wasteMINZ

ORGANIC WASTE COLLECTION AND PROCESSING

GUIDANCE FOR LOCAL AUTHORITIES

JULY 2024

THE TERRITORIAL AUTHORITIES' OFFICERS (TAO) FORUM OF THE WASTE MANAGEMENT INSTITUTE OF NEW ZEALAND

PREFACE: KERBSIDE ORGANICS GUIDANCE

The purpose of this document is to provide information to councils designing kerbside organic collections for households in their area. The guide includes insights gained from local and international experience, and a step-by-step framework to support councils from planning through to operating a kerbside organics service.

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ABOUT WASTEMINZ

WasteMINZ is the largest representative body of Aotearoa New Zealand's waste, resource recovery, and contaminated land sectors. We work towards ongoing and positive development of our industry through strengthening relationships, collaboration, knowledge sharing and championing the implementation of good practice standards.

ABOUT THE TAO FORUM

The Territorial Authorities' Officers (TAO) Forum is a Sector Group of WasteMINZ. The TAO Forum was established to create consistency and efficiency of service amongst territorial authorities through sharing knowledge and best practice.

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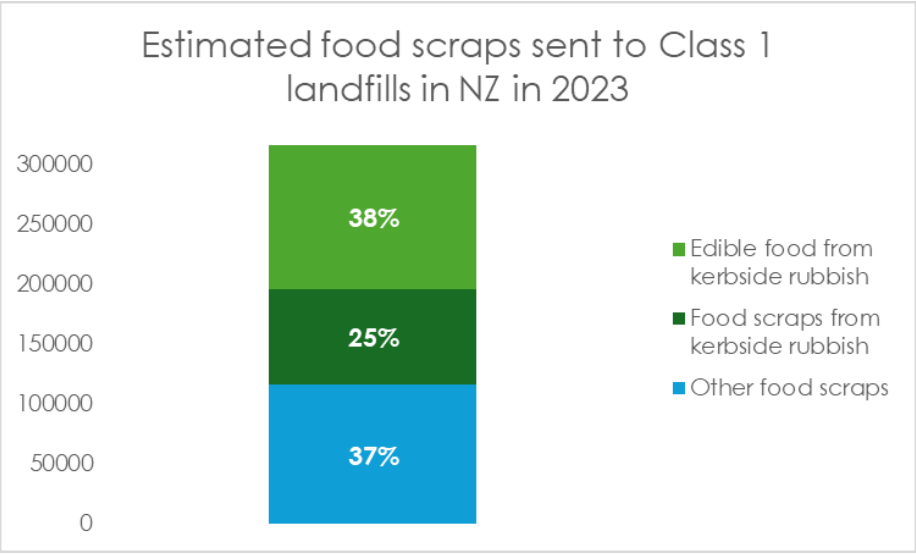
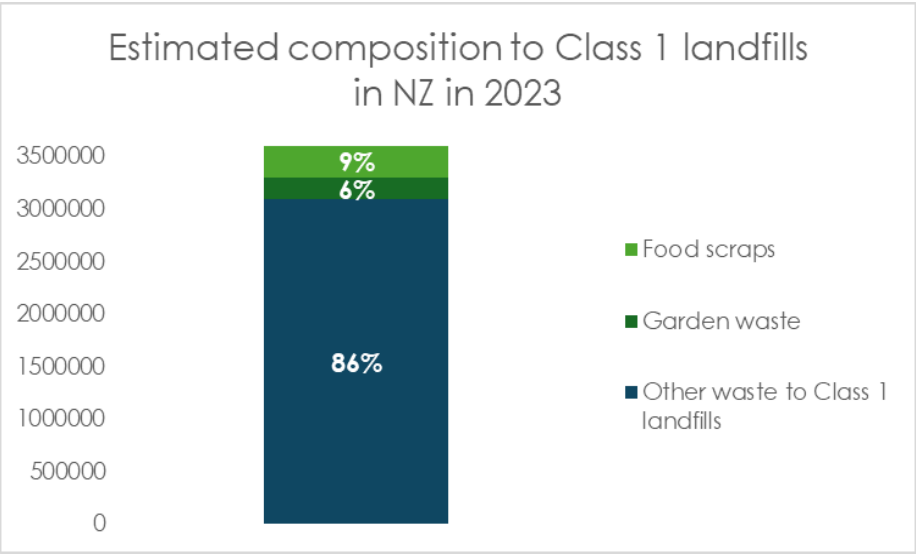
1 INTRODUCTION AND CONTEXT

INTRODUCTION AND CONTEXT

In 2023, Aotearoa New Zealand sent around 316,000 tonnes of food scraps and 200,000 tonnes of garden waste to Class 1 landfills. Over 200,000 tonnes of the food scraps reach landfill through household kerbside rubbish collections and 60% of this could have been avoided as it was edible at the point of disposal, estimated to cost householders $3.2 billion each year.[1] The charts below display organic waste sent to Class 1 landfills in 2023 and the associated proportions.





[1] Data taken from MfE data to Class 1 landfills, New Zealand's Greenhouse Gas Inventory, SWAP audits, and Kantar New Zealand Food Waste Survey carried out in 2023 by Rabobank/Kiwi Harvest available on www.lovefoodhatewaste.co.nz

As per the waste hierarchy, food waste should firstly be avoided and reduced. If this is not possible then food rescue, home composting, and community composting are good options. The next preference is for food waste to be collected and processed through some form of composting or digestion. The least preferred outcome is disposal to landfill. When organic material is sent to landfill it releases methane, which contributes to climate change. According to the Intergovernmental Panel on Climate Change (IPCC) the global warming potential (GWP) for methane is between 28 and 36 times greater than carbon dioxide over 100 years.[2] Collecting and processing organic material reduces greenhouse gas emissions and allows nutrients to be cycled back to the land, which benefits soil health and productivity.[3]

Guide Focus

This guide focuses on the collection and processing of household food scraps and garden waste, but also recognises complementary initiatives including food waste prevention, food redistribution and rescue initiatives, and at-home and community composting.

Council-provided organic collections are a relatively new practice in Aotearoa. The earliest roll-out was Timaru District Council's combined food scraps and garden waste (also known as food organics and garden organics, or FOGO) collection in 2006. At the time of writing, organic waste collections are offered by 21 councils. This represents 30% of all territorial authorities in NZ, covering nearly 60% of the population. Nine of the 21 councils offer collections of separate food scraps, four councils offer collections of separate garden waste, seven councils offer FOGO, and one offers collection of food scraps and garden waste but as separate services.[4]

This guide is intended to support councils to reach the best outcomes for management of organic waste in their area. Councils can delve into background information and insights from local and international high-performing kerbside organics services and follow step-by-step decision-making prompts for planning and running their own service. Throughout the guide there are case-studies, hints and tips, and signposts to complementary resources.

Each council is at a different stage on the organic waste kerbside service journey. From planning, implementing, and operating organic collection services each council can have great lessons to share and seek from each other. In this guide

[2] https://www.iea.org/reports/methane-tracker-2021/methane-and-climate-change
[3] More information on landfill gas capture in Section 0 Carbon
[4] More information on current council services can be found in Appendix •

we have drawn from many of these experiences, and this is reflected throughout.

The guide provides prompts and guidance about what is likely required at each stage, but it is not a comprehensive resource; so, work will still be required! The guide is also designed to be a living document and is planned to be updated as councils implement new services and have new experiences to share. If you have any information, case studies, or experiences you want to share that could be helpful for others, please contact WasteMINZ TAO Forum.

2 HOW TO USE THE GUIDE

HOW TO USE THE GUIDE

The first part of the guide presents information based on local and international research of services that have good outcomes and highlights common features of good performance. The content is designed to prompt further thought to support the design of a kerbside organics collection service that has:

- High yields of food scraps and garden waste diverted from landfill
- A quality end-product that is desired and utilised by local businesses, farms, and communities
- Active participation from residents
- Active engagement with local communities
- A budget suitable for service longevity
- Associated carbon savings that meet local and national targets and strategies
- Flexibility in the service to ensure resiliency and enable waste minimisation over time.

The second part of the guide presents six steps that prompt the user to gather information and assess what suits their unique needs best. The guide is designed to be picked up as and when it's needed; and, while there is a logical sequence, steps can be completed one at a time and out of order; however it suits the user.

Throughout the steps there are notes on drivers relevant to each decision. The drivers are listed below and can help councils to weigh up decisions. The drivers also align with the wellbeings in the Local Government (Community Well-being) Amendment Act.[5]

THINGS TO THINK ABOUT AND ASSOCIATED WELLBEINGS						
Driver	Thinking about council processes	Thinking about cost	Thinking about the product and market	Thinking about carbon	Thinking about culture and community	Thinking about diversion
Wellbeing	Strategy	Economy	Economy	Environmental	Social and Cultural	Environmental

[5] https://taituara.org.nz/community-well-beings

3 WHAT MAKES A HIGH PERFORMING SYSTEM?

WHAT MAKES A HIGH PERFORMING SYSTEM?

This section presents lessons learned, hints, and tips from kerbside organic collections in Aotearoa and overseas. It covers what makes a high-performing system in terms of food scraps and organic diversion, product quality, community approval, cost, and carbon.

3.1 Food scraps diversion

From reviewing local and international research and case-studies, common features of high performing kerbside organic services were identified. These features include:

- Separation of food and garden organic material
- High collection frequency of organic material
- Provision of kitchen caddies
- Provision of caddy liners
- Higher cost and lower convenience for rubbish collection
- A focus on behaviour change and communication tools.

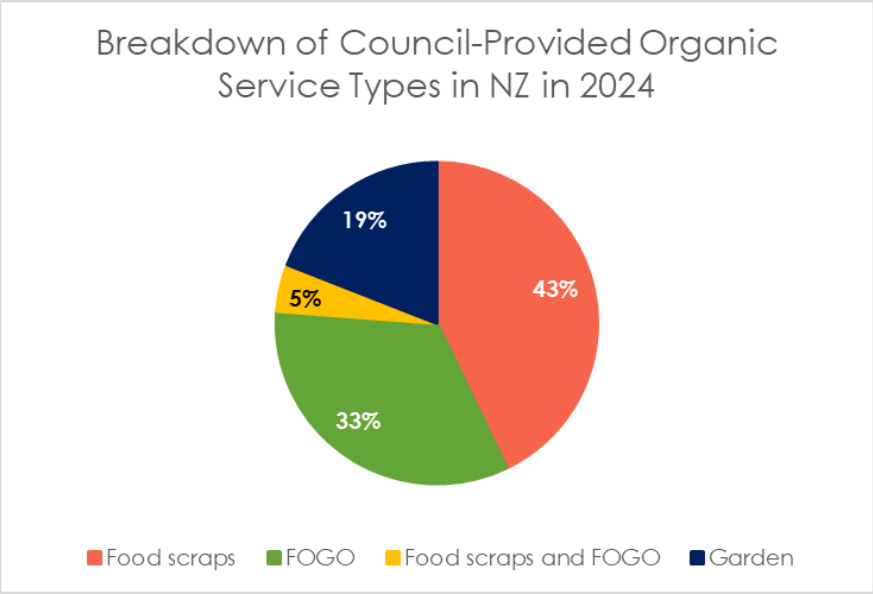
3.1.1 Separation of organic material

There are three main options used for separating household organic material for kerbside collection:

1. Food scraps in one bin
2. Food scraps and garden waste in two separate bins
3. Food scraps and garden waste (also known as food organics and garden organics, or FOGO) comingled in one bin.

In this guide we focus on services that collect food scraps either separately or mixed with garden waste (FOGO).

In New Zealand there are 17 councils currently running kerbside organics collection services that involve food waste. Nine collect food scraps only, seven collect FOGO only, and one collects food scraps and FOGO separately. The number of councils that offer food scraps and FOGO services are similar (9, or 43% food scraps and 7, or 33% FOGO).



The service that a council chooses to provide may depend on:

- Location of the service provided (e.g. rural/urban) and distribution of the community
- Location and type of processing infrastructure available
- Public demand for the service
- Strategic alignment for the council.

The average weight collected for food scraps is quite consistent throughout the year, whereas the average weight of FOGO fluctuates with increased gardening in warmer months.

The table below presents measures collected from local data. Of the 17 councils contacted for information 10 gave information for average bin weight and average yield, 8 gave information about contamination, and 4 gave information about participation. Given the small sample size, particularly for contamination and participation rates, estimates and exclusions have been made.

NEW ZEALAND		
Measure	**Food scraps only service**	**FOGO service**
Average bin weight per set out	2.8 kg	15.5 kg
Average yield (weight/ households served/week)	0.74 kg/HH/week	8.2 kg/HH/week
Average contamination rate	2.5%	-[6]
Average participation rate	41.5%[7]	-[6]

In Australia 242 (43%) territorial authorities have organic collections. FOGO is the most common choice for kerbside

[6] Note: Contamination and participation rate data for FOGO services is not included as the dataset is too small and variable.
[7] Note: Participation rate taken from the Sunshine Yates Consulting report commissioned by MfE 'Research into barriers to use of food scraps collections' 2023 here: https://environment.govt.nz/assets/publications/Waste/Research-into-barriers-to-use-of-food-scraps-collections.pdf

organics services, with 159 (65%) authorities offering FOGO, 82 (35%) offering garden waste, and 1 (<1%) offering food scraps collections only.[8] The preference for FOGO in Australia is largely due to the risk of fires and the need to remove loose garden material from properties, as well as the lack of private garden waste collectors.[9]

Research collated for the Australian Government's Department of Climate Change, Energy, the Environment and Water (DCCEEW)'s Food and Garden Organics Best Practice Collection Manual reviewed some key measures of ten high performing FOGO services in Australia. The research found that the yield of food scraps in a food scraps only collection is higher than in a FOGO collection.[10]

In the UK the most recent data (2018/19) shows that 166 (51%) councils provide organic collections with food scraps services the most common. Of the councils with kerbside organic services, 115 (69%) councils offer food scraps only, 38 (23%) offer FOGO, and 13 (8%) offer both food scraps and FOGO.[11] It is likely that food scraps services are prioritised over FOGO in cities as people are less likely to have large gardens than in rural areas.

AUSTRALIA		
Measure	**Food scraps only service**	**FOGO service**
Average food scraps yield (weight/households served/week)	2.5 kg/HH/week	1.8 kg/HH/week
Average garden waste yield (weight/households served/week)	N/A	7.7 kg/HH/week
Average contamination rate (over both service types)	3%	
Average participation rate (over both service types)	66%	

Research collated for WRAP UK's *Household Food Waste Collections Guide* is presented in the table below. The table shows the indicative average yield of food scraps in a food scraps only collection and in a FOGO collection.[12] As shown in the table, the amount of food scraps captured in the food

[8] https://www.dcceew.gov.au/environment/protection/waste/how-we-manage-waste/data-hub/data-insights/organics-kerbside-collection-services-data-viewer
[9] Garden waste – Bushfire best practice guide (csiro.au)
[10] https://www.dcceew.gov.au/environment/protection/waste/publications/food-and-garden-organics-best-practice-collection-manual
[11] https://www.localgov.co.uk/The-case-for-keeping-co-mingled-collections-while-boosting-food-waste-recycling-rates/53830#:~:text=A%20total%20of%20115%20councils,to%20produce%20biogas%20and%20biofertiliser
[12] https://www.wrap.ngo/resources/guide/household-food-waste-collections-guide

scraps only collection is much higher than in the FOGO collection. This aligns with Australian findings mentioned above that separating food scraps can increase food scraps diversion.

The measures provided for New Zealand, Australia, and the United Kingdom may provide insight into what yield, contamination rate, and participation rate could be expected from an organic service. Although it is important to keep in mind that the service is much more likely to have high yield, low contamination, and good participation if it is set up for success.

UNITED KINGDOM		
Measure	**Food scraps only service**	**FOGO service**
Average food scraps yield (weight/household served/week)	1.5 kg/HH/week	0.8 kg/HH/week
Average Contamination	–[13]	–[13]
Average Participation	35-55%[14]	–[13]

[13] Note: Data is not available for contamination in kerbside food scraps and FOGO services, or for participation in FOGO services.
[14] Note: Average participation in a food scraps only service according to the WRAP Household Food Waste Collections Guide.

CASE STUDY: HOW PRIULA MAXIMISE RESOURCE RECOVERY THROUGH THEIR KERBSIDE SERVICES

Priula is a semi-urban part of the Treviso region in Northern Italy with a population of approximately 215,000 people. They have a recycling rate of over 85% and key to this has been their food scraps collection service which sits at the heart of their kerbside services. They successfully recover approximately 250kg per household of kerbside food scraps – equivalent to a capture rate of over 90%.

What sets the service in this area of Italy apart is that they have carefully invested in the parts of the service that ensure it gives the best possible experience for the residents. This starts with extensive and ongoing communications. They stress listening to and responding to feedback from the public and keep messages simple and continually accessible to the residents. Residents are given high quality calendars each year with collection days clearly marked.

Households are each provided with a ventilated kitchen caddy, compostable liners, and a 25-litre kerbside bin with a lockable lid to prevent spillages. The liners are available free of charge from council service centres or purchased from shops. The use of ventilated caddies and liners dry out the food scraps and minimises odours, flies, and spillages when collecting. The frequency of collections, twice-weekly, also minimises the risk of these problems as food scraps don't sit around for long.

Another key feature for the success of the service is the quality of the collection service. They pay their single operative drivers extremely well, which means the positions are sought after and staff turnover is low. Each driver has a collection round where they become familiar with their 'customers'. They inspect every bin, reject any contamination, and leave a note for the residents explaining why it hasn't been collected. Bins are left neatly by the side of the road when emptied.

Although the service is 'gold plated' in some ways (twice-weekly collections, free liners, high quality comms, every bin inspected, etc.), the result is no more costly overall as they have a high-quality, low contamination feedstock, low staff turnover, minimal issues, and save significantly on residual waste collection and disposal.

Case study from Waste Management in Consorzio Intercomunale Priula Villorba, October 2006 and ***The Story of Contarina - Zero Waste Cities***

TO RFID OR NOT TO RFID?

Radio Frequency Identification (RFID) tags are electronic chips that can be attached to collection containers. They can be used to:

- Manage the bin fleet (e.g. ensure each household has the right bin, track repairs and replacements)
- Aid gathering data on participation and set out
- Enable tracking & charging (e.g. for garden waste collections or pay-as-you-throw services)

Collection vehicles can track pickups using GPS and onboard systems, but RFID tags provide an extra layer of data including being able to tell which households are using the service.

RFID tags can be placed on wheeled bins and kerbside food scraps bins. They can be factory fitted for around $1-2 per tag, but there are additional costs of the tag readers, on-vehicle, and back-end systems.

There are different types of RFID tags with varying levels of frequency. Low frequency tags are usually preferred for collection as they have a shorter range. The shorter range can help to avoid misreads, which can sometimes be an issue with tags with longer ranges. Using tags with manual food scraps bins can slow down collection as it can add time to ensure the tag is read by the reader on the vehicle.

3.1.2 Waste collection frequency

Research in the UK and Australia recognised that frequency of collections affects participation, and the overall yield of food scraps collected. Systems with weekly food scraps collections and fortnightly rubbish collections collect more food scraps than those with weekly rubbish collections.

Fortnightly rubbish collections can help to maintain participation and yield over time. One reason is that, if food scraps are stored in the rubbish bin for longer than a week, there are likely to be issues with pests and odours. Another reason is that limited frequency goes hand-in-hand with limited capacity, meaning that households need to sort their waste effectively to ensure there is enough space in the bin suite provided to store the waste they produce.

