

GROWING LOCAL FERTILITY: A GUIDE TO COMMUNITY COMPOSTING

A COLLABORATION OF
HIGHFIELDS CENTER FOR COMPOSTING
AND THE INSTITUTE FOR LOCAL SELF-RELIANCE



GROWING LOCAL FERTILITY: A GUIDE TO COMMUNITY COMPOSTING

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Any opinions, findings, and conclusions or recommendations expressed in this material are solely the responsibility of the authors and do not necessarily represent the official views of the Utilities Programs.



INSTITUTE FOR
Local Self-Reliance

ABOUT HIGHFIELDS CENTER FOR COMPOSTING

www.highfieldscomposting.org

Highfields Center for Composting is a non-profit, mission-driven organization dedicated to closing the loop on sustainable food and agricultural systems, thus addressing soil health, water quality, solid waste, farm viability, and climate change. Highfields conducts research, offers educational resources, develops community-operated composting programs, and provides technical services with the goal of recycling 100% of Vermont's food scraps by 2017.

ABOUT THE INSTITUTE FOR LOCAL SELF-RELIANCE

www.ilsr.org

The Institute for Local Self-Reliance (ILSR) is a national non-profit research and technical assistance organization that since 1974, has championed local self-reliance, a strategy that underscores the need for humanly scaled institutions and economies and the widest possible distribution of ownership. ILSR's Waste to Wealth program focuses on converting waste from liabilities to valuable assets. It is unique in promoting zero waste planning specifically aimed at maximizing the economic development potential for local communities. Under our Composting Makes \$en\$e Initiative, ILSR has documented model composting initiatives, the job creation benefits of composting, and the link between expanding composting and climate protection. More recently it has researched states with model compost facility permitting regulations and other model policies to promote composting, and has led a peer-to-peer technical assistance program for farmers interested in composting in the Mid-Atlantic region.

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Introduction

Almost half the materials Americans discard – food scraps, yard trimmings, and soiled paper – are compostable. While 58% of the 34 million tons of yard trimmings are recovered for composting, the recovery level for the 36 million tons of food scraps remains low at only 4.8%.¹ Municipal and county governments and private food scrap generators increasingly recognize the importance of diverting food scraps from disposal to reach recycling goals and manage solid waste handling costs. More than 180 communities have now instituted residential food scrap collection programs, up from only a handful a decade ago. Countless supermarkets, schools, restaurants, and other businesses and institutions are also source separating their food scraps for composting. One benefit of composting is that it can be small scale, large scale, and everything in between: small backyard bins, on-site campus systems, farm-based operations, low-tech and high-tech regional facilities. While large-scale centralized facilities will undoubtedly be needed in order to reach high recycling levels, close-by locally-based sites are not only viable, but also bring many local benefits.

Locally-based composting circulates dollars in the community, promotes social inclusion and empowerment, greens neighborhoods, builds healthy soils, supports local food production and food security, embeds a culture of composting know-how in the community, sustains local jobs, and strengthens the skills of the local workforce. When materials are collected and transported out of the community for processing, few if any of these benefits are realized at the local level. In addition, these community-based operations can move from concept to operation in a relatively short timeframe, and typically are welcome in the neighborhood where they are started.

Furthermore, the process of siting and permitting larger-scale composting sites can be time and capital intensive (although certainly less than landfills or trash burners). The exciting news is that many community-scale composting operations are flourishing across the country.

Growing Local Fertility: Guide to Community Composting aims to strengthen expansion of community-scale composting by describing successful initiatives, their benefits, how these initiatives can be replicated, key start-up steps, and the need for private, public, and non-profit sector support. We highlight, for instance, the importance of having trained operators, as nothing will doom small-scale composting as much as a perception of odor and critter problems. The guide is not intended as a manual on the science or art of composting. Nor does it address how to reduce food waste at the source or rescue edible food, both of which are priorities over composting. Rather it addresses how to promote locally based small-scale composting programs, the middle of the food scrap recovery hierarchy (see page 6).

There are many models of community composting. Community composting can involve a range of activities: school programs that introduce the importance of composting



¹ US EPA, Office of Resource Conservation and Recovery, Municipal Solid Waste Generation, Recycling and Disposal in the United States, Tables and Figures for 2012, February 2014. Available online: http://www.epa.gov/waste/nonhaz/municipal/pubs/2012_msw_dat_tbls.pdf.

and healthy soil to school vegetable gardens; entrepreneurs offering collection and composting services within certain neighborhoods; farmers accepting materials from their communities; community drop-off networks; demonstration and training sites that engage community leaders to start their own composting, and more. Each type of activity could justify its own dedicated toolkit.

Here we connect these programs by their common threads. The guide addresses, for instance, the types of materials composted, collection methods, common composting systems, operator training, controlling odors and critters, partnerships, managing volunteers, outreach and education, and using compost.

The guide is divided into six parts:

- Part 1 summarizes what composting is and why it is important, and defines the principles of community composting
- Part 2 describes commonly used composting systems.
- Part 3 provides 31 profiles of a wide range of community

Hierarchy of Food Scrap Recovery

- Source reduction
- Edible food rescue
- Food to animal feed
- Residential backyard composting
- Small-scale, decentralized and locally based composting
- Centralized composting (or anaerobic digestion) at far-away sites

composting initiatives. Several of the programs featured are located in Vermont, where the Highfields Center for Composting is based and where it is actively promoting community-based initiatives. The Institute for Local Self-Reliance (ILSR) has augmented the Vermont models with exemplary programs from around the US.

- Part 4 outlines 12 steps to consider when planning your own project.
- Part 5 shares tips for replication from our model programs.
- Part 6 concludes with suggestions for how food scrap generators, local solid waste planners, and other stakeholders can support community-based composting.

Further resources can be found in the Resources section (page 120).

We welcome feedback on this guide and invite community composters to share their lessons learned and tips for replication. We envision this toolkit as a living document to be updated and augmented with web-based resources.

Please send your comments and questions to:
communitycomposting@highfieldscomposting.org or
communitycomposting@ilsr.org

Rot on!

A Word about Our Research & Methodology

The Institute for Local Self-Reliance identified and surveyed more than 40 community composting programs in the US in fall 2013. More than half participated in the online survey, which solicited basic information on programs such as materials composted, composting method in place, number of workers and volunteers, and volume of material composted, as well as challenges and tips for replication. We then followed up with select sites to gather more information on program highlights and lessons learned and to ensure we had a cross section of program types and areas of the country represented. Highfields Center for Composting then augmented ILSR's survey data with its direct involvement in and knowledge of community-based composting programs in Vermont. These latter programs describe a range of model rural programs.

Part 1: Why Community Composting?

Composting can take place at many levels – backyard, block, neighborhood, schoolyard, community, and regional – and in urban, suburban, and rural areas. There are many methods and sizes. Large-scale centralized facilities can serve wide geographic areas and divert significant quantities of organic materials from disposal facilities. Composting locally at the neighborhood or community-level yields many other benefits: improved local soils, more local jobs, greener spaces, enhanced food security and fewer food deserts, less truck traffic hauling garbage, and increased composting know-how and skills within the local workforce that is reinforced in the next generation. When composting is small-scale and locally based, community participation and education can flourish.

In community composting programs, resources are recognized and managed as community assets. These programs are typically characterized by local control and community access but not necessarily community ownership. Organic materials and nutrients remain and are cycled within the community. The composting systems developed are scale-appropriate to a discrete geography. Community composting involves a relatively small-scale system in which material is converted into compost within a local community. The programs featured in this guide range in size but are united in their intent to serve a given community within a closed loop system. Many but not all community composting programs are non-profit mission driven enterprises. The distinguishing feature of community composting is keeping the process and product as local as possible while engaging the community through participation and education.

Community composting programs are those that strive to meet six core principles.

Guiding Principles:

1. **Resources recovered:** Waste is reduced; food scraps and other organic materials are diverted from disposal and composted.
2. **Locally based and closed loop:** Organic materials are a community asset, and are generated and recycled into compost within the same neighborhood or community.
3. **Organic materials returned to soils:** Compost is used to enhance local soils, support local food production, and conserve natural ecology by improving soil structure and maintaining nutrients, carbon, and soil microorganisms.
4. **Community-scaled and diverse:** Composting infrastructure is diverse, distributed, and sustainable; systems are scaled to meet the needs of a self-defined community.
5. **Community engaged, empowered, and educated:** Compost programming engages and educates the community in food systems thinking, resource stewardship, or community sustainability, while providing solutions that empower individuals, businesses, and institutions to capture organic waste and retain it as a community resource.
6. **Community supported:** Aligns with community goals (such as healthy soils and healthy people) and is supported by the community it serves. The reverse is true too. A community composting program supports community social, economic, and environmental well-being.

Community composting programs in rural areas may differ from those in urban or suburban sites. In densely populated New York City, for instance, where a vibrant and diverse community composting network is blossoming, some are defining locally based compost as within 10 square city blocks, meaning you should be able to find a community compost site within 10 blocks of your home.



Compost builds community! (Photo: NYC Compost Project)

“Composting can take place effectively in a wide range of scale and sizes: small backyard bins, community gardens, onsite systems at schools and hospitals, rural and urban farm-based operations, and large low-tech and high-tech regional facilities. Smaller composting facilities have a higher job-to-ton ratio. In Maryland, on a per-ton basis, small-scale composting facilities employ 6 times the number of jobs as landfills and 11 times more than incinerators. Communities embracing a decentralized and diverse organics recovery infrastructure will be more resilient and will better reap the economic and environmental benefits that organics recovery has to offer.”

– Key finding from Brenda Platt et al., Institute for Local Self-Reliance, “Pay Dirt: Composting in Maryland to Reduce Waste, Create Jobs & Protect the Bay” (Washington, DC: 2013).

highly participatory process. Stakeholders across the private, public, and nonprofit sectors came together to form an informal coalition. There were many public meetings to get input from farmers, activists, students, and others in order to build infrastructure and programs around community assets. This groundwork for success was laid by the work of many groups, organizing over a decade, including: Farm to Plate, Rural Vermont’s Council on the Future of Vermont, Zero Waste by Central Vermont Waste District, Toxics Action, Vermont Agency of Natural Resources, and more.

In sparsely populated rural areas, locally based composting could entail producing and using compost within a 50-mile radius of where the materials are generated. The level and flavor of public participation differs too. The emphasis on public participation and recruiting volunteers is strong in urban areas among urban farms and community gardens. Community engagement in rural areas may more typically be characterized by partnerships among farms, schools, food scrap generators, non-profits, and government waste districts.

In rural Vermont, for instance, community composting programs have arisen from a

Community-scale composting will unlikely be able to recover all organic materials discarded. For instance, urban sites may not want food scraps. Organic farmers may not want compostable plastics. Municipal and commercial sites can frequently process a wider range of materials, and may likely be needed to reach high diversion levels. But public policy ought to favor the development of community-based composting sites to recover as much “waste” as possible and to do so in a way that ensures high-quality compost at well-managed sites that pose no public nuisances.

By encouraging locally based composting, policymakers will ultimately strengthen the public’s commitment to all forms of recycling, improve the quality of compost produced, and build support for and proper participation in municipal or county residential collection programs. Educated citizens directly composting and growing local food, and benefiting from greener neighborhoods, will likely sort their compostables with greater care, thus reducing the level of contaminants. Moreover, community-based composting is an ideal form of recycling, approaching the way ecosystems naturally function: few resources are lost from the system, all matter that was once alive is returned to the earth to support new life. It reduces truck hauling for managing garbage and for providing food. By supporting local food production, the distance between the food producer and the eater can be narrowed. Finished compost is more readily available for growing food by households, urban and rural farms, community gardens, and school gardens. It is also available for low-impact development and green infrastructure such as rain gardens, green roofs, green streets, and bioswales – all best management practices for controlling stormwater. In short, community composting builds more resilient and sustainable communities.

What and Why Compost?

Compost is the dark, crumbly, earthy-smelling material produced by the managed decomposition of organic materials. It is a valuable soil conditioner. Compost adds needed organic matter to soil, sequesters carbon in soil, improves plant growth, conserves water, reduces reliance on chemical pesticides and fertilizers, and helps prevent nutrient runoff and soil erosion. It also reduces the volume of materials that might otherwise be disposed in landfills or trash incinerators such as leaves, grass clippings, brush, garden trimmings, wood, manure, and food scraps, and recycles them instead. And it can benefit local economies. On a per ton basis, composting employs four times more people than landfills or incinerators.¹ Advancing composting and compost use in the US is a key sustainability strategy to create jobs, protect watersheds, reduce climate impacts, improve soil fertility, and build resilient local economies.

¹ Brenda Platt and Neil Seldman, *Institute for Local Self-Reliance, Wasting and Recycling in the United States 2000* (Washington, DC: 2000), p. 27; also see, Brenda Platt et al, *Institute for Local Self-Reliance, Pay Dirt: Composting in Maryland to Reduce Waste, Create Jobs & Protect the Bay* (Washington, DC: 2013).

“Local as possible is still best even if there’s no choice but to centralize some of the rest. That does not mean we choose large or small. That means we work hard to develop as much capacity as we can on the neighborhood or community level, and then, for the remaining organics left to manage, we welcome and are grateful for key partners in organics recovery, such as environmentally responsible municipal curbside pickup programs, commercial haulers, and large-scale organics recyclers.”

– David Buckel, Red Hook Community Farm, Brooklyn, NY (BioCycle, June 27th, 2013)

Tom Gilbert checks the pile at Highfields Center for Composting in Wolcott, Vermont.



Benefits of Community Composting

Raises Awareness

- Exposes community members to the concept of source-separation of food scraps
- Educates children and the general public about composting, how it is done, and how it can be incorporated into everyday life
- Creates advocates and the necessary leadership for changes in policies, laws, and regulations
- Prepares the next generation for full-scale composting as part of our way of life

Environmental Benefits

- Creates a rich nutrient-filled soil amendment
- Enhances soil fertility
- Improves soil structure, thus reducing stormwater runoff and soil erosion
- Substitutes for energy-intensive fertilizers, pesticides, and fungicides
- Improves plant growth, and thus carbon sequestration
- Reduces waste
- Protects the climate by cutting landfill methane emissions and creating a carbon sink in soils
- Reduces vehicle emissions by decreasing transportation distances between material generators and compost producers and users

Community Benefits

- Allows for a neighborhood level, local operation
- Builds the culture and know-how of composting in the community
- Keeps resources and money changing hands within the local community
- Builds healthier local soils
- Promotes human-scale technology, instead of large capital intensive systems
- Supports locally-grown, healthy food production, and “closed-loop” systems



Community composting prepares the next generation for full-scale composting as part of our way of life.

Local Government Benefits

- Diverts materials from landfills and incinerators
- Allows management of organic materials close to the source
- Meets local directives for recycling and waste reduction
- Extends life of regional landfills, avoiding cost and environmental impact of new disposal facilities
- Helps reduce public and private sector solid waste management costs
- Builds support for local municipal composting programs
- Offsets stormwater costs (when compost is used in low-impact development)

Local Economy, Jobs Training & Employment Benefits

- Stimulates and diversifies local economies by supporting local small-scale enterprises
- Encourages local training, volunteering, and employment opportunities
- Sustains more jobs on a per-ton basis than landfilling or incineration
- Helps urban and rural farmers diversify farm products and increase farm income
- Supports new businesses in green infrastructure and low-impact development (e.g., rain gardens, green roofs, conservation landscapes, and bioswales)



Highfields Center for Composting in Hardwick, Vermont

Why is community participation and education a necessary component of community composting?

by David Buckel, Red Hook Community Farm, Brooklyn, NY



Involvement of community members in the work [of composting] has many positive features. First, for some sites it may be the only way to get the work done. Second, community composting is an unusual opportunity in the recycling world for individuals to create something of value for their community with their own hands. After seeing up close how food and other discards turn into black gold for greening their streets, parks, school gardens and urban farms, many participants walk away thinking “how can we not be doing this as much as possible?” Thus many community composters believe their work is the gateway to the bigger realms of recycling and sustainability. Working toward this broader goal helps to generate more leaders and helpers in a community willing to give the extra time and effort required for community composting to succeed. Many participants also value the opportunity to build community by forging new relationships at the compost site that can widen support networks and trigger collective action on other issues of concern in the community. And at the micro level, picking through a mass of materials to extract inorganics – like twist ties and rubber bands and stickers – develops a culture of mindfulness regarding source separation for all forms of recycling.

In addition, community participation and education may be instrumental for persuading city officials and foundations that taxpayer and private funds are appropriately spent on community composting, although at the same time it is important for sites also to develop revenue streams to ensure a diversely solid financial sustainability (e.g., charges for inputs or for finished product).

All this is not to diminish the value of a compost site that merely diverts organic resources from landfill, with no community participation and education, because the bare benefit to the environment for future generations is part of the rationale for community composting as well. But to inspire leaders/helpers, persuade potential funders, and otherwise foster a widened stewardship of the environment through all forms of recycling, community participation and education are a necessary component of community composting.

Note: While David Buckel wrote the above with urban community composting in mind, community engagement is also a vital component of suburban and rural community-based composting.

Part 2: Composting Systems

The phrase “compost happens” is true. Organic matter decays. This is a natural phenomenon that happens with or without people. Nature disperses nutrient rich materials abundantly, however, humans tend to concentrate them on scales far greater than nature ever would, requiring a thoughtful and managed approach to rot. This is how composting came to be. Through rigorous science and the process of trial and error, various approaches and technologies have been developed to best manage the composting process.

There are many types of composting systems, large and small, and everything in between. Regardless of size, well managed composting systems share a few components. Adequate microorganisms and necessary to digest organic materials, as well as adequate oxygen, adequate moisture, adequate food for microorganisms (that is, a balanced carbon to nitrogen ratio), diversely sized food particles that provide pore space for oxygen to travel, and an adequate volume of material to best allow the microbial population to grow and thrive (usually a cubic yard or more). Food scraps represent materials high in nitrogen; thus, any food scrap composting program must find adequate supplies of carbon-rich materials such as wood chips, straw, leaves, and brush. In addition, compost needs time and space to stabilize and mature after an initial phase, typically characterized by high temperatures, and frequent monitoring and management.

Several basic types of composting configurations are used by community-scale and farm-scale operations:

1. Turned windrow composting
2. Bin systems
3. Aerated static piles
4. Passively aerated static piles
5. In-vessel
6. Static piles
7. Vermicomposting

These systems, which are not mutually exclusive and can be used in combination with each other, are summarized below. Table 2 (Part 3, page 29) lists the composting systems and estimated volumes handled by select community-based operations. Note: this guide is not intended as a manual on the art and science of composting, or as a comprehensive evaluation of the myriad systems available. We recommend all community compost sites have volunteers and operators trained in the best management practices of composting. (See Resources, page 120, for training resources.)

Turned Windrows

» *Growing Power, Red Hook Community Farm, Farmer Pirates Cooperative, Earth Matter NY, Lower East Side Ecology Center*

By far the most common technique for composting beyond home scale is the turned windrow method. A windrow is an elongated pile, which is generally turned or “rolled” from the side with a bucket loader, tractor, or a specially engineered machine called a windrow turner. Windrows can also be turned by hand. The long shape of a windrow makes the piles easy to turn and provides surface area for passive airflow into the compost. Windrows also provide a simple



Building a windrow by hand at Red Hook Community Farm (Brooklyn, NY)



Celebrating a finished windrow built at Red Hook Community Farm (Brooklyn, NY)



Tractor turned windrow at Highfields Research & Education Site. See: *Compost Pile Turning video in Highfields Resource Library.*

means to organize a compost site, by combining and tracking materials of a similar age in a scalable volume.

Several of New York City's community composting sites started with manual turning of windrows. Teams of volunteers with shovels would get together to turn a windrow and take part in the action of managed composting.

Some sites now use skid-steer loaders for turning (e.g., Earth Matter and BIG! Compost) and are permanently staffed with 5-day workweeks. Red Hook Community Farm continues to hand turn piles. Avoiding machines when possible can help some programs meet their core goal to use sustainable practices. In addition, when machines are introduced, volunteers may disappear, undercutting public education and engagement goals.

Like the bin systems described below, human-turned windrows lend themselves to engaging volunteers. Windrow systems may allow larger amounts of materials to be handled than in bin systems. Instead of managing 2-person teams, sites may have

10-person teams turning and managing windrows with low-cost equipment such as wheelbarrows.

Bin Systems

» *DC Public Schools, Earth Matter NY, Lower East Side Ecology Center, NYC Compost Project*

Composting in bins is probably the most common style for backyard home-scale systems. The concept applies to larger volume systems as well; bins are commonly used for demonstration sites, community gardens, neighborhood drop-off networks, and K-12 schools. Composting material is contained in a wire bin, a bay with sides, or any number of configurations that provide walls to support the compost pile in order to fit more materials vertically into a smaller space. The material is turned for aeration and can be accessed from an open side or a door/hatch for loading and unloading.

Container-based bins can be plastic and take different sizes and shapes. Many of the systems designed for backyard use are roughly the size of a garbage can and may look like a tall box.

They require the user to aerate the contents by some means, either dumping out everything and turning it back inside, or using a pitchfork or specialized auger on the inside. Materials in bins with volumes less than 3'x3'x3' will not heat up to the 120-150 degrees F considered optimal for well-managed systems. "Cube-based" bins – typically at least 3'x3'x3' – are larger in size than containers and can more reliably achieve the volume necessary for the material to heat up, which reduces pathogens and seeds and accelerates decomposition. While several off-the-shelf brands are available for container-based bins, cube-

Bin system at the Craftsbury, VT Outdoor Center



based bin systems are typically custom built (many open-source designs exist). They are commonly made from wood and chicken wire or hardware cloth, and can be constructed from repurposed materials such as pallets or concrete blocks.

Many community-based sites choose a bin system because it is easy for inexperienced or untrained volunteers to use. Once a bin is full, it is considered a “batch” and no new material is added to it unless the recipe needs adjusting. Each batch is rotated to the next bin, which is typically how the pile is turned.

It is common to have three bins, with the first bin being the place where fresh material is added. Once the first bin is full, a batch is done, and it gets turned into the second bin, and then into the third bin in a constant succession based on the rate of input.

At sites in cold climates like Vermont, insulating the bins can be effective at maintaining high temperatures even in the dead of winter (see *Designing a Bin System for Hot Composting*, www.highfieldscomposting.org).

Bins can be utilized on large scales too, often as a way to organize aerated static pile (ASP) systems. The concept is the same;

A Word about Regulations and Facility Management Requirements

Rules governing composting vary from state to state. Many states that recently revised their permitting requirements for compost operations have exemptions for small-scale and on-farm sites. But many states require all sites to meet performance-based standards, meaning operators shall not create public nuisance odors, generate pathogens, or pollute groundwater or surface waters. The Institute for Local Self-Reliance and Highfields Center for Composting recommend that trained operators manage all compost sites.

maintain distinct batches and use space efficiently by containing material vertically on less of a footprint. In such instances, the aeration pipes are commonly placed at the base of the bins, often in trenches. A large version would be a concrete box with one end open to allow for a bucket-loader to add or remove materials.

Below: Kompost Kids have designed their own 3-bin system built from pallets with a few innovations. They line the bins with filter fabric (which is used in sewers), and use sliding rods (right photo) to hold the doors in place and to facilitate ease of removal. Both innovations make the bins more volunteer-friendly.





Myrtle Village Green, 3-bin system with corrugated metal top and gravel pad

Cats add additional rodent control at the Highfields Center for Composting.

Odor and Rodent Considerations

For community composting, particularly in urban areas, addressing odors and rodents are a paramount issue. In-vessel systems from small tumblers to larger rotating drums are generally viewed as having an advantage over open systems in their ability to control odors and be rodent proof but proper management is the key for all systems. Adequate aeration or oxygen is essential for optimizing the composting process and preventing it from going anaerobic, which can produce nuisance odors. No matter what system is utilized, operators need to ensure adequate aeration.

Windrows that are well-constructed (with a good seal of finished compost) and well-turned (on a schedule that prevents anaerobic conditions) have minimal odors. They are fully exposed, and thus easily accessed by rodents. But if constructed well—scrupulously incorporating all bits of food that may have rolled away from the pile and then sealed to a uniform depth of at least 6 inches—rodents are less interested. And if placed well, with open space all around that makes rodents nervous about predators, and turned well so rodents see no opportunity for a habitat, windrows have the potential to be more rodent-proof than bins wrapped in ¼-inch hardware cloth.

Bins and containers that are well-filled (with good blending of

nitrogen-based and carbon-based material) and well-turned (on a schedule that prevents anaerobic conditions) have minimal odors. Note that for plastic containers, turning material can be frustrating, because it either has to be dumped out or assiduously augured. Further, bins or containers need to sit on a foundation that addresses any “contact water” (water that has come in contact with the active composting process). On cement, for instance, contact water can be spotted and soaked up quickly with wood shavings that are incorporated back into the bin. If a foundation, like bare earth, soaks up contact water, over time it can smell. Rodents are challenging as they chew through wood and plastic, and may take up a habitat under the bin/container even if they are unsuccessful at getting to the food. To prevent access to food, bins need a full wrap of at least ½-inch hardware cloth, including the top hatch (rats will climb the sides to get in through the top). To prevent habitat formation at the base where it’s nice and warm for rodents through cold climate winters, bins need a barrier (like cement, a dug-out pit with sand, or something else inhospitable). Plastic containers need the same things, but rats can still chew through the plastic, so for the same money (after all the hardware cloth) it may be better to get a tumbler that is rodent-proof and easier for turning material.

Source: David Buckel, Red Hook Community Farm, Brooklyn, New York (personal communication, March 20, 2014). Also see David Buckel, “Guidelines for Urban Community Composting, Part A: Getting Past Odors and Rats.” BioCycle, 2013, available online at: http://www.biocycle.net/communitycomposting/docs/bccc_buckel.pdf

Aerated Static Pile (ASP)

» *ECO City Farms, Red Hook Community Farm, Earth Matter NY*

Aerated static piles (ASP) are compost piles with perforated pipes or ductwork underneath that are actively aerated with blowers to pull (negative aeration) or push (positive aeration) fresh air through the material. The ductwork distributes airflow evenly throughout the material. Controls such as timers and temperature sensors are used to operate the fans, which supply fresh oxygen to microbes as well as cool the material if need be. ASP systems can be small- or large-scale, and can be custom built or purchased as fully engineered systems. There are significant benefits that can come with ASP systems and, as is the case with more complex composting systems, a significant learning curve as well. Operators find temperature and moisture control to be some of the most challenging factors to manage, which is why some turning is still advisable.

ASP systems require monitoring and access to electricity (and ideally to water), but once the pile is built, there is less need to get on a tractor, windrow turner, or to shovel to provide aeration. ASP systems can save labor and equipment costs over time, and are space efficient. The active aeration helps the microbes do their job quickly, thus shortening the composting process by months. Some even cut the time in half. This means that finished compost can leave the site faster or be consolidated into less space, leaving more room for new material, thereby increasing the throughput capacity. A second space saving factor is that the material in ASP systems can be piled very closely, because there is less need for “work space,” which is the space where people and equipment move in managing the material. Material can be stacked up against other batches of material. Ultimately this adds up to a great deal of efficiency in space and time.

Another advantage to ASP systems is that food scraps stay contained giving them time to break down before they are exposed through turning or moving the material. This reduces the likelihood of attracting birds or other critters, which can become nuisances or vectors. Well-designed and managed systems can also control pile temperatures in the ideal range of 140-150 degrees F. In addition, most ASP systems have a “biofilter,” which is a layer of natural media such as finished compost or high carbon material. With negative aeration, an external biofilter is created; the air is pulled through the pile and then through the biofilter. The biofilter can be several feet deep and long. With “positive aeration,” a biofilter layer is used to cap the surface of the pile. Either way, by filtering air from the active composting process through the biofilter, the chance for nuisance smells are reduced.

ASPs can have some downsides too, especially for community composters. Problems with particle size, moisture levels, and homogenization are harder to fix in an ASP system than in a turned windrow system. The external biofilter has to be much thicker than for turned windrows. The ASP process requires more work upfront to prepare the material, and in winter the blowers can kill a pile if they are pushing through ambient air that is too cold.



Top: An aerated static pile. Middle, bottom: BIG! Compost NYC's passive aerated static pile, located under a bridge (NYC).

Passively Aerated Static Pile

» *BIG! Compost NYC, Farmer Pirates Cooperative, Roots Composting LLC*

Passive aeration of compost is the process that all composting methods rely on when not being actively aerated through turning or forced aeration with blowers. This process relies on the porosity of the compost's "organic matrix" and the processes of convection and diffusion, which is why large particles that create a porous architecture are such an important factor in any

composting recipe. As compost heats, it creates a "chimney effect," pulling fresh cool air into its base passively (e.g. without mechanization such as blowers).

Designing the base of the compost pile so that it assists this natural process is often called a passively aerated static pile. Designs are highly variable and can be as simple as piling the material on a pile of course wood chips (which can have as much as 50% pore space) or building air channels with ductwork as one would with an ASP system. Small bin systems are often built on wooden pallets or flooring, which is itself a form of passive aeration. Particularly with larger systems that are serving the public, make sure that the channels are not providing an access point for critters. Cover the ends of plastic pipe with hardware cloth for example, allowing for air to flow while blocking rodents. As with every system, turning periodically will decrease the likelihood of critters taking up residence. Turning will also speed up the process and will create a more uniform and finished feeling product.

Earth Tub in-vessel compost system at Philly Compost (Philadelphia)



Richard Hudak, farmer and designer and Brenda Platt of ILSR with the Green Drum Composter during its development at the Hudak Farm (see Lake Region Union School, profile, p. 70).



While static piles are commonly used in community gardens, urban farms, and other community-based projects, we do not recommend passively aerated compost that does not involve turning. "Controlled" composting optimizes efficiency and quality and minimizes odors and rodents. No reputable urban composter would leave a pile unturned. Red Hook Community Farm and the BIG! Compost site, for instance, both use turned windrows in addition to ASP windrows (Red Hook's are solar-powered). Windrows are used in both cases, one set with passive aeration and the other with forced aeration.

In-Vessel Composting

» *Philly Compost, University of Louisville (repurposed dumpsters), Lower East Side Ecology Center, Lake Region Union High School, University City District/The Dirt Factory, University of Maine*

In-vessel systems are enclosed systems, which on a small scale would include plastic tumblers and on a large scale would include rolling drums, containerized ASP systems, and several auger turned systems, to name just a few. In-vessel systems come in many forms, but will either be continuous flow or batch systems. Batch systems would require more than one unit if a constant input of food scraps is being added, so that fresh material is not being added to batches that are almost complete and ready for unloading.

Small-scale tumblers are often recommended for urban residential settings. They are also useful as transitional storage units for materials dropped off by walk-ins. For big sites, tumblers will not work for finishing the product. Often manufacturers' claims about how little time it takes to produce a mature compost have to be ignored.

Food Scraps Can Be Used as an Animal Feed

With the increasing focus on food scraps as a resource rather than a waste, comes greater recognition and interest in using food scraps collected from communities to feed animals, most often chickens. The practice of feeding scraps to animals was in fact the norm (and still is in many places) up until very recently in our history. There is no better use from an environmental and food production perspective than to get the material right back to a local animal. Some conscientious consumers prefer buying eggs fed on human food, recognizing both the environmental and health benefits from avoiding entirely grain-based diets. Feeding laying hens food scraps is the focus here, because of questions raised about feeding food scraps to meat birds and hogs. Both have pathogen risks that are not entirely absent with laying hens, but considered safe based on what we know about chicken biology. In some states (such as Vermont), feeding food scraps to hogs that may have come into contact with meat or are not first pasteurized is illegal. Check local laws before feeding community scraps to hogs.

There are many approaches to feeding laying hens and the approach chosen will depend on location and scale. The system needs to take into account the laying operations and a method for frequently removing uneaten scraps for composting. Vermont Compost Company is well known for feeding hundreds of chickens without grain for years. It starts by making compost with the food scraps first, then letting their birds forage on the compost. Others have a feeding area with bedding and remove the bedding and food scraps for composting at a nearby location.



Top: Continuous flow vermicompost bed at the Highfields Center for Composting. The 40' x 5' x 2' bed generates ~25 cubic yards of vermicompost a year.

