# POP-UP COMPOST PROJECT :

# REFRAMING THE PROCESSES AND PERCEPTIONS OF COMMUNITY COMPOSTING IN NEW BRUNSWICK, NJ

By

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ABSTRACT OF THE THESIS

POP-UP COMPOST PROJECT :

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Thesis Director:
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The sanitary response to trash eliminates refuse from both the individual's and community's consciousness, transporting waste "away" to unimagined landscapes.[1] While municipal waste hauling companies provide a crucial service for American communities, the carting off of trash from neighborhoods to distant places perpetuates an inability to separate and cycle waste streams into more valuable materials.[2] With many communities lacking engaging waste sites integrated into the fabric of their localities, most American places have lost the ability to creatively manage their trash.[3]

This paper identifies the need for incorporating additional waste cycling sites into communities as a way to address America's unhealthy relationship with waste. It reviews New York City's Compost Project, an initiative popularizing the closed-loop waste cycle of composting "by giving New Yorkers the knowledge, skills, and


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[1] Robin Nagle, *Picking Up: On the Streets and Behind the Truck with the Sanitation Workers of New York City*, (New York: Farrar, Straus and Giroux, 2013), 3.
[2] Mira Engler, *Designing America's Waste Landscapes*, (Baltimore: The Johns Hopkins University Press, 2004), xxi.
[3] Edward Humes, *Garbology: Our Dirty Love Affair with Trash*, (London: Penguin Books, 2013), 4.

opportunities they need to produce and use compost."[4] Three selected case studies from this project offer a variety of composting methods and compost site experiences - specific criteria informing the design of innovative urban waste landscapes.

After reviewing case studies in community composting, this project shifts to proposing a composting initiative for the city of New Brunswick, NJ. Entitled, POP UP Compost Project,[5] this proposal envisions a three-step system including 1) organic collection sites, 2) compost cycling locations, and 3) strategies for re-investing finished compost back into the city. Integral to this proposal is the compost drum - a mobile organic collection unit that retrofits a 55-gallon drum with a "waste window." Organic collection sites featuring the compost drum will be integrated at New Brunswick Community Farmers Market locations while compost cycling sites will be located at existing community gardens throughout New Brunswick.

In many ways, this project is a response to the work of landscape architect, Mira Engler, and her efforts to expand the scope of landscape architecture to include public waste sites. These spaces challenge residents to rethink their connection with waste, demonstrating the process of turning materials deemed valueless into valuable while deconstructing fears and guilt associated with waste. Connecting Engler's research to the community composting movement, this project seeks to integrate composting sites as dialectic places - messy yet clean, functional yet beautiful[6] - in New Brunswick, NJ.

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[4] "NYC Compost Project Overview", *Department of Sanitation New York (DSNY)*. Accessed March 20, 2016, www1.nyc.gov/assets/dsny/zerowaste/residents/nyc-compost-project.shtml.
[5] In the title, P.O.P. stands for "people operated power" while POP UP refers to the network of temporary organic collection sites operating during market hours in New Brunswick, NJ.
[6] Mira Engler, *Designing America's Waste Landscapes*, (Baltimore: The Johns Hopkins University Press, 2004), xxi.

# IV. ACKNOWLEDGEMENTS & DEDICATIONS

This section acknowledges key synergistic relationships which have helped to fortify and activate this thesis in ways that I could have never imagined at the project's onset in May 2015. Between project advisors through the Rutgers Landscape Architecture Department, project-partners at Elijah's Promise, community members from New Brunswick, and loved ones, this project is the result of a robust support-system consisting of individuals that have believed in this project from its onset.

First, I would like to thank my primary thesis advisor, Richard Alomar for guiding me to "write, write, write," especially in the early thesis process. I would like to thank Professor Alomar for mentoring on the process of writing - a verbal sketching technique for formulating new thoughts - and for crafting worthwhile ideas into meaningful work. I greatly appreciate your guidance and feedback through the multiple iterations of project concept developments, presentations, and thesis drafts. Thank you for helping to make this project stronger than I could have ever achieved alone.

Next, I would like to thank my additional advisors, Professors Tobiah Horton and Holly Grace Nelson. By raising concerns about project details that I would have otherwise overlooked - including the weight of proposed compost cube designs, and the need to strengthen connections between organic collection sites and compost cycling locations, Professors Horton and Nelson informed my thesis through their feedback over academic year 2015-2016. I would like to thank you both for generously dedicating your time to attend project meetings, for illuminating project shortcomings, and for fostering stronger project concepts and insights throughout the thesis process.

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Lastly, I would like to acknowledge my loved ones - my family, girlfriend, grandmother, relatives, and friends who supported listening to my excessive talks on composting over the past 16 months. To my parents, Debra and Howard Schlesinger, brother George, grandmother Etta, and relatives, thank you for your openness of my decision to select an untraditional path of study within the field of landscape architecture - and for your continued support of my life decisions. To my girlfriend, Frangelin, thank you for allowing me to share developing project thoughts, info-graphics, and work progress, even when little progress had been made! To my friends, thanks for being genuinely interested in the developments of my work and passion.

This project - our project - would have not have been possible without you all! Thank you for your feedback, idea generations, and for listening, questioning, challenging, and supporting. This project is just beginning and I am excited for the continued and additional acknowledgements to come.

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Section I: Part I
## Introduction: A Response to Engler's Critique

*"Waste should be brought closer to our everyday environments and normalized and systems of waste treatment should be decentralized, with aesthetics employed to facilitate this change."*[7]

This thesis examines opportunities for integrating active waste spaces into community life and builds on the work of landscape architect, Mira Engler - responding to many of her points made in *Designing America's Waste Landscapes.* Since Engler's publication in 2004, composting has emerged as a popular and feasible alternative waste cycle across the country with compost cycling sites implemented at both the large-scale outside of cities and at the small or community-scale within neighborhoods. While both of these scales of cycling have their benefits and drawbacks, this thesis focuses primarily on developments in urban community composting projects and the integration of cycling sites "as public waste landscapes serving as grounds for general critique of culture and design."[8]

This thesis therefore applies Engler's insights on waste landscapes to current developments in community composting - a movement distinguished by "keeping the process and product [of composting] as local as possible

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[7] Mira Engler, *Designing America's Waste Landscapes*, (Baltimore: The Johns Hopkins University Press, 2004), xv.

[8] Ibid, xiv.

while engaging the community through participation and education."[9] Community composting sites are creating public spaces for exploring new thoughts about urban agriculture and resource cycling in the city. These sites which are messy in nature, "signify the polar opposite of great cultural centers and explore and complement places at the center, where only accepted norms and behaviors are permitted."[10] By getting residents involved in the highly rewarding process of turning messy food scraps into contained composting cycles, these sites are further expanding the city's "landscape matrix"[11] - the collective landscape identity of a place informed by the spectrum of normalized behaviors that can occur on its landscape.

As community composting grows in popularity, the field of landscape architecture must recognize the power and potential of embracing active waste sites. In doing so, the profession can apply its understanding of site design and spatial planning to further popularize the integration of compost cycling spaces that allow residents to manage their own refuse. Here, landscape architects may find new opportunities for expressing site design, "reexamining aesthetic biases and continue[ing] to look for ways to generate new [landscape] models that incorporate [the] mundane [or the] rejected [into] everyday environments"[12] and community sites.

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[9] "Brenda Platt, James McSweeney, Jenn Davis, "GROWING LOCAL FERTILITY: A GUIDE TO COMMUNITY COMPOSTING," *The Institute for Local Self Reliance and The Highfields Center for Composting, 59,* last modified April 2014, http://ilsr.org/wp-content/uploads/2014/07/growing-local-fertility.pdf.

[10] Mira Engler, *Designing America's Waste Landscapes*, (Baltimore: The Johns Hopkins University Press, 2004), 35.

[11] Ibid, 35.

[12] Ibid, 24.

Section I: Part II
**Overview: Moving From Large to Community-Scale**

This thesis reviews developments in waste management trends while focusing on the compost movement's recent successes as a national and community waste reduction alternative. After reviewing large-scale composting sites and community-scale cycling approaches, this thesis shifts to proposing details for POP UP Compost Project in New Brunswick, NJ.

Section I: America's Waste Epidemic begins by reviewing the social, cultural, and economic culprits enabling the country's wastefulness. This section then focuses on composting cities on the west coast as a viable solution for shrinking landfills and improving soil. This review also reveals drawbacks associated with large-scale composting as industrial composting sites are often removed from the cities producing the collected organic waste.

Section II: Case Studies from New York City Compost Project, moves from large-scale municipal composting to composting-scale composting which integrates waste sites directly into the city. This section shares best practices for implementing and managing community compost sites as hubs for educating and engaging urban residents in the compost cycling process.

Section III: POP UP Compost Project combines lessons learned from the two previous sections into a proposal for a community project in New Brunswick, NJ. This project aims to introduce public waste spaces back into New Brunswick's landscape, creating mobile collection sites and interactive cycle spaces that engage city residents to creatively rethinking their waste.

Section I: Part III
## Acknowledging America's Waste Epidemic

America's current production of waste exceeds all historic projections estimating the wastefulness of 21st Century Americans. A review of America's current disposal trends displays the excessive wastefulness that the nation has achieved. Today, the average American throws away 7 pounds of garbage per day,  2,500 pounds of waste per year and around 102 tons of trash in their lifetime.[13] Since 1980, waste production has increased by over 33%. And with one out of every six trucks on the road being a trash truck, the

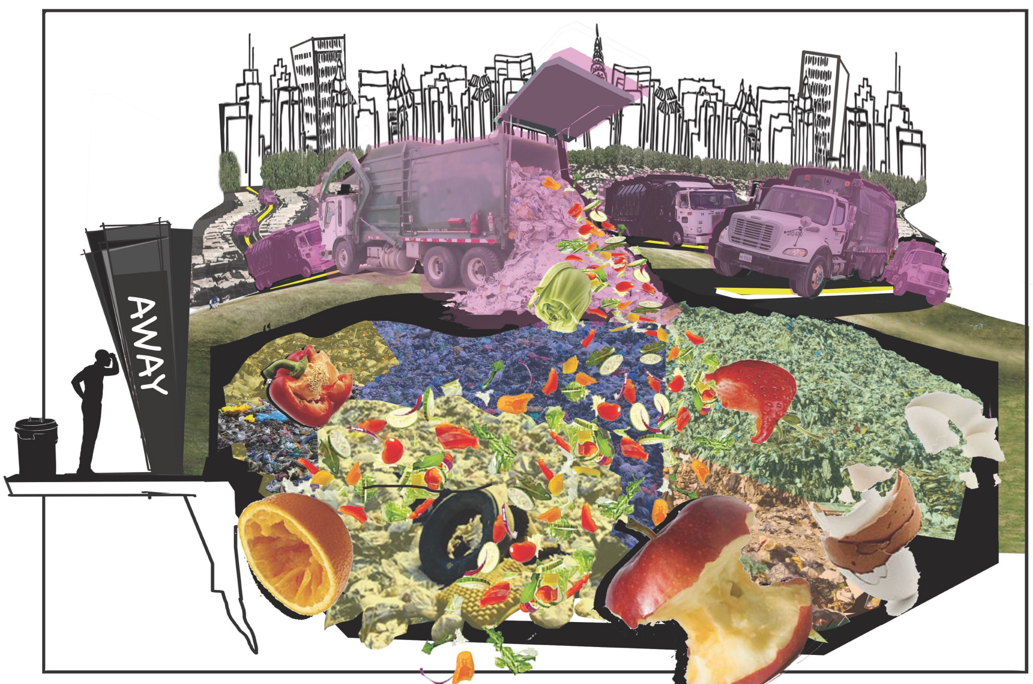


Figure 1. "America's Waste Epidemic." Illustration by the author.

[13]Nickolas J. Themelis and Ljupka Arsova. "Calculating Tons To Composting In The U.S." *BioCycle Magazine, Vol. 56, No. 2.,* last modified February 13, 2015, https://www.biocycle.net/2015/02/13/calculating-tons-to-composting-in-the-u-s/.

Figure 2. *Seven Days of Garbage* by Greg Segell

massive fleet of waste vehicles helps move unwanted materials to fringe landscapes - marginal places that are rarely ever visited.[14]

This thesis explores "America's Waste Epidemic"[15] (Figure 1), the collective concealing of trash in this country and the implications incurred from ignoring growing waste volumes. As a nation, annual solid waste production reports vary between an estimated 250 million tons and 390 million tons.[16] Accounting for only 5% of the world's population, the United

14 Mira Engler, *Repulsive Matter: Landscapes of Waste in the America Middle-Class Residential Domain*, Landscape Journal (Madison: University of Wisconsin Press, 1997) 61.

15 Edward Humes, *Garbology: Our Dirty Love Affair with Trash*, (London: Penguin Books, 2013), 10.

16 Nora Goldstein, Nicholas Themelis, and Rob van Haaren. "The State of Garbage in America," *BioCycle Magazine Vol. 51, No. 10,* last modified October 2010, https://www.biocycle.net/2010/10/26/the-state-of-garbage-in-america-4/.

States produces nearly 25% of the planet's trash.[17] While America is the leader in waste production, most Americans are unaware of the nation's excessive rubbish - primarily because trash "goes away" for processing.

In addition to the dilemma of concealing waste, current economic systems in the United States embrace a culture of waste. Edward Humes explains that as Americans purchase and consume market goods, the economy increases at the expense of more waste.[18] The cost of convenience also takes its toll as 80% of the waste that the United States produces consists of products thrown out after just one use."[19] Archeologist Robin Nagle writes that the disposal of "garbage itself is the great unmarked and purposely unseen result of a lushly consumptive economy."[20] This culture rarely connects the individual with their discarded waste objects. (Figure 2)

Those profiting from the current waste industry, including large waste management providers who maximize profit through the higher tipping fees of landfilling waste, are proponents for privatizing waste and concealing the processes of disposal from the public's consciousness.[21] As Duke University's Center for Sustainability and commerce details, approximately 55% of the 220 million tons of waste generated each year in the United States ends up in one

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[17] Edward Humes, *Garbology*, 10.

[18] Edward Humes, *Garbology*, 11.

[19] "Recycle Facts" *Grow NYC Green Market*, accessed March 01, 2016, http://www.grownyc.org/recycling/facts.

[20] Robin Nagle. Picking Up, 5.

[21] Neil Seldman "Failure of Wilmington Compost Facility Underscores Locally Based Diverse Composting Infrastructure," *Institute for Local Self Reliance,* last modified December 18, 2014, https://ilsr.org/failure-wilmington-compost-facility-underscores-locally-based-diverse-composting-infrastructure/.

of the nation's 3,500 landfills.[22] At an average tipping fee of $44 per ton[23], this conservatively estimates the landfilling industry earning an annual profit exceeding $5 billion.[24] Meanwhile, composting tipping fees per ton are lower than landfilling, a benefit for cities and communities but a potential loss in profitability for waste management companies.

In addition to profiting from poorly separated and cycled waste, the landfilling industry also accounts for the second-largest source of human-related methane emissions in the United States, accounting for approximately 22% of national emissions.[25] Since methane is 30% more potent as a heat trapping greenhouse gas than carbon dioxide[26], waste alternatives which minimize landfilling through closed-loop waste systems work to decrease methane emissions. Composting - as a waste alternative - has the trivalent potential of minimizing annual waste hauling expenses, decreasing greenhouse gas emissions, and increasing the value of discarded materials by transforming organic food waste into soil amendment.

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22 "How much do we waste daily?" *Duke University Center for Sustainability and Commerce.* accessed on March 27, 2016, https://center.sustainability.duke.edu/resources/green-facts-consumers/how-much-do-we-waste-daily.

23 "Municipal Solid Waste" *University of Michigan Center for Sustainable Systems*. Last modified October 2015. http://css.snre.umich.edu/css_doc/CSS04-15.pdf.

