

The Viability of Community Composting at the Melbourne Food Hub

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ISP Ethics Review

(Note: Each AD must complete, sign, and submit this form for every student's ISP.)

The ISP paper by Bailey McNeill (student) does conform to the Human Subjects Review approval from the Local Review Board, the ethical standards of the local community, and the ethical and academic standards outlined in the SIT student and faculty handbooks.

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Abstract

My research assessed the viability of a community compost site at the Melbourne Food Hub modeled after other successful compost hubs and based on local demand. I surveyed 72 people at the Alphington Farmer's Market, located at the Food Hub site, and 31 people answered the survey online for a total of 103 responses. In addition, I interviewed ten people working with existing community compost hubs around Melbourne to find out what compost systems they use, how community members engage with the site, what their biggest problems have been, and their motivations for composting.

My survey found that the majority of the Hub's potential users—67%—already recycle their food scraps in some way. Despite this, there is still significant interest in a swap and go system for food scrap drop-offs at the Hub, with 67% of respondents indicating they are interested or very interested in such a system. Only 3% of respondents do not compost at home and are not interested in the system. Moreover, 66% of respondents indicated they would or would maybe be interested in attending compost workshops held at the Hub. Overall, this data suggests that learning about and practicing composting is important to survey respondents, and there is high demand for a compost hub.

Interviewees working with existing compost hubs, including community gardens and community compost organizations, use a variety of methods to compost such as bay systems, worm farms, and compost bins. Compost is important to these organizations because it is a natural alternative to chemical fertilizers, it improves soil health, and diverts food waste from landfill. These compost hubs vary in their accessibility to the local community, and have attempted to educate the community through distribution of written information, personal interaction, physical signage, stickers on collection bins, and compost workshops.

Based on my survey and interview results, I recommend that the Melbourne Food Hub implements data collection and evaluation for the site early on, uses a bay system in combination with worm farming, funds someone for 4-5 hours per week to help manage the site, and creates a strong, diverse community around the Food Hub to maintain volunteers.

Keywords

Compost: Fully decomposed organic material that acts as a beneficial soil amendment for growing plants, usually in place of chemical fertilizers.

Community compost site/hub: A central location where local community members can drop off their organic waste to be composted onsite.

Swap and go: A system for community compost wherein community members fill up a bin with food scraps, bring it to the hub, and swap their bin for a clean bin to take back home and fill up again.

Food hub: “A business or organization that actively manages the aggregation, distribution, and marketing of source-identified food products primarily from local and regional producers to strengthen their ability to satisfy wholesale, retail, and institutional demand” (Wallace Center, 2018). When I capitalize Food Hub, I am specifically referring to the Melbourne Food Hub.

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1. Introduction

1.1. What is compost?

The use of compost as a soil amendment to facilitate the growth of plants dates back to ancient times, far preceding the advent of chemical fertilizers in the 19th century (Albala, 2015). Home gardeners and organic farmers are the most common users of compost today, and the dark, nutritious mixture is made by “arranging and manipulating organic wastes so that they are gradually broken down, or decomposed, by soil microorganisms and animals” (Blashfield, 2014). The end product of this process, otherwise known as composting, is a porous material full of beneficial thriving bacteria (Albala, 2015). There are several different methods of composting, including, but not limited to, hot composting, vermiculture (worm farming), and in-vessel composting, which can involve putting organic materials into a drum to be mechanically turned (United States Environmental Protection Agency, 2018).

Generally, compost is made by combining brown, or carbon rich materials, in a 2:1 ratio with green, or nitrogen rich materials (Albala, 2015). Green materials can include food scraps from produce, dead plant material, coffee grounds, tea bags, egg shells, lawn cuttings, and sawdust, and carbon materials can include straw, sawdust, woodchips, or dead leaves (Albala, 2015). Industrial facilities can usually handle additional organic materials like meat, bones, and paper products, but these are not commonly included in smaller composts, as they take longer to break down, can introduce chemical inputs into the soil, and attract vermin and pests (United States Environmental Protection Agency, 2018).

1.2. Why compost?

1.2.1. Methane emissions

Organic waste that is sent to landfills decomposes anaerobically—without oxygen—and releases methane, a greenhouse gas that is at least 25 times more potent than carbon dioxide (Intergovernmental Panel on Climate Change, 2007, p. 996). Emissions from waste in landfills account for 3% of all of Australia’s emissions, which is about as much as the country’s entire aviation industry (The Compost Revolution, 2018). In Victoria alone, an estimated 250,000 tons of avoidable food waste is sent to landfill each year from households, with the potential to generate up to 400,000 tons of carbon dioxide equivalent per year (Sustainability Victoria, 2014).

However, the bright side is that it is estimated that if just 1% of Australian households were to compost their food waste instead of sending it to landfills, it would prevent the

equivalent of 45 thousand tonnes of carbon dioxide emissions (Boylan, 2017). In fact, it is estimated that the organics recycling industry across Australia diverted and recycled at least 3.7 million tonnes of organic material from 2007-08, which prevented the equivalent of 4.28 million tons of carbon dioxide emissions (Biala, 2011, p.38). This statistic does not include more grassroots composting efforts, such as backyard composts or community composting hubs. Considering that Victoria's Climate Change Act 2017 has a target of net zero greenhouse gas emissions by 2050 (Metropolitan Waste and Resource Recovery Group, 2018, p.4), it is paramount that residents and councils in Metropolitan Melbourne work to reduce greenhouse gas emissions from organic waste.

If compost is not properly aerated, compost piles can still emit methane. The key to avoiding methane emissions is ensuring that decomposing organic waste gets enough oxygen to break down aerobically (Albala, 2015). In addition to cutting down on methane emissions, proper composting also "returns organic carbon to the soil where it can be stored," which "is vital for combating the challenges of climate change" (Aora, 2015). Because of these benefits and more, composting organic materials thus has the potential to play a large role in climate change policy (Biala, 2011). The most recent Intergovernmental Panel on Climate Change found that we have just twelve years to keep global warming under 1.5 degrees Celsius, and that "every extra bit of warming matters," so the proper recycling of organic waste materials through composting is critical for a sustainable future (Intergovernmental Panel on Climate Change, 2018, para.8).

1.2.2 Soil quality

Compost enriches soil with a range of organic nutrients that promote healthy plant growth (Aora, 2018). Victorian soil, just as most Australian soil, is generally low in organic carbon (Aora, 2018). In Victoria, soil carbon levels fell by 50% after 20 years of continuous annual cropping (Biala, 2011, p.9), but using compost can increase the carbon content and thus fertility of the soil (Aora, 2018). Moreover, the material insulates the soil against fluctuating temperatures, so plants are more resilient in changing climate conditions (Aora, 2018). When compost is added to soil, the soil also has an improved water holding capacity and better holds moisture (Blashfield, 2014). This promotes less water runoff, which is particularly dangerous for wetlands, lakes, stream, and coastal zones, as storm water picks up particulates and pollutants as it travels over ground. The risk to aquatic ecosystems is increased if water runoff contains unabsorbed phosphorous and nitrogen from conventional fertilizers, which can cause algal blooms and ocean dead zones (Sharma & Chetani, 2017).

1.2.3 Natural alternative to fertilizers

Compost as a soil amendment can supply “most, if not all, of [a] crop’s phosphorous, potassium and trace element requirements,” and some mineral nitrogen that would otherwise be supplied by chemical fertilizers (Biala, 2011, p.35). Chemical fertilizers are made using petrochemicals and natural gas, which contribute to global warming; moreover, these chemicals actually degrade soil quality over time instead of improving it (Sharma & Chetani, 2017). Fertilizers are often over-applied, and the reckless use of chemical fertilizers can create a nutrient imbalance in the soil that limits plants’ uptake of other essential nutrients (Sharma & Chetani, 2017). Moreover, conventional fertilizers are known human carcinogens, meaning they have been proven to cause cancer (Sharma & Chetani, 2017).

In addition to supplying necessary nutrients for plants, the heat generated from the pasteurization process of composting helps keep plants pest, weed, and disease free (Aora, 2018), further reducing the need for chemical inputs. Soil amendments made of compost have been found to increase the quality and yield of crops in similar ways to conventional fertilizers (Sharma & Chetani, 2017). By “meeting the plants’ nutritional needs and enhancing plant tolerance,” organic fertilizers “remove a serious source of stress” (Sharma & Chetani, 2017, p. 2).

1.2.4 Dwindling landfill space

Dwindling landfill space poses a large problem in the face of growing global population, as space on the planet will become increasingly more critical to maintain life. If business continues as usual, academics estimate that solid waste generation rates will more than triple by 2100 to exceed 11 million tons per day (Hoornweg, Bhada-Tata, & Kennedy, 2013). Specific to Melbourne, Sustainability Victoria’s 2012-13 audit of household garbage bins found that half of all household garbage was comprised of food and garden waste, with food waste alone accounting for a third of the garbage stream by weight (2014, p.10). If 50 percent of this food waste was recovered, organic waste sent to landfill would fall by 20 percent by weight (Metropolitan Waste and Resource Recovery Group, 2018, p.8). Organic waste can be recycled and reused by composting, and it is thus unnecessary to send it to landfills where space is becoming precious.