Bottom: A handful of red wigglers at Red Hook Community farm.



In the more high-tech systems, oxygen, moisture, and temperature can be automatically controlled. In-vessel systems are popular for venues where space is limited. They can take up little space relative to other composting systems and move compost material efficiently. Nuisances such as odors and pests are mitigated through containment, aeration, and biofilters. Most in-vessel systems will require a secondary composting phase, as what comes out of the vessel will not be mature enough for most uses. However, visible food scraps and odorous compounds will be broken down for the most part at this stage. The companies that produce these systems promote the efficiency and control their systems offer. In-vessel systems can also be designed on-site, from repurposed materials, at low cost.

System choice will depend on the scale of the system. Do substantial research. Talk to references who have used the technology before making an investment. The upfront cost will be a roadblock for most community-scale composters, although foundations and other prospective funders may be interested in developing models for small spaces and neighborhoods. Many farms have been using rotating drum vessels for years to manage their organics, including dead livestock. Looking at a range of options as well as researching in-vessel products is advisable.

Vermicomposting (Worm Composting)

» ECO City Farms, Highfields Center for Composting, Compost Club, University of Louisville

Vermicomposting – or worm composting – involves special species of worms decomposing organic materials into a rich humus. *Eisenia fetida*, commonly called red wigglers, is the most popular species of worm for vermicomposting. Vermicomposting is commonly seen at demonstration sites, community gardens, K-12 schools, and universities.

Small worm bins can be purchased or constructed for indoor use, including in classrooms, apartments, and offices. For larger community-based settings such as community gardens or urban farms, a good vermicomposting system requires that the red worms feed off of partially composted materials that have undergone an initial phase of hot composting, which inactivates weed seeds and pathogens. Thus, vermicomposting works well for making upgraded compost.

Worms produce a compost known as vermicompost, which is not straight worm castings (worm excrement), although the two are often confused. Vermicompost is instead a matrix of organic matter, microbes from all levels of the soil food web, and worm castings and is considered higher quality than straight worm castings due to the diversity of organic matter and microbes present. Vermicompost has high levels of plant available nitrogen compared to straight compost and contains natural hormones produced in the worms' bodies that promote desirable traits in plants. People of all ages are also drawn to worms, they love them in fact, and worms as well as the numerous other creatures (springtails, pseudoscorpions) that are visible to the naked eye are excellent for public engagement and education.

An online search will lead you to numerous design concepts and videos about vermicomposting systems, but the simplest from a user's perspective will work with the worms' natural ecology and tendency to feed in the top layers of the soil and go where there is fresh organic matter. Continuous flow vermicomposting beds (often called reactors) are open boxes, usually 2-feet deep and of various widths and lengths. Fresh material is fed at the top of the box or bed and finished material is cut from the bottom with a blade. The worms tend to stay at the top, free and clear of the blade although occasionally worms will make their way out the bottom. To compost a small amount of material, these systems are excellent. The footprint required to process a large volume of compost is prohibitive, unless space is not limited. For this reason, they are not typically an option for larger-scale operations. They generally require cover as well and may require heat depending upon your location (there are worm composters in northern New York State that operate without any additional heat).

Static Pile

A compost pile that is formed and then left completely unturned is known as a static pile. They are constructed on the ground without any equipment or piping underneath, although they may be covered, for instance, by a tarp. With adequate porosity, the pile may still achieve high temperatures and maintain some level of aerobic activity. A static pile will only function properly if it is receiving sufficient airflow. Lack of oxygen will lead to anaerobic breakdown of materials and the production of methane, a potent greenhouse gas. The pile can be monitored to gauge its progress.

This is an acceptable method for some, but unturned composting would not be adequate where solid waste or organic regulations apply. In general, some level of active management is greatly encouraged to achieve a hot pile that will inactivate pathogen and

weed seeds, deter pests, speed up the process, and educate and engage the public about the art and science of composting.

Static pile composting is not a best management practice for community food scrap composters. We strongly advise against an unturned approach.

“Worm bins can be low-resource wooden boxes, slowly filled until the worms reach the top, and then the worms are harvested from the top and moved to the bottom of an emptied box to start over. My worm harvester is an open wooden box with a screen on the bottom. I place the harvester box, built to be smaller, into the worm bin box, and load it up with fresh material. I just leave it for a week and the worms make their way up through the screen. I pull out the harvester box, tip the worms into a new worm bin box, and then shovel out the vermicompost left behind in the first worm bin box.”

– David Buckell
Red Hook Community Farm, Brooklyn

Top: The Compost Club (CA) makes worm bins that are two feet tall with corrugated plastic culvert pipe sides and plywood tops and bottoms. A layer of landscape fabric is topped with 3-4 four inches of angled 1½ inch driveway rock to provide sufficient drainage. Holes also are drilled in the bottom, and the bins are raised to prevent rotting.

Bottom: “Worm Power Fertilizer” is a bag of worm castings sold by Growing Power (Milwaukee).





SPOTLIGHT: Energy from Organics

Organic matter is full of carbon and therefore energy. This energy can be captured and released through a variety of systems, described briefly here.

Compost Heat Recovery – As aerobic microbes consume organic materials in the composting process, their metabolism generates heat, which is released into the surrounding environment. What if that heat could be captured and put to work? Several composters around the country have developed new approaches to do just this. Agrilab Technologies, Inc., a Vermont-based company, has developed a compost heat recovery (CHR) system that involves a negative ASP system pulling heat and vapor from hot compost, then using a patented heat exchanger to transfer that heat into water. This system was based on the earlier work of pioneer Bruce Fulfurd at the New Alchemy Institute and with City Soil and Greenhouse. The prototype pushed the heat and vapor into a biofilter or planter bed to supply CO₂ and heat

to a greenhouse. This type of compost heat recovery is both scalable and economical.

Other heat recovery models include the “Jean Pain” Mound, and a containerized ASP system developed by dairy farmer, Conan Eaton. Vermont has literally become a hot bed for compost heat recovery systems and prototype development. The Highfields Center for Composting has a project to Hack the Heat at our research and education facility. Several other systems are in various stages of development.

Biodiesel & Waste Oil – Utilizing waste cooking oils, fats, and greases to run diesel engines is now a widespread practice and a great use for a byproduct that has energy value, is available locally, and is not a desirable feedstock to many community-based composters (although compostable). Waste oil can be processed into biodiesel fuel. Alternatively, with the right system, engines can be run directly off of waste oil.

Anaerobic Digestion – Microbial degradation of organic matter without oxygen, or anaerobic decomposition, produces different byproducts than aerobic composting. One of those byproducts is methane (CH₄), a flammable gas with high global warming potential. Cutting greenhouse gas emissions is one critical reason to keep organics out of anaerobic landfills. The controlled process for anaerobic decomposition, called anaerobic digestion (AD), captures methane for use as a fuel. Technically and biologically, AD is more complex than composting. A very specific type of microbe called methanogens generates methane, and the process involves handling and combusting a flammable and potentially corrosive gas. Nevertheless, AD is a widespread practice on a large scale in northern climates, and on a small scale in many warmer parts of the world, where proper temperatures for methanogens can be easily maintained (~100 F) at a small scale. There are also a growing number of small-scale AD models in the US, although very few would correspond in scale and scope to the community composting models covered in this guide. There is a growing interest in capturing food scraps as a feedstock for AD. Potential benefits and challenges are highlighted in Table 1, opposite page.

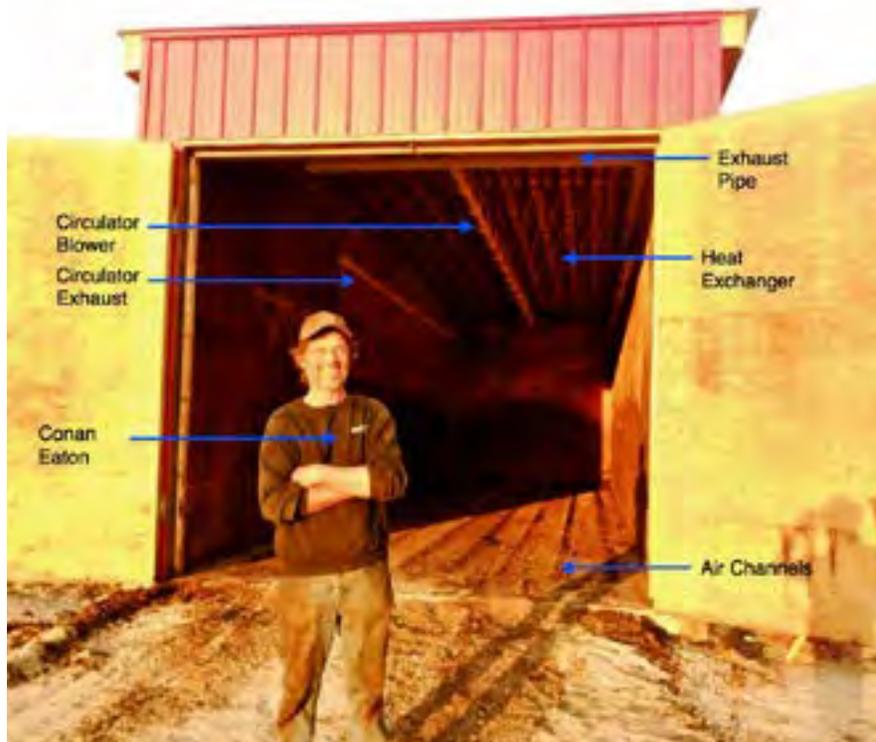


Table 1. Utilizing Anaerobic Digestion for Food Scrap Recycling

Potential Benefits	Potential Challenges
<ul style="list-style-type: none"> • Renewable form of natural gas • Many digesters have available capacity • Retains nitrogen in digestion process • Waste heat from generator for on-farm • Adds efficiency to manure “destruction” • Digesters may not charge tipping fees for receiving food scraps 	<ul style="list-style-type: none"> • Pathogen management post digester • Requires extremely clean, pulped food residuals • Preprocessing could add costs in capture, collection, and transport • Biological oxygen demand (BOD) destruction “efficiency” determines greenhouse gas (GHG) offset values • Nitrogen loss post digester depends on effluent management strategies • Clean food residuals may be contaminated by other feedstocks in digester (e.g., municipal sludge) • Soil application of effluent returns little carbon to soil and may be limited to certain crops depending on AD feedstocks



On-farm AD system currently handles liquid food wastes, but is considering adding slurried mixed food scraps in the future.



The AD unit's electric generator is powered by methane produced with liquid dairy manure.



Waste heat from the generator is used to heat this greenhouse, which produces salad greens which are marketed to a local restaurant.

Part 3: Model Programs

Farmer Richard Hudak surveys the turned windrows that he uses to compost food scraps for Close the Loop! St. Albans.



Community composting is thriving. This section profiles 31 model programs in 14 states and the District of Columbia. Several of the programs featured are located in Vermont, where the Highfields Center for Composting is based and is actively promoting small-scale community-based initiatives. The research conducted by Highfields on composting projects in Vermont is augmented by the work of the Institute for Local Self-Reliance, whose findings expand the scope and range of composting projects we have included herein. The programs featured demonstrate the range of activities possible from demonstration/training sites to pedal-powered collection systems, worker-owned cooperatives, and farms employing multiple composting techniques.

We categorize these programs into 10 main types, generally based either on the type of venue (such as school or farm) or the type of operation (such as collector or composter):

1. Community gardens
2. Farms
3. Schools
4. Drop-off networks
5. Collection entrepreneurs
6. On-site composters
7. Off-site composters
8. Demonstration and community leader training sites
9. Worker-owned cooperatives
10. Home-based or homesteader hubs

These categories do not intend to imply, for instance, that all schools or farms

are community-based, nor that a farm or drop-off network comprises the entire program. Rather, community-based initiatives can take place at schools or farms and involve collection entrepreneurs or worker-owned cooperatives. Further, many programs defy categorization as they represent an amalgamation of types.

The Close the Loop! St. Albans initiative, based in Northwestern, Vermont (see profile p. 53), for example, is an innovative partnership involving schools, a local farm, the solid waste district, and a non-profit. Youth initiated the vision. The non-profit conducted outreach and training of food scrap generators, provided compost site design, and helped with permits. The solid waste district collects food scraps from local schools and businesses and delivers the material to a local farmer, who composts it and uses the finished product to add organic matter and nutrients to his vegetable and berry crops.

Growing Power is another model that is not easily labeled. Based in Milwaukee, it is a national non-profit organization and land trust whose mission is to support people from diverse backgrounds, and the environments in which they live, by helping to provide equal access to healthy, high-quality, safe and affordable food for people in all communities. Growing Power implements this mission by providing hands-on training, on-the-ground demonstration, outreach and technical assistance through the development of community food systems that help people grow, process, market and distribute food in a sustainable manner (see profile, p. 36).

Tables 2 and 3 (pages 29-31) list the core features of more than 40 community composting programs we identified when conducting research for this report (included are the 31 profiled communities). Table 2 lists programs by state

and identifies the composting systems and estimated volumes handled. Table 3 identifies the programs by type and lists them in the order in which they began operation.

With more than 200 community composting sites and 8 to 10 mid-size operations in five boroughs, New York City is a unique example. Much of this work has been supported by the NYC Department of Sanitation's NYC Compost Project. Like the city itself, diversity characterizes these initiatives. Some sites accept food scraps from the local community. Others only accept from their garden members. (New York City is home to more than 600 registered community gardens, some of which compost food scraps on-site.) Several sites are connected to an urban farm or a non-profit dedicated to collecting and processing food scraps. Land used for composting could be privately owned, publicly owned and managed by the City or State, or a land trust established by a private donor. A few community sites in New York City process organics from the general public collected at NYC farmers' markets, called Greenmarkets. The nonprofit GrowNYC started the Greenmarket Food Scrap Collection program, which allows residents to drop off their food scraps at 35 of the 54 GrowNYC Greenmarket locations. The scraps go to local community compost sites, which can handle more than 100 tons per year. Many are affiliated with the New York City Compost Project, which is managed and funded by NYC's Department of Sanitation. Called Local Organic Recovery Programs (LORPs), they include: the Lower East Side Ecology Center, the Red Hook Community Farm, Earth Matter, and BIG! Compost.²

Grassroots organized food scrap composting efforts are at the core of the community composting movement. These efforts usually involve multiple partners, but represent composting on a very small scale. For food scrap generators, on-site composting may not be a viable option. One preferable scenario is to divert

their scraps to someone in the community who sees a value in that material, typically a small farm or homestead scale operation. Collection and transport are provided by the generator, composter, or a third party such as a solid waste district. While the food scrap generator is likely to be charged for the service, at this scale, most large commercial haulers would not be interested. Larger community programs grow out of micro scale programs and the power of successful programs at this scale should not be underestimated.

Ten Basic Types of Community Composting

Community Gardens:

Composting is incorporated into opportunities for neighborhood gardening. The community gardeners frequently are allowed to compost their own yard trimmings and food scraps. In some instances, other neighbors and local businesses are allowed to drop off their food scraps on a limited basis. Compost is used on-site to improve soil fertility for growing. Excess compost is given away or donated to other locations where it can be used.

» *Myrtle Village Green (NYC), North Carolina Community Garden Partners*

Farms (Rural and Urban): Many farmers already compost their own crop waste, wood, and livestock manures. Farmers may initiate the development of a composting program to serve the community or community members might approach a farmer (or several) in search of an on-farm composting partner. Urban



ECO City Farms is an urban farm utilizing several composting techniques to produce soil for its produce hoop houses (Edmonston, MD)

²Community Compost NYC website, <https://sites.google.com/site/communitycompostnyc> (browsed March 24, 2013); and GrowNYC website, <http://www.grownyc.org> (browsed March 24, 2013).

farms often involve the community by relying on neighborhood volunteers or by offering training programs.

» *Red Hook Community Farm (Brooklyn), Growing Power (Milwaukee), Farmer Pirates (Buffalo), ECO City Farms (Edmonston, MD)*



Top: The NYC Compost Project's Master Composter Certificate Course trains community leaders to start community compost sites.

Philly Compost offers pedal-powered collection service to neighboring restaurants within a 2-mile radius (Philadelphia)

Schools: School composting programs can take several forms from classroom worm bins and school garden composting to source-separation collection systems combined with a nearby off-site composting operation, often a local farmer. On-site composting done in conjunction with school gardens provides a full soil-to-soil loop that few students would experience otherwise. In higher education institutions, or schools with agriculture or sustainability programs, students may earn academic credit for collecting materials, learning processing methods, doing controlled experiments, or using the compost produced for on-campus horticultural experiments. Even if schools are simply diverting food scraps to be composted off-site, food scrap separation in the school instills

students with a sense of awareness of our food system and waste stream. Further, compost education can be incorporated into the classroom or students can take field trips to the composting site. Regardless of the program, K-12 schools and universities are an excellent place to start community composting. Young composters grow into old composters, and students are instrumental in spreading compost awareness and experience

throughout the entire community. Investment in training and education of today's youth will have a long-term payback for composting efforts in the future.

» *Lake Region Union High School (VT), Compost Club, DC Public Schools, University of Louisville (vermicomposting); University of Maine (Earth Flow)*

Drop-Off Networks: A network of drop-off locations for collection of food scraps within a neighborhood, city, or district is set up by volunteers or one or more community groups. These may involve creating an online map showing various locations within an area, zip code or town where residents may drop off their food scraps for free, often in exchange for minimal volunteer involvement. Some networks are funded by small grants that cover supplies but usually not salaries. Local governments are also supporting networks through their departments of public works or waste management, and may use city employees to collect and process materials. In some cases, the food scraps are composted at the drop-off site. In other cases, the drop-off site is a transfer point and the food scraps are transported to a farm or other operation.

» *Kompost Kids (Milwaukee), NYC Compost, Highfields "Close the Loop" NEK (Northeast Kingdom, VT)*

Collection Entrepreneurs: Small-scale local entrepreneurs collect food scraps – from residences, restaurants, grocery stores, breweries, coffee shops and other sites – by bicycle, trailer, or truck and transport material to a nearby composting operation.

» *Pedal People (Florence, MA), Community Composting of Rochester, NY*

On-Site Composters: Materials are processed into compost at the same location that generates the materials. Compost is used on-site or distributed or sold to off-site users. Schools and community gardens are common on-site composters.

Off-Site Composters: Food scraps and other materials are delivered to a small-scale site for processing. Finished compost is screened and sold (or donated) and primarily not used on-site (distinguishing this model from a farm that is composting). Local residents may become “paying members” and help with some of the more labor-intensive tasks, such as turning and screening. In other cases, worker-owned cooperatives may be formed where everyone is paid. These programs are typically mission-driven and tend to be non-profit operations but can also include small-scale for-profit businesses. Composting can be a small project of a larger community-based organization such as a community development corporation (CDC).

» *Philly Compost, Roots Composting (Flagstaff, AZ), The Dirt Factory/Univ. City District (Philadelphia)*

Demonstration & Community Leader Training Sites:

The goal of demonstration/training sites is engagement, education, and empowerment. Visitors come to learn about composting, and to tour various models of open and closed bin systems they can purchase or build to use in their backyard. The New York City Compost Project runs a robust Master Composter train-the-trainer program at its network of demonstration sites. The heart of the program is selecting and training community leaders in the art and science of composting who then return to their community to start small-scale composting projects.

» *Brooklyn Botanical Garden, Queens Botanical Garden, Wasatch Community Garden (UT)*

Worker-owned Cooperatives: Worker cooperatives (“co-ops”) are businesses owned and run by and for their workers. Like other types of co-ops, they can operate in any industry; many are also democratically self-managed, using a variety of approaches. Collection services companies and composting operations can both operate as worker co-ops. (For more on co-ops, see page 32.)

» *Pedal People (MA), CERO (MA), Roots Composting (AZ), Fertile Ground Cooperative (WI), Farmer Pirates (NY)*

Home-based or Homesteader Hubs: Residents or homesteaders offer their own backyards to compost neighborhood leaves and other materials (such as the products of neighborhood street festivals). Sometimes they may be a community-based project in “start-up phase,” still looking to lease land. There are limits to what can be done at this scale, as a result, for instance, of state and local composting regulations or labor requirements.

» *We Got Leaves (WI), Fertile Ground (OK)*

Collection Barrels from dining halls at the University of Maine Orono





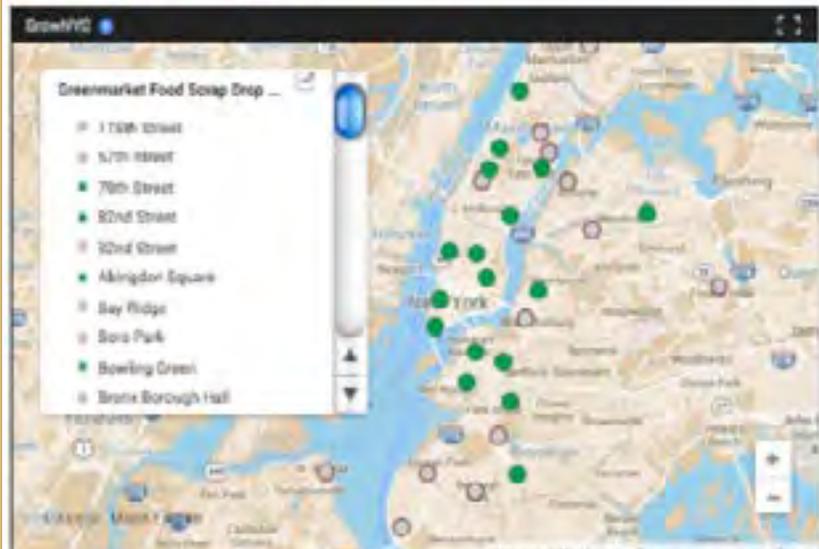
Photo: A. MACKAY/REUTERS + LONDON/PAUL LOVATT

GREENMARKET FOOD SCRAP COLLECTION SCHEDULE

GrowNYC currently offers food scrap collection at 35 Greenmarket locations. Consult our [main compost page](#) for a guide of what we do and do not accept.

Please adhere to the drop-off schedule at each location. Food scraps cannot be accepted after stated hours. All locations are year-round unless noted otherwise.

In case of severe winter weather, markets may close early or be cancelled. Please drop early and check our [blog](#) or [follow us on social media](#) for schedule updates.



Above: GrowNYC started 35 residential food scrap collection locations at its Greenmarkets. Residents can go online for find the nearest site at: <http://www.grownyc.org/compost/locations>

Neighborhood Compost Map

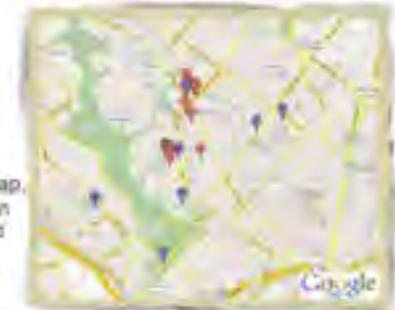
Finding a Composting Site in your Neighborhood

Gardeners and confident composters: share your experience and your bin! You know that the best way to keep organics out of the waste stream is to compost in your own backyard. The reasons are many!

- > no emissions from transporting organics
- > low tech
- > least expensive

"The map is such an awesome resource!"
- unsolicited email, Philadelphia resident

By placing yourself on the Philly Compost Map, you're not only showing overwhelming interest in composting, you'll also help us quantify reduced carbon and methane emissions for our region. The more composters, the better for the planet!



Compost sites on the Map are color coded:

- Shared community sites are **purple**. We ask donors to check with the Site Host before contributing. If your site can accept more organics, or already has more than your household contributing to it, we ask you to share it.
- Private sites are **red**. We ask that everyone check with the site contact before visiting. If your site cannot handle more organics, or is in a hard-to-access space, we suggest you list it as a private site.
- **Yellow** sites are folks that would love to find a shared site nearby. If your compost site is near one of these, please contact that neighbor and share your bin!
- Commercial sites are **green**. We're coming soon to Germantown!
- City sites are **blue**.

To add your site to the map:

- When viewing the map, click on the Edit button along the left side bar. If you don't see an Edit button, you'll need to log in to your Google account. If you don't have one, and don't want to create one, [send an email to us](#) with the location of your compost site.
- After you click the Edit button, you'll see options along the top left of the map itself.
- If you are clicked onto a point, you will be directed to edit just that point. To create a new point, make sure your cursor is not clicked on anything.
- Click on the placemark icon (looks like a tear drop) and position it where you'd like. Or ... while you have the map visible, enter a street address in the map search bar, and select Save to My Map, then to Philly Compost.
- Change teardrop color to **red (for private)** or **purple (for shared)** site, and add any other descriptive text to the text box.

Neighborhood compost map available on Philly Compost's web site at: <http://www.phillycompost.com/Map.html>

Table 2: Composting Systems and Estimated Volumes Processed at Select Community-Based Operations

NAME	CITY	ST	SYSTEM	TONS/YEAR	CUBIC YARDS
Green Energy Initiative (at Northern Arizona Univ.)	Flagstaff	AZ	turned piles	400	1,000
Roots Composting, LLC	Flagstaff	AZ	turned piles	300	900
Compost Club	Sonoma	CA	closed bin, vermi	22	55
DC Public Schools	Washington	DC	2-bin systems		
DC Urban Greens	Washington	DC	forced aeration, vermi	60	150
Resource Center	Chicago	IL	windrow	2,000	5,000
Univ. of Louisville	Louisville	KY	In-vessel (dumpster), vermi	39	98
ECO City Farms	Edmonston	MD	forced aeration, vermi	18	45
Univ. of Maine	Orono	ME	in-vessel (Earth Flow)	140	350
NC Community Gardens Partners	Greensboro	NC	bins, piles, vermi	52	
BIG! Compost	Queens	NY	windrow, forced aeration, vermi	105	263
Brooklyn Botanic Garden	Brooklyn	NY	windrow, vermi, bin	-	-
Earth Matter NY	Governors Island	NY	aerated static pile, windrow, bin		
Farmer Pirates Co-op/Compost Crew	Buffalo	NY	windrow	240	600
Greenway Environmental Services	Poughkeepsie	NY	windrow	12,000	30,000
Lower East Side Ecology Center	Lower East Side	NY	windrow, in-vessel	208-312	520-780
Myrtle Village Green	Brooklyn	NY	bins, vermi	6	15
Queens Botanical Garden	Queens/Flushing	NY	bins	2	6
Red Hook Community Farm	Brooklyn	NY	windrow	225	563
CommonWealth Urban Farms	Oklahoma City	OK	windrow, vermi, bins	25	63
Fertile Ground	Oklahoma City	OK	bins	8	20
Dirt Factory/University City District	Philadelphia	PA	in-vessel (Earth Tub)	15-20	37.5-50
Philly Compost 19125	Philadelphia	PA	in-vessel (Earth Tub), vermi	20	50
Wasatch Community Gardens	Salt Lake City	UT	bins, vermi	40	100
Apple Ledge Farm	Coventry	VT	windrow	4	20
Close the Loop! St. Albans	Northwestern	VT	windrow	260	800
Grow Compost of Vermont, LLC	Waterbury	VT	windrow, forced aeration	6,000	15,000
Close the Loop! Northeast Kingdom	Northeastern	VT	windrow	416	12,000
Lake Region Union High School	Orleans	VT	in-vessel (custom)	2	5
Lowell Graded School	Lowell	VT	bin system	2	5
The Farm Between	Jeffersonville	VT	bin, vermi	16	25
Tinmouth Compost	Tinmouth	VT	aerated static pile, windrow	4	20
Growing Power	Milwaukee	WI	windrow, vermi, bin	21,500	53,750
Kompost Kids	Milwaukee	WI	3-bin	45	1,125
We Got Leaves	Shorewood	WI	3-bin, vermi, passive aeration	4	10

Note: figures in italics are estimated. Contacts either provided figures in tons or cubic yards.

All conversions based on average incoming feedstock density of 800 pounds per cubic yard (1 ton = 2.5 cubic yards)

Table 3: Community Based Composting By Type
(listed by date operation began)

NAME	CITY	ST	BEGAN	TYPE OF PROGRAM												
				Collection Entrepreneur	Community Garden	School	Farm, Urban	Farm, Rural	Drop-off Network	Off-site Composter	On-Site Composter	Demo & Training Site	Worker Cooperative	Home-based		
Resource Center	Chicago	IL	1983				x				x					
Wasatch Community Gardens	Salt Lake City	UT	1989		x						x					
Lower East Side Ecology Center	Lower East Side	NY	1990							x		x				
Brooklyn Botanic Garden	Brooklyn	NY	1993								x	x				
Growing Power	Milwaukee	WI	1993		x		x				x	x				
NYC Compost	5 boroughs	NY	1993		x				x	x		x				
Queens Botanical Garden	Queens/Flushing	NY	1993								x	x				
Greenway Environmental Services	Poughkeepsie	NY	2000				x			x	x					
Compost Club	Healdsburg	CA	2003				x				x					
Red Hook Community Farm	Brooklyn	NY	2003					x			x					
Close the Loop! Northeast Kingdom	Northeastern	VT	2006	x		x		x	x		x					
Pedal People Cooperative	Florence	MA	2002	x											x	
Grow Compost of Vermont, LLC	Waterbury	VT	2008	x					x							
Kompost Kids	Milwaukee	WI	2008	x	x				x		x	x				
Earth Matter	Governors' Island	NY	2009						x		x	x				
BIG! Compost	Queens	NY	2010							x	x					
CommonWealth Urban Farms	Oklahoma City	OK	2010					x			x					
ECO City Farms	Edmonston	MD	2010					x			x					
Univ. of Louisville	Louisville	KY	2010				x			x	x					
Close the Loop! St. Albans	Northwestern	VT	2011	x		x		x	x							
Ferrisburgh Central School	Ferrisburgh	VT	2011				x				x					

Table 3: Community Based Composting By Type (continued)

NAME	CITY	ST	BEGAN	TYPE OF PROGRAM												
				Collection Entrepreneur	Community Garden	School	Farm, Urban	Farm, Rural	Drop-off Network	Off-site Composter	On-Site Composter	Demo & Training Site	Worker Cooperative	Home-based		
Green NAU Energy Initiative	Flagstaff	AZ	2011		x											
Grow NYC	New York	NY	2011	x				x								
Philly Compost 19125	Philadelphia	PA	2011	x					x							
Dirt Factory/University City District	Philadelphia	PA	2012						x							
Empire Zero	Castleton	NY	2012	x												
Farmer Pirates Co-op/Compost Crew	Buffalo	NY	2012				x			x			x			
Fertile Ground	Oklahoma City	OK	2012										x	x		
Myrtle Village Green	Brooklyn	NY	2012		x					x						
NC Comm Gardens Partners	Greensboro	NC	2012		x					x						
We Got Leaves	Shorewood	WI	2012													x
Apple Ledge Farm	Coventry	VT	2013	x				x								
Community Composting Rochester	Rochester	NY	2013	x												
DC Public Schools	Washington	DC	2013			x				x						
DC Urban Greens	Washington	DC	2013				x									
Roots Composting, LLC	Flagstaff	AZ	2013	x					x						x	
The Farm Between	Jeffersonville	VT	2013	x				x								
University of Maine	Orono	ME	2013			x				x						
Cooperative Energy, Recycling & Organics (CERO)	Boston	MA	2014	x											x	
Lake Region Union High School	Orleans	VT	2014			x				x						
Tinmouth Compost	Tinmouth	VT	2014	x				x								

Worker-owned Cooperatives

By Jim Johnson, Democracy at Work Network

Cooperatives (“co-ops”) are businesses owned and run by and for their members. Whether their members are their customers, their employees, or their residents, they have an equal say in what the business does and a share in the profits (which co-ops commonly refer to as “surplus”).¹

Many people are familiar with their local natural food co-ops, which are democratically owned and governed by their consumer-members. Many are also familiar with credit unions, which are financial services co-ops, owned by their account holders. Florida’s Natural and Land O’Lakes are well-known brands, but many people don’t realize that they are actually agricultural (farmer-owned) marketing co-ops. Co-ops can operate in any industry – for example, the Associated Press (AP) news agency is actually a co-op, owned by its contributing newspapers, radio and television stations. Housing co-ops are jointly owned and governed by their residents.