24 Other estimates report annual national profits exceeding 14 billion.
"The US government grossly underestimated how much trash we throw in landfills." *Business Insider.* Accessed on http://www.businessinsider.com/ap-study-twice-as-much-trash-put-in-landfills-than-estimated-2015-9.

25 "How much do we waste daily?" *Duke University Center for Sustainability and Commerce.* Accessed on March 27, 2016. https://center.sustainability.duke.edu/resources/green-facts-consumers/how-much-do-we-waste-daily.

26 "A more potent greenhouse gas than carbon dioxide, methane emissions will leap as Earth warms" *Princeton University.* Last Modified March 27, 2014. https://www.sciencedaily.com/releases/2014/03/140327111724.htm.

As national waste recycling rates are decreasing - a trend tied to fluctuating oil prices and inefficient, international recycling methods - the cost-benefit of recycling is also lowering.[27] In response to this market shift, some waste management industry leaders have begun calling for more stream-lined landfilling practices, arguing that consolidating the multiple waste streams of landfill, recycling, and compost into one landfill stream lowers landfill tipping fees.[28] As recycling rates go down and landfilling

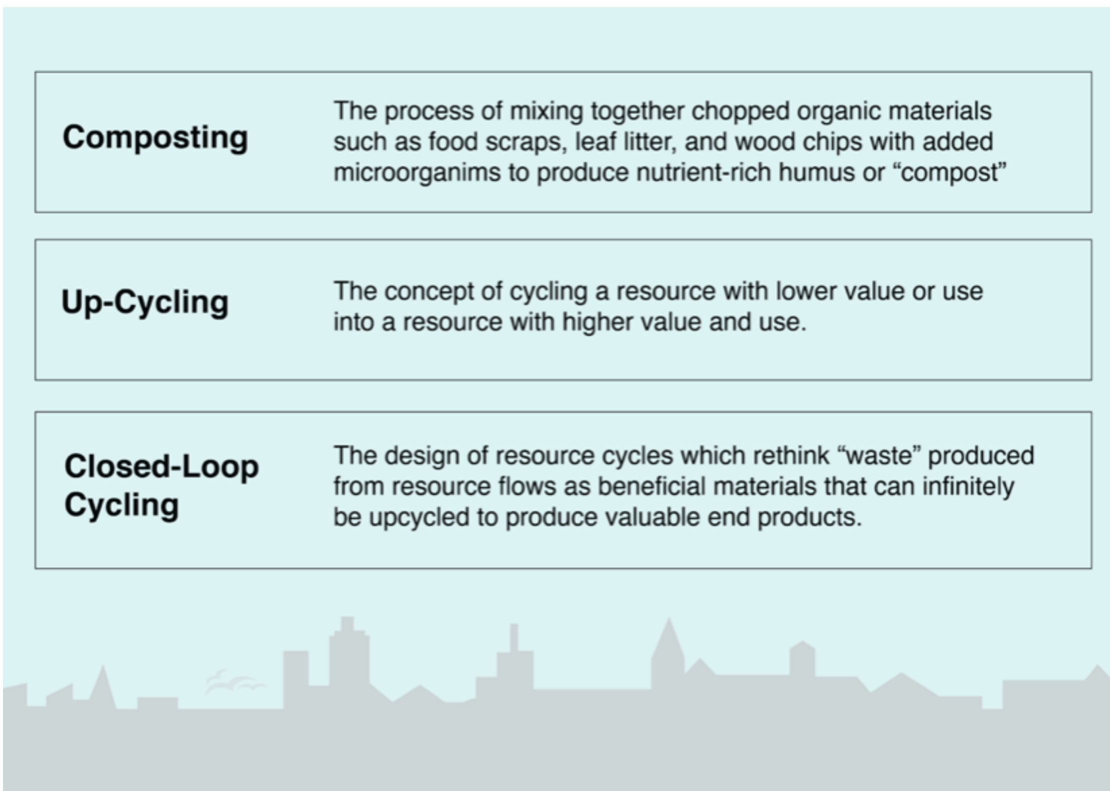


Figure 3. Efficient resource cycling terms. Image by the author.

[27] John Tierney, "The Reign of Recycling" *The New York Times. (*New York: October 3, 2015), http://www.nytimes.com/2015/10/04/opinion/sunday/the-reign-of-recycling.html?_r=0.

[28] "Municipal Solid Waste Landfills: Economic Impact Analysis for the Proposed New Subpart to the New Source Performance Standards" *U.S. Environmental Protection Agency,* last modified June 2014, https://www3.epa.gov/airtoxics/landfill/landfills_nsps_proposal_eia.pdf.

volumes rise, the need for developing waste cycling alternatives less reliant on fossil fuels increases.

Composting as a practice of closed-loop cycling (Figure 3), is a solution for shrinking landfills by turning organic waste[29] into cured compost - “dark, crumbly, earthy-smelling organic material” which is a “valuable soil conditioner.”[30] Composting initiatives can also be seen as an opportunity for addressing the rising rates of nutrient-rich soil loss in the United States as finished compost can be used to amend existing soil in order to return valuable nutrients to the ground. Each year, America’s agricultural soil is being washed away, 10 to 40 times faster than it is being replenished.”[31] The nation’s soil loss is largely the result of large-scale agricultural practices but it is also the result of a nation which lacks a closed-loop waste cycle which regenerates and returns soil nutrients from the city to the country - a waste cycle with rich historical precedence in Europe and the United States.[32]

As McDonough's and Braungart’s *Cradle to Cradle* explains, humans are the only species whose agricultural, economic-development, and waste

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29 Organic waste does not imply that waste is “certified organic.” Rather, organic material refers to waste that consists of plant-based or animal-based materials which naturally decompose given the proper waste management conditions. This thesis focuses on the collection and cycling of plant-based organic material through the composting process.

30 “Brenda Platt, James McSweeney, Jenn Davis, “GROWING LOCAL FERTILITY: A GUIDE TO COMMUNITY COMPOSTING,” *The Institute for Local Self Reliance and The Highfields Center for Composting, 59,* last modified April 2014, http://ilsr.org/wp-content/uploads/2014/07/growing-local-fertility.pdf.

31 David Pimentel. “Soil Erosion: A Food and Environmental Threat,” *Cornell University, College of Agriculture and Life Sciences,* last modified October 27, 2003, www.ids-environment.com/Common/Paper/Paper_83/Soil%20Erosion.pdf.

32 Edward D. Melillo. “Nutrient Rifts,” *Discard Studies Compendium,* last modified April 11, 2016, https://discardstudies.com/2016/04/11/nutrient-rifts/

cycling systems currently depend on vast amounts of soil nutrients without replacing these nutrients back in the ground.[33] The authors explain that "it can take approximately five hundred years for soil to build up an inch of its rich layers of microorganisms and nutrients. McDonough and Braungart report a much higher soil loss than other findings, suggesting that an average decrease of five thousand times more soil than is being made each year."[34] Despite this discrepancy, the conclusion remains clear - America urgently needs to rethink its waste cycles, both at the national and community-scale, in order to turn organic waste into compost to amend nutrient-deficient soils.

The concept of a city capable of separating and cycling its organic waste from valueless heaps of rubbish into valuable soil amendment echoes principles found in *Cradle to Cradle.*[35] As the second portion of Section I explains, American cities have begun implementing compost networks where finished compost returns to nearby farmers for growing fresh produce.[36] Such transformations of large-scale waste systems not only reverse the depletion of regional soil, they also provide powerful examples of closed-loop design - a philosophy of resource efficiency which can be applied to any sector of the economy to transform valueless resources into valuable system inputs, creating synergistic and cost-efficient economic advantages.

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33 William McDonough and Michael Braungart, *Cradle to Cradle: Remaking the Way we Make Things* (London: Vintage, 2009), 96-97.

34 Ibet.

35 Ibet, 45.

36 Jim Carlton, "San Francisco Garbage Helps Make Vineyards" *The* Wall Street *Journal*, last modified October 13, 2011, http://www.wsj.com/articles/SB10001424052970203633104576621633242608082.

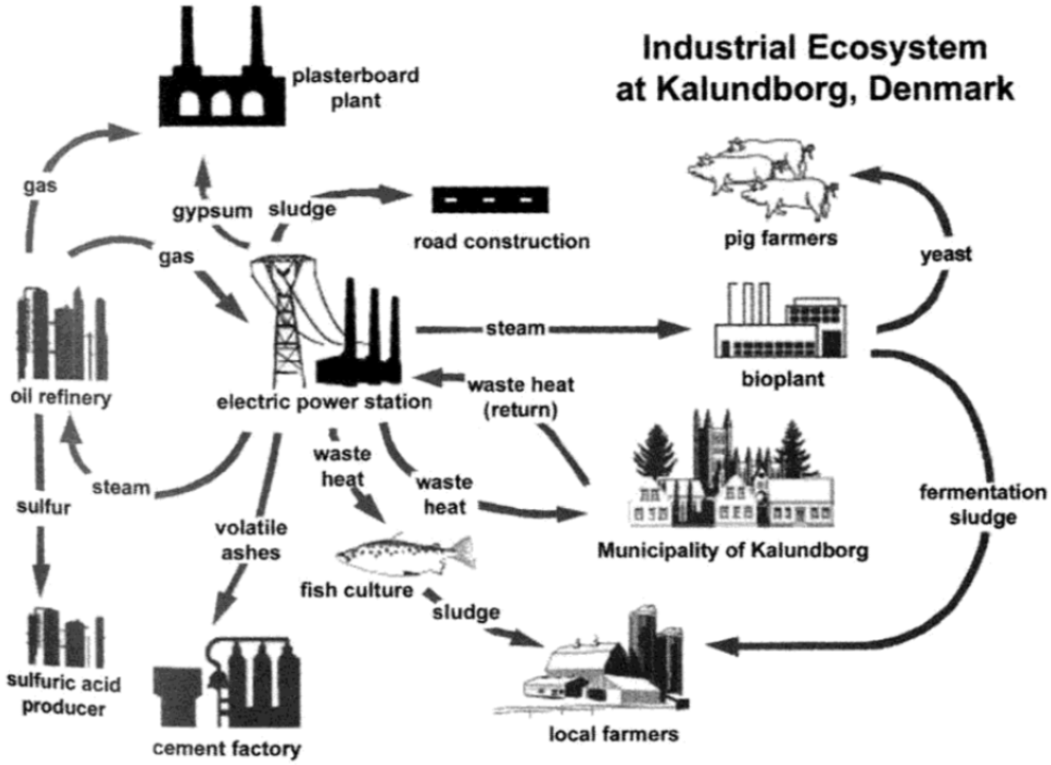


**Figure 2–5.**

Relationships of waste as food for other industrial processes are diagrammed for the Kalundborg industrial ecosystem in Denmark. (Kibert, Charles. Copyright © 2005, John Wiley & Sons, Inc. Reprinted with the permission of John Wiley & Sons, Inc.)

Figure 4. Industrial Ecosystem at Kalundborg, Denmark by Charles Kibert.

Arguably the most important element of a closed-loop resource cycle is the impact that this design approach has as a community connector. The Industrial Ecosystem at Kalundborg, Denmark (Figure 4) illustrates the resource flow for how each waste product of the town's industrial process is rethought as a valuable material to enable more productive re-use. Instead of becoming a privatized nuisance requiring waste treatment, the end-products of Kalundborg industries become connecting mechanisms, forming relationships between companies seeking to improve their manufacturing efficiencies. In doing so, the town is able to enjoy greater profitability as a benefit of their collaborative industrial ecosystem.

Section I: Part IV
## Reimagining Waste Cycles

Every human society has produced waste - material that is discarded once seen as having little or no value. In this way, each society's waste serves as a powerful tool for telling the present generation about historic resource cycling habits - a reflection of each culture's ability to find new value in its valueless resources. Historically, cultures have framed the waste cycle as an opportunity for transforming materials with waning usefulness into marketable end-products that actually improve their landscape.

While the concept of a landfill - a town dump to deposit objects seen as valueless or broken - has existed for over 2,500 years, the location and size of these dumps has changed dramatically since their initial occurrence. The earliest garbage dump is believed to have been built in Ancient Athens in 400 B.C.[37] One big difference between the dump of Ancient Athens and the landfills of current day in the United States is the growing distance between landfills and the communities producing the municipal solid waste. The location of dumps has moved to the "physical and cognitive edges" of communities[38] while the amount of waste deemed valueless has grown exponentially.

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[37] Ibid, 9.
[38] Robin Nagle, *Picking Up: On the Streets and Behind the Truck with the Sanitation Workers of New York City,* (New York: Farrar, Straus and Giroux, 2013), 10.

The placement of dumps on the fringes of built landscapes does offer sanitary advantages - especially when disposing toxic waste. But the growing distances between dumps and the places producing waste supports the popular belief that trash is "thrown away." As Nagle writes, "We generate our dregs, we create their hazards, and then we invent the dump as one of the places to which we banish them so that we can pretend they won't harm us."[39] The image of curbside garbage has become so normal that the individual rarely stops to imagine the details of their consumption habits and the impact of waste's journey after it is collected by the garbage truck.

Yet as Engler suggests, "Failure to notice waste, misconceptions about waste, and repulsions toward waste prevent [people] from deciding how to manage it well. These [factors] hinder the ability to make waste a meaningful part of everyday life and to shape culturally significant waste places."[40] As the country's waste epidemic surges, it is critical to study cities and communities that are rethinking their waste cycling process, either by diverting organic material from the landfill through large-scale composting programs or through community-scale initiatives integrating waste cycling sites into the places where people live.

[39] Ibid, 12.
[40] Mira Engler, *Designing America's Waste Landscapes*, (Baltimore: The Johns Hopkins University Press, 2004), 16.

Section I: Part V

## The Rise of the Compost City

For this thesis, composting is defined as the “process of creating the ideal conditions for the rapid decomposition of organic materials.[41]” Identifying composting as both a closed-loop system and as an up-cycling[42] approach to waste management, this section observes that while centralized composting programs maximize waste diversion from the landfill, this top-


Figure 5. Three-bin system at San Francisco State University’s Cafeteria. Photo by the author.

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[41] “New York City Master Composter Manual,” *NYC Department of Sanitation Bureau of Waste Prevention*, *Reuse & Recycling,* last modified February 2012, 3, http://ilsr.org/wp-content/uploads/2012/09/NYC-Master-Composter-Manual-Under-Revision.pdf.

[42] Up-cycling is the process of a cycling a resource with low value or use into a resource with high value or use.

down approach conceals the composting cycle from public view - offering few opportunities for engaging residents in the waste management process.

In 2009, San Francisco, California became the first American city to mandate that all residents separate organic waste for curbside collection. Led by the resource recovery[43] company, Recology, the city of San Francisco implemented a three-bin system separating materials for landfilling, recycling, and composting. (Figure 5) Since 2009, the city's innovative approach to waste cycling has proven ambitiously successful and has helped achieve

Figure 6: Separating organics from the waste stream.
Photo by the author.

43 As a resource recovery company, Recology's approach to waste services is different than its counterpart, Waste Management, on the east coast. Recology's vision is a world without waste and their mission is designing resource ecosystems that capture, sort, and cycle post-consumer resources into valuable materials. Visit http://www.recology.com for more information.

between 60-80%[44] waste diversion from the landfill. Diversion is achieved through the combined efforts of composting and recycling.[45] Of the waste produced by the city's 850,000 residents, the city diverts far more of its residents' waste from the landfill compared to the national average which removes only 33.8% of waste through recycling and composting initiatives.[46]

The success of San Francisco's composting program has led other cities to adopt similar composting initiatives. In 2015, both Portland, Oregon and Seattle, Washington mandated that all organic material within their cities be separated for curb-side pick up. With organic waste constituting roughly 30% of most city's waste streams (Figure 6), and with food waste contributing approximately 18% to total organic material,[47] the scaling up of city composting has the potential to remove significant amounts of waste from entering the landfill while promoting several additional benefits. City-wide composting initiatives are proving the feasibility of centralized collection and cycling programs - producing mountains of soil instead of mountains of trash.

