SUCH A WASTE: THE ENVIRONMENTAL JUSTICE SHORTCOMINGS OF MODERN COMPOSTING PROGRAMS

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Table of Contents

INTRODUCTION

In the last ten years there has been a growing recognition of the climate and ecological benefits of composting, and thus a wave of organics recycling expansions has attempted to harness its value. Yet, even in the midst of this growth, it remains important to build environmental justice into new waste management programs and laws in order to provide equitable access to all communities.

Composting has been around as long as humans have been growing food.[1] As far back as the Akkadians in Mesopotamia, there is written record

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of the use of composting in agriculture.[2] The process of organics recycling is not new and the benefits are numerous, yet in recent years the advantages of composting have reached a fever pitch. Amongst the ongoing question of how we address global climate change, composting has been identified as one of the most significant ways for individuals to reduce their environmental footprint.[3] Organic waste material comprises about one-third of landfills in the US (31%),[4] where landfills are the third-largest source of human-related methane emissions (14.1%).[5] Thus, diverting organic waste to composting facilities provides a valuable means to decrease methane emissions, and ultimately reduce individual carbon footprints.[6] Although composting is a technology that has existed for most of human history, climate change is shifting our relationship to everything, composting included.

Composting does not exist in a vacuum. Similar to how reducing and reusing are necessary steps that precede recycling, there are steps that precede composting, such as source reduction and feeding people. The food recovery hierarchy is one tool the United States Environmental Protection Agency uses to promote lifecycle thinking pertaining to food recovery.[7] This approach looks at the impact of food waste as a whole, placing composting fourth on the food hierarchy scale. It is important to note that the problem with food loss and waste is a much larger conversation than just composting.[8] It is also important to acknowledge that composting is not limited to diverting

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class where this paper was conceived. The author would also like to thank the editorial staff of the *Vermont Journal of Environmental Law* for their hard work throughout the editing process.

1. Aaron Sidder, *The Green, Brown, and Beautiful Story of Compost*, NAT'L GEO. (Sept. 9, 2016), https://www.nationalgeographic.com/culture/food/the-plate/2016/09/compost--a-history-in-green-and-brown/ (depending on how you define the process of organic decomposition it may be even earlier).

2. *Id*.

3. *See Reduced Food Waste*, PROJECT DRAWDOWN, https://www.drawdown.org/solutions/reduced-food-waste (last visited Jan. 22, 2022) (stating that "if 50–75 percent of food waste is reduced by 2050, avoided emissions could be equal to 10.3–18.8 gigatons of carbon dioxide.").

4. *America's Food Waste Problem*, U.S. ENV'T. PROT. AGENCY (Apr. 22, 2016), https://www.epa.gov/sciencematters/americas-food-waste-problem; Emily Friedman, *Towards 2030: Shortcomings and Solutions in Food Loss and Waste Reduction Policy*, 55 WASH. UNIV. J. OF L. & POLICY 265, at 266 (2017).

5. *See GHGRP Reported Data*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/ghgreporting/ghgrp-reported-data (providing GHG emissions data for reporting facilities across United States) (last visited Jan. 22, 2021); *Basic Information About Landfill Gas*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/lmop/basic-information-about-landfill-gas#methane (last visited Jan. 22, 2022); U.S. ENV'T PROT. AGENCY, 430-R-20-002, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2018 (2020).

6. Friedman, *supra* note 4, at 266.

7. U.S. ENV'T PROT. AGENCY, *supra* note 4.

8. *See* DR. MARTIN HELLER, WASTE NOT, WANT NOT: REDUCING FOOD LOSS AND WASTE IN NORTH AMERICA THROUGH LIFE CYCLE-BASED APPROACHES 22, U.N. ENV'T PROGRAMME (2019) (showing that 140 million tons of food is lost or wasted in North America every year and of that 63 million tons is due directly to use and consumption rather than agriculture or transportation).

food scraps from landfills. Diversion may also include items like yard waste, biosolids, biodegradable plastics,[9] etc.

Since 2009,[10] a growing trend in cities and states contemplating their environmental impact has been to enact mandatory composting laws or provide programs for citizens to compost.[11] Although the federal government has shown support for expanding local composting, it continues to largely rely on states and municipalities to carry out these programs.[12] Like other forms of waste disposal—traditionally a responsibility of states and municipalities—there are a multitude of programs and ordinances being instituted in vastly different ways. The patchwork of composting implementation consequently raises a variety of environmental justice questions.

Most notably for compost programs are those questions that are entwined with ideas of distributive justice.[13] Furthermore, "in an environmental context, distributive justice involves the equitable distribution of the burdens resulting from environmentally threatening activities or of the environmental benefits of government and private-sector programs."[14] Although not of the same character as radioactive waste, composting does not escape the deeply rooted environmental justice problems that have long plagued the field of waste management; namely who is being served and/or targeted in the process of managing a system of waste.

Although the food waste and climate benefits of composting are incredibly important for understanding its explosion onto the mainstream in the last decade, there are many papers that address that issue.[15] Instead, this paper will dig deeper into the question of how we both support the expansion

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9. Sanya Shahrasbi, *Consumers, Plastic, and What It Means To Be "Biodegradable"*, 31 GEO ENV'T L. REV. 581, 587 (2019) (explaining the meaning of biodegradability and how plastic additives claiming to be biodegradable should be properly labeled).

10. *Food Waste Requirements*, Seattle Public Utilities, http://www.seattle.gov/Util/MyServices/FoodYard/HouseResidents/FoodWasteRequirements/FAQs/index.htm (last visited Jan. 22, 2022).

11. *See, e.g.*, MODEL COMPOST RULE TEMPLATE VERSION 1.1 at i, U.S. COMPOSTING COUNCIL (2013) (explaining that in 2011 the U.S. Composting Council initiated a public-private partnership to develop a model compost rule template) [hereinafter MCRT].

12. *See* 7 U.S.C. § 6923(2)(A) (2018) ("The Secretary, acting through the Director, shall carry out pilot projects under which the Secretary shall offer to enter into cooperative agreements with local or municipal governments in not fewer than 10 States to develop and test strategies for planning and implementing municipal compost plans and food waste reduction plans.").

13. Robert R. Kuehn, *A Taxonomy of Environmental Justice*, 30 ENV'T L. REP. 10681, 10683 (2000) (quoting Ronald Dworkin, Taking Rights Seriously 273 (1977)).

14. *Id.* at 10684.

15. *See, e.g.*, Bonnie L. Smith, *Heat up Those Leftovers, Not the Planet: How Combating Food Waste Can Affect Climate Change*, 18 VT. J. ENV'T L. 648, 650 (2017) (explaining food waste contribution to greenhouse-gas emissions); *see also* Rachel Manning, *Reaching the Individual: A Proposed Federal Framework to Reduce Community-Based Greenhouse Gas Emissions*, 30 FORDHAM ENV'T L. REV. 123, 129 (2019) (stating that incentives for composting can decrease greenhouse gases and combat climate change).

of composting programs and guarantee the equitable development of those programs. This paper will first set out a technical basis for what makes composting fundamentally different from every other modern waste system. Then it will look at the pros and cons associated with composting generally. Next, it will take a closer look at the differences between urban and rural communities and their interaction with composting. This distinction is critical in addressing disparate access to waste disposal because it deals with questions of land use, education, politics, race, and money. These questions are deeply intertwined with disparity and injustice. Lastly, this paper will turn to the current landscape of composting programs across the country to address the specific disparity in different composting programs and suggest solutions to expand access in a way that avoids injustice. As the United States moves further into a world that must contemplate every possible method to create closed loop environmental systems, it is important not to lose sight of doing so in an equitable way.

