Summary Report

Newport City Council - Collections Modelling

Cost, performance and service delivery options for the collection of household waste for Newport City Council

Research date: Mar – June 2015

WRAP's vision is a world in which resources are used sustainably.

Our mission is to accelerate the move to a sustainable resource-efficient economy through re-inventing how we design, produce and sell products; re-thinking how we use and consume products; and re-defining what is possible through re-use and recycling.

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1. Introduction

WRAP, through the Collaborative Change Programme (CCP) has been commissioned to work with Newport City Council (NCC) in order to review their waste and recycling services. This forms part of a wider work programme aimed at creating a business plan for achieving 70% recycling by 2025.

Newport is an urban unitary authority with 64,000 households and a population of 146,000 . Waste services are provided via a partnership with a local social enterprise, Newport Wastesavers, and are as follows:

- Weekly recycling collection of paper, glass, cans, plastic, textiles and small WEEE (electricals), using 2 x 55 Litre kerbside boxes and carried out by Wastesavers;
- Weekly collection of food waste, using 23 litre kerbside caddie and co-collected with the dry recycling by Wastesavers;
- Fortnightly recycling collection for card in reusable hessian sacks carried out by NCC;
- Fortnightly collection of garden waste from 240 litre bins collected by NCC. This service is suspended in the winter for 4 months;
- Fortnightly residual waste collection in predominantly 180Litre wheeled bins collected by NCC;
- Flats receive a weekly or bi-weekly residual waste collection and do not receive a garden waste service.

NCC narrowly met its 2014-15 recycling target of 52%.

1.1. Depot locations and tips

All NCC collection vehicles operate from a depot sited next to Docks Way Landfill Site, Wastesavers vehicles are based nearby at the Esperanto Way bulking station

- Residual waste is bulked at Docks Way and then hauled to the Trident Park incinerator in Cardiff. This arrangement is part of the residual waste hub (Prosiect Gwyrdd) and the council receive a subsidy from Welsh Government (WG);
- Garden waste is bulked at Docks Way and then sent to an in vessel composting facility (IVC);
- Food waste is bulked at the Wastesavers depot and then taken to Bryn Pica anaerobic digestion (AD) facility.
- Dry recyclates; glass, paper, metals & plastics are sorted, bulked and baled at Wastesavers depot and then sent directly to reprocessors around the UK;

- Card is bulked and delivered loose to Viridor's bulking station in Ty Coch.

1.2. Overview of the report structure

As far as possible the technical detail and statistical analysis has been placed in the appendices, with the main body of the report structured as follows:-

- **Collections Modelling:** this section details the methodology and outputs of the collection modelling;
- **Strategic Considerations:** this section considers some of the impacts surrounding the implementation of changes to collection services**;**
- **Conclusion and recommendations:** this section brings together the key results and recommendations from the modelling.

1.3. Appendices

The detailed results are included in the appendices.

2. Methodology

2.1. KAT (Kerbside Analysis Tool) - Collection Modelling Tool

WRAP's proprietary model KAT was used to calculate the performance and costs associated with different kerbside collection scheme configurations for NCC. Furthermore, a 'baseline' model was created which represents the current service. It is essential that the resources and logistics of the existing services are reflected as accurately as possible within the baseline, so that it serves as a reliable foundation for testing various alternative collection service options. Authority specific inputs to the baseline include information regarding the Authority's geography, number and type of households, current services and service performance, resources, and waste composition. Known inputs (from the perspective of the model these include: tonnages of each material type collected, numbers and types of households offered the service, and assumed tipping locations) are calibrated to known outputs (which in modelling terms includes the numbers of crew and vehicles used to deliver the collection services). Factors such as productivity, pass rates, participation rates, recognition rates (and therefore capture rates) are subsequently checked (where known), or developed from scratch where required (depending on the data available and its quality) to provide a full baseline model.

Put simply, the baseline model should reflect:-

- Waste composition and tonnages;
- Current participation, set out, recognition and capture;
- Authority characteristics (household numbers, population, housing types, distances etc.);
- Travel logistics (time, distance, speed, pass rate, pick up time etc.); and
- Current vehicle and container types and costs.

This creates a sensible basis for testing the performance of possible new schemes, ensuring that the Authority's specific constraints are properly reflected.

The projected costs are standardised in order to fairly assess the differences between options. **It is important to note that KAT modelling is relative and based on the current service, thus; if efficiency savings could be made on the current services, then they could also be made on the alternative options.** As such the cost differences are the relevant outputs from this work rather than the absolute numbers.

2.2. Baseline

The current collection services provided by NCC include the following:

- 56,513 households receive a weekly multi-stream collection of paper, cans, glass, plastic bottles and food waste collection by Wastesavers using 7.5T stillage vehicles. These households also receive a fortnightly cardboard collection carried out by NCC;
- 48,000 households receive a fortnightly garden waste collection, which is suspended for 4 months over the winter;

- 6,638 communal properties are serviced by near entry recycling facilities for dry recyclables and food waste;
- Residual waste is collected fortnightly predominantly in 180L wheeled bins.