1.2.5 Closing the loop

Composting food scraps and dead plant material replenishes the soil so that new food can grow. The scraps and byproducts of this new food can eventually be used to generate new compost, and so the cycle continues. Composting motivates efficient resource use by getting

the most out of organic materials instead of discarding them to rot in landfills. By composting, people may be more motivated to reduce their food waste when they see it separated out from the rest of their waste, as was evident in the first episode of ABC's documentary television series, *War on Waste*, when average families banded together in a Sydney neighborhood to commit to reducing their waste (Boylan, 2017).

1.3 Composting in and around Melbourne

1.3.1 Policy in metropolitan Melbourne

Food and garden organics collection services vary by local city councils in metropolitan Melbourne. The City of Melbourne itself does not provide organic waste collection services for food scraps (The City of Melbourne, 2018). Households or businesses can arrange a free garden waste pickup through the council, but the council will not accept food scraps in these green bins; it is restricted to plant materials (The City of Melbourne, 2018).

Just outside of the CBD, many smaller city councils are experimenting with food and garden organics collection services (FOGO). The Metropolitan Waste and Resource Recovery Group has found that FOGO services are the “most cost-effective option for councils and residents to deal with organic waste,” (Metropolitan Waste and Resource Recovery Group, 2018, p. 3). In 2018, five councils in metropolitan Melbourne operated a FOGO service, and Yarra City Council and Darebin City Councils are currently trialing a FOGO service (Metropolitan Waste and Resource Recovery Group, 2018, p.8).

Some councils, although they do not offer FOGO collections, are sponsoring community compost hubs where locals can drop off food scraps. Examples include the Kensington Town Hall Compost Hub, with support from the City of Melbourne; Rushall Community Garden in North Fitzroy, with support from Yarra City Council; and the compost hub at the Carlton Neighbourhood Centre, with support from Yarra City Council. Other community organizations, primarily community gardens, have set up compost hubs even without council support. These organizations include but are in no means limited to:

- SEEDS Communal Garden (Brunswick), adjacent to and funded by Milparinka, a disability day center
- West Brunswick Community Garden, adjacent to Moreland Childcare Centre
- SPAN Community Garden (Thorbury), adjacent to and funded by SPAN House, a community center in Thornbury

- Kensington Compost, a volunteer organization operating compost bins and worm farms in the suburb of Kensington

I interviewed representatives from these 7 compost hubs, as discussed later in Interview Results and Discussion. However, there are little to no options for residents of the Alphington suburb located 7km north-east of the Melbourne CBD to compost their food scraps if they do not have their own composting system in their home or yard. Though 58.1% of the occupied private dwellings in Alphington are separate houses, 20.6% are flats or apartments, with an additional 20.5% being semi-detached row or terrace houses, townhouses, or the likes (Australian Bureau of Statistics, 2016). New apartment complexes are frequently springing up in the suburb, and apartments and terrace houses can restrict people from composting at home if they do not have a backyard or balcony. This likely means that many Alphington residents put their food scraps in the bin to go to landfill.

Alphington is under both Darebin City Council and Yarra City Council's jurisdiction. I am particularly interested in the area of Alphington under Darebin's jurisdiction, as this is where the Melbourne Food Hub, discussed in the next section 1.3.2, is located. Darebin is one of the councils currently trialing a FOGO service. Darebin City Council's Waste and Litter Strategy report for 2015-2025 has a target to "Reduce food in landfilled kerbside waste 38% by weight (or 69 kg/capita/year)" and "commits to...active promotion of avoidable food waste reduction including developing education strategies and projects [and] tackling issues around food waste through investigation of potential alternative food waste recycling options" (Darebin City Council, 2015, p.i-ii). Though Darebin is trialing FOGO in one small area of the municipality, it is not in Alphington, and there is currently not a large-scale solution for local residents and businesses to recycle their food scraps. Knowing the importance of composting for reducing methane emissions, preserving and improving soil quality, providing an alternative to harmful chemical fertilizers, saving landfill space, and closing the loop for food waste, it is critical that Alphington does not just wait for a solution from council, and instead steps up in a community effort to support organic waste recycling as integral facet of a sustainable food system. This where the newly launched Melbourne Food Hub, established at the Melbourne Innovation Centre in Alphington, comes in.

1.3.2 The Melbourne Food Hub

According to the National Food Hub Coalition in the United States, a regional Food Hub is "a business or organization that actively manages the aggregation, distribution, and marketing of source-identified food products primarily from local and regional producers to

strengthen their ability to satisfy wholesale, retail, and institutional demand” (Wallace Center, 2018). Food Hubs aim to increase transparency at all levels of the food chain, and promote small to mid-sized producers and makers (New Food Economy, 2016). Within this definition of a food hub, there is room for a lot of variety, but the elements of “source-identified food” and “local and regional producers” remain central (New Food Economy, 2016). For example, the Alphington Farmer’s Market, held every Sunday at the Melbourne Innovation Centre on Wingrove Street, could already be considered a food hub, as it is a center that distributes local food with connections directly back to the farm (New Food Economy, 2016). However, this market is only “the first seed in an extensive roll out plan in the coming months” for the newly launched Melbourne Food Hub (Melbourne Farmers Markets, n.d., para 4).

The Melbourne Food Hub is a joint venture between Sustain Australia and the Melbourne Farmers Markets. Its stated goal is “to co-create a resilient and thriving food system that benefits us all” (Melbourne Farmers Markets, n.d.). The team plans to create this food system by pioneering projects like a commercial community kitchen for food start-ups, a farmer’s depot for storage, a workshop and events space, co-working offices, an urban agriculture project, and community composting facilities (Melbourne Farmers Markets, n.d.).

1.3.3 Study focus and rationale

I chose to partner with the Melbourne Food Hub and Reground, a local business that diverts coffee waste from landfill to community garden, to assess the viability of a community composting site at the Food Hub. Bank of Australia recently granted Reground funding to establish a community compost hub, and they chose the Food Hub site as the location.

For my project, I designed a survey for people who attend the Alphington Farmer’s Market, and developed interview questions to ask people already working with existing compost hubs around Melbourne. My surveys illustrate the local community’s demand for the composting site and workshops at the Food Hub, while my interviews with existing compost hubs provide the Food Hub and Reground with data on what has and has not worked for groups who are already working on similar projects around Melbourne.

1.3.4 Link to sustainability

The Melbourne Food Hub’s goal of creating a “resilient” food system inherently implies an emphasis on sustainability, which is the concept of living within the means of available resources so that social, economic, and environmental systems can “thrive in

perpetuity” (University of Alberta Students’ Union, n.d.). The Hub will focus on the social, economic, and environmental facets of food production, distribution, consumption, and disposal to create a sustainable food system. Specifically, the composting site is important to sustainability as it will recycle valuable resources from organic waste into rich compost that can be used to grow more food, thus closing the loop for organic waste instead of letting those resources escape to landfill, where they will pose environmental harm.

2. Survey Methodology

2.1 Ethical considerations

Before embarking on my research period, I received ethics approval from the Local Review Board (LRB) to survey marketgoers at the Alphington Farmer's Market on Sundays. Nick Rose, the executive director of Sustain, created a branded cover letter for my survey (Appendix A) with information about the Food Hub and survey, and in it included my original ethics disclaimer for participation. I made sure that all research participants were fully aware that their participation was optional and they could choose to end the survey at any time.

2.2 Survey design

After speaking with the Food Hub team and Reground, I designed a survey with their input to administer to attendees of the Alphington Farmer's Market on Sundays. I chose to survey marketgoers as opposed to the wider Alphington community because these people already interact with the Food Hub site and will likely be the first to participate in the community drop off system, as the Hub may trial letting people drop off food scraps on market days once the system is up. We wanted to know if marketgoers were already composting at home, their knowledge of composting, and how much demand there was for the proposed swap and go system for food scrap drop-offs and composting workshops. The goal of the survey was to paint a picture of how likely it would be that people in the local area would use this system, if they would consider volunteering to man the system, and if they would consider purchasing compost from the Hub. After I sent my draft of my preliminary survey with 8 questions to the Food Hub team and Reground, they suggested that I include questions ascertaining people's current knowledge levels about composting, their interest in workshops about composting, and what topics these workshops should cover. Nick kindly added three questions (numbers 3, 6, and 7) about these topics and added a branded Melbourne Food Hub cover letter to the survey.

I also bought three plastic lidded buckets sized 5 Litres, 10 Litres, and 20 Litres for survey respondents to see for reference to answer question 5. I taped the Melbourne Food Hub logo to the front and top of these buckets and labelled them with their sizes to increase visibility and legitimacy of my survey. During surveys, when respondents got to Q5 about how much kitchen waste they might generate per week, I pointed to these buckets for reference.

2.3 Survey administration

I administered my survey (Appendix A) at the Alphington Farmer's Market three times on Sunday November 11, Sunday November 18, and Sunday December 2. Across all three Sundays, I got 71 responses in total. I stood at different locations within the market on each day I surveyed. I offered respondents the option to either write their answers on a hardcopy of the survey, or have me write down their responses as I asked them the questions straight from the paper. I found on the first Sunday that when respondents chose to verbalize their answers and I wrote them down, they were more likely to make valuable comments when talking that I made note of. This also ensured respondents did not skip any questions because of flipping the wrong pages, which I suspect happened with a few surveys on this first Sunday. So for the next two Sundays, I started my interactions with offering to write down answers as respondents verbalized, so the vast majority of respondents spoke while I selected their answers and wrote down comments.