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44 San Francisco is often touted as achieving its 80% waste diversion rates. However, several blogs have done independent investigations to debunk this claim, suggesting that a more realistic number for current waste diversion is around 60% See http://discardstudies.com/2013/12/06/san-franciscos-famous-80-waste-diversion-rate-anatomy-of-an-exemplar/ for more details.

45"Zero Waste FAQ," *SF Environment,* accessed on January 10, 2016, http://sfenvironment.org/zero-waste/overview/zero-waste-faq.

46 "Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2009," *U.S. Environmental Protection Agency, Solid Waste and Emergency Response,* last modified December 2010, https://www3.epa.gov/wastes/nonhaz/municipal/pubs/msw2009-fs.pdf.

47 Kathryn Garcia, "2014 NYC Community Composting Report," *The City of New York Department of Sanitation*, last modified January 2015, 4, www1.nyc.gov/assets/dsny/docs/about_2014-community-composting-report-LL77_0815.pdf.


Figure 7: View of San Francisco's three-bin system with green bins collecting organic waste.

Figure 8. Site experience at Recology, Jepson Prairie. Photo by the author.

After learning about San Francisco's composting program, the author applied and received the Rutgers School of Environment and Biological Science's DeBoer Travel Prize in Landscape Architecture[48] to visit the "Capital of Composting." This scholarship allowed the author to explore how San Francisco's composting program had impacted the population's perception of organic waste cycling. Additional inquiries included whether San Francisco contained small-scale compost cycling sites integrated into its urban landscape to demonstrate composting to city residents or whether composting occurred on marginal sites removed from everyday life.

After spending two weeks traveling the streets and college campuses of San Francisco, the author found that despite the immense waste reductions that city-wide composting produces for San Francisco, there exists minimal opportunities for residents to get involved with composting in the city. While the city has implemented the ubiquitous three-bin curbside system (Figure 7), residents interviewed by the author[49] reported having minimal knowledge of where their organic waste traveled for processing and cycling. In this way, San Francisco's composting has become another method for transporting waste to fringe landscapes rarely visited by city residents. (Figure 8).

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[48] Rutgers School of Environment and Biological Sciences' Roy H. DeBoer Travel Prize in Landscape Architecture. For more information, visit, landarch.rutgers.edu/documents/Awards/DeBoer_Prize_2015.pdf.

[49] During my visit to San Francisco, I selected ten pedestrians at random, inquiring whether they knew where their organics went for processing. Eight mentioned Recology. Zero respondents were aware of the actual composting site location.

Section I: Part VI
## Drawbacks of Large Scale Composting

This project acknowledges the success of San Francisco's composting program while also recognizing the drawbacks that accompany centralized, curb-side, compost collection. Large-scale composting is dominated by industrial-scale facilities located far away from their respective cities.[50] (Figure 9). With few composting sites accessible within the city, San Francisco residents have little opportunity for connecting and learning from the compost cycling process in the own neighborhoods.

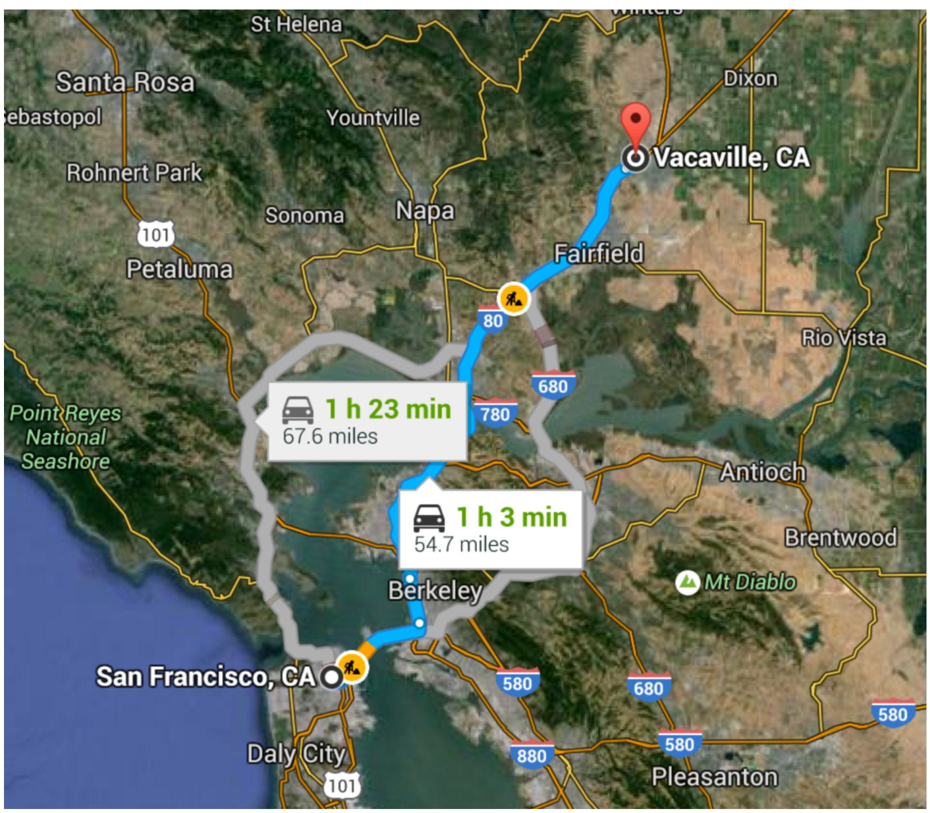


Figure 9. The drive to Jepson Prairie. Image by Google Maps

[50] Mira Engler, *Designing America's Waste Landscapes*, (Baltimore: The Johns Hopkins University Press, 2004), 35.

Visiting San Francisco also offered the opportunity to visit the state's largest composting facility - Recology Jepson Prairie, in Vacaville, CA. Located more than an hour outside of the city, accessing Jepson Prairie required driving outside of the Bay Area to an arid and rural part of the state. At the cycling facility, long curing composting windrows[51] stretched into the horizon while large, unfamiliar, machinery moved throughout the waste site, transporting organic materials, and mixing curing windrows to catalyze the composting process. The sole purpose of Recology Jepson Prairie was to cycle the maximum tonnage of organic materials in the least amount of time.

Jepson Prairie demonstrated the incredible volume of organics cycling that emerges when composting is pursued through a centralized, curb-side approach at the city level. Yet aside from the occasional student group or sustainability tour, Jepson Prairie receives minimal annual visitation. This lack of exposure presents a potential drawback for Recology's large-scale cycling approach. Despite San Francisco's status as the Composting Capital,[52] few residents conceptualize the larger processes required for cycling organic waste into finished compost. Instead of learning from the compost process, most residents comply without ever considering the impacts of their efforts.

By operating one large composting facility located far away from the city, Recology's approach to composting fails to capitalize on several social,

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[51] Defined in later sections, a composting windrow is a large-scale cycling method that layers wood chips with chopped up food scraps to form long, aerated mounds.

[52] Brenda Platt, "San Francisco, CA – Composting Rules," *The Institute for Local Self Reliance,* last modified July 30, 2012, https://ilsr.org/rule/food-scrap-ban/san-francisco/.

cultural, and economic benefits associated with smaller scale organic waste cycling. As Brenda Platt explains, community-scale composting initiatives work to “engage and educate the [neighborhood] in food systems thinking, resource stewardship, and community sustainability”[53] while also providing solutions that “empower individuals, businesses, and institutions to capture organic waste and retain it as a community resource.”[54]

Returning from San Francisco to New Brunswick and the East Coast, the benefits of centralized composting had become apparent as a scale for


Figure 10. Benefits and drawbacks of large-scale composting. Image by the author.

53 “Brenda Platt, James McSweeney, Jenn Davis, “GROWING LOCAL FERTILITY: A GUIDE TO COMMUNITY COMPOSTING,” *The Institute for Local Self Reliance and The Highfields Center for Composting,* 7, last modified April 2014, http://ilsr.org/wp-content/uploads/2014/07/growing-local-fertility.pdf.

54 Ibid.

diverting millions of pounds of organic waste from the landfill and for cycling organic waste into compost for amending the soils of regional farms. But as Figure 10 identifies, the large-scale approach has several associated drawbacks as compost cycling sites are removed from the city and are dominated by heavy machinery - both limiting factors for promoting site visitation and participation in the local compost cycle.

The next section reviews best practices of community composting - a movement that is demonstrating both the feasibility and benefits of cycling organic materials directly within the city. Applying Engler's writings to community composting, Section II reviews community-scale cycling sites that bring people "closer to waste operations, help[ing to] foster creative solutions to problems intrinsic to waste disposal and problems faced by all people."[55] Integrated community composting sites are transforming organic waste from a concealed or feared problem into a highly-visible and celebrated solution, a process which is embracing the full-potential of waste cycling.

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[55] Mira Engler, "Waste Landscapes: Permissible Metaphors in Landscape Architecture" *Landscape Journal (Madison: University of Wisconsin Press, 1998)* xxi.

# SECTION II:

Case Studies from

New York City Compost Project

Section II: Part I

## New York City Compost Project

As the largest city in the country, New York City's 9 million residents produce over 12,000 tons of waste each day.[56] This waste offering is the equivalent in weight to 2,000 African Bush Elephants or over 9,000 Honda Civics. Since New York City no longer contains recycling facilities or landfills within the city limits, almost all of the city's waste is transported out of the city for processing or landfilling.[57] With the highest cost per tonnage for municipal solid waste removal in the country[58], New York City has been ramping up compost cycling alternatives that decrease the amount of organic waste leaving the city and entering the landfill.

As the agency responsible for the collection and processing of New York City's waste, The Department of Sanitation New York (DSNY) has been leading on-going initiatives for decreasing New York City's landfill waste. One of the most successful recent strategies for achieving the dual goal of decreasing waste and shifting the public's perception of the city's waste streams has been the New York City Compost Project. Enacted under DSNY's Bureau of Waste Prevention, Reuse and Recycling in 1993, this project "provides compost outreach and education to the city's residents, institutions,

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[56] "Recycle Facts" *Grow NYC Green Market*, accessed March 01, 2016, http://www.grownyc.org/recycling/facts.

[57] Ibid.

[58] Aaron Short 2014, "New York is top of the heap in garbage-hauling costs," *The New York Post,* last modified May 24, 2014, http://nypost.com/2014/05/24/new-york-is-top-of-the-heap-in-garbage-hauling-costs/

and businesses in all five boroughs."[59] The New York City Compost Project supports local organizations and individuals interested in integrating community-scale composting sites into their neighborhoods.

Community-scale composting is a "decentralized, neighborhood-based model for composting residential food and yard waste"[60] often occurring on sites less than two-acres in size. This scale is similarly labeled as small or medium-scale composting. However, community-scale composting differs from residential compost initiatives since community operations exist on publicly accessible land. Unlike Recology's mandated pick-up of compostable materials in San Francisco, The Department of Sanitation New York's community compost initiatives function on a voluntary basis. While the voluntary model collects and cycles less than 1% of New York City's waste, residents who get involved in their neighborhood's compost initiatives often become personally invested with the organic cycling process in the city.

Prior to the creation of New York City's Compost Project, city regulations prohibited the transport of organic material in the city. These regulations therefore excluded the creation of small-scale composting facilities in New York City. Since 1993, the The Department of Sanitation New York has worked to support a growing network of demonstration Compost Project sites

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[59] "New York City Master Composter Manual," *NYC Department of Sanitation Bureau of Waste Prevention*, *Reuse & Recycling,* last modified February 2012, 4, http://ilsr.org/wp-content/uploads/2012/09/NYC-Master-Composter-Manual-Under-Revision.pdf.

[60] "Brenda Platt, James McSweeney, Jenn Davis, "GROWING LOCAL FERTILITY: A GUIDE TO COMMUNITY COMPOSTING," *The Institute for Local Self Reliance and The Highfields Center for Composting, 59,* last modified April 2014, http://ilsr.org/wp-content/uploads/2014/07/growing-local-fertility.pdf.

throughout the city and currently sponsors 35 locations across the five boroughs. (Figure 11) The Department of Sanitation offers funding assistance to Compost Project host sites - money which helps to cover a portion of each compost organization's annual budget. Additionally, The Department of Sanitation offers compost training programs through their Master Composter certification program which trains new composting leaders for the city.

The result of The Department of Sanitation's Compost Project has been the development of a decentralized, community-scale composting network throughout the city. These sites collectively cycle hundreds of thousands of pounds of organic waste each year into finished compost which is returned to

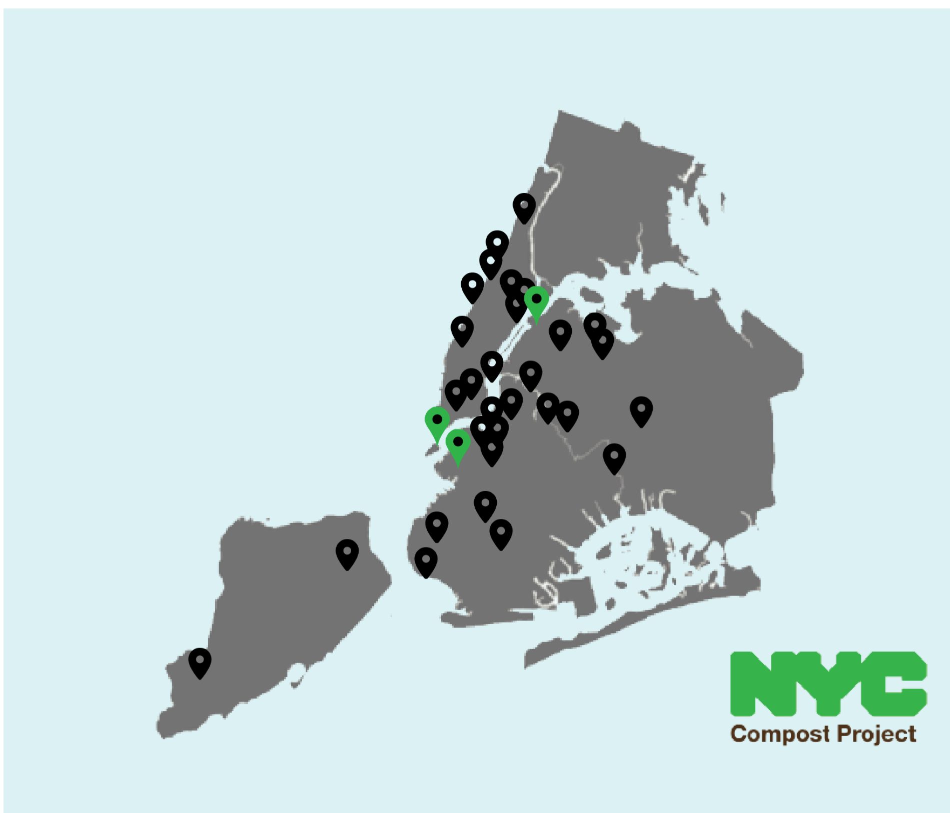


Figure 11: NYC Compost Project sites. Green pins represent case studies. Image by the author.

the city's communities for a variety of beneficial applications. Demonstration sites transform underutilized urban lots into productive waste places engaging residents in closed-loop compost cycling practices. From a landscape architecture perspective, DSNY's Compost Project is intriguing because each host site frames composting through varying site experiences and compost cycling methods. These varied approaches demonstrate a spectrum of organic cycling techniques which residents can experience and engage with throughout the city.

Section II: Part II
## Offering Greater Benefits than the Production of Soil

Of all the waste cycling streams, community composting is the only stream which collects and retains waste for public cycling in the city. (Figure 12) While landfilling and recycling waste streams are collected at curbside and transported outside of New York, the community compost scale offers opportunities for residents to develop tangible connections with their waste, engaging individuals with the soil cycling process, and the multifarious benefits associated with this closed-loop cycle in the city.