3.1.3 Kerbside collection containers

Providing practical and convenient collection methods help to maximise yields. The kerbside food scraps bin should be made from rigid plastic with a lid that prevents leakage and scavengers (cats, dogs, birds) and vermin from gaining access to the contents. Where food scraps are collected separately on a weekly basis, a 20–25L container should be sufficient for most households. FOGO containers are typically 80 to 240L.

The size of the rubbish bin can also influence participation and yield as a smaller rubbish bin encourages the household to separate the food scraps from the rubbish so that it can fit in the bins provided. Where rubbish is collected on a fortnightly basis, a 120-140L mobile garbage bin (MGB) should be sufficient for most households and can be assessed through Solid Waste Analysis Protocol (SWAP) composition data. Note that SWAP surveys weigh waste streams rather than measure their volume, so conversion from weight to volume is likely to provide a better indication for capacity requirements.

3.1.4 Kitchen caddies

Kitchen caddies and liners can be an important part of food scraps collection systems to keep the process clean and hygienic and to encourage participation. The design of a kitchen caddy can influence how readily a householder will accept an additional item in their kitchen and perceived as an extra step 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. Caddies should also be big enough for residents to scrape food scraps

THE PROS AND CONS OF BIN LINERS

There are some good reasons to use compostable bin liners as part of your service, but there are also some drawbacks.

PROS:

- Bin liners have been shown to improve participation and food waste capture, especially over time
- Bin liners reduce odours and mess for households
- Bin liners reduce moisture content in food scraps, making transport and transfer easier and more pleasant for collection crews
- A well-run system using compostable bin liners can reduce overall contamination.

CONS:

- Liners will add in the order of $10/HH/year to the cost of the service if supplied by council
- There are few organic waste operators in NZ that accept compostable plastic liners. The products do not always break down completely in the process and can negatively affect product quality. In AD processes they are a contaminant and are removed before processing
- There are concerns over the potential presence of PFAS and other additives in compostable plastics and whether the degraded product contributes to microplastic pollution (refer to MfE Position Statement)
- If households run out of liners, they may use non-compostable liners instead which can add to contamination requiring inspection and removal
- There are no liner manufacturers in New Zealand.

from plates and have liners that fit the caddy well. The caddies should be large enough to contain at least 2–3 days' worth of discarded food. A ventilated caddy helps manage smells and moisture levels and has been recognised in research to increase participation.

An Australian study found overall rates of diversion from landfill exceeded 70% for households using a ventilated container and 61% for one council using an enclosed container. It also found that the best performing system with a lined, ventilated caddy and a fortnightly rubbish collection had a yield of 1.86kg/HH/week (74% total organics capture) whereas a system with an enclosed, unlined caddy, and weekly rubbish collection had an average yield of 0.38kg/HH/week (20% total organics capture).[15]

3.1.5 Caddy liners

Householder surveys carried out as part of WRAP UK food waste collections trials in 2008/09 suggested that participation would be significantly reduced if supplies of free liners were removed, and residents were required to purchase liners from retail outlets. A roll of 26 liners should last a household approximately 10 weeks on the assumption that they will use 2-3 liners per week. Caddy liners have been proven to increase participation and yield as they are easier and hygienic for households and collections crews.

Liners require adequate mechanical strength to retain their contents yet allow some gas exchange to be able to break down when they reach a composting facility. They should fit well in the kitchen caddy to avoid spills and extra cleaning.

From February 2024 the Ministry for the Environment (MfE) standardised the material that could go into recycling, food scraps, and FOGO bins. Acceptance of compostable bin liners are at the discretion of the council and may be impacted by the cost incurred by council, and the processing method or facility chosen, which should be kept in mind when deciding whether to provide liners in the service.[16]

3.1.6 Communications and interventions

Communication packages and interventions are also integral to the success of a kerbside organics collection service as introducing a new service asks people to change their behaviours and put further effort into their waste management systems at home. Residents need to know how to do the task

[15] collection-manual-fs3.docx (live.com)

[16] For more information refer to Compostable Disposal Flowchart (wasteminz.org.nz), It-s complicated guide final 2019.pdf (wasteminz.org.nz), MfE Position statement on compostable plastics (environment.govt.nz), NZ Facilities that Accept Compostable Packaging public (wasteminz.org.nz)

and be motivated to do it over time for the service to be successful.

Good communication for organics collections:

- Is clear, unambiguous and has no jargon
- Is translated to languages spoken by the residents
- Has a clear call to action to motivate residents
- Uses simple instructions
- Uses images, pictures, and/or videos
- Shifts residents' mindsets to view the behaviour (sorting organic material) as a social norm
- Directs residents to find more information through call centres, online, or at service centres
- Includes access to workshops and learning opportunities through face-to-face communication
- Tells residents what to do, rather than what not to do.

Behaviour change interventions include:

- Stickers on the food scraps bin
- Stickers on the rubbish bin
- Flyers
- Free kitchen caddy liners
- Door-knocking/canvassing
- Workshops, road shows, pop-ups and multiple avenues for face-to-face learning opportunities.

The interventions mentioned above can be used at any stage of the service implementation. It's important to continue communicating with residents to ensure the continued success of the service and often a combination of different interventions work best.

In 2023 a study in Auckland delivered different interventions (stickers, postcards, free liners, and canvassing) to sets of households in two pilot areas receiving food scraps ahead of Auckland Council's regional roll-out. The study found that the most successful interventions to increase set out and participation were sticker prompts and social norms messaging through postcards. Some households received free liners and/or canvassing, although these interventions did not notably influence set out and participation. The study acknowledged the power of visual prompts (stickers) as they are a reminder at the specific time a resident is sorting/disposing food scraps and they do not require excess attention to register the message.[17]

WRAP UK reviewed the percentage change in food scraps yield across a series of pilot projects with interventions such as stickers on the rubbish bin, liners, leaflets, kitchen caddy stickers, and door-knocking. Pilot areas provided with residual

[17] https://knowledgeauckland.org.nz/publications/evaluating-behaviour-change-tools-to-encourage-food-scraps-recycling-in-auckland-city/

bin stickers saw the greatest increase, with an average of 28% increase in yield. The most effective communication package (liners, residual bin stickers, and flyers) saw an increase of 32% increase in yield on average. The liner and leaflet only solution was the least effective, with an average increase of only 2% in yield. This demonstrates the importance of good communication packages for the effectiveness of a collection service.[18]

[18] Household food waste collections guide | WRAP

AUCKLAND COUNCIL'S BEHAVIOUR CHANGE RESEARCH

Auckland Council has several reports and resources available for public use that explore behaviour change. These will be helpful to consider when introducing a new service or an intervention package:

- The **Behavioural insights toolkit: a step-by-step process for building a behavioural intervention** (RIMU, 2020) that has two parts to support users designing behaviour change intervention/s.
- **A Literature Review of Interventions to Reduce Household Waste** (Ovenden, et al., 2023) which is specifically related to household waste.
- **Evaluating behaviour change tools to encourage food scraps recycling in Auckland city** (P. Johnson, 2023) is a University of Auckland Masters thesis that provides different interventions to households receiving the food scraps service in Auckland.

In the literature review, two frameworks are mentioned that focus the thought process when thinking about behaviour change:

- **The EAST framework** explains that if people are expected to change behaviours (e.g. participate in food scraps separation) the change must be easy, attractive, social, and timely.
- **The COM-B framework** identifies capability, opportunity, and motivation to be the key factors to change behaviour.

Image source: https://thedecisionlab.com/reference-guide/management/east-framework

Image source: https://knowledgeauckland.org.nz/publications/evaluating-behaviour-change-tools-to-encourage-food-scraps-recycling-in-auckland-city/

3.1.7 Complementary programmes

Taking a holistic approach to minimising food waste involves identifying opportunities for reduction and recovery in order of priority, according to the waste hierarchy. While the scope of this guide is to provide guidance for council-provided kerbside organic collections, many councils have zero waste commitments and goals. Food rescue and community-led programmes should continue to both minimise waste and empower our communities and be considered as part of a systems approach to organic waste management.

Across New Zealand there are many programmes that prevent food from being sent to landfill. Here are some examples:

Love Food Hate Waste is a non-profit organisation that provides resources and tips to prevent food waste. They have a collection of recipes that teach home cooks seasonally and to use whole ingredients (e.g. both the white and green part of a leek).

Food rescue programmes prevent food from becoming waste and provide food to people in need. Across Aotearoa there are over 20 food rescue organisations, and most supermarkets have collection points for tinned and dried food donations.[19]

ShareWaste is an app that connects people with organic material to people who can compost it across New Zealand.

The Compost Collective is an Auckland-based programme that provide workshops at community venues, workplaces, and gardens to teach people how to compost. They also have online resources available to people outside of Auckland.

Foodprint is an app that alerts users when cafes or other food outlets have leftover food at the end of the day they want to get rid of cheaply.

3.2 Overall organic diversion

3.2.1 Considerations for yield of garden waste organic material

The proportion of garden waste in kerbside household rubbish is an important factor when determining what material to include in the service. There is strong evidence that providing a larger garden waste bin results in more garden waste being collected. While collecting more organic waste sounds positive, it pays to bear in mind that data has consistently shown that most of the additional garden waste collected was never in the kerbside

[19] https://lovefoodhatewaste.co.nz/food-waste/resources/food-rescue-groups-in-nz/

rubbish collection in the first place. This means it is not being diverted from landfill but from home composting, what was left on lawns, private collections, or from alternative organic

diversion e.g. garden waste drop off at transfer stations. This means more material is added to the kerbside collection which adds to the cost, while not actually delivering much extra diversion from disposal.

Key issues to consider when anticipating how much garden waste may be collected by a FOGO collection are:

- The amount of garden waste in kerbside rubbish bins. There is more likely to be garden waste if a lot of households use wheeled bins for rubbish (either a council or private service)
- The proportion of properties with gardens and whether the residents desire a garden waste collection
- The size of gardens as households with larger gardens will likely produce more garden waste
- Seasonal fluctuations as garden waste volume will typically increase in spring/summer/autumn and reduce in winter.

3.2.2 Food waste diversion in a FOGO system

According to studies by WRAP UK, the amount of food scraps collected in a FOGO system is between one third and one half of the amount collected in a food scraps only collection. The below indicative yields are provided by WRAP UK for the three most common food scraps collection services across the UK:

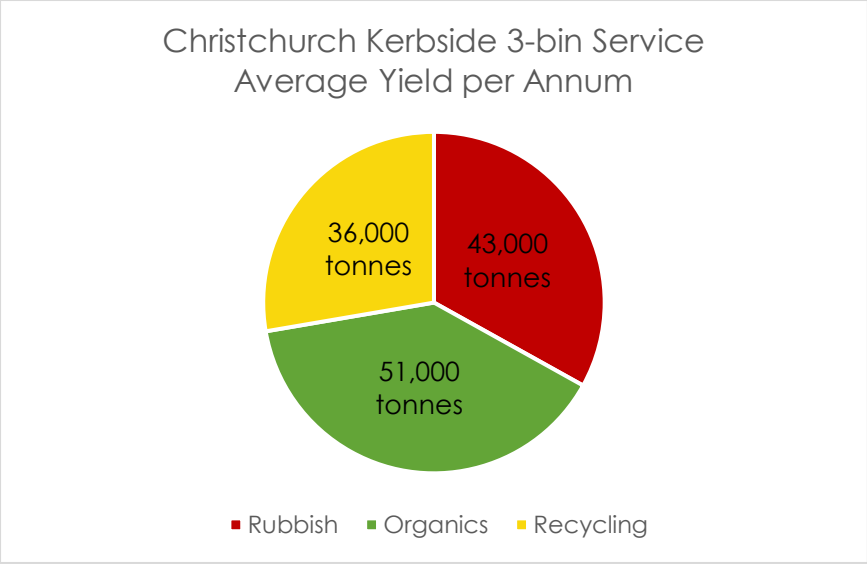
Indicative food scraps yield per HH per week	
Weekly food scraps	1.5kg
Weekly FOGO	0.8kg
Fortnightly FOGO	0.5kg

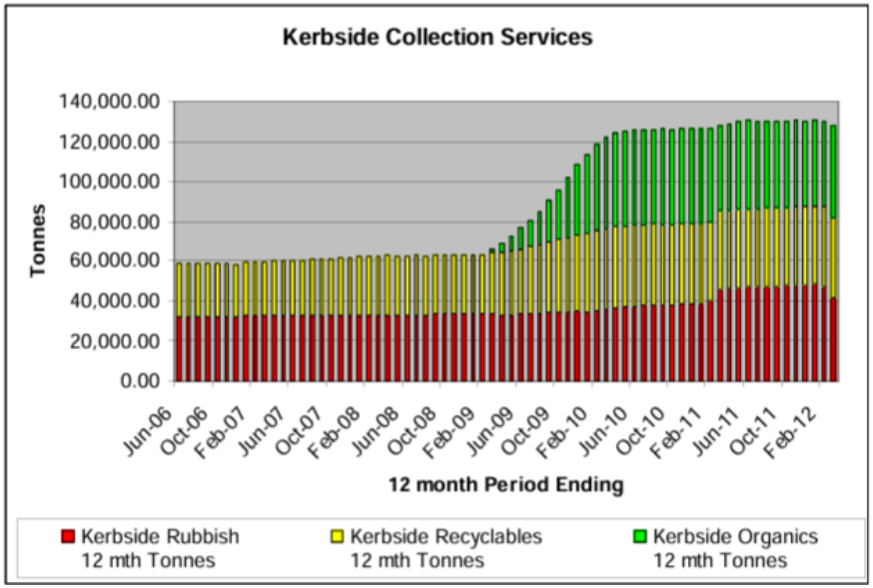
The indicative yields in the table above demonstrate that the frequency of collection service and whether the service is food scraps only or FOGO have an influence on the amount of food scraps collected.

3.2.3 Un-forecasted yield and associated risks in a FOGO system

Some councils in Australia have experienced additional garden waste being drawn into the collection system when kerbside organics collections were introduced. This may increase the diversion rate, but it will also lead to increased organic and total waste arisings. Available figures on average yields from Australian households show that garden waste collections can capture 7kg/HH/week in urban areas and up to 10kg/HH/week in more rural areas.

Organics collections are usually introduced as a weekly or fortnightly service. Services that include food require a weekly collection service. Some European councils have opted for a weekly collection in summer and a fortnightly collection in winter, although this requires more elaborate planning, management, and communication with the community.





CASE STUDY: FORECAST THE UN-FORECASTED - GARDEN WASTE, THAT IS!

In 2009 Christchurch City Council introduced a three-bin system that included:

- Green bin (80l) for food scraps and garden waste (FOGO), weekly
- Red bin (140l) for rubbish, fortnightly and
- Yellow bin (240l) for recycling, fortnightly

When the service changed there was a slight increase in rubbish collected. There was also a notable, increased amount of garden waste that had not been collected by the previous service. There was a moderate drop off in garden waste taken to transfer stations (but not enough to account for the tonnages collected), and some of the garden waste likely transferred from private garden waste collections, but it appears most of the garden waste was new to the system.*

There is now more organics collected than rubbish or recycling. According to the Christchurch City Council's 2019 Waste Assessment the average weight per annum of rubbish is 33% of the total kerbside waste collected, while organics is 39%, and recycling is 28%. SWAP composition data from 2022 shows that rubbish makes up 32% of what's in the rubbish bins, while organic material makes up 12%, and recyclable materials make up 31%.

This demonstrates that when the organic service was introduced, it resulted in extra garden waste being collected that was not previously in the kerbside collected rubbish. When designing a kerbside organic service and considering what material to collect (food scraps or FOGO), keep in mind the garden waste that may be hiding in residents' backyards.

Sources: https://ccc.govt.nz/services/rubbish-and-recycling/how-were-doing-with-rubbish-and-recycling/waste-statistics/
https://ccc.govt.nz/assets/Documents/Consultation/2020/07-July/2019-Waste-Assessment.pdf
http://archived.ccc.govt.nz/council/proceedings/2012/june/cnclcover28th/clause6.pdf

* The council notes that earthquake disruption, consumer habits, waste disposal needs, and change of collection routes should also be considered when analysing the total kerbside waste collected.

3.2.4 Monitoring and evaluation

Monitoring and evaluation helps service providers to develop an understanding of how a service or communications campaign is performing and identify opportunities for improvement. This applies to both waste management services and the communications activities undertaken to promote them. Things to monitor include tonnage, composition, set out and participation rates, capture rate, user feedback, communication monitoring, and contractual key performance indicators (KPIs).The percentage allowance for contamination in the material sent to processing facilities varies between facilities and depends on the processing method. The facility operator will discuss this during the negotiation stage and let you know what penalties apply; they should also alert you if the contamination is too high once the service is implemented.

WASTE SURVEYS

There are several types of surveys to understand more about waste management in your area. These are outlined in the table below:

Survey name	What's involved in the survey	Some ways to use the results of the survey
SWAP (Solid Waste Analysis Protocol)	Waste material samples are collected from kerbside services typically every day for a period of five days. SWAP surveys may be taken in different seasons if waste is expected to be different over time (e.g. tourist populations), and if repeated for comparison should be done at the same time of year. The waste will be sorted into 12 primary classifications and weighed. It can also be sorted into secondary classifications if requested.	With the composition of waste in the service/s you provide you can: • Determine whether a contamination strategy is required • Check that you're on track for goals and strategies • Estimate expected yield of an organic collection.
Participation and Set-out	Participation is typically the percentage of households who have presented their waste at least once over a three-week period. Set-out is typically the percentage of households who present their waste on any given week. The participation and set-out rate are determined by monitoring how many times selected households put waste material out for collection over time. Participation and set-out surveys may be done together – if you want to know participation the data will also show set out for the weeks you survey.	Participation and set-out rates can be used to: • Understand how households manage their waste • Determine whether a strategy to boost resident engagement and participation is required.
Market share	Market share surveys identify the percentage of households that use council provided and private waste services. It can determine the allocation of bags and bins, bin sizes, and private collectors.	Market share can be used to: • Estimate total kerbside waste in the absence of data from private collectors.

3.3 Product quality

The success of the kerbside organic collections service depends on the demand for the product. Just like recycling, if the supply exceeds the demand there will be negative impacts like stockpiling and less favourable disposal options. This means that the product must be reliable, high quality, and something that households, businesses, farmers, or council parks operations in your area want to use and are willing to purchase.

Organic matter is key to regenerating and building resilience in soil, it improves soil structure as well as nutrient retention. Applying organic matter to soil can reduce watering and chemical fertiliser use. Food scraps and garden waste have high nutrient value and are well suited for producing quality soil amendments.

For a product to be high quality however, the organic material sent for processing must have low levels of physical, chemical, and biological contamination. Products created from organic material with low levels of contamination have a larger range of possible applications, greater likelihood of being accepted and purchased, and will reduce risks of contaminating plants and soil.

Unfortunately, food scraps and FOGO collections can have high levels of contamination that negatively affect product quality.

The most common contaminant is plastic – in particular plastic bags or other plastic packaging. In manual food scraps collections, it is possible to inspect bins before emptying. Contaminated bins can be left behind and stickered with information for the household explaining why. This can help in reducing contamination and educating householders. Inspections for FOGO collections in wheeled bins however are not practical during collection, although 'bin inspectors' can be deployed. This means that contamination in wheeled bins is usually not spotted until the bin has been emptied into the collection vehicle. The ability for households to 'hide' contaminating material in wheeled bins is an ongoing issue. Glass is a particular issue in FOGO collections as once it breaks it is impossible to remove and the presence of broken glass severely reduces the quality of the product and the uses to which it can be put.[20]

Managing contamination well is therefore critical to being able to produce a valuable product that provides genuine diversion to beneficial use.

