2023 Edition

MUNICIPAL COMPOSTING GUIDE

Food Scrap Collection and Composting in Eastern MA, RI, & NH

COMPOST
GROW
EAT
REPEAT

BLACK EARTH COMPOST

CONTENTS

PREFACE

Our team at **Black Earth Compost** has created this document as a resource to gather and describe the many branches of the business. This can be used by town administrators, civic groups, and other organizations that want to promote these practices and spread awareness and adoption of these services.

In this document you will find different sections that can be easily referenced from the Table of Contents. Section 2 showcases all of the programs Black Earth has to offer to municipalities. We have included examples or "case study" towns that have implemented each type of program and seen success. Section 3 will get into the nuts and bolts, describing the different products and pricing associated with these programs. Our next section highlights how to get these programs running and market them successfully. Section 5 includes additional services that compliment our compost programs and help divert additional waste away from landfills.

Lastly, Section 6 will get into the specifics of current waste management practices that we see as problematic in our communities today. There is lots of information here but we feel it is important for towns to understand the pros and cons of their options.

We are always developing ways to create positive change and add value to the communities we serve. The core mission at Black Earth Compost is to act as a community network to locally recycle the nutrients in food scraps back into the ground. The network is growing by the day and we want to make sure we are using it to create the maximum return for our environment.

SECTION 1 The Dirt

WHO IS BLACK EARTH COMPOST?

Black Earth Compost, LLC is a compost collection and processing business founded in 2011 and built from the ground up. Operating across southern New England, we specialize in the hauling of food scraps and other organic material from residences and commercial businesses and processing the waste at our local compost sites. Our mission is to divert valuable waste away from landfills and utilize its highest end use; to grow food in our local communities. Currently, BEC (Black Earth Compost) hauls material from over 40,000 residents and 800 commercial locations. These organics are transported to our three compost sites around the Eastern MA region where they are turned into compost and then distributed back to community gardens, farms and residences for landscape use.

Having this vertically integrated structure allows us to minimize capacity restraints while maximizing quality control. We operate the largest organics truck fleet and have the most permitted compost sites in New England in addition to curbside pickup of other sources of waste including textiles, electronics, and leaf and yard waste.

Black Earth Compost at Mehaffey Farm in Rowley, MA 2016

> We handle both the hauling and processing of food scraps, which gives us full control on the entire stream.

OUR PROCESS

Composting is the biological degradation of organic materials (anything that was alive), into a nutrient rich substrate in which new life can grow. At Black Earth, we specialize in handling two forms of waste: food scraps (high in nitrogen), and woodchips, leaves, horse bedding, etc (high in carbon). These materials on their own have minimal value, but the combination of the two plus our active management creates a nutrient rich soil amendment. This is a low cost, carbon offset process that creates a valuable end product while also diverting waste away from landfills.

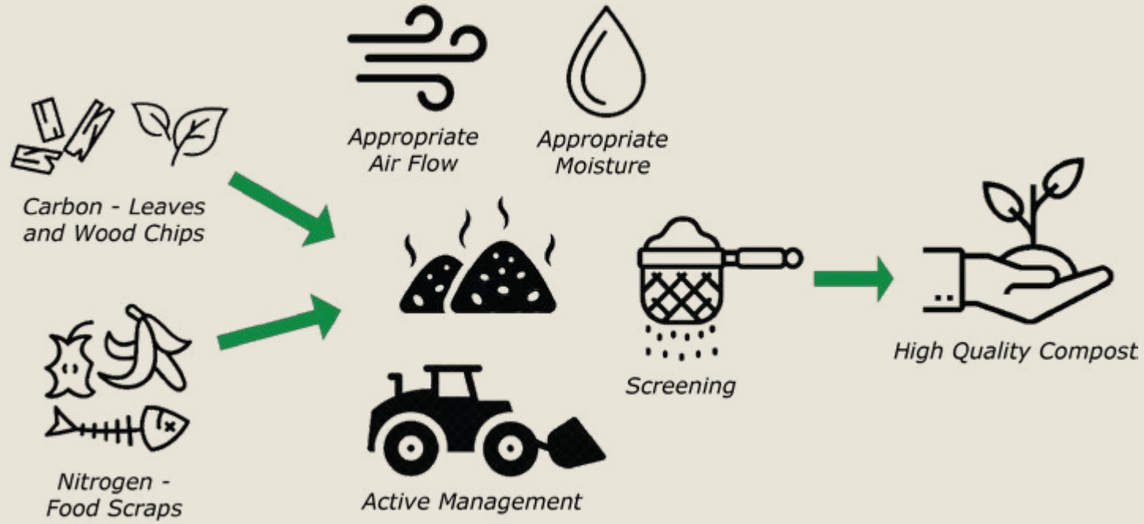
WHY SHOULD WE COMPOST?

- Compost creates a nutrient rich soil amendment, which in turn creates healthier plants that are drought and disease resistant
- This process actually pulls and stores carbon out of the air reversing the effects of global warming as seen here: Compost Can Boost Carbon Capture
- The diversity of ingredients in compost increases the nutrients in our soil and food while also encouraging local food production
- Compost added to soil is an effective way to deal with flooding as it infiltrates soil and holds more water: Compost to increase rainwater soil penetration

Cities on the west coast have implemented mandatory uses for adding compost to post construction soil to help cities manage run-off problems due to compost's ability to soak in moisture like a sponge.

Farmers are also encouraged to switch to compost as seen here on an almond farm in California. Compost application enabled the farm to decrease chemical inputs and increase soil water retention.

HOW IT WORKS



With topsoil depletion and increasing dependence on chemical fertilizers, pesticides, mass produced monocrop farming, the chances of disruption to our food supply also increases. By recycling our organic nutrients into compost to put back into the soil for food production locally, we are decreasing our dependence on this unsustainable form of food production while storing carbon in the soil.

Being able to grow your own food is especially empowering for lower income populations and has the added effect of saving money, increasing social relationships, more time spent outdoors and developing healthier habits.