2.3. Current performance

NCC narrowly met the statutory recycling rate target of 52% for 2014-15; this was broken down as below:

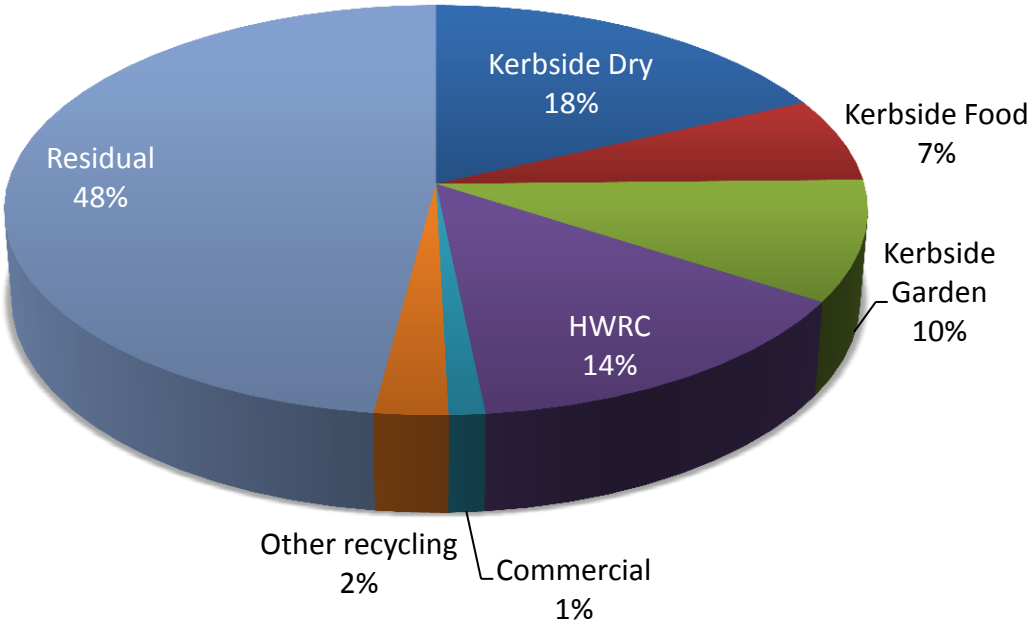

Figure 1: NCC Current Recycling, Reuse and Composting Performance Breakdown

The largest contribution to the recycling rate was from kerbside dry recycling with 18%, this is high compared to other Welsh Authorites, with the best performing authority achieving just over 20%.

Kerbside garden waste and food waste are about average at 10% and 7% respectively.

HWRC contribution is somewhat lower than most councils contributing 14% compared to 25% by some of the top performers.

It is however important to note that Newport only has 1 HWRC site to serve 65,000 households, compared to an average of 1 site per 17,000 across wales. This combined with free garden waste collection, will contribute to the lowered performance from HWRC sites.

In addition, Newport has a high amount of residual trade waste, which exhibits a downward pressure on its overall recycling rate, whilst some councils have little or no trade residual. Removal of trade waste would increase Newport's recycling rate by 4%.

Comparing the yields of individual dry recyclables can be difficult as the quantity available will vary depending on the composition. The figure below compares Newport to Bridgend.

