDDC's priority puts Option 2 firmly as the preferred option, scoring 79%. Options 1a and 3 are joint second with 73%. Until further detail in provided in regards to the Environment Bill, Option 3 should also continue to be considered.

As explained in Section 4.1.2 the service costs are calculated based on the current value of materials, and the costs associated with current contract for sorting materials. It is recommended that further analysis is undertaken to understand the risk associated with material income, as fluctuations in this could change the overall costs for all options.

In order to fully understand the carbon impact of each option in details, to understand the full impact of each option on SDDC carbon footprint, it is recommended that a detail carbon modelling exercise is carried out.

The Saturday freighter and bring bank service are both currently operating inefficiently by collecting large amount of contamination and trade waste. Both which are having large impact on costs and recycling rate. Due to this, it would be recommended that both services are removed, in order to ensure the residents are not unfairly paying for traders and those who are not correctly using these services. It will also encourage residents to use other services which are available such as the kerbside recycling service, charged bulky waste service and HWRCs.

7.2 Commissioning Options

The cost modelling undertaken to review the four options available to SDDC following the expiry of the current recycling contract shows that bring all services in-house is the cheapest option. With outsourcing and a combined in-house / outsourced becoming the most expensive.

This work estimates that the current recycling contract does not make money, and that profit is sought through the material processing available from SDDCs materials. Therefore, all of the options are likely to require an increase in the current budget.

Cost is not the only element that should be considered however, and a review of the strategic decision-making process puts the initial decision as moving to a fully in-house service, at least in the medium term, to give flexibility to SDDC to implement upcoming changes required by the Environment Bill. *It is recommended that a further consideration of costs associated with this approach is considered due to TUPE implications*.

As SDDC already operates a well performing in-house service, with technical expertise it is expected that bringing an additional service in-house would not cause additional risk and there is the experience to manage budget, and changes in cost as they are currently managed.

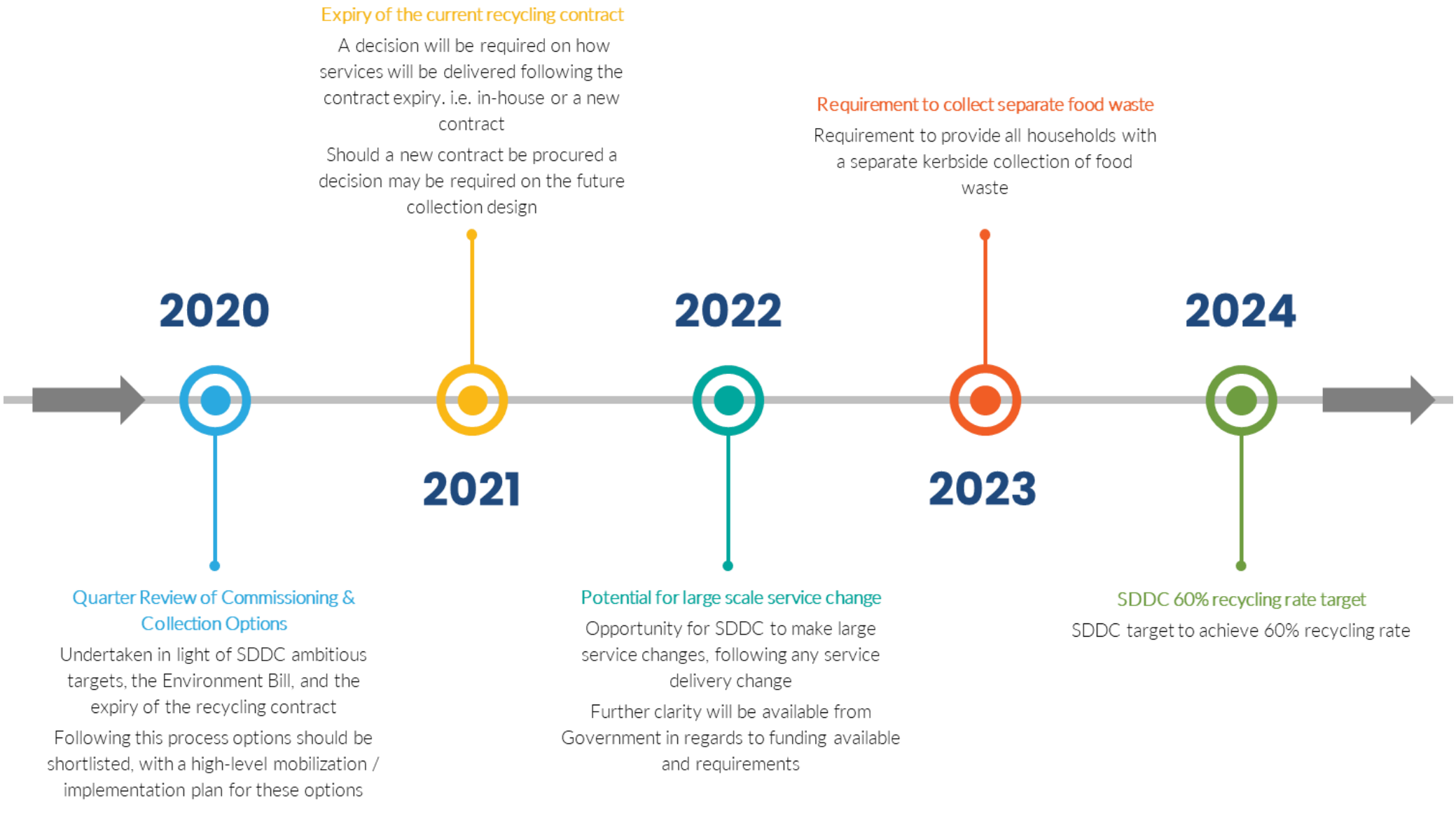
7.3 Five-year strategy

There is a lot of unknown in the next five years, in regards to the exact requirements that will be set out in the Environment Bill, and what funding will be available to local authorities to undertake the required service change. Figure 7-1 shows a five-year timeline of the key areas that SDDC may wish to focus.