The nearest and largest acceptor of MA waste, NH, is getting defensive for retaining their own capacity and are following MA with commercial organics bans.

As more states begin to run out of landfill space, costs to ship will inevitably rise.

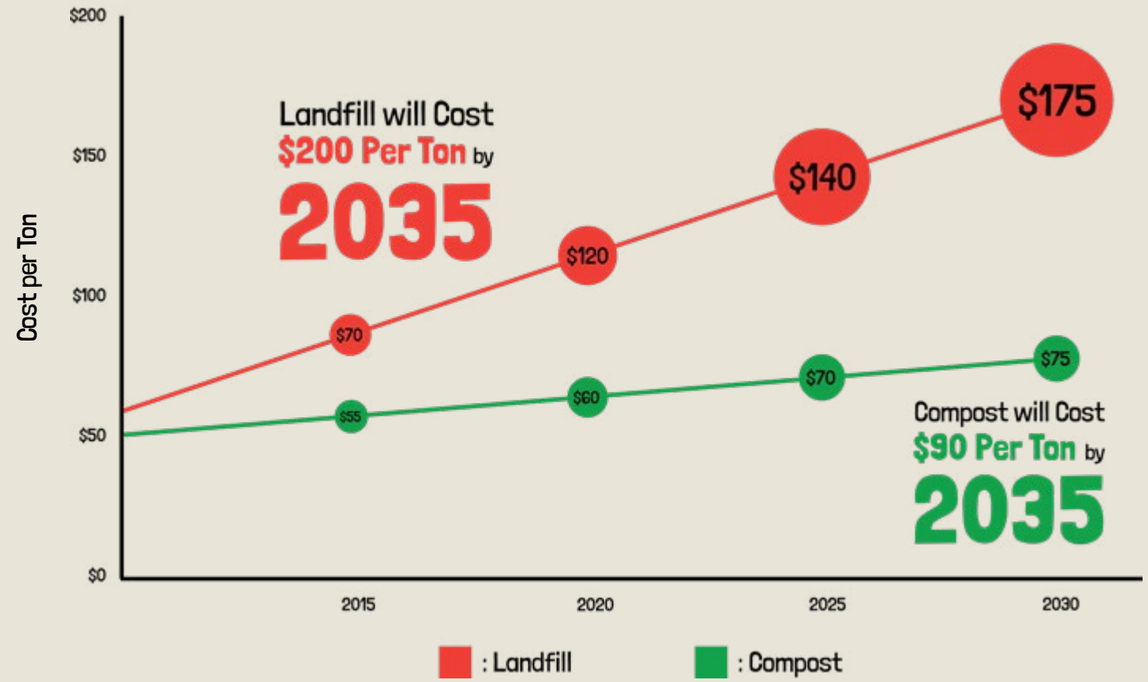
Waste rates are starting to hit triple digits in cost per ton. With organic waste accounting for half of the waste you find in landfills, composting is the most affordable, scalable solution that also improves the environment.

Our average residential bin weighs 10-13 lbs per week, about 550 lbs/year per household (about $30/year per HH in trash tipping fees avoided). Savings for towns are most acute in private programs because residents pay directly. When all landfills in MA close, that $30 savings per household per year will be much higher. Private subscription of composting services is therefore one of the most significant means for towns to lower their waste costs now.

Escalating Waste Costs

- Tipping fees are drastically increasing for waste while composting fees remain stable Shortage of CDL drivers to get worse, impacting nearly entire waste fleet
- Black Earth operates clean, diesel trucks that do not operate under CDL
- The Big Three waste companies have bought out most local, low cost haulers
- Landfills across MA, RI are closing in the next 10 years if not sooner (See p.8)
- Shipping waste out of state is costly and requires new and expensive infrastructure to support

Landfill vs. Compost Costs



- Massachusetts has set new thresholds for commercial organic waste in their 2030 Solid Waste Master Plan, see the guide for municipalities here. Currently anyone producing over 1000 lbs/week must divert the organics
- Mass DEP has set a goal to reduce waste going to landfills by 30% in 2030 and 90% by 2050

A ban on all organics from landfills is likely coming down the pipeline (Massachusetts banning disposal of textiles, mattresses and more organics in 2022). Composting is a long term habit formation process that we need to start managing and building into consumer behavior today. What we do now will have a huge impact in 10-20 years financially and environmentally.

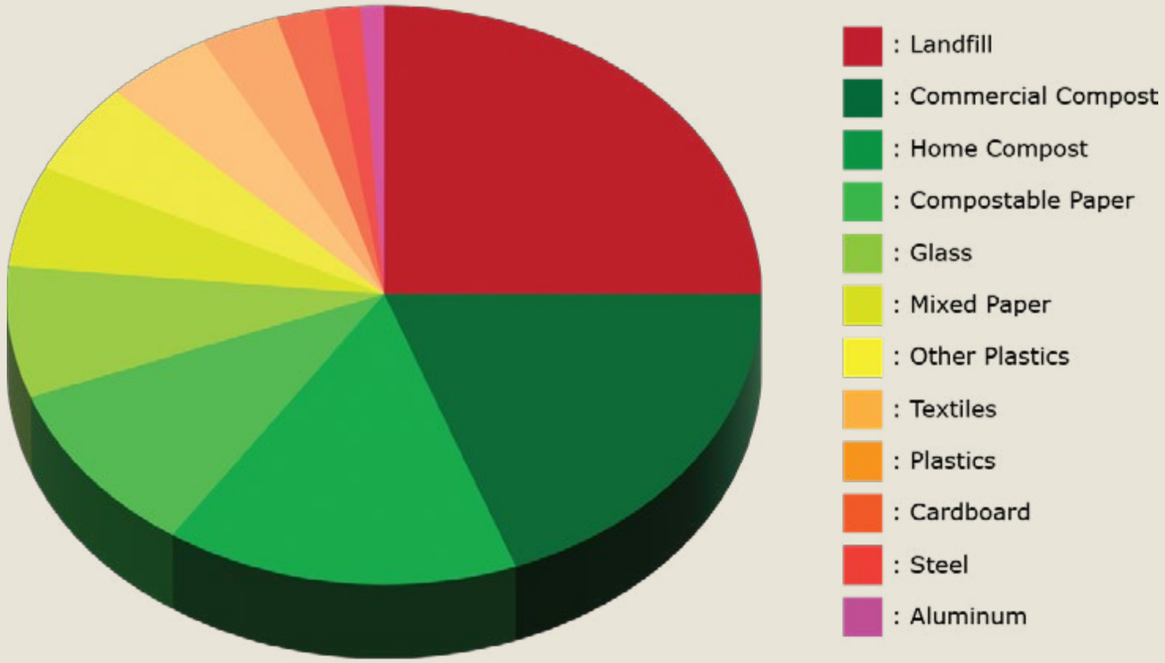
Municipalities should start developing plans to grow organics diversion now. We believe that starting small and growing awareness as adoption increases over time is the best approach. Municipalities should strive to have half their households composting by 2030.

