

Final v2

Commercial FOGO project report

12 APRIL 2023

PREPARED FOR

Boroondara City Council

Report title	Commercial FOGO project report
Prepared for	Boroondara City Council
Status	Final v2
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Project number	P1408
Report date	12 April 2023
Contract date	24 August 2022
Information current to	21 February 2023
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Abbreviations and glossary

ABS	Australian Bureau of Statistics
ANZSIC	Australian and New Zealand Standard Industry Classification
C&I	Commercial and industrial
FOGO	Food organics and garden organics
EFTE	Equivalent full-time employee
MUD(s)	Multi-unit development(s)
SRU	Sustainable Resource Use
SV	Sustainability Victoria

Summary

This study investigated how to best expand FOGO services to those businesses that generate food or garden waste and to large MUDs in the Boroondara City Council (Council).

Council provides kerbside services for general waste, commingled recycling and, since May 2020, FOGO to most households including MUDs, with individual bins for each unit. Council also provides residual waste and recycling services to some businesses individually and via three shared bin corrals to businesses in the Greythorn, Camberwell and Maling Road precincts.

The project has been undertaken in two stages:

- Stage one was designed to consult stakeholders, research approaches and service requirements and analyse potential service options (see Appendix A Research Report).
- Stage two involved a cost benefit analysis of the shortlisted options and a feasibility study.

Stage one summary

In stage one Blue Environment investigated four Council-facilitated service models including:

- the extension of a best practice household FOGO service to commercial properties
- delivery of a bespoke FOGO service for businesses
- on-site organics recycling approaches
- precinct-based commercial processing (e.g. biodigester) solutions.

The research report compiled data on businesses, MUDs with no FOGO service, organics processing options and technology providers for on-site options. Also included were consideration of the market conditions and benchmarking of potential commercial FOGO services in Boroondara with similar local councils in Melbourne.

Our analysis found that Boroondara has a range of business types considered likely to generate significant quantities of food organics and the stakeholders consulted showed interest in using a FOGO service, but due to the low number of businesses that participated in the consultation process, we were unable to provide a clear indication of the likely participation rate in a commercial service.

We undertook a qualitative analysis, including consideration of risks and benefits, to assess each service. Based on our research and consultation, the extension of the best practice FOGO kerbside service to businesses and introduction of a minimal bespoke FOGO service were recommended for detailed modelling. Also included for assessment was further analysis of including FOGO bins in the existing precinct corrals.

Stage two (feasibility assessment)

The feasibility study considered the findings from the modelling undertaken in the cost benefit analysis with commentary on logistics, technical considerations, public benefits and risks.

Method

The cost benefit analysis for these services was produced in MS Excel using data provided by Council, Australian Bureau of Statistics (ABS) data on equivalent full-time employment (EFTE) in Boroondara

by industry subdivision, and Economy.id data on registered businesses in Boroondara by industry subdivision. This data was organised by the Australian and New Zealand Standard Industry Classification (ANZSIC).

As Boroondara Council does not collect waste data specific to businesses, Blue Environment constructed estimates of garbage and organics generation, including proportions of food organics and garden organics. The generation data presented as a default in the model was from Encycle Consulting and SRU (2013) because this source has data for all industry divisions.

The options were modelled to calculate potential loss or gain of customers, generation and diversion of FOGO, greenhouse gas emissions (t CO₂-e), system costs and estimated income for comparison with costs. Due to lack of local business waste data and high levels of uncertainty, we did not model future costs.

Limitations and data gaps necessitated estimation of some parameters and the model includes a number of assumptions. Blue Environment has made best estimates to fill data gaps and provided commentary to explain uncertainties and limitations. Details of modelling parameters and assumptions are outlined in section 4, with option specific assumptions covered in section 5. The full details of data sources and assumptions have been provided in the supporting MS Excel workbook. It is worth noting that the model to support this report is 'live', which means input data and assumptions can be amended to produce instantaneous results for future testing as needed.

Options and scenarios

The four organics waste management service options as described in Table 1 were modelled for this study.

Table 1 Description of modelled options

Service option	Description	Service overview
1	Business as usual (baseline)	Council's existing business customers which receive a weekly garbage¹ and weekly recycling² service are considered
2	Extend Council best practice service	- Provide to existing business customers - Universal service³ - Fortnightly garbage 120L bin¹ - Weekly recycling (not modelled)² - Weekly FOGO 240L bin - Provision of caddies and liners - Community education
3	Extend Council best practice service (weekly or fortnightly garbage)	- Provide to existing business customers - Weekly or fortnightly garbage 120L¹ - Weekly recycling (not modelled)² - Weekly FOGO 240L bin - Provision of caddies and liners - Community education
4	Bespoke FOGO service	- Available to any business or resident in the Council area - Opt in for a weekly collection of a 240L FOGO bin - Provision of caddies and liners. - Community education.

¹ A standard size bin of 120L has been used for the purpose of modelling.

- ² *As there is no change proposed for the contracted recycling service and no separate charge to customers, recycling was excluded from the modelling assessment.*
- ³ *Council advised that opt-out would not be a standard offering but would be considered for genuine cases with demonstrated reasoning.*

Sections 5.3 to 5.6 describe any option specific assumptions along with commentary about relevant findings from the research report.

Combinations of options were also discussed with Boroondara Council following the research phase, with three possible scenarios identified as follows:

- Scenario A - extend the existing best practice FOGO service to businesses (service option 2)
- Scenario B - extend the existing best practice FOGO service to businesses and offer a bespoke FOGO service (service option 2 and 4)
- Scenario C - extend the best practice service but allow flexibility in the frequency of garbage collection and offer a bespoke FOGO service (service option 3 and 4).

Findings

Our qualitative analysis, largely completed during the research phase, found that extending the existing best practice service, or implementing a minimal bespoke commercial service merited further consideration. We found that management approaches exist to mitigate potential challenges, such as caddies and bin liners to address amenity issues and education to reduce contamination. In addition, Council's current organics processor, Bio Gro, advised they had capacity for more organics and were open to explore this endeavour with Council.

Our modelling centred around four options:

1. Business as usual or the current status of Council services with no FOGO collection.
2. Extending best practice services to Council-served businesses, i.e. universal weekly FOGO and fortnightly garbage.
3. Extending best practice services to Council-served businesses with the option of weekly or fortnightly garbage.
4. A minimal bespoke FOGO service offering a FOGO service to any site in the municipality regardless if the site uses Council garbage or recycling services.

Our modelling assumed that suitable unpackaged food organic waste is more likely common in food retailing, food and beverage and accommodation; all business types which are well represented in Boroondara. The services modelled for this project indicated an increase in FOGO diversion from landfill, which is a desired outcome, however based on the assumptions the estimated quantities for diversion were relatively modest.

A key observation of this study was that by reducing the garbage collection frequency to fortnightly in option two, garbage quantity collected by council reduces by approximately 50%, and while some of this would be attributed to diversion of FOGO from garbage, the majority can be linked to the estimated loss of customers.

An important consideration for this study was to understand the potential loss of existing business customers as a result of changing services, and a critical finding was that by reducing the garbage collection frequency to fortnightly in option two, we modelled an approximate 40% loss of existing business customers. This can be attributed to insufficient bin capacity, based on our modelling of

existing customer garbage generation. We also assumed a portion of customers may opt out due to general dissatisfaction.

In comparison, option three which modelled a choice of garbage collection frequency of weekly or fortnightly, resulted in approximately double the FOGO collection estimated for option two, due to reduced customer loss. Similarly, Because the potential avoided greenhouse gas emissions increase with the quantity of FOGO diverted from landfill, option three provides the best performance. However, as the data has relatively high uncertainties Council should treat the modelling outputs with caution.

We understand, based on Council advice, that the priority for Council is to expand the FOGO service to its existing business customers and concurrently align the residential and business service (i.e. consistent waste streams and collection frequency). While option two, would meet both these requirements, our modelling indicated high potential customer loss with this approach, mostly attributed to insufficient bin capacity with fortnightly garbage collection as noted earlier. Notwithstanding the uncertainty already discussed, this finding may pose considerable risk to Councils' reputation, result in a loss of income and undermine the intent to divert organics from landfill.

A bespoke FOGO service would not necessarily reduce potential customer loss described above because the loss relates to garbage bin capacity. Our analysis identified a minimal bespoke FOGO service had potential to attract customers, but we recognise this service would involve a trade-off between uptake and cost. The more flexible the offering the more likely the uptake, but greater flexibility may lead to higher underlying costs with loss of efficiency. We note that some existing Council customers could switch to a private service for garbage and recycling (to retain a weekly garbage service), and choose to take up a bespoke FOGO service, which would also influence potential uptake. We did not see value in modelling a more flexible bespoke service, or variations in uptake at this point, due to the data limitations described for this study.

Our analysis indicated that a relatively small number of the large MUDS, approximately 15% or 160 sites, may be prepared and able to use a bespoke FOGO service. While a bespoke FOGO service could provide an option for some large MUDs, for others it may not be feasible due to available bin space, willingness to give up space for bin storage, and access for bin collection.

The scenarios discussed with Council were considered during our analysis and the structure of the MS Excel workbook enables scenarios with any combination of options to be easily modelled in the future. The net customer change was assessed (refer section 6.1) and we found both scenarios A and B result in a net loss of customers, while extending the council FOGO service with flexible garbage plus a bespoke FOGO service (scenario C) shows a modest gain of customers. This comparison is provided to indicate potential customer movement rather than commenting on whether this is positive or negative. At this stage we believe this finding is of limited value due to the relatively high uncertainties already discussed in the modelling.

Corrals

Further analysis of including FOGO bins in the existing precinct corrals was assessed and presented separately, but was inconclusive due to the paucity of business and cost data. We suggest that Council confirm the number and type of businesses using corrals. Council could consider trialling a FOGO bin at one well-managed site, such as Greythorn, to establish the approach for a shared use FOGO collection service.

Conclusions and recommendations

Implementing a FOGO service beyond residents would be positive for the environment, align with State policy and support the Councils' pursuit of circular economy outcomes. However, the best approach was challenging to ascertain without a clearer understanding of the local commercial waste stream and the business sentiment.

Based on our analysis we believe it may be feasible for Council to consider extending a Council FOGO service to its existing business customers (modelled in option two and three), however due to the risks identified, we caution against simply rolling out the standard residential service, option two (also identified as scenario A), without further research to improve certainty and identify the significance of constraints.

Additionally, we identified that combining a minimal bespoke service (option four) with either option two or option three (described as scenario B and C), would not address the risks associated with potential customer loss. Due to this we concluded the scenarios, while useful to consider, were possibly premature at this stage. Also, with the lack of data we were unable to be conclusive about the feasibility of a minimal bespoke FOGO service (option four).

The information base on which to make the final decision is uncertain, and we are not convinced that it is yet acceptable.

Based on this study we make the following **recommendations** to Council:

1. Undertake further research prior to considering extending a Council FOGO service to existing business customers.

The purpose of our first recommendation is to validate assumptions made in this study, given the risks we have identified for potential loss of existing business customers, and the impact this may have on uptake of a FOGO service. Our second recommendation offers ways to obtain suitable information.

2. Obtain further information on business customer waste generation and organics generation by either undertaking a scan of the current business customer bins to determine how full they are when collected, and how much organics they contain, or consider a survey of businesses to obtain the waste data.

We believe a bin scan would provide more robust information, but the benefit of a survey would be the opportunity to seek other information, such as business interest, perceived challenges and needs, if FOGO was introduced alongside a reduced garbage collection frequency. Depending on Council capacity, a combination of the two approaches could be taken, with the survey scaled by the extent of any bin scan.

As a lower priority, due to the smaller number of businesses involved, we also have a recommendation for corrals.

3. Consider trialling a FOGO bin at one well-managed site with space in the cage, such as Greythorn, to establish the approach for a shared use FOGO collection service.

1. Introduction

Boroondara City Council (Council) is considering the best policy for enabling organics recycling and commissioned Blue Environment to prepare a feasibility study on expanding a food organics and garden organics (FOGO) service to businesses and large multi-unit developments (MUDs).

Council provides kerbside services for general waste, commingled recycling and, since May 2020, FOGO to most households including MUDs, with individual bins for each unit. Large MUDs that are required to have private waste collection services, due to a condition of their planning permit, do not have access to FOGO unless their private waste company offers this service.

Council also provides waste and recycling services to some businesses and a small number have a FOGO bin, although this is not a standard service. In addition to the kerbside service, council manages three shared bin corrals, for a subset of businesses in the Greythorn, Camberwell and Maling Road precincts; these corrals are currently for commingled recycling and residual waste services only.

The project has been undertaken in two stages:

- Stage one was designed to consult stakeholders, research approaches and service requirements and analyse potential service options (see Appendix A Research Report).
- Stage two involved a cost benefit analysis of the shortlisted options and a feasibility study.

This report is the feasibility study and presents the findings from the modelling undertaken in the cost benefit analysis with commentary on logistics, technical considerations, public benefits and risks.

2. Stage one summary

Blue Environment investigated four service models including:

- the extension of a best practice household FOGO service to commercial properties
- delivery of a bespoke FOGO service for businesses
- on-site organics recycling approaches
- precinct-based commercial processing (e.g. biodigester) solutions.

The research report compiled data on businesses, MUDs with no FOGO service, organics processing options and technology providers for on-site options. Also included were consideration of the market conditions and benchmarking of potential commercial FOGO services in Boroondara with similar local councils in Melbourne.

The research report identified business types in Boroondara likely to generate significant quantities of organic waste and the outcomes of stakeholder consultation. There was interest from the stakeholders in using a FOGO service, but due to the low number of businesses that participated in the consultation process, we were unable to provide a clear indication of the likely participation rate in a commercial service or quantify interest in on-site technology in the business community.

We found that on-site organics processing technology may be appropriate where waste collection costs and organic loads are high and, while Council would not provide the processing service to individual private businesses, they could provide guidance, direction and encouragement or possibly grants to incentivise diversion of organics from landfill.

For MUDs excluded from Council services, we identified interest in alternative FOGO services from the small sample of representatives, but it seemed unlikely they would want to pay for capital and operating costs in addition to their existing private waste collection services. We investigated on-site organics processing but concluded that Boroondara City Council would be better placed to monitor the outcomes of the trial running in City of Melbourne, noting that practical trials of organic recovery approaches were out of scope for this project.

We recommended that a Council-managed precinct-based technology service should not be considered further due to the considerable risks and infrastructure and processing costs.

Based on our research and consultation of the four different Council-facilitated services, two were recommended for detailed modelling and one for further analysis in the second stage of the project:

- the extension of the best practice FOGO kerbside service to businesses
- introduction of a minimal bespoke FOGO service
- further analysis of including FOGO bins in the existing precinct corrals.

3. Scope and method

The feasibility study considered the two service model options recommended in stage one:

- extension of the best practice FOGO kerbside service to businesses
- introduction of a minimal bespoke FOGO service.

In consultation with Council, we identified two approaches for the first option, with a differing garbage collection frequency, and for the second option we modelled a single approach.

The cost benefit analysis for these services was produced in MS Excel using waste data provided by Boroondara Council, Australian Bureau of Statistics (ABS) data on equivalent full-time employment (EFTE) in Boroondara by industry subdivision, and Economy.id data on registered businesses in Boroondara by industry subdivision. This data was organised by the Australian and New Zealand Standard Industry Classification (ANZSIC).