Additionally, Nick input the same survey into SurveyMonkey, and the Melbourne Food Hub, Reground, and Alphington Farmer's Market shared the link on their Facebooks. The online survey got 31 responses, which I included in my analysis. In my analysis, I did not separate out online responses from in-person; I considered the 103 responses as a whole.

2.4 Survey bias and shortcomings

Overall, my sample was likely biased towards people who are already interested in composting, as these people were more likely to approach me because of the branded buckets or after overhearing me talking about the survey to other respondents. Thus, the number of people who are "interested" or "very interested" in the swap and go system, composting workshops, and purchasing compost is likely disproportionate to the amount of people who actually attend the Alphington Market, so it was not an entirely random sample of marketgoers. This survey is also not relevant to the entire Alphington community due to my limited sample; moreover, people who attend Farmer's Markets may be more likely to care about composting than the general public. Additionally, it is likely that the online respondents were more likely to already be interested in compost if they chose to take the survey as compared to the actual followings of the Food Hub, Reground, and Farmer's Market pages, so it was not a random sample of their online audiences. However, these respondents are indeed the most likely to use the drop off system and attend the workshops, so it was still valuable to get an idea of numbers and get participants' contact information if they provided it.

2.5 Survey analysis

I input my survey results from my three market days along with the online respondents' data into Excel to analyze the data. I identified key themes and important information, and created bar graphs to visually depict the data. I chose not to analyze and discuss Q1 about how often respondents come to the Alphington market, and Q5 about how much kitchen waste per week a respondent's household might generate, as I didn't find these questions and results directly relevant in providing immediate suggestions to the Food Hub and Reground for how they should set up the site.

3. Interview Methodology

3.1 Ethical considerations

I also got approval from the LRB to interview community compost volunteers and managers, and I wrote and printed a consent form (see Appendix C) for interviewees to read and sign before I began asking my questions. The form introduces my project, provides information about the research, and lays out any potential risks and benefits. The form also details the option for interviewees to remain anonymous and to end their interview at any time. All interviewees except two signed this form, giving their written consent. Two interviewees gave me their verbal consent before I began the interview; for the volunteer at Carlton, I did not have another form, and for Dave, we spoke over the phone. I summarized the information on the written consent form and asked for verbal consent, which they granted. For all volunteers, I asked how they would like to be referred to in the report, and followed their wishes.

3.2 Interview design and preparation

In addition to my surveys, I interviewed people around Melbourne who are working, either paid or unpaid, with organizations that are already acting as community compost hubs where locals can drop off their food scraps to be composted. I found these organizations through online searches and word of mouth. These composting organizations fell into two groups: community gardens and organizations that exist specifically for community composting. The majority of my interviewees came from community gardens. I interviewed three community garden managers/facilitators, one staff member at the community center adjacent to a community garden, and four community garden volunteers with varying responsibilities pertaining to the compost. I also interviewed one volunteer representative from the Kensington Town Hall Compost Hub, and one of the community garden members I interviewed, Michelle Twyford, also spoke to her experience with Kensington Compost. As a note, the two Kensington organizations are both explicitly focused on composting, but are separate. In total, I interviewed ten people.

I wrote an interview guide with specific questions for garden managers or the head of the compost hub (see Appendix D) and a separate guide for compost volunteers (see Appendix E) to follow during my interviews. For people in leadership positions associated with the compost, I wanted to find out what compost system they use, how the community drop offs work, what their biggest problems have been and any solutions they have trialed, what their role entailed (including if they were paid or unpaid), and any community education tactics

they were using. For volunteers, I wanted to find out what motivated them to work with the compost, what they valued about the community/project, and why they thought compost was important. I chose to interview these two groups of people, as they are most relevant for the set-up that the compost site at the Food Hub will likely have: a person/people in more of a leadership position(s), and volunteers. Although I wrote out specific questions, I found that my interviews flowed better when the conversations were more informal. I made sure to gather all the information I needed, but I did not strictly stick to my pre-determined questions.

3.3 Interviews

- 11/8/18: Giovanni Giordano, communication consultant for Milparinka disability day center, adjacent to SEEDS Communal Garden (written consent)
- 11/9/18: Richard Brown, member of the organizing committee for West Brunswick Community Garden and head of the composting group (written consent)
- 11/14/18: Nora, a volunteer at SPAN Community House's garden (written consent)
- 11/14/18: Audrey, the community garden manager at SPAN (written consent)
- 11/15/18: Jo, one of the garden facilitators at SEEDS Communal Garden (written consent)
- 11/15/18: Leo, a volunteer with SEEDS Communal Garden (written consent)
- 11/17/18: Michelle Edwards, community compost manager, Rushall Community Garden (written consent)
- 11/28/18: Michelle Twyford, volunteer representative for Kensington Compost and manager of the Carlton Neighbourhood Learning Centre Garden (written consent)
- 11/28/18: A volunteer and English learning student at the Carlton Neighborhood Learning Centre (verbal consent)
- 11/29/18: Dave, a volunteer for the Kensington Town Hall Compost Hub

I interviewed all of my subjects at the location of their compost hub except for Dave, who I spoke with over the phone, which meant all of my locations were community gardens. I volunteered alongside Audrey and Nora at SPAN and Leo and Jo at SEEDS for a few days before interviewing anyone, which helped build rapport and familiarity. I chose to go to these locations for my interviews to see the system in action, take pictures (with consent), work in the garden to better understand the circular waste stream of composting, and meet more people who I could interview.

3.4 Interview bias and shortcomings

My interviews with people from existing compost hubs are not representative of all community compost efforts that are underway in Melbourne. Moreover, none of the organizations I interviewed are all that similar to the Food Hub, which is distinctly different from a community garden or volunteer organization focused explicitly on compost. I conducted these interviews to provide the Food Hub and Reground with background information on what has and has not worked, but what has and has not worked for these organizations may not hold true for the planned compost site at the Hub.

3.5 Interview analysis

After conducting all ten interviews, I analyzed them by identifying major themes in response to each topic. For some of these themes, I made tables. I focused on information I thought would be most helpful to the Food Hub and Reground in setting up their composting site.

4. Survey Results and Discussion

4.1 Existing compost behaviors and interest in swap and go

Table 1 breaks down the 103 responses to Q2, “Do you currently compost at home?” Options for responses to Q2 were: Yes, No, or Other (I drop off food scraps at my neighbor’s compost, feed food scraps to my chooks, etc.).

Table 1. *Current Composting Behaviors*

Do you currently compost at home?	# of respondents	% of respondents, Q2
Yes	60	58%
No	34	33%
Other	9	9%
TOTALS:	103	100%

67% of respondents indicate that they compost at home or practice another method (“other”) of recycling their food scraps. Only a third of respondents do not compost or otherwise recycle their food scraps. This data suggests that Alphington marketgoers and online respondents are aware of the issue of food waste going to landfill and the benefits of recycling food scraps. It could also suggest that many residents have home gardens that they use their compost on.

Table 2 displays the breakdown of 103 responses to Q4 about interest in a swap and go system for community compost at the Food Hub site on market days. Options for responses to Q4 were: Not interested (I would not use this system), Interested (I would consider using this system), and Very interested (I would definitely use this system).

Table 2. *Interest in a "Swap and Go" System for Food Scrap Drop-Offs*

Interest level	# of respondents	% of respondents, Q2
Not interested	32	32%
Interested	36	34%
Very interested	35	33%
TOTALS:	103	100%

The majority of people expressed some interest in the system—67% are interested or very interested. When these answers are analyzed in light of Q2 about current composting behaviors, it can provide some background information. *Figure 1* shows the levels of interest in the swap and go system in combination with current composting behaviors.