WASTE AUDIT

In 2022 Black Earth Compost conducted a waste audit on 125 households from a local municipality. We collected waste on 10/17 and then one week later on 10/24 on one of our normal routes. Below are the results showing that up to 47% of the waste could have been composted with us and turned into nutrient rich soil.

Combined Waste Breakdown from 10/17 & 10/24 Collections

Percentage of Waste Content based on Weight in lbs. Total Starting Weight of 5,134.7 lbs



SECTION 2

Food Scrap Collection Program

PRIVATE PROGRAMS

We have 14 years of experience implementing large, successful private pay collection programs as well as city funded programs backed by grants with over 35,000 current subscribers. Building infrastructure and new habits to shift our waste management practices takes years and we'd like to help in any way we can to get the conversation started.

- Residents sign up directly with Black Earth Compost for curbside service
- The higher the participation in a town, the lower the cost for residents
- Offering rebates or free starter kits can incentivize residents to participate, contributing to waste diversion from the traditional waste management system
- Minimizes town involvement as Black Earth handles all aspects of customer service including account setup, pickups, bin/liner deliveries and payment.
- All programs include a voucher for 1 bag of free compost per year that can be redeemed at local gardening centers and stores.

Case Study:

Newton and Brookline are two of our most successful private programs. Brookline started with just over 300 preregistered in 2019 and hit their first density drop in 2020 with 500 residents. They have since hit their second density drop of 3,000 residents composting which lowered their monthly price to $59.99/6 months for weekly pickups. Newton followed a similar trajectory implementing a pilot program and then growing into a low cost private program.

Pilot Programs

Pilot programs are a good way to test the waters to see the reception of composting before deciding if it will work city wide. We have done city and grant funded pilot programs that went to high volume private collection programs. Both towns and non profits working within towns are eligible to apply for DEP (Department of Environmental Protection) grants to get curbside compost bins and start-up funds for one of our programs. We have worked with lots of towns to do this. We recommend trying to get over 300 people to start a pilot.

Case Study:

Beverly, Salem, and Newburyport all started free pilot programs around 2014, 100% funded through the town and DEP grants. The programs sponsored free compost pickup for 400 residential participants per town for two years. After two years of weekly curbside service, all programs went to private pay but had gained significant participation from the pilot so the cost for residents was reduced. Beverly has grown to over 1500 households since then and Newburyport to nearly 1000 with Salem not far behind. These programs were a great way to grow density, lower costs, and increase awareness.

Beverly and Nahant also offer participating residents a $20/year rebate on their water/sewer/trash bill. This amount reflects the municipal savings on waste tipping fees since implementation of our compost program. As a result, we quickly ramped up to over 1500 partici-

CITYWIDE COLLECTION

- Town buys a “starter pack” of the bin/ bags and subsidizes the program for all residents
- Town markets the program through their website, email, postcards, etc. to get residents pre registered
- Pricing will vary - this would be a set contract with the city or town based on prevailing wages
- Participation generally starts between 10-20%, plateauing around 50% after 5 or more years.
- This is a more expensive option for cities due to prevailing wages however lower costs can be achieved through higher participation and negotiation with trash hauler

Currently, Black Earth Compost operates a compost site with city wide collection in Manchester, Massachusetts. This gives Manchester a very low cost for city wide collection (see Owning the Infrastructure model below) that residents can opt in/out.

> As of October 2023, Manchester has achieved 50% residential participation rate.

Case Studies:

Lexington, MA
The city currently pays for the first 2000 residents to sign up - anyone after that cap pays private pricing, however, at that point the rate will be lower due to density discounts. We are at 2500 subscribers in Lexington with over 12,000 total households in Lexington (20% participation in less than one year).

Watertown, MA
In 2022 Watertown started a citywide program. The first 1500 subscribers received free curbside service. The next 6 months we gained awareness and added 500 subscribers, then another 500 the following 6 months. We are now on a rolling basis with over 2500 subscribers out of a 12,000 household City (20% after one year).

Own the Infrastructure

- Black Earth covers all up front costs of a new site with savings in hauling for the town
- Get in compliance for the Mass DEP organics ban coming in 2030 potentially avoiding future costs
- Landfills and incinerators are being phased out, creating a need for sustainable waste management solutions and infrastructure now
- Owning a local compost facility reduces reliance on long-distance transportation of our waste to states as far as Louisiana and Michigan
- Establishing your own compost facility in town is the most cost-effective way to initiate town-wide food scrap collection. Longer term leases and 3+ acres of land provide stability and allow for future planning, larger investments which yield more benefits to the town

Own your own compost infrastructure to secure your municipality's waste management future. Black Earth Compost has diverse experience offering comprehensive waste management strategies for towns and we believe every municipality should start planning for the next 10-20 years. Building infrastructure and new habits to shift our waste management practices takes years and we'd like to help in any way we can.

Black Earth's model provides dependable benefits because it is more efficient than the existing waste system. A distributed compost network across the state uses less trucks and less fuel than a centralized or out-of-state solution.