Estimates of waste generation and organics generation were made using guides published by Sustainability Victoria (SV 2013) and Encycle Consulting (2013). To inform the study we developed a model which provides estimated annual costs, emissions etc. for the different options. Due to a lack of local business waste data and high levels of uncertainty, we did not model future costs.

The findings of the cost benefit analysis are summarised in this report, together with commentary on other relevant issues such as:

- logistics – including collection, transfer and transport from source to processing site
- technical – waste stream management and processing considerations
- public benefits – environmental outcomes, carbon emissions, community aspirations
- risks – operational, market, regulatory, commercial.

The detailed method applied to derive quantities and undertake the financial analysis is described in section 4. All options were modelled to calculate:

- potential loss or gain of customers
- generation and diversion of FOGO
- greenhouse gas emissions (t CO₂-e)
- system costs
- estimated income for comparison with costs.

Further analysis of including FOGO bins in the existing precinct corrals was assessed and presented separately due to the paucity of business and cost data. All modelling and assessment are presented in a MS Excel workbook developed to support this study and submitted with this report.

4. Key modelling parameters and assumptions

This section provides the key parameters and assumptions used by Blue Environment for modelling the commercial FOGO service options.

Limitations and data gaps necessitated estimation of some parameters and the model includes a number of assumptions. Blue Environment has made best estimates to fill data gaps and provided commentary in the model. Full details of data sources and assumptions are provided in the model with critical assumptions highlighted in the MS Excel workbook. The model to support this report is 'live', which means input data and assumptions can be amended to produce instantaneous results for future testing as needed.

A Council benchmarking report (Boroondara Council 2022) noted the location of the Boroondara Recycling and Waste Centre within the City of Boroondara to make it possible for FOGO collection trucks to make two trips to the facility per day and collect up to 20 tonnes per truck per day. For this reason, we assumed Council would continue to run the FOGO collection service with consolidation of FOGO at the Boroondara Recycling and Waste Centre before transportation to an organics processor.

We note that a bespoke FOGO service would require Boroondara Council to establish a commercial service, which may operate under different conditions to a standard municipal service but for the purpose of modelling, we have used parameters and assumptions identical to those used for the standard Council service.

Preliminary estimates of FOGO generation, provided in the research report, were refined during the modelling phase and updated for this report. We noted that Council already runs an in-house waste collection service and implementing commercial FOGO may result in additional bins to collect. Based on Council benchmarking (Boroondara Council 2022), we anticipate and assume that the Council trucks and staff are sufficient for extending the FOGO service or offering a new service.

The following sections describe the approach and key parameters used to determine types of businesses, estimated garbage and FOGO generation, potential customer loss due to change, estimated number of eligible MUDs and costs associated with each service.

4.1 Business demographics

To derive estimates for garbage and FOGO generation we mapped the existing customer business sites to assumed ANSZIC industry divisions or sub-divisions. The modelling estimated generation and costs of offering waste and organics services to the following industry divisions and subdivisions:

- manufacturing
- retail trade
 - food retailing
 - fuel retailing
 - motor vehicle and motor vehicle parts retailing
 - other store-based retailing
- accommodation and food services
 - accommodation
 - food and beverage services
- transport, postal and warehousing

- public administration and safety
- education and training
- health care and social assistance
- arts and recreation services
- other services.

The number of businesses in Boroondara was identified from ABS data by industry but required some manipulation to estimate the number of businesses at the subdivision level required for this analysis and align with information on EFTes by sub-division in Boroondara from Economy.ID (2022).

In some cases, Blue Environment had to map Council land use types to industry divisions using assumptions to determine existing customers. The Council land use classification 'office premises' was used in the model as a proxy for the low organics-producing, office-based industries (from the ANZSIC classification) including: professional, scientific and technical services; financial and insurance services; and administrative and support services. In the model these industry classifications are all grouped into 'office premises' because their waste generation factor estimates are identical (SV 2013).

Two mixed land use classifications were challenging to map to a single industry subdivision – *retail premises (single occupancy)* and *retail premises (multiple occupancy)*. Following consultation with Boroondara Council, a sample of 30 sites for each class were researched and assigned an industry subdivision based on the business associated with the address on Google maps. These estimated proportions were used to count the quantity of Council serviced sites in each industry division and determine waste generation by industry.

The split of business types in Boroondara Council, and the assumed split of existing business customers that we used in the model, are shown in Figure 1 and Table 2.

Figure 1 Estimated splits for businesses with existing Council service compared to total businesses

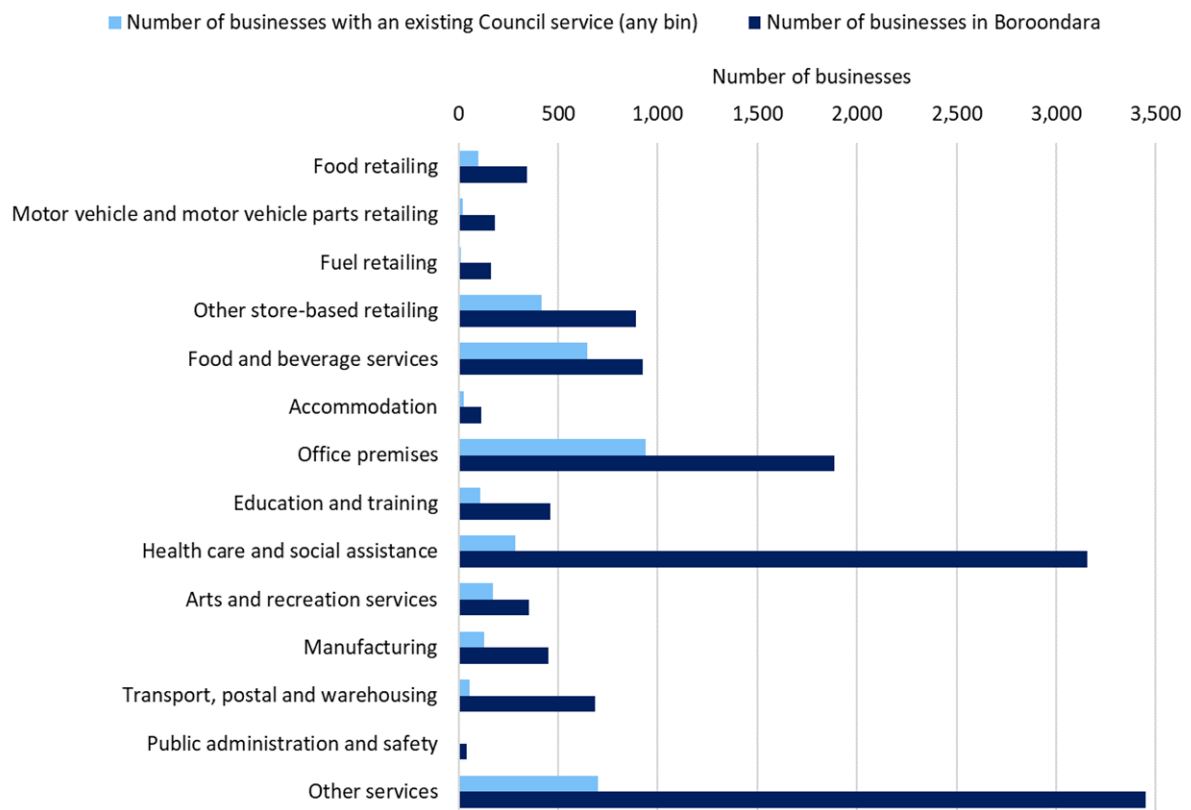


Table 2 Estimated splits for businesses with existing Council service compared to total businesses

Industry division	EFTEs in Boroondara	Number of businesses in Boroondara	Number of businesses an existing Council service
	Number	Number	Number
Food retailing	2,645	343	100
Motor vehicle and motor vehicle parts retailing	241	182	22
Fuel retailing	85	163	11
Other store-based retailing	3,824	891	415
Food and beverage services	2,773	923	647
Accommodation	94	115	26
Office premises	3,055	1,885	938
Education and training	9,653	459	108
Health care and social assistance	11,115	3,158	283
Arts and recreation services	1,042	355	171
Manufacturing	1,868	452	128
Transport, postal and warehousing	1,866	684	55
Public administration and safety	1,743	41	3
Other services	7,473	3,450	700

Figure 2 shows the numbers of EFTEs for all businesses in Boroondara by industry division, which were used to calculate waste generation estimates.

Figure 2 Number of employees (EFTE) by industry division



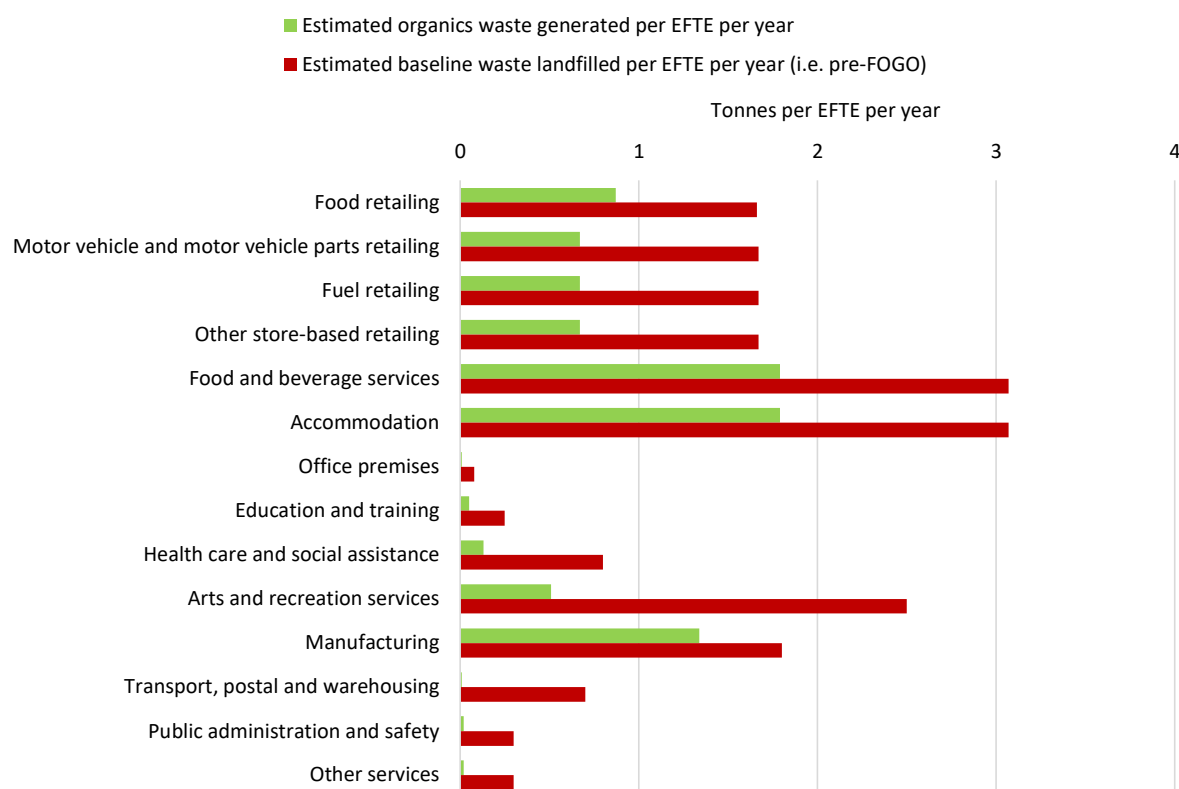
4.2 Business waste generation

As Boroondara Council does not collect waste data specific to businesses, Blue Environment has constructed estimates of organics generation, including proportions of food organics and garden organics. We used the EFTE of employees per business according to 2022 data from the ABS and considered estimates of organics and garbage waste produced per EFTE by industry sub-division from SV (2013) and Encycle and SRU (2013). The data presented as a default in the model (shown in Table 3 and Figure 3) was from Encycle and SRU (2013) because this source has data for all industry divisions. These quantities were assumed to be representative for the businesses in Boroondara.

Table 3 Assumed values to calculate business waste generation

Industry division	Estimated baseline waste landfilled per EFTE per year	Estimated organics waste generated per EFTE per year
	Tonnes/EFTE/year	Tonnes/EFTE/year
Food retailing	1.66	0.87
Motor vehicle and motor vehicle parts retailing	1.67	0.67
Fuel retailing	1.67	0.67
Other store-based retailing	1.67	0.67
Food and beverage services	3.07	1.79
Accommodation	3.07	1.79
Office premises	0.08	0.01
Education and training	0.25	0.05
Health care and social assistance	0.80	0.13
Arts and recreation services	2.50	0.51
Manufacturing	1.80	1.34
Transport, postal and warehousing	0.70	0.01
Public administration and safety	0.30	0.02
Other services	0.30	0.02

Figure 3 Estimated organics and garbage generation rates for businesses in Boroondara by industry division



Council advised that the businesses with an existing Council service were limited to one 240 L garbage bin per week. For some industry divisions, based on baseline data, the estimated waste to landfill per business (i.e. the waste to landfill per EFTE multiplied by the average number of EFTEs

per business) exceeded City of Boroondara's maximum garbage capacity. Where this was the case, the average number of EFTEs per business was brought down so the estimated waste to landfill per business was within the garbage capacity threshold, with the rationale being that City of Boroondara's existing customers tend to be small to medium sized.

4.3 Customer loss

Potential loss of existing customers was included in the model using two parameters. The first parameter was calculated by Blue Environment to estimate the portion of businesses, by industry division, for which a fortnightly garbage bin (240 L) service may not be sufficient based on an assumed waste generation quantity. The parameters used and the assumed proportion of businesses by industry category is shown in Table 4.

The second parameter in the model was an assumed loss due to customers either not wanting a FOGO service and/or the increase in cost. This was relevant for options two and three. Blue Environment estimated this loss at 10% of customers. This parameter is adjustable in the model.

Table 4 Parameters to estimate insufficient bin capacity fortnightly service for Boroondara businesses

Industry division	Proportion of businesses that are non-employing	Proportion of businesses with 1-4 employees	Proportion of businesses with 5-19 employees	Proportion of businesses with 20-199 employees	Proportion of businesses with 200+ employees	Estimated waste landfilled per EFTE per fortnight after FOGO	Estimated proportion of businesses for which one fortnightly garbage bin (240 L) would not be sufficient
	%	%	%	%	%	L/EFTE/fortnight	%
Food retailing	47%	35%	15%	2%	0%	429	53%
Motor vehicle and motor vehicle parts retailing	47%	35%	15%	2%	0%	438	53%
Fuel retailing	47%	35%	15%	2%	0%	438	53%
Other store-based retailing	47%	35%	15%	2%	0%	446	53%
Food and beverage services	24%	42%	28%	6%	0%	787	76%
Accommodation	24%	42%	28%	6%	0%	768	76%
Office premises	55%	30%	11%	4%	0%	22	4%
Education and training	51%	30%	13%	5%	1%	67	19%
Health care and social assistance	59%	30%	9%	2%	0%	214	11%
Arts and recreation services	64%	25%	10%	1%	0%	665	36%
Manufacturing	59%	27%	10%	4%	0%	484	41%
Transport, postal and warehousing	85%	13%	1%	1%	0%	192	2%
Public administration and safety	56%	30%	7%	7%	0%	82	14%
Other services	44%	43%	11%	1%	0%	82	12%

4.4 MUDs demographics

Large MUDs not serviced by Boroondara Council were relevant for option four, the bespoke FOGO service. To estimate the number of sites for non-Council serviced large MUDs, we used Council-provided data identifying the unique street addresses, classified as MUDs with no garbage service. It is worth noting that the data indicated some of these sites had a recycling and/or FOGO bin but we assumed the lack of a garbage service indicated the site was using a private service.