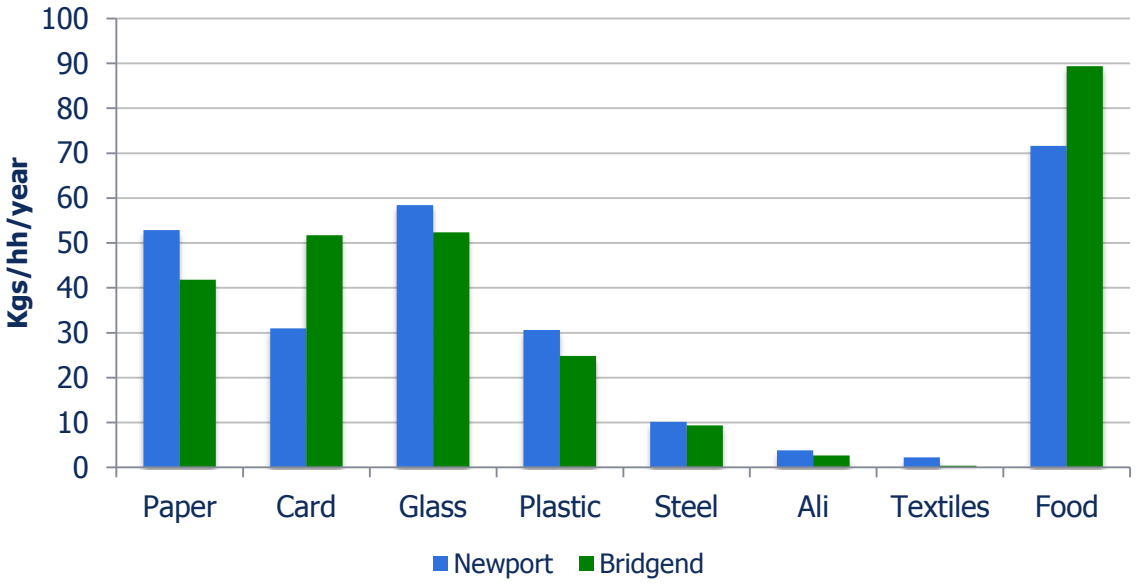

Figure 2: NCC Current Kerbside Yields

Bridgend has a similar demographic to Newport and operates a mature, weekly kerbside sort collection. The only difference is the weekly collection of card with the other dry recyclables. It can be seen that Newport compares favourable for all dry recyclables except card. This is consistent with the view that the fortnightly collection of card is slightly restricting the recycling yield. In addition food waste yields are higher in Bridgend, this may be in part to the fact that the authority has residual waste in sacks.

2.4. Current Service costs:

To understand how the cost of Wastesavers service compares to other councils we have used the latest WLGA waste finance data report, published in March 2015. The WLGA data set is built upon a consistent reporting methodology developed in partnership with the Wales Audit Office and WG. All costs are based around the waste management Revenue Outturn (R/O) of each authority, giving a control figure to cross reference to. A separate line is also included to capture capital depreciation which makes reporting of costs more equitable (those authorities which made capital investment previously appeared to have lower costs when only revenue budgets were assessed).

As can be seen Newport has the lowest cost per household of any welsh authority, this is largely driven by very low kerbside recycling costs and the fact it only has 1 HWRC. Whilst this does not mean that no saving can be found, it shows that Newport perhaps have less scope for implementing more 'easy to make' savings

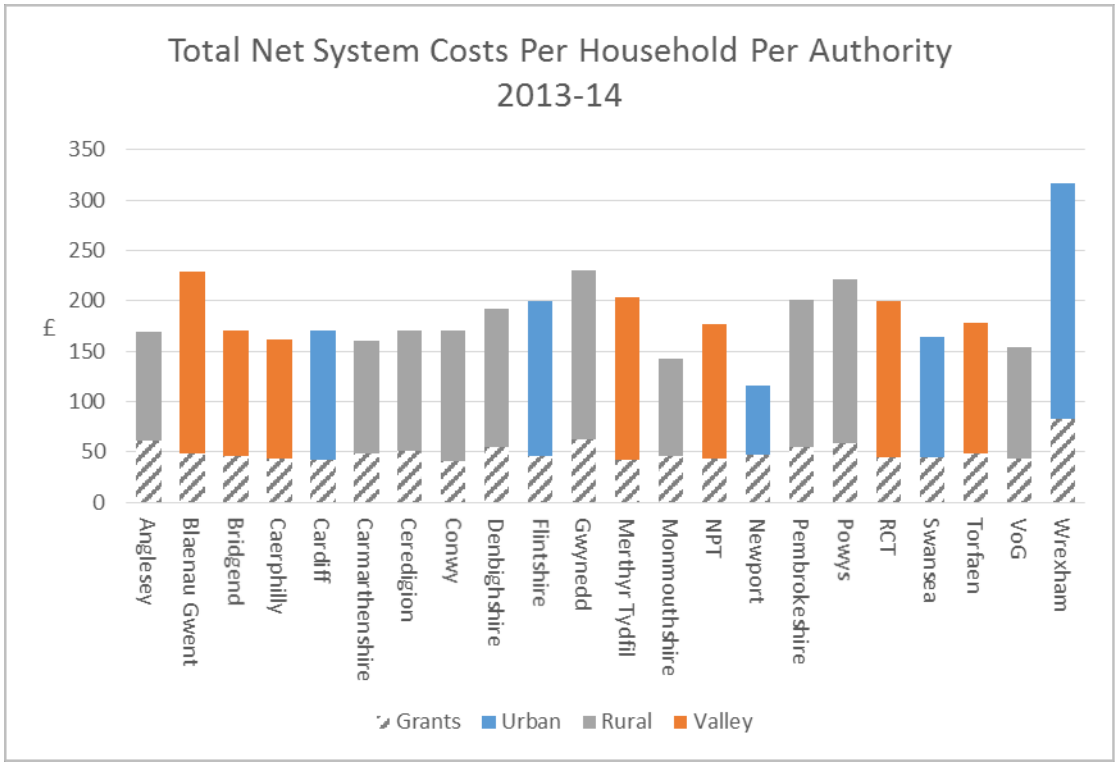

Figure 3: Total Net System Costs per Household per Authority 2013-14

2.5. Options Modelled

The core options modelling examines the impact of changes to the dry recycling configuration and greater residual restriction.