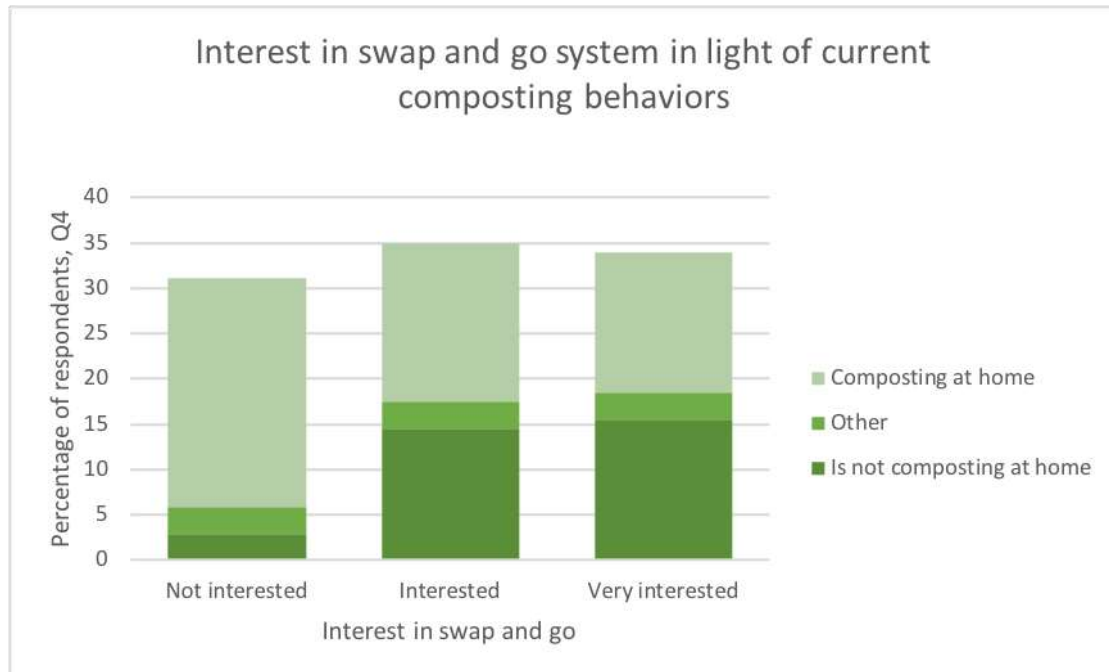


Figure 1. Interest in a swap and go system in light of current composting behaviors.

Of the 32 people who are not interested in the swap and go system, it is likely because 27, or 79% of them, already recycle their food scraps in some way. Only 3% of respondents do not compost at home and are not interested in the system. In other words, 97% of people are either already recycling their food scraps, or they want to. This data is important to consider because it suggests that the overwhelming majority of respondents care about recycling food scraps and want an outlet to do so. Of the 71 people who are very interested and interested in the swap and go system, 48% of them do not compost at home. For nearly half of the interested respondents, this swap and go system could be a useful way for people who cannot and/or do not compost at home to recycle their food scraps. In the comments, many people remarked that this system would be fantastic because they live in apartments and cannot compost. As for the 38% of people who already compost at home or otherwise recycle their food scraps, yet chose “interested” or “very interested” in the swap and go system, perhaps they are looking for a better or easier way to compost. Another explanation is that they thought the Food Hub would *need* their food scraps for compost, like for the urban agriculture area, in which case they wanted to help out. However, the Food Hub would

not necessarily need a lot of food scraps from the community to generate compost, as they will have inputs from the urban agriculture area and community kitchen.

4.2 Knowledge levels and interest in compost workshops

Q3 asked respondents to describe their current levels of knowledge about composting.

Table 3 shows the breakdown of 103 responses.

Table 3. *Current Knowledge Levels About Composting*

Knowledge levels about composting	# of respondents	% of respondents
Not knowledgeable	11	11%
Slightly knowledgeable	66	64%
Very knowledgeable	26	25%
TOTALS:	103	100%

In general, survey respondents are knowledgeable about composting, with 90% of people being slightly or very knowledgeable.

Table 4 displays the breakdown of 101 responses to Q6 about interest in future compost workshops. The online and written surveys only gave respondents the option to answer “yes” or “no” to Q6, but I found that when marketgoers verbalized their answers, a handful of them said they “might” or “may be” interested in workshops, hence the column indicating the percentage of respondents who chose “Maybe.”

Table 4. *Interest in Compost Workshops*

Interested in workshops?	# of respondents	% of respondents, Q2
Yes	62	61%
No	34	34%
Maybe	5	5%
TOTALS:	101	100%

The majority of people are interested in compost workshops, with 66% of respondents choosing “yes” or “maybe.” This data suggests that the Food Hub could have a strong turnout at future workshops. However, the Hub should keep in mind that although the majority of people indicated interest in attending compost workshops, the number of people who would

actually attend will be considerably lower because of peoples' busy schedules, which some respondents touched on in their comments.

I combined the results from Q3 asking respondents to describe their current level of knowledge about composting with Q6 about interest in workshops with the results shown in *Figure 2*. I hypothesized that people with higher levels of knowledge would not be as interested in workshops, while people with less knowledge about composting might be more interested.



Figure 2. Respondents' interest in compost workshops as indicated by Q6 in combination with their existing knowledge about composting as indicated by Q3.

Figure 2 makes it easy to see that there is significant interest in workshops. In general, the data in *Figure 2* seems to suggest that of the 34 people who are not interested in workshops, it is because they already have significant knowledge about composting; 94% of people who said they are not interested in workshops in Q6 are already slightly or very knowledgeable about composting. In contrast, of the 62 people who are or may be interested in workshops, 13% of them are not knowledgeable, 69% are slightly knowledgeable, and 20% are very knowledgeable. This breakdown of knowledge levels suggests that people of all knowledge levels are hungry to learn more, even 20% of whom are already very knowledgeable. Considered as a whole, this data set suggests that having knowledge about compost is important to respondents.

Q7 then proceeded to ask those that indicated they were interested in workshops to circle all topics that would be of interest to them. Table 6 shows the breakdown of responses based on how many people circled each topic. I calculated the percentage of people interested

by dividing the number of people who selected the topic by the number of people who answered Q6 about interest, which was 67 people in total (the combination of 62 respondents who chose “yes” and 5 respondents who chose “maybe”).

Table 5. *Interest in Workshop Topics*

Topic	# of people	% of people interested
Backyard composting	45	67%
Vermiculture	31	46%
Compost and microbes	31	46%
Hot composting	26	39%
Other	6	9%

Backyard composting was the most popular topic, with vermiculture and microbes second, hot composting third, and an option for other topics fourth. Backyard composting as the most popular topic is consistent with the compost-at-home culture that seems to be prevalent in Alphington. In light of this data, the Food Hub could focus on workshops like backyard composting that further empower households to take responsibility for their organic waste at home. By empowering residents to compost at home, the Food Hub will also reduce strain on their community compost system, which is especially relevant considering the issues other compost hubs have had, as discussed later in Interview Results and Discussion.

Under “other”, two respondents indicated interest in workshops focused on small scale indoor composting, like bokashi bins. Interest in other topics also included soil ecology and biology, “composting 101 for dummies and lazy people”, how and when to harvest compost, and what to do with everything you *can’t* put in your typical compost, like bones, meat, and citrus and onion peels.

4.3 Viability of a volunteer workforce for the compost hub

Figure 3 displays the breakdown of answers to Q8 asking respondents if they would consider volunteering with the compost system at the Food Hub.

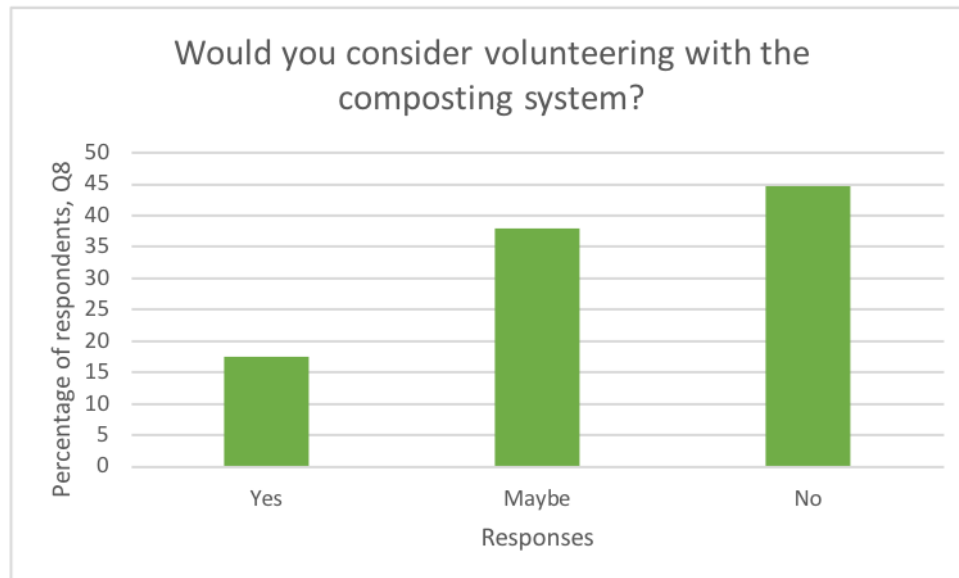


Figure 3. Respondents' consideration of volunteering with the compost system.

Even though the majority of people are interested in participating in the swap and go, as demonstrated in Table 2, Figure 3 shows that the majority of respondents would not consider volunteering. Many respondents commented that they were too busy to volunteer. This data must also be considered in light of survey bias; when people answered my survey face to face, they were probably more likely to say they would consider volunteering because they thought that was the right thing to say. In light of busy schedules and survey bias, the viability of a volunteer workforce for the Hub may be even lower than the answers suggest.

4.4. Interest in purchasing compost

Table 6 below shows the breakdown of responses to Q9 about interest in purchasing compost made at the Melbourne Food Hub.