Due to the expiry of the contract in October 2021, it is unlikely that any service change will be implemented prior to the expiry of the current recycling contract. I*t is recommended that the decision as to commissioning option is made first, alongside further analysis of the implementation strategy for any preferred options.*

It is likely that any service change would not take place until 2022, following any change to the delivery of services either to a new contractor, or taking in-house. This may provide sufficient time for the Government to provide details of the requirements of the Environment Bill and any funding that will be available alongside it. This will then provide time for SDDC to implement new services to comply with the 2023 required to collect separate food waste from all properties, and reach for the 60% recycling target by 2024.

Figure 7-1: Five Year Timeline


2020
Quarter Review of Commissioning & Collection Options
Undertaken in light of SDDC ambitious targets, the Environment Bill, and the expiry of the recycling contract
Following this process options should be shortlisted, with a high-level mobilization / implementation plan for these options
2021
Expiry of the current recycling contract
A decision will be required on how services will be delivered following the contract expiry. i.e. in-house or a new contract
Should a new contract be procured a decision may be required on the future collection design
2022
Potential for large scale service change
Opportunity for SDDC to make large service changes, following any service delivery change
Further clarity will be available from Government in regards to funding available and requirements
2023
Requirement to collect separate food waste
Requirement to provide all households with a separate kerbside collection of food waste
2024
SDDC 60% recycling rate target
SDDC target to achieve 60% recycling rate

APPENDICES

A.1.0 Assumptions Report

A.1.1 Introduction

Eunomia Research & Consulting Ltd. (Eunomia) was commissioned by South Derbyshire District Council (SDDC) in June 2020 to conduct a review of the waste collection services and to model a number of options for the delivery of the waste and recycling services in South Derbyshire. This work builds on a WRAP commissioned project assessing the collection options across the Derbyshire Waste Partnership area and aims to assess possible service changes to kerbside collections, bring sites and freighter service in order to provide cost, operational and performance information on each of the proposed options.

The start of this process is the creation of a baseline model to accurately represent the current service, and to determine the performance of the options being modelled. Authority-specific data is used to populate the model, such as number and types of households, geography characteristics and waste composition. Further assumptions used for future options are also presented in this Appendix.

This Appendix is structured as follows:

- The Introduction (Section A.1.1) continues with a brief summary of the current service provided by SDDC.
- Local Authority Data (Section A.1.2) details the data used and assumptions made for SDDC's current service and future options modelled, such as household numbers, vehicles, logistics and staffing.
- Cost Assumptions (Section A.1.3) shows the cost assumptions made in the model, such as material prices and gates fees.

A.1.1.1 Current Service

A baseline model is set up which reflects the current service in terms of resourcing and performance in order to calibrate the model. A summary of the current service provided in South Derbyshire is shown in Table 0-1.

Table 0-1: Current service

	Refuse	Dry Recycling	Mixed Organics
Frequency	Fortnightly	Fortnightly	Fortnightly
Vehicle	RCV	Split back RCV	RCV
	Refuse	**Dry Recycling**	**Mixed Organics**
Materials and Containment	240 L wheeled bin	240 L wheeled bin (plastic packaging, cans, glass); Insert caddy (paper and card)	240 L wheeled bin

A.1.2 Local Authority Data

A.1.2.1 Household Data

The number of households on each collection service type are shown in Table 0-2, as provided by SDDC. SDDC provided information that communal bins are co-collected with those properties on standard access.

Table 0-2: Number of Households Offered the Services

Service Type	Refuse	Dry Recycling	Organics

Standard Access	46,157 (including 2,500 assisted collections)	46,157 (including 2,500 assisted collections)	46,157 (including 2,500 assisted collections)
Restricted Access	250	250	250
Communal Bin	175	175	175
Total Household	**46,582**	**46,582**	**46,582**

As communal bins are collected by the same vehicles as the standard access properties, these were modelled together. Restricted access properties were not included in the waste flow model; however, the cost of this service was accounted for. Further, trade waste was not included in the model and tonnages were altered accordingly.

A.1.2.2 Capture of Materials

The total kerbside arisings are shown in Table 0-3. The baseline values are based on tonnage and MRF sampling data for 2019/20 provided by SDDC.

Recycling tonnages were supplied by SDDC but were not verified for quarter 4 (January – March 2020). Total paper and card tonnages were supplied and were split into individual paper and card streams using the yearly average composition based on hand sampling data provided by the Contractor (Palm Recycling). The container material (plastic, cans and glass) was also split into the relevant streams using the annual average composition of MRF sampling data, also provided by the Contractor.

For refuse and organic waste, weighbridge data was supplied. It was assumed that all weight entries allocated to Teams 1-12 and Spare Crew that had BIFFA as the disposal site was household organic waste. WRAP analysis was used to estimate the split of food and garden waste in the organic stream[2].