I. THE INTRICACIES OF COMPOSTING

Black Gold.[16] Farmers have used this colloquial term to refer to humus (the fertile by-product of compost) for generations.[17] There has long been an understanding of the benefits provided by recycling organic waste and many cultures around the world have reaped the earthy reward.[18] Although composting is not a new technology, it is one that has often been practiced on a small scale, mostly in backyards or on small farms.[19] Yet, with the emergence of composting into the mainstream, a gap developed between understanding what composting actually is and what it is not.

This section will outline the processes at play in composting, starting broadly with organic decomposition as a whole and narrowing down to specific requirements for maintaining healthy compost. It will then address the inherent benefits and harms of composting as a whole. Next, it will look at potential solutions for disseminating adequate education to fill the gap of misinformation about composting. Lastly, it will delve into some of the most important differences between composting in rural environments versus urban environments and how these differences can lead both to beneficial and harmful results.

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16. Sarah J. Morath, *Regulating Food Waste*, 48 TEX. ENV'T L. J. 239 (2018).

17. Sidder, *supra* note 1.

18. *See Id.* ("Mediterranean farmers in Greece and Italy commonly cycled agricultural "waste" from one farm operation to another, Chinese farmers regularly fertilized their rice paddies with anaerobic (lacking oxygen) composting techniques [and] [sic] [i]n North America, Native Americans wrapped seeds in fish parts to supplement nutrient availability.").

19. ASHLEY BOURGAULT ET AL., COMPOSTING FOR SUSTAINABLE WASTE MANAGEMENT 1 (2005).

A. Creating the Correct Conditions

There are two main processes for breaking down organic materials: anaerobic decomposition and aerobic decomposition. [20] Anaerobic decomposition occurs when your food scraps end up in a landfill or a pile in the backyard without the proper controlled conditions.[21] Organic materials will always breakdown, but in the anaerobic process they release massive amounts of methane.[22] On the other hand, aerobic decomposition happens when your compost is healthy. This controlled technique creates the correct conditions under which methane is no longer released and bad odors are eliminated.[23] There are three main ways to create the correct conditions for aerobic decomposition: "cold" composting, "hot" composting, and Bokashi.[24] All three of these methods require time and attention, although the trade-off is a plethora of benefits.[25]

The basic composition of any compost pile is quite similar. There must be the correct ratio of browns, greens,[26] water, and air.[27] Note that there is no exact ratio because a lot depends on where you are in the world, i.e., what natural environmental conditions exist.[28] Composting in the deserts of the Southwest requires a different type of tending than composting in the rainy Pacific Northwest, or the hot and humid Southeast. Where there is less moisture, logically, more water must be added to maintain the correct ratio, and more heat may affect how the water interacts with the other elements of the compost pile. Therefore, the "correct" ratio of these four components remains necessary to trigger aerobic decomposition, however that exact ratio might look.

Cold composting is what most people are familiar with: the barrel in your neighbor's backyard or the heap in the local community garden. It is called cold composting because it usually remains at an ambient temperature of 0°–

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20. Lecture: Master Composter Program, held by Mary Green, and the Bernalillo County Extension (Feb. 8, 2020) (on file with the author).

21. *Id.*

22. *Id*. Anaerobic decomposition tends to smell. This is an easy way to tell that the composting process is not working properly, and methane is being released. *Id.*

23. *Id.*

24. *Id.* Bokashi is a method of composting that is limited to a small, sealed bucket, which makes it good for an individual living in an apartment but would be difficult to scale up to a programmatic level. Thus, I will not be going in-depth into this method because it is less relevant to the analysis of composting programs at the federal, state, or municipal level, as well as from the perspective of community composting. *Id.*

25. *Id.* There are also other vermiculture methods adding worms to augment the natural breakdown of materials, however these are less commonly used. *Id.*

26. *Id.* Generally, a ratio of 2:1, Browns to Greens. *Id.*

27. *Composting in Winter: Bernalillo County Extension Master Composters*, N.M. STATE U. (Jan. 2021), https://bernalilloextension.nmsu.edu/mastercomposter/winter.html.

28. Green, *supra* note 20.

100° F, depending on where it is in the world and the current season.[29] This process requires much less upkeep, but correspondingly breaks down organics slower (6–12 months) and less meticulously (may never breakdown weed seeds).[30] For cold composting you can add whatever, whenever, and just let it sit without having to turn the pile, as long as you are sure to maintain the relative amount of browns, greens, water, and air.[31] If that ratio is off it is pretty easy to tell because the compost will begin to stink.[32] When this happens, it means the pile has moved into an anaerobic decomposition state.[33]

Hot composting is a harder process and is generally found at the commercial level.[34] It is possible, although rare, to get a backyard compost pile to become hot enough because of the level of tending required and the limited size of these piles.[35] The only way to get a backyard compost heap hot enough is to maintain a smaller sized pile.[36] This makes it manageable to turn the pile without expensive machinery. Unlike cold composting where you can add anything, whenever, all of the materials (browns, greens, air, and water) for hot composting must be added together.[37] Hot composting is not a passive process and requires proper turning two to three times every two to three weeks to keep the air at adequate levels for proper decomposition, and to distribute the heat to the entire heap.[38] The inside of the heap is what heats up.[39] Therefore, if the pile is not being turned the heat does not get distributed to the entire compost pile. If done correctly, temperatures may reach between 140°–170°F.[40] The benefits of this method are a much faster and more thorough decomposition process. In three to six months, hot composting will break down everything.[41]

The physics of composting often sets limitation on expanding the benefits of compost to a larger population. Three things merit closer attention:

> First, *manageability*. There's a point at which a pile simply becomes unmanageably large, at least if you're

29. *Id.*
30. *Id.*
31. *Id.*
32. *Id.*
33. *Id.*
34. *Id.*
35. *Id.*
36. *Id.* Generally, 3'x3'x3' or 4'x4'x4' is an appropriate size. *Id.*
37. *Id,*
38. *Id.*
39. *Composting in Winter*, *supra* note 27.
40. Green, *supra* note 20; *see also* Jean Nick, *A Scientist Shares Insights and Tips For Managing Compost Piles*, RODALE INST. (May 16, 2017), https://rodaleinstitute.org/science/articles/a-scientist-shares-insights-and-tips-for-managing-compost-piles/ (stating that a compost pile "may reach near 170°F and hold for a short while until food resources become exhausted.").
41. Green, *supra* note 20.

> turning it by hand. The second issue is *weight*. An excessively large pile bears down on its bottom layers inhibiting air circulation. Such a pile is likely to go anaerobic. Finally, even if you manage to turn it frequently enough to keep it aerated, a large pile could *heat* up enough to kill off some of the micro-organisms you probably want to add to your soil. One reason commercial, agricultural, and municipal composting systems reach such high temperatures is that they are so large.[42]

These considerations present problems both for local community gardens and larger commercial composters because the larger the pile, the more difficult it is to adequately control the decomposition process.[43] Therefore, in terms of scalability, simply creating a bigger compost pile to reach a larger population is unlikely to work. This is why commercial composting is often used to serve large urban areas because with the addition of machines to manage the physics of a compost pile, production can be scaled up.

A few words about bugs. Compost piles will almost certainly attract insects.[44] However, this is not entirely a good or bad thing. There are two different types of insects when it comes to composting: micro and macro organisms.[45] As many people may know, worms are generally a sign of healthy soil, and are even used to create compost in vermiculture methods.[46] Worms and smaller insects—microorganisms—are a major contributor to the breakdown of organic materials and their presence in a compost pile is generally a favorable sign.[47] Roaches and other macro organisms are considered pests and do not tend to contribute to the health of a compost pile.[48] They are often attracted to compost because it provides a quick and easy snack but may eventually grow into an unhelpful infestation. This is just one of the hidden harms facing the expansion of composting programs.

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42. *Physics*, PLANET NAT. RSCH. CTR., https://www.planetnatural.com/composting-101/science/physics/ (last visited Jan. 22, 2022).