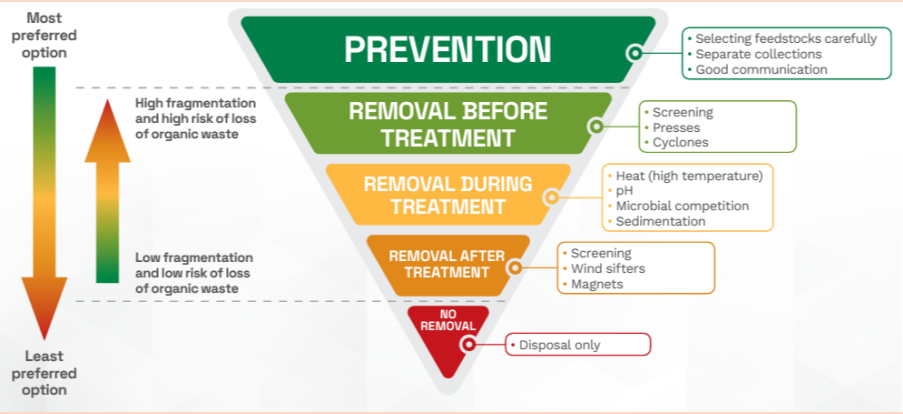
[20] Eunomia (2023) Contaminants in Organic Waste - Stakeholder Engagement Report Prepared for the Ministry for the Environment 15 November 2023

MANAGING CONTAMINATION

Contamination reduces product quality. There are three main types of contaminants, **physical** (e.g. plastics, metal, glass), **chemical** (e.g. pesticides and herbicides, persistent organic pollutants, PFAS, micro and nano plastics), and **biological** (e.g. pathogens, weed seeds).

Contamination can occur at any stage of the process, but the highest area of risk is in the feedstock. In the case of food scraps and garden waste this mainly occurs through householders putting the wrong items in the bin.

There are opportunities to address contamination throughout the process. The most important and effective is to **prevent** contamination entering the organic stream in the first place through **education**. The next most effective is to intercept and remove contamination before it is collected (e.g. through **kerbside inspection**). Once collected it is possible to remove contamination through mechanical and manual **separation**. Finally physical contaminants can be **screened** out of the final product. The diagram below illustrates a 'contamination prevention hierarchy':



Source: ISWA (2023) A Practitioner's Guide to Preventing and Managing Contaminants in Organic Waste Recycling

CASE STUDIES: LINERS CAN HELP REDUCE CONTAMINATION

SLIGO, IRELAND: This study showed that the provision of compostable bin liners and ventilated kitchen caddies to residents coupled with a public awareness initiative reduced the level of contaminants from 18% to 3% by weight and doubled participation by households (Sligo County Council et al., 2019).

KASSEL, GERMANY: This study showed that the distribution of compostable bin liners to households resulted in a drop of contaminants by 56%, whilst also increasing the share of organic waste collected to 23% (Gröll et al., 2015).

13 CITIES & MUNICIPALITIES, GERMANY: This study showed that in areas with the recommendation to use compostable liners, kitchen waste resulted in a contamination level of just 2.5% by mass, while contamination in areas without compostable bin liners had a contamination level of 3.8% by mass (Kern, Siepenkothen and Turk, 2018).

BRATISLAVA, SLOVAKIA: This study showed that a start-up initiative to collect household kitchen waste in high-rise built up areas and found that a door-to-door collection combined with the distribution of compostable bin liners and ventilated kitchen caddies led to levels of contamination below 2.6% by mass (Zenzo, personal communication, 2022

Source: ISWA (2023) A Practitioner's Guide to Preventing and Managing Contaminants in Organic Waste Recycling

3.4 Community approval

3.4.1 Resident perceptions

Household approval and perceptions of organic waste services are key to their success. The main reasons for people not participating in or disliking an organic waste service are smell, messiness, and likelihood of attracting flies. The severity of these issues can be reduced by supplying ventilated kitchen caddies and bin liners. Alternatively, residents could use paper bags, paper towels, or newspaper as to line their bins.[21]

Residents may raise concerns regarding the cost of the service, especially if they compost at home and don't envision themselves using the service. There is an overlap between the material accepted in the kerbside service and at-home composting, however the kerbside service can accept material like meat, bones, and citrus that most at-home composting methods can't manage easily. By framing the service as an accompaniment to the existing residents' efforts and clarifying the acceptable materials it can encourage resident approval.

3.4.2 Community preferences

Different communities may have preferences for the collection, processing type, facility location, and product of a kerbside organics service. Community groups that are likely to have interest and opinions are mana whenua and community composting groups, as well as businesses in agriculture, horticulture, and food processing sectors.

CASE STUDY: FOOD SCRAPS SERVICE RESPONSE IN THE UK

One WRAP survey included in their guide explored attitudes to food waste recycling and found that they were largely positive:

- 59% of UK citizens agreed that the benefits of food waste recycling are very clear to them.
- 85% agreed that it is their responsibility as citizens to recycle their food waste.
- 75% agreed that food waste recycling is part of their household's routine.

A key weakness shown as over half (58%) with access to a service said they were not clear about the process following collection. This demonstrates the need to continue communicating and sharing successes with residents after the initial service roll-out.

[21] It should be noted that there have been concerns raised that paper bags can contain PFAS. Refer: Material excluded from kerbside food scraps and food and garden waste collections | Ministry for the Environment

Early engagement with community groups is beneficial as it allows expectations to be managed and ideally met. When community groups feel connected to the kerbside service they can help to boost participation.

Similarly, early engagement with businesses can ensure that the product will be financially viable and in demand. It could also identify opportunities for joint ventures when procuring new processing facilities and collection services.

3.5 Cost

Cost is always a key consideration when considering options for collecting organics. It is important to understand not just the costs of the kerbside service itself but also how the service can affect overall system costs and the costs that households end up paying (i.e. through rates, private services, transfer stations, etc.).

The different elements that drive the cost of a kerbside service include those shown in the table below. Annual combined costs of collection and processing range from around $60 -$100 per household for a food scraps only service, to $80-$120 per household for a FOGO service. These costs are based on actual costs observed in systems implemented in New Zealand.

	Service Element	Indicative Cost	Comment
1	**Food scraps containers**	$1 per HH per year Liners $10 per HH served per year	The cost of bins depends on whether caddies, liners, and kerbside bins are provided. Although they can be a significant capital cost, across the life of the container (around 10-15 years), these containers are a small component of the overall service cost. The exception to this is if liners are provided. This will be an ongoing annual cost which could add in the order of $10 per household per year.
2	**FOGO containers**	$3-4 per HH served per year	Wheeled bins for FOGO represent a higher capital cost but they should have a long lifetime which levels out the cost over time.
3	**Foods scraps collections**	$30-50 per HH served per year	This will generally be the largest component of cost. The costs will depend on the methodology employed, the number of staff on each vehicle, the vehicle configuration, how far the vehicles travel, housing density and household type, etc. Manual food scraps collections have a relatively high

	Service Element	Indicative Cost	Comment
			labour component but generally use smaller slightly cheaper non-compacting vehicles. One vehicle will typically collect 600-1,000 households a day.
4	**FOGO collections**	$40-60 per HH served per year	FOGO collection vehicles are generally standard side arm lift compactor trucks. They are very efficient in collection, and usually only require a driver, but are more expensive in terms of capital cost. One vehicle will typically collect from 1,000 to 1,500 households per day. Because side arm compactors can also be used for rubbish and mixed recycling collections this provides flexibility in a fleet and can help limit the need for spare or partially utilised vehicles.
5	**Food scraps bulking and processing**	$10-$20 per household served per year	Bulking and processing costs are another large cost component. The cost of bulking will depend on the location of the facility, and whether bulking and transport is required or if collection vehicles can drop off directly. Processing cost will depend heavily on the type of technology chosen, and the scale of the facility. Food scraps are best either managed in a process that can accept a high proportion of putrescible material (such as vermicomposting or Anaerobic Digestion), or they require an appropriate quantity (e.g. 70%) of structural material (such as garden waste or woodchip) to be mixed with it and managed in an enclosed process. Vermicomposting has low capital costs, but it requires land and has similar operating costs to composting. AD has high capital costs so only tends to become cost competitive at scale (above 20,000 tonnes). In-vessel composting also has relatively high capital costs and, because it needs bulking material to be mixed with it needs to be sized at roughly three times the food waste input, which adds to the capital cost for a given amount of food waste. If the processing facility is located a significant distance from where most of the tonnage is collected or bulked, this could add substantially to the cost of processing.
6	**FOGO bulking and processing**	$30-$50 per household served per year	Because garden waste takes up substantial volume, bulking and transport costs can be quite high (although leachate is less of an issue), therefore it is usually advisable to locate a FOGO processing facility in proximity to where most of the tonnage is generated.

	Service Element	Indicative Cost	Comment
			Because FOGO is a mix of food and garden waste, FOGO is generally best suited to an aerobic composting process. The presence of food waste means there needs to be good process controls to prevent odour and pests. Some form of in-vessel, covered, or aerated windrow composting process is usually required. This has higher capital and operating costs than a simple windrow or static pile process that is usually used for garden waste only.
7	**Communications and administration**	$3-$10 per household per year	The importance of good communications cannot be over emphasised. Householders require constant messaging to ensure they make the best use of the system. Therefore, while it is tempting to try and save on communications budgets, savings here could result in additional costs elsewhere, including higher contamination (meaning more cost in decontamination, lower product quality), higher compliance costs, lower participation, higher rubbish disposal costs etc.

Overall cost

The impact of an organic waste collection service on overall costs depends on a range of factors. All else being equal, material collected through a food scraps or FOGO collection that was diverted from the rubbish may provide savings in rubbish transport, bulking and disposal costs. It could also lead to savings in collection costs if, as a result of the organic service, households put their rubbish out less frequently, or the council chooses to move to collecting rubbish fortnightly.

Moving from a weekly to a fortnightly collection will reduce collection costs by about a third (this is because although the collection is half as often more people put their rubbish out each collection day and the bins are fuller, meaning it is slower to collect the round). Council market share for kerbside rubbish may also affect overall costs, as the introduction of an organics collection may affect the services they choose to use contain carbon, nutrients, minerals, and water that can be cycled back to the land to replenish organic matter, increase biodiversity, and sequester carbon.

3.6 Carbon

When organic material is disposed to landfill it releases methane that contributes to climate change, as well as other harmful byproducts like leachate, ammonia, and pollutants. Garden and food organics

Landfill gas capture may be viewed as an efficient and cost-effective way to reduce emissions because the product produced (renewable energy) can offset the use of fossil fuels.[22] Although the potential of the organic material to be processed into a product that has nutrient value and benefits to the community is lost. Considering the lifecycle of food and organic material as per the waste hierarchy means waste management should look beyond gas capture at landfill and assess the lifecycle of the material holistically. To have a resilient and regenerative food system that reduces waste being produced first and foremost is key. The next best option is to collect organic waste and give it another life as a quality product to be used by local farmers and gardeners. There can also be carbon offset from sequestering the carbon from the organics in the soil. In addition, use of organic soil amendments can reduce the use of synthetic fertilisers thereby reducing carbon impacts.

A key possible carbon-related benefit to collecting and processing organic waste is the offset of fossil fuel. For example, when material is processed through anaerobic digestion (AD), it produces biogas from methane which is a renewable energy. If the biogas is used in place of vehicle fuel or fossil fuel heating, then there are associated carbon savings.

Counteracting these benefits are the carbon emissions relating to organic waste collection and bulk haul vehicles, and the reduction in landfill gas generated that was formerly used to generate power or heat. However, these counteractions are relatively minor compared to the carbon benefits of recovering organics. Additionally, when garden waste is collected that was unexpected (i.e. it exceeded estimates informed by SWAP data), the carbon saving is less apparent as it wouldn't necessarily have been sent to landfill previously. It is assumed that un-forecasted garden waste material is stored in residents' gardens to compost/decompose naturally or taken to a transfer station or composting facility.

[22] In New Zealand most landfill gas captured is used to generate electricity, which is generated from 80-90% renewable sources (Energy in New Zealand 2023 shows renewable electricity generation increased to 87% | Ministry of Business, Innovation & Employment (mbie.govt.nz)), so offsetting of fossil fuels will be minimal where this is the case.

3.7 The role of legislation, regulation, and policy

To achieve widespread adoption of kerbside organic collection services nationally generally requires support by legislation and policy. Ambitious requirements are likely to encourage councils to design their service according to best practice, and the levers mentioned below can assist them to do so.

National government levers include:

- Waste strategies with targets, in particular an organic waste strategy
- Policies like kerbside standardisation or banning organics from landfill
- Investing in waste infrastructure and kerbside services
- Increasing the waste levy to encourage resource recovery.

Local government levers include:

- Waste strategies with targets, in particular an organic waste strategy
- Bylaws that require households to separate organic waste from rubbish
- Investing in waste infrastructure and kerbside services.

The Ministry for the Environment released the document 'Improving household recycling and food scraps collections' in 2023, outlining "three big changes" listed below. Following the document, in 2024, the Ministry released the national 'Te rautaki para | Waste strategy'.

- Standardising what materials are accepted in council provided kerbside bins (gazetted in 2023)[23]
- Introducing recycling collections where they're not currently available
- Introducing food scraps collections to urban households

Te Pūtea Whakamauru Para
Waste Minimisation Fund (WMF)

At the time of publication, the Ministry for the Environment's waste minimisation fund is open year-round and will consider applications for funding towards kerbside organic bins, organic processing infrastructure, and support for organic service roll-outs.

[23] https://gazette.govt.nz/notice/id/2023-go4222

The changes are staggered over time and the most relevant to this guide are in the screenshot below:

3.	Food scraps collections for urban households	By 1 January 2030, all district and city councils provide food scraps (or food and garden waste) collections to households in urban areas of 1,000 people or more. Councils with organics processing facilities nearby provide a food scraps service by 1 January 2027 (read more about food scraps collections).
4.	Minimum standards for diverting waste from landfill	All district and city councils meet a performance standard for the amount of household kerbside waste diverted from landfill. The performance standard will increase over time: • 30 per cent by July 2026 • 40 per cent by July 2028 • 50 per cent by July 2030

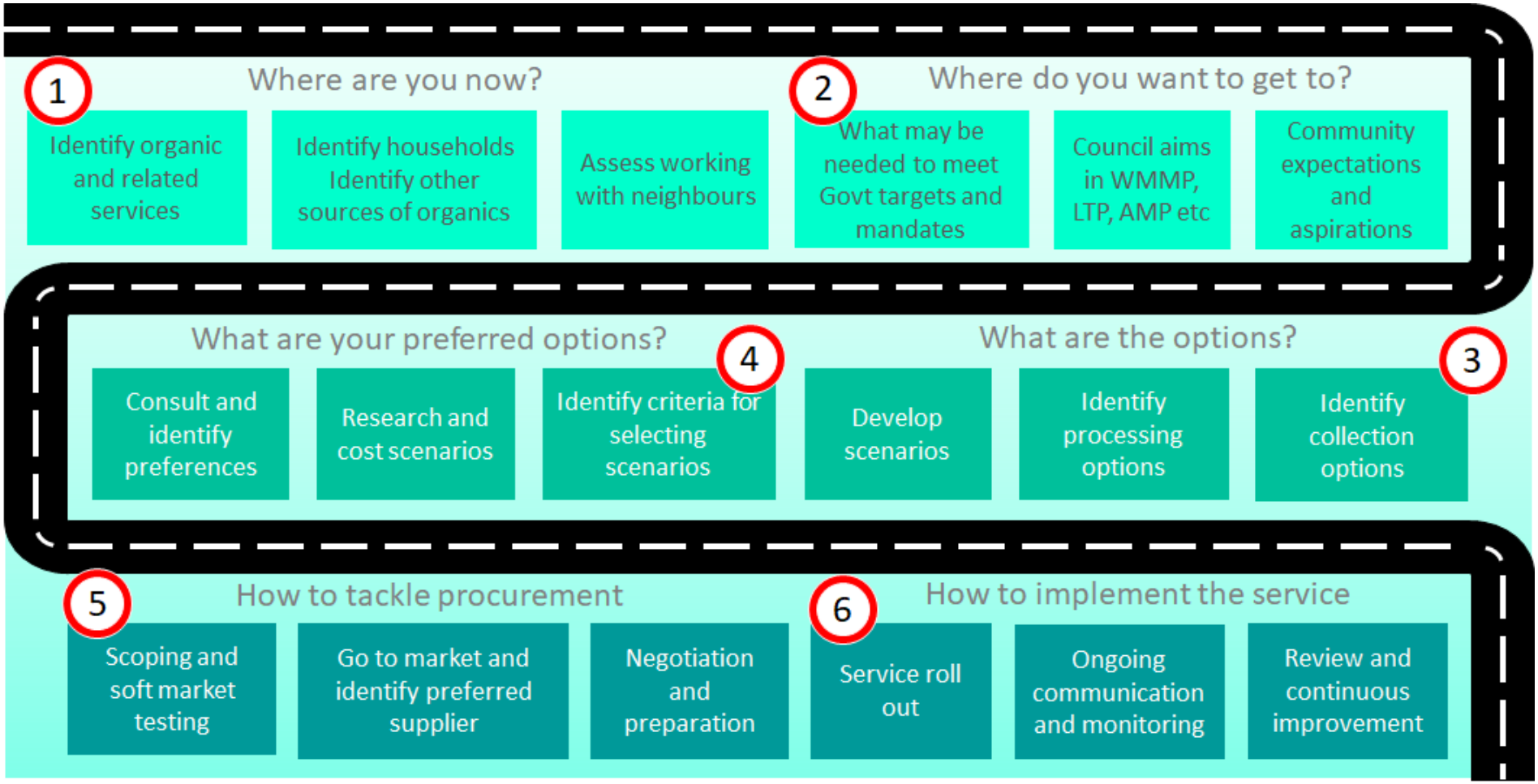
In June 2024, MfE also announced an expansion to the waste disposal levy to increase the levy cost for class 1 landfills from $10/tonne to $60/tonne from July 2024 and increasing by $5 each year until 2027. The expansion also covers applying the levy to additional landfill types and expanding the scope for investment of levy revenue.

4 FRAMEWORK: SIX STEPS TO SUCCESS

FRAMEWORK: SIX STEPS TO SUCCESS

4.1 Road map

This guide identifies six key steps that you will need to work through on your way to rolling out a successful organic waste collection service. These are illustrated at a high level in the roadmap graphic below and explained in detail in the following sections.



4.2 Timeline

This timeline indicates how much time to allocate for different steps from planning to monitoring an existing service. This will vary depending on individual circumstances.

	KEY STEPS		RECOMMENDED TIME ALLOWANCE
1	Where are you now	Gather data	2-3 months
2	Where do you want to get to	Identify targets Identify aims and objectives	2-3 months
3	Options	Explore collection and processing options	1-3 months
4	Preferred options	Calculate budget and expected costs of service Research and establish business case Run a consultation Identify and gain elected member approval and funding in LTP Identify suitable land and consenting if new facility is required	3-9 months
5	Procure	Order bins, caddies, liners Order collection vehicles Create contracts for collection contractors and facilities Build or assign a processing facility	18 months - 2 years
6	Implement & Monitor	Begin communications campaign Train call centre staff Deliver bins to households Communicate and support households, hold surveys Monitor and evaluate participation and contamination SWAP data	1 year for planning, delivery ongoing *Additional time (e.g. 1 year) may be required if building and consenting an organics processing facility.*

STEP 1: WHERE ARE YOU NOW?

STEP 1: WHERE ARE YOU NOW?