Yields predicted for the options were based on the following assumptions:

Dry Recycling

- It is estimated there would be no change in the recycling yields in Option 1.
- An increase in dry recycling of 20% from the baseline is predicted for Options 1a and 2. There are very few authorities with a four-weekly refuse and therefore, we have based the prediction on 15% increase in dry recycling benchmarked for a threeweekly refuse collection system[3] plus 5%. This is estimated on the basis that a 240L four-weekly or a 180L three-weekly collection gives 25% less capacity than a 240L three-weekly collection.
- An increase in dry recycling of 20% was also predicted for Option 3. This is based on the benchmarking of 15% for three-weekly collections[4], plus 5% due to a 30% increase

[2] WRAP (2010) *Performance analysis of mixed food and garden waste collection schemes*, 2010

[3] Eunomia Research & Consulting (2018) *Waste and Recycling Services Support to Derbyshire Dales DC, Chesterfield BC and High Peak BC*, Report for WRAP, February 2018

[4] Eunomia Research & Consulting (2018) *Waste and Recycling Services Support to Derbyshire Dales DC, Chesterfield BC and High Peak BC*, Report for WRAP, February 2018

in recycling capacity. As the container size for fibres in the baseline is likely a limiting factor, capture of cardboard has been increased by an additional 5% compared to other dry recyclables.

Food Waste

- A food waste yield of 60 kg/hh/yr is estimated for Option 1, based on benchmarking results and Eunomia expertise.
- For Option 2 a further 39% increase in food capture is assumed due to the reduced refuse capacity to 60L per week and previous benchmarking results[5]. As Option 1a has the same weekly refuse capacity as Option 2, and it is assumed four-weekly refuse collections will force further behaviour change, an increase of 45% food waste capture is used.
- A 25% increase in food waste is estimated for Option 3 due to three-weekly refuse collections encouraging behaviour change.

Refuse

- A reduction in refuse of 21% is assumed for a reduction in refuse collection frequency to three-weekly. This is based on benchmarking results[6] and applied to Option 3.
- A reduction of 26% refuse is assumed for the move to three-weekly collections and the further reduction of capacity to 180L bins, and is applied to Option 2.
- For four-weekly refuse collections a reduction of 31% refuse is assumed. This is applied to Option 1a.

Garden

- It is assumed that there would be no change in garden waste yields across the different options.

Table 0-3: Estimated Baseline Kerbside Yields (kg/hhld/year) for Street Level Households that receive each Collection Service

Material	Estimated Recycling Performance (kg/hhld/year)				
	Baseline	Option 1	Option 1a	Option 2	Option 3
Paper	37	37	44	44	44

[5] Eunomia Research & Consulting (2018) *Waste and Recycling Services Support to Derbyshire Dales DC, Chesterfield BC and High Peak BC*, Report for WRAP, February 2018

[6] Eunomia Research & Consulting (2018) *Waste and Recycling Services Support to Derbyshire Dales DC, Chesterfield BC and High Peak BC*, Report for WRAP, February 2018

Card	21	21	25	25	26
Plastic Packaging	20	20	24	24	24
Glass	55	55	66	66	66
Ferrous Cans	7	7	8	8	8
Aluminium	3	3	3	3	3
Contamination	15	15	18	15	21
Dry Recycling Total	**157**	**157**	**188**	**170**	**192**
Food Waste	24	60	87	83	75
Garden Waste	235	235	235	235	235
Refuse	434	398	256	288	301
Total Arisings	**850**	**850**	**766**	**777**	**803**
Total (excl Garden)	**615**	**615**	**531**	**542**	**568**

Figure 3-1 shows the quarterly collected tonnages of each stream collected based on Waste Data Flow from 2015/16 to 2018/19, and using tonnages provided by SDDC for 2019/20. There have been no major changes to the service over this time period and tonnages remain relatively steady.