43. E. Vinje, *Composting Big*, PLANET NAT. RSCH. CTR, https://www.planetnatural.com/large-composting/ (last visited Jan. 22, 2022).

44. *How to Regulate the Good and Bad Bugs in Your Compost*, VULCAN TERMITE & PEST CONTROL INC. (May 29, 2014), https://www.vulcantermite.com/eco-friendly-options/regulate-good-bad-bugs-compost/.

45. Green, *supra* note 20.

46. *See Vermicomposting: Composting with Worms*, CALRECYCLE, https://www.calrecycle.ca.gov/organics/worms/wormfact (noting worms convert waste into a nutrient-rich, biologically beneficial soil product known as castings) (last updated Nov. 19, 2021).

47. *Compost Pile Microbes*, CALRECYCLE, https://www.calrecycle.ca.gov/organics/homecompost/microbes (last updated Dec. 7, 2018).

48. *See generally* Sally G. Miller, *Managing Bugs in Your Compost – the Good, the Bad, and the Merely Ugly*, DAVE'S GARDEN (Dec. 20, 2012), https://davesgarden.com/guides/articles/view/3942 (explaining the negative effects that bugs could have on a compost pile).

B. The Benefits and Hidden Harms of Composting

The benefits of composting are many and far reaching.[49] It provides an alternative for recycling organic materials, thus reducing waste, which opens space in landfills.[50] Additionally, compost byproducts can be used to replenish depleted soils, improving soil health in general.[51] Furthermore, composting may improve water and air quality by reducing the discharge of pollutants and methane emissions from landfills.[52] Finally, the development of soil carbon storage through composting may be used as an effective carbon sink to further draw down our total greenhouse gas emissions.[53] The above is by no means an exhaustive list, but it demonstrates the multiplicity of benefits that composting helps generate. Aside from the more tangible advantages to composting there are some often overlooked environmental justice benefits.

Composting may be an important space for community engagement and teaching or learning values. Community composting provides local jobs and benefits that can be a valuable resource for the entire community, including addressing food scarcity, connecting global to local, instilling important ideas about conservation, and providing hands-on education.[54] Community composting provides a space to create a closed loop system where resources that would otherwise be extracted by larger facilities are instead injected back into the community.[55] Furthermore, working together to compile and process compost connects people and creates an environment where individuals may feel more invested in their local neighborhood.[56] As one community composter in New York City put it, "[w]hereas the benefits of a [sic] food scrap collection program are often cast as reduced disposal cost and reduction in greenhouse gases, the benefits of a community-based program may be as

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49. *See* HELLER, *supra* note 8, at 39 (evaluating the benefits associated with land application and digestates).

50. *See* Linnell Edwards et al., *Evaluation of Compost and Straw Mulching on Soil-Loss Characteristics in Erosion Plots of Potatoes in Prince Edward Island, Canada*, 81.3 AGRIC., ECOSYSTEMS, & ENV'T 217, 218 (2000) (noting culled potatoes are a primary material to replenish depleted soils).

51. *Id.*

52. U.S. ENV'T PROT. AGENCY, *supra* note 5 (stating "reducing the amount of food waste sent to landfills can help ease the impact of climate change . . .").

53. U.S. ENV'T PROT. AGENCY, SOLID WASTE MGMT. AND GREENHOUSE GASES: A LIFE-CYCLE ASSESSMENT OF EMISSIONS AND SINKS 13 (3rd ed. Sept. 2006) (evaluating soil carbon storage from compost application to quantify the ultimate emission benefit. The study evaluated the soil carbon storage benefit from year 1 through year 30).

54. GROWING COMPOST: A POLICY GUIDE TO PRESERVING CRITICAL COMMUNITY COMPOSTING IN CALIFORNIA 12–13, SUSTAINABLE ECON. L. CTR. (Jan. 22, 2017) [hereinafter Growing Compost], https://d3n8a8pro7vhmx.cloudfront.net/theselc/pages/927/attachments/original/1485108714/Growing_Compost_Report_smaller.pdf?1485108714.

55. *Id.*

56. *Id.* at 12.

close as your apartment window box and the flowers that flourish there."[57] This observation shows how reframing waste disposal as a truly local issue may give people a direct incentive to more fully participate in community initiatives that keep resources local and bring benefits home.[58]

There is a plethora of benefits to organics diversion, yet it remains important to investigate the potential drawbacks. Although cold composting, on a small scale, may avoid many problems associated with large operations, it does not escape all risks. One problem particular to cold composts is the attraction of pests like cockroaches and rodents, which are enticed by certain organic waste (particularly animal byproducts) that often end up in these piles.[59] Furthermore, backyard and community composters often face the problem of nuisance odors, which are not unique to small scale composting, or for that matter, composting in general.[60]

Even though techniques exist to mitigate these drawbacks, they are not a guaranteed solution and require a certain level of information and work on the part of the individual to be implemented. Without the knowledge or access to resources to correct these common problems, an individual may become fed-up and stop composting completely. While many harms created by composting can exist in non-commercial settings, the concerns of backyard and community composting may be better cured through education, not regulation.[61] Thus, the majority of problems faced in composting programs come from commercial composting and the difficulties in expanding overall capacity. Especially because in the process of scaling up composting programs the hidden harms are bound to be exacerbated.

It may be easy to see compost as a shiny solution with so many benefits that it is a no brainer to expand access. While this is true to some extent, it is important to recognize that as compost facilities continue to expand, hazards may intensify, thus leading to unforeseen problems within vulnerable communities. The harms from commercial facilities often include nuisance odors, human pathogens that lead to contamination, and dangerous bacteria and chemicals from "sewage sludge."[62] The main reason these risks are

57. Louise Bruce, *The Evolution of New York City's Big!Compost*, BIOCYCLE (Mar. 28, 2014), https://www.biocycle.net/2014/03/28/the-evolution-of-new-york-citys-bigcompost/.

58. Luke W. Cole, *Empowerment as the Key to Environmental Protection: The Need for Environmental Poverty Law*, 19 ECOLOGY L.Q. 619, 639-641 (1992) (discussing the importance of differences in experience and perspective for first, second, and third wave environmentalists and how that translates into different community incentives for engaging in environmental improvements).

59. *How to Regulate the Good and Bad Bugs in Your Compost*, *supra* note 44.

60. Brenda Platt & Colton Fagundes, *Yes! In My Backyard: A Home Composting Guide for Local Government*, at 47, INST. LOC. SELF-RELIANCE (May 2018) ("The more densely populated an area, the less amount of space a composting operation can take up before neighbors might start complaining about perceived nuisance odors or appearance of the site.").

61. *Infra* Part I.C.

62. Planet Natural, *Is Your Compost Made of Sewage Sludge?*, YOUTUBE (Oct. 30, 2013), https://www.youtube.com/watch?v=DkYKBnpkh7k.

heightened in commercial facilities is due to not knowing what is going into the compost.[63] Another major risk of commercial facilities is killing important microbes by excess heat that is not properly monitored.[64] All of this can lead to irregular decomposition, creating contamination. If facilities are not taking the proper precautions, a farmer who acquires humus from a commercial facility may find an entire field of crops contaminated.[65] Furthermore, similar to many stories of environmental injustice and racism found in siting landfills, a commercial composting facility may only be allowed to operate in a poor community or community of color.[66] This practice often exposes these communities to risks from unwanted facilities, including nuisance odors and soil, water, or air contamination.[67]

The United States Composting Council ("USCC") in its Model Compost Rule Template ("MCRT") acknowledges that, although composting does not create the same hazards as other forms of waste management, it is not immune to all risks. In order to differentiate between levels and types of risk, the USCC uses a three-tier system in designating materials that enter commercial composting facilities. The MCRT breaks down Feedstocks—organic material used in the production of compost—into three tiers:

> 1) Feedstocks, which include source-separated yard trimmings, woody material, agricultural crop residues, and other materials determined to pose a low level of risk to human health and the environment, including from physical contaminants and human pathogens;
>
> 2) Feedstocks, which include all type 1 feedstocks plus: agricultural residuals, source-separated organics; and [agency] approved food processing residuals and industrial by-products. Type 2 feedstocks are materials that the department determines pose a low level of risk to

63. E. Vinje, *What's In Commercial Compost*, PLANET NATURAL, https://www.planetnatural.com/commercial-compost/ (last visited Jan. 22, 2022).