THIS SECTION DISCUSSES THE IMPORTANCE OF REVIEWING THE CURRENT STATE OF WASTE MANAGEMENT, DEMOGRAPHICS, AND GEOGRAPHIC FEATURES IN YOUR REGION AREA WHEN PLANNING A KERBSIDE ORGANIC COLLECTION SERVICE. THIS INFORMATION IS ESSENTIALLY YOUR STARTING POINT.

The table below will provide you with steps to gather information and details that may inform your service design and delivery.

Characteristic	Questions	How to find the data required	Answers will allow users to	Impacts on decision making
Waste management	• What waste services does your council provide? • What are your annual tonnages? • How long do your current waste contracts have to run?	This information should be available through tonnage data from contractors and contracts.	By using annual rubbish tonnages and SWAP data for organic waste in rubbish you can forecast estimated tonnages. For example, if there is 10,000 tonnes of kerbside rubbish and food waste makes up 4,000 tonnes of that, you will collect a proportion of that 4,000 tonnes, depending on your participation rate. If half of your households use a new food scraps service, you can therefore estimate to collect around 2,000 tonnes of food waste. FOGO collections are a bit different. More people tend to use the service but not all households use it for food scraps, so the amount of food waste collected may be	The estimated amount of organic material collection may impact your decision on service offering (food scraps or FOGO). For example, if your region is densely populated with houses that don't have gardens FOGO is unlikely to be required. These estimates may also impact your decision on processing method as each method has a minimum and maximum input requirement and local operators may not have capacity for the type and volume of waste you anticipate.
	• Is there an organic waste processing operation in your area? Does it have capacity to accept kerbside organics?	To determine whether your local organic material processing facility has capacity to accept kerbside organics, first determine the volume you expect to collect. Once you have an estimate, contact the facility and have a discussion.		
	• What surveys has your council done recently – market share, kerbside rubbish composition using the Solid Waste Analysis Protocol (SWAP), or participation and set-out?	For many councils this information should also be available. The most pertinent survey to designing a kerbside organics service is SWAP data which provides		

Characteristic	Questions	How to find the data required	Answers will allow users to	Impacts on decision making
		information about the composition of material in a rubbish bin.	similar or a bit lower. Also, FOGO collections collect a lot of garden waste that was not collected in the rubbish previously. This is discussed further in Step 3 and touched on in the previous section 3.2.3.	
	• What rubbish and recycling services do private operators provide? • Are private operators providing garden waste collection services? • Are there private operators providing organic waste processing facilities? What is the nature of these facilities? Do they have capacity and capability to accept food scraps/FOGO?	If you have a recent waste assessment, you should have most of this information. Alternatively, this information could be found through waste bylaw/licensing data or through an online search with the name of your area and key words like “rubbish”, “waste”, or “recycling”. If you can’t find tonnage data from private collectors try contacting them for a discussion.	By identifying stakeholders and engaging with private waste operators, councils can understand efforts that private operators may be making in the collection and organic processing space, and interest in adapting to offer kerbside organic services.	This may impact your decision when going to market for collections.
	• Are there any other organic waste streams that can be accessed to add to the kerbside organic collection tonnages?	If you have done a waste assessment or stocktake some of this data may be available. To get detailed data it may be necessary to undertake a study, or alternatively in smaller areas you may be able to get a lot of the information by talking	Determine what other waste streams are available to either complement your feedstocks (e.g. bulking materials for food scraps) or add to the quantity of material to recover more organics and take advantage of economies of scale.	Knowing feedstocks is vital information for planning any facility. It will inform the potential size of the facility and the type of process that is going to be best suited for the available feedstocks.

Characteristic	Questions	How to find the data required	Answers will allow users to	Impacts on decision making
		to key industry operators. You could also seek answers through a procurement process – either an EOI or require that suppliers identify additional feedstocks	Bear in mind that many sources of organic waste are seasonal so don't just look at annual tonnages.	
	• Are there any local community groups involved in this sector that could have a role to play in service delivery?	Approach existing community groups and mana whenua.	Consider options for involving the community sector and mana whenua in service provision.	May impact the types of options that are considered and open up options for community scale collections and facilities where appropriate – for example in remote or connected communities with urban community gardens.
	• Do you have estimates of the private collectors' annual tonnages and composition of the waste?	This information may be estimated in a council's waste assessment, market share survey, or SWAP. The information could also be gathered by asking private collectors directly.	By using annual rubbish tonnages and SWAP data for organic waste in rubbish collected by private operators you can forecast estimated tonnages. If you have the tonnage but not the SWAP data for privately collected rubbish you can assume it is the same as council-collected rubbish. If you have neither tonnage nor SWAP data, but you have market share data you could multiply out the council waste estimate by household.	The estimate of private waste collected will be included in the estimated amount of organic material collection and may impact your decision on service offering (food scraps or FOGO). Most commonly kerbside organic collections are offered as non-opt-out, rates-funded services so households that may choose a private rubbish service are still likely to use the kerbside organic service.

Characteristic	Questions	How to find the data required	Answers will allow users to	Impacts on decision making
Demographic	• How many people live in your area? • What languages are commonly spoken? • How many households are in your area? • How many are in the urban area? • What types of homes are they (e.g. stand-alone, MUDs, etc.)? • Do households in the urban area have large land parcels/large gardens? • Who will receive the service (resident households, visitor accommodation (e.g. Airbnb, hotels, motels, etc.) businesses, schools, MUDs, etc.)? Is this different to who receives the usual council provided kerbside service? • Does your area have a lot of aged care/retirement villages? • What provision do you need to make for future planning changes, population growth, or urban growth?	This information can be found on the Stats NZ website, from existing contractor and kerbside service data, and/or from council rating databases, or local economic studies. You can get an idea of the types of households by looking at Stats NZ district level data for households that shows splits for urban, semi urban, semi rural, rural areas, etc. Usually-resident population and dwelling numbers will give you a useful indication of the number of holiday homes.	Having this knowledge readily available will enable planning and budgeting: • By determining the amount of people and households in your area, you have the basis for budgeting different options (bins, collections, communications, etc.) • By determining the number of households with large gardens or high tourist/holiday population you can estimate likelihood of seasonal spikes in garden waste material collected through a FOGO service. • By determining the number of MUD-type houses and retirement villages you can consider the possibility of needing a bespoke service for less-accessible dwellings early on.	This demographic knowledge may impact decision making by ensuring the service suits the needs of your residents. By identifying the languages spoken in your local communities it will allow you to provide communications in different languages to enable better participation. Bespoke services might need to be planned, for example: • Multi-unit dwellings may need communal bins with twice weekly collections • Hard to access dwellings, e.g. steep streets, no berm, narrow streets, remote communities may need assisted or on-site collections • Households that are likely to have seasonal waste spikes (holiday homes, large gardens) may need more frequent collections in warmer months or the ability to drop-off material to a local transfer station or community recycling centres.

Characteristic	Questions	How to find the data required	Answers will allow users to	Impacts on decision making
Geographic	• How are the councils neighbouring you managing their waste? • What services do they offer? • Would it be possible to partner for the delivery of a kerbside organics collection?	This data can be found on council websites, or through discussions with other council officers.	By linking up with staff from neighbouring councils you may identify possibilities for providing a joint service. If neighbouring councils are at different stages of operating a kerbside organic collection service you can seek advice and share stories.	If a joint venture opportunity is identified the decision-making process will become collaborative – data will be shared, and decisions will need to consider impacts to residents in more than one area. You will need to consider governance arrangements and how budgets for capex and opex are equitably shared.
	• Do you have appropriate sites available for organic waste processing? • If the sites are far from urban areas will you need sites for transfer and bulking of material? • What are the restrictions on land use? Consider district, spatial and regional plans. • Consider the views of mana whenua and the local community when assessing sites. • What consents will be necessary for the activities to be carried out on the site? • What are the timeframes for obtaining the necessary consents?	Review council property and asset management plans. Review regional and local spatial plans. Initiate appropriate consultation and engagement processes. Engage planning specialists to determine consent requirements and potential timeframes.	Determine whether available sites will be suitable, what the conditions the site might have, whether new sites might need to be procured, or whether it will be practical to send waste to an existing facility.	What to do about sites and facilities will have a significant impact on capital expenditure and timelines.

Characteristic	Questions	How to find the data required	Answers will allow users to	Impacts on decision making
	• What is the breakdown of household types? • Do households typically have gardens/sections?	This data is repeated from the above section 'Demographics'.	Glean potential appetite for garden waste collection.	If the households in your area produce garden waste, they may have strong feelings for or against having it collected through a kerbside service. If you don't already know the preference of these residents, early engagement is recommended to understand whether they are composting on-site and don't want to have the service, or whether they are manging it another way (e.g. using a private provider, transfer station drop-off) and would prefer to have it collected through a council service.
	• Are there any hills, strong winds, snow, or other unique geographical features of your area?	This data is likely to be known by council officers who live in the area.	Identify possible bin choice restrictions. Food scraps are typically collected in 23l bins, and FOGO is typically collected in 120-240l bins.	This will impact the choice of bin and potentially the material collected too. Some geographic features raised by council officers in NZ include strong winds blowing away 23l bins, cold frost causing wheelie bins to slip from truck's hydraulic collection arms, and food scraps in 23l bins freezing. Some areas with the latter problem stagger collection times so that the food scraps are collected in the afternoon and has had time to thaw out!

CASE STUDY: RESIDENT INFORMED SERVICE CHANGES

Tauranga City Council currently have a standard kerbside suite of four bins (and an optional fifth) that maximise diversion and recoverability of waste material:

- Red lidded rubbish bin (fortnightly collections in 80, 140, or 240L bin)
- Yellow lidded recycling bin (fortnightly collections in 140 or 240L bin)
- Blue glass crate (fortnightly collections in 45L bin)
- Small green lidded food scraps bin (weekly collections in 23L bin)
- Green lidded garden waste bin (opt-in fortnightly or monthly in 240L bin)

Tauranga consulted with residents through a survey and introduced the service in July 2021. Some findings are included below:

Indicated the proposed fortnightly rubbish collection would work for them	82%
Indicated the proposed fortnightly recycling collection would work for them	88%
Think the existing glass recycling collection works for them	83%
Indicated the proposed weekly food scraps collection would work for them	68%
Indicated they would prefer the proposed garden waste collection to remain with private companies	75%
Indicated that different bin sizes/costs would improve the proposed collections	79%
Charged through rates is their preferred payment method (as opposed to pay as you throw)	61%

The results found that 75% of residents would prefer the garden waste collection to remain with private companies. As the garden waste bin is optional it means that residents who don't require the service or want to keep their current garden waste collector don't have to pay for the council service.

Image source: https://www.nzherald.co.nz/bay-of-plenty-times/news/new-rubbish-bin-collection-service-begins-in-tauranga-western-bay-of-plenty-what-to-expect/U42FA6PK66DZZDGRR5JWBSCFDU/

Things to think about during Step 1: Where are you now?

Drivers	1. Thinking about council processes	2. Thinking about cost	3. Thinking about the product and market	4. Thinking about carbon	5. Thinking about culture and community	6. Thinking about diversion
	WELLBEINGS					
	Strategy	Economy	Economy	Environmental	Social and Cultural	Environmental
Questions	• With the requirement from the Waste Minimisation Act 2008 to produce waste assessments and waste management and minimisation plans (WMMP) every six years it is a good opportunity to complete surveys to inform them. • Surveys that are useful in this step include SWAP, market share, and set-out and participation surveys.	Data capture needs to be as accurate as possible to avoid unexpected costs at the procurement and delivery stage. Unique aspects of your area may influence the cost of your service: • Some households may require bespoke services with more frequent collections and/or communal bins that could increase cost. • A service run jointly with neighbouring council/s could reduce cost.	• From assessing demographics of your area, in particular people with gardens or agricultural businesses you can begin to think about the current access to or availability of compost products. Gain insight into what kind of end-product they would like to use. • During this phase it is also vital to start thinking about what resourcing – staff, outside experts, and budgets you will need at each stage to deliver a service.	From the estimations made in this section, will this service help to reach climate change related targets and goals?	• Consider the demographics of your residents and visitors. How do their living circumstances (urban, MUDs, retirement villages) influence how they will use and respond to the service? • From identifying the local community groups already involved in waste minimisation and organic material, engage with them early on to find opportunities to work together.	From the estimations made in this section, will this service help your council to reach diversion rate related targets and goals?

STEP 2: WHERE DO YOU WANT TO GET TO?

STEP 2: WHERE DO YOU WANT TO GET TO?

THIS SECTION ALLOWS USERS TO EXPLORE ORGANIC MATERIAL DIVERSION AMBITIONS AND ALIGN THEM TO CENTRAL GOVERNMENT LEGISLATION, COUNCIL STRATEGY, AND COMMUNITY ASPIRATIONS.

Characteristic	Questions	How to find the data required	Answers will allow users to	Impacts on decision making
Legal[24]	Is there an organic processing facility within 150km of your council region?[25]	This information may have been collected through bylaw/waste licensing or may be presented in your waste assessment. Another option to find the information is an online search with your area and key words like "composting facility" or "anaerobic digestion facility".	Determine whether the organics material collection must be implemented by 2027 or 2030 according to MfE requirements. Determine whether a new facility needs to be built.	If there is an existing facility you will need to find out whether they have capacity to process the amount and type of material the service will collect. If there is not an existing facility, arrangements will need to be made to build one.
	How much material does your council need to divert to reach the Ministry for the Environment (MfE) kerbside diversion targets?	To determine your kerbside diversion rate use tonnes collected in the below equation: $$\frac{(recycling + food\ scraps)}{(recycling + food\ scraps + rubbish)}$$ According to MfE, the rate should be: • 30% by 2026 • 40% by 3038 • 50% by 2030	If the kerbside diversion rate does not meet those proposed by MfE, the council should consider what may be required to boost diversion of food scraps. For ideas refer to section 3.	This may impact decision making by requiring services to be implemented sooner than expected. It may also be more costly than anticipated as more work will be required to ensure good participation and yield.

[24] These targets are not statutory requirements at the time of writing.

[25] MfE advises that while the requirement for services by 2027 was based on proximity to existing organics facility, a regulation creating this requirement would list the TAs that had to have a service by 2027. They won't need to figure it out for themselves, and it wouldn't be dynamic over time.

Characteristic	Questions	How to find the data required	Answers will allow users to	Impacts on decision making
Council ambitions	What are your commitments in your waste management and minimisation plan (WMMP)? What other strategic objectives is your council committed to (e.g. AMP, LTP, carbon/climate action plans)?	Commitments will be listed in the documents mentioned and it will help to keep a single document that has them all listed to see similarities or conflicts, and to update progress over time.	This will enable councils to ensure goals are met and to be proactive if they're not on track. It will also enable councils to know what data they need to capture from contractors to be able to calculate targets accurately.	As mentioned above councils may require rethinking service components to maximise participation and yield to reach existing goals and commitments.
	What is the general appetite for, and perception of, organic collections held by elected members?	Have any council staff discussed organic waste (or waste management generally) with councillors or in committee meetings? If so, there may be minutes associated for your review. It will be helpful to realise what information is required for councillors to make informed decisions and provide it early on.	It is best to understand the views of elected members early on and include them in the journey. They need to be confident in the work as they are responsible for approving the direction of the service. Knowledge of elected members' opinions will allow council staff to ensure that priorities and expectations are met as best as possible.	Staff will need to present to elected members and seek feedback as plans progress to ensure the process is as efficient as possible.
Community perspectives	Have you engaged with local mana whenua? What are their perspectives?	Do you or any other council staff have relationships with mana whenua in your area? If waste management hasn't previously been	Identify opportunities for engaging with mana whenua or continue previous conversations.	These conversations could have great impact on shaping the service at different stages, e.g.:

Characteristic	Questions	How to find the data required	Answers will allow users to	Impacts on decision making
		discussed, it is important to find ways to engage and include them in the journey.	Understand the local mana whenua perspectives of managing organic material, gain insight into organic material management with a te ao Māori lens, understand how needs of Māori residents may differ from other residents.	• Site location • Collections • Processing • End-products • Communications.
	Identify community capability and ambition in the organic space. Are there opportunities to engage local community compost groups?	Do you or any other council staff have relationships with community compost groups in your area? If not, it is important to find ways to engage and include them in the journey.	Understand the local organic community groups perspectives and gain insight into how their users use the service. Discuss how the council provided kerbside organic collections is complementary and how they could be involved.	These conversations could also impact the shape of the service as mentioned above. Community composters may be interested in helping to process some of the material collected.
	Identify local businesses that would use an organic processing facility.	Are there food manufacturing businesses, or other operations in your area that produce a large amount of food waste or food scraps? You may need to consider undertaking a stocktake or formal investigation to determine quantities of material that could be provide feedstock to a local processing facility.	Large scale composting facilities usually require more material than household council collections. By connecting with local businesses that are likely to be high users of a composting facility it will better inform the design	Having connections with industry may enable a smoother process and flexibility for procuring a facility.

Characteristic	Questions	How to find the data required	Answers will allow users to	Impacts on decision making
			if a new one needs to be built.	
	Identify local agricultural businesses that would use a product made from organic processing.	Are there agricultural businesses in your area that would benefit from fertiliser or other products from organic processing, or could provide feedstock? You may need to consider undertaking a stocktake or formal investigation to determine quantities of material that could be provide feedstock to a local processing facility.	By identifying potential users for the product and discussing what a desirable, quality product looks like to them this will help to determine processing method.	This impacts decision making by informing processing method. Finding end market early is also helpful.
	What feedback have you received recently through consultations, events, etc.?	Recent consultations should have feedback kept on file, perhaps opening a relevant summary document and search for key words like “waste”, “organic”, “food scraps”, or “garden waste”. Events and other outreach may not have captured feedback. Having conversations with council staff who have run workshops and events recently to see what feedback they can share with you.	Understand the local appetite for organic collections and use it to inform the shape of the service.	The feedback provided is likely to be less nuanced than for mana whenua and local community composters. The main impact this is likely to have is whether residents are interested in having garden waste collected.

CASE STUDY: WAIMAKARIRI'S KERBSIDE SERVICE SWAP SURVEY

In 2022 Waimakariri District Council procured a comprehensive waste audit of the local Resource Recovery Park and their kerbside collections ahead of their 2024 waste assessment. The council was keen to understand any changes in waste flows and composition since 2019, when an optional FOGO service and wheelie bin for rubbish were introduced.

For the kerbside rubbish and organics audit, samples of rubbish bags, rubbish bins, and FOGO bins were collected from residential properties using the council service throughout the Waimakariri district over 5 days. Bags were weighed then material was sorted into waste streams and weighed.

The audit found:

- The average rubbish bin had between 39 and 43% (3 and 5kg) organic material (mainly food)
- The average FOGO bin had between 12 and 15% (1.9 and 3.2kg) contamination
- The most common contaminant in the FOGO bin was soil (7 to 10.9%)
- The average FOGO bin had a composition of 75% garden waste and 10% food scraps.

According to the Waimakariri District Council Waste Assessment (2024):

- The food scraps collected per household serviced per week is 0.82kg, which is similar and, in some instances, greater than food scraps only services by other councils in New Zealand.
- The quantity of food scraps in kerbside rubbish decreased when comparing the 2017 and 2022 waste audits, despite population growth.
- The main contaminant in the organics bin is soil, which is likely to be a misunderstanding by the residents. This knowledge may trigger targeted comms to residents.

Image source: Rubbish SWAP audit in Waimakariri courtesy of Bruce Middleton, Waste Not

Things to think about during Step 2: Where do you want to get to?