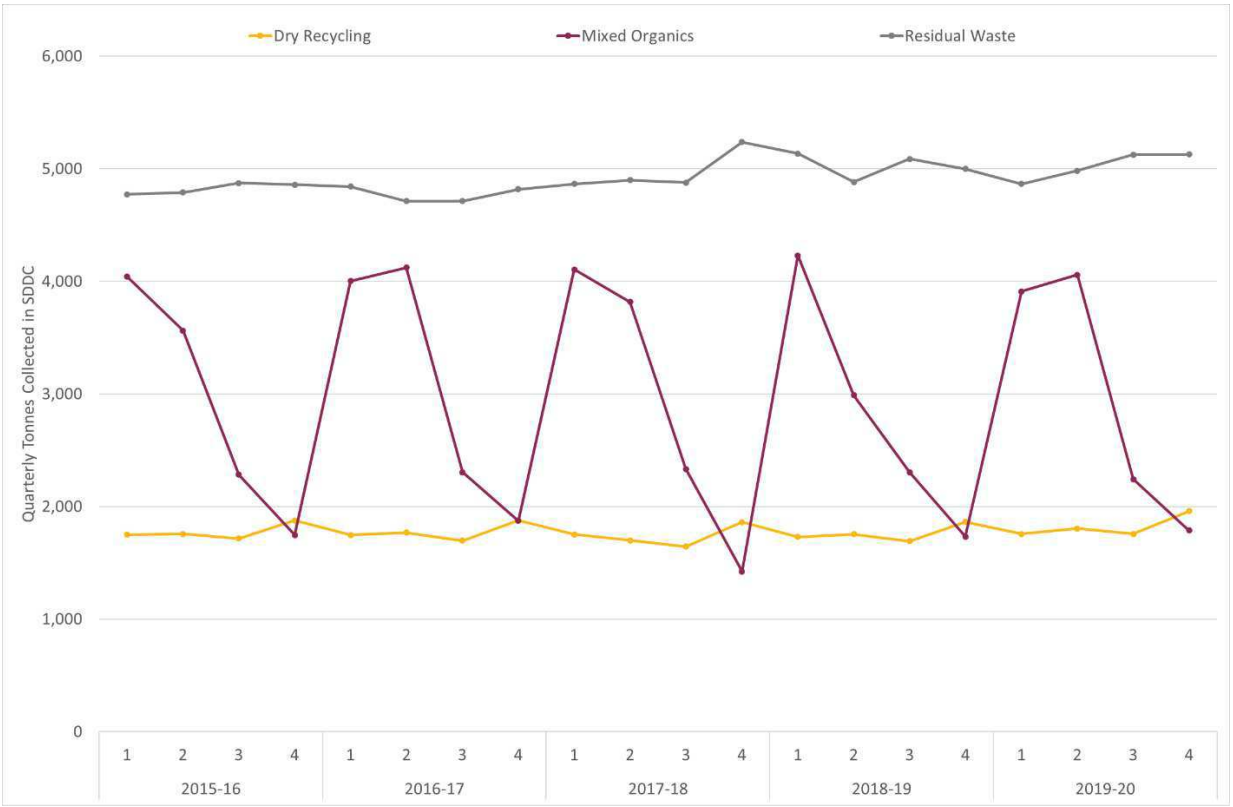


Figure 0-1: Quarterly tonnages of recycling, organic, and refuse streams from 2015/16 to 2019/20.

A.1.2.3 Depot Locations and Tips

The depot and tip locations were provided by SDDC for the baseline and are shown in Table 0-4. It is assumed the same tipping locations will be used in each option, and that where food waste is co-collected with dry recycling or refuse that no additional travel time is required between tipping each material stream.

Table 0-4: Depot and Tip Locations

Facility Name	Postcode	Material
Swadlincote Depot	DE11 9DL	Dry Recycling
Ensor Holdings	DE11 8EU	Dry Recycling
Biffa (Etwall)	DE65 6GX	Mixed Organics
Willshees	DE14 1LX	Refuse
Raynesway (FCC)	DE21 7BA	Refuse

The tipping time is counted from arrival at the tip to being ready to depart, including queuing, weighing and unloading (Table 0-5). The average number of tips per vehicle per day are also shown.

Table 0-5: The time taken to tip materials and the average number of tips per vehicle per day

Option	Material	Time at tip (mins)	Average number of tips per day*
Baseline	Dry Recycling	12.5	1.3
	Mixed Organics	10.0	2.0
	Refuse	8.6	2.0
1	Dry Recycling	12.5	1.3
	Garden	10	2.0
	Refuse	8.6	2.0
	Food	10	1.0
1a	Dry Recycling	12.5	1.5
	Garden	10	2.0
	Refuse	8.6	2.0
	Food	10	1.8
2	Dry Recycling & Food	25	1.0
	Garden	10	2.0
	Refuse	8.6	2.0
3	Dry Recycling & Food	13.6	1.4-1.7**
	Garden	10	2.0
	Refuse & Food	13.6	2.0

* Average number of tips per day from modelling results

** Weeks where fibres are collected require fewer tips than weeks where container materials are collected

A.1.2.4 Participation and Set-out

M·E·L research conducted a compositional study on refuse in 2017[7], which also provides the set-out rate for refuse in South Derbyshire. No information was provided for dry recycling and organic set-out rates. Therefore, we have modelled set-out rates based on WRAP national average data for dry recycling (80% based on rurality), and suggested a set-out rate of 75% for mixed organics, as organic set-out rates are usually lower than dry recycling (Table 0-6).

For the future options a set-out rate of 45% is assumed for food waste in all options. The set-out for dry recycling is decreased in Option 2, as this offers a weekly recycling collection and residents are less likely to present every collection. Set-out rates for refuse are increased in Option 1a, as residents are more likely to present every collection on a four-weekly cycle.

Table 0-6: Set-out rates for dry recycling, organic and refuse containers used in modelling. Assumptions in *italics*

Option	Material	Set-out rate
Baseline	Dry Recycling	*80%*
	Mixed Organics	*75%*
	Refuse	90%
1	Dry Recycling	*80%*
	Garden	*75%*
	Refuse	*90%*
	Food	*45%*
1a	Dry Recycling	*80%*
	Garden	*75%*
	Refuse	*95%*
	Food	*45%*
2	Dry Recycling & Food	*65%* *45%*
	Garden	*75%*
	Refuse	*90%*

[7] M.E.L Research Ltd (2017) South Derbyshire Kerbside Refuse Compositional Analysis

Option	Material	Set-out rate
3	Dry Recycling & Food	*80%* *45%*
	Garden	*75%*
	Refuse & Food	*90%* *45%*

A.1.2.5 Vehicles and Crews

The vehicles used in the baseline model are shown in Table 0-13. It is noted that SDDC provided information that four vans are also utilised in South Derbyshire and an additional RCV for commercial waste. However, as these vehicles only service a small number of properties (250 restricted access, 454 commercial) and collect small tonnages they have not been included in the modelling.