64. OMRI CANADA, STANDARDS MANUAL 12 (2016).

65. Howard Marks, *Environmental Regulations for Land Application of Sewage Sludge and Municipal Solid Waste Compost May Not Provide Adequate Protection Against Metal Leaching*, 17 TEMP. ENV'T L. & TECH. J. 123, 126 (1998) (discussing the lack of federal regulatory oversight for the disposal of biosolids).

66. *See* Holgate Prop. Assoc. v. Twp. of Howell, 679 A.2d 614 (N.J. 1996) (illustrating a composting facility's clash against a local zoning ordinance); *see also* Robert D. Bullard, *Environmental Justice in the 21st Century: Race Still Matters*, 49 CLARK ATLANTA UNIV. 151, 151–59 (2001) (describing historic cases of racial inequality arising from various waste management sources and zoning restrictions).

67. *See* Baker v. Waste Mgmt. of Michigan, Inc., 528 N.W.2d 835 (Mich. Ct. App. 1995) (discussing liability for public nuisance of a commercial composting facility in Michigan); *see also* Systematic Recycling LLC v. City of Detroit, 635 F. Appx. 175, 177 (6th Cir. 2015) (instituting additional monitoring to Detroit to mitigate potential odor nuisance).

> the environment but have a higher level of risk from physical contaminants and human pathogens compared to Type 1 feedstocks.
>
> 3) Feedstocks, which include mixed solid waste (MSW), diapers, sewage sludge, biosolids, and industrial by-products and food processing residuals not covered in Type 2. They include these and other materials the department determines pose a higher level of risk to human health and the environment from physical and chemical contaminants and from human pathogens compared to Types 1 and 2 feedstocks.[68]

It then recommends designs and operational standards for each tier in order to mitigate the specific harms associated with each type of material. These recommendations are an attempt to minimize hazards for commercial composting facilities by standardizing regulations. In terms of commercial facilities, regimented systems are likely advantageous to protect people and the environment from potential harms.

C. Composting Education

One seemingly easy solution to the misinformation and hidden hazards associated with backyard composting would be expanding access to composting education. There are many states and cities that have composting classes for their citizens to attend.[69] However, classes have many unspoken prerequisites for entry: adequate time to attend, an existing awareness of composting as a beneficial tool, understanding how to use often (unintentionally) concealed educational resources, etc.[70] The access to beneficial tools for government sponsored composting education are largely being funneled to a privileged subset of people because communities and individuals have to seek out these resources instead of being engaged in their own backyards.

Across the board, states and municipalities have recognized the need for composting resources and have created very useful guides and graphics to help backyard composters.[71] The issue is that finding these guides requires a

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68. MCRT, *supra* note 11, at 2, 6, 8, 12.
69. Green, *supra* note 20.
70. *Id*.
71. COMPOST RSCH. & EDUC. FOUND., TOOLKITS/RESOURCES, http://compostfoundation.org/ (last visited Jan. 22, 2022); *Backyard Composting Made Easy*, N.M. ENV'T DEPT.,

proactive step on behalf of the individual. Therefore, an important aspect of composting education is bringing information to the communities rather than expecting them to find it themselves. In order to create social change in the realm of composting, three questions posed by the late Luke W. Cole are a valuable tool: 1) will it educate people? 2) will it build the movement? and 3) will it address the root of the problem, rather than merely a symptom?[72] Although composting education programs tend to answer the first question affirmatively, they often fall short of the second and third.

If folks are unable to access resources or are unaware of said resources, the movement will never move past a good idea. The government will walk away saying, "but we tried, and no one showed up." Therefore, the root of exclusionary programs is not that the resources do not exist and are not adequate, it is that they are inaccessible to most people. A possible solution would be to bring this education to school children. Children are likely the best group to engage because they are already a captive audience in schools, which have a mandate to educate. Teaching children about composting not only instills values about conservation in the next generation, thus building the movement, it also creates the opportunity for them to bring composting into their own communities, and thus expanding access.

The potential for expanding composting resources should begin with teaching children proper composting techniques in school. Similar to recycling programs entering schools in the 90's, the effect of teaching composting to children, "cannot be overstated."[73] In Pennsylvania, armed "with the mantra 'reduce, reuse, recycle,' elementary school students fearlessly led the charge on recycling," due in part to the Pennsylvania's Municipal Waste Planning, Recycling, and Waste Reduction Act.[74] Thanks to this Act and a movement towards early implementation, well-funded education programs taught a "generation that recycling and waste reduction is a way of life, rather than an obligation."[75] Many of the same reasons that states and municipalities rallied around recycling 30 years ago have returned today in the conversation about compost; landfill space, decreased air and water pollution, etc.[76] Needless to say, there are deeply important lessons that can be gleaned from both the successes and failures of recycling over the last

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https://www.recyclenewmexico.com/pdf/Backyard-Composting.pdf (last visited Jan. 22, 2022); *Backyard Composting*, KERN CNTY. PUB. WORKS, https://kernpublicworks.com/organics/backyard-composting/ (last visited Jan. 22, 2022).

72. Cole, *supra* note 58, at 668.

73. John Dernbach, *Next Generation Recycling and Waste Reduction: Building on the Success of Pennsylvania's 1988 Legislation*, 21 WIDENER L. J. 285, 287 (2012).

74. *Id*.

75. *Id.*

76. *Id.*

three decades in order to create effective composting programs, and truly build a lasting movement.

D. Environment Matters: The Rural and Urban Divide

The assumption that "everyone can compost" has arguably spurred an industry geared towards wealthy-city-folk who pay for industrialized organic waste processing and food scrap pick-up, while subjugating poor-rural-communities to limited composting access. This is based, in part, on the assumption that rural communities have the "space" to compost at home. While this may be true, there is much more that goes into composting than simply throwing your potato skins and orange peels into a pile in the backyard. The lack of education and misinformation surrounding composting means that even individuals who have decided to set up their own composts may never reap the benefits because they are simply doing it wrong. As "there are relatively few studies focused on understanding household food waste perceptions and behaviors in rural areas," much of the conversation around organics diversion focuses only on urban environments.[77] This often results in rural communities being entirely left out of composting programs and initiatives.

Another major roadblock to access is simply state and local resources. It is common for rural communities to generally be poorer because where there are fewer residents there is often less money and fewer opportunities for socio-economic growth. The lack of resources in rural environments often leads to distributive injustice with waste management as a whole, especially where pick-up might take hours due to miles between properties, poor infrastructure, and fewer facilities.

> Since there are unique challenges of implementing a program in a rural region, where economies of scale may not be achievable and costs may be significant, this has important policy implications about the tradeoffs for such efforts… A focus on consumer education and backyard composting infrastructure may provide fruitful outcomes for rural regions where many households are already composting or will do so in the future, and where other food waste management options relevant to densely populated regions may be less viable.[78]

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77. Meredith T. Niles, *Majority of Rural Residents Compost Food Waste: Policy and Waste Management Implications for Rural Regions*, 3 FRONTIERS IN SUSTAINABLE FOOD SYS. 123, 124 (2020).

78. *Id.* at 129.