Worker co-ops are businesses that are cooperatively owned by their workers. Like other types of co-ops, they can operate in any industry; many are also democratically self-managed, using a variety of approaches. A few of the natural food co-ops in the US are actually worker-owned instead of consumer-owned. Many people are familiar with Equal Exchange, a worker co-op that imports fair trade coffee and other products and distributes them throughout the US.

Worker-ownership can have some natural productivity advantages.² When each worker is also an owner, they have a direct personal stake in the quality of their work and the overall effectiveness of the operation. Worker co-ops are also increasingly being used to provide employment and economic self-determination to marginalized people such as recent immigrants and the chronically underemployed.³ Worker co-ops, as distinct from charities and public assistance, offer an approach to human empowerment that emphasizes independence, personal development, and strong local community ties from the very start.

The collection and transport of food scraps and yard trimmings for processing into compost can support the creation of worker co-ops. The collection and transport of feedstock can be costly; for worker co-ops, this cost is a business opportunity. For example, Pedal People is a worker-owned

cooperative in Northampton, MA, that (among other services) provides bicycle cargo pickup services for food scraps and other compostable items⁴; see their profile on page 46. CERO (Cooperative, Energy, Recycling & Organics), a new worker co-op start-up in Boston, MA, has a market that is being driven by new zero-waste legislation in the state, and recently exceeded its crowdfunding goals on Indiegogo.⁵

The processing of food scraps and yard trimmings into compost can also support the creation of worker co-ops. Roots Composting in Flagstaff, AZ, grew out of a project at Northern Arizona University, and is currently producing about one ton per week, with plans to triple production by mid-2014; see their profile on page 66. Fertile Ground Cooperative in Oklahoma City, OK, is a decentralized, neighborhood-based model for composting residential food scraps and yard trimmings near the source, with 2 worker-owners and 7-10 contract part-time workers; see their profile on page 59.

Like all small businesses, worker co-ops face challenges. Given their fundamental orientation towards “inside” ownership, start-up capital is a particular challenge for worker co-ops, but community support can go a long way to mitigate this. More fundamentally, small business ownership involves risk and sacrifice, and most people with traditional employment backgrounds have no experience “thinking like a business owner.” Worker co-ops function like small grassroots democracies, with the need to learn power-sharing principles and approaches. Fortunately, technical assistance for worker co-op start-ups is available through the Democracy at Work Network,⁶ a project of the US Federation of Worker Cooperatives.⁷

¹ “What’s a co-op?” International Co-operative Alliance, accessed March 5th, 2014, <http://ica.coop/en/whats-co-op>.

² “Research on Employee Ownership, Corporate Performance, and Employee Compensation,” National Center for Employee Ownership, accessed March 5th, 2014, <https://www.nceo.org/articles/research-employee-ownership-corporate-performance>.

³ “Latina-Run Co-Op Empowers Its Members,” All Things Considered, National Public Radio, accessed March 5th, 2014, <http://www.npr.org/2014/02/28/280773943/latina-run-co-op-empowers-its-members>

⁴ “Compost Service,” Pedal People, accessed March 5th, 2014, <https://www.pedalpeople.coop/index.php?page=37>.

⁵ “CERO is creating Green jobs that pay off for people, community & the planet”, Indiegogo, accessed March 5th, 2014, <http://www.indiegogo.com/projects/cero-is-creating-green-jobs-that-pay-off-for-people-community-the-planet>.

⁶ “A Professional Peer Network For Democratic Businesses,” Democracy At Work Network, accessed March 5th, 2014, <http://dawn.coop/>.

⁷ “The United States Federation of Worker Cooperatives is the national grassroots membership organization for worker cooperative businesses,” US Federation of Worker Cooperatives, accessed March 5th, 2014, <http://usworker.coop/>.

Profiled Programs

Each profile provides an overview of the project, why it was started, the partners involved, the number of employees and/or volunteers, the volume of material handled, the composting method used, the funding mechanisms in place, and a main contact (who often shared their thoughts on the meaning of community-based composting). Note that volumes of material handled are presented in the units provided (such as cubic yards per week or tons per year). We used this data provided to estimate annual tonnage and cubic yards handled. See Table 2 (page 29).

Profiles are presented by date composting operation began.

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Wasatch Community Gardens, Salt Lake City, UT

On-site composting at multiple community gardens.



START DATE: 1989

DRIVERS: Wasatch Community Gardens originally started in order to reduce hunger and improve access to local, nutritious food for low-income residents of Salt Lake City. It began as a project of the Crossroads Urban Center in Salt Lake City, UT, to provide fish primarily for Southeast Asian refugee communities in the Salt Lake Valley. Not long after the Fish Co-op project began, Crossroads Urban Center recognized an opportunity to make use of vacant lots to help people grow fresh, nutritious food for themselves and their families. Funding was secured and a community gardening program was begun. The garden project soon spun off into an independent non-profit organization that continues to this day.

PARTNERS: They work with a wide array of partners across their gardening, youth education and adult education programs. Partners include: Americorps UCC, Salt Lake City, Salt Lake County, YMCA, Boys and Girls Club, Youth City, Local Schools, University of Utah, International Rescue Committee, Real Food Rising, Sorenson Unity Center, Juvenile Justice Services, Bad Dog Arts, Red Butte Garden, Salt Lake City Library, Slow Food Utah, Downtown Farmers Market, Harmon's (local grocery store), Mountain Valley Seeds, and Utahans Against Hunger. They have 6 to 8 employees and many volunteers (20 at any given event and 1,000 throughout the year).

COMPOSTING METHOD: Bin system, vermicomposting, static pile

VOLUME: 60 tons per year (estimated) from multiple sites

SUMMARY: Wasatch Community Gardens is a 501(c)(3) organization committed to building community and providing opportunities to

learn and grow through gardening. Its mission is to empower people of all ages and incomes to grow and eat healthy, organic, local food. Its demonstration-only compost system is managed by their Youth Gardening Program, and is an integral part of the gardens that are grown for education and food purposes. Food that is grown is eaten in class, given to students to take home with them, and donated to a local food pantry. In addition to the Youth Gardens, they support an additional 29 community gardens and school gardens across Salt Lake County, where they advocate for (or require) composting as an integral part of each garden operation. Management of these systems depends on the internal management of the gardens by volunteer garden stewards. WCG promotes organic gardening practices, including composting, through their garden policies and public workshops, which community gardeners in their network are invited to attend for free. Last year they offered more than 60 workshops on organic gardening and food preservation, including classes on composting. They own the land for 2 of the 29 community gardens and school gardens they support; the city owns 5; the county owns 3; and 2 are on private land with long-term lease agreements. Their bin systems are managed by "compost stewards" or youth program staff.

FUNDING: Donations, grants, partnerships, annual plant sale, sponsorships, garden plot fees, and event fees.

WEBSITE: <http://wasatchgardens.org/>

CONTACT: Ashley Patterson, Director; Susan Finlayson, Community Gardens Program Director

Lower East Side Ecology Center, New York, NY

START DATE: 1990 (community composting activities)

DRIVERS: The composting program at the Lower East Side Ecology Center was originally founded through an effort to remediate soils in New York City's Lower East Side for community gardening. Today, the center provides City residents and others from as far as New Jersey, with much-needed convenient drop-off locations to promote urban composting.

PARTNERS: A partnership with the NYC Department of Parks and Recreation produced the current composting program. Food scrap generators are comprised of residents from all five City boroughs, Westchester, and parts of New Jersey, who access the center's drop-off sites. GrowNYC's Union Square farmers' market partners with the center to serve as one of the drop-off sites. The center also partners with schools and universities, religious groups, community gardens, and others in the GrowNYC network to provide composting education and programming. In addition, the Ecology Center hosts the Manhattan branch of the NYC Compost Project, a compost and outreach program funded by the NYC Department of Sanitation, Bureau of Waste Prevention, Reuse and Recycling.

COMPOSTING METHOD: In-vessel, windrow, vermicomposting

VOLUME: Approximately 4 to 8 tons of food scraps collected for composting per week (winter: 4 to 6; and summer: 6 to 8)

SUMMARY: The center uses a combination of in-vessel bins (made from one cubic yard retrofitted bulk shipping containers), and a vermicomposting windrow system to compost at a location within the 59-acre City-owned and operated East River Park. The first step of the process is layering the food scraps with sawdust from various local wood shops into the in-vessel system, which consists of 16 1-cubic-yard plastic containers. Once a container is filled, the lid is sealed and the material composted for 10-15 days. The containers are aerated with vents on the bottom and top of the bins. In the

second step, material is transferred to windrows with red wigglers that digest partially composted materials. Together with other microorganisms, the worms produce worm castings. In the final step, the material is screened to produce fine compost.

While the center uses material such as wood shavings and leaves for a carbon source, the operation is centered on its collection of food scraps at two drop-off centers (GrowNYC's Greenmarket in Union Square and outside of subway entrances in Chelsea for public transit commuters). Finished compost is used as a soil amendment on the public parkland and also bagged and sold at the farmers' market.

The NYC Compost Project staff provides customized composting workshops to NYC residents, community gardens, schools, nonprofits and businesses. The Master Composter Certification program is a train-the-trainer program that includes intensive classroom instruction, field trips, and 30 hours of independent community outreach to help advance on-site composting in NYC. The NYC Compost Project hosted at the Ecology Center offers the course in the fall.

FUNDING: Funding from New York Department of Sanitation (DSNY) and partnering with GrowNYC has facilitated expansion of the center's drop-off program to its second location (Chelsea subway entrances) in the past year.

WEBSITE: <http://www.lesecologycenter.org/>

CONTACT: Andrew Hoyles

The Lower East Side Ecology Center operates two public food scrap drop-off centers and a composting site in East River Park. One of the two drop-off centers is strategically placed outside of subway entrances, offering an easy and convenient way for daily commuters to compost.



Growing Power, Milwaukee, WI, and Chicago, IL

Growing Power is one of the premier urban farming and community-based composting enterprises in the country, combining non-profit status with a land trust.

START DATE: 1993

DRIVERS: Growing Power's mission is to support people and the environment by providing equal access to healthy, high quality, safe and affordable food. Growing Power combines organic discard processing, food growing in urban and rural settings, nutrition education and business acumen to communities often neglected by traditional food and distribution networks. The mission has been expanded from its original neighborhood in Milwaukee to cities across the US, namely Chicago. The Chicago branch was founded to address the needs of emerging small and urban farms around the city, and continues to provide assistance to them and local community food centers.

PARTNERS: Growing Power has many partners. It grows seedlings for local farmers for spring planting. It receives compost feedstocks

from businesses farms, and food scrap generators. These entities include but are not limited to Maglio's Produce, Beans and Barley, Garden Fresh, and Outpost Natural Foods Cooperative. The organization distributes healthy food and accesses the community by partnering with farmers markets, local institutions such as the Peggy Notebaert Nature Museum, and the Rainbow Farmers Cooperative. Growing Power partners with universities, such as Marquette, to provide service-learning opportunities for students, while also teaming with local schools to improve school gardens. Local government has also been a key partner in developing new urban agriculture projects.



COMPOSTING METHOD: Vermicomposting bins, static pile/windrow: Growing Power categorizes its incoming material into four main feedstocks: food waste, farm waste, brewery waste, and coffee grounds. These materials help create a "living" system consisting of carbonaceous material, microorganisms, and red wiggler worms. Worms are housed in raised beds or "Living Biological Worm Systems" suitable for urban environments. Growing Power also uses static pile windrows consisting of bedding materials for the earthworms to live in which act as large bins without walls. The food attracts and maintains the worms within this system. Banning bread, dairy, and meat products from the process helps produce a safe and fertile soil-like product (compost) that provides nutrient-rich organic matter to grow fruits and vegetables, and facilitates a closed-loop ecological approach to Growing Power's urban farms.

VOLUME: 43 million pounds per year (at multiple sites in Milwaukee and Chicago)

SUMMARY: Growing Power is a locally based, yet national institution demonstrating the cost efficiency, environmental benefits and community self-reliance in food scrap management, food production, distribution and nutrition education. In addition to static pile composting and its vermicompost bins, Growing Power's flagship two acre Community Food Center and urban farm in Milwaukee features traditional greenhouses, aquaponics, hoop houses, a worm depository, an apiary, poultry hoop houses, outdoor livestock pens, an anaerobic digester, and a rain water capture system.

FUNDING: Growing Power has partnered with local government authorities to acquire funding. The organization teamed with the Milwaukee Housing Authority, for example, to develop a 30,000 sq. ft. vegetable growing site at the state's largest public housing

development. Growing Power also earns revenue from its food, compost, and other products sold at its Milwaukee branch, which includes a café, organic grocery, and merchandise store.

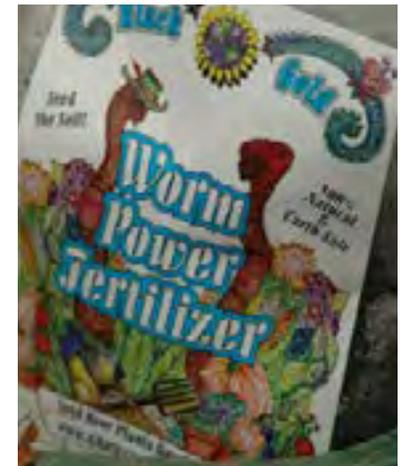
HOW DO YOU DEFINE “COMMUNITY-BASED COMPOSTING”?

Community-based composting is at the core of Growing Power founder Will Allen’s vision. Compost is vital to soil quality and according to Allen, “it all starts with the soil. If people can grow safe, healthy, affordable food, if they have access to land and clean water, this is transformative on every level in a community. I believe we cannot have healthy communities without a healthy food system.”

In 2013 alone, Growing Power trained and employed over 300 at-risk youth in urban agriculture and community food system development. Empowering inner city youth in Chicago and Milwaukee is a key facet of Growing Power’s work. Locating its 40-acre farm site in Merton adjacent to Camp Whitcomb Mason Boys and Girls Club has also facilitated involvement in community-based composting to support the next generation of composters.

WEBSITE: <http://growingpower.org/>

CONTACT: Marcus Thie, CompostMeister



Queens Botanical Garden/ NYC Compost Project, Flushing, NY

A small-scale composting demonstration site maintained with resources from the New York City Department of Sanitation's Bureau of Waste Prevention, Reuse and Recycling.

START DATE: 1993

DRIVERS: The NYC Compost Project maintains demonstration sites so that the public may have a place to come and learn about the different systems and how they work. They can then decide which setup is best for their situation, whether they are setting up a small-scale site at their home, community garden, school, or elsewhere.

PARTNERS: The NYC Compost Project partners with community organizations, city agencies, schools, and non-profits, to name a few. They have two employees at a time.

COMPOSTING METHOD: Earth Machine, wooden 3-bin system, ComposTumbler, chicken wire leaf bin. They also maintain three demonstration worm bins for indoor composting.

VOLUME: Small volume (~6 cubic yards per year). This varies by year.

SUMMARY: The NYC Compost Project strives to increase the amount of composting taking place in New York City and increase knowledge and support of composting. The Queens Botanical Garden hosts thousands of visitors each year. The NYC Compost Project demonstration site provides these visitors with an opportunity to learn how they can both reduce waste and improve NYC soils.

FUNDING: The NYC Compost Project is funded by the New York City Department of Sanitation's Bureau of Waste Prevention, Reuse and Recycling.

WEBSITE: <http://www.queensbotanical.org/Education/compost>
<http://nyc.gov/compostproject>

CONTACT: Jeremy Teperman

Right: Community composting sites in New York City supported or funded by the NYC Compost Project

Below: New 3-bin system at Queens Botanical Garden



Greenway Environmental Services, Poughkeepsie, NY

START DATE: 2000

DRIVERS: In 2000, Greenway began as a partner with Vassar College to resolve an environmental crisis caused by neglect of a demolition waste and yard debris site on campus. Contaminants were leaking into wells.

PARTNERS: Vassar was Greenway's first partner, but partnerships grew with SUNY, New Paltz and Marist College. As Greenway's capacity grew, the City of Poughkeepsie, local carters such as Royal Carting, regional government authorities, other composting sites such as McEnroe Organic Farm, and banks became working partners as well.

COMPOSTING METHOD: Windrows

VOLUME: 12,000 tons of organic material

SUMMARY: Greenway is a private enterprise that has focused on creating wealth from organic municipal discards. Initially, the company grew on providing composting services to Vassar College and then other academic institutions (e.g. Marist and SUNY New Paltz) and diverse clientele in the Mid Hudson area of New York. Its successful management of various organic materials has won the confidence of the City of Poughkeepsie, nursing homes, households and private banks. Most recently the company has moved to a site in Poughkeepsie under an arrangement with the City. Principals Josephine and Shabazz Jackson provide cities with analysis of their organic resources and how best to maximize environmental and economic benefits through proper management. The company has a strong focus on educating a wide range of community members, from Girl Scout troops and elementary school students to retired seniors. Greenway's partnerships have led to particularly enriching opportunities for college-level volunteers and interns, who are trained and receive course credit for participating in activities that integrate aspects of their environmental science curriculum, such as wetlands protection and management and composting site inspection planning. In so doing, says Greenway co-founder Shabazz Jackson, "we are meeting demand from the colleges for outlets in the community where students ("the majors" we call them) can get real life experience."

FUNDING: The Dutchess County Industrial Development Authority provided a loan (overseen by the state Economic Development Corporation). The Empire State



By developing the local composting collection and site processing infrastructure in partnership with local universities, government, and fellow composters, the community-focused Greenway Environmental Services has helped catalyze the waste reduction, compost production, and soil restoration measures in and around the greater Poughkeepsie region.



Development Agency provided a grant. The company has a minority business certification. The company earns money from tip fees received from carters delivering food discards (spanning from a flat \$0/ton to \$40/ton fee), fees for managing the local food waste collection and processing system, and from sale of products that include special blends, biofilters and teas. Products sell from \$15-\$90 per cubic yard.

HOW DO YOU DEFINE “COMMUNITY-BASED COMPOSTING”?

According to Shabazz, being community-based means serving the community and creating a mutually beneficial relationship with the community. Greenway is a community-based composting enterprise because of its interconnections with college students and staff, local and state finance institutions, businesses, food and beverage vendors, environmental and civic organizations.

CONTACT: Shabazz Jackson



Compost Club, Healdsburg (Sonoma County), CA

START DATE: 2003

DRIVERS: The Compost Club began as a project at West Side School, which needed a volunteer to coordinate recycling efforts at lunch. The food scrap composting was so successful that they began to replicate the “program” at other schools, followed by their evolution into a non-profit to set similar programs up across the county.

PARTNERS: Funders (Rotary Club, foundations, private donations), school champions (teachers, gardening coordinators, custodians, parents), the students (one classroom oversees the collection and feeding of the worms), the public (whose purchase of backyard worm bins and worms supports the project), and debt equity (e.g., Kiva Zip loan). Their services are available countywide to any establishment where food is produced or consumed. They are 100% volunteer driven, but are embarking on a goal to start a worm farm and hire an employee to manage it. No employees, 4 volunteers.

COMPOSTING METHOD: Vermicomposting

VOLUME: 22 tons per year

SUMMARY: In 2003, founder Rick Kaye started a vermiculture system to handle 900 pounds of food scraps. The compost produced was sold as a fundraiser for environmental education. The upper grade classes drove the program. Since then, nearly a dozen schools and businesses have initiated a site-wide vermicompost system through the Club’s assistance. The Compost Club consults with schools to set up vermiculture systems in each school. The school raises the money needed. Compost Club makes presentations in classrooms and helps them build the system. Then Compost Club comes back to make sure it is being maintained properly. Club accomplishments include: raised over \$25,000 in grant money to start compost programs at sponsored school sites, helped schools raise over \$8,000 in compost sales, introduced and instructed 500 educators about composting, visited more than 75 classrooms with its “Recycling Changes Everything” talk, and enlisted the help of high school students to build worm bins. This project increases literacy about waste and recycling, and fundamentally changes how waste is handled: each site generates

compost that can be used or sold for the school or institution’s benefit.

FUNDING: Revenue is from private donors, foundations, and service clubs. Government offices provide mini-grants to start vermicompost systems on a case-by-case basis. They also receive funds to make educational presentations in a certain number of classrooms.

RESOURCE: Compost Club recently got a \$5,000 loan through Kiva Zip: <https://zip.kiva.org/loans/2592>

COMMUNITY-BASED COMPOSTING DEFINED: Increasing the awareness and local practice for composting, products, and education. Growing the capacity and services where “composting” skills are evident among the populace, options to compost food scraps (at home, through the waste hauler) are commonplace, and traditional garbage only can begin to disappear from the business landscape replaced by multiple options or at minimum a system to sort and divert materials.

WEBSITE: <http://compostclub.org/>

CONTACT: Rick Kaye



Custom-built vermicompost systems to handle organic waste at schools and institutions producing food scraps or animal manures.



“In 2003, we helped recycle 900 pounds of food scraps at West Side School. In 2012, we helped recycle 44,000 pounds of food scraps at nearly a dozen sites around town. We replicate small scale change, on a large scale.”

– Rick Kaye

Red Hook Community Farm, Brooklyn, NY

Home to New York City's largest community-based compost program run entirely by renewable resources of human or solar power, the Red Hook Community Farm accepts and processes food scraps as part of the NYC Compost Project. The compost program processes over 225 tons per year of organic material.

START DATE: 2003

DRIVERS: Committed to sustainable development of the community, the Farm sought to close the loop on its own organics leftover from food production, as well as organics generated by its farmers market customers, CSA members, and community partners. Thus the compost program launched, beginning with hot compost bins and wormbins, adding tumblers, and then expanding volume to a degree that required turned windrows and finally a solar-powered aerated static pile (ASP) system.



PARTNERS: The Farm itself is on parkland, so key partners include the New York City Department of Parks and Recreation and community neighbors. The Farm hosts the NYC Compost Project funded by the New York City Department of Sanitation, and the Farm's larger Compost Program works with many sources, including the ground-breaking farmers market compost collection program operated throughout New York City by GrowNYC's Greenmarkets. The Program relies heavily on volunteers, including those arriving for weekly work sessions from the City's premier volunteer organization: New York Cares. Over 1000 volunteers help compost each year, through rain and snow, year-round.

COMPOSTING METHOD: The main system is turned windrows, which will remain in full operation but be supplemented by a solar-powered ASP system (2 blowers for 8 pipes) and tumblers (for transitional storage of incoming material) and worm bins (to inoculate curing windrows and improve the product).

VOLUME: At peak performance before installation of the solar-powered ASP, the Farm processed more than 225 tons of organic material per year, and hopes to expand to over 300 tons once the ASP system is fully integrated as a supplement (not a replacement) of the turned windrows.

SUMMARY: The Farm's compost program is the largest of its kind in New York City, powered entirely by the renewable resources from solar panels or human hands/hearts. The organics processed derive from the Farm itself (weeds, spoiled produce, spent crop material), the citywide Greenmarkets compost collection program, the community drop-off site at the Farm, and several other community partners. The program has developed an extensive system for incorporating the public into the work as part of core educational goals, which entails many operational adjustments to get the most out of volunteer labor. The program also demonstrates the potential for community composting to empower youth, create jobs, and serve as job-training sites.

FUNDING: The Farm receives funding from many foundations and private donors, and hosts the NYC Compost Project funded by the New York Department of Sanitation (DSNY), and the larger Compost Program generates revenue through fees for processing material.

HOW DO YOU DEFINE “COMMUNITY-BASED COMPOSTING”?

Neighborhood or college or place of work, and it recycles organic material as locally as possible with as much community participation and education as possible. It is a form of what’s known as decentralized composting, and contrasts to centralized composting that involves citywide collection of residential or commercial organic material that is transported a distance. The first goal for community composting is that organic material flows the shortest possible distance in a cycle internal to a community, from the sources to a compost site and then, in a new form as mature compost, to greening projects in that same community. The second goal is to maximize participation of community members, both to help sustain the operation but also to foster individuals’ education about and commitment to sustainable practices.

WEBSITE: <http://added-value.org/composting-initiative>; <https://sites.google.com/site/communitycompostnyc/>

CONTACT: David Buckel, Community Composting Consultant for Red Hook Community Farm



Close the Loop! North East Kingdom, Northeastern, VT

Close the Loop! NEK is a partnership among the Highfields Center for Composting, the Northeast Kingdom Waste Management District, Kingdom View Compost at Tamarlane Farm, Wise Worm Compost, several other small-scale food scrap recyclers and area businesses and schools to recycle the community's food scraps through composting.

START DATE: 2006

DRIVERS: Close the Loop! NEK is part of an ambitious campaign to develop community based local composting infrastructure capable of recycling all of Vermont's food scraps by 2017. The program is designed as a model for a rural, distributed, community based food scrap recycling network and partnership. In doing so, the program will improve food security and protect our working landscape, while contributing to the local economy and reducing waste and greenhouse gas emissions.

PARTNERS: Highfields Center for Composting, the Northeast Kingdom Waste Management District, Kingdom View Compost at Tamarlane Farm, Wise Worm Compost, Apple Ledge Farm, Winchester Farm, Lake Region Union High School

COMPOSTING METHOD: Windrow (plus food scraps fed to chickens)

VOLUME: The scale of Kingdom View Compost has steadily increased. It is now processing 400 tons of food scraps per year, 1,200 cubic yards of feedstocks, and producing ~600-800 cubic yards of compost annually. Wise Worm compost also processes ~100 tons of food scraps per year, and other small-scale recyclers through out the Kingdom process another >50 tons of food scraps per year.

SUMMARY: Close the Loop! NEK was created in an effort to build composting capacity and community resiliency in Highfields Center for Composting's own back yard. The partners have taken on various roles over the program's long growth trajectory and with increasing growth, participating partners, and community support the program has become a model for distributed small-scale, community-wide composting programming. The program now includes 3 small haulers and 2 small compost sites, >3 micro-haulers/composters/chicken farmers, 7 residential drop-off points



and more than 20 businesses and schools. It is on track to double and triple in coming years.

FUNDING: Funding for the program has come from a number of sources including individuals and private business, Northeast Kingdom Solid Waste Management District (NEKWMD) the Vermont Agency of Natural Resources, and private foundations.

CONTACT: Jenn Davis

WEBSITE: <http://highfieldscomposting.org/nek.htm>

RESOURCES: <http://highfieldscomposting.org/news-resources/resource-library/community-composting-introduction-to-close-the-loop>



Close the Loop
COMPOST

If it is food, you can compost it.

- Meat & bones
- Milk, cheese & other dairy
- Fruits, vegetables & peels
- Soups & sauces
- Dressings & condiments
- Flour, bread & pastas
- Nuts and shells
- Oils & fats
- Eggs & egg shells
- Spices
- Seafood and shells

These items cannot be composted:

- PLU stickers
- Milk & orange juice cartons
- Compostable bags, utensils, and cups
- Store bought floral products

Questions about composting? Contact the Highfields Center for Composting at www.highfieldscomposting.org / 802-472-5138.
Rot on!



Far left: Close the Loop refrigerator magnet, with a simple source separation reminder.

Left: Eric Paris, Close the Loop composter who operates Kingdom View Compost at Tamarlane Farm.

Below: A resident signs up for the food scrap drop-off program.



Pedal People Cooperative, Florence/Northampton, MA

Pedal People collects household compostables with bikes and trailers, taking 85% to the city's transfer center, 10% to private home piles, and 5% to a yard trimming depot. It is a worker-owned human-powered delivery and hauling service for the Northampton area. It hauls furniture, hay, groceries, and other items.



START DATE: 2002

DRIVERS: As trash and recycling haulers, Pedal People was already collecting compostable material, but it was mixed in with trash and they were paying to send it to the landfill. Even though collecting organics was more labor-intensive for them, they believed that it was the responsible thing to do.

PARTNERS: The City of Northampton allows Pedal People to take its customers' compostable material to the City's transfer station (for a fee). One of its customers barter with them to use his backyard to transfer compost between routes (until the end of the day when they pedal the food scraps up the hill to the transfer station). Alternative Recycling Systems transports the food scraps delivered to the City's transfer station to a nearby farm, Farmer's Friend. The Department of Environmental Protection is a new partner, as Pedal People is working on applications for permits to have their own compost transfer station, which is not up a hill. A property owner downtown might rent them a spot in his parking lot to put a dumpster for their own compost transfer point. City Joinery, a small furniture maker nearby saves its sawdust and gives it to Pedal People for its backyard compost pile. Pedal People has 16 part-time workers (owners) and no volunteers (they are a cooperative).

COMPOSTING METHOD: They are a collection cooperative. However they use a bin system to process 10% of the material they collect in their own private homes.

VOLUME: 100 cubic yards per year

SUMMARY: When Pedal People first offered source-separated organics collection, they used

their newsletter and distributed info sheets to inform customers of the new compost collection service that would be offered on a trial basis. Customers could simply put out organics in any clearly marked container, along with their trash and recycling, on their normal pickup day. Initially Pedal People brought the material to their home piles. The volumes grew beyond what they could manage at home. Now they take about 80-90% of their food scraps to the City's residential trash/recycling/compost transfer center. The City then contracts out with a private trucking company who takes the compost to a composting facility about 15 miles away (Farmer's Friend in Belchertown, MA). They face challenges with the regulations that prohibit waste (including compostables) from being transferred from one vehicle to another without a permit. These regs were made with trucks and large volumes in mind, not 10- and 18-gallon totes lifted and dumped by hand.

FUNDING: Initially, Pedal People didn't have any overhead since they were just using personal bikes and a trailer they already owned. Currently they collect trash, recyclables, and compostables. Most customers pay a collection fee, which covers collection of all materials. They take out what they need to cover compost costs from the total that customers pay for refuse collection. The estimated value of their equipment is only \$5,000 (a few bikes and 10 bike trailers).

WEBSITE: <http://www.pedalpeople.coop/>

CONTACT: Ruthy Woodring

Kompost Kids, Milwaukee, WI

START DATE: 2008

DRIVERS: When Melissa Tashjian moved, she lost her compost pile and home garden. She couldn't find a community garden in her neighborhood, and learned that many others wanted a community garden as well. Through the creation of a community garden, they realized how expensive the soil was and thought of creative ways to reduce costs. Along with gardening, many of her fellow "renters" were looking for a place to compost. They found a private landowner who allowed them to start composting on his site. Their neighborhood has many coffee shops within walking distance of the compost site and they all were interested in year-round pickups. At the beginning, a pull wagon and 5-gallon buckets were used twice a day. She would pick up from about 3 to 4 local businesses every week carrying no more than four 5-gallon buckets.

PARTNERS: DNR-approved commercial composter "The Farm's Compost" finishes the curing and screening process of Kompost Kids' unfinished compost (from its main demo site). The farm



donates back the compost to Kompost Kids, who in turn donates it to community gardens around town. Milwaukee is a very segregated city. However, Kompost Kids works in a variety of neighborhoods that are Caucasian, African American, and Hmong.

COMPOSTING METHOD: 3-bin system (built from scratch, see their PDF with building instructions)

VOLUME: 45-50 tons per year (including brown sources) at 15 community compost sites. Kompost Kids actively contributes pre-consumer restaurant scraps to 7 to 9 sites all year long. There are 20 restaurants that participate in their collection program. Out of the 20, 8 restaurants pay them. The rest provide complimentary snacks to the pick-up drivers. Their main location is the Bay View Demonstration site, which processes about 2,000 lbs/week of green material by hand once a week. They have a total of nine 4ft x 4ft pallet bins on this site (essentially three 3-bin systems).

SUMMARY: Kompost Kids is a volunteer-run, nonprofit organization with a mission to educate the public, individuals, businesses, and institutions about the benefits of compost and to reclaim organic materials from landfills to create soil for community-based agriculture projects. Residents can drop off food scraps at 15 different community compost sites. Kompost Kids maintains a searchable map on its web site at: <http://kompostkids.org/composting/compost-sites/>

Materials accepted include fruit and vegetable scraps, baked goods, rice and pasta, paper towels and napkins, paper plates, tea leaves and bags, coffee grounds and filters, and egg shells. Meat, seafood, bones, and dairy products are not wanted. Yard trimmings are welcome with the exception of weeds that have gone to seed, diseased plants, and anything treated (e.g., with pesticides). They encourage people to line their container with a brown paper bag or newspaper to make it easier to clean, and to cover food scraps with shredded nonglossy paper, paper towels,

A volunteer-run non-profit organization creating a decentralized composting model by using community gardens as conduits for people and businesses to manage food residuals sustainably. They operate limited collection service to restaurants.