We assumed it would not be feasible to service a large portion of the 1,056 sites identified due to a lack of accessibility or space for a bin. In consultation with Council, we assumed 30% of these sites would be in a suitable location and be prepared to make space for up to two FOGO bins. Of this 30%, we assumed 50% of the MUDs might take up a bespoke FOGO service, equating to 160 sites as potential customers for a bespoke FOGO service. These assumptions are changeable in the model to consider different uptake scenarios.

4.5 MUDs waste generation

The tonnes of organic waste collected from each participating MUD per bin per year was assumed to be the calculated weight of one full 240 L bin multiplied by 52 (i.e. collected weekly). It is likely that MUDs would generate organic waste in excess of this capacity, but the actual capacity for a FOGO service would be limited by kerbside and bin room space.

Table 5 summarises the quantities and assumptions used for large MUDs.

Table 5 Parameters used for MUDs

Parameters	Unit	Assumed default
Number of MUDs in Boroondara with no Council garbage service	Number	1,056
Number of units in MUDs in Boroondara with no Council garbage service	Number	10,935
Tonnes of organic waste collected per MUD bin per year	Tonnes/bin/year	0.46
Proportion of MUDs feasible to service (i.e. not on a main road, have bin space or are willing to make space)	%	30%
Proportion of generated organic waste that is food organics	%	80%
Proportion of generated organic waste that is garden organics	%	20%
Proportion of MUDs feasible to service that that uptake FOGO	%	50%

4.6 Costs

Blue Environment used data provided by Boroondara Council as well as information from assessment of the performance of other FOGO services to model performance and costs of options. The collection costs were sourced from an internal benchmarking report provided in confidence by Council which indicated a range of \$1.05 to \$1.15 per lift and we assumed the high end of the range for the model. The benchmarking report stated that the collection cost included an allowance for organisational overhead, which we assumed covered all relevant costs to provide the service. The cost assumptions are shown in Table 6.

Table 6 *Cost assumptions*

Cost groups	Parameter	Units	Assumed cost
Bin	120 L bin	\$/unit	\$42.16
	240 L bin	\$/unit	\$46.53
Collection	Garbage bin cost per lift (collection and transport)	\$/lift	\$1.15
	Organics bin cost per lift (collection and transport)	\$/lift	\$1.15
Processing and disposal	Current landfill rate	\$/tonne	\$164
	Expected FOGO disposal rate	\$/tonne	\$108
Miscellaneous	Kitchen caddy	\$/unit/year	\$4.10
	Ongoing liner cost	\$/hh/year	\$8.15

The provision of caddies and/or liners has proved to be a key factor contributing to the degree of food diversion in residential FOGO services, and caddies and liners were identified as an effective management approach for business FOGO in our research report. Use of liners maintains cleanliness of bins and reduces odours. Provision of caddies and liners can be selected or deselected, if desired, in the model.

Also noted in our research report was the importance of community engagement, and because FOGO collection is not common for businesses, we assumed for high-performance community engagement an annual cost of \$20 per site was appropriate. MWRRG (2018, p. 20) suggests effective community engagement is essential to the success of a FOGO service. A high level of engagement and communication with participants might include targeted communications developed for participants, introduction packs, signage for use in bin areas, signage for businesses to display to promote environmental responsibility, bin stickers, information through Council digital channels such as website, e-news and social media, face-to-face, mail or digital communications with individual businesses and trader associations. Lower costs can be selected, if desired, in the model.

To estimate income for each option the annual waste charge for 2022-23 has been used as listed in Table 7. To derive estimated income for new services we combined the current charge with modelled changes in service cost. Also, we assumed the calculated service cost per customer, for a bespoke FOGO service, was a reasonable proxy for the annual waste charge.

Table 7 Current waste charges for businesses (2022–23)

Parameter	Units	Baseline charge	Option 2	Option 3 weekly garbage	Option 3 fortnightly garbage	Option 4
2022–23 charge (240 L bin)	\$/site/year	\$1,161	\$1,215	\$1,370	\$1,293	\$167
2022–23 charge (120 L bin)	\$/site/year	\$477	\$499	\$563	\$531	n/a
2022–23 charge (80 L bin)	\$/site/year	\$262	\$274	\$309	\$292	n/a

5. Option specifications

This section explains the modelled options for a commercial organics service, then describes any option specific assumptions along with commentary about relevant findings from the research report.

5.1 Modelled options

The four organics waste management service options as shown in Table 8 were modelled.

Table 8 Description of modelled options

Service option	Description	Service overview
1	Business as usual (baseline)	Council's existing business customers which receive a weekly garbage¹ and weekly recycling² service are considered.
2	Extend Council best practice service	- Provide to existing business customers. - Universal service³ - Fortnightly garbage 120L bin¹ - Weekly recycling (not modelled)² - Weekly FOGO 240L bin. - Provision of caddies and liners. - Community education.
3	Extend Council best practice service (weekly or fortnightly garbage)	- Provide to existing business customers. - Weekly or fortnightly garbage 120L¹ - Weekly recycling (not modelled)² - Weekly FOGO 240L bin. - Provision of caddies and liners. - Community education.
4	Bespoke FOGO service	- Available to any business or resident in the Council area. - Opt in for a weekly collection of a 240L FOGO bin. - Provision of caddies and liners. - Community education.

¹ A standard size bin of 120L has been used for the purpose of modelling.

² As there is no change proposed for the contracted recycling service and no separate charge to customers, recycling was excluded from the modelling assessment.

³ Council advised that opt-out would not be a standard offering but would be considered for genuine cases with demonstrated reasoning.

5.2 Scenarios

As noted in our research report the final service delivered may involve a combination of options and this was discussed with Boroondara Council following the research phase, with three possible scenarios identified as follows:

- Scenario A - extend the existing best practice FOGO service to businesses (service option 2)

- Scenario B - extend the existing best practice FOGO service to businesses and offer a bespoke FOGO service (service option 2 and 4)
- Scenario C - extend the best practice service but allow flexibility in the frequency of garbage collection and offer a bespoke FOGO service (service option 3 and 4).

The scenarios above were considered during our analysis and the structure of the MS Excel workbook enables scenarios with any combination of options to be easily modelled in the future.

5.3 Option 1 – Business as usual (baseline)

The model first establishes a baseline of business as usual to provide a comparison for the other service options.

The current waste service offered to businesses is a weekly garbage and weekly recycling service. Businesses can choose their bin size as 80L, 120L or 240L depending on their needs. The model assumed a 120 L garbage bin size for all commercial customers as a default.

Based on Council data there are 3,607 businesses with a Council service. Council records indicate that 7% of the existing businesses customers retain a legacy green waste bin that is now serviced in the same way as a residential FOGO bin, but no charges are associated with these bins at present.

Council collects kerbside tonnage data aggregated across all tenement types (i.e. households plus businesses), meaning kerbside tonnages collected from existing business customers were not available. Baseline garbage and organics tonnes collected by Council from businesses were estimated in the model using the method described in section 4.

We note that some business FOGO may be diverted from landfill via private collection or other means in the current state, however as no data was available on private waste collection this is not accounted for in the model.

5.4 Option 2 - Extend Council best practice service

This option considers extending the Councils' best practice residential service to its existing business customers. The modelling assumes identical conditions to the residential service including service configurations and a universal service.

This option would result in one extra truck visit per fortnight to businesses, with a change from four to five visits, and at least one additional bin to be stored at each site.

Already discussed in the research report (Appendix A), the key challenges identified for this option included:

- insufficient bin capacity for garbage
- lack of space for bin storage
- potential amenity issues such as odour, vermin and unsightly spaces
- contamination of the FOGO stream
- customer dissatisfaction with a proposed change of service.

Council has management options for amenity issues, such as providing bin liners, and is well placed to reduce contamination through education programs, potentially teaming up with the Councils' organics processor, Bio Gro. Reducing customer loss, due to general dissatisfaction with a change,

may also be managed to some extent with good communication. Bin storage may be more challenging, particularly with implementation of a universal service, and lead to businesses seeking other options. Bin capacity issues are assessed in the modelling, with the potential impacts shown in section 6.1.

5.5 Option 3 - Extend Council best practice service (weekly/fortnightly garbage)

Considering the potential for insufficient garbage bin space, we modelled an option with flexibility for existing business customers. We recognise this may be considered a type of bespoke option but for simplicity have used the same parameters as option 2 except for the frequency of the garbage service, which can either be weekly or fortnightly.

This option assumes that approximately 30% of customers would prefer or need to retain a weekly garbage service to meet their needs. For customers electing to retain a weekly garbage service, this option would result in two extra trucks visit per fortnight, with a change from four to six visits and at least one additional bin to be stored at each site.

The anticipated key challenges are similar to those in option 2 with the exception of the bin capacity. Also with an expanded service offering, we considered whether Council may be able to attract customers not using, but eligible for, the Council service. We concluded this was unlikely and at best only a minimal environmental benefit.

5.6 Option 4 - Bespoke FOGO service

The option models a minimal bespoke service for FOGO collection only. We used a weekly 240 L bin as a default but recognise that a genuine bespoke service would likely have more choices on offer.

As noted in our research report an advantage with a bespoke service, compared to the standard Council kerbside service, is that the commercial service would be available to any site in the Council area. For this reason, we included the large MUDs not serviced by the Council in our assessment of potential customers for this service option.

This option would result in more truck visits around Boroondara, with the number dependent on uptake. For modelling we assumed in-house collection for the bespoke FOGO service, but we understand Council does not intend to purchase different FOGO collection trucks for any future service. This would mean that customers without a suitable pickup location may be ineligible.

Other factors that may influence uptake include: lack of space for bin storage; lack of awareness or interest; and unwillingness to pay additional costs. Based on Blue Environment estimates, the modelling assumed FOGO service uptake by:

- approximately 15% for large MUD sites not serviced by Council
- 30% of businesses in the industry divisions of food retailing, food and beverage, accommodation
- 5% of business in all other industry divisions.

Potential amenity issues such as odour, vermin and unsightly spaces, as well as contamination of the FOGO stream, may also be challenges with this service. However, if customers are choosing to purchase the service, they may be more self-motivated to manage these issues.

6. Modelling outputs

In this section of the report, we present the results by theme and consider the modelling results of each option for:

- potential loss/gain of customers
- organics generation and diversion
- potential greenhouse gas avoidance
- financial analysis.

6.1 Potential loss/gain of customers

An important consideration for this study was to understand the potential loss of existing business customers due to a change to their current service. Table 9 show the number of business customers estimated for each service.

Table 9 Estimated number of customers for each option

Option	Number of businesses assumed to stay on	Number of businesses assumed to retain weekly garbage	Number of businesses assumed for fortnightly garbage	Number of new businesses and MUDs
	Number	Number	Number	Number
Option 1 Business as usual	3,607	3,607	0	n/a
Option 2 Weekly FOGO, fortnightly garbage for existing customers	2,260	0	2,260	n/a
Option 3 Weekly FOGO, weekly/ fortnightly garbage for existing customers	3,246	986	2,260	n/a
Option 4 Weekly FOGO for non-existing customers	n/a	n/a	n/a	785

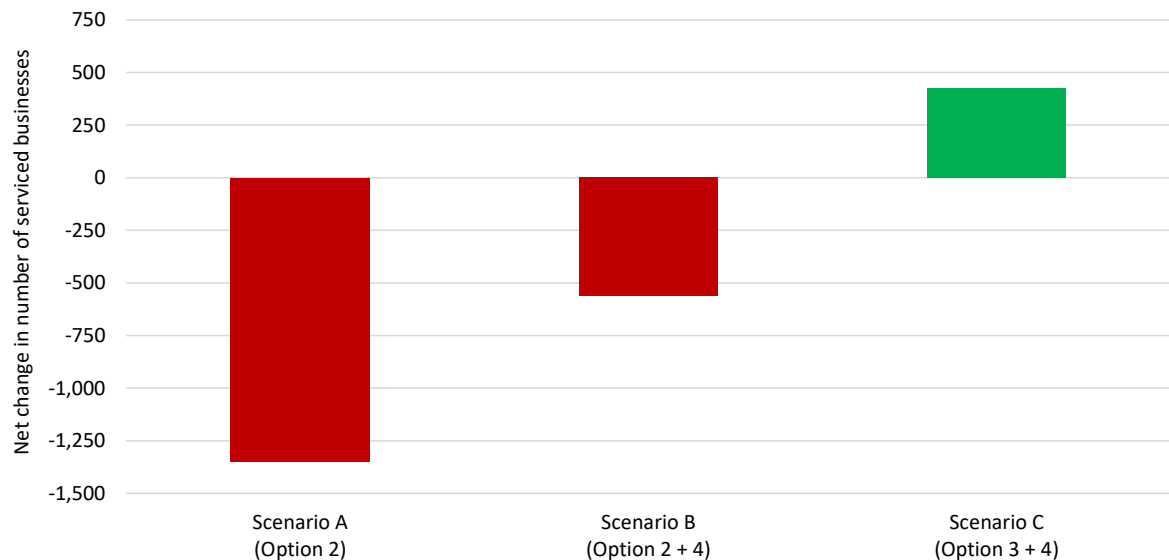
A key observation is that by reducing the garbage collection frequency to fortnightly in option 2, we modelled an approximate 40% loss of existing business customers. This can be attributed to insufficient bin capacity, based on our modelling of existing customer garbage generation. There is also a portion of customers assumed to opt out due to general dissatisfaction.

Our modelling indicates that the overall estimated loss could be reduced to an estimated 10% if existing customers were able choose to retain a weekly service as in option three.

Based on our modelling we estimate around 700-800 new business and large MUD customers for a bespoke FOGO service. Option four is not compared to the baseline as it would be a new service. We note that the estimation is highly indicative because a bespoke service would likely offer more flexibility than a weekly 240 L FOGO service and thus may attract more customers.

For this theme we also considered the potential scenarios (described in section 5.2), which are a combination of options as defined in section 5.1. Both scenarios A and B result in a net loss of customers, while extending the Council FOGO service with flexible garbage plus a bespoke FOGO service (scenario C) shows a modest gain of customers. This comparison is provided to indicate potential customer movement rather than commenting on whether this is a positive or negative outcome.