On top of that, we are able to bring in revenue to the site by producing a valuable compost and can even produce electricity above our compost piles, doubling the impact of your land.

From basic leaf and yard waste hauling to cutting-edge compost facilities, we offer a range of solutions tailored to meet your town's specific needs. The more capital Black Earth puts into the facility and the longer the lease term, the more benefits we can provide to the Town.

Menu of Benefits to Municipality for improving their compost facility with Black Earth

- City wide food scrap collection - free or low cost
- City wide electronics and textile collection - free or low cost
- City wide pickup of yards waste, leaves and holiday trees - free or low cost
- Black Earth staffs and equips town compost site to manage compost piles
- Black Earth pays for infrastructure construction/ improvements
- Black Earth does engineering, construction and operation of site
- Black Earth pays to grind brush and destroy invasives
- Black Earth manages resident compost site drop off
- Black Earth manages transfer station/recycling center drop off (if co-located)
- Residents and/or DPW get free compost picked up at the compost site

SPOTLIGHT

North Shore Regional Compost Facility, Manchester-by-the-Sea, MA

This is our largest option which provides the best benefits. The compost process is fully enclosed for the first 4 to 6 weeks which protects the process from rodents, birds, stormwater and odors. In fact, the food has disappeared within the first week because of the concrete slab aerated static pile technology. The compost piles then gets flipped 3 more times inside before leaving the building. This extra time gets pathogen kill, invasives kill (jumping worms, knotweed, bittersweet, boring insects, etc.), and allows the finished compost to dry so it is ready for curing outside.

SPOTLIGHT

Groton Compost Site, Groton, MA

This is our economy model which allows a town to commit to a shorter lease term (5-10 years). It comes standard with the indoor receiving structure, biofilter odor filtration. Five to ten of our under-CDL collection trucks go out each morning before rush hour and meander back to the site in the afternoon. At Groton we are co-located with the DPW facility and their multi-stream residential recycling center. We got a grant in 2021 from MassDEP to help build this facility.

Future: Solar Powered Compost Facility

Black Earth installs large (1-3 MW) solar canopy to power electric augers, blowers, screeners, loaders and trucks, providing end to end carbon free full nutrient recycling services, grid stability and excess energy production.

The Combination of Public and Private: A Preferred Vendor

- Town buys starter packs, markets composting program to residents with Black Earth Compost as the select vendor
- Would be private collection pricing with contract
- Lots of ways to set this up Ex. RDP points could be used to fund start packs for first X amount of residents to sign up

Case Study

BEC is the Preferred Vendor in Newton, Brookline, Belmont, Wakefield, North Reading, Chelmsford and Canton. These munis embarked on this path by issuing an RFP with the requirements they would like to see such as insurance, paying living wages, proper composting of waste, proof of permits for composting or transfering materials and description of business model to assure long term stability. These towns use funds on marketing, starter packs and bins for residents rather than paying.

This is the middle ground between a town sponsored program and a private program where lots of haulers compete for the same customers, crossing each other's paths on the streets. The benefit is having one uniform program that is easy to support and communicate.

Black Earth directly for service. Preferred Vendor programs require meaningful action and marketing behind them. Without that push, the program usually does not accelerate organics diversion quicker than private models.

Transfer Station, Centralized and Neighborhood Drop Offs

- 48 or 64 gallon bins placed at a designated drop off location chosen by the town, often with combination locks to prevent contamination though not necessary at transfer stations
- Normally this is a transfer station, community garden, or DPW station
- Towns can utilize RDP points to help fund the initial start up costs of the bins and maybe even the entire program
- Great place to start if density is not there yet. However, it makes more sense to move to a curbside program to increase adoption

This is the easiest way to introduce composting and can be relatively cheap as towns can utilize RDP points (Mass only). We can do numerous transfer stations or city drop-off points, usually between 2-8 bins, collected 1-2 days a week, with a compostable liner that we swap out to keep barrels clean. The cost per bin goes down in higher volumes, over 4 bins per stop. We also have bins with a simple combo locking mechanism - we think a letter lock that can spell F-O-O-D is a simple way to go. Some residents will want the convenience of curbside pickup while others may wish to drop off their food scraps. Offering multiple pathways to participate is helpful.

Case Study:

City of Boston Project Oscar (Project Oscar | Boston.gov) currently has 16 neighborhood dropoff locations that Black Earth picks up from weekly. These locked bins can be accessed by anyone living in Boston and we recently placed 3 more pilot bins in September 2023. This program has been a huge success as inner cities are much harder to access for pickups.

CONSIDERATIONS FOR VENDOR SELECTION

We cannot stress enough how critical it is to choose the right hauler who will actually take food scraps to the most valuable end destination. Below are a few points we want to highlight for municipalities when they are looking to implement composting.

Waste vs Composting oriented? Choosing a trucking company dedicated to composting or recycling, NOT waste, ensures the material actually goes to where they say it goes. It is very common for trash companies to say the food waste is going to one place and it really is just added to the trash truck and gets thrown out.

SECTION 3 Program Details

PREREGISTRATION

If we do not currently service a particular area, residents can use our “preregistration” feature. This is a free and non-committal step that allows any resident to express interest in bringing compost collection service to their town. Once there is enough interest in a town, Black Earth will then reach out to pre-registered individuals and get a Private Collection route setup and running.

Bins and Compostable Bags

Our “starter kits” include two sizes of bins (4 and 13 gallons) and a variety of sizes of certified compostable bags that residents can use to collect their food scraps. We can deliver these to residents directly or towns can be involved in the distribution. For households with two or more people we recommend the 13-gallon bin.

STARTER KIT BIN PRICING

Distribution	13 Gallon Bins			4 Gallon Bins	
	Bins Only	Starter Kit	Starter Kit + Countertop Liners	Bins Only	Starter Kit
Black Earth Distribution	$29.50	$36	$37	$11	$15
Town Distribution to New Customers (84 min.)	$28	$34.50	$39.50	$12	$16

Starter Kit & Bin Pricing

We can deliver to a centralized location for pickup or direct to residents that have signed up with Black Earth Compost. Most households with 2 or more people will need the 13 gallon bin.