The opportunities for rural folk to backyard compost is often larger and unhindered by regulations and basic functioning of city life (e.g., time and space). Ordinances and mandates may even be detrimental to community participation in organics recycling.[79] As the Sustainable Economies Law Center recognized, "community composting can act as a powerful lever for economic justice and ecological resilience,"[80] giving communities the ability to organize themselves and create their own waste disposal systems. By mandating commercial composting, these communities are often deprived of a critical opportunity "to become more self-reliant, grow fresh produce, create good jobs," and build rich learning environments for generations to come.[81] Although there is an important place for commercial composting facilities, it is important to recognize that cultural and historical food systems have existed for quite some time in rural communities. These systems often include community composting, which should be encouraged and not thrown away in the process of industrial and urbanization. However, these composting initiatives still need support in order to compete with their expanding urban counterparts.

In urban environments, the availability of land and time to tend a home compost is quite limited. Thus, "if cities wish to require residents to compost food waste, they must first provide the necessary infrastructure."[82] Whether the solution is through the marketplace by hiring independent contractors or providing composting alongside traditional garbage and recycling pick-up, it is necessary to have infrastructure in place if urban composting hopes to benefit the community at large. Therefore, a tailored approach to food waste management between rural and urban regions may be the most prudent solution; offering curbside composting alongside garbage services in densely populated places, while providing access to resources and education in rural communities in order to expand backyard composting in these areas.

II. COMPOSTING PROGRAMS

This section of the paper will take an on-the-ground look into various composting programs, beginning by briefly addressing the national approach. Next, it will delve in at the state level by comparing the laws and systems of Vermont and California. Then it will do the same for municipal composting by looking at Seattle, New York City ("NYC"), and Austin. Finally, it will end with a brief discussion of private composting programs through a local

79. *Community Compost Law & Policy*, SUSTAINABLE ECONOMIES L. CTR., https://www.theselc.org/compost.

80. *Id.*

81. *Id.*

82. Alexandra I. Evans & Robin M. Nagele, *A Lot to Digest: Advancing Food Waste Policy in the United States*, 58 NAT. RES. J. 177, 194 (2018).

Albuquerque company—Little Green Bucket—and the international app—ShareWaste. The questions this section focuses on with each program is what has been successful and what about each program is problematic. The paper will conclude each of these inquiries with some suggested improvements, keeping in mind the overarching purpose of expanding access without neglecting important environmental justice considerations.

A. Composting at the National Level

The most glaring problem in national engagement with composting is similar to most traditional waste management systems.[83] The Tenth Amendment gives control of waste management generally to the States.[84] Although there are certain limitations in a State's power to provide waste disposal, it is widely recognized to have this duty under its police powers.[85] Thus, the federal government cannot do much to mandate composting nationwide because States are traditionally providers of waste disposal within their borders.

This reservation of power to states has resulted in a patchwork of differing waste management programs all over the country.[86] Although some states have been effective in providing composting to their residents as an alternative to regular garbage, the result of state control is more often non-action. In some cases, permitting requirements may even create an unreasonable limitation on backyard and community composting that has the effect of preventing further engagement in this valuable waste management alternative.[87]

Although there have been some attempts to standardize waste disposal throughout the United States, there is still not much of a national legal

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83. *National Accounts*, WASTE MANAGEMENT, https://www.wm.com/us/en/business/national-accounts (last visited Jan. 22, 2022).

84. U.S. CONST. amend. X, ("The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.").

85. *See, e.g.*, Philadelphia v. New Jersey, 437 U.S. 617, 628 (discussing dormant commerce clause limits on the State of New Jersey's duty to provide for waste disposal within its borders); New York v. United States, 505 U.S. 144, 188 (1992) (holding a federal radioactive waste disposal law invalid as violating the Tenth Amendment); Printz v. United States, 521 U.S. 898, 935 (1997) (holding that a federal law compelling states to implement federal mandates violated the Tenth Amendment); *see also* Erwin Chemerinsky, *The Assumptions of Federalism*, 58 STAN. L. REV. 1763, 1766–69 (2006) (discussing the ebb and flow of Tenth Amendment jurisprudence).

86. *See, e.g.*, *State Organics Legislation*, U.S. COMPOSTING COUNCIL, https://www.compostingcouncil.org/page/StateRegulations (including map of laws across the country) (last visited Jan. 22, 2022).

87. ALA. DEP'T ENV'T MGMT. ADMIN. CODE r. 335-6-7-.26, http://adem.alabama.gov/alEnviroRegLaws/files/Division6Vol1.pdf (stating the "adopt[ion] [of] effluent limitation guidelines; a system for issuance of Permits . . ." as a method to effectively compost) (last modified Feb. 15, 2021).

framework for any type of uniform composting system.[88] The national law that exists for "recovered materials" remains at the research and development stage. Thus, various agencies as well as private organizations are spearheading the expansion of composting at the national level by engaging in this research and development.[89] Although these agencies and private entities are well intentioned, what remains problematic in their approach is often a lack of sensitivity towards community needs.

Ultimately, a real lack of data and enforcement resources exists particular to composting because programs are so disjointed and have only existed for about fifteen years. However, this may provide an opportunity to reimagine a new system of waste disposal that centers on community involvement and not on commercial gain. Rather than a one-size-fits-all, it would perhaps be more equitable to compile resources, recommendations, and guidelines that would be made available at the local level for communities to use—or not—in order to serve their specific needs. After all, in order to effectively build a movement around composting, communities themselves should be empowered to take ownership of their own waste management. However, there must be adequate support and space created by government entities for this to occur by providing truly accessible resources to their particular populations. Therefore, a careful balance must be struck between community and government engagement.

B. Programs at the State Level

In 2012, Vermont passed Act 148,[90] which included a move towards mandatory statewide composting by July 2020.[91] One of the most effective aspects of Act 148 is that, although it is mandatory, it is not a wholly prescriptive solution. Rather, Act 148 provides multiple avenues for meeting the mandatory composting directive. This allows for individuals and communities to choose how they engage the requirements set out by the state to meet its overall composting goals. Vermont "has consistently prioritized education and outreach on the food waste ban and has worked to ensure

88. 7 U.S.C. § 6923 (2018); 42 U.S.C. § 6953 (2018) (establishing authority for the Secretary of Commerce to take such actions as may be necessary to: "(1) identify the geographical location of existing or potential markets for recovered materials; (2) identify the economic and technical barriers to the use of recovered materials; and (3) encourage the development of new uses for recovered materials.").

89. *See generally*, *Working Towards A Sustainable Tomorrow: Understanding & Expanding Compost Infrastructure*, U.S. ENV'T PROT. AGENCY (Sept. 28–29, 2009), https://archive.epa.gov/pesticides/region4/rcra/mgtoolkit/web/pdf/usccupdate1.pdf (explaining how to expand U.S. compost infrastructure and including U.S. Composting Council & BioCycle as sponsors)..

90. VT. STAT. ANN. tit. 10 § 6604 (2015).

91. *Id*; *see generally*, *Food Scraps*, VT. AGENCY OF NAT. RES. DEPT. OF ENV'T CONSERVATION https://dec.vermont.gov/waste-management/solid/materials-mgmt/organic-materials (providing information for state residents to comply with the mandate) (last visited Jan. 22, 2022).

option[s] exist for food scrap collection and drop-off."[92] It has also included subsidies to encourage low-cost residential composting.[93] The law sets forth that:

> The plan shall promote…(A) the greatest feasible reduction in the amount of waste generated; (B) materials management, which furthers the development of products that will generate less waste; (C) the reuse and closed-loop recycling of waste to reduce to the greatest extent feasible the volume remaining for processing and disposal; (D) the reduction of the State's reliance on waste disposal to the greatest extent feasible; (E) the creation of an integrated waste management system that promotes energy conservation, reduces greenhouse gases, and limits adverse environmental impacts; [and] (F) waste processing to reduce the volume or toxicity of the waste stream necessary for disposal.[94]