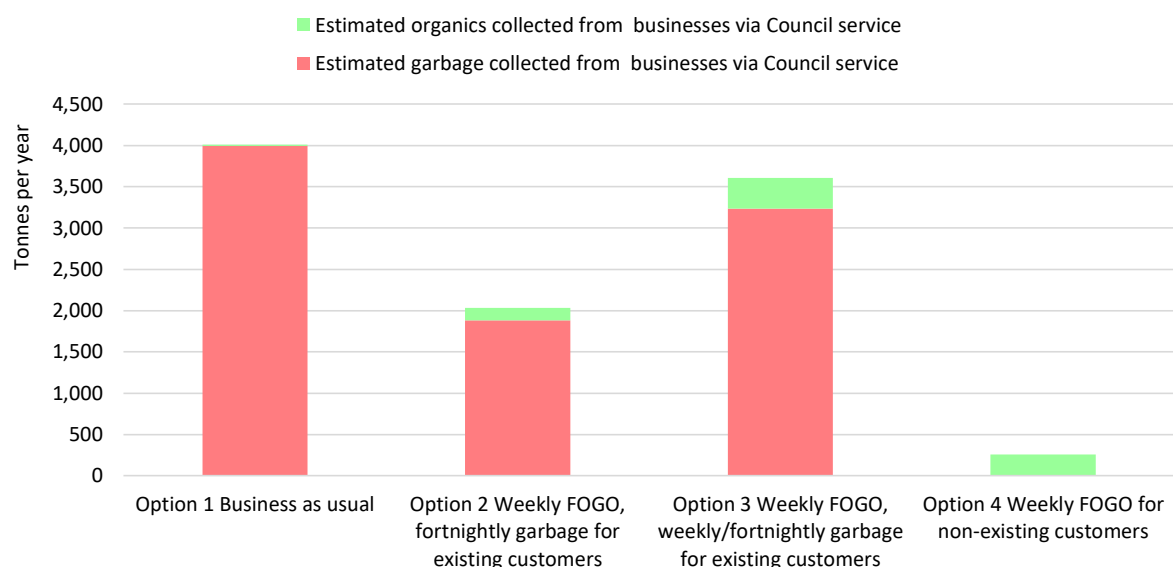
Figure 4 Net change in number of serviced businesses



6.2 Generation and diversion

The estimated waste generation and collection for garbage and FOGO from businesses is shown in Figure 5 and Table 10.

Figure 5 Estimated waste collected from businesses in Boroondara via Council service



In option four the collection would be from businesses and large MUDs, with MUDs contributing approximately 70 tonnes to the estimated 250 tonnes collected per annum.

Table 10 *Estimated waste collected from businesses in Boroondara via Council service*

Option	Commercial FOGO collected at kerbside		Commercial garbage collected at kerbside	
	Tonnes/year	% change	Tonnes/year	% change
Option 1 Business as usual	10	n/a	4,000	n/a
Option 2 Weekly FOGO, fortnightly garbage for existing customers	150	1003%	1,900	-53%
Option 3 Weekly FOGO, weekly/fortnightly garbage for existing customers	380	2620%	3,200	-19%
Option 4 Weekly FOGO for non-existing customers	250	n/a	n/a	n/a

Key observations include:

- By reducing the garbage collection frequency to fortnightly in option two, garbage quantity collected by Council reduces by approximately 50%., however while some of this would be attributed to diversion of FOGO from garbage, the majority can be linked to the estimated loss of customers described in section 6.1.
- Option three results in approximately double the FOGO collection estimated for option two due to reduced customer loss.

6.3 Environmental

The environmental benefits of food waste diversion programs include avoidance of greenhouse gas emissions from landfill, as well as reducing pollution risk from leachate and other gas generation. The model includes assessment of avoided greenhouse gas emissions from landfill based on Blue Environment's industry knowledge on best practice metropolitan landfills, where it is assumed the landfill has a gas capture rate of 70%.

Avoided greenhouse gas emissions are shown in Figure 6 and Table 11. National factors (Clean Energy Regulator 2008) were used to estimate the greenhouse emissions from landfill material.

Figure 6 *Estimated avoided greenhouse gas emissions from businesses diverting organics from landfill*

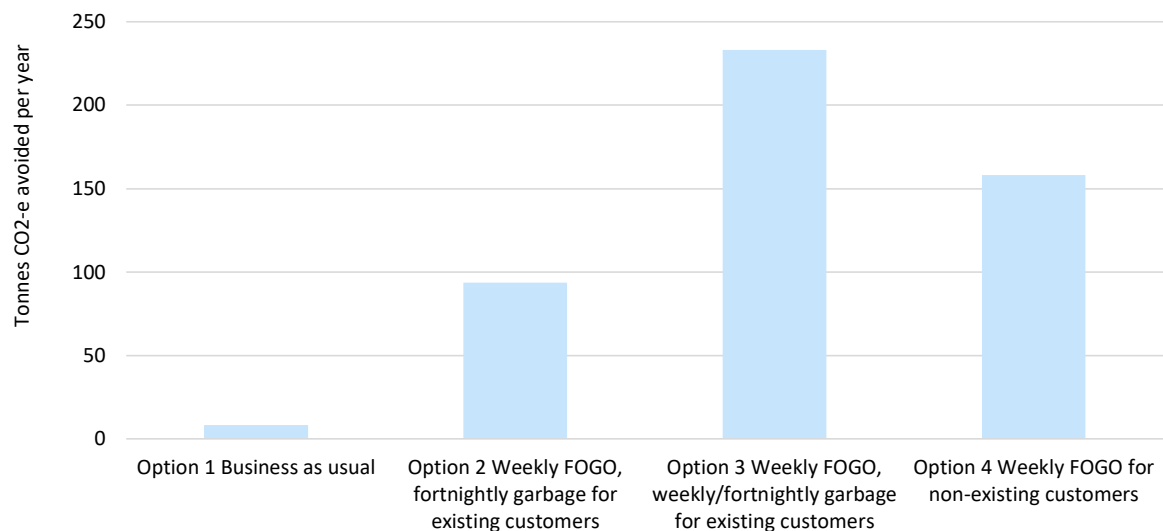


Table 11 *Estimated avoided greenhouse emissions (GHG) from businesses diverting organics from landfill*

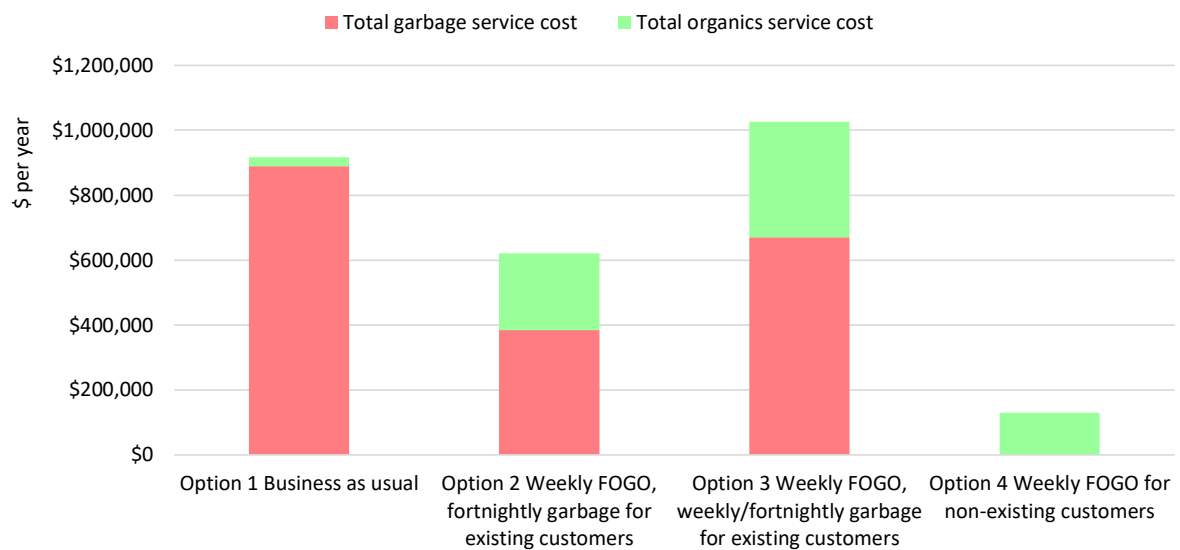
Option	Avoided GHG emissions
	Tonnes CO ₂ -e avoided/year
Option 1 Business as usual	10
Option 2 Weekly FOGO, fortnightly garbage for existing customers	90
Option 3 Weekly FOGO, weekly/fortnightly garbage for existing customers	230
Option 4 Weekly FOGO for non-existing customers	160

The potential avoided emissions increase with the quantity of FOGO diverted from landfill with option three providing the best performance.

6.4 Financial analysis

Our financial analysis considers income, operating and capital expenditure. The estimated total costs are shown in Figure 7 and cost per business (or MUD) in Figure 8. Table 12 and Table 13 provide the breakdown of the calculated service costs. Table 13 excludes caddies and liners from the costs.

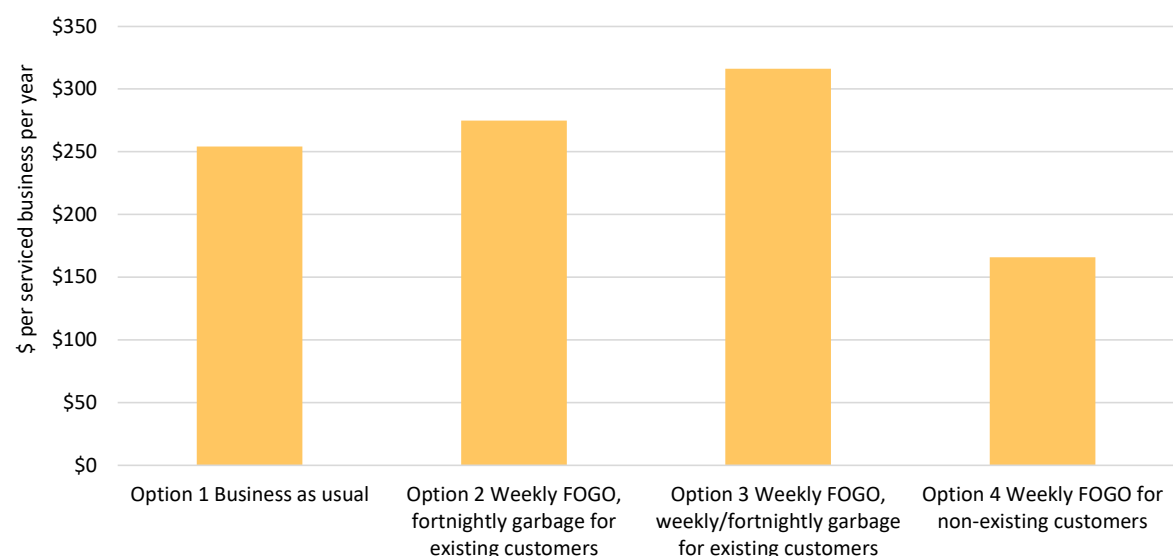
Figure 7 Estimated total cost of organics and garbage service for businesses in Boroondara



The cost of the service is predominantly driven by the number of customers and truck visits per fortnight. The estimated loss of customers for option 2, discussed in section 6.1, contributes to an overall cost decrease for this option relative to business as usual (option 1). Option 3 also loses customers, but a lower proportion and the overall cost of the service is higher due to the extra truck movements, which would be either one or two more visits per fortnight.

The estimated costs for a bespoke FOGO service, option 4, should be considered indicative at this stage because the modelling is based on the same parameters as the standard Council service. We acknowledge that an on-demand service may have different underlying costs which means the estimated customer cost of \$166 per year may be underestimated. In addition, the cost of a bespoke service would be influenced by the number of customers and the degree of flexibility offered in the service. More flexibility may attract customers, but the non-standard timing may reduce efficiency and impact operating costs.

Figure 8 Estimated total organics and garbage service cost per serviced business in Boroondara



For existing customers, the cost per site is estimated to increase for both options two and three, as would be anticipated due to the extra truck visits, of either one or two extra per fortnight.

Total annual costs have been rounded to the nearest 100 in the table below.

Table 12 *Estimated costs (rounded)*

Parameter	Stream	Units	Option 1	Option 2	Option 3	Option 4
Annualised bin costs (including kitchen caddy and liner costs)	Organics	\$/year	\$2,000	\$39,200	\$56,300	\$40,000
	Garbage	\$/year	\$18,300	\$8,300	\$13,300	n/a
Community engagement	Organics	\$/year	\$0	\$45,200	\$64,900	\$15,700
Collection and transport	Organics	\$/year	\$23,300	\$135,200	\$194,100	\$46,900
	Garbage	\$/year	\$215,700	\$67,600	\$126,500	n/a
Processing and disposal	Organics	\$/year	\$1,500	\$16,400	\$40,500	\$27,500
	Garbage	\$/year	\$655,900	\$309,000	\$530,700	n/a
Total service cost	Organics	\$/year	\$26,800	\$236,000	\$355,800	\$130,100
	Garbage	\$/year	\$889,900	\$384,800	\$670,600	n/a
Total service cost per site	Total	\$/site/year	\$254	\$275	\$316	\$166

Table 13 *Estimated costs without caddy and liner costs (rounded)*

Parameter	Stream	Units	Option 1	Option 2	Option 3	Option 4
Annualised bin costs (not including kitchen caddy and liner costs)	Organics	\$/year	\$2,000	\$11,500	\$16,500	\$9,900
	Garbage	\$/year	\$18,300	\$8,300	\$13,300	n/a
Community engagement	Organics	\$/year	\$0	\$45,200	\$64,900	\$15,700
Collection and transport	Organics	\$/year	\$23,300	\$135,200	\$194,100	\$46,900
	Garbage	\$/year	\$215,700	\$67,600	\$126,500	n/a
Processing and disposal	Organics	\$/year	\$1,500	\$16,400	\$40,500	\$27,500
	Garbage	\$/year	\$655,900	\$309,000	\$530,700	n/a
Total service cost	Organics	\$/year	\$26,800	\$208,300	\$316,000	\$100,000
	Garbage	\$/year	\$889,900	\$384,800	\$670,600	n/a
Total service cost per site	Total	\$/site/year	\$254	\$262	\$304	\$127

Waste charge analysis

This section estimates commercial waste charges and income for different options based on current rates and changes in modelled costs compared to the baseline. Commercial waste charges cover a Council-provided kerbside garbage, recycling and, where provided, FOGO service and are charged according to the size of the garbage bin. Rates are set for 2022–23 at \$1,161 for 240 L, \$477 for 120 L, and \$262 for 80 L.

Table 14 provides the estimated changes in costs for options two and three as compared to business as usual. It also estimates the change in annual income from the current service for existing customers. Total annual costs have been rounded to the nearest 100.

The modelling suggests that if Boroondara Council transitioned the existing business customers to a best practice service (option two weekly FOGO, fortnightly garbage) the estimated customer cost

would increase by approximately \$11-\$50. If, instead, Council provided a choice for garbage collection frequency (option three), the estimated increase in cost per year would be in the approximate range of \$46-\$204 or \$29-\$128 for weekly or fortnightly garbage respectively. The cost increase for option three is more, regardless of garbage frequency, due to the customer loss rate for option two, which is anticipated to be relatively high, bringing down total costs (and total income), including when translated to total costs per serviced customer.

To estimate the income from a bespoke service, option four, we have assumed that the calculated cost for the service would be the charge per customer. As discussed earlier, we acknowledge this may be underestimated.

Table 14 Waste charge analysis

Option	Bin size	Units	Option 1	Option 2	Option 3		Option 4
					Weekly garbage	Fortnightly garbage	
Baseline waste charge	240 L	\$/site/year	\$1,161	\$1,161	\$1,161	\$1,161	n/a
	120 L	\$/site/year	\$477	\$477	\$477	\$477	n/a
	80 L	\$/site/year	\$262	\$262	\$262	\$262	n/a
Estimated waste charge increase compared to baseline	240 L	\$/site/year	n/a	\$50	\$204	\$128	\$166
	120 L	\$/site/year	n/a	\$21	\$84	\$53	n/a
	80 L	\$/site/year	n/a	\$11	\$46	\$29	n/a
Estimated waste charge	240 L	\$/site/year	\$1,161	\$1,211	\$1,365	\$1,289	\$166
	120 L	\$/site/year	\$477	\$498	\$561	\$530	n/a
	80 L	\$/site/year	\$262	\$273	\$308	\$291	n/a
Estimated income from waste charge	240 L	\$/site/year	\$1,729,600	\$1,130,400	\$555,900	\$1,203,100	\$130,100
	120 L	\$/site/year	\$710,600	\$464,400	\$228,400	\$494,300	n/a
	80 L	\$/site/year	\$390,300	\$255,100	\$125,500	\$271,500	n/a
	Total	\$/year	\$2,830,500	\$1,849,900	\$909,800	\$1,968,900	\$130,100
Net change in income compared to baseline	Total	\$/year	n/a	-\$980,600	\$48,200		n/a

The waste charge analysis is based on the assumption that all options use the Council run service, with collected materials taken to Council's current landfill provider and organics processor.

