

Household food waste collections guide



This publication updates the 2009 guide and pulls together the findings from more recent studies and pilots conducted by WRAP and others. Through the various sections, this guide is designed to support local authorities by detailing good practice and evidence which can help inform the design and delivery of high capture, cost-effective food waste collections.

Section 4: Food waste caddies and caddy liners

This section covers the containers supplied to households to enable them to participate in a food waste collection service. It contains information on the containers householders will need if they are to present food waste for collection, and provides advice on the provision of caddy liners.

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4.1 Caddies

Providing practical well designed containers for householders to manage food waste in the kitchen as well as for storing it outside the house is important in encouraging householders to engage with a new food waste collection service. It is strongly recommended that local authorities provide all households receiving a food waste service with both internal and external rigid containers.

4.1.1 *Internal containers*

The term 'kitchen caddy' or 'food caddy' refers to an internal container used by a householder to separate and store food waste before it is transferred to the external container that is put out for collection at the kerbside or another collection point.

How a householder uses their kitchen caddy will vary depending on:

- the needs of individual households;
- available storage space in the kitchen;
- the location in the kitchen where food is prepared;
- the location in the kitchen where food waste was previously disposed: and
- their degree of engagement with the food waste collection service.

The design of a kitchen caddy is therefore crucial, in influencing how readily a householder will accept what is an additional item in their kitchen and perceived additional process in separating their waste. Experience suggests that kitchen caddies in neutral colours such as silver or grey are more acceptable than those in bright or primary colours to avoid contrast with the aesthetics of residents' kitchens.

Kitchen caddies are typically either 5 or 7 litres in capacity and come in either solid or ventilated forms (see Figure 4.1). Kitchen caddies are relatively inexpensive and cost between 90p and £1.20 per unit (excluding VAT). They need to be wide enough to allow people to empty plates into them and shallow enough to allow easy cleaning.

Figure 4.1 Examples of vented and non-vented kitchen caddies



The vented style provides good aeration to help avoid smells created particularly as the organic material in food starts to breakdown. To secure food in the caddy vented containers require the use of liners. Caddies with solid sides do not necessarily need liners, although their use is recommended to reduce cleaning of the container. Some householders will choose to purchase their own caddies and there are a range of designs available through a number of retail outlets.

The contents of the kitchen caddy are transferred to the external container (see Section 4.1.2). As residents would for internal rubbish bins, kitchen caddies need to be emptied regularly (when full or at least twice a week) to avoid smells and to prevent the build-up of micro-organisms such as moulds. Examples of how households store food waste safely and practically in their homes can be seen in a range of videos on the Recycle Now website (www.recyclenow.com/recycle/food-recycling).

4.1.2 *External containers*

Separate food waste collection

Where food waste is collected separately at the kerbside, residents need to be provided with an external container in which they can store food waste outside the house and then present it for collection crews to empty.

A rigid plastic container with a lid (lockable) prevents leakage, avoids attracting vermin and satisfies the requirements of the Animal By-Products Regulations (ABPR) by keeping food waste secure through the collection cycle. Figure 4.2 shows examples of suitable external containers.

Figure 4.2 Examples of external containers suitable for food waste collection



A standard 23 litre container will be ample for the majority of households on a weekly separate food collection cycle. This size of container is typically used in separate weekly food waste collection services across the UK. These containers cost around £3.00 per unit (excluding VAT), depending on the specification and quantity ordered. This style of container is slim and easy to store either inside or, more typically, outside the home.

In recent years, manufacturers of food waste containers have refined the design of external containers to make them as practical as possible for both householders and collection crews. For example, many models include lockable lids ensuring the contents are kept secure and preventing spillages and potential access by vermin.

Although the amount of food in an external container will vary from household to household, the average container presented for collection on a weekly collection cycle typically contains 2.0 – 3.5kg, allowing easy loading into the collection vehicle.

The choice of colour for external containers is arguably of lesser importance than for internal kitchen caddies. Most authorities choose a neutral colour such as grey, green or brown often opposite to the garden waste container to help distinguish it to contact centre staff if replacements are needed.