Vehicles used in the modelled options are shown in Table 0-8. The numbers of vehicles per day have been calculated through Eunomia's Hermes model.

Table 0-7: Number of Vehicles on Each Service at Baseline

Service	Vehicle Size	Number of vehicles per day	Crew
Dry Recycling	26 t Split back	4	1 Driver, 2 Loaders
Mixed Organics	26 t RCV	4.5	1 Driver, 2 Loaders
Refuse - Households	26 t RCV	4.5	1 Driver, 2 Loaders
Refuse – Commercial*	26 t RCV	1	1 Driver, 2 Loaders
Restricted access*	3.5 t Van	3 SDDC, 1 Contractor	1 Driver, 1 Loader

*Not included in baseline waste flow.

Table 0-8: Number of Vehicles Used in Modelled Options (excl. GW vehicles)

Option	Service	Vehicle Size	Number of vehicles per day	Crew
1	Dry Recycling	26 t Split back	4	1 Driver, 2 Loaders

Option	Service	Vehicle Size	Number of vehicles per day	Crew
	Refuse	26 t RCV	4.5	1 Driver, 2 Loaders
	Food	7.5 t Food Waste	5	1 Driver, 1 Loader
	Total		**13.5**	
1a	Dry Recycling	26 t Split back	4.2	1 Driver, 2 Loaders
	Refuse	26 t RCV	2.4	1 Driver, 2 Loaders
	Food	7.5 t Food Waste	5.8	1 Driver, 1 Loader
	Total		**12.4**	
2	Dry Recycling & Food	12 t RRV	15	1 Driver, 2 Loaders
	Refuse	26 t RCV	3	1 Driver, 2 Loaders
	Total		**18**	
3	Dry Recycling & Food	26 t Pod RCV	5**	1 Driver, 3 Loaders
	Refuse & Food	26 t Pod RCV	3.2	1 Driver, 3 Loaders
	Total		**8.2**	

* As not all vehicles would need two loaders 1.4 is used to indicate t his

** used for container and fibre collections

A.1.2.6 Work Content

Table 0-9 shows the contracted hours and shift pattern for all services.

The work content (i.e. the time spent driving to/from the round, time on the round collecting, and time spent driving to/from the tip) is an important input into the collection modelling; the assumed work content will be based on the information below. We will assume no change to the work content in the future options.

Table 0-9: Weekly Contracted Hours and Shift Times

	Dry Recycling	Garden/ Mixed Organics	Food	Refuse
Work Content (hours per day)	6.6	6.3	6.6	6.2

	Dry Recycling	Garden/ Mixed Organics	Food	Refuse
Contracted Hours	40	37	N/A	37
Shift Hours*	7:00 – 16:00	6:00 – 14:00	N/A	6:00 – 14:00
Contracted	Contracted group task and finish			
Breaks	1hour unpaid	30mins unpaid	N/A	30mins unpaid

*Average start and finish times

A.1.3 Cost Assumptions

A.1.3.1 Gate fees

Material prices for dry recycling were gathered from an average of WRAP MPR data[8] (April 2019 – March 2020). A cost per tonne was calculated for Container Materials, based on MRF compositional analysis provided by SDDC (Table 0-10), and an assumed sorting fee of £80[9] (Table 0-11). The caddy paper and card was assumed to be sold at a mixed paper and card grade using the WRAP MPR pricing. The same pricings were used for Options 1, 1a and 3, whereas, for Option 2 separate prices for each material were used from the WRAP MPR data, with no sorting fees applied.

Table 0-10: MRF Compositional Analysis of Container Materials

Material	Container Composition
Paper	1.1%
Cartons (Tetrapak)	0.2%
Plastic Bottles	9.6%
Dense plastic packaging	9.6%
Mixed glass	54.7%
Ferrous Cans	7.1%
Aluminium	2.7%

[8] WRAP (2020) Materials Pricing Report - June 2020

[9] Eunomia assumption on the cost of sorting materials through a MRF

Contamination	15.1%

For organic waste a gate fee of £51.70 was provided by SDDC for in-vessel composting (IVC), and for garden waste only options a gate fee of £26.50 was provided. Separate food waste was costed at £20. Recycling credits paid by the Waste Disposal Authority are £60.04.

Table 0-11: Material prices (positive equals a net income from the material)

Material	Sorting Fee	Basket Price	Cost per tonne
Paper and Card	£0	£0	**£16.73**
Container Materials	£80	£55.77	**-£24.23**
Organics	£0	£0	**-£51.70**

For Option 2, where dry recycling is collected separately WRAP MPR data[10] for the separate materials were used and are shown in Table 0-12.

Table 0-12: Material prices for separately collected dry recycling (positive equals a net income from the material)

Material	Cost per tonne
Paper	-£77.12
Card	-£39.23
Plastic Bottles	-£127.40
Dense plastic packaging	-£127.40
Mixed glass	-£7.98
Ferrous Cans	-£115.00
Aluminium	-£801.56

As refuse costs are not carried by SDDC but the Waste disposal authority, the cost of disposal has not been included.

A.1.3.2 Vehicles

The costs and assumptions around upkeep of the vehicles used in the model are shown in Table 0-13.