7. Summary of analysis

Our qualitative analysis, largely completed during the research phase, found that extending the existing best practice service, or implementing a minimal bespoke commercial service merited further consideration. We found that management approaches exist to mitigate potential challenges, such as caddies and bin liners to address amenity issues and education to reduce contamination. In addition, Council's current organics processor, Bio Gro, advised they had capacity for more organics and were open to explore this endeavour with Council.

Although Council provides garbage and recycling services to approximately 25% of its businesses, a noteworthy gap identified through this project was unavailability of waste data for Boroondara business customers. Also, during the research phase, the stakeholders consulted showed interest in using a FOGO service but, due to the low number of businesses that participated in the consultation process, we were unable to provide a clear indication of the likely participation rate in a commercial service. Analysis of the businesses in Boroondara was refined during the project using available data sources and best estimates by Blue Environment. However, as the data has relatively high uncertainties Council should treat the modelling outputs with caution.

Our modelling assumed that suitable unpackaged food organic waste is more likely common in food retailing, food and beverage and accommodation; all business types which are well represented in Boroondara. The services modelled for this project indicated an increase in FOGO diversion from landfill, which is a desired outcome, however based on the assumptions the estimated quantities for diversion were relatively modest.

We understand that the priority for Boroondara Council is to expand the FOGO service to its existing business customers and concurrently align the residential and business service (i.e. consistent waste streams and collection frequency). While option two, would meet both these requirements, our modelling indicated high potential customer loss with this approach. This was mostly attributed to insufficient bin capacity with fortnightly garbage collection. Notwithstanding the uncertainty already discussed, this finding may pose considerable risk to Councils' reputation, result in a loss of income and undermine the intent to divert organics from landfill.

A bespoke FOGO service would not necessarily reduce the issue of potential customer loss because the loss related to garbage bin capacity. As found in our research report, establishing a full bespoke service (i.e. including garbage) would be a high-risk activity and as such we did not recommend this path.

Providing existing customers, a choice to retain weekly garbage, for an additional charge, as modelled in option three, may reduce loss of customers and diminish the associated risks. We recognise this approach has the downside of more truck movements and does not meet the desire for service alignment. If service alignment is a non-negotiable driver, then Council could investigate larger garbage bins for existing business customers before making any service change. In addition, we suggest Council undertake a scan of the current business customer bins to determine how full they are when collected, and how much organics they contain, as this data could significantly enhance assumptions made in this study. Blue Environment could help with this work if needed.

Our analysis indicated that a relatively small number of the large MUDS, approximately 15% or 160 sites, may be prepared and able to use a bespoke FOGO service. While a bespoke FOGO service could provide an option for some large MUDs, for others it may not be feasible due to available bin space, willingness to give up space for bin storage, and access for bin collection.

Additional data from businesses and large MUDs unable to access the standard service, would improve understanding of potential customers for a minimal bespoke service. Our analysis identified a minimal bespoke FOGO service had potential to attract customers, but we recognise this service would involve a trade-off between uptake and cost. The more flexible the offering the more likely the uptake, but greater flexibility may lead to higher underlying costs with loss of efficiency.

We note that some existing Council customers could switch to a private service for garbage and recycling (to retain a weekly garbage service), and still choose to take up a bespoke FOGO service, which would also influence potential uptake. We did not see value in modelling a more flexible bespoke service or variations in uptake at this point due to the data limitations described for this study.

8. Corrals assessment

A brief assessment of feasibility of including FOGO bins in the existing precinct corrals is provided for Council's consideration. The parameters and assumptions for the corrals analysis are also described here.

With the data available on existing garbage and recycling bins, including usage and collections we estimated FOGO amounts and potential contamination. However, as data was unavailable on the number and types of businesses using the corrals, and costs associated with the corrals (i.e capital, collection, maintenance, disposal), we were not able to determine the costs and cost-recovery opportunities.

We found that if used at maximum capacity, adding a 240 L FOGO bin to each corral may help divert 10% of estimated waste to organics recycling. Table 15 shows the estimate of garbage and organics generation and potential greenhouse gas avoidance for each of the three corral sites – Greythorn, Camberwell and Maling Road. This assumes that the current waste stream is made up of 22% food waste with a diversion rate of 40% and 2% garden waste with a 60% diversion rate. The estimated greenhouse gas emissions avoided if a FOGO bin was added to each corral is also shown below.

Table 15 Garbage and organics generation rates and potential GHG avoidance

Corral location	Garbage	Organics	GHG avoidance
	Tonnes/year	Tonnes/year	Tonnes/year
Greythorn	36	3.6	3
Camberwell	14	1.4	1
Maling Road	3	0.3	0.3

Based on Council advice we understand that Greythorn and Camberwell are the bigger corrals and Greythorn and Maling Road are the better organised corrals. Our research found that of the three sites, Greythorn had more potential for a FOGO service due to more space, higher use and a cleaner site. The other two sites were reported to have challenges with cage space and varying issues with littering and amenity. The corrals are in car parks and expanding the spaces would require the removal of car parking. All the corrals are near high foot traffic areas and would need to be carefully managed to avoid odours and pests attracted by the organics waste stream.

Some limited consultation with stakeholders associated with the corrals was undertaken. The manager of the Camberwell Traders Association indicated that the corral at Camberwell is important for the surrounding businesses that have limited space for waste at their premises but highlighted an issue with business staff forgetting the corral access key which could result in dumped rubbish. We noted that in Camberwell, a reliance on business owners to separate waste and 'do the right thing' could make the corral site messy and not amenable.

Blue Environment is unable to provide a feasibility assessment for the introduction of FOGO to the Boroondara corrals due to the unavailability of data. We suggest that Council confirm number of businesses using corrals, and determine business interest and estimated organics generation. It also may be worthwhile trialling the addition of a FOGO bin in one well-managed corral, such as Greythorn, to establish the approach for a FOGO collection service for shared use by businesses.

9. Conclusions and recommendations

Implementing a FOGO service beyond residents would be positive for the environment, align with State policy and support the Councils' pursuit of circular economy outcomes. However, the best approach was challenging to ascertain without a clearer understanding of the local commercial waste stream and the business sentiment.

Based on our analysis we believe it may be feasible for Council to consider extending a Council FOGO service to its existing business customers (modelled in option two and three), however due to the risks identified, we caution against simply rolling out the standard residential service, option two (also identified as scenario A), without further research to improve certainty and identify the significance of constraints.

Additionally, we identified that combining a minimal bespoke service (option four) with either option two or option three (described as scenario B and C), would not address the risks associated with potential customer loss. Due to this we concluded the scenarios, while useful to consider, were possibly premature at this stage. Also, with the lack of data we were unable to be conclusive about the feasibility of a minimal bespoke FOGO service (option four).

We are not yet convinced that the information base used for making the final decision is acceptable due to the number of uncertainties it still contains.

Based on this study we make the following **recommendations** to Council:

1. Undertake further research to validate assumptions (e.g. waste generation quantity and composition) prior to considering an extension of a Council FOGO service to existing business customers.

The purpose of our first recommendation is for Council to validate assumptions made in this study, given the risks we have identified associated with potential loss of existing business customers. Our second recommendation offers ways to obtain suitable information.

2. Obtain further information on business customer waste generation and organics generation by either undertaking a scan of the current business customer bins to determine how full they are when collected, and how much organics they contain, or consider surveying businesses to obtain the waste data.

We believe a bin scan would provide more robust information, but the benefit of a survey would be the opportunity to seek other information, such as business interest, perceived challenges and needs, if FOGO was introduced alongside a reduced garbage collection frequency. Depending on Council capacity, a combination of the two approaches could be taken, with the survey scaled by the extent of the scan. The results of a bin scan, business survey or combination would greatly improve the quality of the model outputs and be used to form a more conclusive assessment of feasibility.

As a lower priority, due to the smaller number of businesses involved, we also have a recommendation for corrals.

3. Consider trialling a FOGO bin at one well-managed site with space in the cage, such as Greythorn, to establish the approach for a shared use FOGO collection service.

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Appendix A Research report

Final (updated)

Commercial FOGO research report

21 FEBRUARY 2023

PREPARED FOR

Boroondara City Council

Report title	Commercial FOGO research report
Prepared for	Boroondara City Council
Status	Final (updated)
Author(s)	Georgia Caggiati-Shortell, Lisa McLeod
Reviewer(s)	Christine Wardle, Joe Pickin
Project number	P1408
Report date	21 February 2023
Contract date	24 August 2022
Information current to	25 November 2022
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Abbreviations and glossary

ABS	Australian Bureau of Statistics
AORA	Australian Organics Recycling Association
AEAS	Australian Economic Advocacy Solutions
C&I	Commercial and industrial
CBD	Central Business District
FOGO	food organics and garden organics
FTE	full time equivalent
MUD(s)	multi-unit development(s)
RV	Recycling Victoria
SV	Sustainability Victoria

Summary

By assessing suitability of food organics and garden organics (FOGO) service models, local government can support State and national government policy to increase diversion of FOGO and reduce greenhouse gas emissions associated with disposing of organic waste in landfill.

This report summarises the research undertaken by Blue Environment for Boroondara City Council (Council) to provide direction on options for expanding a FOGO service to businesses and large multi-unit developments (MUDs).

The project collected data about businesses, MUDs with no FOGO service, an organics processor and technology providers for on-site options. We also considered the market conditions and included benchmarking of potential commercial FOGO services in Boroondara with similar local councils in Melbourne.

In this study we identified that a range of business types in Boroondara are likely to generate significant quantities of organic waste. The stakeholders consulted showed interest in using a FOGO service however due to the low number of businesses that participated in the consultation process, we are unable to provide a clear indication of the likely participation rate in a commercial service.

We also found interest in alternative FOGO services from representatives of MUDs excluded from Council services, but it seems unlikely they will want to pay for capital and operating costs in addition to their existing private waste collection services. Our research identified that the City of Melbourne is running a service trial involving the installation of an organic waste processor in the basement of high-rise buildings. This style of service was not recommended for modelling as data is not available for comparison to MUDs in Boroondara. The modelled options include opportunities for an organics service for Boroondara MUDs ineligible for an existing Council residential FOGO service, however not all MUDs would be able to uptake this service and we recommend that Council monitor the outcomes of the City of Melbourne trial through 2023 to inform future on-site services for large MUDs.

Blue Environment investigated four models including:

- the extension of a best practice household FOGO service to commercial properties
- delivery of a bespoke FOGO service for businesses
- on-site organics recycling approaches
- precinct-based commercial processing (e.g. biodigester) solutions.

Our analysis suggests that due to considerable risks, infrastructure and processing costs the Council-managed precinct-based technology service is not recommended for further consideration. We found that Council may be able to extend the precinct corrals to include FOGO bins, and this is recommended for further analysis in the next stage.

On-site organics processing technology may be appropriate where waste collection costs are high and organic loads are high. While Council would not provide the processing service to individual private businesses they could provide guidance, direction and encouragement or possibly grants to incentivise diversion of FOGO from landfill. As only limited stakeholder consultation has been possible during this project, Blue Environment is not able to gauge interest for on-site technology in the business community.

Based on our research and consultation of the four different Council-facilitated services two are recommended for detailed modelling and one for further analysis in the second stage of this project:

- the extension of the best practice FOGO kerbside service to businesses
- introduction of a bespoke waste service
- further analysis of including FOGO bins in the existing precinct corrals.

1. Introduction

Boroondara City Council is considering the best policy for enabling organics recycling and commissioned Blue Environment to prepare a feasibility study on expanding a food organics and FOGO service to businesses and large multi-unit developments (MUDs).

The project is being undertaken in two stages. This research report is for stage one and summarises the findings of our research and consultation to provide direction on potential service and technology options.

The report contains data, information and analysis of businesses (i.e. excluding industrial manufacturing organisations) producing significant quantities of organic waste, MUDs with no FOGO service, organics processors, and technology providers. It benchmarks commercial FOGO services in Boroondara with similar local councils in Melbourne. This report then shortlists key options for FOGO collection for Council consideration to include in the feasibility study which will form the second stage of the project.

The purpose of this study is to investigate how to best expand FOGO services to those businesses that generate food or garden waste and to large MUDs. Possibilities might include expanding the existing residential best practice FOGO service, developing a bespoke FOGO service for businesses, introducing or facilitating use of on-site organics processing or developing a precinct-based service.

This report contains minor updates requested by the Council and for correction of minor clerical errors since it was submitted in December 2022. Further analysis of the bespoke service option, provided separately to the Council, and results of a further consultation have also been integrated into this updated version.

2. Context

This section outlines the regulatory context, best practice frameworks and FOGO waste generation rates in Boroondara City Council.

2.1 Policy and regulations

Recycling Victoria: a new economy

The *Recycling Victoria* circular economy policy classifies organics as a priority material for recovery for Victorian businesses (Recycling Victoria, p.16). The policy also includes household recycling reforms such as the state-wide standardisation of four core waste and recycling services including combined FOGO waste services for every household in Victoria by 2030. This will reduce the greenhouse gas emissions associated with disposing organic waste in landfill and retain material to be processed into useful products like mulch and compost.

We note that based on our stakeholder consultation a standard four bin service will not be suitable to some MUDs in Boroondara due to space constraints and requirements for some MUDs to provide their own waste disposal as a condition of town planning permits (see further below). Recycling Victoria suggests alternative arrangements such as transfer stations, local drop-off points, home composting support or worm farms where appropriate (*Recycling Victoria*, p. 26). The delivery of an appropriate FOGO service for MUDs following this assessment will contribute to Council aligning with part of this policy.

EPA Victoria regulation

According to the *Environment Protection Act 2017*, all organisations have a general environmental duty which includes reducing the risk of business' activities potentially harming the environment or human health through pollution or waste. This includes the disposal of waste at a lawful place for the waste type and a responsibility to minimise hazards such as odour associated with waste under section 93 of the *Environment Protection Act 2017*. Managing and minimising odour is a key consideration for the storage of waste for collection, especially organic waste which is prone to odours, and the position and style of any on-site organics processing systems.

Small-scale organic waste processing by aerobic or anaerobic biological conversion, as defined in the *Environment Protection Regulations 2021*, in Schedule 1 – Prescribed permission activities and fees, is a prescribed registration activity. This means small scale organic waste processing operations must be registered to legally operate. Before applying for a registration, the applicant must understand the possible risks of the activity and how these will be managed. This helps the applicant comply with their obligation to meet the general environmental duty. Registration can be completed online and if approved, the applicant will receive a registration containing conditions with which they must comply.

Planning

Boroondara City Council offers kerbside waste services to most households and some businesses. Through the planning approval process, certain sites, including some MUDs, are required to submit a waste management plan to Council which considers their specific waste needs and whether they are eligible for a Council waste service. If excluded from the Council service, the site must find a private service to manage its waste disposal. If ineligible for Council bin services, the owner can still access other Council services designed to facilitate better waste management, such as the Compost Revolution service platform. Residents of these sites do not pay for kerbside waste collection but are

still required to pay for public waste collection services in Boroondara as an environmental levy through their service charges.