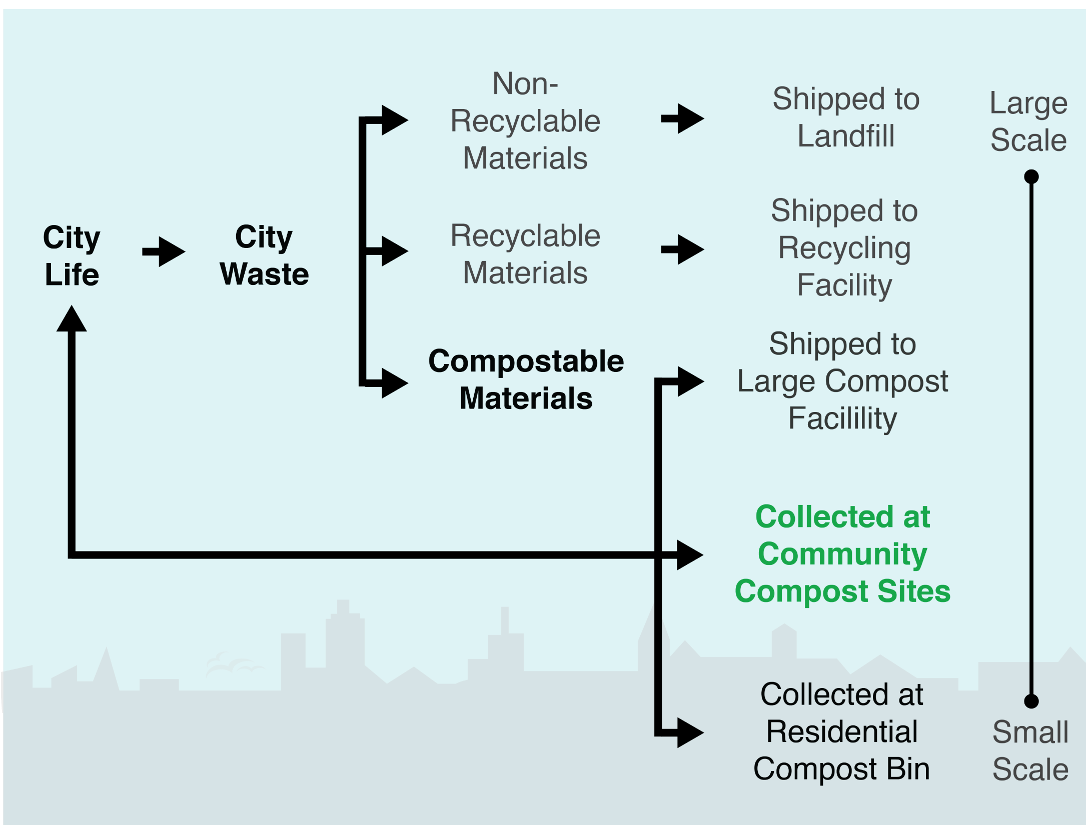


Figure 12. Waste stream and associated scales. Image by the author.

Community-scale composting offers many economic, social, and environmental benefits to the neighborhoods surrounding each site. Figure 13 displays five benefits that New York City's Compost Project provide to involved city residents.[61] While the full spectrum of community-scale composting benefits has yet to be rigorously assessed, organization such as BioCycle Magazine and The Institute for Local Self Reliance have begun to quantify site specific data as it relates to each compost site's public benefits. Expanding on this opportunity, the field of landscape architecture can apply its spatial analyst tools to quantify how various site variables influence composting site's experiences and the benefits of active waste sites.

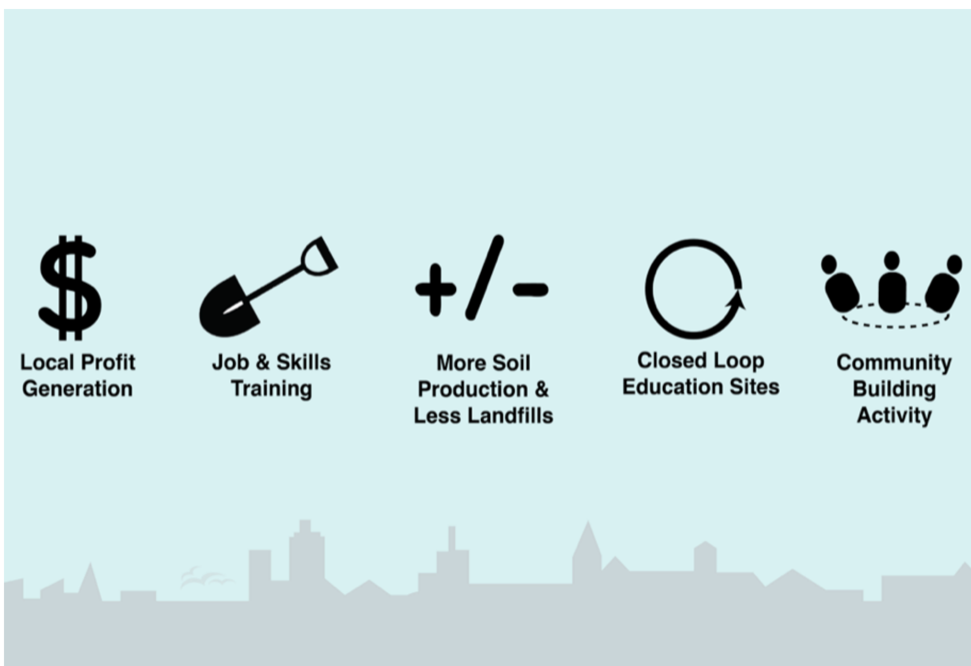


Figure 13. Benefits of community composting. Image by the author.

[61] Neil Seldman "Failure of Wilmington Compost Facility Underscores Locally Based Diverse Composting Infrastructure," *Institute for Local Self Reliance,* last modified December 18, 2014, https://ilsr.org/failure-wilmington-compost-facility-underscores-locally-based-diverse-composting-infrastructure/.

Section II: Part III
## NYC’s Compost Project Case Studies

Having identified the benefits and opportunities of community composting, this portion outlines three Compost Project sites highlighting different cycling methods, variations in community benefits, and site experiences associated with selected locations. Case studies inform composting best practices for both cycling organic materials and maximizing involvement of the community in the composting cycling process.

Prior to reviewing community compost case studies, it is important to outline three community composting terms. (Figure 14) A *compost-build* is a community event which draws local volunteers to participate in the preparation and cycling of organic material for a specified compost cycling method. While NYC’s Compost Project sites offer varying methods for composting, the two primary methods include the *cubic-yard bin method* and the *compost windrow method*. The *cubic-yard bin method* layers collected food scrap and wood chips into a cubic yard - the minimum volume required for the composting process to achieve the proper internal temperature to decompose into finished soil. Meanwhile, the compost windrow method cycles larger volumes of organic material through mounded piles measuring an average of 25’ long by 8’ wide and 5’ high.

While the case studies selected include a variety of composting methods, the primary cycling method for all three composting sites is the compost windrow method. However, each site began their composting operations by implementing the smaller scale, cubic-yard composting method. This cycling approach allows for more control of potential smell and rodent issues associated with poor maintenance of active compost windrows. Only after successfully practicing this smaller scale compost method did compost case sites expand their cycling methods to include compost windrows.

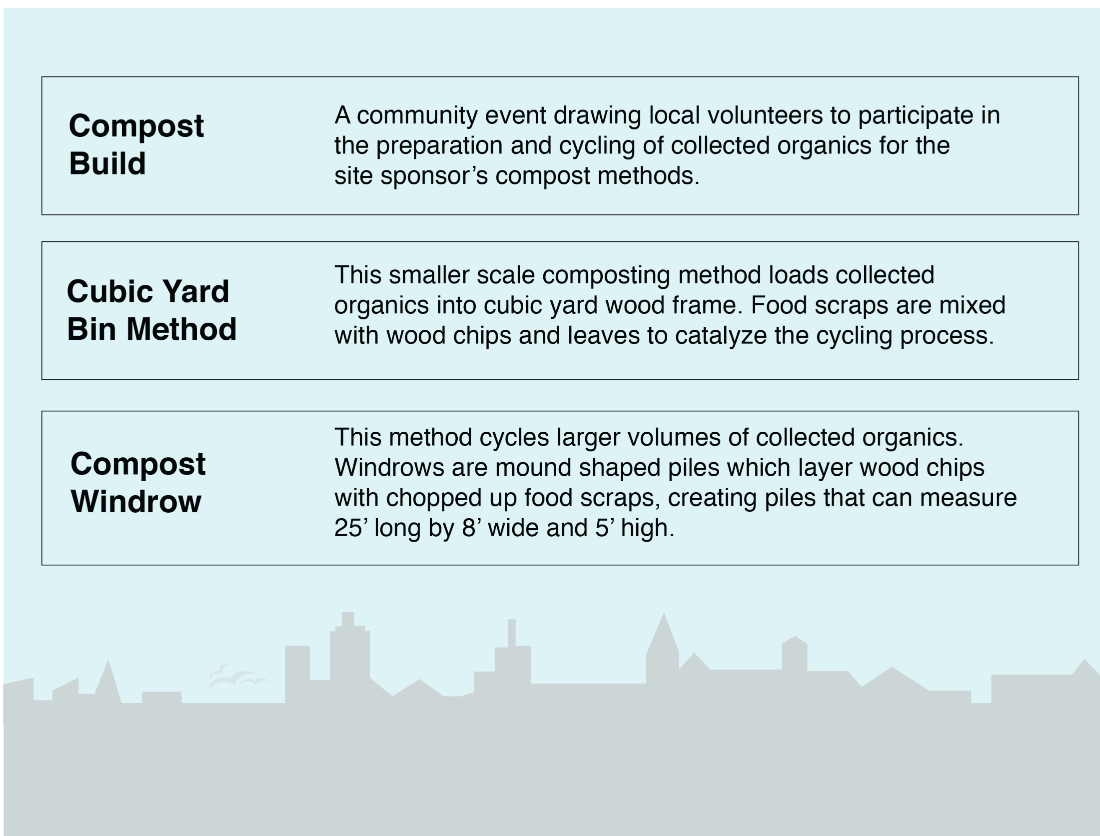


Figure 14. Community composting terms. Image by the author.

Section II: Part IV
## Case Study I: Earth Matter NYC: Governors Island

Located south of Manhattan's financial district on Governors Island (Figure 15), DSNY Compost Project hosted by Earth Matter collects and cycles all of Governors Island's organic waste. The organization offers a cycling model featuring both small and large-scale compost cycling methods on their 2-acre site which cycles 300 tons of organic materials annually. Earth Matter processes 10% of collected organics through the cubic-yard bin method. The remaining 90% of collected material are cycled through the highly efficient and larger scale, compost windrow method. This hybrid demonstration of both small and large scale composting methods is a key

Figure 15: Traveling to Earth Matter NYC. Photo by the author.

component to this non-profit's mission of educating and enacting a "zero waste" future model for both Governors Island and New York City.

Governors Island is removed from the fast-paced city streets of lower Manhattan. The island functions as a convenient away landscape. Only a ten minute ferry ride from Manhattan’s financial district, Governors Island transports city dwellers to a different place. (Figure 16) For Earth Matter the procession traveling to the compost cycling site allows volunteers to leave behind their city routines and promotes new perspectives. As a site that focuses on educating about waste alternatives, the mental impact of such a sequence is powerful, allowing visitors to relax as they begin to contemplate composting on a neighborhood and city-wide scale.


Figure 16. Showing Governors Island's context.
Photo from Google Earth

Earth Matter's mission seeks to "reduce the organic waste misdirected into the garbage stream by encouraging participation and leadership in composting."[62] The organization also works to improve the waste cycle on Governors Island. Earth Matter's relationship with Governors Island is symbiotic as the composting organization provides the valuable service of diverting thousands of pounds of organic waste into compost. Nearly half of Earth Matter's organic material is food waste collected from Governors Island's seasonal programs which draw hundreds of thousands of visitors during the spring, summer, and fall months. Carbon-based organics such as

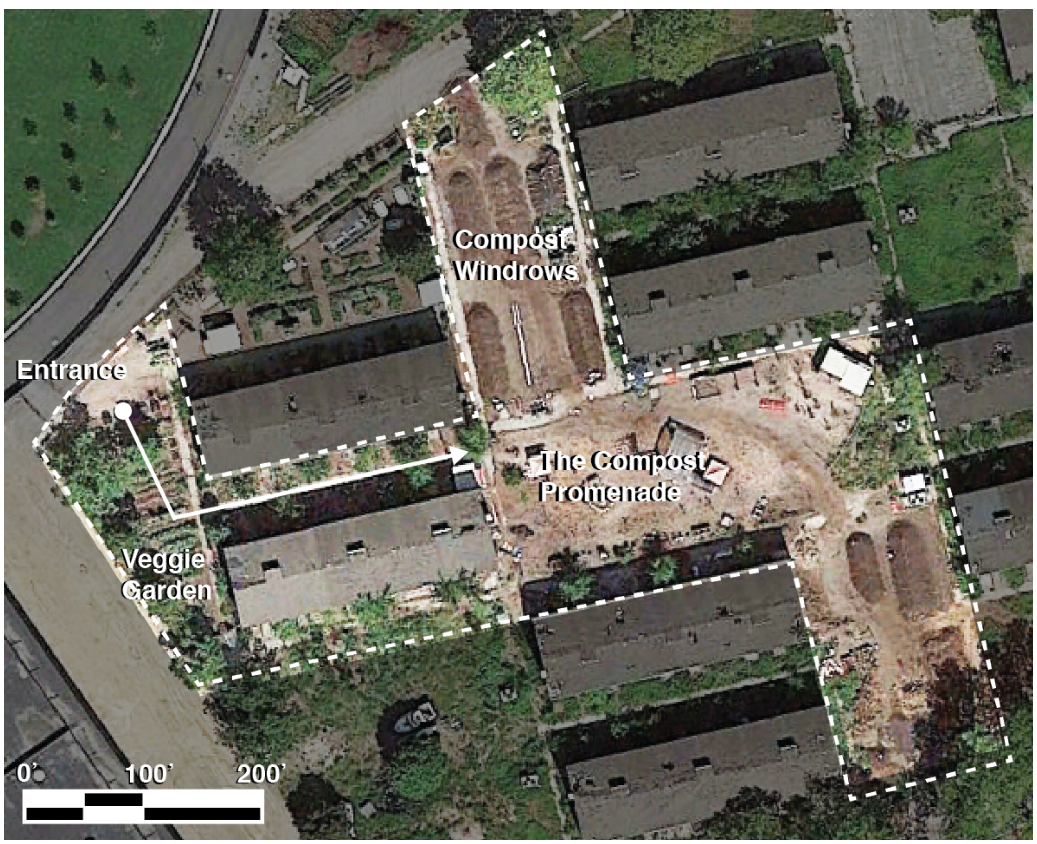


Figure 17. Site map of Earth Matter NYC. Photo from Google Earth.

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[62] "About Us: Mission," *Earth Matters NYC,* accessed on February 20, 2016, https://earthmatter.org/about-us/mission/

the island's leaf litter debris are also included in the Earth Matter's cycling process.[63] In return for their composting services and education initiatives, Earth Matter receives complementary property leasing rights for their site.

The founders of Earth Matter, Marisa DeDominicis, Charlie Bayrer and Kendall Morrison started their non-profit in 2009 "to address the dual problems of resource recovery and healthy soil production through the single solution of composting."[64] Their site - an abandoned Air Force Academy apartment complex - has been transformed into an urban composting hub pushing new concepts and approaches for closed-loop waste cycling in the city. Working within the confines of their site's existing infrastructure, Earth Matter has added several site features including the "Composting Promenade"- a quad-like space which features greenhouses, chicken and rabbit coops, an outdoor kitchen, a vegetable garden, and a row of demonstration residential composting devices. The Promenade is also adjacent to the site's compost windrow section - a 60 foot by 80 foot space cycling the bulk of the organization's organic waste.