"Everyone has something to contribute, everyone's help is valued."

– Melissa Tashjian

“Over the last 5 years the attention brought to food waste has been amazing. Governments, businesses and residents are starting to see the benefits that composting can bring to their city through a little additional source separation. Now we need to see the job market improve for this sector. Energy, raw materials processors, hauling services, soil remediation, and finished product sales are just a few of the forming industries that need government funding to be able to compete with the established broken system that is already in place.”

– Melissa Tashjian

or paper plates to prevent fruit flies and a “stinky mess.” Residents are asked to weigh material before they leave their house in order to help Kompost Kids determine if residents are using the compost sites and to calculate the amount that a household can divert. Contributions can be logged online. Once at the compost site, bins are clearly labeled “ADD HERE.” Contributions should be covered by the “BROWN SOURCE” on-site, usually wood chips.

The service area for its compost pickups is limited to restaurants that their volunteers work in, live near, or frequent. There are three ways for a business to contribute to a community compost site: (1) be a Kompost Kreator – drop off material at a site, (2) be a Organics Diverter – reward compost “courier” volunteers directly with free items from the business, or (3) be a Black Gold Sponsor – pay Kompost Kids for regularly scheduled pickups.

Kompost Kids helps businesses evaluate their waste stream, and provides onsite source separation training for kitchen manager and staff. Businesses participating include coffee shops, restaurants, bakeries, a local yacht club, a natural food co-op, and a distillery.

Compost pile maintenance and composting education are a core part of Kompost Kids’ program. Every Saturday

it offers 2 and a half hours of free education and training at its Bay View demonstration site. Participants can learn the basics of composting, see an active community garden scale composting facility in action, and help transform garbage into healthy, living soil.

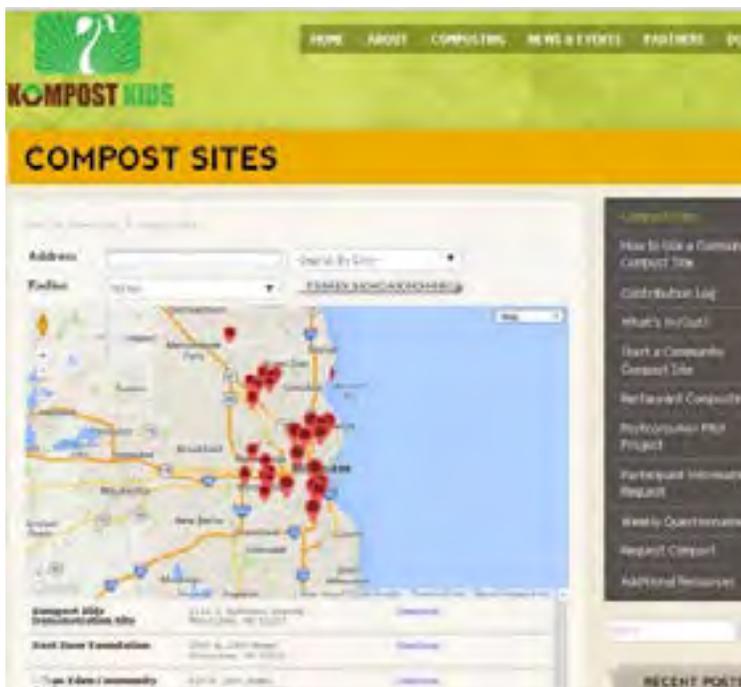
FUNDING: Received a \$10,000 “50 States for Good” grant from Tom’s of Maine, no funding from the City but it promotes Kompost Kids on its website. They are all volunteers. Residents drop off compostables for free. Restaurants pay \$10/week for pickup. Kompost Kids uses that money to sustain their operations.

WEBSITE: www.kompostkids.org

RESOURCES: see PDF: “Soil Generation Maximization Packet” (how to set up a neighborhood drop-off location) <http://kompostkids.trinix.co/wp-content/uploads/2014/01/Soil-Generation-Maximization-Packet.pdf>

HOW DO YOU DEFINE “COMMUNITY-BASED COMPOSTING”? When a group of people, neighbors, friends, and businesses share a composting site or location. Resources such as tools, raw materials and even labor can be shared within the group, along with the soil that is created.

CONTACT: Melissa Tashjian



Earth Matter, Governors Island, New York, New York

START DATE: 2009

DRIVERS: Incorporated in 2009, Earth Matter's work is currently driven by a Zero Waste Island Initiative led by the New York City Department of Sanitation's Bureau of Waste Prevention, Reuse and Recycling (DSNY-BWPRR).

PARTNERS: Earth Matter partners include DSNY, Trust for Governors Island, citizens from the island and other parts of the City generating food scraps, island vendors such as Fauzia's Heavenly Delights and other food court restaurants. Earth Matter also partners with local non-profits, such as the Lower Manhattan Cultural Council, whose kitchen provides food scraps.

COMPOSTING METHOD: Aerated static pile windrows, turned windrows, tumblers, a variety of bin systems, Green Cone system, vermi-composting and deep manure. It is a NYS DEC registered facility.

VOLUME: Approximately 24,000 pounds of incoming material collected and processed per month

SUMMARY: Earth Matter NY accepts and processes food scraps as part of the NYC Compost Project. Located on Governors Island in New York City, Earth Matter uses multiple methods of composting including aerated static piles (O2 system), constructed bin systems, windrow composting as well as ten worm bins for vermicomposting. Earth Matter operates on only one of the 182 acres that comprise the entire island, on which it mainly composts food scraps as well as leaves and brush from landscapers. Food scraps come from local food court vendors (such as coconuts from Fauzia's Heavenly Delights) and public drop-off stations located both on and off the island. Each month 15,000 pounds of food scraps are delivered to Earth Matter derived from a consolidation of four drop-off stations at farmers markets in Brooklyn, but the organization collects food scraps from island drop-off stations via bicycles with trailers. Other equipment used includes a skid steer, chipper/shredder, hand screener, and a vehicle to transport materials. The organization operates a Compost Learning Center where it provides hands on composting education and performs other farm-based activities such as raising 65 chickens. Compost is used in its training programs and demonstration garden. It hopes

Earth Matter, Inc. is a member-based non-profit organization on Governors Island providing composting services and education toward a goal of a zero waste island. The organization encourages a strong sense of community by inviting staff, interns, volunteers, and community members to all actively participate in key decision-making processes.





to use finished compost on 150 acres of the island's parkland.

FUNDING: The City of New York Department of Sanitation provides funding as part of its Zero Waste Island Initiative. Earth Matter partners with the Trust for Governors Island to provide composting services in line with the zero waste goal. A small percentage of funding comes from corporate volunteer workday donations and "friend" donations.

WEBSITE: <http://earthmatter.org/>

CONTACT: Marisa DeDominicis, Co-Founder, President/Director



ECO City Farms, Edmonston, MD

START DATE: 2010

DRIVERS: The plight of underserved food desert areas drove the inception of ECO City Farms. The organization seeks to create a community where residents have greater access to affordable, healthy foods and enhanced opportunities for active living.

PARTNERS: ECO City's main focus is to serve the Prince George's County, MD Port Towns of Edmonston, Cottage City, Colmar Manor, and Bladensburg and these towns reciprocate by embracing ECO City's work and helping them communicate with residents. Entities within and surrounding the Port Towns such as restaurants, food stores, non-profits, food cooperatives, CDCs, farmers markets, youth councils, parks & planning departments, community colleges, and universities are valued partners. Compost Cab, a private niche food scrap collection service for the Washington DC Metropolitan Area, is the primary source of ECO City's feedstocks. ECO City also partners with other service-oriented organizations such as the faith-based Time Harvest Ministries. Community Forklift, a neighborhood building materials reuse store provides ECO City with recycled building materials.

COMPOSTING METHOD: In-vessel, passively aerated static pile, vermicomposting

VOLUME: 700 pounds a week

SUMMARY: As the Washington DC metropolitan area's preeminent urban farm, ECO City Farms uses multiple composting methods to produce a valuable soil amendment put directly back into the farm's intensive closed-loop food growing cycle. Its flagship farm in Edmonston, MD receives approximately 700 pounds of food scraps per week from its collection service, Compost Cab, which is placed into air tight sealed barrels for immediate holding. The material then goes through a multi-stage composting process including the following methods: in-vessel, passively aerated static piles, and vermicomposting via 16 thriving wooden worm bins. The

non-profit is developing a second farm located at and serving the nearby Autumn Woods in Bladensburg, MD, a private low-income housing development, which will house the ECO City's composting operations and be one of the first projects of its kind in the country.

FUNDING: Initial start-up funding was provided through grants from entities such as the EPA and Kaiser Permanente. The Redevelopment Authority of Prince George's County provided funding directed towards the development of the new farm-composting site at Autumn Woods.

WEBSITE: <http://ecocityfarms.org/>

CONTACT: Benny Erez, Senior Technical Advisor (and chief composter), and Margaret Morgan-Hubbard, Executive Director

ECO City Farms is an educational, non-profit organization located in Prince George's County, Maryland designed to serve as a prototype for sustainable local urban farming. The one-acre farm, erected in 2010, composts an estimated 700 pounds of incoming food scraps per week from area residents, using several different methods.



University of Louisville, Louisville, KY

University of Louisville composts material from more than 20 community partners, using a donation system, hand tools, and primarily unpaid volunteer labor.

START DATE: 2010

DRIVERS: Brian Barnes saw that food scraps were going to the landfill, and knew that they could be captured and transformed into soil by a simple process, using volunteer labor. Since University of Louisville was beginning a sustainability push university-wide, he thought this would be a great project to include. Brian contacted the university's Special Assistant to the Provost for Sustainability Initiatives, Justin Mog. Justin supported the project and helped Brian make all of the necessary connections.

PARTNERS: Partners are primarily coffee shops, small food businesses like grocery stores and breweries, landscaping services, and individual household donors. The program has one paid staff

member (part time) and 3 to 5 core volunteers.

METHOD: Bin system, vermicomposting, repurposed dumpsters

VOLUME: 1000 - 2000 pounds per week

SUMMARY: This project proves that a few dedicated people can reuse available materials and re-inhabit vacant spaces to salvage community and university compostables from a variety of sources with almost no conventional resources. They use nature's composting processes in re-imagined dumpsters and barrels to create vermiculture, aquaponic, and composting products for food activists and community gardens at no cost. Their project is light in its environmental impacts, but it generates enough energy to bring otherwise unconnected community partners together in powerful ways.

FUNDING: They are supported by the university. All of their equipment has been repurposed, donated, or purchased out of an annual \$5000 stipend to the project, which also pays for any labor. They are funded by an annual stipend from The Sustainability Council for the Project Manager position. 2014 is their second full year of funding.

WEBSITE: <https://louisville.edu/sustainability/operations/composting.html>

RESOURCES: <http://louisville.edu/sustainability/operations/eco-reps/eco-reps.html>

HOW DO YOU DEFINE COMMUNITY- BASED COMPOSTING?

"Community-based composting" means that a local, bottom-up process is being driven by members of the community to save compostables from the landfill and transform them into plantable, sharable soil, thereby closing the loop on numerous individual sustainable agriculture projects. To qualify as "community-based," the effort should strive for minimal carbon pollution from the transportation of compostables.

CONTACT: Brian Barnes



Close the Loop! St. Albans, Northwestern, VT

START DATE: 2011

DRIVERS: While the Northwest corner of Vermont is very rural, the town of St. Albans and the surrounding region generates a significant amount of food scraps. The Hudak Farm is located just over the border from St. Albans in Swanton. The farm's 30 acres of diversified vegetable and berry production require significant fertility inputs and cover cropping to maintain crop production and soil health. Food scraps collected from the community and composted on the farm, solve a waste management challenge for the community, while replenishing the farm's soils with organic matter and nutrients.

PARTNERS: Northwestern Vermont Solid Waste District (NWSWD), Hudak Farm, Highfields Center for Composting, Bellows Free Academy and other food scrap generators

COMPOSTING METHOD: Turned windrow

VOLUME: In 2013, the farm processed ~ 250 tons of mixed food residuals. Composting will require ~2,000 cubic yards of additional feedstocks and produce ~1,000 cubic yards/year of finished compost. The program and composting operation are slated to scale up in the coming years.

SUMMARY: The Hudak Farm houses a 1-acre turned windrow composting facility. NWSWD collects food scraps weekly from area businesses including Ben & Jerry's, Bellows Free Academy, Northwest Medical Center, St. Albans City School, Hannaford's, and Georgia Elementary. The Highfields Center for Composting supported the development of Close the Loop! St. Albans by conducting outreach and training of food scrap generators in the region, and by providing compost site



design and helping with permits for the operation. The community composting program has been in operation since 2011.

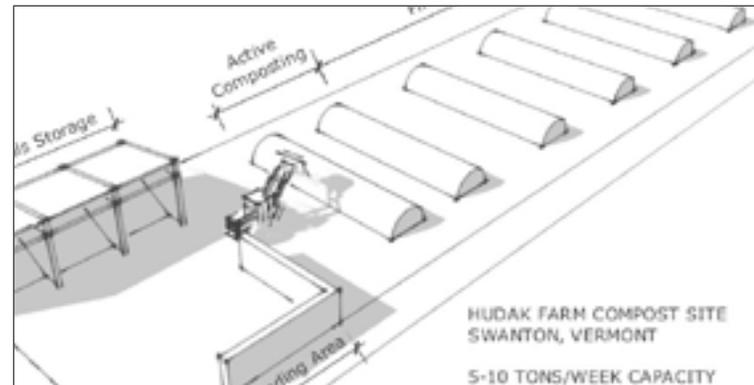
Close the Loop! St. Albans is an example of a vision initiated by youth in the community and built from the ground up by locals with the support of an outside non-profit organization, Highfields Center for Composting. The program has grown to become a replicable public-private-non-profit partnership that has achieved community sustainability objectives and supports the local food system. Training of food scrap generators has achieved clean source separation of mixed food scraps. Close the Loop! St. Albans is expected to grow significantly during the next 5-10 years by including more food scrap generating businesses as well as residential drop-offs for area residents.

FUNDING: The program and infrastructure were funded through a combination of grants from foundations, NWSWD, and individual donations. The farm took out a significant loan for infrastructure development and utilizes existing farm resources (such as land and equipment).

WEBSITE: <http://hudakfarm.com>; <http://highfieldscomposting.org/what-we-do/close-the-loop-community-composting-program/close-the-loop-st-albans>

CONTACT: John Leddy, Northwest Solid Waste District

Close the Loop! St. Albans is an innovative partnership involving the St. Albans High School, Bellows Free Academy, the Northwestern Vermont Solid Waste District, and a local farm, The Hudak Farm. The Hudak Farm composts food scraps that have been collected from area schools and businesses.



Ferrisburgh Central School, Ferrisburgh, VT

The Ferrisburgh Central School composts 100% of the school's food scraps on-site, as well as leaves, sawdust, and a neighbor's horse manure. The compost made is used in the school garden.

START DATE: 2010

DRIVERS: Fifth and sixth grade students were learning about recycling, garbage, and landfills; they realized they were not composting at their school and began a conversation about it. Initially parent volunteers hauled the food scraps off-site, until the school built an on-site bin system in 2010.

PARTNERS: Highfields Center for Composting

COMPOSTING METHOD: Insulated bin system

VOLUME: The school has 240 students and composts ~0.1 ton/week of food scraps

SUMMARY: The school's composting program captures about 200 pounds of food scraps a week and composts them with a blend of horse manure, leaves, and sawdust. Parent volunteers built the bin system and students monitor and manage parts of the composting process. The system has four bins; each holds about four cubic yards. It has just enough capacity to manage all the school's scrap during the school year. The bins are insulated in

order to foster hot temperatures, even during the dead of winter, and they report temperatures over 150 F in January. The system designs, created by Highfields Center for Composting, were the original prototype for the open source design guide now available on the Highfields' website.

FUNDING: Grants, donations

CONTACT: Judy Elson, Nick Patch



Philly Compost, Philadelphia, PA

START DATE: 2011

DRIVERS: Unused equipment from a hotel in Chicago coupled with a great relationship with a very active neighborhood association, Sustainable 19125, offering them a very reasonable lease. Sustainable 19125 had lots of green initiatives but none involved composting. This provided the perfect opportunity to test out a model combining bicycle pick-up and neighborhood drop-off, using “member” volunteer help.

PARTNERS: The New Kensington Community Development Corporation, the Sustainable 19125 neighborhood association, a farm (Two Particular Acres), Green Mountain Technologies. The Compost Coop is a membership-based community organization. Its 6-member volunteer Board of Directors handles administrative matters. For heavier lifts, they rely on monthly member workdays and rely on the volunteer efforts of its members to keep operating. They have a strong neighborhood base of families who have lived there for generations mixed with an increased number of young, educated artistic individuals and families. They have 1 full-time equivalent employee (3 part-timers) and 3 volunteers.

COMPOSTING METHOD: In-vessel (Earth Tub), vermicomposting

VOLUME: 20 tons per year composted at the Frankford Avenue site collected via bicycle trailer from businesses and residential drop-off

SUMMARY: Philly Compost is a local, woman-owned business that provides composting related services in the Greater Philadelphia area. Its specialty is food scrap collection from businesses, but it also makes and sells finished compost and is a sales representative for The Earth Tub. Customers include restaurants, hotels, hospitals, markets, officers, caterers, and schools. They provide custom collections for special events. Food scraps collected with its packer truck are taken to Two Particular Acres, a farm outside of Philadelphia, for composting.

In cooperation with the New Kensington CDC, Philly Compost also runs The Compost Coop, a neighborhood composting site and bicycle collection service for businesses in or adjacent to the 19125 zip code. For an annual membership fee of \$20, residents can drop off their food scraps anytime, and can receive finished compost. (In addition to fruits and vegetables, they accept bread, pasta, baked goods, dairy products, paper towels, napkins, soiled paper products torn into pieces, and flower bouquets but not meat, seafood, or any compostable plastic foodservice ware.) Members

Neighborhood drop-off site supplemented with bike collections from local businesses.



are given the code to a combination lock on the entry gate. This allows them entry at any time. They place their food scraps inside one of two large trash cans inside a hutch, and are asked to cover their food scraps with sawdust (left in a small bin in the hutch). Residents can drop off yard trimmings too but must do so during monthly workdays or by appointment as the material is stored behind another gate. Members provide a pool of volunteers who can be tapped to participate in the monthly volunteer workdays, during which they help empty the Earth Tubs, screen and bag finished compost, and do small construction projects as needed.

The pricing for Philly Compost's business collection service is not consistent among its customers. Fees are based on ease of access, number of pickups per week, quantity, and type of material collected.

FUNDING: Philly Compost borrowed money for its startup costs. It bought the first Earth Tub new; the other

two were donated by a hotel in Chicago, which had bought them but then moved to a larger more automated system. Currently Philly Compost sustains its operation through its collection fees and product sales (as long as there are no equipment problems). The Compost Coop's membership fee helps it be financially sustainable.

WEBSITE: <http://www.phillycompost.com/19125.html>

<http://www.thecompostcoop.org/>

CONTACT: Lee Meinicke, Jennifer Mastalerz



The Dirt Factory, University City District, Philadelphia, PA

START DATE: 2012

DRIVERS: To keep fallen leaves out of the waste stream; to provide local residents a place to drop off food scraps; to reclaim a vacant neighborhood lot; and to provide finished compost to neighborhood gardens. The University City District knew about the need for a sustainable way of disposing neighborhood leaves, and the demand for a place to compost neighborhood food scraps. They also had a high demand for finished compost. Identifying the site and obtaining the appropriate composting technology at a modest cost were the keys to making it happen.

PARTNERS: The property owner, local institutions (universities and hospitals), the City, the State, local commercial composters, Penn State Extension. The surrounding population is generally young (median age 23.9), well educated (53.4% with at least a college degree), and very diverse. They have one part-time employee who works ~5 hours/week and no volunteers.

COMPOSTING METHOD: In-vessel (Earth Tub), and container bins (Earth Machine)

VOLUME: 15-20 tons per year. Approximately 30 cubic yards/year go in, finished compost is roughly half of that volume.

SUMMARY: University City District is a partnership of anchor institutions, small businesses and residents focused around community revitalization in the University City area, which is a diverse neighborhood in West Philadelphia named for its six colleges and universities. The District has a goal to become a model sustainable community and regularly convenes stakeholders and partners through its Sustainability Steering Committee to coordinate, call attention to, and strategize collective efforts. Goals include making compost available to community gardens in University City. To this end, the District started The Dirt Factory, a community composting facility that provides a location for the community to sustainably convert its food scraps and other organic material into a high-quality compost for use in University

City gardens. The project aims to fill a gap between backyard and municipal scale composting in a city where that's not yet available. It also aims to keep the sources and sinks for all material within a very tight neighborhood radius, creating a highly sustainable closed loop system. The University City District collects bagged leaves and wood chips from the neighborhood for processing at The Dirt Factory. Residents can also drop off 5 gallons of food scraps per week. The facility is open for drop-off 5-6 pm every Wednesday and 10:30-11:30am on Saturdays. (Bones, dairy, and meat are not accepted.) A volunteer meets residents during these two one-hour periods and then puts the food scraps in the Earth Tub, along with the leaves/browns. They also accept some food scraps from a commercial compost collection company that collects in the neighborhood. They operate on a vacant lot that was given to University City District to use for free. They give away the compost, twice a year, to individuals and community gardens (who must provide their own vehicles and containers to haul it away).

FUNDING: They receive contributions from institutions, businesses, and individuals, as well as city, state, and philanthropic sources. They purchased two Earth Tubs at a highly reduced cost.

WEBSITE: <http://universitycity.org/dirt-factory>

CONTACT: Seth Budick

The Dirt Factory uses an Earth Tub compost system to produce compost year-round from neighborhood organic materials. The Dirt Factory is also a community education center, featuring residential scale composting facilities, where community members can learn more about composting at home, and gardening using compost.



Farmer Pirates Cooperative (Compost Crew), Buffalo, NY

Farmer Pirates Cooperative is a worker-owned cooperative in Buffalo's East Side, collecting compost from local residents and business. The group embodies the essence of a truly equitable cooperative as its finished compost is distributed to the workers (farmers) based on the amount of time contributed to the collection and production of compost.



START DATE: 2012

DRIVERS: The cooperative arose in 2012 out of a need to access and retain land for community farming and a desire to work together and share resources. The residential compost collection service provides the necessary fertility and organic matter to grow healthy food.

PARTNERS: Farmer Pirates partners with Buffalo residents, local government, restaurants, small grocery stores, and other businesses. These entities largely provide feedstock material to the Farmer Pirates Compost Crew. For example, Five Points Bakery provides food scraps, the equestrian club in Buffalo provides horse bedding, and the City of Buffalo provides truckloads of leaves.

COMPOSTING METHOD: Passively aerated static pile, windrow

VOLUME: An estimated 1,500 cubic yards of incoming material composted in 2013

SUMMARY: Farmer Pirates Cooperative is a worker cooperative of urban farmers including a group of individuals, the Compost Crew, dedicated to composting. They acquired three acres of land for farming. They incorporated under NY's Cooperative Corporations law in April 2012. Farmer Pirates' Compost Crew provides a five-gallon bucket to area residents to store their food scraps until it is collected every other week. Compost Crew also collects and receives compostables from businesses. Four urban farms on the East Side of Buffalo comprise the cooperative. The areas they work in are diverse racially and economically. The places they gather compost from are all in the more affluent areas of Buffalo,



while their actual project sites are located in low income, minority neighborhoods with a high rate of abandoned buildings and vacant land. They have no "employees" currently because as "members" they are all owners of the cooperative. Composting entails building piles that sit statically for a month or longer. As the piles cook down and reduce in size, they are turned with the front end of a small tractor and combined to form windrows. (The Compost Crew could benefit from equipment enhancements and a better supply of water to help the pile cook faster.) The workers are paid for the residential collection and (soon) for commercial collection. Finished compost is distributed to the workers (farmers) based on the amount of time contributed to the collection and production of compost.

FUNDING: A Kick-Starter campaign raised \$15,000 (with 247 backers), enabling the purchase of a used truck and small trailer. Compost collection service fees (\$100/year) are charged for residential pick-ups. Residential customers are also charged \$25 if they opt for an additional five-gallon bucket. Money also comes from commercial collections, in which businesses are charged based on the number of containers needed (most commonly \$10-20/week). The rest of the work is paid out to cooperative members in finished compost. There has also been some personal investment, accounted for with shares in the cooperative. They expect to be able to market their finished compost but are still working on the quality of their output.

WEBSITE: <http://www.farmerpirates.com/>

HOW DO YOU DEFINE "COMMUNITY-BASED COMPOSTING"?

Any composting activity done on the initiative of ordinary people, not big business, that contributes to the beauty, health, and strength of our local community.

CONTACT: Michael Raleigh

Fertile Ground Cooperative, A Limited Cooperative Association, Oklahoma City, OK

START DATE: 2012

DRIVERS: The Fertile Ground Cooperative was involved with a non-profit urban farm in their neighborhood called CommonWealth Urban Farms. They started out their first year partnering with CommonWealth. When a national organic food chain opened nearby, they began getting and composting the produce scraps on a vacant lot in their neighborhood. It was a volunteer effort and it led them to the idea that they could start composting for homes and businesses in order to make some money and help support the work of CommonWealth.

PARTNERS: CommonWealth Urban Farms, a nonprofit urban farm/community education hub. Closer to Earth Youth Gardens, a nonprofit youth group that engages in organic gardening, native landscaping, composting and environmental advocacy. They hire high school students and college students from CTE to work zero-waste events with them. The area is a mixed income, diverse neighborhood. There is a “gentrifying” arts district nearby. They have two worker-owners and 7 to 10 contract part-time workers, some of who are on a track to member-ownership.

COMPOSTING METHOD: 2-bin system, turned piles

VOLUME: 20 cubic yards per year

SUMMARY: They are a grassroots worker-owned cooperative that attracts worker-owners who have an interest in composting, gardening, and permaculture related activities. They utilize the co-op to share resources for administration, marketing, and labor across service areas. As they are exiting the start-up phase, they hope to transition contract part-time laborers to being full worker-owners and to develop a solid business model for others to replicate.

They had help from the Oklahoma Worker Coop Network to draft Articles of Organization and business planning strategies. They registered as a Limited Cooperative Association in the State of

Oklahoma, which gives them the ability to organize as a worker-owned cooperative. They determined the amount of money they needed to incorporate and open a bank account and that became the opening membership share value.

FUNDING: Start up: \$225. Three of them each paid \$75 to open a bank account and register their cooperative. In their first year they focused almost exclusively on a restaurant compost/recycling service. They did not pay themselves, but saved that money as capital for the co-op. They offered a zero-waste service at community events where they were paid but did not pay themselves for labor. Asking for a table at these events allowed them marketing opportunities to spread the word about their services at no cost. Now they bid to cover their costs, plus a 15% profit (\$75/small event; \$500-\$1500/medium-large event). Residential pickup customers are charged \$28/mo (\$33 if 2 buckets). Drop-off customers are charged \$15/mo (\$19 if 2 buckets). Labor costs are low. Their Raised Garden Service charges \$500-\$2500, depending on the job. They also have a Permaculture Design/Installation Service that charges \$250 for a design plus installation costs.

WEBSITE: <http://www.fertilegroundokc.com/>

RESOURCES: <http://www.fertilegroundokc.com/about-us/worker-cooperative/>

HOW DO YOU DEFINE “COMMUNITY-BASED COMPOSTING”?

A decentralized, neighborhood-based model for composting residential food and yard waste near the source with a mostly volunteer labor force.

CONTACT: Terry Craghead, worker-owner

Temporary “under the radar” solution using turned piles in “leased” backyards (their yards and friends yards!) in urban area.

Myrtle Village Green, Brooklyn, NY

Accepts compost from over 100 families and local businesses and educates their garden members about the value and techniques of composting

START DATE: 2012

DRIVERS: Their neighborhood is a “concrete jungle” and residents wanted more green space. Neighbors organized popular support for a plan to convert an empty lot into a new community garden, and it worked. The extant soil in their garden is poor and contaminated, so an ambitious composting project on-site is critical to making the garden a safe and fertile place to work and grow edibles.

PARTNERS: Partners include brewers, chocolatiers, landscapers, cafes, carpenters and millwork shops, and local non-profits. Their members are African-American, Hassidic, Spanish-speaking, white gentrifiers, and young hipsters. There are no employees and 20 volunteers.

COMPOSTING METHOD: Bin system, vermicomposting

VOLUME: 6 tons per year of incoming food scraps/feedstocks

SUMMARY: Anyone can bring food scrap donations to their site, but only trained volunteers are allowed to work the compost bins. This helps reduce contamination. Attractive, multi-lingual signs are essential for on-site communication. They use a three-bin system, which they built. They turn from one bin to the next partially based on temperatures (which they keep in a log book), partially

based on when it is full. They have 20 volunteers. There are 5 main volunteers. Three of them got trained at the Master Composter Training at Brooklyn Botanical Gardens. It is all fairly informal. They orient the other 20 volunteers at 15-minute orientations during garden work parties where other teams are working on other tasks.

FUNDING: Volunteer labor, donations, and a grant for community composting (\$750).

WEBSITE: <http://www.myrtlepark.org/>

RESOURCES: <http://596acres.org/>, <http://www.bbg.org/>

HOW DO YOU DEFINE “COMMUNITY-BASED COMPOSTING”?

People of different ethnic, religious, and linguistic backgrounds finding common ground through collective labor.

CONTACT: Shawn Onsgard

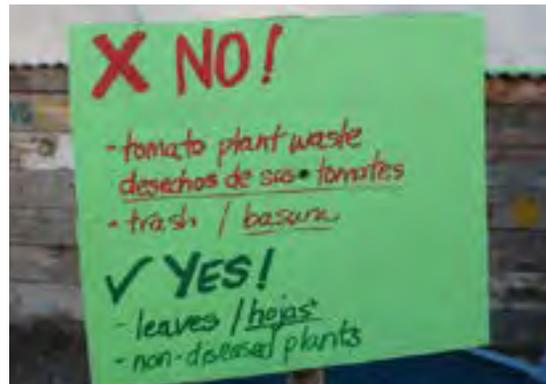


Top left: In our “Ground to Earth” project, volunteers collect coffee grounds and juice pulp from local cafes and restaurants to use as growing medium for our worms. Participating restaurants receive an attractive placard to display and promoting their participation.

Far left: The mushroom project is a cooperative effort with the Halsey Community Garden, and the Park Slope Food Coop. The project cultivates edible mushrooms on salvaged tree timbers felled by Hurricane Sandy in 2012 and is experimenting with edible mushrooms to compost straw mulch in garden beds. The entire process has been documented and promoted as educational literature and blog posts by the Park Slope Food Coop.

Middle: Myrtle Village Green signage, grey donation bins, blue feedstock containers for browns.

Left: Myrtle Village Green bilingual sign



North Carolina Community Gardens Partners (NCCGP), Greensboro, NC

START DATE: 2012

DRIVERS: The organization was developed to provide coordination, education and resources for community gardens across the state. They wanted to know how many community gardens (CGs) or urban farms (UFs) were doing on-site composting and importing food scraps in order to help the NC Department of Natural Resources (NCDENR) make possible changes to the rules for composting at these sites. It was expected the results would make the rules more compatible for CGs and UFUs to compost while also minimizing environmental and public health risks. In 2012 NCDENR, NCCGP and the Center for Environmental Farming Systems (CEFS) sent out a survey to community gardens and urban farms across the state; they received 165 responses, 74 percent of those said they made compost on-site.

PARTNERS: Community gardens, community garden organizations, NC Cooperative Extension at NC Agricultural & Technical State University and NC State University, NC Division of Public Health, NC Public Health Foundation, CEFS, NCDENR, and multiple other community, health and faith-based organizations. They also have 14 board members, who they consider partners.