Drivers	1. Thinking about council processes	2. Thinking about cost	3. Thinking about the product and market	4. Thinking about carbon	5. Thinking about culture and community	6. Thinking about diversion
	WELLBEINGS					
	Strategy	Economy	Economy	Environmental	Social and Cultural	Environmental
Questions	• How can previous feedback from elected members be integrated into the service design at this early stage? • When is an appropriate committee meeting to present ideas and seek feedback? • How can you include elected members in this journey? • How to manage the tension between wanting to reduce waste over time and procuring a service to collect waste?	• By identifying businesses that contribute organic material to the processing facility this may reduce cost. • By identifying agriculture or other users of the product this can help with budgeting and informing the price of the product.	By engaging with mana whenua, local industry, agriculture, and community compost groups they are likely to provide recommendations for the product and may be interested in using the product when it is produced.	• How do you need to shape the service to ensure you meet the goals and targets identified in this step? • What product are your communities recommending? Do the products offset carbon?	By engaging with mana whenua early on the service can better meet the needs of Māori. • What are the views of organic material management according to te ao Māori? • What are the requirements of an ideal site for processing? • How could local marae be involved? • How can we best communicate with Māori when releasing communications about the service?	• How do you need to shape the service to ensure you meet the goals and targets that you identified in this step? • Do your local communities want garden waste collections?

STEP 3: WHAT ARE THE OPTIONS?

STEP 3: WHAT ARE THE OPTIONS?

THIS SECTION PRESENTS ALL OPTIONS AVAILABLE WHEN DESIGNING AN ORGANIC MATERIAL COLLECTION WHEN THERE ARE NO RESTRICTIONS, ALLOWING USERS TO IMAGINE THEIR IDEAL SERVICE AND WHAT DECISIONS ARE MOST IMPORTANT TO THEIR UNIQUE SITUATION. IT WILL EXAMINE THE PROS AND CONS OF EACH OPTION.

There are two key parts to the options you might consider. These are the organics collection system and the processing methodology. These two elements are not independent of each other, as what material you collect and how you collect it influences the type of processing facility you will need. This can also work the other way around if there is an existing facility you have the option of using, or existing local markets for a type of product. Another consideration is the type and frequency of your residual rubbish collection. As noted above, the frequency, capacity, and cost of the rubbish collection can impact how much people use the organic service; if rubbish is frequent, convenient, and cheap people are more likely to put organics in the rubbish than if it is less frequent, has a limited capacity, or incurs a charge.

For this reason, it is helpful to look at the options in terms of 'scenarios', where a scenario refers to a group of options that make sense as a package. In other words, each part of the package supports the other parts.

For the purposes of this guide, we will firstly consider the different components of each system separately and note the role they play.

Component	Common Options	Indicative Cost	Considerations
Interior containers	5 – 10 litre bench top kitchen caddy - **solid-sided** 	$5-$10	Benchtop caddies provide a convenient receptacle for separating waste in the kitchen and are provided to assist householders to separate their food scraps. Solid sided caddies can be used with or without liners. Using without liners means households have to wash the containers out regularly or they can get smelly and off-putting. Some households choose to line their caddies with newspaper or paper bags. Whether this is allowed is discretionary (see kerbside standardisation below).
	5–10 litre bench top kitchen caddy - **ventilated** 	$5-$10	Ventilated caddies must be used with liners. Liners reduce moisture in the food waste and stop it from smelling and leaching – often referred to as the 'yuck factor'. This helps householder acceptance and is considered a key feature of high performing systems internationally to get better participation rates. If liners are used this can make the collection transport and transfer of food waste easier as there is less smell and leachate to manage. The main drawback is that they do not work without liners so a constant reliable supply of liners must be provided otherwise the resident will either stop using the service or will use other non-approved liners that may add contamination to the system. The other drawback is that supplying liners adds cost to the service.
	Compostable liners	8-12c each/ $8.40 - $12.50 for 1 year supply (104)	Liners can be made either of compostable plastic (these should be certified compostable to a recognised standard), or fibre based.[26] Certified compostable liners should break down fully in a commercial composting facility, although the facilities that accept these are limited (refer to: NZ Facilities that Accept

[26] Recognised international standards in New Zealand are: AS4736, EN13432 and ASTMD6400/6868. For more information refer to compostables-packaging-position-statement.pdf (environment.govt.nz), and It-s complicated guide final 2019.pdf (wasteminz.org.nz)

Component	Common Options	Indicative Cost	Considerations
			Compostable Packaging public | WasteMINZ). It's important to note that they will not break down in anaerobic digestion facilities and are usually removed as contamination. Households that use a food scraps collection typically use an average of two liners per week, meaning an allocation of 104 liners per year would suit most households. However large households or those that produce more food scraps will need additional liners.
Kerbside containers: Food scraps	23-25L kerbside container 	$15-$20 each	The optimum size for a food scraps only bin in generally considered to be around 23-25 litres, and most bin manufacturers offer this size. This provides sufficient capacity for almost all households, while not being too heavy for manual lifting. The small size also discourages households from putting other materials such as garden waste in the bin. The bin usually lives outside, and households transfer food from their kitchen caddy (or other container if no caddy is provided) into the bin – although some households reportedly keep it under their sink. Keeping it outside avoids potential issues with odour. The bins usually feature a lockable lid which is locked by the position of the handle. A food scraps only collection requires manual collection. To date there has not been a viable method of automated collection developed. Attention should be paid to the supplier of the bins. Several councils have reported excessive breakages of bins from certain brands. Quality bins that are appropriate for NZ conditions may have a higher up-front cost but are likely to be more economical over time.

Component	Common Options	Indicative Cost	Considerations
Kerbside containers: FOGO	80-240L kerbside wheelie bin 	$40 - $60 RFID tags (optional) $2 each	FOGO bins are usually provided in 80, 120, 140 or 240 litre sizes. Some councils give residents a choice of size. The size of the FOGO bin doesn't affect how much food scraps are collected, but it does affect how much garden waste is collected – the bigger the bin the more garden waste is collected (as per Section 2.2 Separation of organic material). This will vary by season, climate, and typical size of household sections, but a useful rule of thumb is '2 x bin capacity in litres = total annual kg per household'. So, a 120L bin will collect about 240kg of organics per year, and a 240L bin will collect around 480kg per year. While collecting more organic waste sounds positive, it pays to bear in mind that data has consistently shown that most of the additional garden waste collected was never in the rubbish in the first place, so it is not being diverted from landfill but from home composting, being left on lawns, private collections, and some transfer stations.[27] This means more material to collect and process which adds to the cost, while not actually delivering extra diversion from landfill. FOGO bins are generally viewed as convenient by residents and tend to be more popular than food scraps only bins due to their ability to accept garden waste. FOGO bins are also perceived to have less issues with odour and leachate compared to food scraps only bins. The presence of garden waste in the bins provides some opportunity for air to circulate and dry out the food waste, contributing to their popularity with residents. Wheeled bins are too heavy to be manually lifted so are usually collected by automated side arm lift vehicles, although they may be collected by rear load

[27] This is why it is proposed that garden waste will not count towards council kerbside targets.
Improving-household-recycling-and-food-scraps-collections-Sept-2023.pdf (environment.govt.nz)

Component	Common Options	Indicative Cost	Considerations
			vehicles, which do require some manual handling to manoeuvre bins to the truck and back. The use of wheeled bins and automated collections reduces health and safety risks from manual handling. In terms of contamination, wheeled bins provide more opportunity to hide non-complying material, and it is usually not practical for collection crews to inspect bins before they are emptied, meaning there can be higher levels of contamination in the collected material. Wheeled bins can be fitted with Radio Frequency identification tags (RFID). This allows for better management and tracking of the bin fleet and depending on the type of RFID tags and readers used, can also enable pickups to be tracked by property and potentially charge and/or reward households.
Frequency	Twice or more weekly	Most expensive (50% higher collection cost than weekly)	More frequent collections are associated with higher rates of participation and better capture of food waste. The best performing services internationally have 2-3 collections a week. More frequent collections provide more convenience and reduce the potential for odour issues.
	Weekly	Moderate cost	Most food scraps and FOGO services in place are weekly collections. This collection frequency is perceived to provide a balance between convenience, performance, and cost.
	Fortnightly	Lower cost (2/3rds of the weekly collection cost)	Fortnightly collections of food waste are rare because of issues with odour and pests, the capacity of bins, and weight. Fortnightly or even less frequent collections of FOGO can be more practical due to the ability of the garden waste to help dry out the food waste and prevent it from smelling, and there is less of an issue with capacity.
Collection vehicles	Specialist food waste collection vehicles	Moderate cost	Specialist food waste collection vehicles are designed for optimal performance in manual collection of food waste. They may contain features to prevent leachate leakage, allow for left-side low entry operation, and low loading height.

Component	Common Options	Indicative Cost	Considerations
			These vehicles are usually operated with single or two person crews. They are small in size and do not require compaction as the food waste is already dense and compaction can create leachate.
	Side load compactor vehicles (FOGO)	Moderate to high cost	Side load compactors are used for wheeled bin FOGO collections. Garden waste has a low density so it requires compaction to make it economical to collect. Side load compactors can also be used with little or no change in specification for rubbish collection and mixed recycling collection. This provides flexibility in fleet management and makes it easier to ensure backup vehicles are available.
	Electric vehicles and other low emission vehicles	High cost	Any truck type can potentially be powered by batteries or other fuel sources such as hydrogen fuel cell. Alternative fuel technology is advancing rapidly and the capabilities of electric and other vehicles are improving. The main advantages of electric vehicles are lower carbon emissions and quieter operation. The current disadvantages are the lower range making them most appropriate for urban, slow speed scenarios without lots of hills, the additional up front capital cost, longer lead time for delivery, and a lack of operational track record. The jury is still out on lifetime operational costs – fuel costs are lower, along with some maintenance costs like oil, engine, and transmission, but other costs like tyres and brakes may be higher and the level of battery degradation may impact its usable lifetime and residual value.
	Combination vehicles		Food scraps or FOGO can also be collected on multi compartment vehicles, as an example Christchurch have started using trucks that collect recycling and FOGO.[28] This can be efficient in rural and semi-rural situations as it avoids the need for two or more vehicles to cover one route. The disadvantages of multi compartment vehicles are that they are more complex (and hence more

[28] https://newsline.ccc.govt.nz/news/story/why-use-two-when-one-will-do

Component	Common Options	Indicative Cost	Considerations
			expensive to purchase and maintain), that the load capacity for each material collected is less, and that they must return to base to empty when one compartment is full making them hard to optimise (and so reducing efficiency).
Contamination management	Food scraps	Communications spend is typically $3-$10 per household per year	In all instances contamination management starts with clear communications to residents about what can and cannot be put in each bin (refer section 3.3). For food scraps only collections, inspections by the operator when emptying are a first line of defence against contamination. If operators spot contamination they can leave it behind/not empty the bin and leave a note for the householder explaining why the item/bin wasn't collected. This is a very effective method, but it requires more time and effort from the operator, which will slow down the collections and make the service more costly although this may be balanced out by less contaminated higher value material. For FOGO collections, it is usually not practical for an operator of a side load vehicle to get out of the truck and manually inspect bins before emptying. In some instances where there are runners used (for example in narrow urban streets with lots of parked cars and no easy access to the footpath), the runners could do inspections. Side load collection vehicles, however, normally have cameras viewing the hoppers where the bins are emptied into. The cameras can record contamination, and the driver can then put a note on the bin and/or note the contamination in the information management system for future inspection, follow up communications, or compliance action. Another approach is to have 'bin inspectors' doing random checks and providing feedback to residents. Repeated offenders can have access to the service suspended or removed. There would normally be a process of engagement and education followed before this step is taken.

Component	Common Options	Indicative Cost	Considerations
			The final avenue of contamination management is at the processing facility where material is inspected, and contamination removed before and/or after processing (refer section 3.3)
Supply of liners	Free liners delivered to households on request		If liners are used then it is important to determine how they will be supplied. Providing liners to households that want them on request helps ensure that liners are always available and reduces the risk of householders using other non-approved liners. This service can work by there being a 'I need more liners' tag near the end of a roll of liners. The householder then affixes the tag to the top of their kerbside bin on collection day and the operator has a supply of liners in the collection vehicle and simply puts the new liners in the mailbox or in the empty bin. This will impose costs although it also means that households do not get given liners if they don't need them.
	Free liners with regular allocation (e.g. once or twice a year)		A free allocation of liners can be delivered to households on a regular basis (usually annually or six monthly). This limits and controls the number of liners that are given out. However, it means some households may not have enough, in which case they will either need some way they can purchase additional liners, or they will use non approved liners or simply not use the service. It also means supplying liners to households that may not use the service – or use it infrequently, which is additional cost for no benefit.
	Limited free allocation and ability to purchase liners		
	Official liners available for pickup from designated outlets		Given that it is important that only approved liners are used, there should be convenient outlets for householders to purchase (or obtain for free) additional liners.
	Households must purchase approved liners		In general, if liners are to be used, it should be as convenient as possible for the households that need them to be able to obtain a supply. Restricting access raises the risk of contamination, and/or reducing participation in the service.

RUBBISH COLLECTION OPTIONS

While not strictly part of an organic waste collection service, as noted in section 2, rubbish collections can affect the performance of your organic waste collection service. Simply put, the cheaper and more convenient the rubbish collection service is, the less likely people are to separate their organic waste from their rubbish.

If you want to maximise diversion of organics it may be worthwhile considering changing your rubbish collection system as well. Some options to consider are:

- Providing smaller wheeled bins
- Investigating fortnightly collection of rubbish
- Reviewing user charges

When developing scenarios, these types of options may be worth including.

There are advantages to implementing changes to services as a package, rather than changing one service at a time. These include:

- Less confusion for households overall
- Contractors can plan equipment requirements more accurately leading to lower costs
- The services introduced as a package support each other (e.g. fortnightly collection of rubbish encourages the use of food scraps bins, and food scrap bins enable fortnightly rubbish collections by reducing potential odour issues).

Processing Options

The processing option that is most appropriate for your circumstances depends on a range of factors. These include:

- The feedstock from collections - whether it is food scraps only or FOGO, and how it might change throughout seasons
- Whether there are other feedstocks available that can add to the material from your organic collection, and what these feedstocks are
- The quantity of the different feedstocks you have available
- The potential contamination levels of the feedstocks
- The availability of suitable sites – how much land is available, how close it is to houses or other activities, what is the current zoning, what might be the issues or constraints in obtaining resource consents?
- What the appetite for capital investment is
- What local markets or end uses are available for the product(s) of the process
- Whether there are existing facilities in proximity, and what their capabilities and capacities are
- The preferences of potential contractors/operators.

In general food waste and grass have high moisture and nitrogen content and not much structure. This means it can easily start decomposing anaerobically (in the absence of oxygen), which generates methane and can smell. This means that it either requires an anaerobic process or there needs to be enough other structural (or 'bulking') material to provide air flow to stop it becoming anaerobic and provide carbon to get right carbon to nitrogen ratio (about 30 carbon to 1 nitrogen). Common bulking agents include garden waste, wood chips, and bark. Organic waste processing operations commonly source different feedstocks to get the right 'recipe' for the particular process and product they are aiming to produce.

Seasonality

One of the challenges of managing an organic waste process is that there can be significant changes in the quantities of different feedstocks available depending on the season. In general, there are large peaks in spring and autumn then low amounts in winter and a slightly lesser dip in summer. This is particularly the case for garden and FOGO collections.

Processing Technology Options

The table below provides a high-level outline of some of the most common types of organic waste processing and their key characteristics:

Method	General notes	Food scraps/ FOGO Compatibility	Relative cost	Site considerations	Ability to scale	End product
Vermicomposting (windrow, raised bed)	Uses special worms to process organic materials. Can take a high proportion of putrescible materials.	Food scraps	Low to medium Low capex, requires suitable land and equipment.	Large to medium site depending on the capacity required. Suitable for rural sites due to land area. Odour may be an issue on input material. Temperature range of site location.	Can scale from small (household or community scale) to very large industrial scale.	Worm castings (vermicast) and liquid
Open windrow composting	The most common method in NZ. Suitable for garden waste. Requires turning which can lead to odour release.	FOGO if low quantities of food waste, and location is suitable.	Low Low capex, requires suitable land and equipment.	Large More suitable for remote sites due to land and potential odour.	Can scale from small commercial to very large commercial.	Compost
Aerated static pile (ASP) composting	Air is forced into the piles or windrows which helps keep the process aerobic and makes it able to accept food wastes. The process can be	FOGO Food scraps if there is a source of garden waste or other carbon-rich bulking	Medium	Medium More controlled than open windrow	Typically becomes economic at medium scale.	Compost

Method	General notes	Food scraps/ FOGO Compatibility	Relative cost	Site considerations	Ability to scale	End product
	operated with or without covers. Covers help process control but add cost.	agent in appropriate quantities to get the right mix.		but still potential odour issues.		
In-vessel composting (IVC)	Aerobic composting takes place in sealed environments such as containers, silos, tunnels, rotating drums, etc., where parameters such as air, moisture and temperature can be controlled.[29] This makes it suitable for processing materials with moderate levels of putrescible waste (up to 50% but typically around 30% by weight).	FOGO Food scraps if there is a source of garden waste or other carbon-rich bulking agent in appropriate quantities to get the right mix.	High	Medium to small Can be operated on more compact sites and closer to urban areas, but odour may still be an issue if compost is windrowed outside during maturation.	IVC technologies are often modular and so can be readily scaled.	Compost
Anaerobic digestion (AD)	Biological degradation happens in the absence of oxygen. This process is well suited to wetter	Food scraps FOGO can be processed if a 'dry' process is used or if	Medium to high	Small to medium Enclosed process and smaller site requirements so	Generally considered to be economic from about 10,000 tonnes per annum, upwards.	Digestate (liquid, and solid)[30], biogas (renewable energy), heat.

[29] This can also include technologies such as agitated bed and agitated pile.

[30] Digestate is not well understood as a product in New Zealand Markets. At the time of writing work is underway to develop a digestate standard so product can be certified. The Digestate Biofertiliser Accreditation Scheme | Biogas - a Bioenergy Association site

Method	General notes	Food scraps/ FOGO Compatibility	Relative cost	Site considerations	Ability to scale	End product
	types of feedstocks such as food and sludges. There are different types of processes including 'wet' and 'dry'. In the dry process about 50% garden waste can be processed.	the FOGO input is balanced by a large proportion of other putrescible material.		able to be operated in more urban contexts.		A significant advantage of AD is that it produces methane (biogas) which can be burned as a fuel source. If this offsets other fossil fuel sources, then this can reduce greenhouse gas emissions.
Other technologies	Includes pyrolysis and gasification, aerobic digestion, hydrothermal deconstruction, torrefaction etc.	Varies	High	Small Varies but generally enclosed process and smaller site requirements so able to be operated in more urban contexts.	Can generally scale in a modular fashion.	Ash, heat energy; liquid, solid (char/biochar), gaseous (syngas) products.

As a general starting point, food scraps only collections pair well with vermicomposting or anaerobic digestion while FOGO collections pair well with aerated composting or in-vessel composting. The preferred technology can be altered by the range of factors noted earlier including what other feedstocks might be available, as this will determine the mix in the processing facility.

Transfer and Bulking

The ideal scenario is that collection vehicles can drop off directly at your organic waste processing facility. However, if the facility is located out of the district, or away from the main population centre(s), there will likely be a need for collection vehicles to empty at a central location and to then consolidate this material for bulk transport to the processing facility. This step means you will need an appropriate site and making provision for this will add complexity and cost. Transfer of food waste can be difficult because of the potential for odour, mess, and vermin. This means an enclosed facility may need to be considered. FOGO material is less likely to be odorous but will still require careful management because of the potential for vermin. The quantities and volumes involved are also significantly greater and so a larger space for bulking will be required.