A 35–40 litre container is an option for large families or for those who do a great deal of food preparation. Larger caddies have been used in some schemes that also allow small amounts of garden waste or paper packaging although the inclusion of non-food items can make benchmarking of scheme performance difficult and may not be acceptable to all treatment plant operators. Larger food waste containers may start to raise manual handling concerns if presented full and collection crews are lifting large numbers of containers in a day. Tailoring container sizes to different housing types requires a good

understanding of average numbers of occupants in properties. It is also more expensive to deliver individual containers than blanket deliveries, particularly as standard containers stack easier in the depot and on the delivery vehicle. If households require additional capacity, they could be offered two standard 23 litre containers on request to ensure they have sufficient capacity for all their food waste.

A wheeled bin is not an ideal container for separately collected food waste and is therefore not recommended for weekly food only collections. Wheeled bins provide far more capacity than is required by the average household on a weekly basis and are more expensive than 23 litre containers. Wheeled bins are frequently used in communal collections from flats where several households are sharing the same container. Typically, wheeled bin collections are slow to load for kerbside crews compared to the manual empty of 23 litre containers and their use would also require more resources and increase the service costs. In addition, food waste may stick to the sides of wheeled bins if liners are not used and it can be difficult for householders to clean down to the bottom of the bin.

Food and garden waste mixed collection

Where food waste is collected with garden waste, a 140–240 litre wheeled bin will typically be needed. The exact size depends on the collection frequency and average garden size of the area serviced.

An advantage of wheeled bins for mixed food and garden collections is that the local authority may already have purchased suitable containers with a long life span for the garden waste service. It is important to consider whether the container's capacity is sufficient for the household size. Containers with too large a capacity for the average household are likely to draw in additional garden waste which might not previously have been collected. Oversize containers may also hide contamination. Surveying property types and consultation with residents groups to consider whether some flexibility in container capacity is needed may help schemes fit local circumstances better.

4.2 Liners

Liners are an important part of the system for collecting food waste. Surveys and focus groups suggest that residents prefer to use liners to:

- keep their internal kitchen caddy and external container clean and hygienic; and
- transfer food waste from the kitchen caddy to the external container securely.

Householder surveys carried out as part of WRAP food waste collections trials in 2008-09¹ suggested that participation would be significantly affected if supplies of free liners were removed and residents were then required to purchase liners from retail outlets.

¹ www.wrap.org.uk/content/local-authority-separate-food-waste-collection-trials

More recent WRAP research on barriers to participation found that households without an ongoing or adequate liner supply tended to stop participating with subsequent difficulties in re-recruiting these households onto the scheme later (see Section 2).

Some local authorities that launched food waste collections schemes without any liner provision from the start (advising residents to use newspaper to line their kitchen caddies) have reported satisfactory participation and yield. But despite the option of wrapping in newspaper, large proportions of presented food waste is contained in caddy liners which means residents are preferring to use liners and are purchasing them.

Current financial pressures on local government may limit the ability of councils to provide sufficient liners or indeed any liners as part of the service. Similarly, households may be unwilling or have insufficient disposable income to purchase their own supplies of liners. The reduced access to liners may well result in lower levels of scheme participation, with adverse impacts on local authority costs, including:

- increased refuse disposal costs due to lower diversion of food waste;
- increased communications costs in trying to re-engage residents; and
- loss of capital as the containers provided to non-participating households are not being used.

Table 4.1 summarises some of the key advantages and disadvantages of using caddy liners. Local authorities need to decide on a liner supply option that is appropriate to their service and local area and which fulfils their objectives from providing a food waste collection service.

Table 4.1 Advantages and disadvantages of using liners

Pros	Cons
<ul style="list-style-type: none"> ■ Makes the process cleaner for residents and easier to transfer food waste to external containers. ■ Many residents prefer to use liners. ■ Householder participation increases, leading to higher capture rates and yields. ■ Collections are easier for crews – food waste doesn't stick to containers and all food waste is emptied from the container. ■ Collection chambers in vehicles are kept cleaner and chances of spillages/ leakages are reduced. 	<ul style="list-style-type: none"> ■ Adds an additional cost to the service, if councils supply them to residents. ■ It can be time-consuming to set up distribution if not done by the collection crew. ■ Wastage of liners can occur if distributed inefficiently and to non-participating households. ■ Additional cost to households if they purchase liners. ■ Depends on willingness of household to purchase. ■ Liners need to be specified to the dimensions of the caddy. ■ Liners need to be compatible with the food waste treatment plant.

4.2.1 Types of food waste liner

The choice of liner type for your collection system depends on many factors.