Table 6. *Interest in Purchasing Compost*

Interest level	# of respondents	% of respondents
Not interested	21	21%
Interested	38	37%
Very interested	43	42%
TOTALS:	102	100%

Overall, there is significant interest in purchasing compost, with 79% of respondents interested or very interested. This total suggests that the majority of people may have gardens at home that they would like to use the compost on. Some respondents commented that they would not want to pay for the compost if they were the ones donating food scraps to generate

it, and a couple respondents mentioned they might be interested in purchasing the compost if it was really affordable. This data suggests that people may be interested in purchasing the compost so long as it is very low priced, and, I am assuming they are interested in high quality compost. Because there is significant interest in purchasing compost, the Food Hub and Reground could explore the option of selling compost in order to help fund the compost project.

5. Interview Results and Discussion

5.1 Why compost?

An important facet of my interviews was finding out why a particular organization composts. I found three main themes when asking organizations why they compost: composting provides an alternative to chemical fertilizers, improves soil health, and reduces food waste sent to landfill. For the community gardens, reducing food waste in the community did not appear to be the primary theme; rather, many interviewees first noted the importance of compost primarily for its use for growing food in the garden, as they use it instead of store-bought, chemical fertilizers (Brown, 2018, pers.comm; Nora, 2018, pers.comm; Jo, 2018, pers.comm.). The compost makes the soil more fertile and improves the health of the plants. Like Leo, a volunteer with SEEDS, said, “I have a garden at home, and it doesn’t thrive nearly as well as this garden does, and I’d put a lot of that down to the great compost, and the nutrients the plants are constantly getting” (2018, pers.comm.).

Interviewees from community gardens did cite the greater issue of food waste as a reason for composting, like Nora saying “When kitchen scraps end up in landfills, we are actually wasting a lot of very good resources for our soil” (2018, pers.comm.). Community gardens are doing the local community a service by composting their food scraps, and they benefit by using the compost as well. For Kensington Compost and the Kensington Town Hall Compost Hub, diverting food waste from landfill and generating compost is the primary reason they compost (Twyford, 2018, pers.comm; Dave, 2018, pers.comm.). Dave, a volunteer for the Kensington Town Hall Compost Hub, is primarily motivated to compost because he wants to “change all of Australian society” and the way the concept of waste is viewed (2018, pers.comm.). He says it’s about “making sure there is a resource available” for recycling organic waste, because he thinks “we should be composting everything that comes out of our kitchens” (2018, pers.comm.).

As of right now, all of the community gardens I spoke with are using the compost they generate directly on the garden, and are not selling the end product. Kensington Compost donates their compost to a variety of local community gardens (Twyford, 2018, pers.comm.), and Kensington Town Hall Compost Hub donates half of their compost to a local community garden and makes the other half available to registered community members for free (Dave, 2018, pers.comm.).

This data suggests that community gardens compost primarily because they need it, especially if they want to grow food without chemical inputs, though recycling food waste

from the community is still important to them. Kensington Compost and the Town Hall Compost Hub compost because they want to keep food out of landfill; however, their end product is still going to community gardens to grow food.

5.2 Comparison of composting systems

The first question I asked interviewees was to describe the physical set up for their compost system. Compost hubs I studied use bay systems with hot composting, worm farms, and/or compost bins, or a combination of these tactics to generate compost, as outlined in Table 7 by organization and interviewee.

Table 7. *Compost Systems Used by Existing Compost Hubs*

Hot composting in bays	Worm farms/compost bins
<p>West Brunswick Community Garden, Richard Brown: Five flush cubic meter bays made out of wood. Short wooden plank border at the front keeps compost piles contained. Bays are covered with custom-made, weighted tarps.</p> <p>SEEDS, Jo: Four cubic meter bays made out of wood and steel with a removable wooden panel at the front. Have a fifth bay as a holding system for finished compost, located separate from first four flush bays. No lids. Looking to expand with 2 more bays.</p> <p>Carlton Neighbourhood Learning Centre, Michelle Twyford: Three flush cubic meter bays, about to add 3 more adjacent bays. Plastic mesh stretched over wooden frames make hinged lids that cover each bay.</p> <p>Kensington Town Hall Compost Hub, Dave: Three 1.2 cubic meter bays, located next to each other, but not flush. Hopefully adding more bays soon, dependent on funding. Front of bays are removable wooden slats, adjustable to height. Sides of bays made out of wire mesh. Hinged lids made out of recycled steel.</p>	<p>SPAN, Audrey: Fifteen bins total, split evenly between worm farms and compost bins.</p> <p>Rushall Community Garden, Michelle Edwards: Twelve compost bins and three worm farms.</p> <p>Kensington Compost, Michelle Twyford: Seventeen worm farms and compost bins set up all over suburb of Kensington. No “central” compost hub.</p> <p>SEEDS, Jo: 2 worm farms along with the bay system</p>

Bay systems are the most popular compost system, and some organizations that use bay systems also use worm farms or compost bins in conjunction with bays, such as SEEDS. It seems that bay systems are the best option for efficiently processing large quantities of waste.

I visited all of these sites except for the two Kensington organizations, and the photos below depict some of their systems.



Figure 4. The 5 bay system with custom fit, weighted tarps at West Brunswick Community Garden.



Figure 5. (Left) The hinged lids for bins at the Carlton Neighbourhood Centre, covered in plastic mesh.



Figure 6. (Right) There is a gap between the bin and lid, which could allow vermin in (Twyford, 2018, pers.comm.)



Figure 7. The three bay system at Kensington Town Hall (Kensington Town Hall Compost Hub, 2018).



Figure 8. Michelle tending to one of the compost bins at Rushall Community Gardens with a compost fork made by Bulldog.

5.3 Community drop-off systems and educational tactics

Compost hubs have different strategies in how they open up their system to the local community and educate locals who drop off food scraps. Table 8 indicates how each organization registers, or does not register, community members for the Hub and how they onboard and educate members. Educational tactics include distributing written information, personal interaction with people who drop off, physical signage at the site, stickers on collection bins about what and what not to include in drop-offs, and compost workshops.

Table 8. *Community Compost Registration and Education*

Organization and interviewee	Access to system	Registration process	Onboarding and education
West Brunswick, Richard Brown	Drop off point located just inside the garden fence, open to all community members at all times.	Community members can register online on Moreland City Council's website, but there are likely many unregistered users	<ul style="list-style-type: none"> -Council automatically sends educational information to registered members' emails upon registering -No formal onboarding, but WB encourages community members to come see the compost process and garden -Physical signage at site -Stickers on bins -Holds compost workshops for volunteers and community members
SEEDS, Jo	"Swap and go" crate located outside Milparinka, open to all community members at all times. Pick up some food waste from local cafes.	No registration process	<ul style="list-style-type: none"> -No formal onboarding, but encourage community members to come volunteer in the garden -Physical signage at site -Stickers on bins

SPAN, Audrey	“Swap and go” crate located outside SPAN, open to all community members at all times.	No registration process	-No formal onboarding -Physical signage at site -Stickers on bins
Kensington Town Hall Compost Hub, Dave	Bays inside a locked gate that registered members have the combination code to. People can also drop off food scraps when Ken is working at the system.	Community members register online via the Hub’s Facebook page	-After registering, members come to the Hub in person to get introduced to the system and get the combination code and some written information. -Physical signage at site -Has a Facebook page with composting information and updates
Carlton Centre, Michelle Twyford	Drop off bin located outside the Carlton Centre with a combination lock that registered members have access to.	Community members register in person or online	-No formal onboarding -After registering, members get educational material about Hub and combination code sent to their emails -Physical signage at the site
Kensington Compost, Michelle Twyford	Various bins located around Kensington are open to all community members at all times.	No registration process	-No formal onboarding -Kensington Compost’s Facebook page details the locations of bins and provides composting information and updates

In general, all organizations have some physical signage at the site about what and what not to include in the compost (though I am unclear whether or not Kensington Compost has signs at each drop off point). West Brunswick seems to do the most education on the topic of composting, going a step further to supply composting workshops. Because Kensington Compost and the Kensington Town Hall Hub specifically focus on composting, they have Facebook pages focused on compost education and updates, whereas the community gardens or centers may have Facebook pages but they are focused more broadly on the organization

than the compost itself. Figures 9, 10, and 11 below show some of these drop off points and educational tactics. Overall, compost hubs have different accessibility for local community members. It seems that limiting access to the system with some sort of lock can help mitigate some of the problems discussed below in section 5.4



Figure 9. (Left) The locked drop off point at the Carlton Centre.



Figure 10. (Right) The Swap and Go crate with signage at SPAN.



Figure 11. A kitchen caddy for collecting food scraps with an educational sticker provided by Moreland City Council in partnership with West Brunswick.

5.4 Problems with community compost

5.4.1 *Quality of inputs*

Compost hubs have had some trouble with the community drop offs. Volunteers and managers frequently cited the quality of inputs as one of their biggest problems with community composting. All community compost heads reported that they often find non-compostable materials such as produce stickers, rubber bands, plastics, and kitchen implements in the drop-offs. Some people also drop off “compostable” bags, which do not actually compost in the systems (Brown, 2018, pers.comm; Twyford, 2018, pers.comm). As Michelle at the Carlton Centre said, “compostable” bags “...drive me insane. They never break down...you have to say no to those” (Twyford, 2018, pers.comm). Jo from SEEDS mentioned having found broken glass and plastics amongst other non-compostable items, which she feels may stem from people not having the same values around generating compost, and “is an example of how being a compost hub does fall into the role of being a dumping ground sometimes, which is really unfortunate” (2018, pers.comm.). However, she also noted that it is an opportunity for education within the community, which they could approach by attaching fliers, inviting people to workshops, or showing them how SEEDS composts (2018, pers.comm.).