Furthermore, it requires the plan shall be revised every five years to include appropriate analysis and assessment of the current state of waste management.[95] The revisions are meant to include education and outreach components, and performance and accountability measures.[96] Aside from an extremely effective self-composting brochure,[97] the State has invested in drop off sites, haulers, as well as information on how to site new composting facilities—for its enterprising citizens.[98]

Vermont set out three categories to orchestrate its approach: 1) Convenience.[99] If it is inconvenient, composting rates plummet. Thus, the law includes requirements for services and infrastructure that offer more opportunities to the public;[100] 2) Incentives. It is more likely that everyone will participate in reducing their waste if they have to shoulder the true

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92. *Id.*
93. *Id.*
94. VT. STAT. ANN. tit. 10 § 6604 (a)(1)(A)-(F).
95. VT. STAT. ANN. tit. 10 § 6604 (2).
96. *See* VT. STAT. ANN. tit. 10 § 6601(e) (stating general purposes of the revisions).
97. *See The Dirt on Compost*, VT. DEP'T. OF ENV'T CONSERVATION, https://dec.vermont.gov/sites/dec/files/wmp/SolidWaste/Documents/Universal-Recycling/The-Dirt-on-Compost.pdf (providing tips and strategies for composting at home and complying with the law) (last updated Mar. 2019).
98. *Food Scraps*, AGENCY OF NAT. RES., https://dec.vermont.gov/waste-management/solid/materials-mgmt/organic-materials#:~:text=Drop%2Doff%20composting%3A%20You%20can,about%20services%20in%20your%20area (last visited Jan. 22, 2022).
99. *Act 148: Universal Recycling and Composting Law*, CHITTENDEN SOLID WASTE DIST. [hereinafter Act 148] https://cswd.net/about-cswd/universal-recycling-law-act-148/ (last visited Jan. 22, 2022).
100. *Id.*

burden of their individual contribution; [101] and 3) Mandates. [102] The requirement of universal participation increases participation in composting. [103] Along with these three perspectives, Act 148 initially included a slow phase-in of the law. Starting in 2014, "businesses generating over 104 tons of food scraps per year were required to send those scraps to a donation program, a farmer for livestock feed, and/or a composting facility."[104] In 2015, that was extended to "include those who generate more than 52 tons per year, and so on. By 2020, food scraps from all businesses and residents [were] banned from the landfill."[105] This method allowed space for the culture and infrastructure in Vermont to meet the law, and thus mitigate some of the disproportionate burdens felt by vulnerable communities.

However, "[a]lthough Vermont's food waste laws seem to have garnered success in the state, they may not be successful or even politically acceptable in many other states. For example, more politically conservative states might resist heavy-handed governmental involvement in their decisions about personal waste, and thus may be reluctant to participate due to privacy concerns." [106] Furthermore, the "Pay-As-You-Throw" (PAYT) program, which Vermont perceived to be a successful incentive to reduce trash waste, may be problematic when applied to impoverished communities. The program results in individuals who produce more waste shouldering their "true share of the cost" of managing that waste, while those who generate less pay proportionately less. [107] Yet, when considering folks living in poverty, they are often the same people with limited access to informational resources. Thus, these communities may potentially shoulder an unfair portion of the bill, unless this information and support in changing behaviors is brought to them directly.

On the other hand, in California, local governments were able to successfully reduce the amount of solid waste disposal coming from single-family residential sources (28% of total waste disposal) but faced challenges when it came to commercial and multifamily sources.[108] Thus, instead of enacting a mandatory state law like Vermont, it adopted one directed only at

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101. *Reducing the Impact Of Wasted Food By Feeding The Soil and Composting*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/sustainable-management-food/reducing-impact-wasted-food-feeding-soil-and-composting (stating that the average person makes 1.16 pounds [of] recycling and 0.42 pounds [of] composting [per][day].") (last updated Dec. 15, 2021).

102. Act 148, *supra* note 99.

103. *Id.*

104. *Id.*

105. *Id.*

106. Evans & Nagele, *supra* note 82, at 191.

107. Act 148, *supra* note 99.

108. CAL. STAT. AB 341 SOLID WASTE: DIVERSION, CH. 476 SEC. 1(b)(2) (enacted) (2011).

commercial operations,[109] while mandating municipalities across the Golden State extend their own programs for residential composting.[110] The California legislature identified its intent to: (a) require businesses to recycle their solid waste; yet (b) allow jurisdictions flexibility to develop and maintain individual solid waste recycling programs.[111] Furthermore, "[b]y requiring a jurisdiction to implement a commercial solid waste recycling program," the law essentially imposed a state-mandated local program.[112] However, it was not intended to limit, "modify or abrogate in any manner the rights of a local government or solid waste enterprise with regard to [sic] solid waste handling."[113]

The benefit of this approach is that it allows municipalities to tailor solutions to their specific circumstances, while recognizing that individuals and businesses are not on equal footing when it comes to participating in composting. Unlike Vermont's approach that treats the entire state the same, California is dealing with a much larger and more diverse populace,[114] and thus its method tends to be more friendly towards municipalities by focusing on supporting local programs to help reach its overarching state diversion goals. In response to California mandating local diversion programs, a variety of municipalities adopted differing approaches.

In San Diego, compost bin vouchers were implemented to allow more people to participate in a program that may have otherwise been inaccessible.[115] This is particularly beneficial to low-income folks who may not be able to afford backyard composting equipment. San Diego began this program in order to provide residents with "easy and affordable access to composting resources and education in order to achieve greater diversion of organics entering the landfill."[116] It is also a non-commercial solution that may allow individuals and communities to retain the benefits that come from composting.

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109. *Id.* (defining "business" as "commercial or public entity, including, but not limited to, a firm, partnership, proprietorship, joint stock company, corporation, or association that is organized as a for-profit or nonprofit entity, or a multifamily residential dwelling.").

110. *Mandatory Commercial Composting*, CALRECYCLE, https://www.calrecycle.ca.gov/recycle/commercial (last updated June 21, 2021).

111. CAL. PUB. RES. CODE § 42649 (2012).

112. CAL. PUB. RES. § 18838 (2012).

113. CAL. PUB. RES. § 42649.5(a)–(b).

114. *Compare* U.S. CENSUS BUREAU, *Total Population in Vermont* (2019), https://data.census.gov/cedsci/all?q=vermont (showing Vermont population estimate 623,989), *with* U.S. CENSUS BUREAU, *California* (2019), https://www.census.gov/search-results.html?q=California (showing California population estimate 39,512,223).

115. *Compost Bin Voucher Program Application*, CITY OF SAN DIEGO ENV'T SERV., https://www.sandiego.gov/environmental-services/recycling/residential/compostbinvoucher (last visited May 16, 2018).

116. *Backyard Composting*, CITY OF SAN DIEGO ENV'T SERV. https://www.sandiego.gov/environmental-services/recycling/residential/composting (last visited Jan. 22, 2022).

In 2009, San Francisco implemented its own mandatory composting law, which paved the way for other big cities to expand their existing programs.[117] The city took on most of the burden to provide pick-up for its residents because it was dealing with a relatively small area of land.[118] The new composting municipal service was directly integrated into a landfill flat rate, alongside garbage and recycling.[119] Furthermore, apartments, made efforts "to educate residents and install diverting devices (baffles) in the garbage disposal chutes used in older buildings."[120] All of this was part of a broader program to reduce waste by 2020. Similarly, Bakersfield—a more rural municipality—and the adjacent unincorporated area, instituted curbside green waste pickup using green-colored containers provided by the city.[121] Although Bakersfield has not passed a mandatory composting law, it has effectively integrated composting into its waste management program. The success of these Californian cities in providing composting to their residents is impressive, yet beyond the boundaries of these cities those services tend to trickle off.