As noted above the fortnightly collection of card is likely to be reducing the yield obtained. When NCC moved its main dry recycling from fortnightly to weekly in 2003 it saw a significant increase in yield.

Given that NCC had recently replaced its residual wheeled bins with 180L bins, it was agreed to look at options that reduced residual collections to three weekly as a way of restricting waste.

Table 1 below summarises the service configurations of the options modelled.

Table 1: Summary of core modelling options

OPTION	Baseline	Option 1a	Option 2a	Option 3a	Option 1b	Option 2b	Option 3b
Refuse	Fortnightly	Fortnightly	Fortnightly	Fortnightly	3 weekly	3 weekly	3 weekly
Wastesavers	Weekly Dry/Food	Weekly Dry/Food	Weekly Dry/Food Card Romaquip	Weekly Dry/Food No Plastic	Weekly Dry/Food	Weekly Dry/Food Card Romaquip	Weekly Dry/Food No Plastic
NCC Dry	Card Fortnightly	Card Weekly		Card/Plastic Weekly	Card Weekly		Card/Plastic Weekly
Garden	Fortnightly	Fortnightly	Fortnightly	Fortnightly	Fortnightly	Fortnightly	Fortnightly

Option 1 is based on the current card collection moving to weekly using the same vehicles. Option 2 adds the card to the Wastesavers dry and food waste collection. For option 3 the current council card RCV is replaced by a two compartment RCV to enable the collection of plastic as well as card.

For the "a" options, refuse remains fortnightly, with the "b" options seeing a move to 3 weekly residual.

For each of the options the following impacts are considered:-

- Cost
- Performance
- Increased yields
- Capital expenditure
- Material income

2.6. Resource Recovery Vehicles (RRVs)

Since 2007, RRVs have been developed as an alternative to stillage and kerbsider type collection vehicles. RRVs commonly collect the full base range of dry materials as well as food waste and other minor streams (such as small WEEE, batteries and so on).

Standard RRVs are usually mounted on a 12 tonne chassis and are able to load on either one or both sides as well as having an element of compaction for plastic, cans and cardboard. A number of manufacturers are now producing such vehicles, including CWS Engineering, Romaquip (Figure 4) and Terberg. These vehicles cost between £90,000 and £125,000 and are typically crewed by a team of driver plus one loader. The latest models can be seen in operation in, Conwy, Anglesey, Powys, Merthyr Tydfil, Blaenau Gwent, Neath Port Talbot, Cotswolds, Cheshire West and Chester, Bristol, Belfast and Armagh.

Figure 4: Romaquip Kerbsort (Conwy)

The standard compartment volumes for this vehicle have been modelled, although it should be noted that the manufacturers are able to make adjustments to the compartment sizes to suit various service configurations.

These vehicles are used in option 2a and 2b as an alternative to the existing stillage vehicles.

2.7. Estimated yields:

The impact of a move from fortnightly residual waste collections to three weekly collections has been estimated based on the performance of other authorities that have made this switch. At the time of modelling only Gwynedd, Bury and Falkirk had moved to three weekly residual collections with a small trial also being carried out in Somerset.

Figure 5 below, shows the changes in residual and recycling yield experienced by these councils.