COLLECTION VEHICLE EFFICIENCY IN ITALY

In Italy some municipalities use collection vehicles that can tip directly into the back of a rear load compactor truck.

The compactor truck can meet them on their round, and this minimises lost time on collections and eliminates the need for a transfer facility.

Developing Scenarios

As you can see from the tables above the range of possible combinations of different ways systems could be configured is almost endless. To help sort through these different options, it is useful to develop scenarios, or combinations of options that work together towards a particular outcome. The scenarios that you choose should be based on the priorities you have identified in 'Step 2: Where do you want to get to?'. For example, if cost is a particular consideration, then you will want to include some 'low cost' scenarios. Alternatively, if you consider diverting as much as possible to be a key objective, then including some 'high diversion' scenarios will be important. Some scenarios that you might want to consider include:

1. Low cost	6. Balanced
2. High diversion	7. FOGO
3. Carbon reduction	8. Food scraps
4. Community scale/local	9. Hybrid (some FOGO/some food scraps)
5. Resilient	10. Urban only

It is a good idea to limit the number of scenarios, as the more scenarios there are the more confusing it can become making it hard to make clear decisions. At this stage it is important to emphasise that the scenarios do not have to represent the ideal final configuration of your system, but more a 'direction of travel'. There will be plenty of opportunity further in the process to refine your system. It may be that your final preferred scenario combines features from one or more of the scenarios.

Undertaking a scenario exercise will help identify some of the positives and negatives of different approaches, focus in on what is going to work best for your community, and highlight areas where further investigation is needed. Each scenario will impact on your council's wellbeings and other drivers differently

WHAT MATERIALS TO COLLECT: KERBSIDE STANDARDISATION GUIDANCE

Food scraps collections should ideally collect food scraps only, while FOGO collections can collect food scraps and garden waste. The following materials may also be collected at the discretion of the council:

- Compostable plastic or fibre bin liners (for food scraps and FOGO collections)
- Seashells
- Small amounts of garden waste (in food scraps collections)
- Fibrous or woody plants (in FOGO collections)
- Noxious weeds (in FOGO collections)
- Garden waste material likely to contain chemical spray residue (in FOGO collections)

For clarity, the following materials are excluded from food scraps and FOGO collections:

- ✘ Paper and cardboard: kitchen paper towels, hand towels and serviettes, newspaper and shredded paper, food-soiled cardboard containers (e.g. pizza boxes), cardboard (including egg cartons)
- ✘ Compostable packaging: compostable plastic products or packaging, compostable fibre products or packaging, compostable labels
- ✘ Teabags
- ✘ Sawdust from treated timber
- ✘ Animal waste
- ✘ Ash

For more information see: Standard-materials-for-kerbside-collections-Guidance-for-territorial-authorities.pdf (environment.govt.nz)

Image source: https://www.dunedin.govt.nz/services/rubbish-and-recycling

CASE STUDY: DUNEDIN'S HYBRID KERBSIDE ORGANIC SERVICES

Dunedin City Council is preparing to roll-out their kerbside organic collection services in July 2024. Some households will receive a FOGO service and others will receive a food scraps service.

The council went to consultation with the preferred option of a food scraps service and an opt-in garden waste service. This option was adopted by council and received strong support from elected members as it aligned with the city's net carbon zero by 2030 goal. Although when the council went to market to find a contractor the compliant responses preferred mixed food scraps and garden waste collections.

In Dunedin there is a high proportion of student accommodation and apartments that a FOGO service wouldn't be suitable for. The council decided to offer an option of FOGO or food scraps bins for different households. The initial distribution of bins was based on property type - MUDs would receive food scraps bins, and residential properties would receive FOGO bins.

Although the hybrid service didn't complicate procurement and planning significantly, it made public engagement more difficult. Some residents were unhappy with the service that they were allocated. To address this the council has instituted a settling in period of at least 6 months where residents are able to test the service they've been provided before choosing the other service.

Things to think about during Step 3: What are the options

Drivers	1. Thinking about council processes	2. Thinking about cost	3. Thinking about the product and market	4. Thinking about carbon	5. Thinking about culture and community	6. Thinking about diversion
			WELLBEINGS			
	Strategy	Economy	Economy	Environmental	Social and Cultural	Environmental
Questions	What stage will you need to: • Present options to senior management • Present options to elected members • Consult with the community • Can you align consultation periods with other consultations such as WMMP or annual/long term plans?	There are a range of costs to consider: • Capital costs • Annual operating costs • Costs to council • Costs to the ratepayers • Cost to the residents (ratepayers and renters) • Gross costs versus net costs (accounting for savings, such as savings from disposal, and income) • Impacts on private operators .	• FOGO and food waste are different feedstocks which can be used to produce different products (e.g. compost or digestate and biogas) • Product quality is impacted by contamination • What local markets are available for the type of product you might produce?	Carbon impact depends on: • How much food or garden waste organics is diverted from landfill • The rate of gas capture at the landfill • What the landfill gas is used for (e.g. whether it is flared or used to generate electricity) • Whether the process generates biogas that substitutes for fossil fuels • Replacement of fertilisers and carbon sequestration in soils • Extra transport emissions.	Cultural and social impact to consider include: • Mātauranga Māori and views of mana whenua • Resident acceptance, and participation • Cost of living impacts • The needs of different communities (e.g. urban, rural), immigrants) • Potential for involvement of community groups, e.g. community composting, community gardens, local solutions.	Diversion can depend on: • Frequency of collections (more frequent = more diversion) • Use of caddies and liners • FOGO vs food scraps only • How many households get the service • What type of residual waste collections are in place – the more capacity, convenience, and less direct cost the less food scraps collected.

STEP 4: WHAT ARE YOUR PREFERRED OPTIONS?

STEP 4: WHAT ARE YOUR PREFERRED OPTIONS?

THIS SECTION BRINGS THE FOCUS BACK TO WHICH OPTIONS BEST SUIT THE COUNCIL AND MOVES FROM THE THINKING PHASE INTO THE PLANNING PHASE.

After considering your starting point, the needs of your community, your communities' aspirations, and the different options/scenarios, it is helpful to identify which of these scenarios are most likely to be the best fit. This exercise will help with the following:

- give a better understanding of potential costs and performance, which is useful for setting budgets and targets
- give a clear indication to potential service providers about what your preferences are
- enable you to put clear options out for public consultation.

It is important to remember that you do not have to select a single scenario and any preferences identified at this point do not have to represent the final choice, as there will still be plenty of opportunity to amend and refine the service option through the procurement process.

Some useful actions to undertake during this step are presented in the table below:

Characteristic	Questions	Consider
Identify criteria	• Undertake an exercise to identify what the key criteria for your council/community are • Depending on the process you are undertaking you may want to involve senior officers and or elected members.	• Criteria can be whatever you decide. Some common criteria include waste diversion performance, cost, carbon impacts, community acceptance, resilience, proven operational record, and consentability.

Characteristic	Questions	Consider
		• It pays to not have too many criteria as this can lead to confusion and make decision making harder. 5-10 criteria are usually a workable number. • You can give weighting to the criteria – i.e. identify some as more important than others.
Prioritisation (shortlisting)	• There are a range of methods that you can use to prioritise your scenarios. These can range from informal discussions, to polls, to some form of multi-criteria analysis (MCA)	• Whatever process you use to identify your preferred scenarios, it is important to remember the process is just a way of sorting out competing options. There may be a compelling reason why a scenario should or shouldn't be considered further that is not accurately reflected in the process. You just need to be able to give good reasons for the scenarios you have shortlisted. • Try and limit the number of scenarios you take forward, once again, as too many scenarios can lead to confusion and make decision making harder. You can tweak scenarios later in the process.
Cost modelling and/or detailed investigation	• Undertake a cost modelling exercise on your shortlisted scenarios • Investigate potential rough order costs for processing options • Undertake a feasibility study that considers the wider operating environment beyond kerbside services, and how the service could integrate, for example, with commercial organic waste recovery • Develop a business case • Consider how kerbside rubbish collection frequency may impact the kerbside organics service.	• The level of detail you go to with your investigations at this stage will depend in large part on the decision-making process you are working with, and what the potential magnitude of commitment by the council is. For example, if you are considering options that could require significant capital investment you will require a high standard of evidence and information, and a business case process will be appropriate. Alternatively, if it is likely that you will be engaging a contractor and paying for a service, a cost modelling exercise might be most appropriate. • It will be useful to consider how this exercise integrates with other council processes, for example, undertaking a section 17A review and Long Term and Annual Plans
Consultation	• Special consultative procedure	• There are different points at which you can choose to consult with the community. When it comes to service

Characteristic	Questions	Consider
	• Integration with Long Term Plan or Annual Plan consultations.	options/scenarios it is most helpful to present a small number of well thought through realistic and costed options. This means that the community is being given clear choices. Having undertaken the detailed investigations means these choices are now better understood and can be presented to the community. • It is also a good idea when presenting options for them to be well differentiated. Subtle differences may be hard to communicate clearly to the community.
Identify preferred scenario(s)	• Based on the outcomes of your detailed investigations and public feedback you may identify a preferred scenario or scenarios that you can take forward for pricing through procurement.	• While it is helpful to identify preferred scenarios, it is not always necessary. An alternative is to focus on outcomes. If you can clearly establish what a successful system will deliver for your community then these can be communicated to potential suppliers and the suppliers can put forward solutions. The drawbacks with this approach are that you may not get a solution that you are happy with, and it is very difficult to compare the costs and benefit of solutions if they are very different. The approach still leaves you needing to identify a preferred solution but puts the point of that solution forward a step.

SECTION 17A SERVICE REVIEWS (S17A)

Section 17A of the Local Government Act (2002) (LGA) requires councils to review their services at certain points; including when a significant change in the level of service is planned.

The service review is intended to ensure that services are being provided cost-effectively (which does not necessarily mean lowest cost) and "meeting the needs of communities… for good-quality local infrastructure (and) local public services". Aspects considered include a consideration of governance, funding, and delivery methods.

The introduction of a new organic waste service would be considered a significant change in the level of service and so a section 17A service review should be carried out.

SPECIAL CONSULTATIVE PROCEDURES (SCP)

The LGA also sets out how councils should consult with their communities. One way is by undertaking the 'special consultative procedure' (section 83 of the LGA).

This requires councils to agree to a 'statement of proposal' which describes the issue and its implications. This information must be made publicly available and a period of no less than one month is allowed for the public to enter submissions to council about the issue; which must be reviewed and considered before a decision is made. Waste management and minimisation plans, for example, are subject to the special consultative procedure.

CASE STUDY: IDENTIFYING END MARKETS IN THE WELLINGTON REGION

In 2023 Hutt, Porirua, and Wellington city councils began to develop a business case for diverting organic material from landfill. The project team identified markets for potential products from a proposed regional organic processing facility. The councils recognised the importance of producing products that are desirable to local businesses and other organisations.

The different market types identified were horticulture, agriculture, viticulture, council-use, retail, and forestry. They contacted the New Zealand horticulture industry body to seek and understand compost and fertiliser requirements of producers. Some of their learnings from meeting with Horticulture New Zealand and a local council-operated nursery are:

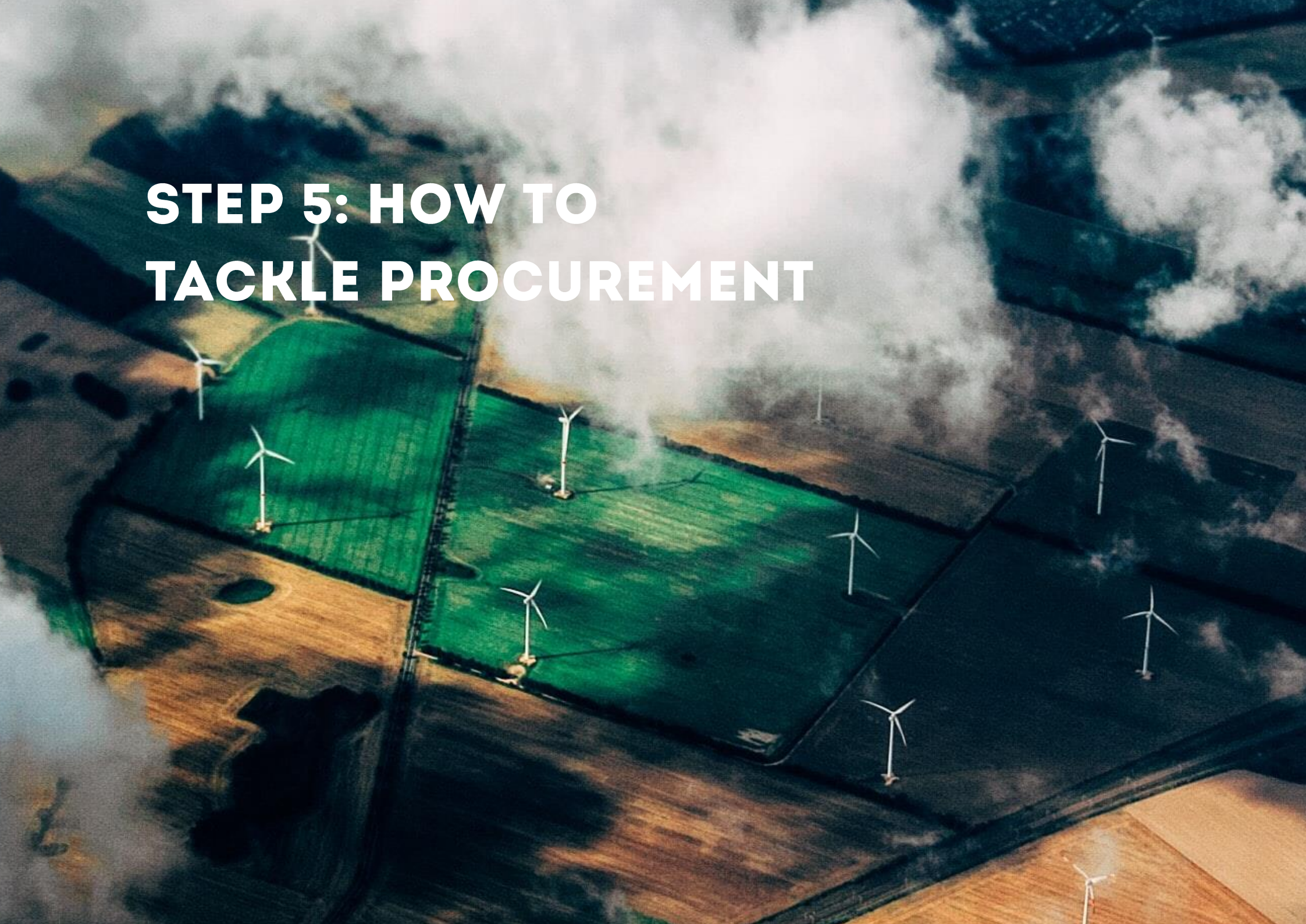
- There are no mandated compost quality standards in New Zealand
- Users expect products to have undergone standardised, scientific testing
- The associated risks of compost include pathogens and pesticides getting into food, and contaminants leaching into waterways
- The producers' requirements for fertiliser (both amount and concentration) are likely to differ between seasons, various crops, and plant species
- Liquid fertiliser from vermiculture and digestate from wet AD is practical to spread and is a homogenised mixture.

Key information the project team gathered included:

- The size of the market, i.e. number potential customers and amount of product needed
- What the existing market is, i.e. What are the competing products? How much do they cost?
- Barriers and opportunities to producers when deciding to use a new product.

Things to think about during step 4: Options

Drivers	1. Thinking about council processes	2. Thinking about cost	3. Thinking about the product and market	4. Thinking about carbon	5. Thinking about culture and community	6. Thinking about diversion
	WELLBEINGS					
	Strategy	Economy	Economy	Environmental	Social and Cultural	Environmental
Questions	Think about: • WMMP • Government mandated targets and performance standards • LTP, Solid Waste Activity Management Plans, Climate Change and sustainability targets and objectives • Who is involved in determining priorities – senior staff, elected members, iwi community representatives?	How important is cost in your priorities. Think about: • Capital costs and budgets • Annual operating costs and budgets • Costs to council • Costs to the ratepayers • Cost to the residents (ratepayers and renters) • Gross costs versus net costs (accounting for savings, such as savings from disposal, and income).	Think about: • Will the preferred option(s) produce a product that has local markets? • What levels of contamination are expected? • Will the facility provide an opportunity for other local organic waste streams to be recovered and add value?	Think about: • How much food or garden waste is diverted from landfill • The rate of gas capture at the landfill • What the landfill gas is used for (e.g. is it flared or used to generate electricity) • Whether the process generates biogas that substitutes for fossil fuels • Replacement of fertilisers and carbon sequestration in soils • Extra transport emissions • Sites and consents.	Do the preferred options take account of: • Mātauranga Māori and views of mana whenua • Likely resident acceptance and participation • Cost of living impacts • The needs of different communities (e.g. urban, rural, different socio-economic groups, immigrants) • Potential for involvement of community groups, e.g. community composting, community gardens, local solutions.	What is the level of diversion that can be expected: • Food scraps • Garden waste • How many households get the service? • How will this impact performance targets?



STEP 5: HOW TO TACKLE PROCUREMENT

STEP 5: HOW TO HANDLE PROCUREMENT?

THIS SECTION EXPLORES PROCUREMENT AND PROVIDES GENERAL TIMELINES AND CONSIDERATIONS.

In many ways the procurement process is where your preliminary work starts to become reality. The procurement process will convert your ideas and preferences into an actual service design that will be rolled out. It is therefore vitally important that the procurement is scoped and structured so that it can give your community what is wanted. The service will likely be in place for at least 10 years, so it pays to take the time to get things right.

This section is not intended as a guide to running a procurement but offers guidance and ideas of what to consider in relation to kerbside organics at each stage of the procurement process.

Once you have decided what your objectives are for the organic waste collection service and have considered how different scenarios could impact your objectives you may have some preferred options, a single preferred option, or you may want to leave it to the market to provide solutions. This will start to shape how you structure your procurement.

Key considerations at each stage of the procurement are outlined below.

Procurement Stage	Things to think about	Considerations
Scoping	• Procurement objectives • Service scope: collections, processing, integration with other services (e.g. rubbish recycling, transfer station) • Procurement and evaluation team • Timelines.	It is good to get clear at the start about what a successful procurement will look like for your council, this will guide what you do. For example, are you looking for a partnership arrangement where you work collaboratively with the contractor, service delivery according to set specifications, or a lowest cost conforming response?

Procurement Stage	Things to think about	Considerations
		What is included and excluded in the procurement exercise. A key factor is whether you will be wanting new organic processing facilities built or accessing existing facilities. This could impact the length and value of the contract and the contract is structured. It is important to have the right people as part of the procurement and evaluation team. Someone with experience and knowledge of organic waste collection and processing will be valuable, so consider outside experts if none are available in council. As a rule of thumb, it is a good idea to allow at least two years from starting the procurement to when the service is due to start. This allows time for internal approvals (2-3 months) the procurement process itself (3-6 months), negotiations and sign off (3-6 months), procuring equipment and/or building plant and infrastructure, and rolling out the services (6-12 months).
Soft market testing	Soft market testing could be in the form of a request for information (RFI), expression of interest (EOI), or a formal pre-procurement engagement.	Soft market testing can be used to find out things that will help you structure your procurement effectively: • What operators are available that might bid? It will be particularly important to consider what existing processors may be able to take your material • What would make them more or less likely to bid? • What timelines will they require for ordering equipment or building facilities? • Do they have a preferred form of bidding (single stage, multi-stage, RFQ, RFT or RFP)? • What information do they require to be able to accurately specify and price their response? • Will the timeframes of your procurement process give them enough time to respond well? – are there any similar procurements they might be bidding on at the same time?
Going to market	Single, multi-stage, request for proposal (RFP) request for tender (RFT), or request for quotation (RFQ) Do you want an input-based (services exactly specified) or an output-based (outcomes specified but service is left to the market to offer)	Your contract documentation should provide bidders with all the information they need to be able to give you the types of responses you are looking for. The clearer you can be about what you want, the more likely you are to get it. What you want to find out is how good the bidder will be at delivering organic waste services, not just how good they are at writing proposals. The form of contract, length of contract, sharing of risk, key performance indicators, reporting, provision for variations etc. should all align with the type of relationship you want to have with your contractor(s).