In the first instance WRAP strongly recommends that you speak to the operator of the food waste treatment facility you'll be using to identify what liner specifications will be acceptable to them. The specification may vary depending on the type of technology used to treat the food waste collected, e.g. in-vessel composting (IVC) or anaerobic digestion (AD).

- For local authorities whose treatment contractor uses an IVC process, compostable liners are the only option.
- For local authorities whose treatment contractor uses AD, the choice of liner options may also include polyethylene (PE) liners as well as compostable liners. The actual options for AD depend on localised issues such as the type of de-packaging equipment and post-digestion screening equipment at the AD plant.

To date, household food waste collections have used two main types of caddy liners:

- starch (corn starch and potato starch being the two commonest types); and
- paper.

These liners are designed to be compostable and are compatible with IVC and other aerobic composting processes. Section 7.1.2 gives details of the IVC process and Appendix B provides information about compostable liners.

Figure 4.3 Compostable caddy liners



The use of a third type of liner, polyethylene (PE) (which is non-biodegradable), by some local authorities supplying food waste to AD treatment facilities is a recent development. PE liners should only be considered for AD processes that have agreed to their inclusion and can ensure that the digestate produced by the AD process meets the appropriate standard (BSI PAS 110). Section 7.1.1 gives details of the AD process.

All three liner types (starch, paper, PE) are widely available to purchase either in bulk directly from a manufacturer or wholesale retailer. For compostable liners residents can access from a local supermarket, other local retailers or online.

Over the last few years some local authorities have promoted the use of plastic carrier bags as a substitute for providing householders with caddy liners. This has been possible when the AD plant being used by the local authority for its collected food waste has 'de-packaging' equipment able to remove all liners and other packaging materials. The use of plastic carrier bags should not be promoted widely as IVC facilities are unable to process plastic waste streams and hence carrier bags, like PE liners, they are a source of contamination at these facilities.

Despite the perceived benefits in avoiding the cost of purchasing liners for householders, the participation in food waste collections where the use of carrier bags is promoted has tended to remain low. Surveys are unclear why this is the case. However, frequent comments about the carrier bag not fitting the caddy, and bags having holes in them suggest the design of plastic carrier bags makes many of them unsuitable for the purpose of lining food waste caddies. In addition, the recent carrier bag charge in England, preceded by those in Wales and Scotland, creates a new cost barrier to the use of plastic carrier bags in household food recycling collections.

The use of compostable carrier bags in food collections is a recent development in the UK pioneered by retailer The Co-operative. These carrier bags are made from compostable starch and after being used to carry shopping from the local store can be re-used as a liner in a food recycling system, particularly where the food is treated by IVC. The bags are similar to plastic carrier bags in price but are significantly cheaper than purchasing liners at retail outlet. A key benefit of these carrier bags is that as they are available at local express stores and so the access points for households are greatly improved. A case study on their use in a local authority area has been prepared and can be found at

http://www.wrap.org.uk/sites/files/wrap/Oldham_Council_carrier_bag_case_study_Dec_2014.pdf

4.2.2 What should be considered in the specification of liners you are buying?

Figure 4.4 Liner decisions for councils

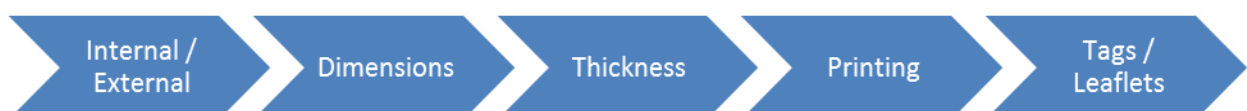


Figure 4.4 summarises the aspects that should be considered before ordering liners and which are detailed below.