Density Pricing for Private Pay Residential Collection Programs

Prevailing Wage Rates and compost returned can vary with Municipal Pay. RI rates may differ. Rates are also subject to change over time.

What is Compostable?

Black Earth Compost accepts all food scraps, soiled paper products and certified compostable serviceware. This includes meat, dairy, bones and solidified grease/oil in addition to hair, fur and houseplants. See our full listing here.

Compostable Serviceware must meet one of these third party certifications:

- BPI - Biodegradable Products Institute (bpiworld.org)
- CMA - Composting Manufacturing Alliance
- TUV - OK Compost/TUV

MA PRIVATE PRICING

Subscribers Per Square Mile	Weekly Collection		Every Other Week Collection	
	6 Month Term	1 Month Term	6 Month Term	1 Month Term
5	$114.99	$20.99	$89.99	$16.99
25	$89.99	$16.99	$69.99	$13.99
50	$69.99	$13.99	$54.99	$10.99
100	$59.99	$11.99	$44.99	$8.99
250	$49.99	$9.99	$39.99	$7.99
500	$44.99	$8.99	$34.99	$6.99

Grants and RDP Points

With climate saving initiatives coming down the pipeline from the federal government there has been a wave of new grant opportunities available to towns and cities. The EPA most recently announced a $30M grant initiative for underfunded cities and towns across the country to invest in post-consumer materials management. Rhode Island specifically, received $3.9M. Several areas in New England currently qualify for this grant. Our team has experience and is active in this space daily, so if you are at all interested in a program but need help with funding please reach out.

For Massachusetts residents only, this wheeled carts grant from Mass DEP could help cover the initial startup costs of a program. There is also a grant that supports a PAYT implementation program.

Additionally, RDP points (Mass only) are a huge area of savings for towns and cities. Towns might use RDP points collected from Transfer Stations to buy starter packs and kick off a compost program.

RDP Points Guide - Massachusetts

FAQ

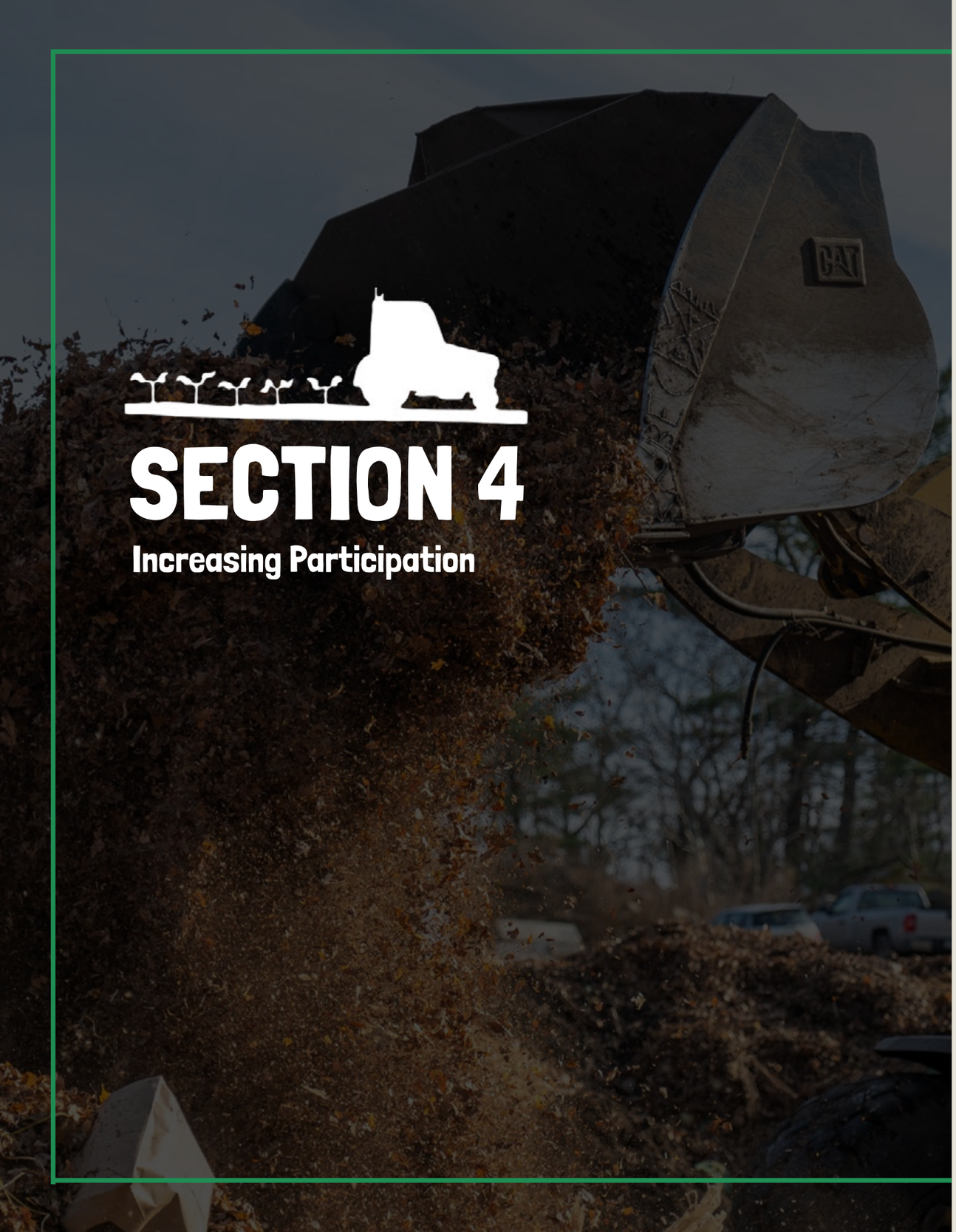
Is composting difficult?
No! Once a new routine is established and habits are changed, people quickly embrace their new practice. Additionally, with bans on single use plastic, more BPI certified products are becoming available. These items are an easy swap for everyday products that can be composted with us. The easiest way to think about it is "If it grows it goes."