The organization continuously explores how to maximize the use of their unusually shaped site to include additional urban agriculture benefits. On weekends, the Composting Promenade supports various activities. Visitors stroll down the line of demonstration models to learn about tumblers, static composting piles, vermicompost, and low-tech composting solutions that

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[63] The other half of the organization's organic materials arrive from NYC's Greenmarket compost programs which are shipped to the island by ferry each week.
[64] "Our Story," *Earth Matters NYC,* accessed on February 20, 2016, https://earthmatter.org/about-us/mission/ https://earthmatter.org/about-us/our-story/

they can incorporate in their own apartments, backyards or community gardens in the city. Children play with roaming goats and chickens - animals that feed on the site’s fresh food scraps in return for providing manure. Volunteers move throughout the site cycling organic materials and helping to maintain both the vegetable gardens and animal coops. The Composting Promenade is Earth Matter's center stage - an energized gathering space that visually demonstrates the dynamic activities fostered through the organization’s zero-waste and urban agriculture missions.

Adjacent to the Compost Promenade is the compost windrow area which is responsible for cycling the bulk of the organic material entering Earth Matter's site. While Earth Matter minimizes the amount of compost machinery, this space integrates a lifting machine for picking up and emptying 64-gallon

Figure 18. Machine emptying compost totters onto windrow.
Photo by the author.

totters full of food scraps onto forming windrows. (Figure 18) Earth Matter's windrows consist of long, linear volumes of organic material measuring 8.5 feet wide by 4.5 feet high and approximately 30 feet in length. The organization is able to cycle compost windrows in approximately two months as compared to the year-long process required for cycling demonstration cubic-yard bins into finished compost.

The compost windrow build process begins with volunteers emptying 27-gallon plastic totters of collected food scraps onto a 10 inch thick bed of wood chips. The volunteer crew continues the process of layering food scraps and wood chips until the windrow mound reaches 4.5 feet in height. Once at this height, the crew ensures that all food scraps are covered with a thick pile of wood chips to minimize smell and rodent issues. After the new windrow is covered, Earth Matter's staff debriefs with the compost-build volunteer group before completing the work day.

Despite the minimal presence of machinery, Earth Matter's windrow builds maintain an ethos of people-powered[65] work. Embracing the human aspect of their compost windrows, Earth Matter has also adopted a tradition of naming newly constructed windrows after current events occurring in New York City. (Figure 19) Earth Matter's co-founder, Marisa DeDominicis explains the importance of this naming process below:

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[65] People-powered or human-powered composting relies on manual labor to cycle organic waste into finished compost. As the Red Hook Community Farm case study further demonstrates, this method of composting requires the most volunteer input while providing the greatest return on social benefits from the cycling process.

"Although compost operations have grown significantly and we now use machinery, it is important that we retain an engaging and community-driven personality as an organization. For example, we name compost windrow piles, allowing volunteers to easily identify their windrows when they revisit Earth Matter NYC. This leads to a increased sense of investment and pride in the compost-build experience and allows staff to easily track the cycling process."[66]

Earth Matter's site experience allows the organization to frame composting in new and powerful ways. The organization invests ample time into making their site engaging for a wide range of visitors - strengthening the

Figure 19. Group huddle to determine windrow's name.
Photo by the author.

[66] "Composting, Zero Waste On NYC's Governors Island," *BioCycle Magazine,* Vol. 55, No. 9, last modified October 2014, 35, www.biocycle.net/2014/10/20/composting-zero-waste-on-nycs-governors-island/.

connection between composting and the diversity of cultural and ethnic populations living in New York City who frequent the site. The organization also works to ensure that their site is enjoyable for children and parents who arrive on weekends to play with the organization's roaming animals.

Earth Matter NYC exemplifies a community-scale compost operation integrating both large-scale compost windrows and small-scale composting cubic-yard bins. (Figure 20) By encouraging neighbor participation and leadership in composting, shifting the public's perception on waste, and providing a closed-loop demonstration for the surrounding city, Earth Matter NYC offers an excellent model of an urban waste site. Their success reflects the passionate work of staff and volunteers that maximize the efficiency, beauty, and fun embodied in community-scale composting.


Figure 20. Analyzing windrow build details at Earth Matter NYC.
Image by the author.

Section II: Part V

## Case Study II: NYC Compost Project hosted by Build It Green! (BIG!) Reuse: Astoria, NY

The Compost Project hosted by Build It Green! (BIG!) Reuse in Astoria Queens is the largest community composting operation in the city. As an innovation hub improving composting technologies and time-saving standards, BIG! embraces soil-cycling methods reflective of large-scale composting operation integrated onto a compact site in the city. (Figure 21)

Many of the site's approaches to compost cycling can be accredited to Eric Martig, a landscape designer who ventured away from private sector design work to pursue a career in compost management and design. As a

Figure 21. Build It Green! Reuse's compost windrows under the Queensboro Bridge. Photo by the author.

previous Volunteer Coordinator at the Gowanus Canal Conservancy, Martig entered community composting by building compost windrows using 100% human-powered methods. Eventually, he moved on from the Conservancy to join Build It Green! Reuse as their Community Compost Manager.

At BIG! Reuse, Eric Martig continued serving his mission to improve the efficiency of urban composting systems in New York City. Over several years, Martig produced and implemented a master plan for composting at Build It Green's quarter-acre site under the Queensboro Bridge. (Figure 22) By analyzing regulatory set-back guidelines and determining strategies for citing composting windrows in the proximity of residential areas, Martig and BIG! implemented their technology-forward composting system in Astoria, NY as a model for expediting the compost cycling process. Site proposals also minimized BIG!'s dependency on a large staff and volunteer work crew. While promoting neighborhood involvement is a key to community composting, depending on a consistently high volunteer turnout for compost cycling can be a limiting factor restricting the amount of organic material that a demonstration site can accept and process.

Martig also worked to incorporate several composting innovations which would later be adopted at other DSNY Compost Project host sites throughout the city. Among these innovations is the site's integration of static aeration composting - a computerized oxygen pumping system which pushes air to the core of the site's compost windrows through perforated PVC tubes. After identifying that this technology helped large-scale composting facilities across the country to improve their compost windrow cycling efficiency, Martig developed a funding strategy to lease and implement the static-aeration technology into the site's existing windrow cycling operations. The new technology helped to minimize the labor required to maintain aerobic activity, a time-saving standard which further decreased the organization's reliance on local volunteers to meet their compost cycling demands.

Connected with the static-aeration technology, Martig and BIG! Reuse also implemented the use of GOR-TEX covers to insulate their windrows. While compost windrows offer several cycling advantages, they run the potential risk of smelling through the release of harmful volatile organic

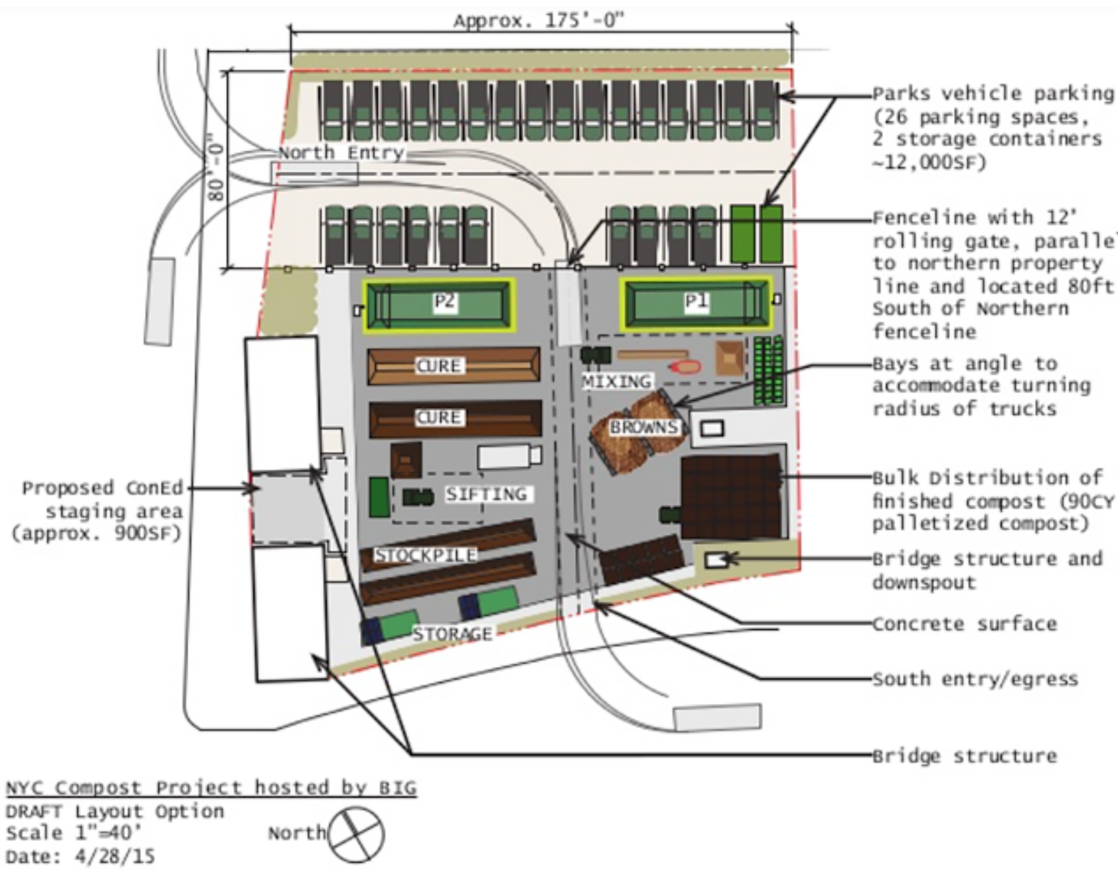


Figure 22. Build It Green! Reuse's master plan proposal by Eric Martig.

compounds - potent greenhouse gases including methane. When GOR-TEX compost covers are used, they reduce smell and VOC emissions by 90%. These covers also work to retain the windrow's heat and moisture, helping to speed up the rate of the windrow's decomposition process. While GOR TEX covers are an additional investment, they demonstrate the multiple benefits resulting from covering community-scale windrows in an urban context.

Lastly, BIG! Reuse's compost operation demonstrates several types of compost machinery for city residents to experience. BIG! Reuse was the first demonstration site in New York City to introduce both the JAY-LOR mixer and Bobcat front-end-loader into their site's cycle. Erik Martig identified this time-saving investment while visiting his family's cattle farm in upstate New York. Martig recognized that the machine which his family used to chop large bales of hay for cattle feed could be implemented at BIG! Reuse to cut-up organic material into smaller pieces - a critical step in preparing compost windrows to cure faster and achieve proper decomposition.[67]

By embracing some of the technologies implemented at large-scale composting operations, Build It Green! Reuse demonstrates technological strategies for maximizing soil cycling on a compact urban lot. Despite being designed by a landscape designer, the site is planned primarily for efficiency of waste cycling and is less focused on the visitor's experience. However, BIG! Reuse function-forward design cycles upwards of 400 tons of compost a year with three full-time composting staff members. (Figure 23) Further, the

[67] Eric Martig (Community Compost Manager at Build It Green! Reuse) in discussion with the author, March 10, 2015.

organization's approach offers an example of how decentralized composting can maximize waste management on underutilized parcels across the city.

In prioritizing composting volume over consideration for community involvement, the following question emerges - *What are the implications for a "community-scale" composting operation which designs its processes to limit the engagement of the surrounding community?* While the answers to this question remains unclear, BIG! Reuse displays the benefits and drawbacks of machine-powered composting. Further, their site adds to the waste landscape matrix of the city - diversifying the spectrum of composting practices to include machine technologies for residents to experience.

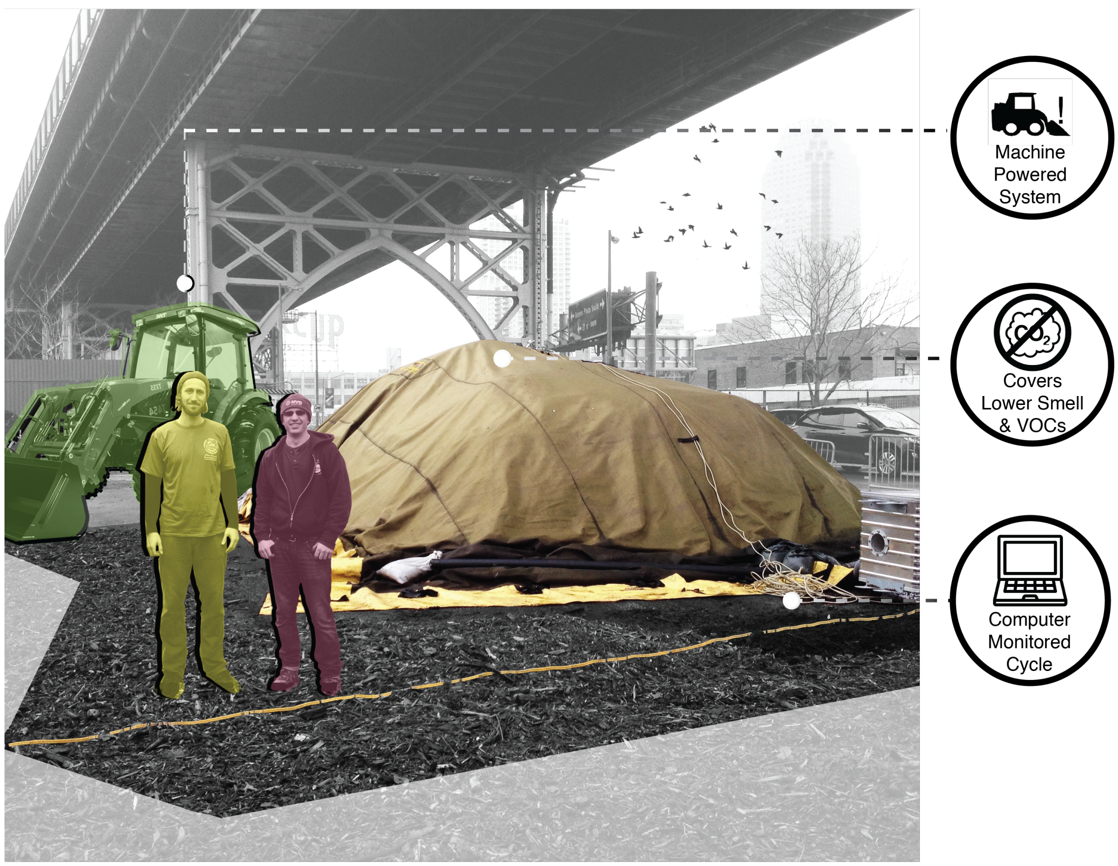


Figure 23. Analyzing BIG!'s site benefits and drawbacks.
Image by the author.

Section II: Part VI

## Case Study III: NYC Compost Project Hosted by Added Value's Red Hook Community Farm, Brooklyn

Red Hook Community Farm is an urban agriculture and compost cycling hub operated by the non-profit, Added Value. Located blocks from the largest New York City Housing Authority development in Red Hook, the 2.5-acre urban farm (Figure 24) is a social enterprise engaging and empowering the surrounding community through their farming enterprise. The site has also emerged as a model for involving local residents in growing their own food and cycling their own compost through people-power in the city.


Figure 24. Red Hook Community Farm's site plan.
Image from Google Earth.

Transforming an underutilized asphalt baseball field into one of New York City's earliest urban farms in 2003, Added Value established diverse operational roots for their site and began a composting community initiative to create more soil as the base for their farm. Over the last decade, Added Value has developed its composting program to become "the largest composting operation in the country powered entirely by human power and renewable energies."[68] Red Hook Community Farm's path to becoming one of the city's best examples of an urban agriculture project and a people-powered compost project is the result of many operational phases - with each evolution offering a varied approach to soil cycling.