- **Internal/ external caddy.** The majority of local authorities that provide caddy liners supply them for the internal kitchen caddy rather than the larger external caddy. Typically, external liners are more expensive even though fewer liners can be provided: one per week rather than 2–3 per week for the internal caddy. In addition, continuity of supply can be an issue. Note that external caddy liners are not widely available to purchase from retail outlets.
- **Dimensions.** Make sure you obtain the right size (dimensions) for the caddy you're ordering for. If the bag is too big you'll be paying for excess material but conversely if it's too small it won't fit the caddy. When the liner is placed into a caddy there should be enough material at the top so that it can be tied prior to emptying. As a guide it takes around 6–8cm to tie a full liner. So for residents emptying the caddy when it is close to being full, including the material overhanging the lip should suffice. Where possible, specify either the dimensions or the size and brand of the caddy when requesting prices from suppliers. If you ask for a 5l liner without these further specifications you risk getting the wrong size liners and making it very difficult to compare prices.
- **Thickness.** Typically around ~16 micron gauge (μm) for starch liners, ~1 ply for paper liners and ~7–10 micron gauge (μm) for PE liners should be sufficient to enable the liner to retain its structure in most collection systems prior to being loaded into the collection vehicle. Note that the micron gauge relates to the specific polymer and should only be used as a guide. The thickness of the material is only one indicator of performance and factors such as leakage and resistance to tear are also important to consider. Samples of the bags should be provided by retailers so you can examine their strength and flexibility relative to the caddy and its use before considering promoting their use more widely.
- **Certification.** Make sure the liner (paper or starch) is certified to EN13432 and that the treatment operator has received a sample.
- **Liner printing.** For compostable liners, it is recommended that the independent certification logo and unique product code are printed on the liners. This is important information for the treatment plant operator and will help inform site-based decisions on how the material is treated.
- **Last liner remaining print.** Some manufacturers are able to print a note or stripe on the last few liners to signal to residents and collection crews that supplies are running low and that additional liners are required.
- **Caddy tags.** Some authorities request a paper caddy tag to be inserted with the package of liners so that residents can alert the collection crew that they need a new roll. Crews will need to be reminded that the re-order tags should be removed and left with the householders' container so that they can be re-used next time.
- **Lead time.** Make sure your supplier can supply the liners well in advance of the planned scheme roll-out. Delays in providing householders with liners may affect participation and, if they occur when the scheme is due to roll out, may lead to additional costs.

4.2.3 Cost of purchase

Obtaining value for money when purchasing caddy liners is essential to minimise costs for your local authority. Table 4.2 gives indicative unit costs for the bulk purchase of caddy liners by local authorities. Note that prices vary consistently especially since liner manufacture is largely outside the UK so variable exchange rate can be expected to impact prices. The unit price is especially influenced by the order size with smaller authorities or pilot projects likely to see a higher unit rate for a short term supply.

Table 4.2 Indicative bulk purchase costs for caddy liners by local authorities (December 2015)

Type of caddy liner	Indicative unit cost per liner
Starch-based compostable liner	£0.015
PE liner	£0.005
Paper liner	£0.04

Whilst local authorities can procure large quantities of liners and benefit from lower prices the costs to residents of purchasing small quantities in retail outlets is higher. The average price per compostable liner (purchased in a roll) is around 12 pence suggesting for an average participating household liner consumption may cost towards £16 per year.

It may therefore be more beneficial for liner purchase to sit within the remit of the local authority. If your authority uses a waste management contractor to deliver the service you should consider who buys the food waste liners to ensure best value is achieved. Local authorities are VAT exempt, whereas a private company such as a contractor is not. However, if the authority procures the liners for re-sale to residents, then they are liable for VAT and so would need to include VAT in the charge to householders.

4.3 Liner supply models

In supplying caddy liners to residents, either at the launch of the scheme or via ongoing provision there are a number of different questions to consider:

- How will residents access liners?
- Should liners be supplied free or at a cost?
- What frequency should they be supplied and in what quantities?

The answers to these questions are determined by considering which supply option fits your service operation, the costs involved in the purchase and distribution of liners and the treatment costs paid by the authority.

Experience from services operating across the country indicates there are a number of ways in which liners are supplied to residents. These can be described as:

- doorstep delivery by the local authority or its contractors;
- central distribution via a local authority supply network (civic centres and offices, libraries, sports centres, one stop shops, etc.);
- retail establishments (local shops and supermarkets); and
- a combination of the above methods.

Different methods may be chosen at different stages in the lifetime of a scheme (see below). For example, a local authority may opt for a blanket doorstep delivery of a starter pack at scheme launch followed by liner provision via council sites once the scheme has settled down. However, adopting different supply models at different times is likely to cause confusion risking fall off in participation. It is vital that the transition from one model to another (e.g. from a trial to an authority-wide roll-out) is communicated effectively.

The following sections detail options for liner distribution at different stages in the lifetime of a food waste collection scheme.