Another issue is community members dropping off organic materials that take longer than 6-8 weeks to decompose. Most community composting projects interviewed were moving compost through their systems at that rate or faster, meaning these materials will not break down. Garden clippings from peoples’ home gardens present a problem as “We just don’t have time to compost it, as there’s a three month minimum turnover rate for garden waste, and the compost is moving through the system too quick for that” (Twyford, 2018, pers.comm). Some people also drop off the whole contents of their bokashi bins, which stink and rot (Edwards, 2018, pers.comm; Brown, 2018, pers.comm). A common problem is people dropping off whole fruits and vegetables in the compost, as these take a long time to decompose. This proves frustrating for community composters, because it highlights the issue of food waste.

5.4.2 *At or over capacity for drop-offs*

Many community compost managers and volunteers I interviewed said that one of their biggest problems with being a compost hub is that they are at, or over, capacity for how much kitchen waste they can accept. Richard of West Brunswick said that a few months back, “We got to a crisis point, and had to stockpile some of the food waste...now, if we had

any more kitchen waste from local people, we'd be in trouble" (Brown, 2018, pers.comm). For all the organizations interviews, there is either a need or a potential for expansion of composting facilities to process more kitchen waste because of local demand.

5.4.3 Vermin and pests

Hubs have generally had little to no problems with vermin and pests, though Rushall Gardens used to have a lot of rats (Edwards, 2018, pers.comm.). At Rushall, Michelle noted that lidded bins, as opposed to a bay system, have been better for keeping out flies and rats, as "rats have to burrow under the bins [to get to the food scraps] instead of being able to scurry over the top [of piles]" (Edwards, 2018, pers.comm.). She also mentioned that when the compost is managed properly and does not stink, vermin and pests are less likely to come (2018, pers.comm.). Keeping out mice and rats is especially important for the Food Hub as they are in an environment that is home to tiger snakes, so pest-proofing the system is paramount so snakes are not attracted by prey.

5.4.4 Moisture content

Three interviewees touched on the importance of maintaining the right moisture content for the systems. Dave mentioned that the wire mesh sides of the bays at the Kensington Town Hall, in combination with the steel lid, have been a problem because the compost dries out too quickly (2018, pers.comm.). He said they've lined the sides of the bays with coffee sacks to help keep moisture in, which has been working better (2018, pers.comm.). Michelle of the Carlton Centre likes the plastic mesh for the lids over the bays at Carlton because it lets rain in (Twyford, 2018, pers.comm.). Michelle of Rushall Gardens noted that the lidded worm and compost bins are good for keeping moisture in (Edwards, 2018, pers.comm.).

5.4.5 Problems with worm farms

Nora and Audrey of SPAN and Michelle of Rushall Garden mentioned that worms cannot break down food waste as quickly as other composting systems, especially when materials are not chopped up small. As Nora said, "Food scraps are supposed to be cut small to help the worms digest, and we something that is so huge, like a huge carrot—it's just not supposed to be in the compost" (2018, pers.comm.). Worm farms also may not be able to handle as much material as other systems; "Sometimes it's actually better, for example, for a worm farm to not have more food that day, but there's nowhere else to put it [the food waste]" (Audrey, 2018, pers.comm.). Worms are especially susceptible to hot weather, so there is a risk to the system when hot summer months come. Yarra City gave Rushall Gardens a grant for Hungry

worm bins, which have worked well thus far, but Michelle noted that worm populations need time to get established, and can only take food scraps that are chopped up small (Edwards, 2018, pers.comm). These bins also have not been through a hot summer yet (Edwards, 2018, pers.comm).

5.4.6 Finding a brown source

Some organizations mentioned difficulty with obtaining a regular source of brown material to use in the compost, as “it’s constant to keep that up,” because compost generally requires a 2:1 browns to greens ratio (Twyford, 2018, pers.comm). When the task of sourcing browns has been left up to managers or volunteers like Michelle of Rushall Gardens, they’ve “gotten sick of it,” and haven’t had the time to keep chasing down a source (Edwards, 2018, pers.comm). Table 8 details what materials each organization uses for their brown source and where they get them.

Table 9. *Brown Materials and Source by Organization*

Material	Organization and Interviewee	Source of material
Woodchips	Kensington Town Hall Compost Hub, Dave	Melbourne City Council
	Rushall Community Garden, Michelle Edwards	Yarra City Council
Sawdust	West Brunswick, Richard Brown	Local furniture joiner
	SEEDS	
Shredded paper	SEEDS	Milparinka (adjacent to garden)
	West Brunswick, Richard Brown	Moreland Childcare Centre (adjacent to garden)
	SPAN community garden, Audrey and Nora	SPAN Community House (adjacent to garden)
	Kensington Town Hall Compost Hub, Dave	Donated by a member, but not seeking more due to chemicals in inks
Dry leaves	West Brunswick, Richard Brown	A garden member gathers dry leaves as part of his job
	Kensington Town Hall Compost Hub, Dave	Dropped off by members

Richard noted that the dry leaves are the “best” source of browns, but that they are only readily available in the fall and because a member has ample access to dry leaves (Brown, 2018, pers.comm.). He also mentioned that they try to keep their use of shredded paper to a minimum, as the chemicals in the inks can contaminate the compost (2018, pers.comm.).

Because their local councils regularly drop off woodchips for free, Kensington Town Hall Compost Hub and Rushall Gardens do not have to chase down a brown source, which could make labor easier. Audrey of SPAN noted that they haven’t had trouble with a browns source yet, but that they “could easily source woodchips from Council” (2018, pers.comm.).

5.5 Volunteering and labor management

5.5.1 Labor management

All organizations I interviewed primarily rely on volunteers to manage their operations. However, the Carlton Centre, Kensington Compost Town Hall, SEEDS Communal Garden, and SPAN have at least one paid role to facilitate the organization’s operations. For community garden managers Michelle Twyford, Jo, and Audrey, they are paid not just to manage the compost, but to work on other projects in the garden as well. This paid role keeps them accountable to the garden, and provides consistency to the volunteers (Jo, 2018, pers.comm.).

The funding from the City of Melbourne is supporting the pilot project at the Kensington Compost Town Hall funds one person, Ken, to work at the Compost Hub for 4-5 hours per week, whose labor is supplemented by a volunteer committee. I interviewed Dave, one of the volunteers on the committee, and he said that the “budget to employ Ken has been really useful” (2018, pers.comm.). As a volunteer, Dave tried to come once a week, every week, but he got busy, and it was difficult for other volunteers to regularly fill in. Richard Brunswick remarked on how the compost system at West Brunswick works so well because he, as a retired volunteer, has ample time to work with the garden, but that when he got sick for a few months, the system began to fall apart (Brown, 2018, pers.comm.). This data suggests that having at least one paid role, or a very dedicated volunteer like Richard, for an organization wherein the laborer is accountable to come every week can be useful to maintaining the compost’s success.

5.5.2 Hours per week

Interviewees were not exactly sure how many hours per week went in to managing the compost. Answers varied by organization, and ranged from 4-10 hours per week. Many organizations had one person that would work about 4-5 hours per week, supplemented by a

volunteer group that did more work. Some organizations open up to have working bees once a month or so; for example, whenever the first bay at Kensington Town Hall Compost Hub is full, they host a working bee to transfer the contents of each bay over to the next (Dave, 2018, pers.comm). They have a dedicated group of volunteers that attend these working bees, but would like to extend their reach into the community to have more volunteers in case these cannot show up (Dave, 2018, pers.comm.).

5.5.3 Motivations for volunteering

I asked volunteers, “What motivates you to be involved here?” and “What do you value about that organization?” I wanted to figure out what kept people coming back so I could provide suggestions for the Food Hub as to how they could maintain a strong volunteer community. My results to these questions, containing quotes from volunteers and manages, can be found in Tables F1 and F2, located in Appendix F, as these tables take up significant space. Basically, volunteers are motivated to be involved because of the physical environment and act of gardening, which includes a passion for gardening, reaping the benefits of harvest, and getting outside and connecting with nature (Table F1). Additionally, volunteers value the community because it facilitates interaction with a diverse group of people and social connection and inclusion (Table F2). These responses are specific to community gardens, as the motivations for Kensington Compost and Kensington Town Hall Compost Hub volunteers are covered in section 5.1, Why compost? because composting is their primary activity.

As Audrey, the community garden manager at SPAN, put it, “For most of the volunteers, [composting] is just part of what we do—I’m not sure if they would go out of their way to do it if it wasn’t involved in the garden itself” (2018, pers.comm.). Obviously, a short-coming of these responses is that they are specific to community gardens, which the Food Hub is not. However, finding out these motivations can make a strong case as for why the compost site should be closely connected to the urban agriculture area at the Food Hub, with volunteers working on both projects. Volunteers may quickly tire of just working with the compost if they do not feel they are connected to nature and have a strong community amongst the other volunteers.