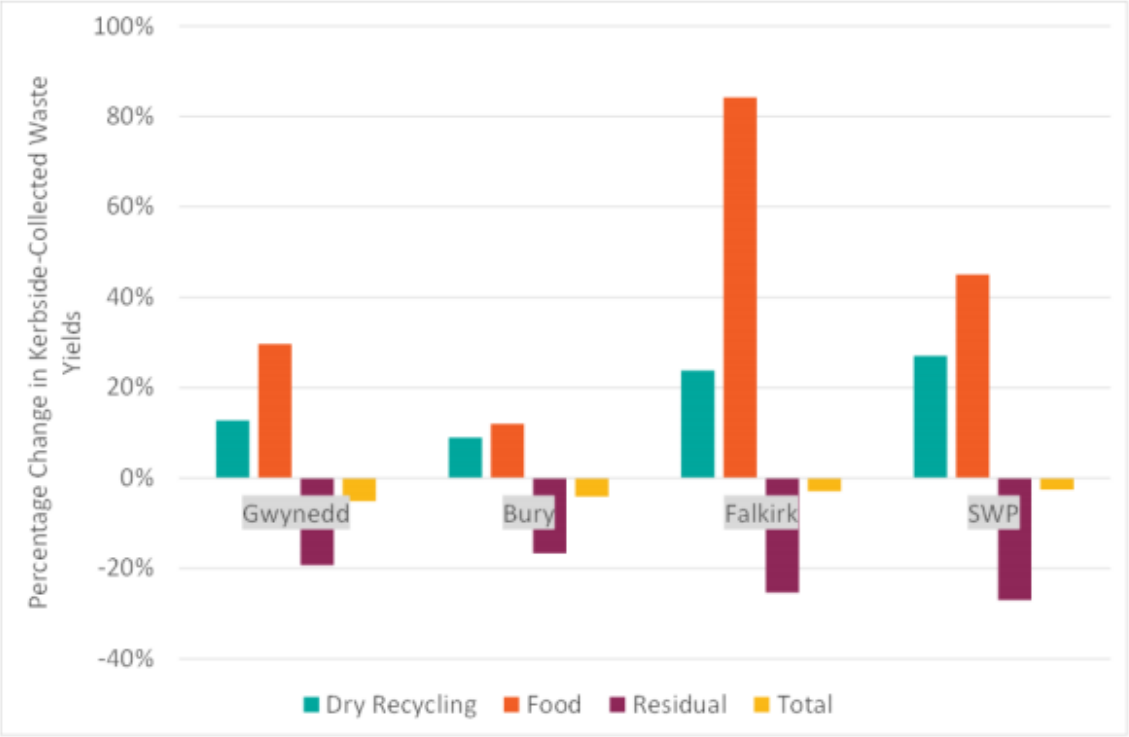

Figure 5: Impact of 3 weekly residual

The results show a clear pattern, of increased recycling and decreasing residual. Dry recycling increases by between 10% and 30%, though it should be noted that SWP added mixed plastics to its collections. Food waste increased by between 10% and 85%. Bury operates a mixed garden and food waste service and Falkirk's initial food yield was very low as such 30% to 40% is perhaps more realistic. It is also interesting to note that in all instances there was a small drop (2% to 5%) in total arisings

Based on this data the following central estimates have been made for the impact of 3 weekly residual in Newport

- Dry recycling increases by 15% for all materials other than glass;
- Glass recycling increase by 10% (due to the existing high capture rate);
- Food waste recycling increases by 30%;
- Garden waste recycling increases by 5%.

3. Modelling results

The following section seeks to present the headline results and draw out the key findings. A more detailed breakdown of the modelled costs can be found in the Appendix.

Note that for modelling purposes we are only interested in how costs will change under the different scenarios and as such, not all fixed costs and overheads are included.

For comparative purposes all capital costs are annualised, however in practice NCC may choose to directly purchase some capital. All costs are 2014-15 prices, and are based on a settled service. There will be a cost associated with any service change; however that will depend on the specific timing of the change, ages of vehicles etc.

The costs are broken down as follows:

Residual Collection -This includes annualised capital costs as well as direct vehicle revenue costs (fuel, maintenance, insurance etc.). It also includes all costs relating to direct operational staff (drivers and loaders,) and associated costs including cover for holidays and sickness.
Wastesavers - This includes annualised capital costs as well as direct vehicle revenue costs (fuel, maintenance, insurance etc.). It also includes all costs relating to direct operational staff (drivers and loaders), depot running costs and management of service. The figure is net of any material income received as this is passed back through to NCC.
NCC Dry - This includes annualised capital costs as well as direct vehicle revenue costs (fuel, maintenance, insurance etc.). It also includes all costs relating to direct operational staff (drivers and loaders); The figure is net of any material income.
Green -This includes annualised capital costs as well as direct vehicle revenue costs (fuel, maintenance, insurance etc.). It also includes all costs relating to direct operational staff (drivers and loaders,) and associated costs including cover for holidays and sickness. Supervision and management is assumed to be constant across all options.
Management and Supervision – This is the core NCC management costs that aren't service specific.
Receptacle replacement – This includes an allowance for on-going replacement of receptacles, and annualised cost for any new receptacles required for service changes.
Disposal Cost – This is the cost of disposal of non-recyclable waste, assumed to be via Trident Park and is net of WG subsidy.
Organics Treatment- This is the costs relating to the processing of garden and food waste.

3.1. Core Results:

Table 2 shows the component service costs of each of the core options modelled.