COMPOSTING METHOD: 72% compost in bins, 4% compost in piles, 13% vermicompost

VOLUME: Limit allowed (by NC regulations) is 1 cubic yard a week of food scraps per CG or UF

SUMMARY: NCDENR does trainings across the state to educate CGs and UFUs about the NCDENR, Division of Waste Management composting guidelines. The trainings also include how to safely compost to minimize environmental and health impacts. CGs and UFUs are now allowed to process up to 1 cubic yard of nitrogenous material (food waste, manure) per week, plus amendment. They also must meet local zoning requirements. NCCGP has created an online Garden Directory to map community gardens across the state; 100+ gardens are on the map to date.

FUNDING: In-kind support from partners and board members

WEBSITE: www.nccgp.org

RESOURCES: <http://portal.ncdenr.org/web/wm/sw/compost>

HOW DO YOU DEFINE "COMMUNITY-BASED COMPOSTING"?

Composting on a small scale where numerous people, businesses and organizations from the community are involved. Locations of compost operations may include: community gardens, urban farms, workplaces, and backyards of homes.

CONTACT: Lisa Valdivia

A statewide network of community gardens, some of which compost on-site.



We Got Leaves, Shorewood, WI

A residential/community garden consulting, compost education, and bin maintenance service, free, and open to anyone interested in composting in backyards or at a larger scale at garden sites or schools.

START DATE: 2012

DRIVERS: Joshua Liberatore saw the need to raise awareness about organics diversion in his community. The neighborhood was rich in coffee shops, and all were sending coffee grounds to the landfill. There was also a problem with leaves in the gutter, leading to nutrient loading in Lake Michigan and the Milwaukee River. He decided to try to tackle both problems at once, by marrying excess leaves with spent coffee grounds. This started by hauling coffee grounds on his bicycle, establishing connections to local shops, distributing free coffee grounds to gardeners via Craigslist, contributing to community compost sites, or composting them himself in his sizable backyard system (4 cubic yards).

PARTNERS: Kompost Kids (board member/volunteer), Urban Ecology Center (accepted some excess coffee grounds), Shorewood Conservation Committee (member). The area is middle class, mostly white, politically progressive, 50/50 rental/owner occupied property. It is in the most densely populated community in Wisconsin, but only 13,000 residents (living generally on small lots). We Got Leaves has no employees and no volunteers; it's a one-man operation so far!

COMPOSTING METHOD: 3-bin open system, with 3 to 4 additional closed holding bins in rotation, also vermicomposting indoors (2 bins); passively aerated static piles (plastic chimneys and lots of turning)

VOLUME: 4-5 tons per year, mostly coffee grounds, leaves, and kitchen scraps but also garden trimmings and grass clippings

SUMMARY: The project grew out of one man's personal obsession with composting in particular and local disposal in general. His activities are specifically tailored to what he sees as the disposal and environmental needs of his community; his ambition is to demonstrate just how much compost capacity can be crammed into a small suburban lot.

FUNDING: No financing, purely volunteer. Joshua Liberatore probably only has \$100 worth of equipment in his backyard but none of it was purchased.

WEBSITE: <http://wegotleaves.wordpress.com/>

RESOURCES: <http://www4.uwm.edu/shwec/index.cfm>

HOW DO YOU DEFINE COMMUNITY BASED COMPOSTING?

Looking around at what the organics diversion needs are of a particular community and finding out how the principles of local disposal can be most efficiently applied.

CONTACT: Joshua Liberatore

“All of my materials are do-it-yourself bins, repurposed materials, or retrieved from the side of the road. This is a big source of pride!” –Josh Liberatore



Apple Ledge Farm, Coventry, VT

START DATE: 2013

DRIVERS: Since 2007, Apple Ledge Farm has grown and become a home to many different pastured livestock and other diversified products. With the need for compost to maintain vegetable production and the success of selling eggs from their chickens, the farm has opted to provide composting to the community and replace imported grain by feeding food scraps to its laying hens.

PARTNERS: Ned and Jana Lovejoy run this family farm with farm interns. They engage food scrap generators in the Coventry/Newport area and will soon receive food scraps delivered by the local waste district from residential drop-off locations in the region.

COMPOSTING METHOD: Windrow composting (in conjunction with feeding food scraps to chickens)

VOLUME: The scale up at Apple Ledge will allow for an average of 52 tons of food scraps per year to be composted with about 150 cubic yards of feedstocks and animal bedding. Approximately 70 cubic yards of compost is expected to be produced per year.

SUMMARY: Feeding food scraps to the laying flock at Apple Ledge Farm will happen in two distinct ways. In the winter

when the hens are in a greenhouse, they will be fed in a feeding area, and residual feed will either be removed or layered with carbon bedding material into a pack. In the summer, the farm employs an innovative mobile pasturing system and the flock will be fed in the field. Food scraps will be loaded into a well bedded manure spreader, then pulled by tractor to the pasture. The hens will then feed on the scraps and residuals will be mixed with the spreader into a compost windrow for active management.

FUNDING: Apple Ledge is a self-funded farm, mainly through egg, vegetable and meat sales. To prepare the farm for receiving food scraps, Highfields provided funding for collection materials and technical resources through a USDA rural development grant.

WEBSITE: www.vimeo.com/78850025

CONTACT: Ned and Jana Lovejoy

Apple Ledge Farm collects food scraps from local schools and businesses and receives scraps from regional residential drop-offs to feed to its chickens and to compost, with finished compost applied to its farm fields and pastures.



Community Composting, Rochester, NY

Community Composting offers residents and small businesses a doorstep compostables pickup service and delivers finished compost back to their subscribers.

START DATE: 2013

DRIVERS: Community Composting is a small, independent business started by Brent Arnold, Steven Kraft, and Luke Stodola. They were backyard composting and many people around them expressed a desire to compost but didn't have the time or tools or another outlet. They decided to meet this demand for services.

PARTNERS: Epiphergy, who composts what they collect and then gives them back finished compost to return to their customers. Other partners: Lots of Food; Rochester Grow Green. About 50% of their customers are gardeners, as they choose to receive compost each month. They have families and single residents as well as a number of cafes and restaurants that are subscribed to the service. They have 2 employees, no volunteers.

COMPOSTING METHOD: They are strictly a collection service. They bring the compostables to Epiphergy for processing.

VOLUME: 47,000 pounds of food scraps collected so far! They expect to pick up at least 37 tons in 2014.

SUMMARY: To get started, Community Composting put a general interest form online and tried to get a sense from the community of how many people wanted their service. They brought engaging displays at various community festivals. Once they reached a critical mass in a fairly small geographical region, they launched. As of March 2014, Community Composting had 100 residential

customers, all within a 5-mile radius of one another. They have one driver who works one day a week. They use a truck to pick up food scraps in little green buckets. At each pick-up, the used bucket is switched out with a clean bucket. The materials go to Epiphergy, a commercial composting facility, where they wash out all the buckets at a washing station. They do not have

much face-to-face, email, or phone contact with customers but have developed a comprehensive and powerful software package that they believe sets them apart from other collection service providers. They are able to manage billing, track the weight for each subscriber, develop optimized routes to save fuel, and manipulate data real time to watch how their business is operating. Their online system allows their customers to join, choose plan, pay, suspend while on vacation, see statistics, and more. They would be interested in licensing this technology to other businesses or groups.

FUNDING: They charge collection service fees: subscribers pay a monthly or yearly fee for pickup service. They charge adequately in order to pay their drivers, operate vehicles, and cover equipment (\$10,000) and legal fees.

WEBSITE: <http://www.communitycomposting.org/>

HOW DO YOU DEFINE "COMMUNITY-BASED COMPOSTING"?

"We exemplify community-based composting on a number of fronts. The business was formed as our neighborhood had a demand for taking care of all of the food scraps being generated. As a group of friends, we came together to provide a service to our local community, meeting our own needs instead of relying on support from the government or other agencies. Our compost is processed locally and redistributed back into our community. In addition, we donate compost to community-based organizations and gardens. We integrate software that was put together in-house, and we out-source as many of the things we can't provide ourselves to friends and other people in town." - Steve Kraft

CONTACT: Steve Kraft



DC Public Schools Pilot, Washington, DC

START DATE: 2013

DRIVERS: The recycling program provided to DCPS is designed to address the Healthy Schools Act of 2010, which includes a 45% target diversion rate and establishing a composting program. In the 2013-2014 school year, DGS implemented a pilot organics collection in 10 DCPS schools and a pilot program to support on-site composting in more than 8 DCPS schools with active school gardens.

PARTNERS: Government agencies (DCPS), Office of the State Superintendent of Education (OSSE) and private contractors/composting experts (e.g. ECO City Farms). Washington, DC's urban population is incredibly diverse including many racial and ethnic groups and socio-economic backgrounds. The program has 2.5 full-time equivalent employees.

COMPOSTING METHOD: On site: 2-bin systems and/or worm bins. Pick up: goes to a commercial compost facility in Wilmington, DE.

VOLUME: ~200 pounds organic materials/school/week are collected (there are 10 schools)

SUMMARY: The DC Department of General Services works with elementary, middle, and high schools across the city. Each school is different. For the on-site program, they worked with OSSE's school garden program to identify pilot schools and with ECO City Farms who designed a 2-bin-system prototype. They worked with OSSE and ECO City Farms to provide training to teachers at schools that received a 2-bin-system and/or worm bins from DGS. Teachers receive a presentation, handouts, and ideas for science lesson plans, and get credit for completing trainings. Compost bins are primarily for educational purposes; in this program, they are not trying to process all of the food scraps produced in the school in the on-site bin.

For the organics collection pilot, they provided the schools with twice a week collection, color-coded bins, educational posters,

labels, support, and training. They collect material from the kitchen and the cafeteria. It took several months to help each school get started and to achieve consistent sorting with minimal contamination.

They found there are three main success factors: (a) budget, (b) buy-in, and (c) "boots on the ground." They were always able to find a "champion" at each school - either a teacher, custodian, or administrative staff - who was eager to carry the program forward. However, even with a champion, all schools required ongoing visits from DGS staff to provide feedback, additional training and/or outreach to the many staff members involved in making the program work, and assistance with troubleshooting.

FUNDING: By the DC Government.

WEBSITE: <http://dgs.dc.gov/page/healthy-schools>

CONTACT: Beth Gingold, Schools Conservation Coordinator

The DC Department of General Services (DGS) provides waste and recycling hauling services to all DC municipal buildings, including all DC Public School (DCPS) schools. It is operating pilot on-site composting at 8 schools with active school gardens and has partnered with the non-profit urban farm ECO City Farms to provide set-up and composting expertise.



Roots Composting, LLC, Flagstaff, AZ

Small-scale startup urban composting pilot, working on prototypes to expand operations.

START DATE: 2013

DRIVERS: A combination of the desire to support local agriculture (poor soils in arid Arizona) and a realization of the tremendous amount of landfilled waste. They grew out of a project at Northern Arizona University. After two years of research at the University, they launched the business, with assistance from a local business incubator (NACET).

PARTNERS: Landscapers, food waste generators, local business experts, local garden/agriculture advocacy group. No full-time workers, 3 part-time employee-owners, 5 student interns. Roots Composting is a member managed LLC, with active management and decision making involvement from all its members.

COMPOSTING METHOD: Static piles or turned piles

VOLUME: Projected 300 tons per year; we anticipate will be 900 cubic yards input, 400 yards output after screening.

SUMMARY: Roots Composting is an employee-owned company with a mission to provide the Flagstaff community with a high quality source of local compost to extend landfill life and support regional agriculture, while shifting thought and behavior around the concept of "waste." Roots offers collection and composting. Its collection service includes provision of clean bins (swapped upon pickup), assistance training staff on sorting compostables, and kitchen workflow analysis. Clients receive a window sticker that advertises they compost. Collection fees for weekly pickup are: \$15/mo. for 1-2 bins per week; \$20/mo. for 3-4 bins per week; and \$25/mo. for 5-6 bins per week. Two to four pickups per week are also offered (fees increase to \$40/mo. for 6-8 bins per week). Clients include the Flagstaff Medical Center, Criollo Latin Kitchen, Macy's European Coffeeshouse, an additional four coffee shops, two breweries, one restaurant, and one grocery store. As an outgrowth of a University project, Roots is very interested in the science of composting, such as pile management. They perform many steps

of the composting operation by hand, which helps them maintain more precise control over product quality. They hand screen the finished compost to reduce particle size and produce several grades of compost including a premium grade (screened to 1/8 inch) and a high-grade blend (screened to 1/4 inch). Roots' philosophy: "Our business model is about much more than just making a profit from otherwise wasted materials. Instead, we focus on cooperatively and collaboratively working with a variety of partners, customers, and clients to creatively find a diversity of value in discarded fruit and vegetable scraps, landscaping byproducts, various animal manures, and other decomposable materials. ... Our products support local agriculture and community beautification through community gardens, backyard gardeners, landscapers, greenhouses, and small to mid scale farmers. Roots Composting is proud to be part of the growing trend towards sustainable foods, sustainable waste management, sustainable communities, and sustainable economies."

FUNDING: They are still testing their funding model and are hoping collection fees and compost sales will offset their collection and production costs. They have initiated a service charge, and began official sales in March 2014, with the first batch selling out in 10 days. The second batch was being screened at the time of this publication, with two-thirds of the compost sold in advance.

WEBSITE: <http://www.rootscomposting.com/>

RESOURCE: <http://www.cvcompost.com/NAU-Compost-Research-Project.pdf>

HOW DO YOU DEFINE “COMMUNITY-BASED COMPOSTING”?

“There can be no fruiting fungus without strong growth of mycelial networks. Similarly, community-based composting is inherently based on growing effective relational and generative networks. Our work is deeply embedded in the community in an ever-evolving capacity, both in a physical and philosophical sense. Physically, we continue expanding our web of feedstock inputs from a diversity of material inputs. Philosophically, we constantly strategize methods to link unexpected ideas, organizations, and individuals with the composting process.” -Patrick Pfeifer

CONTACT: Patrick Pfeifer, Kevin Davis Ordean, Matthew Laessig



The Farm Between, Jeffersonville, VT

The Farm Between collects food scraps from local generators to use as chicken feed and material for its hot bin-system composting. After hot composting, material is vermicomposted.



START DATE: 2013

DRIVERS: The Farm Between exemplifies ecological growing practices to produce cold hardy organic fruits, fruit nursery plants, and popular value-added fruit products like fruit syrups. Capturing local food scraps supplies the farm with chicken feed, offsetting imported grains, and cycling nutrients through its composting systems to increase soil health and crop productivity. The farm is located in rural Vermont, which generates a low density of food scraps and had little organized community composting prior to the current system.

PARTNERS: Johnson Elementary, Cambridge Elementary, local businesses and restaurants and Highfields Center for Composting

COMPOSTING METHOD: Bin system and vermicomposting (in conjunction with feeding food scraps to chickens)

VOLUME: In its pilot phase, the system is sized to feed 45 laying hens from 22.5 tons per year of mixed food residuals. Composting will require ~200 cubic yards of additional feedstocks and produce ~100 cubic yards/year of finished compost. The operation is slated to scale up in the coming years.



SUMMARY:

Composting and chicken production took place on the farm prior to providing food scrap recycling services to the community. John and Nancy Hayden (farm owners/

operators) collect and process food scraps and other organics on their farm. Local food-scrap generators include Cambridge and Johnson Elementary Schools, The Mix (cafe), Cambridge Village Market, and Brown and Jenkins Coffee Roasters. On a weekly basis, the farm collects food scraps from generators in 32-gal. totes, then feeds the scraps directly to chickens in their coop. Chicken bedding, manure, and uneaten feed are removed from the coop (weekly or more often if needed), blended with additional carbon materials, and composted in bins under thermophilic conditions to inactivate pathogens and weed seeds. After the “hot” composting method is complete, the material is fed to red wigglers to produce vermicompost.

When asked what motivates him, John talked about providing a community service to minimize food waste landfilled. Not only does the finished product fertilize his crops and fruit trees, but also John benefits economically from the process of composting. He earns a collection fee for hauling local community members’ food scraps to his farm where they provide food for his chickens, saving him money on feed. The manure he acquires from his chickens and horses are then incorporated into his compost pile and serve as an integral part of his compost recipe. Finally, most of John’s food scraps come from within two miles of his house, making collection an economically and environmentally sustainable venture.

FUNDING: Initial infrastructure and materials at the Farm Between took advantage of existing farm resources (e.g. barn, worms); USDA Rural Development grant monies (via Highfields Center for Composting) funded collection materials, food scrap generator training, and supplies to cover scale-up and improve composting activities.

CONTACT: John Hayden

University of Maine, Orono, ME

START DATE: 2013

DRIVERS: This project came about as an effort save money, to continue the institutional advancement toward sustainability, and to serve as a demonstration site for students, other individuals and potential commercial users.

PARTNERS: This is a collaborative effort among the University of Maine's Auxiliary Services (dining services); its Cooperative Extension; its Recycles, Conservation & Energy Compliance; and students and professors in several academic departments. Auxiliary Services purchased the compost system from Green Mountain Technologies. Facilities Management has one full-time employee who operates the system daily with other support during peak times.

COMPOSTING METHOD: In-Vessel (Earth Flow). The Earth Flow is a 10-foot by 40-foot system with a computerized mixing system using a vertical inclined auger.

VOLUME: 1 ton of organic material per day during the academic year, totaling 140 tons per year

SUMMARY: University of Maine composts pre-consumer food scraps from all food service centers on campus. The University has approximately 12,000 students. Four food centers service approximately 49,750 meals per week and 7,550 lbs. of pre-consumer material is collected weekly. Food scraps from the various dining halls are collected using white plastic trash cans. Staff brings the discarded food to the campus site where the Earth Flow machine is located. Staff mix one part food (N) with four parts of horse bedding (C), using a skid-steer loader. After 21 days, the active compost is removed from the Earth Flow machine. It is still hot and continues to cure. Finished compost is used on campus as a soil amendment, for landscaping, farming, and for horticultural classes. For example, the students have several hoop houses where they grow three harvests a year. The goal is to produce 10 pounds of salad mix per day, for use in one of the student cafeterias.

FUNDING: Operational costs of the compost facility are funded through University of Maine Auxiliary Services and facilities annual budget. The initial project was funded by the University of Maine green campus initiative with no external dollars.

WEBSITE: <http://umaine.edu/news/blog/2013/01/14/plate-to-plant/>

HOW DO YOU DEFINE "COMMUNITY-BASED COMPOSTING"? The community is the university campus, which includes students and staff. The entire community receives the benefits by recycling food scraps through food production, landscape beautification and educational programming. It is a team effort to make this program successful.

CONTACT: Mark Hutchinson, professor

The university facility turns nearly one ton per day of food scraps from campus dining facilities into a high quality compost to be used for grounds and other campus needs.



Right: Earth Flow machine; Below: Collection Barrels from dining halls. Below, right: Student project called "Fresh Greens," in which students grow lettuce for campus food centers using compost.



Lake Region Union High School, Orleans, VT

A large custom built hand powered rotating drum is housed in a shed with the potential for a compost heated cold frame roof to grow seedlings.

“Composting is a great way to teach about biological cycles while dealing with the high school’s food waste in a responsible way. The natural world works in cycles – the water cycle, carbon cycle, and life cycle all being examples of a significant theme of the sciences. With the death of one being begins the life of another – the embodiment of one man’s trash is another man’s treasure. In the case of compost, you could say, one banana’s peel is another thermophile’s meal.”

– Maxwell Vanhouten

START DATE: 2014

DRIVERS: This 400 student high school has an Agriculture Department that decided to divert the entire school’s food scraps by composting the material on campus to return to the school’s garden, greenhouse, and orchard.

PARTNERS: The Agriculture Department at Lake Region is facilitating this project, led by Maxwell Vanhouten. The program involves ~50 students, although a core class of ~12 will mainly monitor the system.

COMPOSTING METHOD: In-vessel drum

VOLUME: The school produces ~3 tons of food scraps per year, which will be incorporated with approximately 40 cubic yards of other materials a year. An estimated 10 cubic yards of compost will be produced.

SUMMARY: The school has volunteered to pilot a prototype in-vessel composting system concept developed by Highfields that



is being designed and built by a local vegetable farmer named Richard Hudak and his engineer and carpenter sons, Yuri and Lexi. The prototype design will be tested by the school and then shared in an open-source composting forum on Highfields web site (pending testing). The program will teach the students hands on and technical aspects of composting as well as give them an opportunity to lead field trips for elementary students coming to learn about composting and gardening.

While this project is still in the pilot stage and being developed, it is worth sharing some of the system’s unique design concepts. The entire system uses under \$5,000 in materials and could be modified to be built from mostly salvaged materials. The 5’ diameter, 6’ long drum is turned by hand with a boat lift crank. The drum is closely encased in an insulated shed, which can be removed in the summer, and in the winter and colder seasons, retains the heat from the composting process. The system has the potential for a greenhouse roof, which would be heated passively through the composting process. The goal of this feature is to extend the growing season and to capture energy that would otherwise be lost to the elements.

FUNDING: This project is primarily funded through a USDA rural development grant procured by Highfields Center for Composting. To supplement the funds, Lake Region received a grant through the New England Grassroots Environmental Fund.

This project was still in startup phase as of March 2014. We include it because it is a unique model with many replicable aspects and because we want to highlight projects supported by the USDA as part of the Rural Development Grant that funded this Guide to Community Composting.

CONTACT: Maxwell Vanhouten

Part 4: How to Plan a Community Compost Project

At the outset of a community composting initiative it is worthwhile to take time to engage in a process of gathering information, exploring potential partnerships, and picturing the whole project before getting started on a particular piece. There is a wide spectrum of possible composting projects and activities. After getting a sense of the possibilities and opportunities you will have to make an assessment of the most promising path forward. A number of key decisions and limitations will shape your direction and further define the project. The scope of the assessment required will be scale dependent, with larger projects requiring more in depth research and smaller projects requiring less. Whatever the scale, it will save you time and trouble later in the process if you take the time now to ask the right questions. The following is a list of areas that deserve your serious consideration on the front end of a community composting initiative:

- Do you have a composter, a composting site, and composting strategy?
- How much material is available to compost in your area? What sort of feedstocks is available?
- What types of generators are you planning to serve and how much material do you expect they will generate?
- How much material do you want to handle? How much material is required to make this financially feasible?
- Do you need a permit?
- How much of your time will this project take? What is the cost of starting the project?
- Is this project going to generate income, and if so will this be your primary income?
- What are your goals or interests in doing this?
- Who can help you?

Steps 1 through 12 will walk you through defining and refining a plan to implement your community composting vision.

Step 1: Clarify goals

Putting together a composting program is a puzzle that can be built in many ways; different scenarios will meet different end goals. Being very clear about your goals and interests will help you achieve them, stay the path, and make modifications throughout the planning and implementation process that support your goals.

The first step in getting started is to clearly identify why you are interested in a community composting initiative and what you hope to achieve. Are you composting to engage youth or community leaders in the art and science of composting? Are you working to close the loop on your community food system?

Are you composting to produce a marketable, saleable product? Are you composting to save money on waste hauling and disposal costs? Answering these questions will help you establish the scale of your program, determine where to look for resources and partnerships, and determine what the necessary program components will include.

As you explore the possibilities, seek out potential partners and make asks. You may be approached with offers and requests that you hadn't imagined. With all the opportunities to take advantage of, don't lose sight of why you were interested in composting in the first place. Begin with a vision of what you hope to achieve so you understand what success looks like,



SPOTLIGHT: Tinmouth Compost, Tinmouth, Vermont

The primary goals of the Tinmouth Compost project are to create a regional organic recycling facility that produces horticultural-grade compost for use on Breezy Meadows Farm and to reduce chicken feed costs by feeding food scraps to chickens. Secondary goals of the project are to create a revenue source through compost sales to farms and to help food scrap generators and municipalities comply with Act 148 (The State's Universal Recycling Law). Expected objectives include:

- Diversion of 0.5-1 ton/week in year 1
- Production of 50-200 laying hens in year 1
- 75-200 cubic yards of finished compost in years 1-2

and then be ready to alter or amend that vision to support your goals.

When you've really defined your goals and looked at different scenarios to reach those goals, you will be well equipped to design and build a successful community composting program.



Step 2: Decide which parts of the process to undertake

Every composting arrangement includes someone who develops and coordinates the program, someone who generates the material to be composted, someone to collect it, someone to undertake the actual composting process, and someone to utilize the finished compost. You may fit one or all of these composting roles. Each component of the program is a venture unto itself, which is why many programs have different partners who fulfill the different roles. Decide if you will engage in one, two, or all of these aspects. The tasks you do not plan to assume responsibility for will require a partner to fulfill. Every aspect involves education and training, and will likely benefit from some additional technical or professional assistance, especially as the scale increases.

Most composting programs involve collecting or receiving materials in some fashion, thus, material handling considerations are important. Material collections can be “drop-off” or “pick-up.” In both cases, your customers need a place to put source-separated materials throughout the week. Will you provide containers or ask your customers to find and use their own containers?

If you opt to offer collection service, you will need to decide by what means you will pick up: by bicycle, personal vehicle, neighborhood electric vehicle, van, pick-up truck, or trash truck. Obviously, a bicycle uses the least fossil fuels and is the most sustainable. However, you need to be realistic about the weather.

Whether food scraps are dropped off or picked up, community members need education on how to source separate as well as how to store material until it is collected. This can happen through handouts, workshops, one-on-

one education, listservs, and signs. One important outcome of education is material that is free of trash and contaminants.

You will also need to consider whether you will clean any containers provided or make that the responsibility of your clients. Some programs will give everyone a matching bucket, will switch out your dirty bucket for a clean bucket, and have a location where buckets are washed. In other locales, everyone provides their own mismatched containers, the dirty container is left at the curbside, customers are encouraged to line the bottom of their buckets with newspaper or a paper bag, and it is up to each household whether they want to clean their bucket or reuse it dirty. Costs can be kept low by using repurposed kitty-litter pails or 5-gallon pickle buckets (rebranded with a program sticker or label).

Your collection services might also include offering a “zero waste service” at community events and festivals. This is a great way to become better known in your community and generate some income. It will provide you free marketing and advertising. This usually involves being responsible not only for composting, but also for trash and recycling.

Step 3: Identify potential partners and collaborators

Outside the primary roles of generator, hauler, and composter, there may be a number of other roles to fill in order for the community composting project to come to fruition: finding food scraps and feedstocks; community outreach and establishing buy-in; financial management; technical support; site design and permitting; management of the volunteer workforce; marketing and sales. Imagine the roles and partners who can help get these things done. Table 4 (page 76) lists potential partners who may be able to meet possible project needs.

Partners can bring opportunities, funding, material resources



SPOTLIGHT: Public-Private Partnerships

The public sector can play a vital role in supporting community-based composting, from directly funding programs or equipment out of city budgets to providing in-kind services, free land, and public grants. Local government can pay for residential compost pickup, rather than asking residents to pay extra, out of pocket to a private collection company. Governments benefit from the avoided cost of garbage collection and disposal.

In-kind assistance can include establishing compost sites across the city, maintained by city workers. Municipalities can designate public areas for compostable drop-offs, or allocate city staff time for the marketing of a compost project and creation of ad campaigns. City connections and networks can be used to help identify free sources of leaves and wood chips. City government can agree to buy back the finished compost instead of purchasing the same product from a commercial enterprise further away.

Providing access to city land is one of the best ways government can support community-based composting. Cities can make small empty and unused parcels of land available at no cost. They can offer vacant land, even if for temporary use. Cities with brownfield sites can exchange access to land for compost use in brownfields reclamation.

and equipment, land/space, good will, and buy-in. The best composting configurations are keyed in to take advantage of local or regional assets. Take inventory of the particular skills, expertise, and activities in your area and look for common points of interest. Consider the political environment and important relationships between stakeholders in your community; look for opportunities to capitalize on these.

The basis of successful partnership largely lies in good communication, and the development of clear roles that partners willingly take on. Sometimes partnerships fall short because of a lack of clarity around what the expectations of that relationship was. Writing these expectations down in the form of memorandums of understanding (MOUs) or contracts alleviates ambiguity, defines roles and responsibilities, and helps

- everyone stay on track. Partners need to have skin in the game, or
- obvious incentive to make good on the “partnership.” Willingness
- needs to be demonstrated. For example, if a school would like
- to partner in community composting, would they be willing to
- fundraise for it? Ultimately we want partners to feel connected to
- the compost project and feel connected to the compost project
- and care about its success. While it sounds obvious, a sense of
- connectivity and pride develops as partners take on an active role
- in the program; so inviting partners to take ownership needs to be
- an intentional part of the project’s development.
- Partnerships present opportunities and challenges, and the final
- note on finding partners is to be selective. Careful consideration



SPOTLIGHT: Greenway Environmental Services, NY

By building a coalition of public, private, and community-based partners, Greenway Environmental Services has embraced all key aspects of community composting, but warns that one must not “stretch yourself too thin.” The company oversees, engages in, and has been the lead in developing all components of its local composting infrastructure. This helps ensure a sustainable source of feedstocks. Working with students, staff, dining service vendors, and faculty, the company has established the on-campus composting programs for several universities and colleges in and around Poughkeepsie (Vassar, Marist, SUNY New Paltz). It set up and manages the 6 day/week collection of organics from these generators by partnering with Royal Carting, a local carter hauler, and McEnroe Organic Farm, a nearby competitor who, like Greenway, undertakes the actual composting. Greenway developed its primary composting facility by partnering with the farm at Vassar College. Greenway is closing the loop in its greater community by returning its compost and soil products back to its institutional clients while also utilizing products for its own projects (which include bioremediation, wetland, and landscaping/nursery projects). It recently secured government funding to transfer composting operations to two new sites. These new facilities will provide programs and education with the intention of encouraging new community members to take on aspects of urban and small-scale, community composting enterprises.

must be given to whether the partner is appropriate (to meet your goals) and whether they will realistically be able to make good on their offer. You don’t necessarily want to take the first person who raises their hand. Additionally, every time you add another person into the process, this adds to your “burden” of communicating well.

Step 4: Select materials to compost and collect

Many materials are biodegradable and can be composted. Figure 1 (page 75) lists the wide range of materials composted by the operations profiled in this report: leaves, grass clippings, brush/branches, manure, paper products, food scraps, and more.

Many community composting programs focus on capturing an organic resource generated in the community that would otherwise be handled as a waste or might be recycled outside of the community. Food scraps are the most commonly accepted material by those profiled in this report. (If you are planning to target food scraps, Step 5 outlines the process of assessing the who, what, where, and how much food scraps are in your community.) Food scraps themselves come from a wide range of sources (Food Scrap Generator Sectors, p. 79) and each will have a different strategy for outreach, capture, education, collection, and handling. The materials you target should be guided by and align with your goals, the infrastructure capacity you design for, and the program and human labor you anticipate expending.

It is essential to have an adequate supply of carbon-rich materials on hand when composting wet and putrescible food scraps. Best management practices in composting involve developing a blend of materials to create ideal conditions for microbes to function. This means optimizing the carbon to nitrogen ratio of composted materials. It also means making sure the pile is not too wet or too dry. Successfully composting food scraps and other nitrogen

rich materials such as manures, requires carbon-rich materials such as garden and yard trimmings, clean shredded paper, woody material like wood chips and bark, and well-bedded animal manures (see “Common Compost Ingredients,” page 77). From where will you source your carbon materials? How will you ensure you always have a supply onsite? If you do not have adequate carbon-rich feedstocks or dry materials to absorb some of the extra liquid from wet food, your composting process may be limited. Find out if there are available sources of leaves and yard trimmings, saw dust or wood shavings, straw and bedding from horse barns and heifer operations.

Another factor to consider when weighing what materials to process and how you will optimize the blending of feedstocks is whether you want to accept certain common materials that can be challenging to work with. These materials include meat and dairy, compostable foodservice



SPOTLIGHT: Access to compost testing through partnerships

Partners may have access to compost testing, for free or at a discounted price. For example, Kompost Kids gets free testing through UW Madison Soil Science Department. Roots Compost LLC gets a discounted rate through the Northern Arizona University.



SPOTLIGHT: Roots Composting LLC

Roots Composting, LLC partners with a local nursery, who allows them to screen and bag their compost on site, store equipment, and store compost. The nursery sells their compost and keeps half the money. Roots can also sell compost on their own and keep 100% of the income. The nursery also lets them use a bob-cat for free, as long as they pay for their own fuel. This partnership is based on reciprocity and bartering. Roots compost bags also list all of their restaurant customers and partners. This provides free advertising for the partners and increases their motivation to be involved.