4.3.1 *Scheme launch*

The majority of local authorities provide free liners at scheme launch irrespective of whether they will be providing free liners either at the doorstep or via council sites after the launch period. A roll of 26 liners should last a household approximately 10 weeks on the assumption that they will use 2-3 liners per week. Delivering a larger supply of liners to all households at the start of a scheme increases the risk of wastage and loss of investment due to non-participating households.

Usually liners are distributed by the collection crews or a private contractor either at the same time as the caddies and information leaflets are provided, or separately with information leaflets as part of any door-to-door engagement. Liner rolls can be deposited inside the external container to protect them from damage, particularly from bad weather. Due to risk of harm to children and compliance with Trading Standards controls, liners should not be posted through letter boxes unless they are properly secured in packaging.

4.3.2 *Ongoing provision*

Where liners are provided via a doorstep delivery, distribution can occur in two main ways:

- **Blanket drop** – a blanket drop to all households every 6-12 months; and
- **Top-up system** – collection crew top up liners on request (tags, notes or call centre request) by the resident.

Blanket drops can either be done by an in-house team or an external contractor. If an in-house team undertakes delivery it should be a distinct duty away from day-to-day collection activities as crews generally don't have time to perform large drops of liners and would struggle with the storage space required for liners within the vehicle.

Using this method, liners are delivered to each household irrespective of whether they are using the service or not. Blanket drops can be beneficial for encouraging high participation and inclusion in the service, and for reminding residents that the service is available. However, they can be costly as liners are being provided to non-participating households.

Top-up systems can work in a number of ways but frequently the collection crew is the key distribution route. Residents attach their own note or council supplied caddy tags to the container to signal to crews that more liners are now needed. The advantage of this system is that only residents using the service are provided with liners, thus reducing wastage, and delivery can be done efficiently as part of the collection service.

Appendix C contains a

Figure 4.5 Denbighshire County Council and Cardiff Council caddy tags (used in their trial)



Appendix C contains a summary table setting out the benefits and disadvantages of doorstep delivery.

4.3.3 Central distribution via local authority network

Many council sites such as council offices, parish council offices, libraries, leisure centres, civic centres or one stop shops provide suitable access points for residents to obtain liners.

A number of different supply combinations are available that include local authority networks:

- distribution of liners free of charge at the doorstep (either via a blanket drop once or twice per year or via an on request top-up system);
- distribution of free liners via council sites only (no doorstep delivery);
- distribution of charged liners via council sites only (no doorstep delivery); and
- distribution of liners either free or charged at council sites and at local retail establishments.

The doorstep distribution can be supported by liners being available either free or charged at council distribution sites (if residents use more than the delivered quantity).

Council sites (such as the one shown in Figure 4.6) tend to provide a spread of locations with a guaranteed footfall and which offer a range of opening times (such as libraries and sports centres), so most residents will have a 'local' site close to them. Rural services such as mobile libraries can also be utilised to ensure access.

From an operational perspective, the ability of these sites to handle cash transactions (e.g. library, sports centres, etc.) means they have the necessary infrastructure in place to take payments for liners should your authority wish to charge for liners.

Remember that council re-sale of liners attracts VAT. Reviewing the sale price to consider the unit cost of the liners, the delivery costs, the desired margin and the VAT element is important to ensure that the charge for the liners is competitive compared with other retail options in the area.

Figure 4.6 Example of central distribution of caddy liners



The following practical points should be considered.

- **Where will liners be stored on site?** Pick an area that has enough space, easy access for staff and which is suitable for liner storage (e.g. away from damp areas where liners may be damaged).
- **Where will the liners be promoted on site?** If the availability of the liners is not promoted, there will be low take-up and their storage at the site will soon become a burden for staff. Posters, banners and online references to where residents can obtain liners may be useful ways of communicating their availability to households.
- **How frequently will they need to be restocked?** Assess how many visitors the site receives per week. Frequency of deliveries may need to start at once every two months (depending on storage capacity), but can be adjusted down when the service settles. To maximise efficiencies, more than one delivery may be done in one day so it may be that orders can be pooled.
- **How should liners be re-ordered when stocks are low?** What's the best way for the site to request a new delivery of liners? An email may be sufficient or an order form completed (possibly online). There might be an existing council system that could be utilised.
- **What reporting will need to be completed by the site?** The number of (rolls of) liners issued or sold each month should be the minimum level of reporting required of each site. This information could be captured via sales records or via a separate recording system. If time permits, other information such as the postcode of residents could be recorded so that the catchment area for residents obtaining liners from each site can be determined.
- **If liners are provided free of charge, is there a limit as to how many a resident can take?** To limit the number of rolls that residents can take (to stop potential misuse), the liners should be positioned in a place where staff members are located such as a service desk.
- **How much time will adopting this system take?** Although additional time may be required at the start of the service to get things set up, it should require minimal time to maintain once the process is up and running.