Table 2: Component service costs for all options

	Fortnightly refuse	Fortnightly refuse	Fortnightly refuse	Fortnightly refuse	3 weekly refuse	3 weekly refuse	3 weekly refuse
		Weekly card	WS card	NCC Card & plastic	weekly card	WS card	NCC Card & plastic
	Baseline	Option 1a	Option 2a	Option 3a	Option1b	Option 2b	Option 3b
Residual Collection	£1,126,902	£1,126,902	£1,126,902	£1,126,902	£865,279	£865,279	£865,279
Wastesavers	£1,020,907	£1,020,907	£1,278,591	£1,077,417	£1,310,512	£1,233,202	£1,080,472
NCC Dry	£454,286	£902,793	£0	£937,837	£913,856	£0	£1,027,345
Green	£439,069	£439,069	£439,069	£439,069	£439,069	£439,069	£439,069
Management & Supervision	£331,089	£331,089	£331,089	£331,089	£331,089	£331,089	£331,089
Receptacle Replacement	£257,344	£257,344	£224,595	£257,344	£280,405	£244,381	£280,405
Disposal Cost	£1,655,425	£1,602,952	£1,602,952	£1,602,952	£1,326,481	£1,326,481	£1,326,481
Organics Treatment	£615,316	£615,316	£615,316	£615,316	£671,341	£671,341	£671,341
Total	**£5,900,338**	**£6,296,372**	**£5,618,515**	**£6,387,927**	**£6,138,031**	**£5,110,841**	**£6,021,480**
Difference from Baseline		***396,034***	***-281,823***	***487,589***	***237,693***	***-789,497***	***121,142***
Recycling Rate	**52%**	**53%**	**53%**	**53%**	**59%**	**59%**	**59%**
Recycling Rate (with IBA)	**58%**	**59%**	**59%**	**59%**	**65%**	**65%**	**65%**

As can be seen the move to weekly card, using the current system (1a) would result in a significant increase in costs, this is due to extra cost related to running RCVs weekly. Whilst the extra card recycling generates some income and some disposal savings, it is not enough to offset the extra collection costs.

The addition of card to the Wastesavers vehicles (2a) is the most cost effective option and generates a net saving. This is due to the cost saving from the RCV pass for card and additional card recycling being greater than the additional cost incurred by the Wastesavers collection. Under this option Wastesavers will replace the current 7.5T stillage vehicles with modern 12T RRVs,this results in an additional cost of operation per vehicle. However the number of additional vehicles is small (1.2) because plastic and cans will no longer be sorted at the kerbside.

The move to weekly card collections is likely to only have a small impact on recycling rate and we have assumed only a 1% increase in overall recycling. However combined with the cost savings, and the improved service to residents, this option is worth pursuing.

The introduction of three weekly refuse collections, results in a reduction in all “b” options compared to the equivalent “a” options, however only option 2b shows a saving against the baseline.

Under option 2b, the residual waste collection and disposal costs are reduced. There is a slight increase in organics treatment, due to the additional food and garden waste recycling. The net cost of the Wastesavers recycling is broadly similar, this is due to the cost of additional vehicles being offset by the additional income.

3.2. Material income

The material values are based on the prices received at the time of modelling and the market for kerbside sort material.

Secondary commodity values are linked to both supply in primary commodity markets and demand for manufactured goods. Recycled products can compete directly with raw materials and this will be dependent on a number of key factors including supply, demand, quality and price, all of which interact with and influence each other.