Fig. 1: Types of Materials Accepted by Profiled Programs

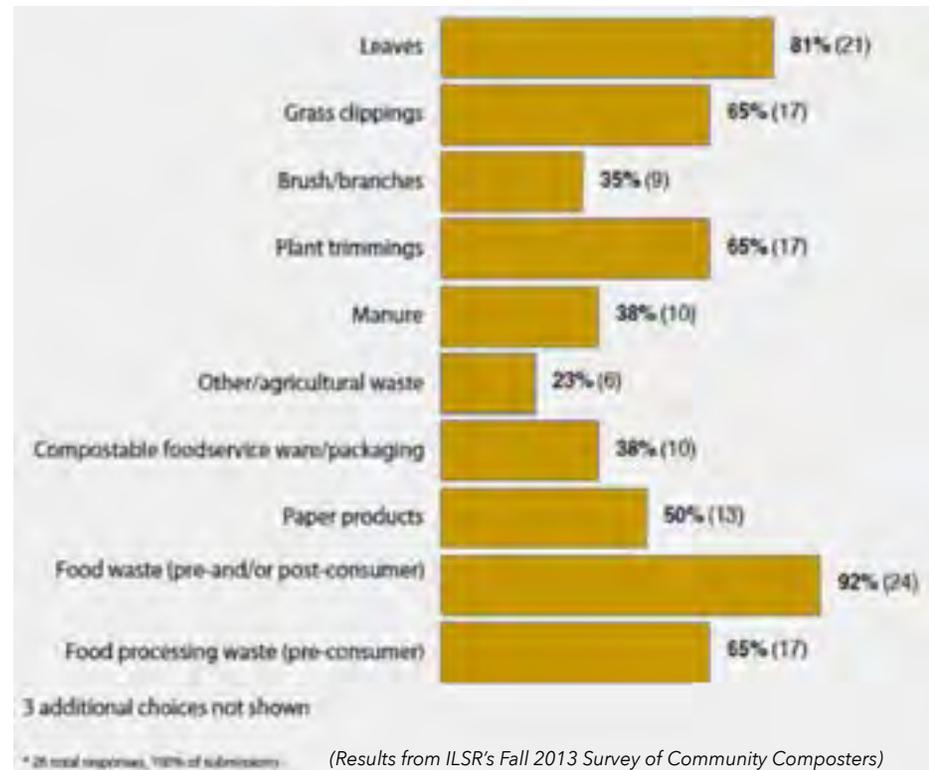


Table 4: Potential Partners to Address Possible Project Needs

POSSIBLE PROJECT NEEDS	POTENTIAL PARTNERS
Land or a compost site	Farmers, municipalities, city government, parks, public land, property owners, “benefactors” (willing to allow free use of land)
Feedstocks	Farmers, arborists, a local waste district or public works department, breweries, landscapers, nurseries, city or state road crews, carpenters, mills
Food scraps or food scrap generators	Aside from established databases (see Researching Food Scrap Generators) partners could include the local farm-to-plate network, food stores, restaurants, coffee shops, bakeries, hospitals, conference centers, universities, food hubs, farmers markets
Volunteers, or people power	Members, community gardens, food banks, schools/universities, prisons, community organizations, boys and girls clubs, 4-H groups, master gardeners, churches, neighbors, various ethnic groups with an embedded culture of gardening
Tools, equipment, a bucket loader	Institutions that have a facilities department, municipalities, organizations that could share existing equipment, organizations that would award you funds to purchase these, landscapers and nurseries, universities, farmers, city public works departments
Hauling or collection service	The local waste district or public works agency can identify registered haulers, or may be able to fill this role. Look on the internet. The State may have a list of approved trash and recycling haulers, who may want to diversify. BioCycle has a new database.
Buy-in	Local elected officials, a non-profit or community organization, influential community members, food policy councils, sustainability task forces, zero waste initiatives, municipal “green teams,” anti-incineration groups, climate change groups, “transition town” initiatives.
Financial planning or marketing assistance	Regional development corporations, graduate students in business schools, Small Business Technology Development Centers, other small business development organizations
In-kind donations ¹	Non-profits, gardens, community development organizations, municipal governments, schools, universities, building supply stores, makerspaces (community centers with tools)
A venue to sell finished compost	Nurseries and gardener supply store, hardware stores, food stores, food coops, farmers markets, festivals, landscapers, nurseries, state highway agencies, “green street” initiatives, watershed stewards, low-impact development installers (for rain gardens, green roofs, bioswales, etc.)
Financial capital	Companies and groups offering award monies, grants (for agricultural projects and community development), the local investment council, banks, private donors, investors, private and community foundations, credit unions, small Business Technology Development Centers, economic development centers, workforce business councils, Kickstart campaigns, direct public offerings, grants for agricultural projects

¹ Use of land, free buildings, water, electricity, internet, website development, screen printing, repurposed materials (many will donate or barter for what you need).

COMMON COMPOST INGREDIENTS

HIGH NITROGEN MATERIALS

These materials or “feedstocks” have high nitrogen content, which corresponds with the high level of protein in the foods of humans and animals. Ask yourself, “would or did a human or animal eat it?” If the answer is yes, then it’s probably a nitrogen ingredient. These materials are commonly referred to as “greens” in home composting and are required for microbes to create the new proteins required for reproduction.

- Food Scraps
 - Fruits & Vegetables
 - Breads & Grains
 - Meat & Dairy
- Industrial and commercial food processing byproducts
- Butcher residuals
- Animal Manures
 - Cow
 - Chicken
- Grass

HIGH CARBON MATERIALS

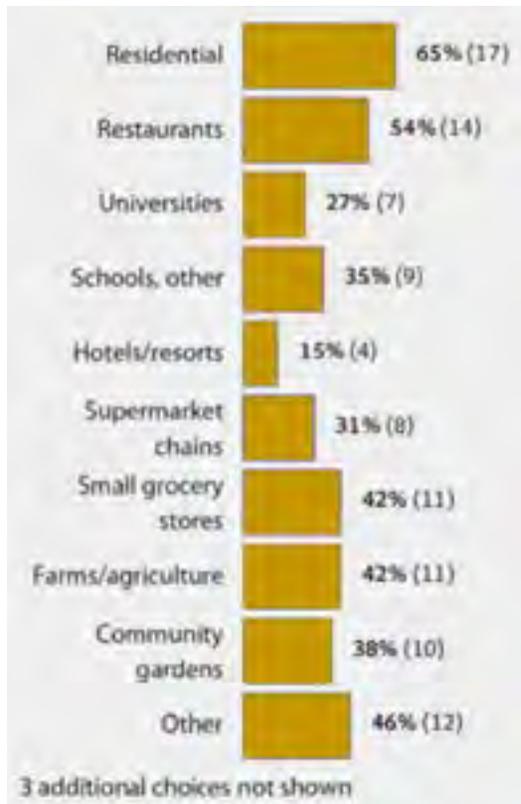
These materials or “feedstocks” have a high carbon content, which corresponds with a high level of plant tissues (e.g. lignin, cellulose, waxes, and sap). These materials are commonly referred to as “browns” in home composting and are the energy source for microbes, driving metabolism and heat, just like carbohydrates fuel humans and wood fuels a fire.

- Woody Materials
 - Wood Chips
 - Sawdust
 - Bark
 - Leaves
 - Garden Wastes
 - Hay
 - Straw
- Well-bedded Manures (varies widely)
 - Horse Bedding
 - Calf Bedding
- Paper & Card Board
- Fats & Greases



ware (such as take-out clamshells, cups, plates, and cutlery), and specialty materials that may come from a particular generator (such as ice cream, fish waste, coffee chaff). These materials all are composted very effectively at programs around the world, but require extra care. Plates and cups, for instance, may need to be torn apart to speed biodegradation. We discuss tips on this subject in “Composting Challenging Materials” (see pp. 108, 110-111).

Fig. 2: Source of Compost Materials in Profiled Programs



(Results from ILSR's Fall 2013 Survey of Community Composters)

Step 5: Research Food Scrap Generators and Other Sources of Material

There are many sources of materials to compost. The programs participating in our survey sourced mostly from food scrap generators such as restaurants, universities, schools, resorts, and supermarkets. See Figure 2, left. Farms and community gardens typically compost material generated on-site, but they are also increasingly accepting food scraps generated off-site.

Once you've identified your target generators, the next step is to assess how your operation can meet its goals in relationship with the volume of food scraps you are likely to capture or want to capture. Are you looking to work with households, a business, a school? Are you looking to serve the entire community

across all food scrap generation sectors? The capacity you design your program around depends on the answers to these questions. For some programs your capacity will be based on what is generated in the community, for others it will be based on the portion of material you want to capture.

For example, you may set an objective to collect food scraps and coffee grounds from 200 local residences, 3 coffee shops, 1 school, and 5 restaurants. You may set an objective to build program capacity to capture and recycle 30% of your community's commercial/institutional sector and 50% of the residential sector. See Estimating Food Scrap Generation (pages 80-81) for different methods to estimate volumes of materials available. There are many ways you could approach this research. Estimation techniques vary in their accuracy, so always plan for some variation and contingency in your capacity.

Step 6: Planning your compost site

Whether developing your own composting operation or looking to partner with a composter, it helps to start by looking broadly at your options. If the choice seems obvious, challenge yourself to dig deeper in the beginning stages, as unexpected realizations are par for the course and can cost the project time and resources.

- If you are looking to develop your own composting operation, what is the ideal scale of your project?
- Will you take materials generated on-site and/or off-site?
- What materials have you decided to compost?
- What is the estimated volume and weight of materials?
- Do you have adequate carbon feedstocks to compost food scraps or other materials high in nitrogen?
- Who will be in charge of managing the composting process?

(continued on page 82)



Food Scrap Generator Sectors

The materials you target for capture could fall into one, several, or many categories of food scrap generator (FSG) sectors. In addition, yard trimmings, chips from tree services, farm wastes such as manures, offices generating shredded paper, all may be generated in your community and well utilized by your program. The breakdown of FSG sectors will vary significantly from community to community.

Residential Sector: The portion of a community's food scraps generated by individuals and families in their homes. In many regions a significant percentage of these are or can be recycled at homes, either through backyard or animal feeding systems. For some residents, composting at home can be challenging and this is where residential drop off and community collection services are appropriate and needed.

Commercial/Institutional Sector: The portion of a community's food scraps generated by businesses and institutions such as restaurants, grocery stores, delis, hospitals, schools, colleges, cafeterias, etc. These FSGs produce scraps from 100s lbs/week to ≥ 1 tons/week. The majority of generators in this sector will not compost on-site themselves and community collection services provide them with a viable solution to close the loop locally.

Food Processing Sector: The portion of a community's food scraps generated by food makers and manufacturers such as breweries, distilleries, meat processors, packaging facilities, large bakeries, candy makers, and coffee roasters. These large FSGs produce scraps generally in the multiple tons/week. One thing that makes this sector unique is the homogeneity of the material typically generated compared to other sectors that have a mix of scraps. Breweries, for instance, generate grain, hops, and yeasts. Candy makers might have one batch that's all chocolate. Composters need to approach these materials with special care, especially if these materials are nitrogen-rich and wet (thus, requiring dry carbon-rich bulking amendments and being more prone to odors and process challenges). Many generators in this sector find low cost or free recycling options for their material (such as grains going to a pig farm or whey going to an anaerobic digester) and may not be candidates for a new program unless it provides them with the opportunity for cost savings or resolves an operational issue in their facility (such as more frequent collection).



SPOTLIGHT: Estimating Food Scrap Generation

Many resources and data sources are available for estimating food scrap generation. We split the techniques for estimating your targets into looking at individual generators and looking at generators across the community; both techniques may be enlightening at different points in your process. Check with your local solid waste agency to find the best resources available for your community.

ESTIMATING FOOD SCRAP GENERATION FOR INDIVIDUAL GENERATORS

There are a couple of ways to estimate generation by individual households, businesses, and institutions. Researchers have captured numerous data points across various generator types and developed factors and simple formulas to estimate food scrap generation. These formulas are what the FSG databases are based upon. More accurate is to do a physical audit of generators, which can have the additional benefit of causing the generator to see their waste with their own eyes and think about things like waste reduction. We cover both techniques briefly.

FSG FACTORS AND FORMULAS

For dealing with individual generators such as a school or restaurant, basic metrics such as number of students or number of meals served is enough to get rough estimates of generation (Elementary, Middle and High Schools all have different rates of food scrap generation per capita).

We included some sample generation calculations from Vermont Compost/Biogas Data Viewer:

Tons/Week Elementary Schools = number of students x 1.13 / 2000 (pounds/ton)

Example: $500 \times 1.13 / 2000 = 0.28$ tons/week

Tons/Week Middle Schools = number of students x 0.73 / 2000 (pounds/ton)

Example: $500 \times 0.73 / 2000 = 0.18$ tons/week

Tons/Week High Schools = number of students x 0.35 / 2000 (pounds/ton)

Example: $500 \times 0.35 / 2000 =$ tons/week

Tons/Week Restaurant = number of meal served x 0.5 lbs / 2000 (pounds/ton)

Example: $500 \text{ meals per week} \times 0.5 \text{ lbs} / 2000 = 0.12$ tons/week

Tons/Week Hospital = number of beds x number of meals served x 0.6 lbs of food waste per meal x 7 days in a week / 2000 (pounds/ton)

Example: $500 \text{ beds} \times 5.7 \text{ meals per day} \times 0.6 \text{ lbs of food waste} \times 7 \text{ days} / 2000 = 5.98$ tons/week

CONDUCTING A FOOD SCRAP AUDIT

Conducting a food scrap audit can provide a clear picture of the potential food scrap generation available. You should decide if the data provided will offset the time and expense of conducting an audit. Audits can be a lot of work for an unnecessary degree of detail. There are different ways to do an audit, depending on what exactly you are looking to assess and how much information you want. The basic goal is to identify the components of your organization's waste and calculate their percentage of the total waste generated so that this information can be used to identify areas to reduce waste and improve waste management practices. If your organization contracts for trash, and/or recycling collection, records from the contractor on waste/recycling volumes and finances over time would be very useful to gather.

An audit consists of collecting and opening trash bags from a normal day of operation; sorting their contents into recyclables, compostables, garbage, and miscellaneous articles that could be repurposed; then recording their respective weights. You can target the information by choosing to collect only from certain places, for example just collecting trash from the school cafeteria and sorting that, as opposed to the entire school's waste. Or you could look just at pre-consumer waste by auditing the school kitchen. There are a number of waste audit guides; the Environmental Protection Agency has a good one with clear directions, helpful set-up tips, log templates, and guidance in analysis.

There are also simpler ways to estimate projected tonnages or cubic yards. Do not assume you need to do a full audit for every generator.

ESTIMATING FOOD SCRAP GENERATION FOR AN ENTIRE COMMUNITY

When looking at targeting your whole community, look for existing sources of data about food scrap generators. This can be challenging, but there are a growing number of sources and they are getting better. Databases online often have GIS mapping capabilities and can allow you to get a significant amount of information including generator names, estimated generation rates, assumptions used to make those estimates, and even contact information. Vermont Compost/Biogas Data Viewer is one example and a second database is under development in Vermont created by the State. One challenge is knowing your source's strengths and weaknesses. For example, are certain sectors or generator types missing or based on poor assumptions? If possible use more than one data source.

Residential food scrap generation estimates vary, but we know that average households are typically going to create between 8-10 pounds/week of food scraps. You can use that in combination with population data to estimate the residential sector. If your program restricts meat and dairy, then capture is going to be 10-15% lower.

With food processing FSGs, there is often little public data available, so this is an area that may need a good deal of detective work. It's also an area that many community composters may not need to worry about at all, unless there is an opportunity that is worth capitalizing on. The food processors can have enormous generation and therefore, they are the most likely to have already found a valuable use for the material in order to cut costs. They may have large amounts of liquid wastes, which would be easier for a digester to handle or for a farmer to feed to animals. For this reason, this sector may be worth assessing, but may not contribute many participating generators in your program.

Participation rate is another important factor in taking FSG data and using it to plan the scale of your program. For instance, in community composting programs in Vermont (pre-organics ban), participation by businesses, schools, and food manufacturers usually starts at around 7-15% in the first year and has reached as high as 35% in the most established program in the state (Central Vermont's Montpelier region). For planning your infrastructure, estimate high participation rates so that the program has room to grow and for doing business planning, estimate low participation rates so that your business model is based on conservative revenue streams.



- What kind of budget do you have for equipment?
- How much space do you have? How much space do you need? Remember, you need space for storing carbon-rich material, the active composting phase, curing compost, screening compost, and for storing finished compost.
- How close and potentially sensitive are your neighbors?
- If you plan to use the compost on-site, how much do you need? If you want to sell your compost, what volume is your local market likely to buy? Are you going to provide compost to organic growers?

Some of the first questions you'll be asking are about scale. The goals of the operation as well as the food scrap generators you've identified are two of the most critical factors in planning the operation's scale. Don't be afraid to start small and think big. Starting composting on a pilot basis, then growing into a larger operation is a smart and common approach. It allows you to make mistakes on a micro scale and get to know the flows and needs that will be unique to your operation. Ultimately, scaling the operation to an appropriate size will depend on your business plan, local food scrap generators, how much room you have to grow, labor, and equipment availability.

Finding the right location for a new compost site can take a great deal of effort, particularly in urban environments, where farmland is less common. Visibility may or may not be advantageous to your project, depending on your goals. People are generally more welcoming of small "demonstration" composting systems that might accompany urban agriculture or community gardens, whereas with larger scale systems there can be an unwelcoming attitude. It is more productive in the long run to consider factors like these in choosing a proper composting site in order to avoid dealing with problems later on, such as opposition from neighbors. Community composting operations have found land under bridges, on

farms, in abandoned lots, on rooftops and on old landfills. What did these locations all have in common? They were all underutilized spaces and were able to glean the support of neighbors and/or municipal partners. Look for similar situations for your program.

In some cases, you will start with a location predetermined. This is probably the case if you are a community garden, urban farm, farm, school, or university. If you are a non-profit or community organization, you may not have any land to start with and will have to look for it. For that reason, many projects start small, along side a building or in someone's yard and later grow into a full-fledged project.

Many community compost programs depend on free land. Therefore, composters need to work with what they can get. Often times, a local community organization or community development corporation can partner with you to develop a "land use agreement" with their organization or with the city government.

When choosing a site, you may need to consider availability of water and electricity. Or once you have the site, you may want to position the compost operation close to a source of electricity and water (not streams or bodies of water but outlets for watering the piles when needed). You want incoming loads to have easy access to the receiving area but at the same time you need to ensure that the site is pleasant for visitors who enter the property.

It is often said that people smell with their eyes. This is an important aspect of community relations for composters to appreciate as it can reduce friction with the community and communicate the rigor (therefore building trust) of the operation.

Other siting considerations should include the surrounding

Bulk Density Will Help You Estimate Weights and Volumes of Materials

Organic materials have different bulk densities (BD). What is bulk density you may ask? BD is the weight of a certain volume of a material. In the US composting world, BD is usually measured in pounds/cubic yard. For example, the average BD of wet food scraps is 1000 pounds/cubic yard. This is very useful for planning purposes and for compost recipe development.

Here are a few useful measurement references utilized by compost practitioners:

- 1 cubic yard = 27 cubic feet
- Average BD of food scraps = ~1000 lbs/cubic yd
- 2 cubic yards food scraps = ~1 ton = ~2000 lbs
- 1 gallon of food scraps = ~4.58 pounds
- 1 x 48-gallon tote = ~220 pounds
- 9 x 48-gallon totes = ~1 ton
- TPW = tons/week
- TPY = tons/year
- CY = cubic yards

Depending on the scale and focus of your work, you may think about the raw materials of composting slightly differently. For instance, you may need to track the number of totes of food scraps you collect or receive in a given week. Knowing the weight or volume of an average full tote, will enable you to calculate, track, and report on the weight or volume of materials you are handling.

environment: natural and built. Having local and state permit requirements in hand will help you begin to do a base level assessment of how compliant a potential site may be. Ultimately, the operation and its potential discharges, including those that are unintended, can threaten surface and groundwater if not sited properly. Site selection and layout is an important task, and seeking outside technical assistance may be prudent for optimum operations flow, environmental protection and neighbor relations.

COMPOSTING SYSTEMS

There are many compost system choices. Some are better for small spaces while others are better if you have a lot of land. Some systems are more of a natural fit for a school or community garden, whereas another system might work better at a university or on a farm.

You also need to decide if you want to use fossil fuels, biofuels, or do all the work by hand. If you plan to use large collection vehicles or equipment such as windrow turners or bucket loaders, you will need access to capital or available machinery, and space to store it.

If space is constrained, you may opt for an in-vessel or bin system. If space is not a challenge, open windrow systems or static aerated piles may work well. The latter systems work best on land that is sloped 2 to 5%, in order to facilitate drainage. If you plan to handle food scraps, you may be required to have an impermeable pad and to manage any stormwater runoff. Managing stormwater is an important consideration and should be given adequate attention as it will impact your space available for actual composting operations, and may become a significant line item in your construction or operations budget.



For resources on planning a zero waste event, see the Resources, page 120.



SPOTLIGHT: Zero Waste!

Zero waste is both a philosophy and a goal to eliminate a cycle of gratuitous consumption and waste. Zero waste is a systematic approach towards conserving and recovering resources by designing and manufacturing products such that their components can be dismantled, repaired, or recycled, and one industry's discarded materials can become another's feedstock.

Many events or businesses are interested in "going green" specifically through waste reduction. Community composters are well situated to address this need through offering an event planning service or "resource recovery stations" (waste-sorting stations).

Your budget may ultimately dictate whether you can buy off-the-shelf technology or build your own custom-designed system from repurposed materials. Some systems can be constructed on site, from free materials such as lumber, wooden pallets, repurposed dumpsters, or plastic drums.

Step 7: Learn state and local zoning, permitting, and regulatory requirements

Compliance with state and local regulations is important. Many of the goals of these regulations – preventing pollution, producing safe compost, mitigating nuisances and public health concerns – are critical to the success of the project and the community composting movement as a whole. Contact your local and state solid waste, agriculture, natural resource, and environmental protection agencies to find out what the laws are. They may be able to direct you to resources to support you in your project's goals and will let you know where you fit into the regulatory framework.

It is also important to get to know the regulators. They may tell you that you are exempt. However, they might want to visit your site on a regular basis. As long as they see that you are keeping your site clean, are controlling stormwater and other runoff, are managing your compost so as to kill pathogens (required number of turnings, meeting certain temperatures for a certain number of days, etc.), you are more likely to prevent any regulatory or neighbor issues.

Some states may have passed regulations with a tiered system of permits, depending on your size and the type of feedstocks you bring in. In those cases, you need to find out whether you need:

- a certain type of surface or pad to operate
- to file a stormwater plan
- to show proof of training
- to document your management of the process in terms of temperatures and number of turnings to satisfy PFRP (process to further reduce pathogens).

If you are working with a partner composter, make sure that they are in compliance and ask them if they would be willing to sign an MOU to that effect.

Even if you only do collections, there are still permits for hauling. Every pick-up truck or garbage truck will likely need a permit; bikes and bike trailers may need permits too. Check with your local solid waste agency.

Step 8: Develop a financial plan

A lot of community composters will have no need for a financial plan. Typically projects that are handling more than a ¼ ton of food scraps per week start to require enough labor and material resources that a basic cost benefit analysis is strongly advisable (this also happens to be the scale at which composter permitting is required in Vermont). Whether starting up, ramping up, or strategizing how to finance on-going maintenance at these levels, you definitely want to have a clear sense of your finances to be sure that you don't work yourself into a hole. Committing the time to this process and this process to paper will provide a number of benefits not just in making your strategy exceptionally clear to yourself, but also to attract potential funders or partners. (Many community loan funds or banks will require a business plan if you are seeking financing.) You can use the financial plan as a point of comparison to the actual resource costs and values you are deriving from your efforts once in operation if you are the

documenting type. Recording your projects inputs and outputs not only helps you, but also helps others in the composting community if you are willing to share that information.

CONSIDERATIONS AT THE MICRO SCALE

Micro-scale projects commonly seek to capitalize on shared interests, serendipitous arrangements, and sometimes in-kind donations of labor, time, materials and equipment. Nonetheless it is advantageous to the overall success of the project to assess its feasibility through a financial lens, even if money is not the ultimate factor in the project's implementation or long-term operation.

The following questions may be helpful in planning your resource requirements:

Resource Requirements: What resources do I have/need? Equipment, materials?

Organizational Structure: Who else is going to be involved in decision-making about this project? What will that look like practically speaking?

Management: How much time will it take to manage this project once it is up and running? Do I have that kind of time? Does the involvement required make sense in relation to my broader goals? Who else will be involved in the operation of this project, and how? Volunteers? Paid staff?

Reward: What will the rewards be? Do those rewards justify the time and expenses involved? Today and next year?

Key factors to address before choosing a composting scenario:

- Project goals
- Scale or capacity needed
- Budget
- Regulatory compliance:
 - Solid waste and permitting regulations
 - Local zoning
 - Stormwater
 - Use on organic farms
- Compost system selection
- Neighbors and community support
- Conservation controls (e.g. pollution mitigation)

BUSINESS PLANNING FOR SMALL TO LARGE COMPOSTERS

Draft a business plan for financial success if you are anything larger than a very small composting operation. This plan can be used as an operating guide and/or as the basis of a financing proposal for start-up and scaling-up. Basic elements of a business plan and some key considerations include:

Vision: What does your community composting project look like? What are your goals? Is this going to be your main income? Or does this provide diversified income, value-added, or cost savings for your main operation?

Management/Organizational Structure:

Is this for-profit or not-for-profit? This determines what kind of ownership and decision making ability you will have. It determines what kind of organizational structure you will need to develop. It also dictates what kind of funding may be available to you. Who else will be involved in the operation of this project, and how? Volunteers? Staff?

Marketing Plan: Think about what kind of product you want to make, and match the types of feedstocks with this end-goal in mind. If selling compost, is there a market and what is the volume of that market? What kind of product am I going to make? What seasons are people buying compost in my area? How are they buying it? Do I want to

sell wholesale or retail? How will I advertise?

Resource Requirements: What resources do I have/need? Itemized budget for equipment, labor, and materials? How much does making compost cost me?

Cash Flow Projection: Do I have adequate resources to carry this through one year of production? How long is it going to sit on the pad before I can sell it? Do I have enough capital to buy feedstocks until I begin generating revenue? If my business were to grow, could I support the increased costs of labor and feedstocks in my activity?

Projected Profit & Loss: At what point do I break even?

Funding Requirements: How much funding do you need to raise?

A further note: timing is important! In the Northeast United States there are only two seasons to sell compost: spring and fall. The product needs to be ready to move at those times. For that reason, particularly with the compost business, it would be beneficial to map out this timeline of carrying costs, lest you don't have finished compost ready to sell in the spring. Start at the date you want to sell by, and work backwards.

Business planning may seem daunting to figure out; many find they benefit hugely from professional expertise in business planning. There are a number of places to look for help; these services may be offered at a low cost or even for free. Organizations like Small Business of Vermont will provide this service. Colleges and universities that have a business school often have a service offered by graduate students in business enterprise planning. Regional development corporations can help with planning as well as search for funds that may be available to you.



SPOTLIGHT: Bike Hauling

In Massachusetts, you need a permit to use a bicycle for hauling. Municipalities may have their own rules. At present in New York City, it is illegal to use a bike for hauling without a license.



Step 9: Organize your finances

This is where you take your overarching project goals and sketch out their financial reality.

Start planning the financial aspect of your composting project early on, even if you don't expect your project to involve a monetary exchange. Financial consideration in the start-up phase may involve a full business plan and identifying funding sources; it will likely impact how you develop your "product" and involve creating a marketing strategy. The level of financial detail you'll need to plan, will depend on your scale, the sorts of partners you bring on, and your funding. You will need to draft a budget. The following tables outline many of the typical costs associated with operating food scrap collection and composting operations.

Step 10: Identify potential funding sources

Community composting projects meet their needs for start-up funds, materials and equipment, labor, and salaries in a number of ways. ILSR's fall 2013 survey found that the majority of community-based composters depend on grants and volunteer labor. Non-profits or community groups in particular use a variety of sources to start-up and maintain their programs. For example, at the outset of a compost program, existing staff of a nonprofit or public works department might be called into service to run the pilot project, or a grant might be obtained to cover the salary of a community organizer, materials, and equipment. Farms and other facilities might use trucks and

(continued on page 92)

Table 5: Potential Funding Sources

NONPROFITS	FOR-PROFIT ENTERPRISE
Grants	Grants are sometimes available for businesses, though usually directed at specific industries. You need to find out which funders support for-profit.
Municipalities, or the Solid Waste District. It may be possible to receive support for planning and organizing a compost project.	Municipalities, or the Solid Waste District. It may be possible to receive support for planning and organizing a compost project.
Private Investors, Donors	Low-cost Financing: Many nonprofits have a lending arm that offers low-interest financing. For example, Vermont Community Loan Fund or the Vermont Economic Development Authority.
Fundraising Events	A local Investment Council
Fundraising through crowdsourcing or Kickstarter campaigns.	Traditional banks and Credit Unions: will loan to you if you meet certain criteria.
Research or collaborations with a university	Research or collaborations with a university
Private money, credit cards	Fundraising through crowdsourcing, or Kickstarter campaigns.
Business sponsorships	Fundraising Events
In-kind donations of equipment, labor, and time	Awards and contests

Table 6: Costs Estimations of Food Scrap Collection Materials

MATERIAL	ESTIMATED	NOTES
5 gallon bucket & lid	\$5-9/ea.	*A note on all containers: it is a good idea to have 20% more totes on hand than clients, to manage damage, theft, collection expansion and unforeseen events.
32 gallon tote	\$57/ea.	This is a great size for smaller businesses and self-haulers to manage.
48 gallon tote	\$65/ea	
Stickers for labeling	\$0.50-\$1.25/ea.	Costs are greatly reduced by bulk orders. Using stickers can help you repurpose used containers.
Printing costs for laminated color poster	11"x17" \$4/ea.	
Large metal signage	\$25-50/ea.	
Printing costs for 1 page tri-fold color brochure	\$1/ea.	Printing costs are greatly reduced by ordering in bulk.
Printed t-shirt	\$10/ea.	
Garden cart	\$100	This is a good tool for moving 5-gallon collection buckets.
Tipping bar	\$250*	The price here is a rough estimate. A tipping bar is something that can easily be made by a local metal fabricator.
Compost Site Tipping Fees	\$25-\$55.00 /ton	Compost sites charge a fee to receive and process food scraps and sometimes yard waste. Tipping Fees vary significantly throughout the country.
Pressure washer, hot water pressure washer	\$250-1,250	The hot water pressure washer is the best if you can afford it.

Table 7: Costs Estimates of Compost System Materials & Equipment

MATERIAL	ESTIMATED PRICE RANGE	NOTES
Residential 3-Bin Systems	\$0-500	Free pallets make great composting bins. For demonstration bins, often aesthetics justify higher materials costs.
Residential Single Bins and Tumblers	\$0-\$500	Municipalities often sell discounted black plastic composters. The cheapest options are often wire cages. The largest capacity drum compost tumblers for residential applications are upwards of \$400.00.
Prefabricated In-Vessel Composters	\$15,000-\$100,000	A wide variety of options exist (see Resources for link to CalRecycle technologies vendors website). Do research and talk to other operators of the system before you purchase.
Back Yard Compost Thermometers	\$30.00	Typically 18". Respond slowly and will not last as long as commercial grade counterparts. Good for school applications where multiple are needed for students.
Commercial Quality Compost Probes w/ Handles	\$75-200	Typically 3', although longer custom ones can be specially ordered. Handles will add years to its life! Quick read thermometers are a good investment when time is limited. Purchasing in bulk can cut the cost in half.
New/Used Loaders	\$10,000-100,000	Huge price range depending on the size of the loader and whether it's new or used. If the equipment can serve multiple uses e.g. as a loader for turning piles as well as a tractor for field cultivation, costs will be spread across more of the operation.
Loader Operation	\$25-\$50/hour	It costs money in fuel, maintenance, and depreciation to operate a loader. For example, an 80 HP loader is accounted for at \$35.00 per hour to run.
Small Self-Made Compost Screener	\$0-200	Lots of simple designs and ideas on Google. Screening compost is not always necessary.
Commercial Compost Screener	\$15,000-\$100,000	Basic and used screeners can be found for under \$50,000. Conveyors make screening more efficient. Make sure your loader and screener are compatible.
Compost Feedstocks (Raw Materials)	\$0-15/cubic yard	Raw materials are free whenever possible and most composters get paid to accept & process food scraps. Certain materials may involve a hauling cost. High carbon materials such as bark and sawdust are the most expensive.
Feedstock & Compost Analysis	\$30-\$350	Basic analysis can be conducted by some universities for lower costs. US Compost Council Seal of Testing Assurance Lab tests start at around \$40.00. Find Testing Protocols on the Highfields for Composting Center website (Feedstock Sampling Protocol).
Hand Tools (shovels, rakes, forks)	\$15-\$50	
Wheelbarrows	\$50-\$150	For carrying heavy loads, double-wheeled wheelbarrows are more stable.