[10] WRAP (2020) Materials Pricing Report - June 2020

Table 0-13: Vehicle Costs

Vehicle type	Cost per Vehicle	Interest on Capital	Fuel Cost per Litre	Maintenance	Insurance	Annual Road Fund Licence	Annual Cost
RCV	£160,000	0%	£1.31	£16,000	£8,000	£650	**£47,507**
Split-back RCV	£190,000	0%	£1.31	£19,000	£9,500	£650	**£56,293**
Pod RCV	£180,000	0%	£1.31	£18,000	£9,000	£650	**£53,364**
FW	£65,000	0%	£1.31	£6,500	£3,250	£200	**£19,236**
RRV	£127,000	0%	£1.31	£12,700	£6,350	£200	**£37,393**

The value for annual maintenance and insurance is calculated as an overall percentage of the cost of the vehicle, this has been set as 10% and 5% respectively

19/10/2020

A.1.3.3 Staff

Staff unit costs proposed to be used in the modelling are shown in Table 11. The staff costs for refuse and organics drivers and loaders were provided by SDDC. It was assumed that recycling staff would have the same salary, but a reduced pension compared to the refuse and organics staff, as no information was provided by the contractor.

Table 11: Costs of operational staff for SDDC

Description	Salary	NI	Pension	Overtime	Annual cost
Dry Recycling Driver	£20,867	£1,796	£2,087	£1,067	£25,817
Dry Recycling Loader	£19,171	£1,454	£1,917	£0	£22,542
Organics/Refuse Driver	£20,867	£1,796	£2,987	£1,067	£26,717
Organics/Refuse Loader	£19,171	£1,454	£2,646	£0	£23,271

A.1.3.4 Containers

New containers required for any service change are assumed to be purchased outright as a one-off capital expenditure and annualised over 10 years with no interest rate applied to cover borrowing costs. The annual costs modelled cover the annualised capital expenditure and the annual replacement of containers. Container costs were provided by SDDC for current containers used and estimated costs of containers used in future options were provided by Eunomia. These are shown in Table 12.

Table 12: Containers Specification and Cost

Container	Volume (litres)	Unit Cost	Annual Replacement Rate
Wheeled bin	240	£16.43	4.5%
Caddy/Insert	-	£5.10	5.0%
Wheeled bin	180	£14.59	4.0%
Box	55	£2.75	9.0%
Reusable Bag	-	£0.76	18.0%
Kerbside Caddy	23	£4.01	4.0%

A.1.3.5 Depot Works

In each of the options modelled, it has been assumed that work may be required to develop the depot in order to provide space for additional vehicles, purchase additional

equipment or to develop a Waste Transfer Station (WTS). These costs have been included, and where necessary annualised according to Table 13.

Table 13: Annual cost for depot works

	1	1a	2	3
Equipment & Staff	£5,000	£5,000	£95,000	£5,000
Development Work			£40,000	
Additional Land	£15,000	£15,000	£30,000	
Total	**£20,000**	**£20,000**	**£165,000**	**£5,000**
All equipment is annualised over 10 years **Develop**ment work, and purchase of additional land is annualised over 25 years				

A.1.4 Commissioning Options

A.1.4.1 Staff

Staff unit costs where provided for all staff levels within the SDDC operated services, were costs differed between staff undertaking the same role these costs were averaged to give a fixed cost per role. These costs are shown in Table 14, alongside the costs which have been assumed based on the likely organisation structured and assumed costs.

Table 0-14: Cost of SDDC staff and assumed Ward Recycling staff

Description	Salary	NI	Pension	Overtime	Other	Annual cost
SDDC Staff						
Waste & Transport Manager	£36,876	£4,106	£5,089		£1,511	**£47,582**
Waste & Transport Supervisor	£29,636	£2,899	£4,090			**£36,624**
Waste & Transport Officer	£26,317	£2,573	£3,632		£963	**£33,485**
						19/10/2020
Refuse Driver / Chargehand	£20,726	£1,767	£2,958	£712		**£26,163**

Refuse Loader	£19,171	£1,454	£2,646			**£23,271**
Clinical Waste Driver	£19,171	£1,454	£2,646			**£23,271**
Ward Recycling Staff						
Recycling Contract Manager[1]	£30,000	£2,829	£1,200			**£34,029**
Recycling Operations Manager[1]	£28,000	£2,553	£1,120			**£31,673**
Recycling Supervisor[2]	£26,317	£2,321	£1,053			**£29,690**
Recycling Driver[2]*	£20,726	£1,549	£829			**£23,104**
Recycling Loader[2]**	£18,174	£1,197	£727			**£20,098**

Assumed staff structure based on the contract size.

* Driver salary is equivalent to that paid by SDDC, due to the competitive nature of these jobs

** Loader salary has been taken from a recent job advert for Wards Recycling in South Derbyshire

[1]Pension assumed at 4% due to the managerial position, this is higher than operational staff

[2]Pension assumed at 2% to account for likely uptake of pensions, and lower contributions expected

A.1.4.2 Pensions

Pensions rates have been assumed to change for all staff employed by Wards Recycling across the options. For the outsourced and in-house / outsource option the pension rates remain the same as in Table 14, the LAC option pension rates are increased to 7% for all staff, and for the in-house option all staff receive LGPS at 13.8%.

The current SDDC LGPS contribution has been calculated as 13.8%. This has remained the same for all staff currently employed by SDDC.