Does it smell?
As long as liners are used and the bin is kept out of the sun there will be limited food scrap odor. In the summer you can expect a bit more smell from the heat just as you would with normal trash. When ordering countertop bins we recommend ones with carbon filters.

Will it attract rodents?
All of our bins have secured lids that will keep out rodents. Ensure your compost is completely enclosed and the bin latch is secure to avoid issues. Many of our subscribers who have backyard compost piles have switched to curbside pickup as our bins are better at preventing rodents.

But don't truck emissions outweigh the benefits of CO_2 reduction?
While our trucks are certified clean diesel or gasoline, we expect to have fully electric trucks running off solar power in the near future. With compost storing carbon in the soil we are actually net positive in the struggle to reduce GreenHouse Gases.

What about Home Composting Machines?
Home machines that are electric are often sold as a good solution but fall far from their promises. They dehydrate food scraps that turn into mold when wetted, and have myriad hidden costs like constant electricity usage, monthly filter subscriptions, and some ask to mail the 'finished' material back to them every week. We receive frequent phone calls asking to help empty rotting material from these tumblers, which we cannot service.



SECTION 4

Increasing Participation

PAY AS YOU THROW

The best residential programs hold people accountable for what they produce. One method we have seen huge success from is the Pay As You Throw policy implemented in Vermont. See this article on how it works. This drives participation rates as residents are monetarily incentivized to compost and reduce their landfill waste.

Case Study

In Ashland, MA they implemented a PAYT model and saw a significant reduction in trash. See the full report here. Chicopee started a similar program and saw similar results, although it is important to note that with COVID 19 trash increased in 2020 and 2021. That report can be found here.

Every other week trash collection alternated with recycling and combined with weekly compost collection is a great system. Since half the weight (the smellier /heavier / wetter stuff) is mostly food scraps and picked up weekly, bi-weekly trash is much easier to manage and cuts the amount of truck driving in half. More material per stop is more efficient and costs less. This is the most economical and sustainable way to handle municipal waste. Towns should consider moving towards a compost program combined with PAYT model.

What doesn't work:

One method we have seen that is currently marketed as a magic bullet is Co-Collection which involves picking up recycling and compost in the same truck and bringing it to a facility to be separated. This method not only creates multiple waste streams but requires far more logistics to manage on the back end. For very small rural areas, this method may be feasible, however, in our experience for most towns it is ineffective.

Share program details on social media

- Share info on town website and link to Black Earth Compost
- Email marketing campaigns
- Physical mailers to send home with kids at school
- Mail out postcards with program details to town residents
- Town specific yard signs and marketing materials to display in popular areas such as the library, community gardens, and town squares

Marketing and Outreach – Town Toolkit

While Black Earth will do some of the heavy lifting, towns will want to market and spread awareness about the program to their residents. We can assist by creating individualized flyers, yard signs, QR codes and have a handful of other marketing materials that can be tailored to fit a specific towns' needs. We also have draft emails with Black Earth letterhead that can be helpful for initial outreach. These flyers and documents are available in our Town Toolkit which we customize to your program. Below are some ideas and examples of ways in which other towns have successfully marketed their own compost programs.

GLIDEPATH FROM ZERO TO CITYWIDE EXAMPLE

Black Earth starts service when there are 5 subscribers per square mile, at $114.99/6 months. The town gets involved, using RDP funds to buy the starter kits for enough people to get the first price drop, and helps market the program. Then at 25 subscriptions per square mile of the town, we lower the price to $89.99. Schools start participating in pickups with kids helping bring awareness home to parents, towns rebate residents $30/year because that's the tipping fee offset (revenue neutral). The Town pushes business adoption, at least what is in line with ½ ton law from DEP waste ban. Then at 50 subs/sq mile, we lower to $69.99.

More people sign up. Support for an opt-in city-wide program grows. First year, we target the first 15% of the city that wishes to sign up for free curbside composting. Then raise the bar 10% each year. As more people join, more political support grows. This is a multi-decade habit formation process that should get started with small increments. In five years we have half the city participating plus the schools and businesses. Organic waste is widely used across town.

SCHOOLS – STARTING AT THE ROOT

School Programs

Schools are a great way to educate and instill better habits for the next generation. We try to coordinate residential and school programs together so schools are motivated to help grow residential programs. We offer schools $10 referral bonuses for each resident that they get to sign up. Energetic parents and teachers are often key people to help drive residential participation levels.

In total we have about 100 schools that we pick up from. Some towns choose to involve their entire school system at once, while others start small and focus on working out the kinks in one school. Generally, the best approach seems to be smaller rollouts starting with the younger grades, as these students are usually more engaged with separating their waste. For a list of case studies and examples of how to roll out a school composting program, please see the following link on our website: Case Studies | Black Earth Compost. More specifically, City of Brookline Schools Compost Guide has the most comprehensive plan for rolling out a program.

Creating an educational segment (like the ones that rolled out with recycling) built around the implementation of the program is a great way to educate and reach households. For educational rollouts, we alway recommend that people get connected with Change is Simple.

Black Earth Compost driver with a members of a school's Green Team

Case Study:

A recent article about a program we got up in running at the Bresnahan Elementary school in Newburyport, MA that was a huge success: Bresnahan compost program hits pay dirt | Local News | newburyportnews.com. Black Earth Compost also installed raised garden beds at the Bresnahan school, that the students use during their after school gardening programs. The cycle truly becomes full circle when the students are harvesting vegetables and flowers from the very compost they helped create. Black Earth partners with a local non-profit Backyard Growers who has a curriculum and program support for schools, grades, or green teams that want to integrate hands-on garden education. School Announcement Trays - Google Docs

> "Schools provide an opportunity for the next generation to learn about composting.