SPOTLIGHT: Sample Budget

Tom Gilbert operates a farm in northern Vermont, which includes a small layer operation. Tom collects 3/4 ton of food scraps per week from the small rural towns of Stannard and Greensboro, to feed 50 laying hens. The hens are raised nearly exclusively on food scraps and pasture.

DESCRIPTION	UNITS	UNITS	\$/UNIT	TOTAL	FARM COST	PARTNER COST	NOTES
Equipment & Supplies							
Totes	32-Gal Tote	14	\$55.00	\$770.00		\$770.00	
Instructional Signs	Signs	8	\$5.00	\$40.00		\$40.00	
Starter Kits	Kits	75	\$9.00	\$675.00		\$675.00	buckets, brochure, stickers, mag, yes/no sign
Res. Drop-Off Signs	Signs	4	\$50.00	\$200.00		\$200.00	
Long Handle Scrub Brush	Brush	1	\$10.00	\$10.00	\$10.00	\$0.00	
Truck	Truck	0	\$0.00	\$0.00	\$0.00	\$0.00	Not valued here, replacement included in mileage costs under Operations
Trailer	Trailer	1	\$1,250.00	\$1,250.00	\$1,250.00	\$0.00	Half of purchase allocated
Feeding Bin Materials	Bins	4	\$0.00	\$0.00	\$0.00	\$0.00	free materials
Feeding Bin Construction	Hrs	5	\$20.00	\$100.00	\$100.00	\$0.00	
Outreach & Promotion							
Outreach Labor	Hrs	20	\$30.00	\$600.00	\$300.00	\$300.00	
Residential Post Card	Postcards	500	\$0.75	\$375.00	\$0.00	\$375.00	
Residential Post Card	Postage	500	\$0.33	\$165.00	\$0.00	\$165.00	
Posters	Posters	10	\$0.75	\$7.50	\$7.50	\$0.00	
Newspaper Ad	Ads	4	\$100.00	\$400.00	\$0.00	\$400.00	
Education							
Trainings	Hrs	30	\$50.00	\$1,500.00		\$1,500.00	
Sandwich Board	Sandwich Board	2	\$0.00	\$0.00	\$0.00	\$0.00	Scrap lumber used
TOTAL START UP COSTS				\$6,092.50	\$1,667.50	\$4,425.00	

	DESCRIPTION	UNITS	# OF UNITS	\$/UNIT	TOTAL	NOTES
INCOME	Collection Fees	Totes	520	\$5.00	\$2,600.00	10 32-gal totes/wk
	Eggs	Doz	1000	\$4.50	\$4,500.00	50 birds @260 eggs/hen/year
	Soup Birds	Pounds	50	\$3.00	\$150.00	cull 10 birds/yr; 5 lbs ea.
	Compost	Yards	5	\$50.00	\$250.00	mitigated input cost

Income Subtotal \$7,500.00

EXPENSE	Start-Up Cost	Fixed	1	\$238.21	\$238.21	Start-up costs amortized over 7 years
	Collection - Truck	Miles	1300	\$0.55	\$715.00	2 12-mile RT trips/wk
	Collection - labor	Hrs	78	\$20.00	\$1,560.00	2 45-min trips/wk
	Trainings & on-going edu	Hrs	6	\$20.00	\$120.00	3 trainings/yr & misc communications
	Tote Washing	Hrs	39	\$20.00	\$780.00	3/4 hr/wk
	Res Drop-Off Mgmt	Hrs	12	\$20.00	\$240.00	new participant emails, group updates, misc
	Wood Chip	Yrds	3	\$0.00	\$0.00	free
	Sawdust Collection	Hrs	6	\$20.00	\$120.00	time to collect sawdust from wood shop
	Sawdust Collection	Miles	120	\$0.55	\$66.00	mileage to collect sawdust from wood shop
	Wood Shavings	Bales	25	\$5.50	\$137.50	3.25 CF compressed, softwood; supplement free sawdust & woodchip
	Soap	Bottle	1	\$14.00	\$14.00	
	Compost-Making	Labor	8	\$20.00	\$160.00	
	Compost-Making	Tractor	6	\$35.00	\$210.00	USDA rate for 52 HP Kubota w/ loader
	Hay	Bales	25	\$2.50	\$62.50	mulch hay for compost
	Egg Cartons	Cartons	1000	\$0.00	\$0.00	collect used cartons during pick up and sales
	Chicken Slaughter	Hrs	5	\$20.00	\$100.00	10 birds
	Freezer Bags	bags	10	\$0.25	\$2.50	2 gal freezer bags
	Discounted Totes	Totes	312	\$5.00	\$1,560.00	Discounted pricing for schools and depot (6 totes/ wk)
	Billing	Hrs	6	\$20.00	\$120.00	monthly billing

Expense Subtotal \$6,205.71

Total Net Income \$1,294.29



SPOTLIGHT: FUNDING

- » CERO LLC (Boston) raised \$17,000 through an Indiegogo Campaign. They are also trying to raise money through a direct public offering with Cutting Edge Capital.
- » Farmer Pirates raised over \$15,000 through a Kickstarter campaign.
- » Pedal People (a worker cooperative) only needed \$100 to get started, in order to register their “dba” with the state. They now fund their capital through Patronage Dividends or Retained Earnings, which is part of their financial structure.
- » Fertile Ground (also a worker cooperative), opened up its first bank account with \$225, by collecting \$75 from each of its worker-owners.
- » Kompost Kids won \$10,000 through the Tom’s of Maine “50 States of Good” Competition.
- » Roots Composting LLC won first place at a “start-up weekend” business plan competition. This entitled them to one year of “incubation services” through NACET (Northern AZ Center for Entrepreneurship and Technology). They were also awarded \$5,000 to use for start-up costs.

equipment they already had on hand. Volunteers might provide labor or sweat equity for various site tasks, workshops, and public education. Special funds through the State might help pay for the compost testing, required for labeling and sale.

For as many projects that derive income from grants, there are as many that don’t; and they may not derive any income at all. On the whole, this national community has learned to be very frugal and innovative. The largest amount of funding for many operations may come in the form of “in kind services.” If you are affiliated with a non-profit, school, university, community garden, etc., you may find you are able to avail yourself of free land, electricity, water, indoor storage, phone, internet, use of vehicles and other equipment (shovels, wheelbarrows, skid-steer loaders, and front-end loaders). If you can arrange this through

partnerships, you may find your need for funding to be very low. Community composting projects can generate income, although not all do. Profits predominantly come from collection fees and selling finished compost; though other revenue sources include selling soil amendments, worms, compost tea, compost bins, workshops or trainings, presentations, plant sales, crops, firewood (if you get more wood than you can chip and use), and accepting donations. Most composting projects are looking for start-up or working capital, and as they become successful, money is needed in order to scale up their operations. “Table 5: Potential Funding Sources” (page 87) lists a few avenues to explore.

Step 11: Assess project feasibility

The product of Steps 1 through 10 once completed will be greater clarity around the feasibility of implementing your vision. Maybe the vision has changed slightly or shifted in light of realities made clear during your discovery process. Hopefully by asking the right questions, meeting with the right partners, and clarifying your goals and intentions with your community, an organic process unfolded that has led you to the natural next steps. Does that picture meet the needs and goals of your project?

At this juncture you have a choice: Go forward or abandon ship. You can adjust the goals and try to fit the pieces together in a different way if things still aren’t clear or it may be a good time to talk to other community composters or possibly a consultant. Doing a project on a pilot basis is never a bad way to start and is a way to answer unanswered questions, and make small mistakes in order to avoid large ones later on. Assuming you and your partners are ready to move forward, it is now time to draw a quick map of the process going forward based on all that you have discovered.

Step 12: Define your project

Community composting projects with more than one party, where various partners are depending on each other for successful implementation would do well to draft agreements to communicate and document goals, expected outcomes, roles, funding that's changing hands, and timelines of who will do what when. Define the project by establishing formalized partnerships, in the form of memorandums of understanding (MOUs), scopes of work (SOWs), or contracts, as well as budgets and business plans if warranted. At this point it's helpful to have a concept for the composting method and scale that suits your goals and

financial plans (refer to Part 2: Composting Systems), as well as a general sense of a food scrap generator outreach and collection strategy.

A well-defined project has a clear budget, a clear scope for design of all elements of the composting infrastructure and food scrap capture program, as well as plans for development, and deployment of the project. At this stage, budgets and plans are still preliminary and can change as the scope becomes better defined. It is better to budget conservatively at this point.





Tom Gilbert operates a farm in northern Vermont which includes a small layer operation. Tom collects 3/4 ton of food scraps per week from the small rural towns of Stannard and Greensboro, to feed 50 laying hens. The hens are raised nearly exclusively on food scraps and pasture.

Part 5: Tips for Replication

This section offers tips for replication from the profiled programs featured in this toolkit. The tips are organized into three areas:

1. TIPS FOR PROGRAM DEVELOPMENT
2. TIPS FOR WORKING WITH FOOD SCRAP GENERATORS
3. TIPS FOR COMPOSTERS



TIPS FOR PROGRAM DEVELOPMENT



TIP: Train members of your composting program

By choosing to recycle organic “wastes” back into our soil, ordinary citizens become activists, and not bystanders. This increases food and soil security, improves air and water quality, and helps to curb global warming. It is important to the longevity of the compost program that participants gain a way of looking at their actions as a part of this whole system. Teaching someone what to compost is only a small portion of teaching someone how and why to compost. Whether composting food scraps at a school, ski resort, prison, or restaurant, ensuring all members of the composting program receive training prior to the beginning of the food scrap collection is crucial to success. Good trainings accomplish a number of things. They:

- Ensure greater understanding of what can and cannot be composted;
- Result in less trash contamination in food scrap collections, and consequently higher quality finished compost;
- Result in fewer problems with food scrap storage and handling;
- Increase participation in the program, and in at-home composting;
- Foster a sense of ownership and pride; and
- Increase participants’ environmental literacy.

To craft a training with these outcomes, the content should teach a systems thinking awareness, provide an overview of the composting system and infrastructure, and make the participants’ role in the process clear. Participants must be inspired to act or be engaged on some level. Understanding your audience’s interests will help you determine what specific considerations you should make to get their buy-in. Leaving participants with informational brochures, stickers, and posters will help keep the food scraps trash-free after the memory of the training has faded.



- Events, Volunteer Workdays
- (BIG! Compost, Queens,
- NYC), New York Compost
- Project
-
-



SPOTLIGHT: At ECO City Farms (MD), Volunteers = People Power & Community

At ECO City Farms, “working hands replace tractors and expertise and ideas come from engaged minds of all ages and backgrounds.” People power, often in the form of volunteers, makes the farm possible. Each year volunteers contribute an estimated 1,000 hours to support farm activities, including composting. Benny Erez, Senior Technical Advisor (and chief composter), manages all composting volunteers. While these volunteers help ECO City throughout the week, Erez usually has at least two volunteers dedicated to composting on Monday when the bulk of the composting work is performed such as processing all of the new feedstock material (i.e. approximately 700 pounds of food scraps from Compost Cab, the farm’s collection company). New volunteers “shadow” Erez, listening, learning, and actively participating in hands-on instruction, with the support of two interns, and take ownership of tasks more independently as they gain more experience. Erez personally communicates with and schedules staff to assure an efficient operation by phone and email. Various volunteer composters either were or become products of the training course offered through an ECO City/Prince George’s County Community College partnership. “Volunteers are extremely important,” says Erez, “not only to actually help the small operation but they provide connection to community. With volunteers you can actually create community.”



Other Volunteer Examples:

- » University of Louisiana uses students who must each put in 1 hour a semester, as a requirement for their course. Students who have an interest in sustainable foods or “freganism” find composting of interest.
- » The Dirt Factory uses community service work hours from folks who have been convicted of misdemeanor crimes.
- » Wasatch uses work crews from the Youth Garden Program or youth from a court ordered “youth restitution” program.
- » Myrtle Village Green schedules work days along with a potluck or barbeque, to add a social component.
- » At Philly Compost volunteering is part of the membership agreement for residential drop-off customers.
- » Volunteers at Greenway Environmental Services range from elementary school Girl Scouts to retired seniors. Greenway has developed a volunteer program with activities including conducting field studies, leading tours, nursery and landscaping tasks, and litter removal. Environmental Science students from local universities, such as Vassar College, participate in field studies and site inspection program design and implementation to earn college credit.



TIP: Recruit volunteers

Volunteers are a common element of community-based composting programs. Recruiting and involving volunteers in the work of composting has many pay-offs. For many sites it may be the only way to get the work done. At ECO City Farms, for instance, volunteers equate to people power and make the urban farm possible (see spotlight on page 96). But in addition to helping meet labor needs, volunteers build community and engage the community. They often become composting ambassadors, helping to spread the gospel, if you will, about why and how to convert waste into a valuable soil conditioner. As David Buckel at Red Hook Community Farm notes, “many participants also value the opportunity to build community by forging new relationships at the compost site that can widen support networks and trigger collective action on other issues of concern in the community.” Involving volunteers and community participants builds empowerment, cultivates a sense of ownership, and enhances the capacity of communities to effectively manage their own waste.

Your project may provide unemployed people with new skills, increase carpentry skills amongst high school students through the building of bins, educate college students in composting and gardening classes.

There are many ways to engage volunteers. Many projects find it is best to have a core group of staff or volunteers handling the day-to-day composting tasks, to make sure they are done well. When labor-intensive work is needed, such as turning and screening, consider scheduling a volunteer work day. Many projects schedule a regular “work day” every week or every month where volunteers sign up or just show up to help with these tasks. In a community garden setting, these workdays may be scheduled at the same time as other work parties, so composting is seen as one of many food production tasks.

Connect composting to sustainable agriculture and local food production in order to attract volunteers. The local food movement continues to grow. People want to be taught and empowered how to grow and eat local and healthy food.

In some locations, a certain number of volunteer hours are required, for the privilege of being able to compost your food scraps for free. In a university setting, volunteering can be a class requirement or extra credit. Often the folks who want the compost become your volunteers. They want good, screened compost and are willing to help with transport in order to use the product.



TIP: Pay attention to community outreach and marketing

The heart of community-based composting is involving and reaching out to the community. You have to let the community know you exist and how to get involved. But you also have to market your compost product and any other services you may provide such as food scrap collection service, zero waste planning for community events, or composting workshops and training.

Marketing your composting program is similar to marketing any product or service. Common methods include word of mouth, websites, Facebook, Twitter, and fliers. Another



Top: Kompost Kids primarily uses volunteer vehicle, bikes, and carts to pick up compost.

Bottom: Consider starting a Master Composter training program. They require volunteerism. (NYC Compost Project)

“The quintessential story of the garden is that it is a community building experience, physical activity and a reason for people in the neighborhood to talk to each other. I have come to know more people who I live next to, people who I would not know otherwise. We now have a shared interest, we recognize each other on the street, and together we see the garden grow. Religious and economic barriers come down. One conversation at a time.”

– Shawn Onsgard, Myrtle Village Green

• be sure to wear and sell them!

• Depending on the demographics of your area, this may mean interfacing with many different ethnic and language groups and accommodating their unique needs. For example, you may decide to create bilingual Spanish/English fliers, handouts, or signage. You may need to bring in an interpreter to work with immigrant populations. You may need to schedule work days on Sundays (to accommodate religious Jews) or Saturdays (to accommodate religious Christians). Sometimes this will happen naturally. In other cases, you may need to make conscious decisions to make all groups feel equally welcome.

Youth learn to compost on Governors Island (Earth Matters)



successful approach is being seen in the community, doing your work. Other strategies include internet videos (such as comparing grades of compost to fine wine), leaving handouts at the restaurants you service, tabling at community events, pennant nights at local elementary schools, hosting events with restaurants, and making presentations at local food, nutrition or urban agricultural meetings. You can request to make a presentation for a local business or entrepreneurs group or be the host for a monthly Green Drinks. If you have T-shirts,

• There are various ways to draw people into your property. In some cases, it is attractive signage (see tip below on signage.)
 • Some community gardens may put their compost in the back, so visitors are greeted first by growing things rather than by compost bins.

• If your compost project is part of a community garden, there will be many opportunities for community interaction. Many composters report the satisfaction they get in meeting people from their neighborhood, from other cultures and ethnic groups, people they would not otherwise meet, sharing work and play and children, bonding over a shared experience. Some projects offer workshops, either on composting, or other gardening topics, such as on growing mushrooms.

• Likewise, there are many opportunities to reach out and involve youth. School groups can take a field trip to tour your project. You can go out to local schools and make presentations about composting. Youth programs can participate in your weekly work days. Younger children can help with painting of signs, bins, and bike trailers.

• Announcing a “give away day” will cause people to flock to your site. Many projects reduce their excess compost supply on just two days, in the fall and spring. Word of mouth will ensure a large number of people will visit your project on those special





Clockwise, from below: Earth Matters' "chicken composting" signage on Governors Island, NYC; Kompost Kids banner and tabling at "Bay View Bash"; Earth Matters' public collection bins on Governors Island, NYC; Kompost Kids signage; Pedal People tailgate signs.



SPOTLIGHT: Signage

- » Kompost Kids has screen painted signs saying GOOD and BAD. They have other signs saying ADD FOOD HERE
- » Myrtle Village Green has a sign saying YES and NO and another sign saying PUT DONATIONS HERE photo. Myrtle Village Green has a sign warning against diseased plants and trash, in both Spanish and English
- » At Governors Island, Earth Matter has colorful bins offering four choices: "mixed paper recyclables," "bottle and can recyclables," "compostable food waste," and "non-recyclable refuse"
- » Kompost Kids has signs mounted to wood poles for use at street festivals, which show sorting requirements for "landfill," "recycling," and "compost"
- » ECO City Farms has clear signage posted for local residents dropping off their compostable material individually at the farm and at its farmers market drop-off stations. Chief composter Benny Erez and his interns work alongside the hauler, Compost Cab, instructing where each material goes as needed when actively composting.
- » The University of Louisville took a plain white donated van and asked some art students to decorate it. The result was very eye catching.
- » Pedal People drive their bikes and trailers through the downtown area, collecting trash and recyclables from 80 trash cans. Their colorful trailers with website and phone number provide free advertising.

days. Be sure to collect the names of everyone that stops by, so you can keep in touch with them throughout the year.

Once people are involved with your program as participants or “customers,” it is important to continue open communications. There are lots of easy ways, such as email, listservs, websites, and Facebook. But face to face and personal communication remains important too.

And at the end of the day, it is important to leave time for socializing and fun! Consider hosting a picnic, barbecue, or sing-along in your space. Having time to just hang out will help you get to know your neighbors and help everyone feel more bonded. The more folks are involved with your operation, the more they will be aware of what you do and want to participate.

This food was delivered to a compost site. The lettuce was not even wilted.



TIP: Have clear signage

No matter what type of program you operate, signage is important. Signage can convey critical instructions, educate the public, and provide free advertising. Make sure your bike trailers, car, van, or truck advertises the name of your company.

Clear signage is particularly critical at the point of collection, whether in a restaurant, a zero waste festival, a public park, or at the compost site itself if participants are allowed to drop off food scraps. You need to clearly communicate what types of materials are accepted and where they go. It is also important to think about bilingual signs.

TIP: Align Your Composting Efforts with Edible Food Rescue

In the US, 31% – or 133 billion pounds – of the available food supply at the retail and consumer levels in 2010 went uneaten.³ Another study found that a shocking 40-50% of all food ready for harvest never gets eaten.⁴ Aligning your community compost project with efforts to rescue edible food and keep this resource out of landfills/incinerators and in hungry bellies will increase the project’s impact. There is a vigorous national movement committed to food rescue, whether harvesting surplus or unmarketable crops from farmers’ fields (gleaning), diverting excess food from restaurants and catered events, or recovering food that may not be saleable because it is bruised, blemished, or past its “sell by” date. Food rescue simultaneously addresses issues of waste and poverty, offering fresh food to those in need.

³Jean C. Buzby et al., *The Estimated Amount, Value and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States* (USDA, February 2014). ⁴Jeff Harrison, “Study: Nation Wastes Nearly Half Its Food” (*The University of Arizona*, November 18, 2004), citing research by Timothy W. Jones.



SPOTLIGHT: Marketing & Outreach

- » The University of Louisville took a plain white donated van and asked some art students to decorate it. The result was very eye catching.
- » Fertile Ground is contracted to provide zero waste services at community festivals. They get a free information table and all of the collection receptacles have their name and logo. This has led to articles and stories in local magazines and newspapers.
- » Wasatch Community Gardens has an annual plant sale that attracts 5,000 people. This gives their program a lot of visibility. The Gardens educates more than 15,000 kids a year about gardening and from where food comes.
- » Roots Compost LLC was the featured business at a recent Green Drinks happy hour.
- » Philly Compost believes in ongoing education and finds its customers are very responsive to short email reminders.
- » Pedal People offers biking workshops on how to fix and maintain your bike. This gets them better known in the community.
- » Earth Matter NY, Inc. drives bicycles with hitched trailers around the 182-acre Governors Island to collect compostables from public drop-off stations. The non-profit has also adopted fun ways to market their

brand and engage their partners, for example, through their "Rot-Star" of the Month award to

exemplary composters.

- » Compost Club goes out to local schools and makes presentations.
- » The Dirt Factory has a large banner across the front of its property. It has created planters and an open space classroom for events, using their excess room. That way other projects within the University City District can use the space, while informally exposing more people to composting.
- » Myrtle Village Green practices "chicken diplomacy." They have four chickens that provide eggs and manure and also draw in curious young children. They offer workshops on composting, lasagna composting, and shiitake mushroom cultivation. In addition, Myrtle Village Green plans a potluck and barbecue after each monthly work day.
- » Greenway Environmental Services invites local citizens, students, and others to tour their facilities. The company also partners with local universities and community colleges to offer work study programs and independent projects for college "green committees," provides public presentations, canvasses neighborhoods, and contribute to news articles promoting composting as a public good.

TIPS FOR WORKING WITH FOOD SCRAP GENERATORS



TIP: Provide collection service to food scrap generators

Offering collection service to food scrap generators may be worthwhile to (1) generate revenue, (2) provide a consistent supply of material to be composted, and (3) control the quality and types of materials composted. Many of the programs profiled in this toolkit offer collection service and are doing so through a variety of means: bicycle, van, pick-up truck or larger truck. Most seek a certain "route density" in order to avoid traveling all over town to pick up only one container.

You will want to identify the day of the week that you will collect. Most residential collection can be once a week, whereas restaurants and coffee shops may request twice or three times a week, and supermarkets may want daily collection.

Provide your customers with clear handouts on what you accept and what you do not. Pictures are often helpful.

Residential collection fees can vary greatly, depending on what the market can bear in your area. For commercial customers you can set a flat commercial fee or offer customers a different rate, depending on factors such as number of pickups per week, weight, ease of access, and type of material.

Decide whether you will provide customers with a collection receptacle or whether they should provide their own. Pedal



Top: University of Louisville van

Middle left: Signage at Weavers Way, Chestnut Hill Garden Festival's Eco Alley

Middle right: Logo on Grow Compost Vermont truck.

Left: Community Composting Rochester banners and stickers

- People customers provide their own repurposed buckets, whereas Community Composting of Rochester provides customized buckets.

- If you are looking to develop a community-wide program, it may be strategic to focus on the largest generators first (such as grocery stores and hospitals). When a few of these commit to participation, the program may become viable.

- Approach willing generators; they are motivated to participate and more likely to follow source separation guidelines, thus avoiding unwanted contaminants and providing clean material.

- Schools, universities, nursing homes, and other institutions are often easier to connect with because they have a facilities manager. Conversely, restaurants can be hard to reach out to because they operate in fast-paced environments, and when they are open, they are busy. Think about this when you approach, and in how you decide to make contact. Consider starting with a notice in the mail, like “Goodbye stinky trash, hello compost!”; follow up with a phone call or drop in.

- Before you approach the generator, consider their particular concerns, and know your audience. Food scrap generators in general will wonder about regulations, cleanliness, costs, and time. Check local regulations about food scrap separation before you go, as this is something the generators will be concerned about. In Vermont, food scrap separation is legal as long as nothing causes a nuisance. It is even legal to compost on site, however waste, recycling, and food scraps must be appropriately managed.

- Then there is the pitch. One Philadelphia composter tells her clients “It is as simple as moving my hand 10 inches.” Many generators can be easily persuaded by the offer of a site visit, where you can do a walk through of the client’s kitchen and show how food scrap separation can be done cleanly and effectively. Demonstrate how to set up workstations, possibly with a hole in the table and a bucket underneath, or how they might stack

buckets to a height that enables good workflow. Space is often tight, so point out how buckets or other containers can be stored in under-utilized areas or set up out back. Provide sawdust free of charge to cap a full tote and minimize odors in the warm season. Point out that separating your food scraps makes the dumpster less gross. If providing buckets, show how they fit inside an industrial dishwasher and can be washed out hassle-free every day. If you are charging for service, you may want to consider offering a 1-month free trial and training so that the client can see how easy it is.

A major aspect of the pitch is the value proposition. What will you be giving them? Many generators participate in composting programs because it is in line with their values, or because they receive positive feedback from the community for their participation. Generators may be able to save money by composting, especially if they can renegotiate their trash bill (see sidebar). And finally, remember to approach with professionalism and strive to provide consistent service. Schools need a lot of consistency, and the larger the generator, the less casual this arrangement will be.



TIP: Understand and help food scrap generators renegotiate their solid waste contracts

One major value proposition for food scrap generators to source separate their food scraps is to save money on garbage collection and disposal fees. You can better market your food scrap separation and collection service by increasing your knowledge of waste disposal contracts and helping food scrap generators renegotiate these contracts. Community-based collection service providers have to compete with traditional trash haulers who are increasingly providing food scrap collection service. You'll be in a better position to compete if you can demonstrate savings to your clients.

Trash bills generally reflect one figure – the amount of money billed for waste disposal service. However, this figure is comprised of three fees – container rental fees, collection and hauling fees, and tipping fees paid by the hauler to the landfill or incinerator for

“tipping” or depositing the load of trash. Food scraps are a relatively heavy material and commonly represent the heaviest portion of a food service business’ waste. Since food scraps are generally not bulky, source separating food scraps is likely to reduce the overall weight of your trash, while having smaller impacts on the volume. Changes in waste volume may be substantial for a large generator, but may not be detectable for a smaller business. Large schools or businesses, for instance, that divert large amounts of food scraps will reduce the volume of their trash and therefore may likely be able to rent a smaller dumpster. In addition, the removal of putrescible materials from the trash may enable the frequency of collection to be cut. While waste hauler services tend to be volume-oriented, such as dumpster size or how often the dumpster is emptied, the fees haulers pay for disposal, “tipping fees,” are calculated by weight. Most often, it is through a reduction in the weight of trash, which decreases haulers’ tipping fee costs, and thus provides you with an argument to help reduce your client’s overall trash bill. Thus, for every ton of food scraps diverted, the hauler is avoiding per ton disposal tipping fees, savings that can be



This supermarket replaced its trash compactor with a compactor devoted to food scraps.



SPOTLIGHT: Philly Compost is making ends meet...revenues help cover collection costs for businesses



PHILLY COMPOST
NEIGHBORHOOD

CONTACT for PRICING: jen@phillycompost.com 215-880-0463



To maintain the Compost Group as an affordable residential composting option, Philly Compost is now providing organics collection service! Pick-ups will be by bike and processed right in the neighborhood. Support your local economy while reducing your carbon footprint!

AFFORDABLE ORGANIC COLLECTION
ALL ORGANICS ACCEPTED
A GENEROUS HELPING OF FREE COMPOST EACH YEAR
CLEAN BINS AT EACH COLLECTION
WASTE DIVERSION REPORTS AVAILABLE
SMALLEST CARBON FOOTPRINT IN COMMERCIAL COMPOSTING
LOCAL, WOMAN OWNED SMALL BUSINESS

with the support of:   



SPOTLIGHT: Collection Pricing

» Community Composting of Rochester has designed a comprehensive software package. It enables them to manage billing, track the weight for each subscriber, develop optimized routes to save fuel, and manipulate data real time to watch how their business is operating.

» Philly Compost's collection pricing varies by customer. It's based on ease of access, number of pick-ups required per week, type of material collected, and more

» Roots Composting LLC explains that in the east, collection fees can be higher (equal or less than landfill diversion fees) and sale of compost will be much less. In the arid west, the opposite is true. There is lots of land so landfill costs are low. However, demand for rich soil is great, so you can charge more for compost than for collection.

passed on to the food scrap generator.

In addition to the per ton tipping fee charged by the landfill, haulers may also pay a state tax and/or a disposal surcharge. In Vermont, for instance, landfill disposal costs roughly \$110 per ton: approximately \$82 per ton to tip, \$6 per ton in state taxes, and \$22 per ton in district surcharges. That's a lot of potential savings to clients.



TIP: Reject trash contaminated food scraps

Trash contamination is bad and should be monitored closely and addressed.

A good training for generators and clear signage at material separation stations substantially reduces and eliminates contamination. Additionally, clear communication among the composter, the hauler, and the generator helps to address this problem. However in some cases, such as schools, institutions, and businesses with high turnover or transient populations, there is a somewhat continuous need to retrain. And while it is hard to slap people on the hand when they are doing the right thing (composting), you need to reject totes contaminated with trash, and allow the client to figure out what to do with the waste. Some composters have found it useful to be upfront about this policy in the form of contractual agreements.



TIP: Supply food scrap generators with sawdust

Smells and flies are a common concern when capturing and storing food scraps between collection service. Flies and maggots, which can be issues during warm times of the year, can be avoided by adding a thick layer of sawdust to food scraps stored



in totes. In winter in Vermont, food scrap totes often turn to “totesicles” and sawdust in the bottom of the tote helps to tip the frozen material out. While sawdust adds a cost, the sawdust adds value to the composter and can make or break the feasibility of composting to generators who are rightfully sensitive. Supply generators with a tote of sawdust and a scooper and advise them to add sawdust every 2 to 3 days and more often if an issue needs to be resolved.



TIP: Adequately price collection service

The price to charge clients for your food scrap collection service should be determined by the sum of your hauling costs, the tipping fee you pay the composter, and your business administration costs. At the Highfields Center for Composting, we are currently charging a flat fee of \$13 per 48-gallon tote and

The City of Eugene, OR, is generously making available all its digital marketing files from its Love Food Not Waste program, which is a partnership among the City, the business sector, and a local composter. Contact the City's Zero Waste Coordinator to gain access to its open source dropbox.



SPOTLIGHT: Beginners 101 Guide to Renegotiating Trash Hauling Contracts

In order to see cost savings for participating in a community composting program, food scrap generators can renegotiate their trash hauling contracts. Advise them to ask questions of their hauler and gather information before requesting a review of trash collection charges, in order to strengthen their negotiation. Food scrap generators have a right to know and understand what costs are imbedded and passed on to them through the flat fee they pay each month for the dumpster(s) used.

Step 1 – Quick Cost Savings: Smaller Dumpster or Less Frequent Collection

If food scrap generators have clearly seen a reduction in their trash since beginning participation in your composting program (e.g. dumpster is routinely NOT full), they may be able to quickly reduce their trash costs by switching to a smaller dumpster and/or requesting less frequent collection. Contacting other haulers and shopping around may help them save money.