6. Suggestions for the Melbourne Food Hub

Based on data from the survey and interviews with existing community compost hubs, I have come up with some suggestions that the Melbourne Food Hub and Reground may find helpful when setting up the compost site.

6.1 Data collection and evaluation

It is critical that the Food Hub and Reground set up the compost site from the beginning with data collection and evaluation strategies so they can monitor their progress. I suggest that the compost site has a combination code or some kind of closed-access policy, wherein users have to register, for easy data collection about how many households are dropping off. A closed-access policy can also help alleviate the problem of quality of community drop-offs, as it will not be open to everyone who may or may not know about composting. The Food Hub could follow Kensington Town Hall Compost Hub's example and register members who want to drop off their waste via an online link on a Facebook page specifically made for the compost site. Then, registered members will be automatically added to a spreadsheet, and can come down to the site to see how it works firsthand before getting a code to the site. The Hub could have a scale next to the bays like Kensington Town Hall so community members can weigh and record the waste they drop off. By requiring community members to weigh their own waste, it encourages people to take responsibility and interest in the waste they produce, and reduces strain on volunteers who man the system. Similarly, when users of the urban agriculture area and community kitchen at the Hub drop off organic waste, they should record waste.

By having some closed access to the system, the Hub can ensure that they do not get overwhelmed by the amount of organic material being dropped off, and can easily track how many households are using the service, how much waste is being diverted from landfill, and how much compost is being produced for the growth of local food. The Hub can translate these findings into reports and/or marketing that demonstrate their contribution to local sustainability. This data can serve the basis for future proposals to get funding from Darebin Council or other organizations to continue to compost site's operations.

6.2 Paid position and volunteer management

I feel that allocating funds for paid labor to help run the compost system just 4-5 hours a week will be crucial for the site's success. Relying solely on a volunteer workforce can be risky because of fluctuating schedules and the lack of a binding commitment to come, but having one person who consistently helps maintain the system can provide consistency

and quality. Perhaps Reground's grant from Bank of Australia or future funding from the sale of processed compost could help cover a part-time role. Another option is to attempt to source funding from Darebin City Council. As Michelle Twyford noted about community composting, "They [council] do need to pay someone. It's not much. It's taking it [food waste] out of the system. Food waste is one of our biggest polluters, and it's so easy to fix" (2018, pers.comm.) Regular volunteers can supplement this role. It could be best to have workdays on weekends to allow more people to come out, as some survey respondents commented they have full work schedules.

6.3 Bay system in combination with worm farms

Depending on how much compost the Hub wants to process, they could build a bay system comprised of 3-6 bays and have a few worm farms in addition. They could look into getting custom fit tarps such as those at West Brunswick, and build the bays out of wood to keep moisture in. Based on my interviews, it seems that a bay system can process organic waste more efficiently than bins or worm farms. However, worm farms generate quality waste castings that are beneficial to gardens, and they provide an opportunity for education, as people, including children, can lift the covers off bays and see the worms in action.

The Hub should consider arranging a regular drop-off source of browns before opening their compost site up to the community. The Hub could consider getting a regular supply of woodchips dropped off from the local Darebin City Council and reaching out to local furniture makers for sawdust. Additionally, seeing as Reground is setting up the compost site at the Food Hub, they will be able to provide a regular supply of coffee grounds and dry coffee chaff. These are not brown, but rather green, nitrogen-rich materials; however, they are still quality inputs for the compost; interviewees Audrey, Richard Brown, and Jo all noted how good the coffee chaff in particular is for the compost (2018, pers.comm.).

6.4 Compost and food waste education

Along with focusing on various compost topics like backyard composting, which respondents indicated they would be interested in, I highly recommend focusing on food waste and how to avoid it as an integral part of the Hub and Reground's workshops. Many compost hubs have had trouble with drop-offs because people include whole fruits and vegetables, and it is frustrating for them not just because these items do not break down, but because it highlights the massive issue of food waste in society. Workshops could focus on using all parts of the plant (e.g. making pesto out of carrot tops, baking chips out of potato peelings), how much food you should buy each week so that none will go bad, and creating

shopping lists before shopping. Composting is not a solution to food waste as whole. Rather, composting should be a strategy to help recycle unavoidable waste, like inedible parts of a plant, and garden organics.

6.5 Creation of community

I know that the Food Hub is planning smooth integration between the different areas and projects of the site, and I want to reaffirm the importance of a strong connection between the urban agriculture area and compost site for education and volunteer purposes. Working together, the urban agriculture area and compost site can educate people on the full life cycle of food production, consumption, and disposal. Moreover, volunteers will be less likely to burn out of just working with the compost if their volunteer duties include significant time spent on the urban garden.

As my results indicate, volunteers at community gardens highly value the diverse community created around the garden. Some gardens are naturally inclined towards diversity because of the work the adjacent centers do. For example, English students hailing from many different countries study at the Carlton Neighbourhood Centre and work in the garden, and Milparinka's clients work in the SEEDS garden. However, I noticed that when administering my survey at the Food Hub site, the vast majority of respondents—I would estimate about 92%—were white, with Australian accents, though of course this is just my observation. In order to create a diverse community that volunteers want to be a part of, and for the Food Hub to fulfill its mission of supporting “everyone, regardless of their status or background, to have dignified access to good food at all times” (Melbourne Farmers Markets, 2018, para. 4), the Hub and Reground should take tangible steps to bring together Australians of different backgrounds, abilities, and socioeconomic status. Perhaps they could partner with a nearby non-profit or education center to bring in volunteers that might not otherwise have access to the Hub's operations because of cost, schedule, or language barriers. The Hub can have community building activities like morning tea, community lunch from the garden, or art activities on volunteer days to bring people together and make volunteering an enjoyable experience for everyone. By making the space welcoming and inviting to people of diverse backgrounds, the Food Hub and Reground can build a stronger community and better maintain engaged volunteers.

7. Conclusion

The importance of compost to sustainability cannot be overstated, as it reduces methane emissions from landfill, improves soil quality, provides a natural alternative to chemical fertilizers, saves landfill space, and closes the loop for organic waste streams. Knowing the importance of compost, the Melbourne Food Hub and Regound want to set up a community compost site at the Food Hub to provide local residents the opportunity to recycle their food scraps. My community surveys indicate that there is significant demand for such a system, and for compost education. Existing successful compost hubs around Melbourne provide promising models for the Food Hub and Regound to emulate in their design of their own hub. I recommend that they start with strong data collection and evaluation, provide funding for paid labor 4-5 hours a week, use a bay system in combination with worm farming, and create a strong community within the Food Hub to ensure a successful community compost system.

This research can serve as the basis of a compost hub that has the potential to recycle significant amounts of organic waste in the Alphington community. Moreover, one of the Food Hub's goals is to be replicable around Victoria and Australia, and their model for a compost site based on this research could potentially be applied around the country. For future ISPs, I recommend students to focus on food waste and how to avoid food waste in innovative ways. Or, students could work with this Food Hub or a similar organization to look at another facet of the Hub, like produce aggregation and distribution. I also recommend for students to possibly work with community compost hubs to get them set up with data tracking and evaluation tools and strategies that can help these organizations track their impact.

This research has inspired me to get more involved with my local community garden. I want to speak with managers and volunteers to see if they would consider operating as a compost hub where residents could bring their food scraps, and I would like to help man this system if they get it up and running. I also hope to get more involved in local government and investigate the potential for a FOGO service back home, and potentially administer more community surveys to gauge the demand for such a project. Residents in my home and college towns are not nearly as knowledgeable or active about composting as my survey respondents, and I hope to help change those attitudes and behaviors.

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***Appendix A. The Viability of Community Composting at the Melbourne Food Hub
Community Survey***

Thank you for agreeing to take part in our community composting survey! Your responses will be vital in helping us design and implement a range of community composting activities and services for members of the local community. We see composting as central to our shared vision of a healthier and more sustainable food system.

About the Melbourne Food Hub

The Melbourne Food Hub is a Joint Venture Collective Impact project between Sustain: The Australian Food Network and Melbourne Farmers Markets. It is funded by a two-year Innovation Grant from the Lord Mayor's Charitable Foundation. The Melbourne Food Hub is a place for everyone to connect to a healthy and flourishing local food system, through an accredited weekly farmers market (the Alphington Farmers Market), a commercial kitchen, co-working offices, a food distribution business (including marketing and branding services for local produce), diverse forms of urban agriculture, and a workshop and events space.

For more information about the Melbourne Food Hub visit (<http://melbournefoodhub.org.au/> - under development).

For more information about Sustain visit <http://sustain.org.au>

For more information about Melbourne Farmers Markets visit <http://mfm.com.au>

If you would like more information about the Melbourne Food Hub please contact Adam Perkins, Food Hub Manager, via adam@sustainaustralia.org

About this survey

This survey should take no more than 5-10 minutes. Unless you leave your email and indicate interest in being contacted further about the proposed community composting project at the Melbourne Food Hub, your survey responses will remain strictly confidential and anonymous.

Thank you so much for your time and cooperation – we really appreciate it!