This case study focuses on lessons learned from Added Value's various approaches to composting, specifically reviewing the farm's transition from operating heavy compost machinery to using 100% people-powered compost cycling methods. Related to this transition, this study reviews how the site's compost manager, David Buckel, has designed the process of organic material cycling around the principle of ergonomics - ensuring that manual composting methods maximize efficiency and minimize strain on the human body. This case study also acknowledges how Added Value's mission and work demonstrates the power of composting as a transcending action - where composting has grown to symbolize more than the simple cycling of food scraps into finished soil.

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68 "Compost Operation, " *Added Value,* www.added-value.org/compost/.

Due to flooding after Hurricane Sandy, Red Hook Community Farm's operations were halted for two growing seasons. As the routines of community farming returned to the site, Red Hook Community Farm started to explore opportunities to design their site to maximize organic waste collection and cycling. Working with Brooklyn-based architecture and urban design studio, Thread Collective,[69] the farm separated their site into two distinct areas, with one space to grow produce and another area to cycle compost. With the new layout in place, the farm resumed their composting operations, exploring the integration of compost machinery as a time saving standard.

For those who have never participated in a compost windrow build, cycling compost is heavy and hard work. Roughly weighing 650 pounds per cubic-yard, organic material requires intensive effort to lift, transport, mix, and cycle into forming composting windrows. The strain of this hard work can often limit the amount of organic material that a site can process. For organizations like Added Value, instructing volunteers on how to perform the tasks of cycling compost also takes time - an additional limiting factor to the manual cycling approach. In reflecting on these limitations, Added Value purchased and introduced the Bobcat front-end-loader machine to their site in 2013, in order to speed up the compost process and decrease the manual strain on volunteers from the surrounding community.

With the introduction of the Bobcat, Added Value's processing time required for composting decreased. But as the presence of machinery

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[69] To the author's knowledge, Red Hook Community Farm is the only NYC Compost Project host site that has been designed by an architecture and design firm.

became familiar on the farm site, the number of compost and farming volunteers decreased significantly. The community - long supportive of Added Value's weekend work days - felt as though their volunteer efforts had been replaced by the Bobcat. Added Value began to notice the unintended side effects that accompanied their machine-powered compost productions. Instead of helping to alleviate the hardest portions of volunteer work, the presence of machinery was replacing all of their volunteers. The community farm was losing its community.[70]

Figure 25. Added Value's compost tool shed.
Photo by the author.

[70] David Buckel (Compost Manager at Added Value) in discussion with the author, July 15, 2016.

It did not take long for Red Hook Community Farm to both realize and reverse the use of machinery. In 2013, the organization's compost manager, David Buckel, decided to remove all machinery from the site in order to observe how the community responded to a people-powered community farm initiative. Soon after the machines were removed from the site, volunteers returned to the farm to support the production of food and the cycling of compost using only manual tools. (Figure 25)

David Buckel and other staff at Added Value recognized that in order to serve the farm's mission of "promoting the sustainable development of Red Hook by engaging community through the operations of a socially responsible urban farm enterprise," human-powered operations were the


Figure 26. Red Hook's active windrow sign.
Photo by the author.

ideal work method. However, this work approach required a deep understanding of the principles of ergonomics. If machines were not going to be used, then each on-site segment of the composting process needed to be rethought “for the minimization of human labor."[71]

The resulting approach to composting at Red Hook Community Farm follows a linear composting process where fresh organic materials arrive at one end and move through a series of windrows to eventually emerge as finished compost. David Buckle labels each stage in the compost process with red signs (Figure 26) which help explain each windrow’s curing stage to volunteers. Signs also keep track of dates when each compost windrow is built as well as how many additional days each windrow requires in order to

Figure 27. Added Value’s static aerated pile method.
Photo by the author.

[71] David Buckel (Compost Manager at Added Value) in discussion with the author, July 15, 2016.

move to the next phase of cycling. Figure 27 shows Phase II of the process which moves organic material onto the first static aeration windrow. Here, the compost windrow is oxygenation by perforated PVC piping located beneath the organic material which pumps air to the core of newly formed windrow.

Since the farm has transitioned to 100% people-power, Added Value's composting cycle depends on expected numbers of compost build volunteers each week. Unlike Build It Green! Reuse's machine approach, one challenge of a people-powered operation is that this method requires consistent community volunteer input. By thinking through all aspects of the human-powered compost cycling process and ensuring that volunteer quotas are met, Added Value manages a high performance compost project which cycles over 300 tons of compost per year. The site also builds community skills and knowledge around the human-powered soil cycling process.

The result of Added Value's compost approach is a community-led site that prides itself on its hard work and its production. As Buckel explains, "you feel a difference as soon as you walk onto our premises."[72] That difference is largely a statement to the site's sense of pride which emerges from Red Hook Community Farm's work ethic. The waste space also appears immaculately well-kept and orderly - a visual cue demonstrating ownership that has helped to popularize this waste site as a neighborhood place.[73]

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[72] Ibid.

[73] Joan Nassaur, "Messy Ecosystems, Orderly Frames" *Landscape Journal, (Madison: University of Wisconsin Press, 1995)* vol. 14 no. 2, 161-170, http://lj.uwpress.org/content/14/2/161.full.pdf+html.

Red Hook Community Farm educates city residents on how to grow food and cycle compost with their own hands in the city. (Figure 28) The site demonstrates a fossil-fuel-free alternative to composting - an approach which requires consistent involvement of the surrounding community but which maximizes the benefits of community-scale composting. Additionally, Red Hook's attention to cleanliness and order challenges residents to rethink negative characteristics typically associated with waste sites. Added Value's practices are helping to shift the city's perception of community waste sites - as accessible spaces which engage and uplift through the powerful act of cycling organic waste into a valuable local resource for the city.


Figure 28. Added Value's compost-build site details. Image by the author.

Section II: Part VII

## NYC Compost Project: Selected Best Practices

The three New York City Compost Projects selected for review in this section offer best practices for how to achieve a range of intended compost project outcomes at the community-scale. In exploring urban composting projects, these three examples offer lessons on the benefits and drawbacks of composting with varied engagement from the surrounding community. Additionally, these sites offer multiple composting tools and techniques for cycling organic materials into finished soil. Figure 28 reviews lessons learned from these studies and identifies the following three foci: Scaling-Up, Ergonomics, and People-Powered composting.

“Scaling-Up” refers to the importance of starting a community compost project small and growing the initiative over time. Each of the three compost projects reviewed in this section started off composting through the cubic-yard compost bin method. After succeeding at this scale, each organization scaled-up to accept more organics, cycling compost though the larger yet more complex method of compost windrows.

“Ergonomics” refers to the efforts of Red Hook Community Farm and Earth Matter NYC to design their compost system logistics around the functions of the human body. In doing so, people-powered work becomes highly efficient, never exceeding weight load limits that the average human can easily lift or transport. These physical efficiencies ensure that volunteers can assist in the soil cycling process without risk of injury.

“People-Powered” composting projects offer greater potential for attracting community engagement and higher volunteering rates. While Red Hook Community Farm and Earth Matter NYC offer examples of compost projects which connect strongly with city residents, these organizations also invest more energy into developing and facilitating monthly community work days schedules, demonstration workshops, and other site programming. Meanwhile, Build It Green! Reuse demonstrates a site which has replaced the requirements of volunteer input with machine-powered composting methods, saving time yet limiting community involvement at their site.

The three identified sites in this section demonstrate different approaches to composting. Each site offers a unique combination of site programming which supports three different waste site experiences. Additionally, these sites display an on-going committed to further developing their site programming to maximize composting benefits in the city. As a network of decentralized sites, the selected composting operations also function as a collective of compost demonstration spaces. Together, these urban waste sites are championing the larger community composting movement in New York City and beyond - collecting and cycling millions of pounds of organic material in the city each year while shifting the local perspective of organic waste from nuisance to valuable resource.

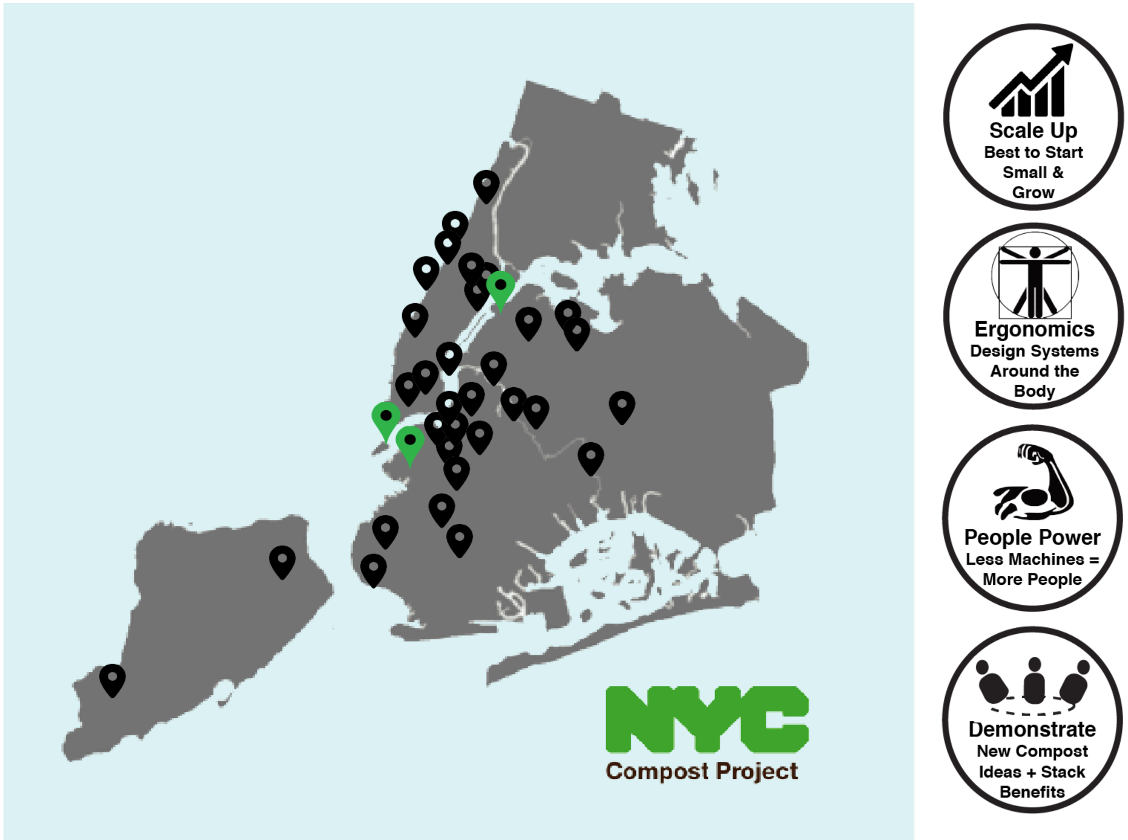


Figure 29. NYC Compost Project best practices. Image by the author.

# SECTION III:

POP UP Compost Project Review

New Brunswick, NJ

Section III: Part I
## **Project Context: New Brunswick, NJ**

This section begins by contextualizing why the city of New Brunswick, NJ is an ideal urban environment for supporting community-composting. As a city of approximately 56,000 people,[74] New Brunswick is also home to New Jersey's largest public university - a land-grant college intended to serve the "agricultural and technical education"[75] of state residents. Further, Rutgers University's mission seeks to "conduct cutting-edge research that contributes to the environmental, social, and cultural well-being of the state and its economy, while performing public service in support of the needs of the citizens of the state."[76] In addition to its connections with Rutgers University, the city is experiencing a growing network of urban agriculture non-profits, social-services organizations and community-art collaboratives which are all working to improve the well-being of their respective communities.

Despite New Brunswick's robust community initiatives and the city's 40-mile proximity to New York City, no initiative currently exist to collect and cycle the city's organic waste into compost. However, the need for reducing organic waste remains high. In 2015, New Brunswick produced an average of 50 tons of non-recyclable waste, every day. The city's annual production of 18,600

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[74] "New Brunswick, New Jersey," *City-Data,* accessed on February 27, 2016, http://www.city-data.com/city/New-Brunswick-New-Jersey.html

[75] "What is a Land-Grant College?," *Washington State University Extension*, last modified February 24, 2009, http://ext.wsu.edu/documents/landgrant.pdf.

[76] "About the University," *Rutgers University, The State University of New Jersey,* accessed on March 10, 2016, http://www.rutgers.edu/about.

tons of non-recyclable waste - or 37,200,000 pounds[77] - consists largely of materials transported to the Edgeboro Landfill in East Brunswick, NJ.[78]

However, much of New Brunswick's daily production of waste consists of organic materials that could be sorted, collected, and cycled into compost. Of the 50 tons of non-recyclable waste produced each day, an estimated 15 tons or 30% consists of compostable material.[79] Roughly 17% of this material is comprised of food waste.[80] Figures 30 and 31 review the impact that capturing and removing portions of the city's organic waste would have on the overall waste stream leaving New Brunswick for the landfill.

POP UP Compost Project emerges as an opportunity for collecting and cycling New Brunswick's organic waste stream into finished compost. The project imagines transforming the city's plant-based organic materials into a valuable soil amendment which is retained in the city and reinvested into community's landscape needs. Equally important, this proposal explores the creation of an alternative waste stream as an opportunity to create stronger connections between residents, organizations, and institutions living and operating throughout the city.

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[77] Jennifer Bradshaw, *Public Information Officer, City of New Brunswick,* email message to author, February 4, 2016.

[78] Sue Epstein, "Middlesex County's Edgeboro Landfill still has lots of life left," *NJ.com*, last modified March 24, 2013, http://www.nj.com/middlesex/index.ssf/2013/03/middlesex_countys_edgeboro_lan.html.

[79] 30% is an estimate based on: Kathryn Garcia, "2014 NYC Community Composting Report," *The City of New York Department of Sanitation*, last modified January 2015, 33, www1.nyc.gov/assets/dsny/docs/about_2014-community-composting-report-LL77_0815.pdf.

[80] "Compost Food Scraps at Greenmarket" *Grow NYC: Green Market,* accessed on March 10, 2016, http://www.grownyc.org/compost.

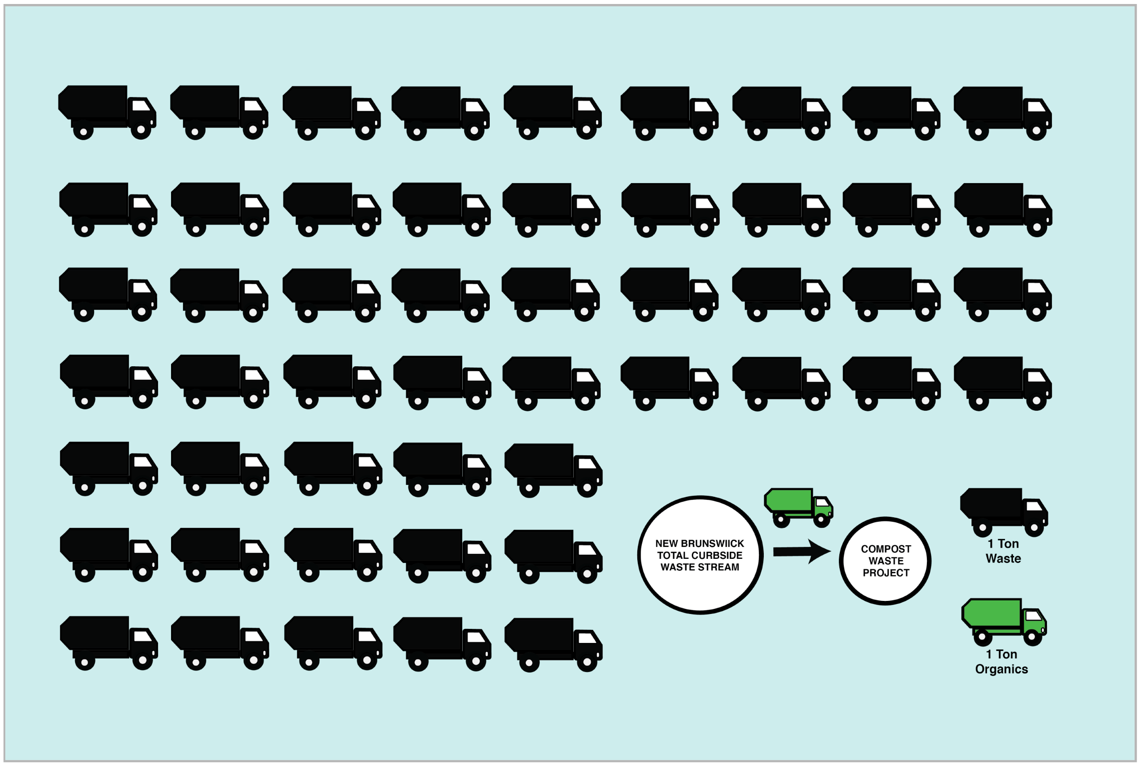


Figure 30. Daily landfill waste in New Brunswick, NJ. Image by the author.