The drawbacks of California's approach are similar to the broader United States shortcoming. It is a federalism problem. That is, access to composting and the quality of the services depends largely on local California governance. In other words, where you live within the state and whether the municipality sees fit to enact a law, create a program, or support a private company. This has created a patchwork of metro areas with access to curbside composting while rural communities are left to fend for themselves, leaving distribution gaps.[122] However, California recognized the potential environmental injustice of this approach, and proactively developed a specific composting environmental justice initiative to mitigate this unfair treatment.[123] Furthermore, in 2015 California put in place state-wide organic

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117. CAL., ENV'T CODE §§ 1801–1802 (2009); *Recycling & Compositing in San Francisco – FAQs*, SAN FRANCISCO DEP'T ENV'T, http://www.sfenvironment.org/article/recycling-and-composting/mandatory-recycling-and-composting-ordinance (last visited Jan. 22, 2022).

118. Yerina Mugica & Andrea Spacht Collins. *Food to the Rescue: San Francisco Composting*, NRDC (Oct. 24, 2017), https://www.nrdc.org/resources/san-francisco-composting#:~:text=In%201996%2C%20San%20Francisco%20became,and%20zero%20waste%20by%202020.

119. S.F. DEP'T ENV'T, *supra* note 117.

120. Thomas P. Redick & Kimberly Parker Beck, *Composting Codes and Coexistence Issues with Urban Agriculture*, 16 ABA AGRIC. MGMT. COMM. NEWSLETTER, no. 3, at 9 (Aug. 2012).

121. *Green and Wood Waste*, KERN COUNTY PUBLIC WORKS, https://kernpublicworks.com/organics/green-and-wood-waste/#bakersfield (last visited Jan. 22, 2022).

122. Niles, *supra* note 77.

123. Growing Compost, *supra* note 54 (working in conjunction with Berkeley Law School's Environmental Law Clinic, this manual was developed to assist compost facility operators think through environmental justice questions as they implement the state's organic waste reduction targets.); *see* Janaki Jagannath and Dan Noble, *18th Technical Training Series*, ASS'N OF COMPOST PRODUCERS, https://apps.cce.csus.edu/sites/calrecycle/lea_tts18/speakers/uploads/2A.Environmental_Justice%20(Noble).pdf (last visited Jan. 22, 2022).

waste recycling program requirements, exempting jurisdictions that already met the new standard.[124]

Thus far, California seems to have the most comprehensive understanding of maintaining a balance between self-initiative and structural support in order to justly expand composting. It is worth recognizing that California, by and large, is a wealthy state with a bent towards the progressive.[125] Regardless, California's approach is potentially a workable roadmap to help inform the development of national composting programs.

C. Programs at the Municipal Level

The most diverse and innovative programs in the United States are happening at the municipal level. The following municipal examples are only the floor of organic waste management programs. There are many, many more popping up all over the country, experimenting with a variable combination of conveniences, incentives, and mandates.[126] Seattle, New York City, and Austin are a few cities that have managed to implement workable programs that have been running relatively smooth for some time.

One of the first municipalities to start composting at a citywide level was Seattle, which now has a robust curbside pick-up program serving the entire city.[127] Seattle has had mandatory yard waste composting since 1988.[128] In 2003, Seattle passed a municipal ordinance creating mandatory recycling and an accompanying pick-up program both at the commercial and residential levels.[129] Since 2003, Seattle's ordinance has been amended to include mandatory composting of not only yard waste, but also food scraps.[130] Seattle Public Utilities has since interpreted this ordinance to cover food scraps generated by residential properties as well.[131]

What seems to have made Seattle's ordinance effective is the combination of mandatory participation, while simultaneously providing

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124. CAL. PUB. RES. § 42649.82 (2016).

125. U.S. CENSUS BUREAU, *supra* note 114.

126. *See generally* Redick & Beck, *supra* note 120 (detailing four different composting ordinances).

127. *Food Waste Requirements*, *supra* note 10.

128. SEATTLE, WASH., MUN. CODE §21.36.085 (2008) (stating that "yard waste shall not be mixed with garbage, refuse or rubbish for disposal").

129. *Zero Waste Case Study: Seattle*, U.S. ENVTL. PROT. AGENCY, https://www.epa.gov/transforming-waste-tool/zero-waste-case-study-seattle (last visited Jan. 22, 2022).

130. SEATTLE, WASH. MUN. CODE § 21.36.082 ("B. All commercial establishments that generate food waste or compostable paper shall subscribe to a composting service, process their food waste onsite, or self-haul their food waste for processing. All building owners shall provide composting service for their tenants or provide space for tenants' own food waste containers. [Exception for pre-approved business that don't have room to store this refuse].").

131. *Food & Yard (Compost) Services*, SEATTLE PUB. UTILITIES, http://www.seattle.gov/utilities/your-services/collection-and-disposal/multi-family-properties/for-managers-and-owners/food-and-yard-services (last visited Jan. 22, 2022).

services and infrastructure for folks to meet that requirement. Furthermore, Seattle includes an exception for home composting, which allows folks to opt out of the city program if they are composting themselves.[132] This is important for the purpose of supporting backyard and community composting. To further empower individuals, Seattle has created its Friends of Recycling and Composting steward reward program.[133] If a resident opts into this program, "they may receive a one-time $100 credit."[134] In return this individual takes on the responsibility of educating their community and making sure folks are properly sorting their garbage.[135] Every composting resource available through the city has also been translated into 16 different languages,[136] which allows individuals to communicate effectively with a diverse citizenry. Thinking about Mr. Cole's social change questions, Seattle seems to be moving in the right direction. It is not only thinking about creating infrastructure but also about building a community-empowered movement.

In New York City, the former mayor Michael R. Bloomberg recognized food waste as the "final recycling frontier."[137] In response to this notion, his administration began an ambitious curbside pick-up program in 2013, which has continued to this day.[138] This program has become the largest in the country, serving more than one million residents of all five boroughs in NYC.[139] NYC effectively and innovatively retrofitted existing garbage trucks and modified routes to accommodate organic waste, rather than create additional costs and negative environmental impacts.[140] Instead of adding a whole new waste program, NYC managed to integrate its composting into the wider waste disposal system. This not only benefits the city and

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132. *Composting Yard and Food Waste at Home*, SEATTLE PUB. UTILITIES & SAVING WATER P'SHIP http://www.seattle.gov/Documents/Departments/SPU/EnvironmentConservation/CompostingAtHomeGuide.pdf (last updated Dec. 2016).

133. *Friends of Recycling & Composting Program*, SEATTLE PUB. UTILITIES, https://www.seattle.gov/util/cs/groups/public/@spu/@foodyard/documents/webcontent/01_013851.pdf (last updated Nov. 18, 2014).

134. *Id.*

135. *Recycling Volunteers*, SEATTLE PUB. UTILITIES, http://www.seattle.gov/utilities/services/food-and-yard/bldg-owners/managers/100-credit (last visited Jan. 22, 2022).

136. *See Food Waste Prevention: Composting*, SEATTLE PUB. UTILITIES, https://atyourservice.seattle.gov/2016/09/29/food-waste-prevention-composting/ (providing a food waste composting guide in various languages) (last visited Jan. 22, 2022).

137. Emily S. Reub, *How New York Is Turning Food Waste Into Compost and Gas*, N.Y. TIMES (June 2, 2017), https://www.nytimes.com/2017/06/02/nyregion/compost-organic-recycling-new-york-city.html.

138. *Id.*

139. *Id.*

140. *Can We Have Our Cake and Compost It Too? An Analysis of Organic Waste Diversion in New York City*, CITIZENS BUDGET COMM'N (Feb. 02, 2016), https://cbcny.org/research/can-we-have-our-cake-and-compost-it-too.

environment but also creates an easy way for NYC residents to integrate composting into their lives.