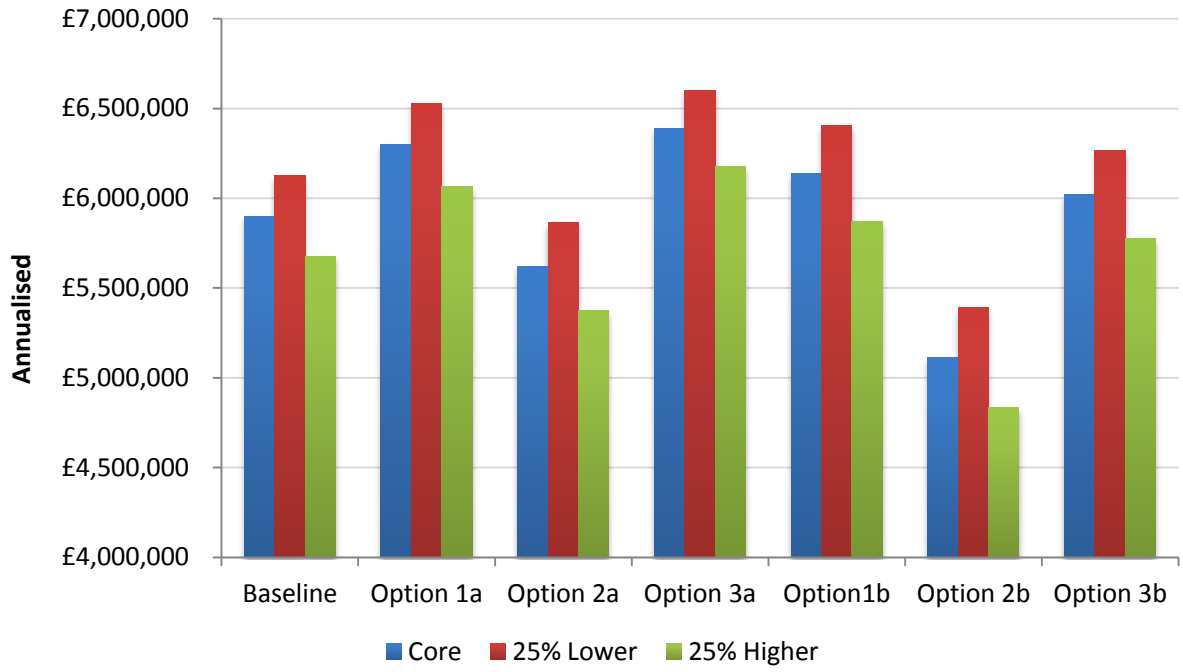

Figure 6: material income sensitivity

The figure above shows the significant impact of material values on the overall costs of service; however the relative performance of each option remains unchanged. An assessment of value for money of Wastesavers by WRAP found that material income derived by Wastesavers is high compared to other Welsh Authorities and the authority has a reputation for high quality recyclate, which will minimise the impact of market fluctuations. Whilst prices for some material can be fixed, this is often counterproductive as a risk premium will be attached to any fixing, which is likely to result in less income over a given period of time.

Further sensitives around composition and housing growth will be examined in the CBA model as these have a broader impact that kerbside collection alone.

3.3. Further options:

3.3.1 Garden waste

Following the initial modelling, it was requested that the reduction in garden waste frequency be examined. The logic for this is that should residual waste collections move from 2 weekly to 3 weekly, the juxtaposition with a retained 2 weekly garden waste service may be confusing.

As there is little data on such a change the modelling is less robust than the core modelling, but gives an indication of the likely impact of such a change.

Although the reduction in garden waste collected is somewhat speculative, we have used a 10% reduction as a central estimation. Given the amount of garden waste relative to the containment and the fact that excess can be taken to the HWRC site at Docks Way, this seems sensible. It may be that for heavy garden waste users NCC issue a larger or second orange lidded bin.

Based on this assumption the reduction in frequency of garden waste and residual waste to three weekly results is a saving of £86K per year, at the expense of 1% recycling rate.

Table 3: Component service costs for all options

	Fortnightly refuse Baseline	3 weekly refuse weekly card Option1b	3 weekly refuse WS card Option 2b	3 weekly refuse NCC Card & plastic Option 3b
total core	£5,900,338	6,138,031	5,110,841	6,021,480
3 weekly garden saving		-86,038	-86,038	-86,038
Net cost	£5,900,338	£6,051,993	£5,024,803	£5,935,442
Difference from Baseline		***£151,655***	***-£875,535***	***£35,104***

3.3.2: 4 weekly residual collection

There is very limited data around the impact of 4 weekly residual waste collections, although a number of trials are currently taking place. Given everything we have seen from the introduction of fortnightly refuse and three weekly refuse, it is reasonable to expect that further residual restriction will result in a greater increase in recycling, through quantifying this is challenging. As such we have chosen a conservative core assumption of a further 5% increase in dry recycling and 10% in food waste, due to the "yuk" factor of having it hanging around for 4 weeks.

Table 4: Component service costs for all options

	fortnightly refuse Baseline	fortnightly refuse WS card Option2a	3 weekly refuse WS card Option 2b	4 weekly refuse WS card Option 3b
Residual Collection	£1,126,902	1,126,902	865,279	748,197
Wastesavers	£1,020,907	1,278,591	1,233,202	1,246,665
NCC Dry	£454,286	0	0	0
Green	£439,069	439,069	439,069	439,069
Management & Supervision	£331,089	331,089	331,089	331,089
Receptacle Replacement	£257,344	224,595	244,381	244,381
Disposal Cost	£1,655,425	1,602,952	1,326,481	1,176,124
Organics Treatment	£615,316	615,316	671,341	689,097
Total	**£5,900,338**	**5,618,515**	**5,110,841**	**4,874,623**
Difference from Baseline	0	***-281,823***	***-789,497***	***-1,025,716***
Recycling Rate	**52%**	**53%**	**59%**	**61%**
Recycling Rate (with IBA)	**58%**	**59%**	**65%**	**67%**

Table 4 above shows the comparison of option 2, under fortnightly, 3 weekly and 4 weekly residual. Whilst the recycling improvement assumptions for option 4 are conservative and result in only a further 2% rise in recycling, the additional cost saving is significant. However the practicality of moving straight from fortnightly to 4 weekly residual may make this option unviable in the short term.

The modelling suggests that the introduction of three weekly residual waste collection, will increase the overall recycling rate in Newport to 65% once IBA is included and it is likely to be the case that a further 5% can be achieved from non-kerbside recycling sources (e.g. commercial, HWRC etc.).

4. Implementation of service change

It is important to note that the modelling carried out represents the cost differences between options based on a settled state, and that any change in service will result in an additional mobilisation cost, including but not limited to:

- Education and leafleting costs
- Initial re-routing and post implementation fine tuning
- Increased complaint handling
- Additional missed collection support vehicles
- Staff training
- Resource dis-optimisation during service roll out

The exact make-up of these costs will need to be developed as part of an implementation plan.