2.2 Best practice frameworks

Commercial guidance

The Victorian food organics recycling guide (Victorian Government, 2016) aims to improve the recovery of organics at small-to-medium food services organisations. It includes a summary of options for businesses to recycle food and costs associated with each management option. It also includes estimates of organic waste generated per full-time equivalent (FTE) employee for some sectors. Food is likely the most significant type of organic waste generated by businesses in Boroondara given the number of cafes and restaurants. This guide may provide Council with useful information to use in communication and education material for businesses.

Encycle Consulting and Sustainable Resource Use conducted a study into commercial and industrial (C&I) waste and recycling in Australia by industry division in 2013 for the federal Department of Sustainability, Environment, Water, Population and Communities (Encycle, 2013). This guide also includes estimates of organic waste generated per full-time equivalent (FTE) employee for several additional industry sub-divisions.

MUD guidance

‘Introducing a kerbside FOGO collection service’ (MWRRG, 2018) was published four years ago by the now defunct MWRRG but is still relevant. It outlines steps for successfully introducing FOGO services to local government areas. The guide outlines the following key considerations for high-density housing and food-waste intensive businesses (MWRRG 2018 p.33):

- smaller receptacles for food waste only or commercial food dehydration units may be possible service options
- food organics without garden organics can be messy, soiling bins and making them unpleasant; to avoid this, compostable bin liners are essential
- shared bins or food organic skips can be provided, but there can be issues associated with a lack of shared responsibility for contamination, therefore effective engagement of tenants and facility managers is critical
- although not yet common in Australia, dehydrating units could be used if tenants and the body corporate/facilities managers are effectively engaged.

Sustainability Victoria has developed a better practice guide Waste Management and Recycling in Multi-unit Developments (SV, 2019). This covers all aspects of waste management in MUDs including organics. The guide suggests a variety of on-site organics recycling options ranging from concepts for individual residences to shared organics recycling in communal garden spaces and pre-treatment systems such as dehydrators.

Where on-site composting or kerbside collection is not available the guide suggests consideration of dehydrators, in sink waste disposal units, food macerators (for commercial), domestic biodigesters or anaerobic digestion (waste to energy). The guide details organics recovery approaches (SV 2019 Appendix 4) including the merits of organics processing systems (e.g. composting) and pre-treatment systems (e.g. dehydrator or in-sink disposal). This may provide Council with useful information to use in communication and engagement with MUDs and businesses.

2.3 FOGO generation in Boroondara

Boroondara City Council provides kerbside services for general waste, commingled recycling and has provided a kerbside FOGO service since May 2020 to most households. Council also provides waste and recycling services to some businesses. There are a small number of businesses with a FOGO bin that was a legacy garden waste bin replaced in the residential FOGO roll out. In addition to the kerbside service, Council manages three shared bin corrals, for a subset of businesses in Greythorn, Camberwell and Maling Road precincts; these corrals are currently for commingled recycling and residual waste services only.

Current commercial organics generation

As Council does not collect waste data specific to businesses, Blue Environment has constructed preliminary estimates of organics generation. We have used the number (or equivalent number) of full-time employees (FTE) per business according to 2022 data from the Australian Bureau of Statistics and assumptions of organics waste produced by businesses in Victoria by industry sub-division (Victorian Government, 2016) where available, or the Encycle & SRU (2013) estimates of kilograms generated per FTE per year for industry sub-divisions not described in the first source (Victorian Government, 2016).

The generation estimates per FTE from Sustainability Victoria (2019) have been included for comparison, but not used for the preliminary generation estimates as the categories correspond to specific business types. For this comparison, the SV category 'Metro bakery' corresponds to food retailing and the range of 'Metro café/restaurant' and 'Metro pub' corresponds to food and beverage services. The details of these estimates are described in Table 1 (overleaf).

Boroondara City Council currently provides garbage and recycling services to 3,608 commercial properties, accounting for 55% of commercial sites listed by Council. Seven percent of commercial properties use the existing residential FOGO service for organics delivered by Council. When organised by suburb, the highest number of residential FOGO bins used by businesses are in Hawthorn, followed by Camberwell and Kew.

There are two broad categories for retail trade in the Council classification system for single occupancy sites and multiple occupancy sites. Most retail trade sub-divisions generate similar quantities of organic waste by FTE according to Encycle and Sustainable Resource Use (2013) so these categories have not been divided and will be used in modelling aligned to the ABS defined industry sub-division 'Other store-based retailing'. The number of retail business addresses will be smaller than the number of actual businesses in the of a council classified premises type and ABS defined industry as some premises have multiple businesses with one bin collection site.

Commercial sites that do not have Council waste services include aged care facilities, nursing homes, churches with accommodation, childcare centres and schools. These sites are not rateable as specified under section 154 of the *Local Government Act 1989*, and therefore are not suitable for inclusion in an expansion of the existing residential kerbside FOGO collection services but may benefit from a bespoke commercial service.

Table 1 Preliminary estimates of organic waste produced from selected commercial sectors in Boroondara

Industry	Sub-divisions of interest	FTE in Boroondara	Organics generated (kg/FTE/year)	Organics generated (kg/FTE/year)	Organics generated (kg/FTE/year)	Preliminary estimate of organic waste generated in Boroondara (t/year)
Source:		ABS 2022	Victorian Government 2016	Encycle & SRU 2013	Sustainability Victoria 2019	Using Victorian Government 2016 source ¹ where available or Encycle & SRU 2013
Retail trade	Food retailing	2,645	3,350	870	1,478	8,860
	Motor vehicle and motor vehicle parts retailing	44	NA	670	NA	30
	Fuel retailing	85	NA	670	NA	60
	Other store-based retailing	3,824	NA	670	NA	2,560
Food and beverage services	Food and beverage services	2,273	4,510	1,790	1,851 – 2,220	12,510
	Accommodation	9,594	6,170	1,790	NA	59,190
Office premises ²		3,055	NA	10	NA	30
Education and training		9,653	NA	50	NA	480
Health care and social assistance		11,115	660	130	NA	7,340
Arts and recreation services		1,042	NA	510	NA	530

¹ This source was discounted during the second stage of this project because the estimated quantities were found to be inconsistent with other sources.

² Office premises is a council classification of a commercial site. It includes a range of services not easily mapped to a particular industry. For this information compilation, the number of office premises sites known to Council, ABS data on the financial services industry and FOGO generation rates for financial services has been used as the behaviour of this group is likely similar to most office premises based Council customers.

Current MUDs organics generation

In the initial FOGO rollout in 2020, most MUDs were able to access FOGO collection services. MUDs with individual bins for each unit have access to the FOGO service and as of November 2022, all shared bin MUDs serviced by Council have FOGO services rolled out. There are about three or four sites which have not transitioned due to site space and other issues. MUDs required to have private waste collection services due to a condition of their planning permit do not have access to FOGO unless their private waste company offers this service. There are 368 Council-serviced MUDs with shared bins in Boroondara which account for 4,136 individual residences.

A household kerbside bin audit was conducted in Boroondara (EC Sustainable, 2022) based on housing types categorised as single unit dwellings, MUDs with individual bins and MUDs with shared bins. The audit results indicated that, on average, households in MUDs with shared bins placed approximately 2 kg of organic waste for collection in the organics stream and a further 0.82 kg of material suitable for the FOGO bin in their other bins per week. This is not adjusted for MUDs without FOGO bins but is indicative of all MUDs with shared bins and can be used as a proxy for the FOGO feasibility study modelling.

MUDs with shared bins had the highest proportion of FOGO waste in residual waste bins at 31.8% by weight, while MUDs with individual bins had approximately 25% of FOGO accepted material in their waste bins. MUDs with shared bins had the highest rate of contamination in their organics bins at approximately 16% contamination compared to MUDs with individual bins at 4.5% and single unit at 3.5%. This indicates room to improve organics recovery in MUDs with shared bins via expanding FOGO services to all Council-serviced MUDs.

2.4 Commercial waste charges

The Boroondara City Council Annual Budget 2022-23 outlines waste service fees. For businesses outside the Camberwell Traders, Greythorn Shopping Centre Traders and Maling Road Traders, the fees are the same for businesses and residential. Table 2 outlines the charges for 2021-22 for comparison with collection fees for most current year available, showing the change for modelling purposes in the feasibility report. The charges cover all waste services provided by the Council, noting that businesses and residential properties received different services.

Table 2 Waste charges for businesses (2021-22 and 2022-23)

Type	2021-22 Fee (incl. GST)	2022-23 Fee (incl. GST)	Increase %
Waste collection – property charge: 240 L bin	\$1,160.00	\$1,161.00	0.38
Waste collection – property charge: 120 L bin	\$477.00	\$477.00	0.00
Waste collection – property charge: 80 L bin	\$261.00	\$262.00	0.38

For the key trader areas, a fee to cover all Council waste services is based on bin size, business type and location, with the highest 2022-23 fee for large restaurants in Camberwell at \$1,345 ranging to Greythorn and Maling Road 80 L bins for offices at \$56. These are outlined in Table 3.

Table 3 *Quarterly waste collection fees for precinct traders (2021-22 and 2022-23)*

Type	2021-22 Fee (incl. GST)	2022-23 (incl. GST)	Increase %
Camberwell Traders (Food premises)	\$1,320.00	\$1,345.00	1.89
Camberwell Traders (Retail premises)	\$850.00	\$868.00	2.12
Camberwell Traders (Office premises)	\$518.00	\$529.00	2.12
Greythorn Shopping Centre Traders (Large restaurant >100 seats))	\$1,120.00	\$1,145.00	2.12
Greythorn Shopping Centre Traders (Restaurant or cafe <100 seats))	\$562.00	\$574.00	2.23
Greythorn Shopping Centre Traders office 240 L bin	\$233.50	\$238.50	2.14
Greythorn Shopping Centre Traders office 120 L bin	\$97.00	\$99.00	2.06
Greythorn Shopping Centre Traders office 80 L bin	\$54.50	\$56.00	2.75
Maling Road Traders (Restaurant/café/food)	\$562.00	\$574/00	2.14
Maling Road Traders office or retail 240 L bin	\$233.50	238.50	2.14
Maling Road Traders office or retail 120 L bin	\$97.00	\$99.00	2.06
Maling Road Traders office or retail 80 L bin	\$54.50	\$56.00	2.75

Within these trading areas a relatively small number of businesses access the Council-managed bin corrals for commingled recycling and residual waste services. The businesses are located close to the corrals and have no space for separate bins. The three corrals are serviced by Council on a 'needs basis', which for Camberwell can be up to three times per week. Businesses using the corrals are subject to the fee structure outlined in Table 3. Other businesses in the trading area receive a weekly Council collection for garbage and recycling but all traders are subject to the fee structure in Table 2.

We note the disparity in the current pricing structure and waste service frequency within the commercial sector and between commercial to residential properties and understand that resolving this disparity is a priority for Council.

A key driver for commercial uptake of FOGO service will likely be acceptability of the level of fees charged. The chosen approach will need to reflect a balance between significant diversion of FOGO from landfill and an efficient, cost-effective approach. A detailed cost analysis will be considered in the second stage of the project during the modelling of potential service options.

3. Stakeholder consultation

Blue Environment consulted with a range of stakeholders to assess current services for commercial organics, investigate commercial organic waste generation in the area, gauge appetite for different service provisions, investigate different organics processing options and learn from the experience of other councils that have implemented FOGO and/or commercial waste services for their community.

In consultation with Council, eight groups of stakeholders were identified, and Council approached MUDs and business stakeholders to gauge their interest in participating. Several representatives from MUDs and trader associations agreed to participate in the consultation. A list of the stakeholders contacted is available in Appendix A.

Stakeholders were approached in October and November 2022 including local trader associations at Ashburton Village, Camberwell and Glenferrie, FOGO generating businesses and representatives from MUDs with private waste collection. The commercial FOGO services of the Cities of Melbourne and Merri-bek were also reviewed. No stakeholders were available to discuss mixed development sites, i.e. with a combination of MUDs and businesses.

3.1 Commercial and MUD stakeholders

Boroondara commercial sector

Consultation was undertaken with representatives from Glenferrie, Ashburton and Camberwell Trader Associations to gain an understanding of the appetite for FOGO services from businesses in Boroondara and the obstacles to delivering a FOGO service.

The precincts are quite different with distinct needs and ideas. The Glenferrie Trading Association president felt there would be interest in FOGO services in his precinct based on his experience with the local businesses. The Association president was not aware of any existing FOGO service for businesses from private waste collectors. The key challenge for FOGO services in the area was a lack of bin space, and businesses would need to be provided with containers and compostable bags. The representative indicated that a collection service for FOGO would need to be at least weekly to prevent vermin.

Consultation with the Ashburton Trading Association marketing and executive assistant suggested, although they could not confirm, that it is likely that some businesses in Ashburton have a private organics collection, and there are some community initiatives where food outlets have arrangements with local residents to compost their food waste. The Ashburton Trading Association marketing and executive assistant focussed on how businesses could use a FOGO service as a promotional tool including displays in windows and encouraging the community aspect of good environmental practices. Cafés are the main type of business in the Ashburton precinct and the representative felt they would likely be interested in a FOGO service if they did not have a private service.

In contrast, the Camberwell precinct is spread out and accounts for some 500 food businesses. Waste is serviced via the shared bin corral, Council-serviced individual bins and private waste collections. There is some appetite in the precinct to 'do the right thing' and be more environmentally conscious. The manager of Camberwell Centre Association noted that it is not straightforward to introduce new systems, especially for bins, as many businesses are part of large shopping centre operations with shared bins. As with the Glenferrie precinct, there is limited space for bins, especially for shops with two entrances.

Representatives from all precincts cited challenges with uptake of FOGO, such as vermin, birds and odour, and emphasised the need for education and training for use of the new service including in languages other than English. The Camberwell Traders Association manager indicated that a FOGO service where businesses could nominate if they needed FOGO and select the frequency of bin collection (for both FOGO and residual waste bins) would be beneficial rather than a standard service that might not suit the variety of business types. The representative for Ashburton favoured a simple waste management service like the residential FOGO service to limit confusion for users and limit the frequency of trucks in the area.

Swinburne University was also consulted to gauge interest and uptake of organics recycling. They currently collect food organics with bins around campus, and caddies in offices. The university also has a private green waste collection and a timber collection. They rely on moving waste material offsite due to space constraints but the representative indicated interest in on-site organics waste management approaches provided they could fit in a small area.

MUDs not currently accessing FOGO services

Representatives from four MUDs with private waste collection in the Boroondara Council area were consulted for this project. Each expressed a sense of inequality between residents serviced by Council and those who had to pay for private waste collection. This was exacerbated by not receiving any FOGO services from either their private waste collectors or Boroondara City Council.

The representatives indicated current practice for some MUD residents is to take food scraps to community gardens to compost in shared spaces, give scraps to friends or family with a FOGO service in Boroondara or, doubtless most commonly, dispose of food scraps in the residential waste bin provided. A representative from a newer building reported in-sink food disposal systems installed in the apartments, and another was aware of apartment residents with worm farms on balconies.

Stakeholders indicated that a drop-off point for FOGO in the community serviced by Council would be used by residents in their buildings where they were unable to have bins collected on the kerb due to their location. All stakeholders were very interested in a FOGO service.