NYC shows how the addition of municipal engagement can greatly expand access to composting and how important community composting programs are for the development and furtherance of organics recycling in general.[141] It took NYC until 2013 to adopt composting as a service the municipality provided, even though tens of thousands of New Yorkers had already been composting for decades.[142] In fact, community composting was always an integral part of community gardening within the city.[143] NYC Compost Project became the first organized iteration of composting in NYC, originally focusing on outreach, education, and technical assistance. Because of its success, particularly the operations component—Local Organics Recovery Program—skeptical lawmakers were convinced that a city-wide composting program could be successful. Over a five-year period from 2007-2013, this little three-bin, community garden composting organization expanded into a city funded program."[144] It is hardly a coincidence that this success story finds its roots in community organizing. Programs like this tend to flourish when communities are actively engaged in the process and invested in the outcome.[145]

The next year (2014) in the middle of the country, the city of Austin, Texas amended its preexisting universal recycling ordinance to include organics.[146] For an easier adjustment, the mandatory recycling of organics was set to come into staggered effect, over four years, from October 2014 to 2018.[147] The flexibility built into this program is one noteworthy aspect of Austin's ordinance. It allows responsible parties to:

> transport the organic material to a composting facility, compost on-site, or contract with a licensed recycling service provider. The responsible party may also divert organic materials to food banks, farms, or other material processors in ways that prioritizes feeding people and animals or industrial uses over composting in the waste diversion hierarchy outlined in the ordinance.[148]

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141. Nora Goldstein, *Community Composting in New York City*, BIOCYCLE (Nov. 18, 2013), https://www.biocycle.net/2013/11/18/community-composting-in-new-york-city/.

142. *Id.*

143 *Id.*

144. Bruce, *supra* note 57.

145. *Id.*

146. AUSTIN, TEX. ORDINANCE 20140612-010 § 15-6-93(E)(3) (2014).

147. *Id* at § 15-6-91 (D).

148. *Austin, TX — Universal Recycling Ordinance*, INST. FOR LOC. SELF-RELIANCE, https:/ilsr.org/rule/food-scrap-ban/austin-tx-universal-recycling/ (last visited Jan. 22, 2022).

Additionally, as part of its initiative, in 2016 Austin added a rebate program for residents to encourage home composting.[149] This includes a potential $75 rebate given to individuals for home composting equipment when they attend a free composting class or watch the class online.[150]

Although there are valuable aspects to Austin's ordinance, it fails to provide the flexibility that NYC or Seattle gives to their residents because the ordinance seems to only apply to property owners or their designees.[151] The burden is on landlords to educate their tenants and provide adequate facilities. This falls short of actively engaging the entire community to build a lasting movement. Furthermore, the ordinance provides that the responsible party[152] must:

> (4) remove the recyclable or organic materials by either: (a) transporting the recyclable and organic materials to a materials recovery or composting facility authorized by law; (b) contracting with a City-licensed recycling service provider to transport the recyclable and compostable materials to a materials recovery or composting facility authorized by law; or (c) transporting recyclable or organic material, as permitted and required by City Code, to a material recovery facility, food bank, processor, material broker, urban farm, urban ranch, rural farm, rural ranch, community garden, or a facility that prioritizes the hierarchy of beneficial use as set out in Subsection (D) of this section.[153]

The major problem with Austin's law is that it treats composting notably like recycling. This is valuable to the extent that people are generally more aware of recycling, and thus more likely to participate in composting if it is like something they already know about. However, when being translated into law, composting is quite a different beast from recycling, and has wholly different implications for community health and involvement. Because

149. *Curbside Composting Guide*, AUSTINTEXAS.GOV, http://www.austintexas.gov/composting (providing citizens with reasons as to why they should compost, a possible rebate) (last visited Jan. 22, 2022).

150. *Id.* (mentioning filling out a questionnaire as part of the rebate application, which may present a burden for those who cannot read/write. There may also be language barriers. However, adding the option to participate online is valuable because it allows folks who may otherwise have time constraints or transportation limitations to access an option when and where they are able.).

151. AUSTIN, TEX. ORDINANCE 20140612-010 § 15-6-1(13).

152. *See id* at § 15-6-1(19) (defining Responsible Party as: (i) the owner of a premises or an employee of the owner or (ii) the manager of a premises or an employee of the manager).

153. *Id* at § 15-6-92 (A)(4) (presenting the Hierarchy as: (1) feeding hungry people; (2) feeding animals; (3) providing for industrial uses; and (4) composting).

Austin's law seems to gloss over this difference, it fails to provide adequate flexibility for backyard and community composting. In fact, it fails to provide adequate flexibility for composting as a whole.

D. Private Composting Programs

Aside from governmental action on composting, there are many private programs that have sprung up both locally and internationally in the last few years to fill in where the government has yet to provide services. Using a vast array of tools from online technology to conventional small business models, innovative companies are creating new interconnected social webs separate from traditional waste management. In a sense, they are trailblazers of an anarchic reform for these systems.

In Albuquerque, New Mexico, a small company, Little Green Bucket,[154] provides pick-up and drop-off services for a city (and a state) that does not offer any composting as a public utility. Aside from a weekly or bi-monthly food scrap pick-up service,[155] they give their clients the opportunity to collect a seasonal supply of humus created from the accumulated refuse. The major problem with this private company is that it costs $20 a month, which is an unreasonable amount to expect most people to pay, especially considering that New Mexico ranks as one of the poorest states in the nation.[156] Although this company is taking initiative in a relatively community friendly way, it is still bound to the capitalist free-market, and thus must turn a profit to survive.

On the other end of the spectrum is an app, created in 2016, to expand home composting networks.[157] ShareWaste "uses a digital map to connect individuals with food scraps to nearby neighbors who have compost capabilities, like a heap or a bin. Users accepting compost scraps can mark their compost site on the map for other users to find."[158] This app was initially created in Australia but is now available globally with "nearly 6,000 users [sic] currently signed up for ShareWaste across the globe."[159] The brilliance of this novel idea is its ability to connect community members and create a more economical option for organic waste disposal.[160]

Using technology to foster ecological resilience and empower individuals to become more community oriented and self-reliant is important

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154. LITTLE GREEN BUCKET, https://littlegreenbucket.com/ (last visited Jan. 22, 2022).

155. *See id* (providing clean "little green buckets" every pick-up).

156. *Id*; Rachel Moskowitz, *Poverty in New Mexico*, N.M. DEPT. OF WORKFORCE SOLS. (Jan. 9, 2019), https://www.dws.state.nm.us/Portals/0/DM/LMI/Poverty_in_NM.pdf.

157. Josie Colt, *Compost Makes an Internet Community Grow, Thanks to an App*, WIRED (June 19, 2018), https://www.wired.com/story/sharewaste-composting-app/.

158. *Id.*

159. *Id.*

160. *Id.* (the app is not limited to composting).

for the continued development of composting systems everywhere. However, the idealist technocrats often forget that with anything digital there are going to be people and communities left out. Not everyone has the money to buy an adequate device to run the app or has the familiarity with technology to use it. For example, many tribal communities still live off the grid and elderly folk tend to have a harder time navigating new technologies.[161] Yet, even taking these vulnerable communities into consideration, ShareWaste is truly the first attempt at bringing one of the oldest technologies known to man into the 21st century,[162] and although it may not be perfect it has the potential to uproot a century old system of waste management.

CONCLUSION

Although composting is a technology that dates back farther than state and municipal responsibility for waste disposal, the United States is seeing an increased interest in this alternative to contend with multiple modern problems. In response to this momentum, yet still conforming with Tenth Amendment state functions, a patchwork of different composting programs has begun to develop nationwide. Within these small laboratories, an opportunity exists to test new and dynamic waste disposal systems, in the form of composting. Additionally, it is valuable to incorporate differing solutions to reflect a truly diverse country, as no one-size-fits-all. However, in composting's nascent stages it is important to hold a critical eye up to each program so that it is comprehensively implemented and effectively serves the intended community without succumbing to injustice.

161. *Id.*
162. *Id.*