Procurement Stage	Things to think about	Considerations
	procurement? Or a combination?	Allow sufficient time for respondents to write a good proposal, at least six weeks if it's straight forward and more if it's complex. Provide as much information as possible to respondents. This could include and is not limited to: • Quantities of organics expected • Composition data • Number of eligible households • Whether alternative services will be provided for rural properties, multi-unit dwellings, or commercial premises • Location of relevant existing infrastructure for processing or bulking • Other sources of organics that could be accessed, etc. It is a good idea to run information days or tours of any relevant sites. Input based approaches have the advantage of allowing easy comparison between bidders and being sure you will have options priced that you want to see. This will be important if you have consulted publicly on scenarios before going to market. Output based approaches are good when you are seeking innovation from the market, and there aren't preferences or constraints on the form of service. Hybrid options include specifying a default service (or several options), and inviting alternative proposals, or specifying things you don't want. For example, you could specify 'no manual collections', or 'no garden waste' but leave the rest of the service configuration open.
Negotiations	Have a negotiation plan in place that covers: • List of negotiation points • Ideal outcomes • Walk away positions.	In theory, any aspect of a contractual arrangement can be negotiated once you have selected a preferred bidder. Common areas for negotiation include: • Contract detail – sharing of risk • Performance standards, penalties, and rewards • Variations to procurement scope • Variations to budget

Procurement Stage	Things to think about	Considerations
		• Timeframes for implementation If you are procuring facilities, you will need to think about how the facilities are owned. See the sidebar below and Appendix 0. You will need to reach an arrangement that works for both the council and the contractor. Your negotiation/consenting team should have a key decision maker who has the authority to make the level of decisions that will be required.
Lead up to contract start	Contractor implementation plans	Key things to consider include: • Bin deliveries • Vehicles obtained and commissioned • Vehicle signage • Facilities to accept collected organics are commissioned and available (or temporary arrangements are in place) • Communications with households timetabled.

CASE STUDY: AUCKLAND COUNCIL'S ERGONOMIC FOOD SCRAPS SERVICE

Auckland Council's Waste Solutions team has been selected as finalists for the 2024 Safeguard Awards for designing and delivering a kerbside food scraps service that prioritises health and safety of collection staff.

The service requires manual handling to pick up and empty food scraps into the collection vehicle. Given that staff are collecting between 700 and 1000 bins a day, the repetitive nature and cumulative load of the task puts staff at high risk of musculoskeletal injury. Waste Solutions identified the need to find ergonomic solutions.

Waste Solutions commissioned the Auckland University of Technology (AUT) to help. AUT identified the need to:

- Limit the bin size to ensure a manageable total weight
- Design the bin at the right height to reduce the need for staff to bend or crouch excessively to lift the bins
- Design the truck hopper to allow staff to empty material without overreaching.

After reviewing the bins provided in their trial areas Waste Solutions recognised that they did not meet the recommendations given by AUT. In 2021 they began to make and test prototypes, in 2022 they procured the final design, and in 2023 began roll-out delivery.

Although the bespoke bin design was expected to be more expensive than an off-the-shelf bin, given the stronger plastic and UV protection it has a longer life and is less prone to damage.

Between April 2023 and April 2024:

- 400,000 bins were delivered to households
- Around 2000 (<0.04%) were replaced
- There were no health and safety related incidents.

WHO OWNS PROCESSING INFRASTRUCTURE?

When it comes to processing infrastructure, there are a range of ways that it can owned and operated, and which is best will depend on the situation. Below is an indicative list of some of the main options you might consider.

Type	Description
Full council ownership	Council is responsible for the design and construction of the plant and has full ownership
Design build operate (DBO)	Council owns the plant but design, construction and operation reside with the contractor
Design build finance operate (DBFO)	As with DBO but the contractor also finances the infrastructure
Build own operate (BOO)	Contractor owns the plant (on council land) and equipment and takes all the capital and operational risk. The contractor has an exclusive contract with council
Build own operate transfer (BOOT)	As with BOO but the plant and equipment transfers to council ownership at an agreed residual value at the end of the contract
Full private ownership	Council is a customer of a private facility
Joint procurement with other councils	Councils jointly procure a facility (potentially using one of the above models)
Public private partnership	Council (or councils) jointly own the facility with a private operator or operators.

Appendix 0 contains further details on the pros and cons of the different approaches.

Things to think about during Step 5: How To Handle Procurement?

Drivers	1. Thinking about council processes	2. Thinking about cost	3. Thinking about the product and market	4. Thinking about carbon	5. Thinking about culture and community	6. Thinking about diversion
			WELLBEINGS			
	Strategy	Economy	Economy	Environmental	Social and Cultural	Environmental
	What is the process to get the procurement approved? Think about: • Delegated authorities • What level of approval is required at each procurement stage (e.g. budget approvals, approval to go to market, approval to negotiate, acceptance of contract). • Timings of meetings and getting items on the agenda, and how this can impact procurement timeline.	Where before costs were theoretical, when you go to market you will have actual costs. Think about: • Capital costs and budgets • Annual operating costs and budgets • Costs to council • Costs to ratepayers • Cost to residents (ratepayers and tenants) • Gross costs versus net costs (accounting for savings from disposal, increased income, etc.).	• Will your council's preferred option/s produce a product that has local markets? • What levels of contamination are expected? • Will the facility provide an opportunity for other local organic waste streams to be recovered and add value?	• How much food or garden waste is diverted from landfill • The rate of gas capture at the landfill • What the landfill gas is used for (e.g. is it flared or used to generate electricity) • Whether the process generates biogas that substitutes for fossil fuels • Replacement of fertilisers and carbon sequestration in soils • Extra transport emissions.	Do the preferred options take account of: • Mātauranga Māori and views of mana whenua • Likely resident acceptance and participation • Cost of living impacts • The needs of different communities (e.g. urban, rural, different socio-economic groups, immigrants) • Potential for involvement of community groups, e.g. community composting, community gardens, and how they could be involved in local solutions.	• What is the level of diversion expected for food scraps and/or garden waste • How many households get the service? • How will this impact performance targets? There is some evidence to suggest food waste collections lead to less food waste being generated as it makes householders more aware of what they throw out. Consider measuring the quantities in the rubbish pre and post food scraps collection to determine if this is occurring.

STEP 6: HOW TO IMPLEMENT THE SERVICE

STEP 6: HOW TO IMPLEMENT THE SERVICE?

THIS SECTION EXPLORES GETTING THE SERVICE UP AND RUNNING AND HOW TO SET IT UP FOR ON-GOING SUCCESS WITH RESPECT TO SERVICE DELIVERY, COMMUNICATIONS, AND MONITORING AND REPORTING.

Characteristic	Initial roll-out	On-going	Notes
Monitoring and reporting	At this stage you will have agreed on key performance indicators (KPIs) with your contractors. Some example KPIS are in the Notes column. Make sure you know what they represent and what you can do if they're not being met. Gather your historic data. By having monthly rubbish tonnages and the number of households serviced pre and post roll-out you can measure the decrease of waste sent to landfill. Note that this may not be possible if there is a significant change in the areas serviced e.g. for joint working. Having SWAP surveys are also helpful at this point to reflect on the progress made once the service has launched.	Monitoring and reporting should be used to understand how the service is performing. Understanding performance is important for strategic goals as well as contractual KPIs. Collection contractors should provide monthly tonnage data broken down by service (rubbish, recycling, recycling contamination, and organic material) by area (if servicing more than one). It is optimal to have this data in a spreadsheet (rather than an email or weighbridge receipt) to avoid errors. Ensure that reporting expectations are clear in contractual reporting agreements. By keeping a record of how many bins have been allocated to households and using it alongside contractor tonnages and bin lift data, set-out rates and average bin weights can be calculated. As waste assessment and waste management and minimisation plans are submitted every six years, councils should take out surveys to get more specific data about their waste services.	KPIs will be negotiated with your contractor(s). What you choose to include as KPIs will depend on the nature of your contract, what type of collection service you have (FOGO or food scraps), whether you have collection, processing, and communications as the responsibility of one contractor or whether you split these functions. Generally, KPIs should be based on objective measures and should have clear performance levels and consequences if they are not met. KPIs should provide a clear incentive for good performance. Consequences can include financial penalties, rewards for good performance and remedial processes. Some KPIs that you could consider include: • Missed collections

Characteristic	Initial roll-out	On-going	Notes
		• SWAP surveys show what type of material is in the bins. These are typically done for rubbish bins but can be done for organics bins to investigate reports of contamination. SWAPs can indicate whether interventions to decrease contamination/increase diversion should be introduced. • Participation surveys show how residents participate in the services. Participation surveys can indicate whether interventions to increase participation should be introduced. • Market share surveys show the amount of households using council or private suppliers for waste services. Market share surveys can inform estimates for waste arisings.	• Replacement of broken, stolen bins • Supply of liners (if used) • Contamination levels (connected to inspection regimes) • Health and safety incidents • Customer related KPIs – satisfaction (how satisfied the customer is with the service) and effort (how much effort the customer was required to use to resolve an issue) If there are indications from collection tonnage data or surveys that the service is producing a low yield, or that household participation isn't good review the interventions mentioned in the first section of this guide.
	Review your rates database and bin asset management system/s to ensure you have the right number of bins allocated to the right properties. Make sure residents know that the collection is coming 3 months before the service begins and deliver bins no more than 4 weeks before the service begins. By delivering bins too early you risk them going missing or households	The council call centre will receive requests for service for broken bins, missing bins, and missed collections. They may also receive more difficult requests like complaints or households wanting to be included in the service in areas that aren't yet eligible for the service. This feedback will allow council officers to gain insight into how well the service is serving residents.	It is best to offer the best service you can upfront as residents may dismiss the service early on if it is not easy or clean to use. From feedback gathered you may need to tweak your service through interventions like offering a ventilated caddy or a sturdier bin. You should hold frequent meetings with collections contractors to discuss any challenges like missed collections.

Characteristic	Initial roll-out	On-going	Notes
	putting material out for collection before the collections start. If households have a standard bin size for rubbish but can opt for a different size you can offer a settling-in period (recommended 6 months by several local councils). Explain that they are likely to be able to manage with the bin size provided as the organic material removed will create more space but after the settling-in period they can choose a different size. Areas that have high populations of holiday-homes may need to accommodate for residents that may not be home to move their new bin inside their property.		The service may also need to be extended with urban intensification or interested rural households.
Communications	There are several components to ensure the service roll-out is as smooth as possible, before collections and processing occur, ensure that residents know what to do and how to do it. Ask yourself and others 'what would I need or want to know if I didn't know about this service?' Decide how to reach residents. Messaging could be provided through newspapers and flyers in the post, posters at schools, community halls, or libraries, or digital signage on the roadside. Face-to-face communications could also be done at schools, community halls, libraries,	Continued communications are important as people move in and out of areas and some need a reminder or extra motivation. Are you communicating the collective narrative with residents? Consider sharing the amount of organic material you collect – this could be presented in an illustrative way like the same weight as 100 whales, or the same volume as 200 double decker buses. Sharing the emissions saved also links waste management to the bigger concept of climate change. For residents to understand their influence on waste minimisation and climate change, they will be more likely to continue the behaviour and get others on board. By collecting feedback through customer surveys, notes from the call centre, and conversations you	Ensure that residents are aware of the upcoming change and what it involves. Reflect on the interventions mentioned in the first section of this guide. Consider the EAST framework for behaviour change. The framework outlines that the service should be easy, attractive, social, and timely. How do these prompts align with the design of your service delivery? What interventions can you provide upfront? It is more effective and efficient to provide support at the

Characteristic	Initial roll-out	On-going	Notes
	supermarkets, community gardens or composting groups, etc. Ensure that call-centre staff are trained if this is a new service. You may require a few extra sets of hands here to ensure you can reach as many people as possible before the roll-out begins.	will gain insight into residents' perceptions of the service. What is this feedback saying? What improvements could be made? From data collection, are the goals in your WMMP and other documents being met? Do you need higher yields or participation in the service? If so, what interventions can you provide at this point?	beginning than reengaging residents once the service is running.
Service delivery	Discuss timelines with your contractors to confirm delivery dates for communications, bins, and the start date of collections. Is there local storage available for the bins before delivery? Double check logistical data with collections contractors. Which households are going to be serviced? Do they have or need maps? Double check capability with collections contractors. Are they on track for employing staff? Do they have enough trucks?	Review the KPIs and other data collected and meet with the contractors often to get insight into how the service is running from their perspective. Do the KPIs indicate that something about the service delivery should be changed? Did the collection contractors raise a challenge regarding a route or resourcing that needs a solution?	According to the council's goals and commitments the service might be expected to diminish over time, i.e. food waste is reduced rather than increased. Is this reflected in your contracts? What efforts can you make to promote waste minimisation?
Establishing facilities	If you are building a new organic waste processing facility you will need to think about the following: • Have you identified and secured an appropriate site, or sites? • Are all the relevant consents in place? • Have the appropriate contractors and specialists been engaged?		There are different ways that a facility can be established (refer Appendix 0). You could contract the entire development out, or council could manage the process itself. This can be a complex process and appropriate professionals should be engaged to

Characteristic	Initial roll-out	On-going	Notes
	• Is the timeline for construction and commissioning realistic? Have you allowed for contingency? • Is the plant and equipment on order and will it be ready in time? • Are all operational plans and documentation in place?		assist, including, planners, engineers, architects etc.
Processing (ongoing)	Double check capacity with the processing facility(ies): Are they ready to receive organic material? Are they consented to receive organic material? If it's an existing facility are they ready to receive this particular type of organic material i.e. will it throw off the balance of nitrogen and carbon?	How well is the processing facility managing the volume of material? Are they able to consistently produce a quality product for market? Has the facility identified any issues with contamination? What tools do you have to address contamination?	Minimising the capacity and/or frequency of the rubbish bin collection can reduce contamination as users must sort waste diligently to maximise space. If general communications and reduced capacity aren't cutting it extra assistance can be given to households that repeatedly struggle with contaminating their organics (and recycling) bins.

BIN COLOURS AND NEW ZEALAND RECYCLING SYMBOLS

WasteMINZ has established standard colours for bins and bin lids, bilingual signage, and event signage.

Black and dark green bodies should be used for wheelie as the darker colours maximise the amount of recycled content that can be used in the production of the bins.

Lime green bin lids should be used for food scraps and FOGO, which can typically be told apart as food scraps bins are smaller and don't have wheels (around 23L) and FOGO bins are larger wheelie bins (80-240L).

Dark green bin lids should be used for garden waste.

The New Zealand Recycling Symbols for Food Scraps, Garden and FOGO and be found here and are as follows:

When using Māori translations check that they're appropriate with local mana whenua.

CASE STUDY: CYCLONE GABRIELLE RESPONSE IN HASTINGS

On the 13th and 14th of February 2023 severe ex-tropical cyclone, Gabrielle, caused widespread damage and flooding in the North Island of New Zealand. There was a massive impact in the Hastings district from record rainfall that caused riverbanks to burst, and the effects are still being managed one year on. Here's a small snapshot of Hastings District Council's response and how the management of waste was impacted by inaccessible roads, damaged waste infrastructure, and loss of power and communications.

The road network in Hastings was severely impacted (16 bridges were destroyed and 28 significantly damaged), as were waste and power facilities. Only one waste facility was accessible between Napier and Hastings and priority for disposal was given to regional hospitals and supermarkets. A helicopter was used to provide the initial access to assess the status of the region's landfill for possible damage and commence planning for re-opening once road access and temporary power supply from generators was established.

Council kerbside rubbish and recycling services were suspended on the day the cyclone struck (advised the evening before) which was extended for the rest of the week once the impacts were realised. The priority in the response phase was to protect public health, and the immediate waste management response focussed on putrescible waste and then flood damaged household goods.

A local composting facility is located next to a river and was flooded to almost 3 metres deep. The composting facility took eight weeks to reopen, meaning that households with private FOGO collections as well as industry could not use the facility during this time. Currently there is no Council provided organic waste collection in Hawke's Bay.

Here are some prompts when considering preparedness and resilience in emergencies and how it relates to your kerbside organic service, for example if urban areas went without power for 3 days:

- Do households have bins to store food?
- Are there places where residents could drop off material?
- What channels do you have to communicate with residents?
- What infrastructure is available if local facilities need to close?
- How can you utilise existing contractors or other people that can move waste?
- Do you have a network with bordering councils? How might you work together?

Image source: https://www.rnz.co.nz/news/national/512571/probe-into-civil-defence-response-to-cyclone-gabrielle-to-be-released

Things to think about during Step 6: How to implement the service

Drivers	1. Thinking about council processes	2. Thinking about cost	3. Thinking about the product and market	4. Thinking about carbon	5. Thinking about culture and community	6. Thinking about diversion
WELLBEINGS	Strategy	Economy	Economy	Environmental	Social and Cultural	Environmental
	Consider upcoming council plans during roll-out: Is there a consultation or changes that affect households? Review reporting expectations and ensure that you will have sufficient, timely, and accurate data to report. Keep a log of internal and external reporting with due dates and calculations. Are your waste assessment and waste management and minimisation plan due soon? What surveys have you got on hand and what surveys would be good to complete in order to have comparative data after implementation of the service? SWAP surveys of organic material in the rubbish bin before and after the roll-out can illustrate the benefits and performance.	Does the budget allocated allow the service to be delivered to the best standard according to the first section of the guide? Keep in mind that it is cheaper upfront to set the service up for success than once it's running. Do you have enough staff and resources for roll-out and on-going communications?	Gather feedback from those using the product: • Does it have a positive impact? • Is the product high quality? • How could it be improved? • Is the product available for residents? Availability can influence the understanding of the benefits of organic material collections and consequently participation in the service.	How can you share the carbon related wins of the service? Residents can be motivated when they can link their waste management behaviours to climate change.	• What is the feedback? • What could be improved? • Are people on board with the story? • Is the product available for use by mana whenua? Is it used on marae?	How can you share the waste related wins of the service? How can you keep residents participating in the service and normalise the behaviour? Is there a way to reward residents for waste diversion or promote waste minimisation in schools, community groups, etc.?

APPENDICES

A1: DEFINITIONS

Anaerobic digestion (AD)	A process for biological degradation of organic waste in the absence of oxygen. The AD process produces a biogas which can be used to generate energy or heat or both, and a digestate which can be used to improve soil.
Aerated static pile (ASP)	Aerated static pile is a composting process that provides greater process control by forcing air into the pile. This helps stop the compost from becoming anaerobic when higher moisture content materials such as food waste are processed.
Biosolids	Biosolids are the nutrient-rich organic materials resulting from the treatment of wastewater in a treatment facility (i.e. treated sewage sludge).
Bulking agents	Bulking agents are carbon-based materials, that are added to compost to add structure and keep it healthy. Common bulking agents include wood chips, saw dust, dry leaves, and shredded paper or cardboard.
Bulking facilities	Transfer points where collected material is consolidated before being transported in bulk to a processor.