A.1.4.3 Vehicles

In all options the same vehicle configuration has been used to replicate the current fleet, these costs are provided in Table 15

Table 0-15: Vehicle Costs

Vehicle type	Annual Cost per Vehicle	Annual Fuel Cost	Maintenance	Insurance	Annual Road Fund Licence	Annual Cost
Ford Transit	£3,395	£27,883	£2,376	£1,188	£165	**£35,007**
RCV	£22,409	£27,883	£15,686	£7,843	£650	**£74,470**
Spare RCV		£13,941	£13,808	£6,904	£650	**£35,304**
Split Back RCV	£27,143	£27,883	£19,000	£9,500	£650	**£84,176**
Spare Split Back RCV		£13,941	£19,000	£9,500	£650	**£43,091**

19/10/2020

A.1.4.4 Corporate Overhead and Profit

The review of the current service has identified that it is unlikely that the current contract covers full corporate overhead and profit (COP) that would be expected on a contract such as this. In all options the following assumptions have been made regarding the COP added to each option, as a percentage of the overall service costs as shown in Table 16.

Table 0-16: Corporate Overhead and Profit

Option	Corporate Overheads	Profit margin	Total
Outsourced	5.0%	8.0%	**13.0%**
In-house	2.0%	0.0%	**2.0%**
LAC	5.0%	0.0%	**5.0%**
In-house/ Outsource	The COP for the relevant options are allocated to the service costs delivered by each option		

A.1.4.5 Other Costs

A range of other costs have been incorporated into the modelling in order to ensure the full operational costs are captured. This include the containers, local overheads, costs of depots and income from recycling credits. These costs have been taken from information provided by SDDC and proportioned across the current services for those which are associated with the refuse and garden services and those associated with the recycling service as shown in Table 17.

Table 17: Other Costs

	Refuse and garden waste	Recycling	Source
Containers	£100,485	£50,160	SDDC – cost split by container type for each service
Depots	£50,000	£50,000	Estimated costs for depot operations

Overheads	£103,833	£77,912	Refuse and garden waste taken from SDDC budget. A rate of 75% of this was applied to recycling service to reflect the smaller service
Commercial Waste Income	-£30,000		SDDC budget
Recycling Credits		-£728,625	SDDC budget

A.2.0 Detailed Modelling Results

A.2.1 Resources Required

The number of vehicles and crew required to deliver each of the options, which substantially drives the costs of each option, is presented in this Appendix. The collection requirements are calculated based on either the volume or weight capacity of the vehicles or the time available in the working day to collect from households – whichever is the limiting factor.

It should be noted that, the modelling normally produces non-integer numbers of vehicles and crew for each of the options. In practice, officers will need to consider how resources can be shared between services, or not utilised every day, in order to minimise the need to round up to integer numbers of vehicles within each service, which would subsequently lead to under-utilisation of the resource. However, we understand that savings from the reduction in fractional numbers of vehicles are hard (and sometimes impossible) to realise.

The number of vehicles and crew members required for each of the options are presented in Table 0-18.

Table 0-18: Vehicles and Crews Modelled in Each Option

Service	Baseline	1 - Sep FW	1a - Sep FW, 4W Res	2 - MS, 3W Res	3 - TS FW Pod, 3W Res
Dry Recycling	4.0	4.0	4.2	15.0	5.0
Separate Food Waste	0.0	5.0	5.8	0.0	0.0
Garden Waste	4.5	4.5	4.5	4.5	4.5
Refuse	4.5	4.5	2.4	3.0	3.2
Total Number of Vehicles	**13.0**	**18.0**	**16.8**	**22.5**	**12.8**
Total Number of Crew	**39**	**49**	**45**	**58**	**47**

A.2.2 Pass Rates Achieved

This section presents the modelled pass rates, which is the average number of households passed by one collection vehicle in one day. The average resulting pass rates

achieved in the baseline and future options is detailed in Table 0-19. The pass rates can generally be explained by the changes in the number of vehicles outlined above.

Table 0-19: Average Pass Rates Modelled for Options

Service	Baseline	1 - Sep FW	1a - Sep FW, 4W Res	2 - MS, 3W Res	3 - TS FW Pod, 3W Res
Dry Recycling	1,157	1,157	1,107	617	1213 1217*
Separate Food Waste		1,836	1,602		
Garden Waste	1,033	1,033	1,033	1,033	1,033
Refuse	1,026	1,026	979	1,026	956
* Depending if collection fibres or container materials					

A.2.3 Modelling Costs

The following tables present the costs modelled for each option including vehicle costs (Table 0-20), fuel costs (Table 0-21), staff costs (Table 0-22), containment costs (Table 0-23), and recycling costs (Table 0-24) and income through recycling credits (Table 0-25).

Table 0-20: Modelled Annual Vehicle Costs

Service	Baseline	1 - Sep FW	1a - Sep FW, 4W Res	2 - MS, 3W Res	3 - TS FW Pod, 3W Res
Dry Recycling	£225,034	£225,034	£233,848	£559,447	£270,226
Separate Food Waste	£0	£96,962	£110,864	£0	£0
Garden Waste	£213,651	£213,651	£213,651	£213,651	£213,651
Refuse	£213,850	£213,850	£112,104	£142,567	£171,935

Table 0-21: Modelled Annual Fuel Costs

Service	Baseline	1 - Sep FW	1a - Sep FW, 4W Res	2 - MS, 3W Res	3 - TS FW Pod, 3W Res
Dry Recycling	£90,032	£90,032	£95,488	£56,487	£125,594
Separate Food Waste	£0	£28,766	£40,713	£0	£0
Garden Waste	£148,055	£148,055	£148,055	£148,055	£148,055
Refuse	£114,305	£114,305	£59,022	£76,203	£105,556