4.1. Routing

The modelling exercise gives a robust estimate of the resources required to deliver different collection scenarios. However, individual round sizes will vary and detailed planning and re-routing will be needed to ensure effective deployment of resources.

There are various routing software solutions available to authorities looking to re-route waste and recycling collection services. These fall into two main categories:

1. Route management software: Software of this type, which continues to be widely used both by public and private sector service providers, provides various interfaces for the design and management of routes but does not automate the process. Instead of supervisors and service managers designing routes, using maps and highlighters, the routes are created on screen by dragging-and-dropping streets, street segments or individual properties to allocate them to individual routes. As a prior exercise, the user will input the amount of waste of each type that they typically collect from each house and the collection time. Based on this data, as the routes are created the software will count the number of properties and make estimates regarding the point at which the round is collecting from as many properties as are practical, either in terms of collection time or vehicle capacity. Additional factors, such as travel time to and from the depot and the tip, allow the operator to quickly design routes which are practically deliverable. The data is stored in a database which is accessible by most council CRM systems, so that information regarding assisted collections or frequently missed collections or other customer complaints or issues can be easily associated with the round lists and flagged to the collection crew.

2. Route optimisation software does the entire above but also automates the design of the rounds using sophisticated algorithms to calculate the best possible routes through the entirety of the work.

Route management software is much quicker to set-up, is cheaper, and offers significant benefits over traditional paper-based methods of work management.

Whilst route optimisation is more expensive, both in terms of software costs and set-up time, an increasingly significant number of users report that it successfully designs genuinely more efficient routes. Once set-up has been completed, new routes can very quickly be generated with less user effort when, for example, service patterns change. It is entirely practical with route optimisation software to re-route services in the most rational way possible: if garden waste services are to be provided at different frequencies at different times of the year, when residual service frequencies are changed, when targeted recycling materials change or when the materials collected in various streams change over time. Route optimisation software would allow, for example, for the regular and fully automated re-routing of commercial waste collection rounds as customers leave and join the service.

4.2. Additional support

Additional support, be it overtime or temporary additional staff and rounds, should be planned and budgeted for during the first few weeks of a service change. Specifically, this is necessary to deal with:

- Potential additional workload due to resident anticipatory stockpiling of waste;
- Potential additional workload in collection areas with day changes as extra materials will be set out if the gap between collections is greater than normal;
- Slower collection times as crews familiarise themselves with new vehicles, collection areas and set out patterns;
- Additional vehicle breakdown likely with new vehicles;
- Deployment of new staff under some of the options;
- If a phased roll out approach is adopted then there are likely to be partial rounds until the full service roll out is complete.

In addition, it is normal to expect an increase in both receptacle requests and missed collections during a service change. Missed collections can result from resident collection times/days changing or crews' unfamiliarity with particular nuances of an area. It is common for informal assisted collections to develop in a stable service and every effort should be made to document these prior to route changes.

We have budgeted for receptacle replacement; however it is likely that these costs will be skewed towards the months around any service change. This is in part due to the added promotion but also due to previous non recyclers taking part.

4.3. Training

We would recommend that additional costs be budgeted for training (although this may just involve a refocusing of current training budgets) specifically to cover the following issues:

- All operational staff should receive general training on the new service as they are ambassadors for the service and will readily be approached by members of the public;
- New vehicles will mean new systems of work and risk assessments;

- Understanding new material grades and rules such as side waste polices;
- Contact centre staff will need guidance and new scripts for new service rules and how to apply any grace period or leniency..

5. Conclusions and recommendations

The current kerbside collection service performs well, delivering a good level of recycling at a very low cost. It broadly complies with the Welsh Government collections blueprint as well as the Waste (England and Wales) Regulations (2011) requirement for separate collection.

Increasing the frequency of card recycling from fortnightly to weekly is estimated to generate a small increase in overall recycling levels (1%).

The most cost effective method of introducing a weekly card collection is to add it to the weekly Wastesavers collection, this generates an estimated saving of £282K per annum compared to business as usual.

The reduction of residual waste collection frequency to three weekly is likely to significantly increase the overall recycling rate (by a further 6%).

When three weekly residual waste collections are combined with weekly collections of card through the Wastesavers service, there is an estimated saving of £789K per annum compared to business as usual, or there would be an estimated saving of £507K per annum, when compared to just introducing weekly card collection.

If residual waste is reduced to three weekly, it may be sensible to reduce garden waste frequency to match residual waste. This is likely to generate a small additional saving of around £86K per annum at the expense of 1% recycling rate.

Given the current performance in Newport, it likely that NCC can achieve a recycling rate of 65% or above through the introduction of three weekly residual waste collections. It is likely that with improvements to other services the 70% (HWRC and trade) target could be met.

It is important to note that year on year budgets will be impacted by movements in material markets and inflation. As such this modelling shows comparative performance rather than absolute.