There were varying reports of contamination concerns, with some buildings experiencing high rates of contamination in the existing commingled recycling and others reporting very little. Concern about contamination may need to be considered as a factor in the appropriate FOGO service offered at these locations. The key issues for the representatives were:

- equal opportunity for FOGO to all Boroondara residents
- low cost or no change in costs compared to private waste collection services
- educational material including signage for their bin room
- collection access to their bin rooms as they are unable to put their bins for collection on the kerbside.

3.2 Organics processor

Council's current organics processor, Bio Gro, was consulted to explore its capability for processing commercial FOGO, available capacity and other market information.

This processor services nine councils, including seven directly, and while it does not currently take any council-provided commercial FOGO, it processes commercial organics from other sources (e.g.

farms). Bio Gro believes it has both the capability to process commercial FOGO and capacity if it increased shifts at their operation and cited a strong end-market for resulting products.

The key issues noted for commercial FOGO were control of contamination and potential restriction of inputs such as excessive liquids. Bio Gro noted consolidation of FOGO at the Boroondara transfer station allows Council to better understand contamination types and the lower performing geographic areas for the residential FOGO service. This would allow Council to target education for improved outcomes from the existing service by reducing contamination. Bio Gro also expressed a willingness to support Council in educating commercial customers.

Costs for processing of commercial FOGO would be driven by risk, anticipated volume and whether any specific new equipment is required.

3.3 Council benchmarking

This section outlines commercial FOGO collection initiatives of other councils for businesses and MUDs. Merri-bek and Melbourne were forthcoming but Banyule City Council (approached to benchmark use of internal crews) and Ryde City Council (NSW, approached to benchmark use of a long-term service model) did not respond.

Commercial FOGO services

Merri-bek City Council Commercial Plus service

Merri-bek City Council offers two types of service to its non-residential properties. The first is a standard commercial waste service with weekly garbage and recycling bin collection and opt-in FOGO. The service is funded through a waste charge in rates and the charge is set each year based on the size of the bins.

Merri-bek City Council also offers an opt-in FOGO service to businesses, schools, residential properties and organisations, including those that do not pay rates. The bespoke service, called Commercial Plus, allows more bin capacity than the standard service and customers can have as many garbage bins as needed for their property. Users are invoiced twice a year and the cost is \$20.97 per bin per collection for 2022-23. The charge is per litre for a 240L bin with charges calculated for alternative bin sizes.

City of Melbourne CBD precinct commercial waste hub

The City of Melbourne laneway disposal hubs in the central business district (CBD) precinct allow businesses, mainly from the hospitality and retail sectors, to access organic waste recovery services and reduce the quantity of bins on the street and waste collection truck frequency. The Degraes Street Recycling Facility offers on-site organics processing using an ORCA food waste digester which macerates food waste and disposes to the sewerage system. Food waste unsuitable for the ORCA, such as coffee grounds, is collected for off-site processing at the Dynon Road transfer station using GAIA EnviroTech accelerated composting system. This is a dehydrator and composting system that takes most food organics and garden organics. The GAIA was in the CBD however was moved to the transfer station due to odour. Food waste is collected daily from custom-designed recycling hubs in Degraes Place and Centre Place. The final product is used in City of Melbourne parks and gardens as a soil amendment.

The City of Melbourne currently offers commercial organics collections for businesses free of charge but it has indicated that the service will incur a cost in the future. Organics are collected from businesses in plastic bags or via a self-booked system where businesses place organics in a steel bin,

with the contents collected by e-bike. Businesses are not responsible for dropping off organics to locations themselves because the material needs to be sorted for suitability for the different on-site organics processors. Uptake of commercial organics collection varies across eligible areas but is generally high, which is attributable to the convenience, flexibility in options and no cost. Uptake for Caledonian Lane is approximately 80% and for Sniders Lane approximately 50-60%.

Collected organics are hand-sorted in a labour-intensive process. Sorting stations operate from 7 am to 7 pm most days, and 7 am to 9 pm on busier nights. Good sorting is necessary to ensure the processing equipment functions properly. Most sorted food is taken to the Degraeve St Recycling Facility's ORCA system, while garden organics and foods unsuitable for the ORCA are taken to Dynon Road transfer station's GAIA system.

The City of Melbourne additionally offers a rateable individual kerbside collection service for small, non-hospitality businesses that generate minimal waste. Businesses generating significant quantities of waste tend to use the shared waste management services.

MUD FOGO services

Merri-bek City Council offers MUDs with four or more dwellings shared FOGO bins. One 240 L FOGO bin is shared between six units, to a maximum of three FOGO bins in total at a site. For sites with fewer than four dwellings, individual FOGO bins are issued. All MUDs are offered FOGO services, including those with private waste collection arrangements who can still access the Commercial Plus service. Merri-bek residents are also eligible for discounted worm farm and compost system equipment from Compost Community. Like Boroondara City Council, Merri-bek City Council lists Sharewaste as an option for composting opportunities in the local community on the Council website.

In the City of Melbourne, MUDs with two to five storeys have FOGO bins collected weekly with regular waste and recycling services. The City of Melbourne does not offer universal FOGO to high rise residences although there is a service trial for high-rise MUDs greater than five storeys at the time of writing. The trial includes the installation of an organic waste processor in the basement of high-rise buildings with two in place to date and additional buildings to be included in the trial in 2023. The organics processors are dehydrators from Enrich360 and Eco Guardians that reduce FOGO waste by 80% of its original volume. The dehydrated output is collected by City of Melbourne and used as soil amendment product. The systems have some modifications that allow data tracking by apartment using RFID access cards.

4. Assessment of market and models

This section considers the market conditions and FOGO service options for the businesses operating in Boroondara and large-scale MUDs. Four models, including the associated technologies, are analysed to assess the suitability of each model to enable organics recycling. A summary of risk and benefits of options is also provided.

4.1 Market conditions

The Australian Organics Recycling Industry (AORA) provides a national perspective and AORA's Vision 2031 (AORA, 2022) provides a 10-year roadmap for the organics recycling industry.

AORA identified two key feedstock sources for the recycling industry being councils (51.5%) and commercial contracts (47.4%) and two major end use markets of urban amenity (52.5%) and intensive agriculture (26.2%) (AORA, 2022 p.6).

The most significant problems identified by AORA are:

- regulatory policy uncertainty
- contamination of input material
- Government policy (such as waste and recycling strategies)
- business licensing and operating permits
- development applications (time, cost and politicisation)
- Government procurement failing to support organic recycling products
- short council contract periods.

Internal issues such as technology, labour costs, logistics and access to finance were considered more minor obstacles to growth.

In Victoria 60 organics processing providers were identified by AEAS (2020). AEAS modelling estimated 1.5 million tonnes of organics were processed with 0.7 million tonnes additional supply capacity in Victoria. The AEAS modelling indicated a shortfall in Victoria for meeting the 80% recycling rates and above. Since the publication of the AEAS modelling, Repurpose It has begun processing and may provide up to 0.2 million tonnes of additional organics processing capacity per year when running at full capacity (Korycki, 2022).

Locally Boroondara has access to five organics processing providers including Cleanaway's South East Organics facility, Veolia, Sacyr Environment Australia Pty Ltd, Repurpose It and the current Council organics processor Bio Gro. Bio Gro indicated it has capacity consider a commercial FOGO stream from Council.

4.2 Best practice FOGO kerbside service

This organics management option considers expansion of the current best practice FOGO service to commercial properties. The Council best practice FOGO services are weekly FOGO and recycling collections and fortnightly residual waste collections. Consideration needs to be given to service frequency, amenity, space and contamination for commercial properties.

Existing commercial customers receive a weekly waste and recycling service. In this model they would shift to fortnightly residual collection. Fortnightly landfill bin collection may be practical for businesses if the landfill waste decreases sufficiently with separation of FOGO.

In terms of amenity, businesses generating FO may not have GO to layer in the FOGO bin. This may lead to messier, odorous FOGO bins but could be managed with compostable bin liners. Council supplies a free roll of compostable liners with the residential service. If expanding to businesses, a management approach could be to supply compostable liners for a range of bins sizes.

Space is another consideration as businesses may not have sufficient space for a third bin. Smaller bins may be an option, especially if businesses can reduce landfill waste by diverting their FOGO, or businesses could possibly share a FOGO bin. This implies a choice to opt-in is likely to be more suitable for commercial customers.

A further issue is the control of contamination. While weekly FOGO may be a contributing factor to the higher contamination rates, Council would need to understand and apply appropriate controls for commercial FOGO to reduce the likelihood of contamination.

While the standard Council service would not be suitable for ineligible large MUDs or non-rateable properties, the service could be offered to existing commercial customers and those eligible customers not currently using the Council service.

The risks and benefits for this model are summarised in the Table 4 (overleaf).

Table 4 *Risks and benefits of extending best practice FOGO kerbside service management to businesses*

Risks	Benefits
Weekly FOGO collection and fortnightly residual waste may be insufficient for businesses that generate large quantities of food waste or waste that cannot be composted, leading to existing customers seeking another option	Existing best practice FOGO service works well for rest of Boroondara (average quantities of organics recovered are higher than average for councils in Melbourne according to Waste Collection Benchmarking – Boroondara (2022))
FOGO service may be used for food currently collected for home or other composting, thus be higher volume than previously present in the garbage stream (i.e. higher costs without corresponding fall in landfill costs)	The capital and operating costs for Council are more certain based on existing experience running the service
Storage systems for collection may cause odour issues and businesses may have limited storage capacity for bins leading to businesses seeking another option	Potential for reduced landfill disposal costs, depending on the FOGO and garbage service chosen
May increase traffic from collection vehicles and transport of products to point of sale and land application	Aligning residential and commercial services would enable increased efficiency for internal crew
Commercial and shared bin FOGO material collected may be more contaminated than household FOGO due to anonymity and lack of responsibility	Caters to both food organics and garden organics
As the service would not be available to some businesses and MUDs, introducing this option with no alternative may result in dissatisfaction in Council's services	Increased diversion of recoverable material from landfill including FOGO contributing to reduced greenhouse gas emissions
	Aligns with state government policy for increasing FOGO recovery
	Meeting community expectations of responsible environmental management by Council

4.3 Bespoke service

A bespoke commercial service could be tailored to individual businesses and MUDs where the business or MUD chooses the quantity and/or type of bins they require and pay on a per bin basis. As described in section 3.3, Merri-bek City Council offers a bespoke service called Commercial Plus. Our understanding is that this service does not yet have a strong uptake but the approach taken by Merri-bek Council could be used to inform development of a bespoke service for Boroondara.

A bespoke service could be flexible to account for the needs of various business types and unusual location types such as mixed development sites. Variables to consider for this option would be bin size, frequency of collection and location. This service could be offered as a full service or for FOGO only.

This service might be popular with businesses that do not have enough room for the standard service bins. For example, a business generating large amounts of cardboard and smaller amounts of waste and food scraps might exchange their 240 L rubbish bin for an 80 L rubbish bin, 80 L FOGO bin and maintain their 240 L recycling bin.

An advantage with this service, compared to the standard Council kerbside service, is that the commercial service would be available to any site in the Council area. The risks and benefits for this model are summarised in the following table (overleaf).

Table 5 *Risks and benefits of providing a bespoke waste or FOGO only service to businesses*

Risks	Benefits
Maintenance of collection arrangements could be expensive as there is lower financial certainty regarding take-up of the service	Service is available to all businesses and MUDs (space permitting)
Different, potentially complicated, new service for Council to deliver and track	The flexibility can account for the needs of individual and shared bin arrangements
Possibly significant portion of time for Council working out arrangements with users	Provides an opportunity to align charging with cost of service and potentially adjust other existing services
If take up by businesses is spread out this may reduce efficiency for pick-ups	A FOGO only service may provide an attractive option for sites that do not want or need a full bespoke service (for waste and recycle too)
The cost to access the service may be a deterrent and result in lower than optimal uptake	Caters to both food organics and garden organics
Collection arrangements and bin areas could become odorous if not maintained or during periods of hot weather	Increased diversion of recoverable material from landfill including FOGO contributing to reduced greenhouse gas emissions and reduced leachate in landfills
May increase traffic from collection vehicles and transport of products to point of sale and land application	Aligns with state government policy to improve diversion of FOGO material from landfill
	Meeting community expectations of responsible environmental management by Council

Based on our analysis we have excluded a full bespoke service, i.e. one that offers varying bin types, bin sizes and frequency of collection. We have identified several factors that mitigate against investigating a full bespoke service.

First, it would require significant infrastructure (front-lift trucks, various bin types, systems to store bins, new software systems etc.). The two options for provision of this infrastructure would be –

- Manage entirely in-house, which would involve major and risky investment.
- Use a contractor, at least in the early stages of service establishment. It is difficult to envisage how a Council-managed private contract could compete effectively with a directly engaged private contract. It is likely that success in recruiting clients would require loss-making prices.

Second, to be successful, Council's bespoke service would need to attract businesses that have currently not taken up Council's service offering. These businesses would likely have a contract with a private company, which Council would be seeking to displace, most likely at the end of their contracts. In the best-case scenario, uptake would be slow. Council's investment may have a long payback.

Third, Council would be competing head-on with private waste companies, which would not be pleased. They may consider this government-intrusion into the private market and seek ways to challenge its legality or at least its reasonableness. The existing companies have the advantage of incumbency with default to renew. They would gain access to Council's pricing mechanism and seek to undercut it. They may be willing to take short-term financial pain with the aim of 'seeing Council off'.

Based on the reasons above establishing a full bespoke service would be a high-risk activity for Council. If this option is seen favourably by Council, we would suggest that a minimal bespoke service should be established first, focusing on current Council business customers. Successful establishment of a minimal bespoke service would provide a firm basis for assessing a broader full bespoke service, and a lower risk environment for its establishment.

4.4 On-site organics processing

On-site organics recycling solutions are methods of waste treatment that occur at the same location the organic waste is generated. These can range from small scale composting to sophisticated technology for processing large quantities of organic waste such as bio-digesters, to-sewer disposal and dehydrators. This section outlines approaches for commercial properties or large-scale MUDs to manage their food waste or garden waste on-site.

Table 6 outlines on-site organics management systems for businesses generating small amounts of organic waste, for example, 2 kg per day.

Table 6 On-site organics processing options for small amounts of organic waste

Management type	Description	Appropriate for	Time commitment	Outputs
Worm farms	Use of worms to digest and aerobically decompose food scraps producing worm castings.	Offices and shops with or without a yard generating small amounts of food scraps	~1 hour per batch including loading, turning, decanting and unloading	Outputs suitable for on-site gardens or donation to community gardens
Compost , including: • in-vessel compost • tumbler • compost heap	Aerobic decomposition of food scraps and garden waste. Requires combination of green and brown organic material for best results	Businesses that have a yard area generating small amounts of and a combination of food scraps and garden waste	1-2 hours per week	Outputs suitable for on-site gardens

Council has a partnership with Compost Revolution which entitles Boroondara residents to 40% off and free delivery for composting products. Under this program, interested businesses producing small quantities of food waste or garden waste could purchase a compost bin, worm farm or bokashi bin at a discount to manage their own organic waste (noting the bokashi bin may be too small for many businesses). The options listed in Table 6 may be suitable for small offices, shops and florists in Boroondara provided they can access a garden for the outputs.

During stakeholder consultation, some businesses indicated that for small amounts of FOGO, business staff would collect organic waste in a sealed container to take home and put in residential FOGO bins or compost it themselves. While not an on-site solution, this approach may be suitable for smaller quantities of FOGO and could be encouraged by Council.