Table 0-22: Modelled Annual Staff Costs

Service	Baseline	1 - Sep FW	1a - Sep FW, 4W Res	2 - MS, 3W Res	3 - TS FW Pod, 3W Res
Dry Recycling	£283,434	£283,434	£294,535	£858,425	£473,183
Separate Food Waste	£0	£243,765	£278,715	£0	£0
Garden Waste	£329,462	£329,462	£329,462	£329,462	£329,462
Refuse	£329,769	£329,769	£172,870	£219,846	£311,010

Table 0-23: Modelled Annual Containment Costs

Service	Baseline	1 - Sep FW	1a - Sep FW, 4W Res	2 - MS, 3W Res	3 - TS FW Pod, 3W Res
Dry Recycling	£46,631	£46,631	£46,631	£82,789	£161,215
Separate Food Waste	£0	£25,800	£25,800	£0	£0
Garden Waste	£33,949	£33,949	£33,949	£33,949	£33,949
Refuse	£33,949	£33,949	£33,949	£97,749	£42,550

Table 0-24 Modelled Recycling Costs (minus is income)

Service	Baseline	1 - Sep FW	1a - Sep FW, 4W Res	2 - MS, 3W Res	3 - TS FW Pod, 3W Res
Dry Recycling	£67,848	£67,848	£81,418	-£450,785	£129,738
Separate Food Waste	£0	£55,598	£80,618	£0	£0
Garden Waste	£620,487	£288,299	£288,299	£288,299	£288,299
Refuse	£0	£0	£0	£0	£23,166

Table 0-25: Modelled Recycling Credits (minus is income)

Service	Baseline	1 - Sep FW	1a - Sep FW, 4W Res	2 - MS, 3W Res	3 - TS FW Pod, 3W Res
Dry Recycling	-£436,065	-£436,065	-£523,278	-£704,917	-£671,998
Separate Food Waste	£0	-£166,906	-£242,014	£0	£0
Garden Waste	-£720,163	-£653,188	-£653,188	-£653,188	-£653,188
Refuse	£0	£0	£0	£0	-£69,544

A.3.0 Evaluation Results

Qualitative	Option 1		Option 1a		Option 2		Option 3	
	Sep FW	Score	Sep FW, 4W Res	Score	MS 3W Res	Score	TS FW Pod 3W Res	Score
Alignment with Environment Bill	This option provides a separated food waste collection, and a free garden waste collection. On the recycling collection, most materials remain collected together including glass, there is however a separation of paper.	3	This option provides a separated food waste and a free garden waste collection. On the recycling collection, most materials remain collected together including glass, there is however a separation of paper.	3	This option provides a separated food waste and a free garden waste collection. On the recycling collection, all materials are sorted at the kerbside. This aligns with the expectation of the Environment Bill	5	This option provides a separated food waste and a free garden waste collection. On the recycling collection, most materials remain collected together including glass, there is however a separation of paper.	3
Resident Acceptability	This option introduces a food waste service, which is not being evaluated as all options introduce the same service. However, other than that there is no change in the service offered to residents, therefore a score of 3	3	This option introduces a food waste service, which is not being evaluated as all options introduce the same service. This option then goes further to introduce a 4-weekly collection service, residents may view this as a vast change in service. However, it is unlikely that this would be an immediate change, and residents will eventually get used to this service	2	This option introduces a food waste service, which is not being evaluated as all options introduce the same service. This service would require residents to store additional boxes at their property, which some resident may not have sufficient space for. Residents have previously used this service, so should understand how it works. Due to the additional requirements placed on the resident a score of 2	2	This option introduces a food waste service, which is not being evaluated as all options introduce the same service. This service would require residents to store an additional bin at their property, which some resident may not have sufficient space for. However, residents are receiving additional capacity for their recycling, especially paper and card, which is seeing an increase in capture. This provides an additional benefit which will offset the impact of an additional bin. There is also very little change to residents in the service.	3
Ease of Implementation / Deliverability	No change in vehicles required	3	There will be additional vehicles required, as well as tipping provisions for food waste.	2	A huge change in vehicle needs, and an increase in vehicles, as well as additional development of a Transfer Station capable of tipping separate materials	1	Requirement for a new fleet of RCV w. Pods, which may not time well to combine the recycling & residual service together	2
Impact on Recycling Market	There is no change in the quality of the recycling material, as there is no change in the collection. Although mixed organics will be separated, this happens in all options, so is not evaluated.	3	There is no change to the recycling service, however as refuse is moving to a four weekly service this could create higher volumes of contamination with the recycling stream. Although mixed organics will be separated, this happens in all options, so is not evaluated.	2	As materials are sorted separately at the kerbside, there is likely to be very little contamination within the recycling stream. This is a huge improvement on the materials, however the materials market is currently unpredictable and material prices may change quickly.	5	As residents are provided with additional capacity for their paper and card, this will ensure that there is very little paper or card which requires sorting through the MRF. However, there is unlikely to be any improvement on the quality of the container stream	4
Climate Change Impact	Introduction of food waste vehicles, may cause a higher emissions. There is no change in removing material from the residual waste service.	2	Introduction of food waste service is offset, but the reduction in residual vehicles. There is a push of material out of the residual stream and into recycling due to the restriction on capacity	4	There is an increase in the number of vehicles required, however there is a shift of material out of the residual stream and into specific material streams.	4	Overall reduction in the number of vehicles required to operate the service, alongside a shift of material into recycling, with removal of card within the MRF stream	4

Total	21	23	26	25