Step 2 – Information Gathering

Here are some examples of information that will be useful:

- Try to find out how many tons per month (or tons per dumpster collection) the hauler is collecting from the food scrap generator – OR – how many tons per month or dumpster collection they estimate the food scrap generator produces.
- This information provides a point for negotiating a decrease in the trash bill, since how many tons of waste (e.g. tons of food scraps) are no longer being added to trash is now known.
- Try to find out how much the hauler pays in tipping fees at the landfill.
- Ask for an explanation of the costs that are embedded in the flat fee paid each month. Obviously the hauler has to pay for gas and upkeep for their trucks, the salaries and benefits of their drivers, the purchase and upkeep of their containers and administrative overhead costs. They also have to pay a fee for tipping trash at the landfill or an

incinerator. With this information the food scrap generator can argue that over the past X months it has been paying the hauler to dispose of its trash including the tipping fee of X amount per ton, but it has reduced the weight of its trash and therefore deserves to see some of those savings to the hauler, passed on to the client.

Step 3 – Requesting a Cost Reduction

If your client is able to get information on the amount of tons generated and the costs to the hauler to tip that tonnage at the landfill, they then have points for negotiation. With that information, your client may call the hauler again to begin the actual negotiation, which may consist of the following statements or questions:

- I'd like to talk with your customer service representative about my bill. My school/business has been routinely billed \$____ per month for the removal of our trash which is estimated to weigh ____ tons per collection or ____ tons per month according to your information.
- Over the past ____ months my school/business has changed our habits and we are now separating our food scraps from our trash for composting. We began this practice on _____ and have diverted ____ tons (or pounds) to date, which is equal to _____ tons per month.
- These ____ tons per month of food scraps represent ____% of our old estimated trash tonnage (calculate this by dividing the tonnage of food scraps per month by the estimated tonnage of trash you were supposed to have produced before this composting program took effect and multiply it by 100 to obtain the percentage).
- Therefore, we are currently paying the same rate, but producing less tonnage. We would like to see a reduction of ____ % in our trash bill commensurate with this reduction in monthly tonnage.

\$10 per 32-gallon tote. This price was determined by our costs to service a certain number of generators in a feasible collection route in a day. In our rural area, 50% of the cost of our tote pays for hauling; 25% goes to the composter; and 25% is for business administration, materials, overhead, route expansion, and profit. When you fulfill all three of the collection, hauling, and composting roles, you get to keep 100% of the fee. Additionally if you lower your overhead costs, through thrift or a partnership with someone who will cover the cost of your totes (such as the waste district or public works agency) or a grant that covers the cost of expensive equipment, this increases the likelihood of creating a viable composting business model.

A tip about billing: Payment for your services (if billed monthly), generally does not come in for 30-35 days after you have performed your services. Some haulers use a pre-paid billing model for the first of every month, which saves them the hassle of tracking down delinquent account holders and avoids cash flow crunches.

TIPS FOR COMPOSTERS

TIP: Master the art of composting and ensure operators are trained

You will want to be sure at least one or two people in your project are trained in composting, particularly if you are managing food scraps, grass clippings, or manures. In many regions there are great training programs available (see Resources, page 120, for some available training programs). Composters handling their own waste on a small scale or doing home composting education might find trainings such as Master Composter train-the-trainer programs or Cooperative Extension courses more than adequate. Composters composting others' wastes, usually on a slightly larger scale, would do well to participate in a more technical training program, such as the US Composting Council's operator trainings, the Maine Compost School, or a local certification program where available, such as the Vermont Compost

Master Composters in training commit to community service hours and building bins. NYC Compost Project.

TIP: Best Management Practices for Food Scrap Composting

- Cover and blend food scraps immediately upon arrival to compost site
- Use a balanced compost recipe
 - Carbon:nitrogen ratio of 25:1 - 30:1
 - Moisture content of 50-65%
 - Bulk density of 700-1000 lbs/cubic yard
 - 5-10% of mix is large porous particles (e.g. wood chips)
- Keep fresh food scraps contained in layer of carbon feedstock or compost
- Monitor active compost frequently: temperature, moisture content, density, smell, and visual observation
- Manage compost aerobically through turning and/or blowers
- Stormwater and contact water are captured and filtered on-site
- Feedstocks and compost is tested periodically to monitor process
- Contaminants (e.g. trash, oil) are segregated and removed from site
- Track materials coming in and out of the site





Above: Fieldtrips and workdays. The role of a Master Composter is to become a community leader. Below: Brochure from NYC's Master Composter course.



SPOTLIGHT: Master Composter

NYC's Master Composter Certificate Course: A Model Composting Education Program to Train & Engage Community Leaders

New York City's Master Composter Certificate Course is among the best master composter programs in the country. First, it is a “train the trainer” course; candidates achieving master composter status via program completion transfer their knowledge forward to other community members and future potential composters. Master composters create this exponential effect, because the course not only requires 18-23 hours of classroom instruction and two field trips, but also 15 hours of supervised community training and 15 hours of independent community service projects specifically geared toward progressing on-site community-based composting in the City. To ensure the Master Composter course has long-lasting community impact, the certificate program coordinators perform an extensive vetting process to invite only viable community leaders to participate in the course out of a pool of hundreds of candidates. Key concepts learned throughout the course include: the small-scale composting process; how to use finished compost; how to design and build on-site compost systems; and techniques for teaching others about composting. It is recommended that other cities aiming to adapt NYC's model program address these core concepts, at a minimum.

Other Training Examples:

- » Students at Northern AZ University spent two years researching various methods and recipes. This research was part of coursework. After they felt they perfected their technique, they were able to spin off their own social entrepreneurship, Roots Compost, LLC.
- » Brian at University of Louisville and Terry at Fertile Grounds in OK attended Growing Power workshops before they got started.
- » Melissa at Kompost Kids and Shawn at Myrtle Village Green were trained through their local Master Composter programs in Milwaukee and New York.

Operators Certification Training. Depending on the size of your operation and state law, at least one person may need to be licensed as a compost facility operator.

While trainings, reading and visiting other compost sites will give you many good tools as a composter, nothing can replace experience and hands and nose in the compost pile. “The footsteps of a farmer are his best fertilizer” goes the ancient Japanese proverb and this ancient wisdom holds true quite literally for compost makers as well. Careful management and trust of the composting process pays off. Don’t be afraid to make mistakes – making small mistakes is critical in order to avoid making big ones!



TIP: Manage your compost site well

The quickest way to lose support for your project is to create a smelly mess, attract pests or produce a product where nothing will grow. The best way to mitigate critters, odors and angry neighbors is to follow “best management practices” for composting (see sidebar, page 113). One critical bit of advice is that it is important to keep a carbon source (“browns”) on hand at all times. Carbon materials balance out odor causing nitrogen ingredients and contain odors with a “cap” that filters and breaks down the acids associated with most bad smells. The cap also creates an effective physical barrier that deters predators and insulates potential food sources in the hot core of the pile.

Many best management practices such as compost recipe development, pile monitoring, and pile turning are all covered in more depth in the Highfields Center for Composting’s composter toolkits available for free online (including videos, recipe calculator, and monitoring sheets). These subjects are also covered for schools and home composters. Other resources such as the On-Farm Composting Handbook are referenced in Resources, page 120.



TIP: Handle food scraps immediately to avoid problems

As soon as the food scraps or other high-nitrogen materials arrive, mix them together with your “browns” and let composting begin. (Laying down a layer of browns first before food scraps are unloaded is also a good practice.) Make sure your compost mix is “capped” with more browns or other coverings such as burlap, fleece, or other pile covers.

A good compost mix or recipe will also help avoid drip or runoff, as the carbon will absorb the water from the decomposing fruits and vegetables.

In some cases where customers drop off their own food scraps at a time when trained volunteers are not around, you may need to have a closed drop-off or “donation” container, instead of letting folks deposit food scraps directly into the compost system. Be sure this container is well sealed and the food scraps do not hang around for more than 2 to 3 days, depending on the weather.



SPOTLIGHT: Quality Guidelines

If Pedal People has a problem with a customer (e.g., contamination), they have a “cute yellow sheet” where they can leave a personal note “we stopped by, the following was not done properly.” It has their compost guidelines printed on the back. If things don’t improve, they send an email. If things still do not improve, they make a phone call.

Top: Trash that has to be sorted out of poorly-separated food scraps before composting.

Above: This windrow facility accepts yard trimmings in plastic bags. Workers spend 2 hours/day vacuuming the perimeter of the fence for plastic debris. Removing the plastic contamination removes quite a bit of organic matter too.



TIP: Be wary of composting challenging materials

Inevitably most composters are faced with certain inputs that they are not sure how or if they should accept and manage. Most common of these are meat and dairy, paper products, and more recently compostable plastics. All of these materials can be properly composted and there are benefits to accepting all of these products, first and foremost, increasing the potential diversion in your region and the types of generators you can service. There are also potential drawbacks. As a composter, you have the final say about what comes into your operation. You are the “gatekeeper of the soil” so to speak and many composters take that job very seriously. You also need to work with the generators and haulers to let them know about what is acceptable to you, so that you avoid needing to reject unacceptable material that comes to the site. Watch out for materials in the compostable gray area such as paper cups, which are typically coated with polyethylene. Similarly, not every compost operation can process compostable plastic clamshells or utensils, so make sure the generator and the hauler are aware of your specifications.

In general, when handling a potentially challenging ingredient such as fish waste or ice cream, dilution is the solution. Contaminants such as trash are better avoided all together and certainly persistent chemicals, in-organic materials like rocks, or large particles like whole logs that would take years to break down.

Below, left: Local caterers may consider compostable natural fiber packaging if you ask them. This Atlanta caterer packages food with composting in mind. (Photo: Holly Elmore, Elemental Impact.)

Below, right: Mom’s Organic Market, a natural grocery store in the DC region, uses compostable plastic utensils.



Can I compost meat and dairy?

Absolutely and composters large and small do it around the world. The primary concern when composting meat and dairy, and also fats, is smells and the critters attracted by those smells. If meat and dairy are composted in a proper recipe, following best management practices, odors are controlled and the material is broken down making excellent compost. One key is to use plenty of brown material to cap these odorous materials. Hot and contained compost bins can be created on a very small scale using insulation and hardware cloth.

Can I compost paper products?

Absolutely and they are an easily compostable carbon input that can help balance nitrogen rich ingredients such as food scraps. Glossy paper should be avoided as well as any mixed paper. Shredded office paper is a great and commonly available material that is an excellent and moisture absorbent carbon ingredient, so long as envelopes with plastic windows aren’t present. When paper composts, you can tell that it came from a fiber if you use too much of it. For a nicer looking compost, use no more than 20% paper. Some people who collect compost at home and then bring it to a residential drop-off point like to keep it in a paper bag. By accepting brown paper bags, you can accommodate participants who would prefer this practice.

Can I compost compostable plastics?

Compostable plastics (such as the corn-based polylactic acid, PLA) are polymers that break down under proper composting conditions. (They are often derived from plants such as corn, but compostable plastics can also be made from 100% fossil fuels.) Many food scrap collection programs utilize compostable plastic bags, which can help encourage participation and address the “ick” factor, by creating a barrier between the food scraps and the compost bucket or tote (similar to the brown paper bag). Other programs want to service generators who use compostable foodservice ware such as compostable plastic cups and silverware.

There is a range of challenges with compostable plastics. Many composters find that the conditions they can achieve in their composting process does not adequately break down the plastic. Another challenge is that a compostable fork looks identical to a petroleum based plastic fork, making it hard to distinguish from contamination. Some composters in some cities are working with foodservice establishments to only use certified or third-party approved compostable ware. (This can work well especially in closed venues such as sports stadiums.) Other composters prefer to treat these products as contaminants and simplify the process of educating generators.

A final challenge is that the organic agriculture community considers PLA plastics a synthetic. Not all regulating bodies have adopted the recommendation from the National Organics Standards Board that these be on the list of restricted use products, but some have (such as Vermont Organic Farmers) and it is likely that more will, including the USDA National Organic Program. The means that compost approved for use on organic farms could not contain compostable plastics.

If you choose to accept plastics, expect to deal with a learning curve. Keep these products at the core of your pile to allow them to break down and remember that many people view them as “trash” and avoid letting these products spread around the compost site, as this will give visitors the wrong impression. Also, check with your local organic certifying body and make sure that organic farmers know that your product contains PLA, as they could lose their certification if they used a restricted product.



TIP: Be innovative and frugal

A common theme among community-based composters is their drive to be creative, innovative, resourceful, and frugal. This is a strong do-it-yourself (DIY) community. Very little is bought outright when it can be created using supplies found lying around.

Here are some of the innovations we uncovered:

- Many projects build their own bins from pallets and other scrap materials.
- The community’s artistic sensibilities are displayed in painting, signage, craftsmanship, and decor. [Kompost Kids]
- Projects have designed their own box screens, trommel screens, and worm sifters.
- A number of projects are collecting food scraps via bicycle. Some have built and painted the trailers used to pull up to 350 pounds at a time. [Kompost Kids]
- Collection containers run the gamut.
- To save money, peel-off labels are used for branding before customized buckets can be obtained. Logos may be stenciled or screen painted by hand.
- Machinery is often bought used, and nursed back to life.
- Baggers and screens may be fabricated from other machinery [Grow Compost VT]

Top left: 3-bin system made from pallets. Bon Secours NY Health Systems Schervier Garden (NYC Compost Project)

Top right: Painting bins (Kompost Kids)

Bottom left: Vermicomposting is done in repurposed plastic flavoring barrels from a local distillery (Univ of Louisville)

Bottom right: Philly Compost sells compost in used grain bags





SPOTLIGHT: Online Community of Trommel Screen Builders

“Necessity is the mother of invention.” In this age of open-source collaboration, it is encouraging to note that there is an entire “online community” of folks in various countries, sharing trommel screen designs. The same basic design is used for manual screening, bicycle powered, motorized with an old washing machine motor, and even solar powered. Users share their YouTube videos, modify each other’s designs, then come back to post their improved versions.

See the following photos and online videos:

- <http://us.t77.net/show/compost+trommel> (Collection)
- <http://thegreenlivingforum.net/forum/viewtopic.php?f=12&t=106271> (Manual / Duncan, New Forest, UK]
- <http://www.instructables.com/id/Trommel-Compost-Sifter/> (Manual / Steve Gerber, location unknown)
- http://www.ncstreetops.org/uploaded/2011-12_SCHOOL_PHOTOS/Farm_blog/pedal.jpg (Bike-powered / North County School, Lake Placid, NY)
- <http://i1.ytimg.com/vi/n78rTaaGY4k/maxresdefault.jpg>
- <http://www.youtube.com/watch?v=n78rTaaGY4k> (Matthew Lowe)
- <http://dbco-op.org/compostsifter/> (DB Co-op, Brooklyn, NY)
- <http://www.youtube.com/watch?v=Cm5NaHRhVF0> (Motorized / Geoff Babcock, location unknown)
- <http://us.t77.net/video/kA6miB3UKGY/rotary-soil-sieve-soil-trommel/#.UqE60CfnPjD> (Motorized / Farm in Great Britain)
- <http://www.youtube.com/watch?v=WUA1g-edH-c> (Solar-powered / One Straw Rob, Southern Wisconsin)

Top: Philly Compost trommel screen, built during one of its volunteer days. A local bike shop donated the bike rims (in return they received some compost).

Middle: Earth Matters bicycle powered trommel screen, built by DB-Coop.

Bottom: ECO City Farms hand crank screen.

- Compost is sometimes sold in repurposed bags, or customers bring their own containers [Philly Compost]
- Lots of Kickstarter Campaigns were initiated to purchase start-up equipment.
- Earth Tubs might be donated or purchased used.



TIP: Market your compost

If you are not using all the compost you produce on-site, you will need to consider how to distribute or sell your finished product. First decide if you are giving away compost or selling it, and how, such as in bulk by the cubic yard or by the bag or bucket. If you do not need the revenue from compost sales, it is easier to give away compost than to sell it, although some people may value the compost more if they have to pay for it. Either way, do not wait to identify markets, otherwise you may experience a backlog of compost. Selling bagged compost can increase revenue but may be slower than selling in bulk. Selling one bag at a time can take time.

Bagging compost can be done manually or with a machine (which you may be able to borrow a few times a year). Consider bagging your compost in reusable containers, such as used grain bags from a local brewery. You can also ask customers to “BYOB” (bring your own bucket) and cart away the compost in their own containers. This can save time and money.

One approach is to work with a local nursery and ask them to sell your bagged compost, while keeping half of the proceeds. You can ask for good “shelf space,” near the check-out line. This will provide you with free marketing for both your product and your service. Another approach is to collect rotten produce at a farmers market in exchange for a free space to sell your bagged compost.

You also want to be creative and think about where your typical



customers hang out or what type of listservs they read. For example, farmers markets, garden clubs, master gardener workshops, community garden listservs, and CSAs are all places with potential compost customers.

While selling your compost, think about other products you can sell. These may include red wiggler worms, worm castings, compost tea, and home compost bins.

Red Hook Community Farm maintains a clean well-maintained site. Covered windrow is curing.



Guerrilla marketing: consider low-cost, unconventional tactics to draw attention to your message. This costume, used by Highfields Center for Composting, generated buzz at many events.



SPOTLIGHT: Good ideas

- » University of Louisville created compost berms around their repurposed dumpsters, to catch any runoff. They plant the berms with herbs and berries to beautify the site.
- » At the Dirt Factory, one staff person, two graduate students, and the director of sustainability share a “Google Doc,” where they log temperatures daily for their Earth Tub. No need for fancy software.
- » At Myrtle Village Green, core volunteers share a paper logbook that they keep in a small shed, near their 3-bin system.
- » Myrtle Village Green and Wasatch Community Gardens avoid the inclusion of diseased tomato vines, knot weed, morning glory, and black walnut. Myrtle Village Green had to discontinue accepting cocoa hulls, because they tended to make the piles moldy.
- » ECO City Farms works closely with its hauler and main source of compostables, Compost Cab, to ensure that contamination is minimized throughout the composting process, for example, by requiring Compost Cab to remove plastic bags - even those certified as compostable - from incoming material. The farm also seals all food storage barrels, using built-in protective plastic to line their in-vessel system, and reuses excess runoff water from that system to control odor and contact water issues, especially given their adjacent proximity to Anacostia River streams.
- » The Lower East Side Ecology Center’s in-vessel system is made of durable plastic and is completely closed off to rodents. The Center also uses industry-approved rat traps and is able to direct the majority of runoff through a connection to the sanitary sewer system.



SPOTLIGHT: Austin, TX, Recognizes Benefits of a Decentralized Composting Infrastructure

The City of Austin embraced zero waste planning January 2009 and in December 2011, adopted a 321-page zero waste operational plan, entitled *The Austin Resource Recovery Master Plan*.¹ The foundation for the City's zero waste planning efforts is the United Nations Urban Environmental Accords, which the City signed in 2005. The Accords are a set of 21 actions that the United Nations asked city governments to adopt and implement. The following three Accord actions are incorporated into Austin's resource recovery master plan:

- Implement "user-friendly" recycling and composting programs to reduce per capita solid waste sent to landfill and incineration by 20 percent by 2012;
- Adopt a citywide program that reduces the use of a disposable, toxic or nonrenewable product category by at least 50 percent by 2012; and
- Establish a policy to achieve Zero Waste going to landfills and incinerators by 2040.

In Austin, organic materials are the largest fraction of the discard stream, representing more than 47 percent of materials landfilled. As a result, organic materials recovery is a central part of the City's zero waste plan. But Austin may perhaps be unique in its official recognition of the benefits of a decentralized composting infrastructure:

"...decentralized composting processes can reduce the carbon footprint of collection and transportation while consuming organics in more localized situations that do not require large organized collection programs.

The [Austin Resource Recovery] Department recognizes that, in addition to helping the City achieve its Zero Waste goals, composting also addresses the community's interest in enriching the region's soil, strengthening sustainable food production and completing the food cycle. These additional benefits were identified by the Sustainable Food Policy Board's December 2010 letter to the Austin City Council and were considered while developing the Department's Master Plan."²

As a result, the City has adopted a highest and best use philosophy for city collection programs of residential food scraps to guide its planning.³ In addition to the eventual rollout of a citywide household yard trim and food scrap collection program, the Austin Resource Recovery Department (previously the Solid Waste Services Department) is first initiating the following new programs:

- Expanding its home composting incentive program to encourage the development of home and onsite composting; and
- Establishing composting trainings at community gardens and implementing a junior composter and master composter training program.

¹ *City of Austin, Resource Recovery Department, The Austin Resource Recovery Master Plan, December 11th, 2011.*
Available online: http://www.austintexas.gov/sites/default/files/files/Trash_and_Recycling/MasterPlan_Final_12.30.pdf

² *Ibid*, pp. 105-106

³ *Ibid*, p. 107

Board and staff at Highfields Center for Composting get acquainted with their worms.



Conclusion

While composting is an age-old technique for cycling organic materials into soil, it is not yet standard operating procedure throughout most of the US. Where it has become institutionalized, the systems implemented tend to be centralized, relying on large-scale collection to out-of-town large-scale far-away facilities. Clearly, communities cannot maximize composting and overall waste diversion levels without providing all waste generators the opportunity to set out their organic discards for collection and composting. But to build more resilient communities and reduce the government and business cost of handling organic material, particularly transportation costs, we can do better at promoting locally based composting at closer-in smaller-scale facilities.

The good news is that community composting is viable and can function in urban, rural, and suburban locations. Programs are operating from coast to coast in many settings from farms to schools; they are utilizing a variety of composting methods and equipment. Many are focused more on local food production and producing fertile soil for crops than on composting as a waste reduction strategy. All the best programs emphasize education, training, and outreach.

Despite the many compelling drivers to support community-based composting, a number of obstacles to widespread implementation of decentralized systems exist. These include: increasing consolidation and vertical integration of the organics recovery industry; lack of training programs and best practice toolkits for small-scale composting; difficulty in finding adequate land for composting operations; securing the proper mix of ingredients for optimal composting conditions; having trained staff adequately maintain the composting system; regulations that impeded community-based operations; and lack of equipment designed for small-scale operators. Local and state government policies are needed to overcome lack of a decentralized and diverse infrastructure and other obstacles to diverting organic materials from disposal through locally based systems. No matter who you

are – a food scrap generator, a resident, a hauler, a farmer, a local or state official, an equipment manufacturer – you can support the development of a locally based composting infrastructure. See sidebar, “What To Do If You’re A...” (pp. 118-119).

A focus on composting and what kind of infrastructure is needed is timely. Composting, particularly food scrap composting is expanding. As the benefits of composting as a waste reduction, job creation, climate protection, and soil enhancement strategy become more widely recognized, composting will continue to grow. Currently there is a lack of infrastructure to process food scraps. What is needed is a highly decentralized and diverse organics recovery infrastructure that first prioritizes food rescue, backyard composting, small-scale locally-based community composting, and urban and rural on-farm composting before the development of centralized regional facilities. Communities embracing such an infrastructure will be more resilient and will better reap the economic and environmental benefits that organics recovery has to offer.

We hope this guide contributes to the growing community composting movement.



Join the growing community composting movement!

In October 2013, BioCycle sponsored the first national Community Composting Forum in Columbus, Ohio. The Institute for Local Self-Reliance and the Highfields Center for Composting were among the co-sponsors. The one-day event brought together community composters, urban farmers and community gardeners to learn, network and grow. Sessions covered composting methods, financing, volunteer coordination, permitting, land access and compost quality, and next steps for building a community of practice.

If you are interested in joining the community composting network, please visit: <http://biocycle.net/communitycomposting/resources.html> and/or contact ILSR at communitycomposting@ilsr.org.

What To Do If You Are A...

FOOD SCRAP GENERATOR (E.G., A GROCERY STORE, HOSPITAL, HOTEL, OR RESTAURANT)

- See if a community group is working in your area, to help connect you to collection and compost facility options.
- Identify local compost facility options (such as a community operation or farm).
- Factor how far away your food scraps will travel in selecting a composter.
- Weigh your options, not only based on cost, but customer service, cleanliness, distance of travel, finished product, and community involvement.

HAULER

- Partner with non-profits or farmers to ensure that collected materials are composted as locally as possible rather than hauled to a centralized far-away facility.

LOCAL SOLID WASTE PLANNER

- Adopt a hierarchy of food scrap recovery that prioritizes source reduction, edible food rescue, followed by locally based composting over centralized composting at far-away facilities.
- Consider a local solution rather than a plan to transport food scraps out of town.
- Identify community groups with which to partner.
- Allocate funds to keep food scraps local. Money saved in fuel costs and tipping fees might offset costs of composting locally.
- Identify land within your jurisdiction to dedicate to community composting. Composting programs are often in need of a small piece of land, to lease inexpensively. This land may be used for compost processing, or as a transfer point to collect and haul organic matter to a partnering farm or commercial facility outside of town.
- Coordination of shared equipment among small-scale sites.

LOCAL OR STATE ELECTED OFFICIALS AND REGULATORS

- Make sure all regulations do not impede but rather facilitate the development of well-operated small-scale community-based composting systems.
- Identify state land that could be used for composting.

BIOCYCLE PRESENTS

cultivating community composting



- Support research and development, such as of systems and equipment for small-scale composting operations.
- Help farmers and other small-scale composters navigate zoning and other regulations.

FARMER

- Partner with a local collection company.
- Find out if a local group or entrepreneur is educating citizens and businesses about composting. Offer to work with them.
- Consider allocating a small parcel of your land for composting materials from off of the farm.
- Undertake composting or offer to let a community group compost on your land at no charge.
- Find out what the requirements are in your state, regarding use of an impermeable pad, stormwater and contact water controls, etc.

RESIDENT

- Learn about backyard composting
- Consider joining a network of neighborhood composting sites
- Encourage your municipality to start a pilot program for backyard education and/or curbside pickup. Ask them to “keep it local.”
- Join a local “zero-waste” initiative, or start one!
- Bring your household organic waste to a local drop-off location

COMMUNITY GARDEN

- Investigate provisions for composting within the garden.
- Sponsor workshops on cold and hot composting methods.
- Consider being a “drop-off point” for nearby residents.
- Establish a procedure for how the compost will be handled and who will take responsibility for supervision (proper odor and critter control at drop off, proper composting methods, storage of curing compost).

URBAN FARM

- Consider being a drop-off site for local residents.
- Partner with local community groups and non-profits who have a goal of reducing organics landfilled or burned and want to support your goal of building your soil for healthy, local food.

COMPOST USER

- Give preference to locally produced compost.

EQUIPMENT MANUFACTURER

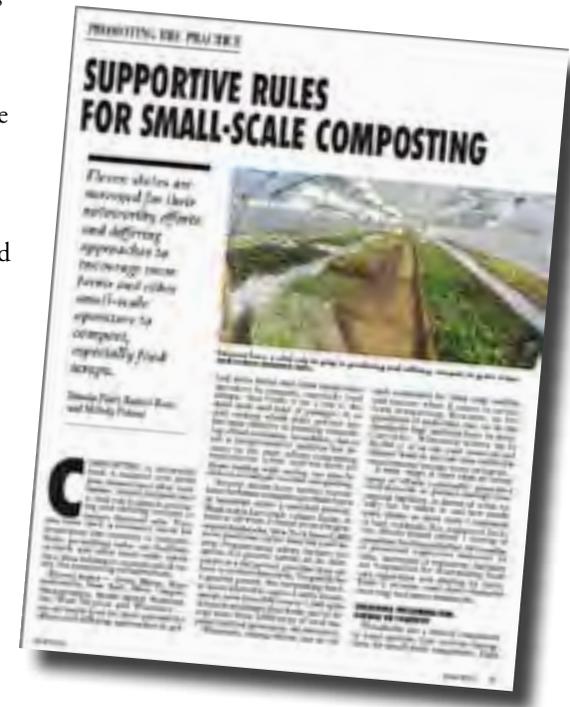
- Design technology and equipment that is low cost, cost effective, durable, and at the necessary scale for community-based composters, e.g., bicycle-powered sifters/screeners and mixers/shredders.

UNIVERSITIES

- Sponsor an engineering “challenge” for new technology. Challenge criteria might specify, for example the use of materials readily available from a home-supply store, that could be built in 60 days or less, insulated, using no electricity, with no moving parts, that could be used year-round, in a vacant lot, being both flexible and transportable.

K-12 SCHOOLS

- Center a curriculum around your composting program. The sciences and the arts can all integrate composting activities.



Resources

To find and download *Growing Local Fertility: A Guide to Community Composting* free online, along with many other educational resources and videos for communities, farms, composters, schools, businesses, and home composters visit www.HighfieldsComposting.org.

COMMUNITY COMPOSTING RESOURCES

BioCycle

<http://www.biocycle.net/tag/community-composting/>

Community Composting Forum

<http://www.biocycle.net/communitycomposting/>

Community Composting NYC

<https://sites.google.com/site/communitycompostnyc/>

Highfields Center for Composting

<http://highfieldscomposting.org/>

Growing Power

<http://www.growingpower.org/>

The Community Composting Network (UK)

<http://www.communitycompost.org/>

Institute for Local Self-Reliance

<http://www.ilsr.org/initiatives/composting/>



COMPOSTER TRAINING PROGRAMS

US Composting Council - Operator Training Courses

<http://compostingcouncil.org/training/>

Maine Compost School

<http://composting.org/>

Highfields Center for Composting

<http://highfieldscomposting.org>

New York Compost Project

Workshops: http://www.nyc.gov/html/nycwasteless/html/compost/compostproj_wrkshps.shtml

Master Composter Certificate Course

http://www.nyc.gov/html/nycwasteless/html/compost/compostproj_mastercomposter_course.shtml

ECO City Farms

<http://www.ecoffshoots.org/education/outreach-education/>

Growing Power's Regional Outreach Training Centers

http://www.growingpower.org/training_centers.htm

You can also look online to see if your state or region has a compost operator training.

RESOURCES FOR ORGANICS RECYCLING PRACTITIONERS

BioCycle Magazine

<http://www.biocycle.net>

Compost Science and Utilization

<http://compostscience.biocycle.net>

On-Farm Composting Handbook (NRAES-54).

©1992 by NRAES (Natural Resource, Agriculture, and Engineering Service). For more information, contact, (607)255-7654, or nraes@cornell.edu. Scanned with permission and made available online on Cornell's Composting web site: http://compost.css.cornell.edu/OnFarmHandbook/onfarm_TOC.html

Field Guide to On-Farm Composting (NRAES-114). ©1999 by NRAES (Natural Resource, Agriculture, and Engineering Service). For more information, contact, (607)255-7654, or nraes@cornell.edu.

Compost Facility Operator Manual: A compost facility operator training course reference and guide

John Paul and Dieter Geesling, 2009.

The Science of Composting

Eliot Epstein. CRC Press, 1996.

Worms Eat My Garbage: How to set up and maintain a worm composting system, 2nd Addition.

Mary Appelhof. Flower Press, 1997.

CalRecycle Technologies Vendors - Comprehensive List of In-Vessel Vendors

<http://www.calrecycle.ca.gov/organics/Food/Compost/InVessel.htm>

RESOURCES FOR ESTIMATING FOOD SCRAP GENERATION

Vermont Compost/Biogas Data Viewer

<http://organics.stone-env.com/vtcompostbiogas/bin-release/>

Identifying, Quantifying, and Mapping Food Residuals from Connecticut Businesses and Institutions

<http://www.ct.gov/deep/cwp/view>.

[asp?a=2718&q=325382&deepNav_GID=1645%20](http://www.ct.gov/deep/cwp/view.asp?a=2718&q=325382&deepNav_GID=1645%20)

RESOURCES ON ZERO WASTE EVENTS

Eureka Recycling! Zero-Waste Events

<http://www.eurekarecycling.org/page.cfm?ContentID=29>

Seven Generations Ahead

http://www.sevengenerationsahead.org/images/uploads/sga_zw_event_planning_guide_final.pdf

Green Mary Zero Waste Events

<http://www.green-mary.com/>

Eco-Cycle Zero Waste Events Services

<https://www.ecocycle.org/zero-waste-events#ZW%20Event%20Services>