Referrral Program and Fundraisers

Black Earth has multiple programs for school referrals: for every 50 subscribers referred via a link, we will build a tall raised bed and fill it with our soil blend. Alternatively we can also deduct $10 per subscriber from the school's collection costs. PTOs are an excellent source of referrals to drive town collection subscribers and help lower costs to subscribers and schools.

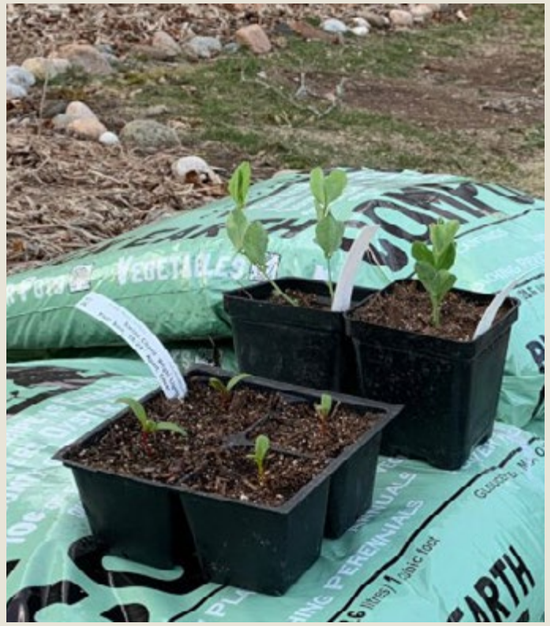
The fundraiser program is simple, we provide all necessary flyers and handouts and have QR codes with trackable links so we automatically attribute a percent of each sale to the participating school. For more information on how other schools have implemented this program visit our website here.

> Student garden clubs are a great way to see compost in action.

COMPOST PRODUCTS

Our compost is rich because we utilize a variety of ingredients such as fruits, vegetables, fish, lobsters, coffee grounds and more as our nutrient sources. We sell our compost in bulk to farmers, towns, individuals as well as our bagged compost at select stores across the region.

To top it off, we lab test our compost frequently and do plant growth trials in house to ensure quality. Using compost improves soil health by adding nutrients, enhancing microbial activity, and improving water retention. Create a solid foundation for growth all season long. Learn more about our compost quality.



- No grass clippings that contact pesticides, herbicides, etc
- Free of weed seeds due to high process temperatures
- Lab tested for Salts, Nutrients, Heavy Metals, PFAS, Herbicides, Soil Food Web Biology, and Food Safety Modernization act (FSMA) compliance
- Made locally with your food scraps!

"We make one of the best composts in New England, suitable for your family to grow their own vegetables.

A note about PFAS:
We are happy to report that our compost falls in the low PFAS category of products. Note, there is no such thing as zero-PFAS products anymore. PFAS is everywhere at this point, because it is in rain. Black Earth is one of the first (if not the first) food scrap composters to be testing for PFAS and publically displaying our results. See our 2023 annual report here and a MassRecycle podcast with managing Partner Andrew Brousseau.

Electronic Waste Curbside Collection

- We pickup electronics curbside from households
- Electronics are brought to a recycling plant who provides us a certificate that data has been destroyed
- Eligible items: Anything with a cord, TVs (no CRTs), flat screens, printers, microwaves, kitchen appliances. Nothing with refrigerant.

Residents can sign up directly on our website and pre-pay. We then notify them via email and text about the pickup day. At the same pickup a household can put out textiles, donations and Zero Waste bags (see next section). For more about what electronics are accepted and how to recycle those with Black Earth see our website here.

Town Special Collection: Towns can also set up a special town wide pickup and promote it through their communication channels. Residents can then sign up and pay directly with us through the town. This is a great way to get residents diverting other forms of waste away from landfills.

> We are focused on recycling multiple streams of materials.

Textiles Curbside Collection

- Purchase sticker through website and place items in bag on regular food scrap pickup day
- $7/bag or purchase a pack of 5 stickers which can be used for textiles or yard waste
- Textile collection is also possible during electronics collection
- Eligible Items: clothes, sheets, towels, linens, belts, hats, and shoes, even if torn or stained, and fabric scraps.
- Ineligible Items: Nothing moldy or wet. No rugs, carpets, comforters, and pillows.

Textiles are 5-10% of the waste stream by weight so this is another easy way to reduce your town's trash. Residents put their textiles into a white drawstring bag and Black Earth collects them either on the pickup route (requires a sticker on the bag) or on an Electronics pickup. Textiles are recycled where they are graded for resale or shredded for rags or insulation.

Leaf and Yard Waste

- Yard debris removal
- Invasives destruction
- Management of leaf and yard waste site
- Operating on a backhaul allows us to optimize the efficiency of our trucking resulting in below market rates
- Bulk compost drop off at discounted rate

Municipal Leaf & Yard Waste Site Management

We offer a number of services to help the Town manage its yard waste site.

- Once per year large clean out of leaves (our wheel loader or yours)
- Once per week removal of leaves (this is the cheapest option for leaf removal.
- Management of Leaf & Yard site (no food scraps put in, just managing what residents and DPW bring in)
- Tailings Cleaning separating Rock & Stick

Community Garden Builds and Rebuilds

Black Earth Compost builds custom raised beds and has been doing so for many years. These raised beds are filled with our nutrient rich soil blend and are built to last. Over the years we have worked to build many community gardens, community farms, and school gardens. We have teamed up with Backyard Growers, a local non-profit in Massachusetts that can help administer these gardens if a town needs help getting set up.

The need for local food production, especially for lower income individuals, is increasingly a concern of ours. Community gardens are a great way to get people to commune with others, eat healthy food, teach their kids how to grow, and get people outside. One of our missions when we first started this business was to increase local food security. Community gardens play a vital role in that.

Biofilter Media

- We produce a biofilter media using specifications from our compost engineering partners.
- We blend it on site for our own uses and to sell to municipalities for their facilities (typically a wastewater treatment plant)
- We also produce a mix for biotreatment swales that allows infiltration along the swale plus habitat for fungal and microbial degradation of some pollutants.