Contamination	Inappropriate material (including excessively dirty material), placed in recycling and food scraps collections. Contamination may also occur if the method of collection means one recyclable material cannot be efficiently sorted from another (e.g. broken glass contaminating paper and cardboard)
Soil amendment products	Products for improving soil structure or fertility, such as compost and digestate produced by composting and anaerobic digestion of organic materials.
Composting	The controlled aerobic, biological decomposition of biodegradable materials[31].
Composting Facility	A facility that uses controlled aerobic, biological decomposition to process organic waste streams such as food waste, green waste, natural agricultural wastes, waste from abattoirs or fish processing facilities, or bio-solids to produce compost or soil amendment products as an output. This typically includes technologies such as windrow, vermicomposting or in-vessel methods.

[31] Adapted from: https://www.compostingcouncil.org/page/CompostDefinition

Discretionary material	TAs can choose whether to accept some specific organic materials, including compostable bin liners. For a full list refer to Standard-materials-for-kerbside-collections-Guidance-for-territorial-authorities.pdf (environment.govt.nz)
Disposal facility*	As defined in the Act and in the Climate Change Regulations Act (and amendments) (or replacement Acts), which at the time of writing read: "A facility, including a landfill, at which: • waste is disposed of, and • at which the waste disposed of includes household waste, and • that operates at least in part as a business to dispose of waste, and • any other facility or class of facility at which waste is disposed of that is prescribed as a disposal facility. "
Dispose or disposal*	As defined in the Act (or replacement Act). At the time of writing, this read: (a)the final (or more than short-term) deposit of waste into or onto land set apart for that purpose; or (b)the incineration of waste. (2) In subsection (1)(a), for all purposes relating to the levy, final (or more than short-term) deposit of waste means any deposit of waste other than a deposit referred to in section 26(3). (3) In subsection (1)(b), incineration means the deliberate burning of waste to destroy it, but not to recover energy from it.
Diversion rate	This is the total quantity of diverted material (recycling and food waste) collected and recovered divided by the total quantity of all waste, recycling, and food waste collected.
FOGO	Food Organics Garden Organics. A collection where food scraps and garden waste are co-collected in the same container.
Food scraps/food waste	Waste that is derived from any item of food and is organic in origin and includes fruit and vegetable scraps, meat, fish, bone, and shell discards, and any other similar food scraps.
Food scraps contamination	Any material that is collected through a food scraps collection but is disposed of to landfill rather than becoming a diverted material.
GHG	Green house gas. The main greenhouse gases are Carbon Dioxide (CO_2), Methane (CH_4), Nitrous Oxide (NOx), and Chlorofluorocarbons (CFCs).
Global warming potential (GWP)	The potential radiative forcing caused by a gas over time. It is usually expressed in relation to the impact of CO_2 equivalent (CO_2e). For example, the CO_2e of methane over 100 years is commonly accepted to be 28 times that of CO_2, therefore it has a GWP of 28.

Garden waste /green waste	Organic plant material including lawn clippings, weeds, plants, and other soft vegetable matter which, by nature or condition and being free of any contaminants, will degenerate into compost. For clarity, green waste does not include soil with some grass or vegetation attached.
Garden waste /green waste contamination	Any material that is collected through a garden waste collection but is disposed of to landfill rather than becoming a diverted material.
Home composting	The small-scale activity of turning organic matter from household green waste and/or food scraps into compost in a home or backyard garden.
Household waste	As defined in the Waste Minimisation (Calculation and Payment of Waste Disposal Levy) Amendment Regulations 2021 (or replacement Regulations). At the time of writing, this read: "Waste from a household that is not entirely from construction, renovation, or demolition of the house."
In-vessel composting (IVC)	A process where composting takes place in an enclosed space. This allows for greater control of moisture, temperature and air, as well as odours, compared to an open air process
Kerbside rubbish	Domestic-type waste collected from residential premises by the local council (or by a contractor on behalf of the council), or by private waste collections (through kerbside or similar collection).
MUD	Multi-unit dwelling
National Waste Data Framework 2022	A set of procedures that provide guidance for waste management facility operators and territorial authorities on how to gather and report data that will meet mandatory reporting requirements.
Organic waste	Biodegradable natural waste materials. This can include food scraps and/or green waste, as well as natural agricultural wastes, waste from abattoirs, fish processing facilities, bio-solids and the like.
Participation	The proportion of households that use a service. This is usually measured over a four-week period.
Priority product	A product can be declared a priority product by the Minister for the Environment if: the product will or may cause significant environmental harm when it becomes waste; or there are significant benefits from reduction, reuse, recycling, recovery, or treatment of the product; and the product can be effectively managed under a product stewardship scheme.
Private waste operator/private service providers	Commercial organisations/individuals involved in the collection, transportation, management, processing, or disposal of waste or diverted materials.

Set out	The proportion of households that put material out for collection on a given collection day.
SWAP	Solid Waste Analysis Protocol.
Transfer station	As defined in Waste Minimisation (Information Requirements) Regulations 2021 (or replacement Regulations). At the time of writing, this read: A facility that contains a designated receiving area where waste is received, and from which waste or any material derived from that waste is: i) transferred to a final disposal site; or ii) transferred elsewhere for further processing; and iii) that does not itself provide long-term storage for waste or material derived from that waste.
Vermicomposting	Using worms to process organic waste to produce vermicast, a high nutrient soil improver.
Waste hierarchy	The waste hierarchy is a tool used globally for explaining the different steps to reduce and manage waste. The most desirable steps are those at the top of the hierarchy, At the bottom are the techniques that are least desirable. There are different versions of the hierarchy. The version used by the Ministry for the Environment in NZ has from most to least desirable: Avoid, Reduce, Reuse/repurpose, Recycle or compost, Recover and Destruction and Disposal.
Waste disposal levy	A levy imposed by government on waste disposed of to– raise revenue for promoting and achieving waste minimisation; and increase the cost of waste disposal to recognise that disposal imposes costs on the environment, society, and the economy. Under existing legislation 50% of the levy is remitted to local authorities on the basis of population to apply to waste minimisation projects. A portion is retained by central government for administration and the remainder is applied to a contestable waste minimisation fund
Waste management and minimisation plan	waste management and minimisation plan or plan means a waste management and minimisation plan adopted by a territorial authority under section 43
Waste operator	A person who is a waste collector or operates a waste management facility.
Windrow composting	A form of aerobic composting where the material is arranged in large rows (windrows), this facilitates management and the processing in batches.

Definitions adapted from WasteMINZ 2022 National Waste Data Framework Protocol for Mandatory Reporting to Ministry for the Environment, December 2022

A2: FREQUENTLY ASKED QUESTIONS

What are the benefits of collecting food scraps and garden waste?

Some benefits include diverting waste from landfill, GHG emission reduction, and potentially carbon offsetting. Refer to the introduction and context section and section and section 0 for more detail.

How can our council get elected members, community, and households on board?

When communicating with the groups mentioned make sure you keep the benefits of the service top of mind, explain how the service helps to meet strategic goals for your council and central government.

What are common concerns or complaints we may receive and how can we address them?

People may not understand the need for food scrap collections. A common perception is that food scraps rot in landfill and that this is natural and good. Education on the 'why' is important to motivate residents.

Some residents home compost, feed food scraps to chickens or pets, or use an in-sink food waste disposer and don't see the need for themselves.[32] This may be true for some, but few people compost all food waste at home. Often meat, bones, shells, citrus etc. are not compatible with home composting methods so a council provided service is complementary to what they're doing at home. Also, it is important to acknowledge that not everyone uses all council services. One option is to allow households to opt out of the service if they complete an official home composting course, this is an approach used in Italy.[33]

A further objection can be the additional cost, which is a concern in difficult economic times. The cost of the service is relatively low ($1-2 per week per household), and this can save households some money by reducing the amount of rubbish that needs to be disposed of and paid for. An option here is providing smaller rubbish bins for a lower annual cost if the service is funded through rates.

Will our council need to go through a Section 17A review or a Special Consultative Procedure (SCP)?

A Section 17A review will be required for a new organic waste service as significant changes require reviews according to the Local Government Act (2002). A consultation will also be

[32] Note: although associated methane is captured from food scraps processed through in-sink food waste disposers it is more beneficial to compost food scraps as per the waste hierarchy.

[33] zero_waste_europe_cs4_contarina_en (2).pdf

required, and one way to run this is through an SCP. Find more information at the end of Step 4.

How much will it cost to implement a kerbside organics collection service?

There are indicative costs in section 1.5.

Should our council collect food scraps on their own or with garden waste (FOGO)?

According to best practice, when food scraps are separated from all other waste streams, they have a higher capture rate and better outcomes. Although there are many factors to consider when deciding what service to offer and there's no one-size-fits-all approach, steps 1 through 4 will assist you in this decision process.

How should the material be processed?

Processing options are included in Step 3 and include vermicomposting, open windrow composting, aerated static pile composting, in-vessel composting, and anaerobic digestion. The options include compatibility for food scraps and FOGO, relative cost, site considerations, ability to scale, and product.

How frequently should our council collect food scraps or FOGO?

Any organic collection with food should be collected weekly.

What should we provide the households?

According to best practice, households receiving food scraps services should receive ventilated kitchen caddies, caddy liners, and a small but strong kerbside bin.

How can we promote waste minimisation and reduce contamination?

Waste minimisation and contamination reduction can be addressed through behaviour change communications and interventions. These are mentioned in section 2.1.6.

A3: COMPLEMENTARY RESOURCES

- Te rautaki para - Waste strategy - Ministry for the Environment
- Standard kerbside collection materials guidance- Ministry for the Environment
- Improving household recycling and food scraps collections - Sept 2023- Ministry for the Environment
- Guide to managing organic contamination: ISWA Contaminants Report 2023
- Guide to compostable plastic products and packaging: It's complicated guide 2019 - WasteMINZ
- Material excluded from kerbside food scraps and food and garden waste collections
- MfE Position statement on compostable plastics - Ministry for the Environment
- NZ Facilities that Accept Compostable Packaging – WasteMINZ
- Bin colours and New Zealand Recycling Symbols: Standardised bin colours recycling bin suppliers event signage (wasteminz.org.nz)
- Environment Waikato decision making tool for organic waste processing: Microsoft Power BI
- Solid Waste Analysis Protocol – Ministry for the Environment
- Milan food waste case study: (zerowastecities.eu)
- Italy food waste collections: Cities with intensive foodwaste collection in Italy
- **Other Guides**
- UK Household food waste collections guide (WRAP)
- Australian Food and Garden Organics Best Practice Collection Manual (dcceew.gov.au)
- Australian Better Practices FOGO Guide: A step-by-step guide (wasteauthority.wa.gov.au)
- Auckland Council: Evaluating behaviour change tools to encourage food scraps recycling in Auckland city
- British Colombia: Best management practices organic waste curbside collection (gov.bc.ca)

A4: OVERVIEW OF NATIONAL COUNCIL SERVICES

BELOW IS A TABLE WITH AN OVERVIEW OF WASTE SERVICES OFFERED BY COUNCILS WITH KERBSIDE ORGANIC SERVICES, IT SHOULD BE UPDATED WHEN NEW ORGANIC SERVICES ARE LAUNCHED. THERE ARE LINKS TO COUNCIL WEBSITES AND SOME VIDEOS HOSTED ON YOUTUBE.

Council Name	Launch	Food scraps/ FOGO/ garden waste	Organics bin size	Organics frequency	Rubbish bin size	Rubbish frequency	Rubbish charging mechanism
Auckland Council https://www.wastenothing.co.nz/ https://www.youtube.com/playlist?list=PLNiuqKCzobSy-jQYOmJh09Km3FEQ_kTkc	2023	FS	23l	Weekly	80l, 120l, 240l	Weekly, considering fortnightly [34]	Rates-funded and PAYT (planning to move to rates-funded)
Central Otago District Council https://www.codc.govt.nz/services/recycling-and-rubbish	2023	FOGO	240l	Weekly	140l	Fortnightly	Rates-funded
Christchurch City Council https://ccc.govt.nz/services/rubbish-and-recycling	2009	FOGO	80l, 240l	Weekly	80l	Fortnightly	Rates-funded
Dunedin City Council https://www.dunedin.govt.nz/services/rubbish-and-recycling https://www.youtube.com/watch?v=wF16jY7DVbE	2024	FOGO and FS	23l, 140l	Weekly	140l (or 80l after 6 months settling period)	Fortnightly	Rates-funded

[34] https://ourauckland.aucklandcouncil.govt.nz/news/2024/03/changes-proposed-for-auckland-s-waste-handling-as-region-moves-closer-to-zero-waste-target/

Council Name	Launch	Food scraps/ FOGO/ garden waste	Organics bin size	Organics frequency	Rubbish bin size	Rubbish frequency	Rubbish charging mechanism
Hamilton City Council https://www.fightthelandfill.co.nz/	2020	FS	23l	Weekly	120l	Fortnightly	Rates-funded
Hauraki District Council https://www.hauraki-dc.govt.nz/rubbish-recycling	2023	FS	23l	Weekly	140l	Fortnightly	PAYT
Hutt City Council https://www.huttcity.govt.nz/services/rubbish-and-recycling/rubbish,-recycling-and-garden-waste-bins	2021	Garden waste	240l	Monthly	120l, 240l	Weekly	Rates-funded
Kawerau District Council https://www.kaweraudc.govt.nz/services/rubbish-and-recycling	2010	Garden waste	240l	Fortnightly	60l, 120l	Weekly	Rates-funded
Mackenzie District Council https://www.mackenzie.govt.nz/services/rubbish-and-recycling	2022	FOGO	240l	Weekly	140l	Fortnightly	Rates-funded
Matamata-Piako District Council https:/www.mpdc.govt.nz/our-services/rubbish-a-recycling https://www.youtube.com/watch?v=VCi8MQ-dKrs	2023	FS	25l	Weekly	120l	Fortnightly	Rates-funded
New Plymouth District Council https://www.npdc.govt.nz/zero-waste/recycling-and-rubbish-collection/	2019	FS	23l	Weekly	140l	Fortnightly	Rates-funded
Ruapehu District Council https://www.ruapehudc.govt.nz/our-services/rubbish-and-recycling	2021	FS	23l	Weekly	Bags	Weekly	PAYT

Council Name	Launch	Food scraps/ FOGO/ garden waste	Organics bin size	Organics frequency	Rubbish bin size	Rubbish frequency	Rubbish charging mechanism
Selwyn District Council https://www.selwyn.govt.nz/services/rubbish-recycling-And-organics	Before 2017	FOGO	240l	Weekly	80l, 240l, bags	Weekly	Rates-funded
South Taranaki District Council https://www.southtaranaki.com/our-services/rubbish-and-recycling	2006	Garden waste	240l	Fortnightly	120l	Weekly	Rates-funded
Tauranga City Council https://www.tauranga.govt.nz/living/rubbish-and-recycling https://www.youtube.com/watch?v=ZqZDarr3Xoq	2021	FS, garden waste	FS: 23l Garden: 240l	FS: weekly Garden: fortnightly or monthly	80l, 140l, 240l	Fortnightly	Rates-funded
Thames-Coromandel District Council https://www.tcdc.govt.nz/Our-Services/Rubbish-and-Recycling/Rubbish-and-Recycling-Kerbside-Services https://www.youtube.com/watch?v=cptxLf99RZo	2023	FS	25l	Weekly	120l	Fortnightly	PAYT
Timaru District Council https://www.timaru.govt.nz/services/environment/waste-minimisation	2000	FOGO	140l, 240l	Weekly	140l, 240l	Fortnightly	Rates-funded
Waimate District Council https://www.waimatedc.govt.nz/services/rubbish-and-recycling/rubbish-and-recycling	2021	FOGO	240l	Weekly	140l, 240l	Fortnightly	Rates-funded
Wamakariri District Council https://www.waimakariri.govt.nz/services/rubbish,-recycling-and-organics	2019	FOGO	80, 140, 240l	Weekly	80l, 140l, bags	Weekly	Rates-funded (bins), PAYT (bags)

Council Name	Launch	Food scraps/ FOGO/ garden waste	Organics bin size	Organics frequency	Rubbish bin size	Rubbish frequency	Rubbish charging mechanism
Whakatāne District Council https://www.whakatane.govt.nz/services/rubbish-and-recycling	2010	Garden waste	240l	Fortnightly	80l	Weekly	Rates-funded
Western Bay of Plenty District Council https://www.westernbay.govt.nz/property-rates-and-building/rubbish-and-recycling https://www.youtube.com/watch?v=dkZeOLkYhk0	2021	FS	23l	Weekly	140l	Weekly	PAYT

CONNECTING COUNCILS:

There are various channels and ways to connect with councils across the motu:

- LGNZ Listserv LGConnect Discussion Groups | Taituarā (taituara.org.nz)
  Join discussion group: 'WASTEMIN Waste minimisation education/communications and behaviour change'
- Contact the WasteMINZ TAO Forum Steering Committee through the Sector Group Manager
- Check out the resources on the TAO Forum
  Portal https://wasteminz.sharepoint.com/sites/TAOForumResourcePortal
- Participate in the Local Government Officer's Quarterly Huitima.

A5: OPTIONS FOR OWNERSHIP OF PROCESSING INFRASTRUCTURE

Description	Pros	Cons
Full Council Ownership	• The councils have full control over the facility and facility design • There are no issues with residual value and there would be scope to change the operator if they are not performing • Able to apply for WMF funding which could substantially reduce capex costs and hence per tonne costs • Can support WRRT.	• There is risk of a disconnect between the facility preferred by council and what the operators require • While this can be reduced through involving the operator in the design, there could be tension around upgrades and changes, and level of responsibility for maintenance and wear and tear • End markets need to be identified by the council.
Design Build Operate (DBO)	• The plant would be specified to exactly the operator's requirements. • If the council is able to obtain cheaper finance than an operator this could reduce the overall cost • Able to apply for WMF funding which could substantially reduce capex costs and hence per tonne costs • Can support WRRT • As the facility is owned by the council this avoids issues of ownership and residual value at the end of the contract.	• As the facility is owned by the council there could be tension around upgrades and changes, and level of responsibility for maintenance and wear and tear.
Design Build Finance Operate (DBFO)	• This is the same as DBO but would be utilised where the contractor is able to access cheaper finance	• This is the same as DBO but would be utilised where the contractor is able to access cheaper finance.

	• Able to apply for WMF funding which could substantially reduce capex costs and hence per tonne costs • Can support WRRT.	
Build Own Operate (BOO)	• No capital expenditure required by the councils • Appropriate where there is a long enough contract period for economic amortisation of capital (e.g. 15-20 years) • A split ownership model with council owning the buildings and hard infrastructure and the contractor owning movable plant is a good way of sharing risk and responsibility • Clear allocation of responsibility for upgrades, maintenance etc.	• Requires a long contract period. council has limited say in the design and operation of the facility • Does not provide any incentive to ensure residual value in the asset - i.e. there may be issues with plant not being maintained in the final years of the contract.
Build Own Operate Transfer (BOOT)	• Similar to BOO but provides a mechanism to transfer residual value at the end of the contract • Provides an incentive to invest in and maintain the plant.	• Council has limited say in the design and operation of the facility and could be left with having to purchase an asset at its residual value that may no longer be fit for purpose.
Full Private Ownership	• No capital expenditure is required by the councils • Council carries no risk. Council is able to enter into shorter term arrangements which provides flexibility in the event that requirements change over time • Potential to make use of/enable the expansion/upgrading of existing facilities.	• Council has no say in the location, design and operation of the facility, or what happens to the product • Council may be a price-taker unless the tonnages offered are significant in the context of the facility.