For businesses producing large quantities of organics, a variety of on-site processing technologies is available. Requirements for space, power, water, ventilation and product collection vary between technologies.

Table 7 describes the different types of on-site organics processing technology available. The information in this table is drawn from consultation with on-site organics technology distributors, the Victorian Organics Recycling Guide (Victorian Government 2016) and NSW EPA fact sheet on food waste management options (NSW EPA 2021). There are several types of products from a range of brands for each type of technology.

Key limitations when considering on-site technology are space and power requirements as well as organic waste types suitable for processing. For example, while some systems can process a wide range of materials, others are limited to certain food types and unable to process common food wastes such as coffee grounds. Some systems can compost food packaging.

There may not be sufficient space, power supply or drainage to install even simple on-site technology options in some bin rooms or in precincts. In addition, some on-site systems may require a trade waste agreement from the relevant water authority (Yarra Valley Water for the Boroondara area) for disposal to sewer and an EPA permission to undertake the activity.

The costs associated with dehydration and in-vessel composting are informed by the Victorian Organics Recycling Guide published in 2016. These are indicative costs as the impact of inflation and electricity cost increases are not reflected. The cost listed for sewer disposal is the current cost of the ORCA range.

Table 7 On-site organics processing technology

Type	Description	Possible use and limitation	Outputs	Mass reduction	Advantages	Disadvantages	Indicative Costs
Dehydration and bio-dehydration	These dry food into a friable 'flake' that in some situations can be applied to on-site or off-site gardens. Bio-dehydration technologies use biological agents to partially decompose and stabilise food. Dehydration units can process 10 kg per day with dimensions: L (1 m) x W (0.75 m) x H (1.2 m) up to 1,000 kg per day with dimensions: L (1.75 m) x W (3 m) x H (2 m)	Suited to daily operations such as hotels, hospitality precincts, hospitals and accommodation facilities for both food and garden organic material	Sterile and pasteurised biomass good for composts, gardens or incinerating to generate energy Condensation Heat	80-90%	Reduce weight and volume of food organics Reduce frequency required for collection Reduce odour potential	Relatively high energy use and carbon footprint if using fossil fuel power Variable efficiency according to type, scale and use of technologies. There is no licensed incinerator in Boroondara	\$15,000-\$220,000 Electricity operating \$4-\$80 per load Labour time of 15-30 minutes per batch
In-vessel composting	In-vessel composting uses an enclosed vessel and electricity or gas to speed up decomposition by controlling and monitoring temperature. Some systems produce compost from food and garden waste to Australian Standard AS-4454, others produce a mixture called 'soil conditioner'. Processing 100–2,400 kg per day the size ranges from: L (5.5 m) x W (1.3 m) x H (1.8 m) up to L (12.8 m) x W (2.1 m) x H (2.3 m)	Moderate to large and regular quantities of food such as major shopping centres and tourist venues for both food and garden waste	Fertiliser or compost product although not necessarily to the Australian Standard	40%	Can be fully automated but requires staff handling for loading and unloading	4-8 hours per day of staff handling Requires large space	\$10,000-\$380,000
To-sewer disposal	These units macerate and liquify food before discharging it to sewer. Some units biologically treat the liquified food and larger commercial units must discharge to an interceptor to remove solids, fats and oils before discharging to sewer.	Variable model sizes, suitable for individual businesses generating food waste with some exceptions including coffee grounds. Also used at City of Melbourne's Degraes Street Recycling Hub.	None, all outputs are to sewerage system	99%	Reduce need for collection and transport Anaerobic digestion recovers biogas energy at Melbourne Water's Eastern Treatment Plant (Melbourne Water 2022)	Not all liquified food would be recovered for biogas energy recovery Least preferred in food waste hierarchy (National Food Waste Strategy 2017)	\$60,000–\$120,000

The use of on-site technology could be in a precinct (see Section 4.5) or by larger businesses. For example, accelerated in-vessel composting may be suitable for a large shopping centre; while dehydration units may be appropriate for hospital and accommodation facilities. On-site organics processing technology may be particularly appropriate where waste collection costs are high and organic loads are high. While Council would not provide the processing service to individual private businesses, it could provide guidance, direction and encouragement or possibly grants to incentivise diversion of FOGO from landfill.

The table below describes the risks and benefits of on-site processing.

Table 8 *Risks and benefits of on-site organics processing by businesses*

Risks	Benefits
Upfront costs for on-site technology may be prohibitive for business and large MUD uptake	May provide an alternative to FOGO collection services for some businesses
As limited stakeholder testing has been possible, it is unclear whether there is an appetite for businesses to consider on-site technology	On-site treatment reduces collection truck movements improving amenity
The use of on-site technology in MUDs is limited, making it more challenging for Council to demonstrate the value	Producing compost that can be used as soil improver is good for the environment
It is less certain whether investment of time and effort by Council will result in the desired FOGO reduction outcomes	Diversion of recoverable material from landfill including FOGO contributing to reduced greenhouse gas emissions and reduced leachate in landfills
On-site processing in inappropriate locations may increase detrimental local amenity impacts	Aligns with State and national government policy for increasing FOGO recovery
Dehydration units, in-vessel composting, etc. require varying levels of training to operate the unit. This may result in management issues for businesses or large MUDs which could cause local impacts.	Meeting community expectations of responsible environmental management facilitated by Council
Relies on businesses to implement systems therefore Council has less influence on appropriate use	
If this model was pursued without other services, it would be unlikely that Council could achieve large scale organics reduction across the customer base	

4.5 Precinct-based shared FOGO service

This option considers ways to build upon Boroondara's commercial bin corrals in the shopping precincts of Camberwell, Maling Road and Greythorn. Blue Environment considered multiple approaches for this service including addition of FOGO bins to the cages, use of on-site processing (e.g. biodigesters) at the existing precinct corrals and an alternative location for precinct processing at the Riversdale transfer station.

Precinct based shared solutions can provide businesses a way to better manage waste if they are constrained for space at their property. However, in a highly developed urban setting, there are a number of aspects requiring careful consideration such as space, amenity, approvals and cost to install and operate equipment.

Add FOGO bins to corrals

Adding FOGO bins to the existing corrals may require expansion of the cages which would use car parking space. Removing parking may be problematic for a busy urban shopping setting, especially at the smaller precincts. Our understanding is that Greythorn has space for a FOGO bin in the cage and Maling Road may have space, but the Maling Road site will in the future lose land to a train line development. Camberwell does not have space in the current cages so carparking would need to be sacrificed, although the Camberwell Centre Association manager suggested this may be an acceptable exchange for improved waste services.

Adding FOGO bins would also likely increase site maintenance requirements due to potential odour and vermin. Additionally, based on advice from Council about existing usage, the sites may require changes to current access, such as addition of a swipe system or another means to enable equitable use of the service.

This option would only be suitable for businesses eligible to use the corrals which represents a small proportion of businesses in each precinct. Council was not able to provide exact data but estimated a low proportion of total precinct businesses access the Camberwell and Maling Road corrals, while about 50% of precinct businesses access the Greythorn corral.

Precinct on-site treatment (including biodigester)

Alternatively, on-site technology could be installed alongside the existing corrals. This approach would require more space in the carpark. If similar technology to City of Melbourne Council was implemented, Boroondara City Council would need to manage the collection of organics, sorting and operation of the system which would require additional staff. The City of Melbourne precinct system also requires two sites, one for a macerating system which disposes to the sewer and another for treatment of organics unsuitable for the macerator in a biodigestion system. It is also noteworthy that City of Melbourne does not yet charge a fee for their Degrares precinct service.

A biodigester, whether home-scale or a business version, relies on anaerobic digestion technology, with key input and output considerations. The inputs rely on the right mix of bacteria and maintenance of favourable conditions (e.g. pH, temperature, moisture, etc.) so needs ongoing management and is highly sensitive to contamination. The digestate, a low nutrient biomass, can be used for soil amendments, stockfeed, etc. provided additional nutrients, processing and the like occurs, otherwise this would need to be disposed to landfill.

Given the highly developed nature of Boroondara, alternative precinct sites are unlikely to exist, but the Riversdale Road transfer station was considered for completeness. The depot is used for consolidation of waste collections and allows landfill and recyclables drop off. This site was discounted as a feasible approach due to several reasons including:

- advice from Council that the site space is limited and, will in the future, need to accommodate the operations from the Kew depot
- the anticipated cost of establishing and operating a service of sufficient size to process organics is expected to be prohibitive
- the type of operation is likely to be highly contentious with the surrounding community due to amenity and increased vehicle movement concerns
- the uncertainty regarding success of necessary EPA approvals, noting the point above
- the distance from businesses would mean Council collection is still likely required and this would be in addition to the capital and operating costs for the system.

A further consideration is the production of methane, which is explosive if not managed properly, and would require collection and management. We have not identified any demand for methane in Boroondara which is another reason this technology has been discounted as a feasible approach.

The table below describes the risks and benefits of precinct-based approaches. Where the risk or benefit is specific to either FOGO in corrals or a technology option this is stated.

Table 9 *Risks and benefits of precinct-based shared FOGO*

Risks	Benefits
For a biodigester the infrastructure and processing costs required for Council to manage are high and funds may not be available	Precinct sites could be tailored to the needs of the users with the appropriate size and number of FOGO bins and collection frequency
For a biodigester the additional cost for Council to establish and potentially operate the service, including collection of organics from businesses and sorting (if using on-site technology) may not be able to be recovered with fees for use	Centralised locations for FOGO drop-offs would allow committed recyclers to take personal responsibility for FOGO recycling
The more complex pricing mechanism may be challenging for Council to manage	For addition of FOGO bins - the use of corrals is familiar for the businesses which may assist separation of FOGO into the correct bin
For a biodigester the management requirements for Council would be considerable and the technology is highly sensitive to contamination	Diversion of recoverable material from landfill including FOGO contributing to reduced greenhouse gas emissions and reduced leachate in landfills
For a biodigester there is a risk of explosion if methane is not properly managed	Aligns with State and national government policy for increasing FOGO recovery
The site would be potentially odorous if not managed properly; this risk would be higher at the busier sites	Meeting trading precinct expectations of responsible environmental management facilitated by Council
If using a shared FOGO bin system, there is potential for less overall organics recovery and increased risk of contamination due to reliance on personal accountability of business staff to separate organics and dispose correctly	
Removal of parking from busy urban shopping areas may result in community dissatisfaction	
The service would only be available to businesses in the precinct so is unlikely to achieve a large reduction of organics to landfill without additional services outside the precinct	
There is uncertainty if any necessary approvals would be granted given the highly developed environment	

5. Key findings and conclusions

Council has an opportunity to develop an innovative service to meet the waste needs of Boroondara businesses, offer a FOGO service to residents with unusual waste collection requirements, and consider the service costs to users and Council. A commercial FOGO service and FOGO services for large MUDs aligns with the State and national government policy to increase diversion of FOGO and offer a FOGO service to all households by 2030.

Boroondara has a range of business types considered likely to generate significant quantities of organic waste. The stakeholders consulted showed interest in using a FOGO service but, due to the low number of businesses that participated in the consultation process, we are unable to provide a clear indication of the likely participation rate in a commercial service.

Based on the issues identified, including lack of availability of land, amenity issues and cost, the Council-managed precinct-based technology service is not recommended for further consideration. However, Council could provide guidance, direction and encouragement or possibly grants to incentivise larger businesses with suitable feedstock to invest in and operate their own on-site organics processing and divert FOGO from landfill.

Smaller on-site organics processing systems may provide a viable option for some businesses or large MUDs. As only limited stakeholder consultation has been possible during this project, Blue Environment is not able to gauge interest for on-site technology in the business community. We did find interest from some large MUDs excluded from Council services, but it seems unlikely they will want to pay for capital and operating costs in addition to their existing private waste collection services. We recommend Council monitors the outcomes of the City of Melbourne service trial to inform future on-site services for large MUDs.

Another option for Council to consider outside of the FOGO services in this study might be to establish community drop-off points for small amounts of FOGO at appropriate hubs such as parks, libraries and community centres. This might not be a charged service but could be an alternative for residents of MUDs unable to access the residential FOGO service, provided Council can apply appropriate controls to reduce the likelihood of contamination.

Based on our research and consultation of the four different Council-facilitated services, two are recommended for detailed modelling and one for further analysis in the second stage of this project:

- the extension of the best practice FOGO kerbside service to businesses
- introduction of a minimal bespoke waste service
- further analysis of including FOGO bins in the existing precinct corrals.

The final service delivered by Council may involve a combination of these models and will require a robust and comprehensive education campaign.

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Appendix A Stakeholder consultation record

Appendix A Stakeholder consultation record

Appendix table 1 Stakeholders consulted

Name	Organisation	Relevance	Date and time
Dennis Armstrong	Resident – 17 Lynch Street Hawthorn	Multi-unit development with private waste collection	31 October 2022
Julie Mehegan	Chairperson of Owner's Corporation – 85-101 Maling Road Canterbury	Multi-unit development with private waste collection	2 November 2022
Mafalda Lou	Chair of Body Corporate 64-66 Riversdale Road Hawthorn	Multi-unit development with private waste collection	4 November 2022
Sam (surname not provided)	Glenferrie Traders Association President and local business (restaurant) owner	Commercial services	7 November 2022
Catherine Flynn	Representative – 22 Wattle Road Hawthorn	Multi-unit development with private waste collection	9 November 2022
Alex Hume	Marketing and Executive Assistant, Ashburton Traders Association	Waste trader association relevant to commercial FOGO needs	11 November 2022
Kerry Daly	Manager Camberwell Centre Association	Waste trader association relevant to commercial FOGO needs	15 November 2022
Zander (surname not provided)	Rex's Café	Business with private waste collection	15 November 2022
Georgia (surname not provided)	My Other Brother	Business	15 November 2022
Sally (surname not provided)	City of Melbourne	Benchmarking council	4 October 2022
Joanne Sullivan	City of Merri-bek	Benchmarking council	28 September 2022
Sage Hahn	Operations Manager, Bio Gro	Organics processing service	22 November 2022
Deborah Saltmarsh	Swinburne University	University with private waste collection	22 December 2022

Appendix table 2 *Planned stakeholder program and status*

Stakeholder group	Stakeholders to be approached	Status
City of Boroondara	Waste operations team	Contact via project manager to date
Major commercial food organics and/or garden organics waste generators at key shopping centres/districts	Three per key shopping centre/district (to be nominated in consultation with Council)	Three contacts provided and consulted from Trader Associations of Glenferrie, Ashburton and Camberwell One restaurant (run by the president of the Glenferrie trader association) and two cafes consulted (suggested by the manager Camberwell Centre Association)
Major non-shopping commercial food organics and/or garden organics waste generators	Three (to be nominated in consultation with Council)	Swinburne University was consulted
Body corporates (or other most relevant contact) of MUDs	Ten (to be nominated in consultation with Council)	Four contacts were consulted of the four that were provided by Council
Private waste collection companies	Solo (Council's new recycling contractor)	In consultation with Council determined not required to contact
Organics processors	South East Organics Facility	Council advised not to contact
	Bio Gro (Council's current organics contractor)	Consulted
On-site organics processing technology providers	Closed Loop (composting)	A desktop review and consultation with Dunbrae Environmental and Eco Guardians
	Eco Guardians (dehydration)	
	Potentially others following research	
Other Councils	Melbourne	Consulted
	Merri-bek	Consulted and desktop review
	Banyule	Did not respond
	Ryde	Did not respond