EVENTS

Black Earth is able to provide pickup service for large scale city events. Events are a great place for the public to be exposed to composting, but can be difficult to service due to the high probability of contamination. An army of volunteers will be necessary to monitor all of the bins throughout the event. Examples of successful pickups include events such as the Head of the Charles Regatta in Cambridge, MA and the Newport Folk and Jazz Festivals in Newport, RI.

Our Pumpkin Smash community event has been a very popular way for folks to come out and compost their pumpkins in a very interactive way. Folks can bring their seasonal pumpkins and take aim at the targets we display on our truck. Composting pumpkins every year is a fun way to get a lot of material out of the waste stream, all while spreading awareness of composting.

SECTION 6

Composting in the News

Growing our food locally:

As we discussed earlier, compost reverses global warming through deep carbon storage, methane avoidance and reinvigorates our ability to grow food. One of the biggest challenges we face is actually growing that food locally. Composting food scraps into healthy soil and building gardens to grow food supports this initiative. To ensure the entire system works effectively we need to invest in growing our own food.

Some towns and cities are currently using processes like anaerobic digestion and sewage treatments for residential compost scraps because it's their only option but it has significant drawbacks. Digestion is needed in New England because there is not enough capacity for composting in the state yet. Municipalities should be knowledgeable about these drawbacks.

There are so many benefits of food scrap collection in the community but there are definitely challenges that come with it. Our job is to make that process as easy as possible for our communities.

Compost vs Anaerobic Digestion

We believe that a municipality will be at risk starting an organics program with a hauler using an anaerobic digester (AD). Anaerobic digesters are large and complex multi million dollar machines that break down food waste anaerobically in order to create methane. AD is suitable for large industrial loads that can liquefy such as dairy, but not residential collection as we will articulate below.

AD is using the food scraps to produce hydrocarbons for combustion, whereas composting puts energy and nutrients into the soil in order to sequester carbon and grow food.

Municipal Risk with AD

- *Residents want compost not digestion:* People want to know where their food scraps are going, and if the word compost is being used to describe the program, the scraps need to be composted. If not, the residents lose faith in the program. BU professor Laura Orlando strongly voiced this sentiment in her Testimony before Cambridge, MA City Council. The issue gained further attention from this WGBH Article.

- Depackagers make the most trash with residential food scrapS: Residential food scraps are not suitable for digesters because the depackaging/liquefying process separates out many items that could otherwise be composted (fruit pits, corn cobs, bones, compostable plastics, etc.) that must be sent off as part of the more expensive and wasteful trash stream.

- *The amount of methane produced is minimal*: It has a small impact relative to the amount of fossil fuel natural gas pushed into the nation's pipelines. It will never be a replacement because the yield per ton of food is low.

- *There are better ways to produce truly renewable electricity without combustion*: We have better ways to produce much larger amounts of electricity using renewables coupled to batteries or nuclear power for carbon free, non combustion power.

- *The energy is better used in the soil:* The digestion process takes the energy out of the food scraps to create minimal electricity. Soil microbes could be using this energy to help plants grow and sequester carbon instead of converting to hydrocarbons for combustion.

- *Short haul is better than double long hauls*: Increased trucking for centralized Depack Stations then to AD plants exposes municipalities to global fuel cost increases, truck cost increases, and CDL driver shortages.

- *Centralized solutions expose an entire region to facility breakdowns:* Haulers frequently have to scramble for options when a Depack Station or AD plant break down

- *Tipping fees at anaerobic digesters are higher than at composters:* When digesters need material, their tip fee is low, but as they fill up, this fee increases. Composting tipping fees are more stable.

Digesters Connected to Wastewater Treatment Plants: It's Just Disposal

Anaerobic Digesters that are connected to Wastewater Treatment Plants (WWTP) do see benefits from reduced amounts of biosolids and a fuel source to burn to keep the facility running (and the digester itself warm). However in terms of nutrient recycling this is the least effective option.

At the WWTP the nutrients get mixed with sewage (full of toxins) which instantly plummets their value and degrades the work we collectively did to separate the food waste at the curb. On top of that, the WWTP is designed to use electricity to dispose of the food scrap's Nitrogen. The Potassium washes out to sea, and the Phosphorus ends up in the biosolids which are difficult, or even illegal in Maine, to apply to soil.

At the end of the day, the important thing is that the organics get out of the trash and that the collection programs begin but there is a gradient on the highest end use that needs to be considered.

Composting is less risky, less price volatile and has a higher impact on climate change and soil health therefore a win for all. The distributed model of composting exists in Austria and the wider Europe continent and it is what Black Earth Compost intends to build here with municipal partners.

"We believe the most resilient solution to the waste crisis is local distributed compost facilities.

Looking forward

In the summer of 2023 Black Earth traveled to Austria to research how they managed their waste crisis when the last landfills closed in 1994. Austria was forced to quickly implement a dramatic organic waste diversion strategy that significantly lowered their solid waste. They chose decentralized composting as the optimal solution. The majority of the organic waste now goes to over 400 farms that compost it and use it on their own fields, eliminating their need for fertilizer. The cost of waste is high enough that businesses and households prefer to compost their organic waste. It's working out great. For more on how they did it, here is a great video from one of Austria's main consultants and official site inspector, Florian Amlinger, who helped push these initiatives forward successfully.

We are also looking to invest in an electric truck fleet in the next 2-5 years. This means quieter, zero emission vehicles on the roads and using our own solar energy. As our landfills continue to fill up, our ultimate vision is to have a compost site for every 10 municipalities. This vision provides communities with a low cost way to compost while protecting our environment and reinvigorating our soils to grow food.

Summary

With a growing population, climate change and a looming waste crisis as headwinds, we feel a sense of urgency to help municipalities implement composting programs that save towns money while protecting our environment. Black Earth is one of the only companies that combines private pickups and the process of composting together. That combination gives us great synergies and cost savings that we then pass down to our customers. We are here with 13 years of knowledge and experience and want to make this process as easy as possible. If you have any questions about any of our services, products or just want to chat about dirt we are here and happy to help.

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