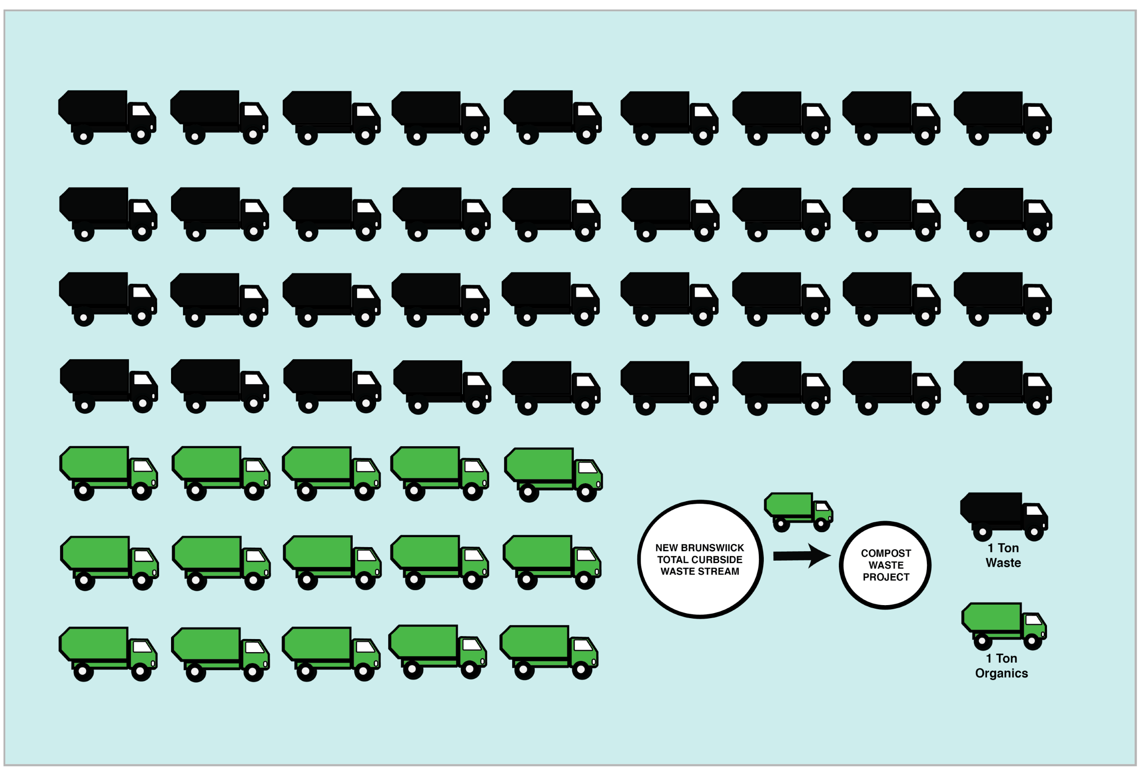


Figure 31. Compostables included in daily landfill waste from New Brunswick. Image by the author.

Section III: Part II
## Proposing a 3-Step Process

The task of successfully integrating and sustaining a composting system in a small city such as New Brunswick requires maximizing public involvement and community support. Early in the process of planning the proposed compost project, the author established a key collaboration with the local food-justice and urban agriculture non-profit, Elijah's Promise. Connecting with Anthony Capece (Community Garden Coordinator) and Martha Cambridge (AmeriCorps Garden Member), this collaboration empowered POP UP Compost Project by associating the compost initiative with one of New Brunswick's most well-known and respected non-profits. Implementing the compost project through Elijah's Promise also afforded opportunities for receiving project funding through grants seeking to educate and engage communities around food and environmental initiatives.

Resulting from the desire to generate community support for the initiative, the project team named the emerging work, POP UP Compost Project. Here, "P.O.P." stands for "People Operated Power," an homage to the human-powered composting projects from New York City that have actively engaged their surrounding communities through the manual cycling of food scraps to finished compost. POP UP further references the mobile, food-scrap collection sites proposed to collect organic materials at convenient locations throughout New Brunswick. Mobile collection stations offered the opportunity to frame the cycling process as a highly visible activity - extending the first stage of the compost process into several neighborhoods throughout the city.

Demonstrated through Figure 32, POP Up Compost Project proposes a three-step approach to cycling compost. The first step creates "pop-up" organic collection sites at New Brunswick Community Farmers Market sites which gather household organic waste. Once collection sites close, organic materials are then transported to compost cycling sites where project staff and volunteers cycle organic waste into curing cubic-yard piles during compost-build events. After organic material has finished the curing process, finished compost is returned to city residents, serving various landscape needs that benefit the health of New Brunswick's communities.

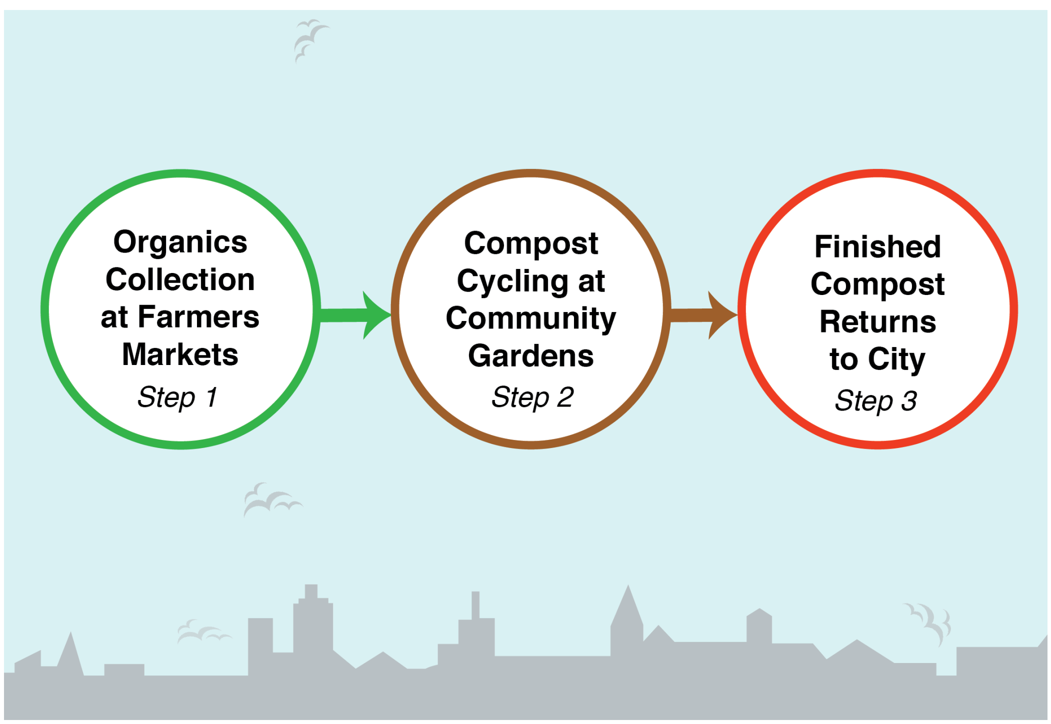


Figure 32. Collection, cycling, and compost-return. Image by the author.

Section III: Part III
**From Compost Cube to Drum Design Process**

After identifying the project's three-site approach, attention shifted to envisioning details for organics collection sites and mobile collection devices. The first iteration of the mobile collection unit is displayed in Figure 33 - a concept sketch for the compost cube. The compost cube demonstrates a mobile unit which can be rolled into a publicly accessible space to collect plant-based food scraps from participating city residents. Compost cubes are equipped with waste windows - translucent panes which display the visual accumulation of organic waste in public spaces. This aspect of the cube is a

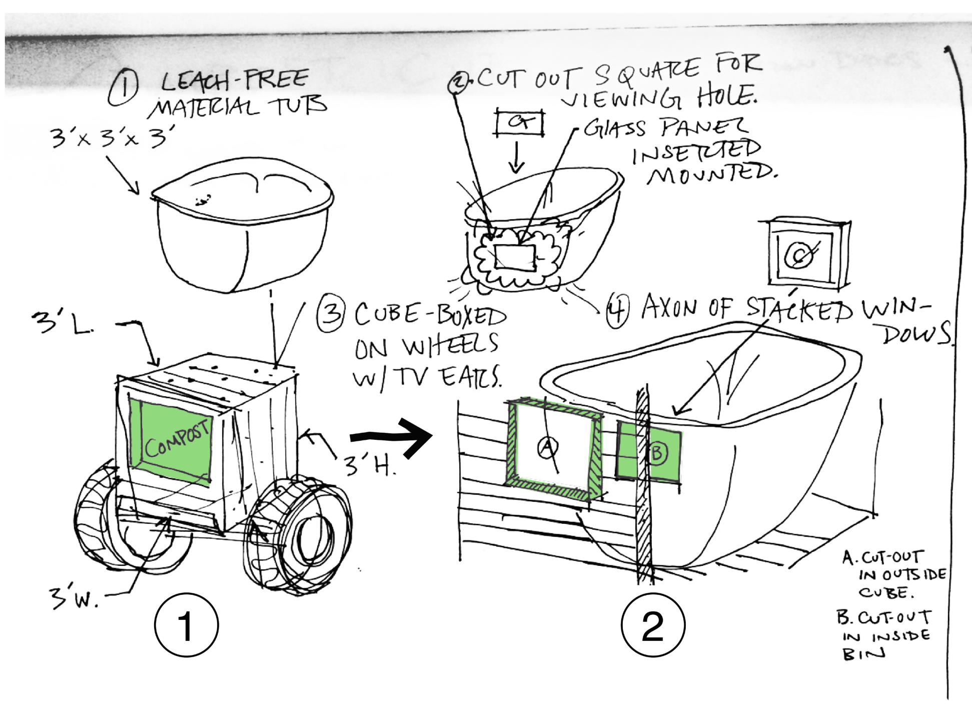


Figure 33. Sketches of mobile waste collection device.
Image by the author.

direct response to one of the main culprits perpetuating America's Waste Epidemic - the inability to visualize waste collection in public spaces.

As the author continued to develop details and construction documents for the compost cube, several design challenges emerged. First, the volume proposed for the compost cube - one cubic yard - would have weighed approximately 800 pounds once full with collected plant-based food scraps. Second, the cost of constructing one of the custom-welded cubes would have exceeded $2,500 per cube. Since the proposed collection spaces imagined the arrangement of several cubes, the cost of implementing compost cubes as the primary mobile collection unit emerged as an unfeasible and unaffordable solution.

In an effort to retain many of the ideas embedded in the compost cube, the cube shifted to the compost drum, a mobile 55-gallon drum retrofitted with an acrylic waste window. (Figure 34) As an idea originally proposed by the local welder, Jonathan Shore, the drum offered several advantages over

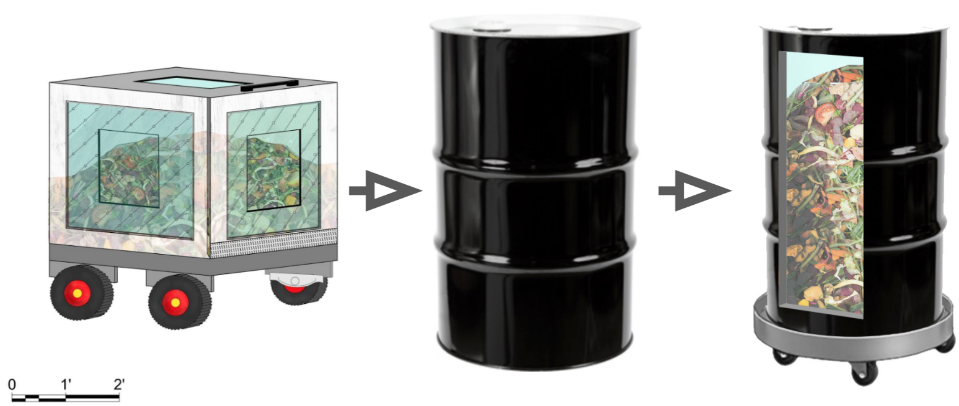


Figure 34. Evolution from compost cube to compost drum.
Image by the author.

the cube. First, 55-gallon drums were readily available and relatively inexpensive to purchase. Since 55-gallon drums are made of steel, they could be cut to fit the installation of the acrylic waste window. Secondly, the drum's volume was smaller than the proposed compost cube. After filling with plant-based food scraps, the drum would weigh approximately 250 pounds - 550 pounds less than the proposed compost cube. Lastly, the drum existed alongside an inventory of affordable dollies and lifts to ease the process of transporting the retrofitted compost drum from collection to cycling sites.

Identifying these advantages, the project team - now including Anthony Capece and Jonathan Shore - pursued the construction of the first compost drum prototype during February 2016. The retrofitting process installed several proposed components onto the existing 55-gallon drum. First, an 18 inch by 16 inch lucite "waste window" was added to the drum.[81] Next, the design team installed a false floor in the compost drum which subtracted an additional 10" of interior volume. Figure 35 displays the process of welding the specified components onto the existing 55-gallon drum.

In reviewing the compost drum, it should be noted that this mobile device is primarily designed for displaying collected plant-based organic materials. While several other more feasible and cost-efficient collection devices exist, the compost drum offers a new perspective on food scrap collection. By choosing to retrofit a 55-gallon drum, the project team also recognizes that

[81] Lucite acrylic is specified as 250 times stronger than glass. Product information from manufacturer. "Acrylic Sheet," *Freckle Face,* accessed on January 20, 2016, http://freckleface.com/shopsite_sc/store/html/acrylicsheetonequarterinchthick.html.

the drum contains strong semiotics as a container that traditionally stores toxic materials. In POP UP Compost Project, food waste that is generally viewed as a smelly nuisance is collected and contained as it begins the project's compost cycle. The waste window allows residents to view the drum's contents and offers the opportunity for questioning whether the drum's plant-based organics are pernicious or valueless. Once residents begin to visualize and experience the composting process for themselves, they may rethink food waste as a local resource worthy or collection, cycling, and reinvestment within their city.


Figure 35. Retrofitting the compost drum prototype.
Photos by the author.

Section III: Part IV
**Step 1: POP UP Organics Collection Sites**

This section shifts to exploring proposed details for POP UP Compost Project's organic collection sites. After analyzing opportunities for integrating organic collection sites into an established network of activated sites in the city, the project team identified New Brunswick Community Farmers Market (NBCFM) as an ideal project collaborator for siting collection locations.

Realizing this opportunity, the project team connected with the NBCFM organization and successfully achieved an agreement to integrate organics collection sites at their existing farm market locations. While the NBCFM organization hosts several market sites around the city, the project team decided to limit organic collection sites to two locations during Phase I of the project. These locations include the New Brunswick Community Farmers Market sites at Joyce Kilmer Square Park (George St. and Albany St) and at Esperanza Garden (178 Jones Ave.).

As a unique farm market model,[82] New Brunswick Community Farmers Market emerged through a partnership between the City of New Brunswick, Rutgers Cooperative Extension, and Johnson & Johnson to "support the development of a sustainable community by bringing healthy food from local farms to families and households across the city."[83] The integration of

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[82] NBCFM allows local residents to purchase produce using Supplemental Nutrition Assistance Program or (SNAP) nutritional assistance while offering other purchasing benefits supported through the organization's partnership with Johnson & Johnson.