The Survey

1. How often do you attend the Alphington Farmer's Market? **Please tick one**
 - a. Every week
 - b. 2-3 times per month
 - c. Once a month
 - d. Rarely
2. Do you currently compost at home? **Please tick one**
 - a. Yes
 - b. No
 - c. Other (I drop off food scraps at my neighbor's compost, I feed food scraps to my chooks, etc.)
3. How would you describe your current level of knowledge about composting? **Please circle one:**
 - a. Very knowledgeable – I understand the process and benefits of composting, different composting techniques and their advantages / disadvantages
 - b. Slightly knowledgeable – I know about composting in general and some techniques but I don't understand the detail and how it 'works'
 - c. Not knowledgeable – I don't really know much about composting at all
4. To what extent would you be interested in a "swap and go" system for composting at the Alphington site, where you would drop off your food scraps on market days in exchange for a clean bin for the next week? **Please tick one**
 - a. Very interested: I would definitely use this system
 - b. Interested: I would consider using this system
 - c. Not interested: I would not use this system
5. If you are interested in the swap and go system, about how much kitchen waste per week do you predict your household would generate? See the buckets for reference.
Please tick one



- a. 5 litres
 - b. 10 litres
 - c. 20 litres
 - d. 20+ litres
6. Would you be interested in learning more about composting through structured workshops run at the Melbourne Food Hub in Alphington? **Please tick one**
 - a. Yes
 - b. No
7. If 'yes' to qn 6, what sorts of topics would be of interest to you? **Please circle all that apply**
 - a. Vermiculture – worms, worm composting and worm products
 - b. 'Hot' composting – what is it and how does it work?
 - c. Composting and microbes – is 'homemade' / 'community-made' compost better than anything you'll get at Bunnings – and why?
 - d. Backyard composting – what's the best option for me?
 - e. Other – please make suggestions here
8. Would you consider volunteering with the Melbourne Food Hub to learn about and work with the composting system? **Please tick one**
 - a. Yes
 - b. No
 - c. Possibly
9. Would you be interested in purchasing compost made here at the Melbourne Food Hub? See the Melbourne Food Hub bag as an example. **Please tick one**
 - a. Very interested: I would purchase this compost
 - b. Interested: I would consider purchasing this compost



c. Not interested: I would not buy this compost

10. If you are interested in the swap and go system, volunteering at the composting project, and/or volunteering with other projects at the Melbourne Food Hub, please leave your name, email / phone number below:

Name:

Email:

Phone:

11. Please write any additional comments you have about this topic or any other thoughts about the Melbourne Food Hub and how we can be of benefit to the community

Appendix B. Undiscussed Survey Results

Table A1.

Q1, How Often Do You Attend the Alphington Farmer's Market?

Frequency	# of respondents	% of respondents
Every week	30	29%
2-3 times/month	34	33%
Once a month	19	18%
Rarely	10	10%
Rarely (first time)	10	10%
TOTALS:	103	100%

Table A2.

Q5, Estimated Food Waste per Household per Week

Estimated food waste/household/week	# of respondents	% of respondents
5 litres	31	41%
10 litres	30	39%
20 litres	12	16%
20+ litres	3	4%
Total:	76 respondents	100%

Appendix C. Informed Consent Form

The Viability of Community Composting at the Melbourne Food Hub

Bailey McNeill

INTRODUCTION

I am an American university student from UNC Chapel Hill studying abroad in Australia for the semester with the School for International Training (SIT). As a part of my program, "Australia: Sustainability and Environmental Action," I am undertaking a 5 week research project assessing the viability of a community composting site at the Melbourne Food Hub, located in Alphington. Through my research, I hope to learn from existing community composting projects around Melbourne to see what has and has not worked for these models to inform the Food Hub's plans for their composting hub. Before you agree to participate in this study, you should know enough about it to make an informed decision. If you have any questions, please ask me.

INFORMATION

Participation in this study will involve the following:

1. Being casually interviewed in community garden and/or compost project settings for 10-15 minutes, and being asked questions that revolve around this study question:
How viable is a community composting site at the Melbourne Food Hub, and what composting practices should they implement?
2. The information gained from this interview will be incorporated into a written report that will be submitted for an undergraduate class, included in the SIT program library, and possibly published on the internet. It will also form part of a short oral presentation that I will make to my class.

RISKS

This study may not pose any obvious physical or emotional risks. There could be a slight potential for embarrassment or discomfort by answering personal questions and sharing your views on community composting.

BENEFITS

Participation in this study may not benefit you directly. However, the knowledge that I obtain from your participation, and the participation of other volunteers, may help me to better understand the nature of community composting projects and how to build a successful community composting model. For this, I highly value your participation, and hope you will gain satisfaction from potentially helping launch new community composting initiatives.

CONFIDENTIALITY

You have the option of either remaining anonymous or of having your contribution to the study acknowledged. If you choose to remain anonymous, the information in the study records will be kept strictly confidential and will be available only to myself. No reference will be made in oral or written reports which could link you to the study.

PARTICIPATION

Your participation in this study is voluntary; you may decline to participate. If you decide to participate, you may withdraw from the study at any time. You may also decline to answer any specific question. If you withdraw from the study at any time, the information already obtained from you will be destroyed.

Subject's signature: _____ **Date:** _____

Researcher's signature: _____ **Date:** _____

Appendix D. Interview Guide for Compost/Garden Managers

1. Can you describe the physical composting system that you have set up here at _____?
 1. What method(s) do you use?
 2. What materials do you accept? What materials do you not accept?
 3. Where do you get these materials?
2. How does the drop off system for community members work? Can they only bring their bins at certain times, or drop off whenever is convenient?
3. Do you track how much food waste is dropped off by week, and how many households are dropping off?
4. If yes, how many households are dropping off bins weekly, and about how much are they dropping off?
5. What have been some of the biggest difficulties your organization has faced with implementing community composting?
 - a. What non-compostable materials are commonly found in the waste you receive from the community?
6. What strategies are you using to overcome these difficulties?
 - a. Educational tactics?
7. How many days per week does your organization work with the composting system, and about how many hours per week does it take to manage?
8. Is someone paid to help manage the composting project?
9. What do you use the compost you generate for? Do you sell or do you plan on selling compost?
10. What do you think motivates volunteers to help out with the compost?
11. Why is composting important for your organization? Why do you think composting is important for this community?

Appendix E. Interview Guide for Compost/Garden Volunteers

1. What work do you do with the compost system?
2. What are common non-compostable materials that you see in the compost?
3. Why is compost important to this organization?
4. What motivates you to volunteer here?
5. What do you value about this community?

Appendix F: Volunteers' Motivations for Involvement

Table F1. *Motivations of Volunteers Concerning the Physical Environment and Act of Gardening.*

Themes	Reponses				
<i>Passion for gardening</i>	“Gardening is one of my passions” Nora, SPAN	“...because I love this garden that much. It motivates me to get out of bed every morning” Michelle Edwards, Rushall	“I think half of [the volunteers] just really love gardening and being outside.” Audrey, SPAN	“The chance to learn about gardening, including seed-saving, propagating, soil management, fertilizing...” Richard Brown, West Brunswick	“I love veggies. I like talking to nature, and veggies. Always care [for them], and they live longer, all healthy.” Volunteer, Carlton Centre
<i>Reap the benefits of harvest</i>	“...we share whatever we can harvest...we have a community lunch. So it’s very nice to see people enjoy the things that we have been growing here” Nora, SPAN	“The opportunity to grow healthy food, especially if they haven’t got a garden at home” Richard Brown, West Brunswick	“The main goal is to pump out as much food as possible, so that’s where the compost comes in because it’s really important [for growing]” Michelle Twyford, Carlton Centre	“For people who don’t have a garden, I think this is a great way to have a garden and reap the rewards, because you can take some of the produce home at the end of the day” Leo, SEEDS	
<i>Getting outside and connecting with nature</i>	“...something that doesn’t restrain me in a room. I really prefer to go out and about in the garden” Nora, SPAN	“...the ability to slow down, to be in nature” Jo, SEEDS	“Love of nature is very good...sitting inside, playing at computer no good. Have to touch nature.”	“I live in a terrace, and I’m crammed in with the walls...and then I come out here, with this big open sky” Michelle Edwards, Rushall	

Table F2. *Motivations and Values of Volunteers Concerning the Community*

<i>Interaction with a diverse group of people</i>	“If you are living in a multicultural society like here...it helps if you have this kind of garden to work on to be around people who are different from you” Nora, SPAN	“It’s a lot of people of different backgrounds, different cultures, different abilities, and it’s a nonjudgmental space” Leo, SEEDS	“It’s an eclectic group, a bit like the United Nations; it’s very multicultural. You’ve got someone from every country, which is good, having people of all different backgrounds” Michelle Twyford, Kensington Compost	“The goal is for [volunteers] to come together in their common interest for gardening and for Milparinka clients to experience a setting different from what they get inside all day” Giovanni Giordano, Milparinka (SEEDS)
<i>Social connection and inclusion</i>	“People within cities are really lonely...It [the garden] gives volunteers opportunities for connection, inclusion, education” Jo, SEEDS	“...a way to connect to other people...something to do that means they’re not at home alone” Audrey, SPAN	“A place to meet and socialize” Richard Brown, West Brunswick	“Special needs people are often left behind, but this garden is a community oriented space that they can participate in” Giovanni Giordano, Milparinka (SEEDS)