Appendix C contains a summary table setting out the benefits and disadvantages of using local authority distribution networks.

4.3.4 Events

Councils that have a stand at a local event may want to consider taking rolls of food waste liners to the event to give to local residents who they speak with. The supply of a roll of liners can be a useful discussion tool which can help officers engage residents for longer to talk about scheme details and convey wider recycling information

Figure 4.7 Merton Council uses food waste liners at events for demonstration purposes



Appendix C contains a summary table providing the benefits and disadvantages of a central distribution via a local authority network.

4.3.5 *Retail establishments*

Food waste liners are increasingly available in retail outlets such as local shops, supermarkets, garden centres and DIY outlets. There are also many independent suppliers on the internet that offer a range of food waste liner products which are often cheaper than those available from high street retailers.

If you are thinking of promoting local retail outlets to residents, among the issues you need to consider are the following.

- **Access.** Will all residents have the same access to retail outlets? Will the available options be fewer or more restricted for some residents such as those in rural areas? Will access to retail outlets need to be complemented by being able to purchase liners from local authority outlets for example?
- **Liner specification.** Will the size of liners sold fit the containers that your authority is providing? The majority of liners sold by the main retailers will fit every caddy size between 5 and 10 litres, but the additional capacity is consequently more expensive if you have smaller caddies. Will the type(s) of liners being sold be accepted by the treatment facility you are using? Retailers will need to be informed of the bag specification required for your scheme and compostable bags should meet the EU standard EN13432.
- **Price.** Will the liners be sold at a price considered affordable to residents?
- **Stock.** What other products will liners be competing with in terms of shelf space? Is there a risk the retailer will change brand (specification) after a couple of months or discontinue stocking liners altogether if there isn't enough interest? How will stock control be managed to avoid ageing of the liners and compromising their integrity?

Information should be provided on the local authority website on locations of local retail outlets and updated regularly. It is recommended that liner prices at retail outlets are not provided on the website as these are subject to change.

While a food waste scheme is bedding in, there may be a number of enquiries from local residents about different types of liners. It may help to prepare a list of FAQs on food waste liners especially including information on the required specifications, particularly if retailers within the local area are stocking a wide range of liners.

Appendix C contains a summary table setting out the benefits and disadvantages of using local retail networks.

4.3.6 *Comparison of liner supply options*

It's not straightforward to definitively compare performance between different liner supply models and determine whether adopting a different approach will significantly change performance or cost. That's because performance will be influenced by a wide range of factors and it's difficult to isolate their effects from the liner supply model. These wider factors include:

- deprivation levels;
- service quality;
- communications messages;
- access to liner supply outlets; and
- prices (liners and gate fees) at the time of the decision to adopt a particular system.

In particular if some residents have lapsed in participation due to a specific experience in using the service then the uptake for a new liner supply model might not be as high as if households were experiencing the approach for the first time.

Section 11 details how a range of 'intervention measures' that include the provision of free caddy liners to householders has been demonstrated to increase the yields of food waste collected by authorities operating established separate weekly food waste collections.

4.3.7 *Monitoring and evaluation*

Monitoring and evaluation are vital to be able to assess trends in liner provision over time and understand how the scheme is performing. WRAP has produced extensive guidance on monitoring and evaluation and this should be referred to for specific methodologies (www.wrap.org.uk/content/monitoring-and-evaluation-guidance).

In terms of liner distribution, there are a number of things you could monitor:

- number of rolls provided to residents by collection crew over a defined period (top-up scheme);
- number of requests for liners via the call centre and online;
- website hits;
- attitudes to liner provision and usage; and
- volume sold/ distributed via local retail outlets and/or council sites.

Monitoring may allow you to:

- refine the number of liners you provide to residents in a year;
- reduce the number of blanket drops you provide; or
- revise your charges.

Importantly it will allow you to revise your budget for liner purchase and allow better targeting of resources towards increasing scheme participation.

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