[83] "About Page," *New Brunswick Community Farmers Market*, accessed on March 10, 2016, http://nbcfarmersmarket.com/about.asp.

organics collection sites into existing farmers markets complements NBCFM's mission of supporting the development of New Brunswick's sustainable communities by closing the city's food waste loop. Here, a synergy is created by combining collection sites with farmers market sites - offering the opportunity for demonstrating the collection of the city's plant-based food scraps while simultaneously selling healthy produce back to the community. Farmers market sites therefore offer a complete encapsulation of the local food system cycle from start to finish.

With collection site locations determined, the project proposal shifts its focus to the integration of compost drums as collection units at NBCFM sites. Figure 36 displays proposed organics collection drums in use, illustrating various collection details. One of these aspects includes incentives for residents to cycle their food waste at farmers markets. Each week that residents deposit a 3.5 gallon bucket of residential food scraps into the compost drums, they will receive $2 off on the produce that they buy at the market. By offering incentives for cycling, POP UP Compost Project will be able to garner greater community support for supplying the compost cycle with residential plant-based organic waste.

In addition to collecting plant-based food scraps, the compost drum arrangement also functions as a demonstration site. Figure 37 illustrates how drums are used to collect nitrogen or carbon-based organic materials. After collecting these two streams of organic materials, drums then demonstrate the mixing process of combining "green material" with "brown material," an


Figure 36. “Organics collection site” proposal at NBCFM.
Image by the author.


Figure 37. Compost drums demonstrating organics mixing.
Image by the author.

important process for activating the composting process. While organic collection sites will demonstrate the mixing process of organic materials, no actual decomposition or "composting" will occur at the collection sites.

One advantage that community composting offers over large-scale composting is that the smaller scale allows for better control over the cleanliness of collected organic material.[84] This scale also allows community compost organizations to build relationships between the residents providing organic material and the staff operating the composting cycling process.

For this project, organic collection site locations will be equipped with POP Up Compost Project personnel who will interact with market participants to ensure that all collected organics consists of proper, plant-based organic material. Project staff will be present at collection site locations to speak with community members - answering any questions related to New Brunswick's compost project while also offering information on upcoming compost-build days and other opportunities for involvement.

As the amount of organic material arriving at collection sites increases, plant-based food scraps that cannot fit into compost drums may need to be loaded into 27- gallon plastic totters. (Figure 38) While these totters will not be equipped with waste windows, they will provide an ergonomic and highly efficient opportunity for storing and transporting food scraps from collection sites to cycling sites.

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[84] David Buckel, "Guidelines for Urban Community Composting," *BioCycle Magazine,* 3, accessed on March 10, 2016, https://www.biocycle.net/communitycomposting/docs/bccc_buckel.pdf.


Figure 38. Grow NYC staff collecting organics into totters.

Section III: Part V

## Step 2: POP UP Compost Cycling Sites

Once plant-based food scraps are gathered in compost drums at organics collection sites, they will be transported to compost cycling sites. Compost cycling sites will be integrated into two existing garden sites in New Brunswick at Shiloh Community Garden (Tabernacle Way / Oliver St.) and at Jones Avenue Urban Farm (178 Jones Ave, Esperanza Community Garden). This section offers an overview of how compost cycling sites will function to transform collected organics into finished compost with the assistance of community involvement.


Figure 39. Distance between collection site and cycling site.
Image by the author.

Since compost cycling sites will process waste gathered at organics collection sites, it is important to study how organics will be transported to cycling sites and secondly, and how arriving organics will enter the compost cycle. Figure 39 displays the half-mile transportation distance between the NBCFM collection site at Joyce Kilmer Square Park (George St. and Albany St) and the compost cycling site at Shiloh Community Garden. To keep consistent with the people-powered mission of this project, project staff are currently researching bike trailer alternatives that can support transporting a full compost drum and additional 27-gallon totters to cycling sites.

As organic material arrives at Shiloh Community Garden, POP UP Compost Project team members and volunteers will be ready to receive

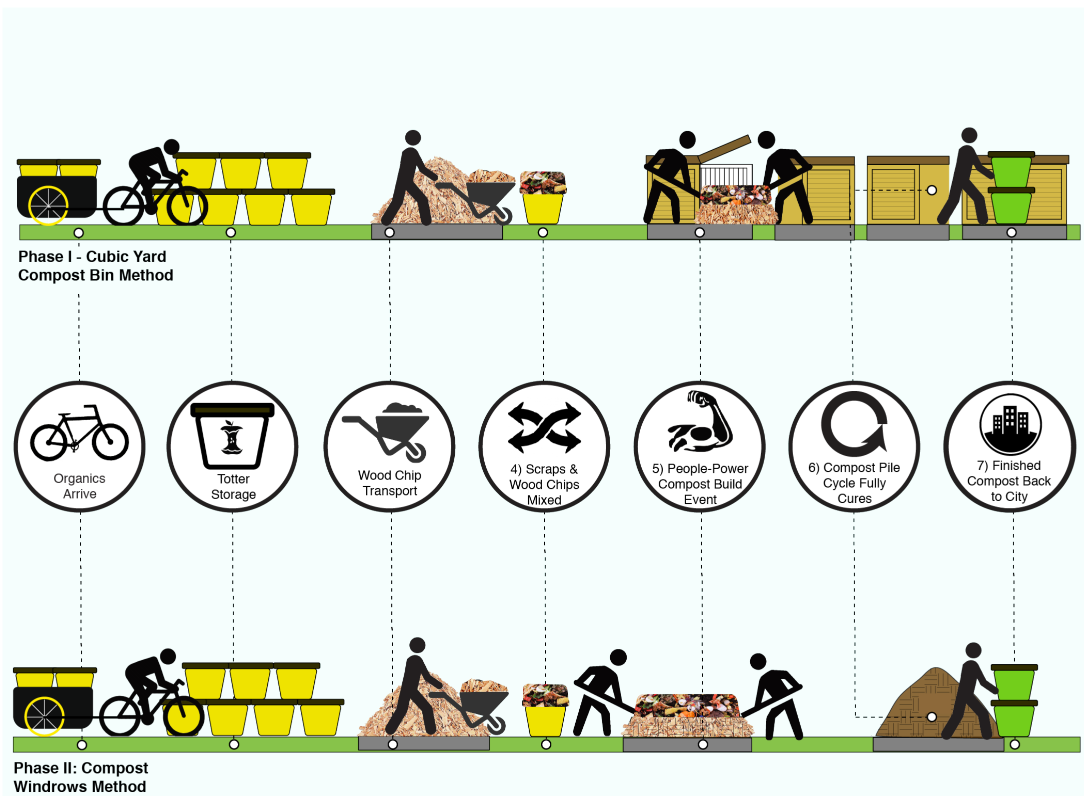


Figure 40. Spatial study of compost processes. Image by the author

compost drums and 27-gallon plastic totters for processing. Figure 40 illustrates the proposed process of receiving incoming food scraps at cycling sites. In Phase I of the project, team members will shovel layers of food scraps and wood chips into cubic-yard windrow bins. After successfully managing this method for several months, the project will transition to integrate Phase II's compost windrows. Instead of replacing cubic-yard composting entirely, composting windrows will be integrated alongside the cubic-yard bins and will offer greater efficiency for organics cycling.

During Phase I, cycling sites will compost exclusively through the cubic-yard bin method as this approach provides greater control of potential smell and rodent issues. In *Guide Lines for Urban Composting,* David Buckel offers advice for compost start-ups by suggesting the following:

> "The best general advice is to start small. Use smaller [compost cycling] operations to develop exercises, test solutions to problems, and further test commitments others have made to [your compost cycle] as part of the plan to run the operation well. Make sure that the small-scale can be successful before taking on more."[85]

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[85] David Buckel, "Guidelines for Urban Community Composting," *BioCycle Magazine,* 1, accessed on March 10, 2016, https://www.biocycle.net/communitycomposting/docs/bccc_buckel.pdf.

Buckel's advice points out a common problem with community-compost projects. Too often, organizations become overly ambitious, integrating compost windrows before they fully understand the science of soil cycling. Learning from this advice, Figure 41 offers POP UP Compost Project's phasing proposal. In addition to introducing the compost windrow methods to existing sites after testing smaller scale cycling, the phasing proposal also details plans for expanding the number of organic collection and compost cycling sites within the project's network. *Growing Local Fertility: A Guide to Community Composting* suggests that "communities embracing a decentralized and diverse organics recovery infrastructure will be more resilient and will better reap the economic and environmental benefits that

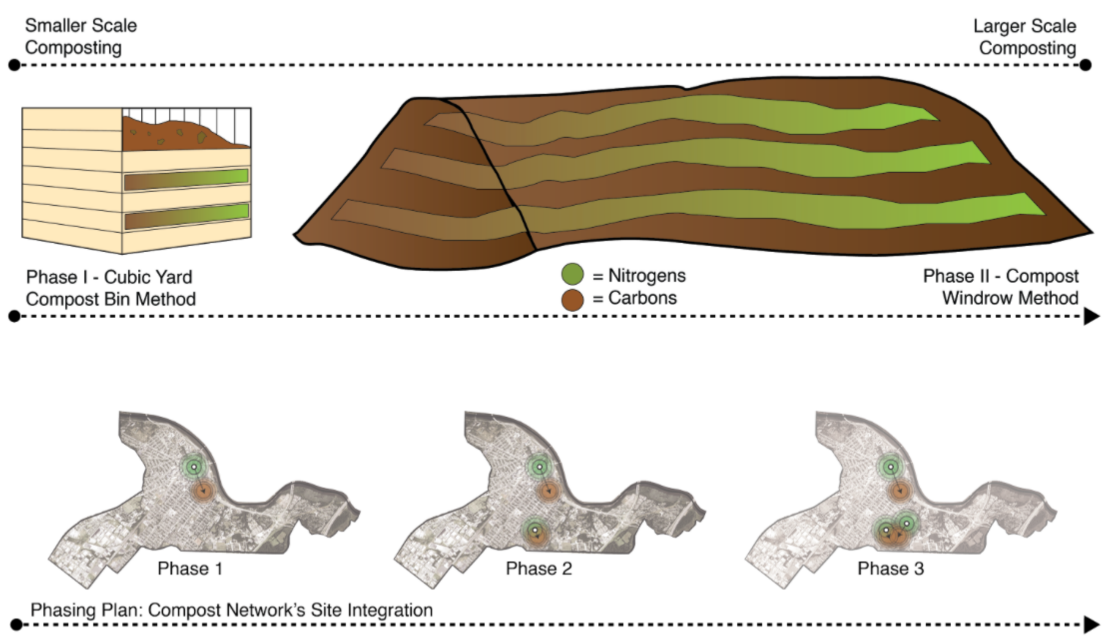


Figure 41. Compost methods and phasing proposal. Image by the author.

organics recovery has to offer."[86] By integrating several composting locations across New Brunswick, POP UP Compost Project will work to increase its resiliency to absorb potential compost cycling site disruptions that may occur at participating cycling locations.

With a phasing plan identified, project focus shifts to the implementation of a composting site at Shiloh Community Garden. Figure 42 illustrates Phase I's proposal for 29 cubic-yard compost bins at this site. These bins have the potential to process approximately 35,000 pounds of organic waste per year, producing an estimated 21,000 pounds of finished compost following the typical conversion factor of organic material to finished compost.[87] The addition of Shiloh's composting programming complements the site's existing community garden beds and apiary project - creating a robust integration of urban agriculture services on this 1-acre site.

Figure 42 also displays several best practices gleaned from the NYC Compost Project case studies. These practices include people-operated power compost cycling methods, the creation of a waste demonstration space for gathering educating the public on the compost cycling, and the designation of a bin storage area to receive organic material. Together, these practices produce a compost cycling site intended to maximize community engagement and educational opportunities for New Brunswick.

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[86] "Brenda Platt, James McSweeney, Jenn Davis, "GROWING LOCAL FERTILITY: A GUIDE TO COMMUNITY COMPOSTING," *The Institute for Local Self Reliance and The Highfields Center for Composting,* 8, last modified April 2014, http://ilsr.org/wp-content/uploads/2014/07/growing-local-fertility.pdf.

[87] Calculations are based on an average cubic-yard of compost weighing 700 pounds and this method of composting retaining 60% of organic material's original weight.

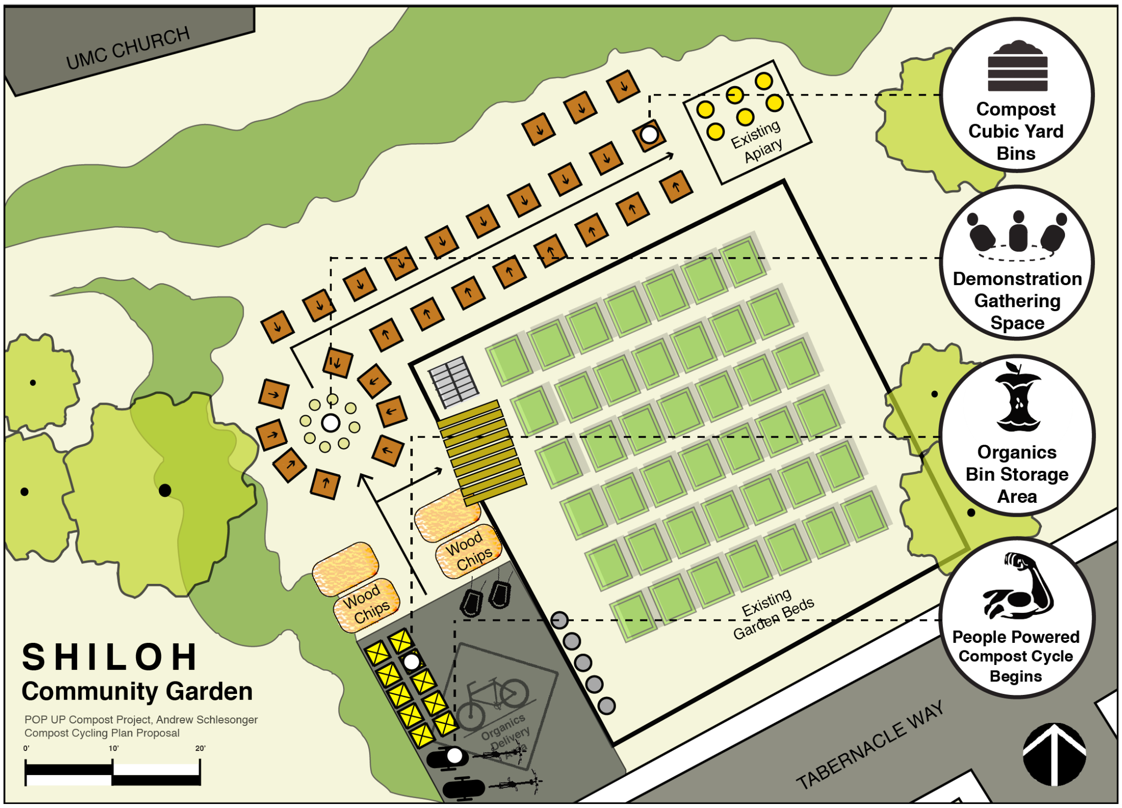


Figure 42. Shiloh Community Garden’s site proposal. Image by the author.

Section III: Part VI
## Step 3: Finished Compost Returns to the City

This project offers several opportunities for improving the urban agriculture and local landscapes of New Brunswick, NJ. As Figure 43 illustrates, the third step of POP UP Compost Project seeks to identify diverse distribution opportunities for supplying finished compost to city partners. These partners have the potential to include school gardens, community garden, community projects, and tree plantings. Additionally, project staff plans to continue researching opportunities for applying compost as an amending agent to ameliorated polluted residential soils throughout the city.

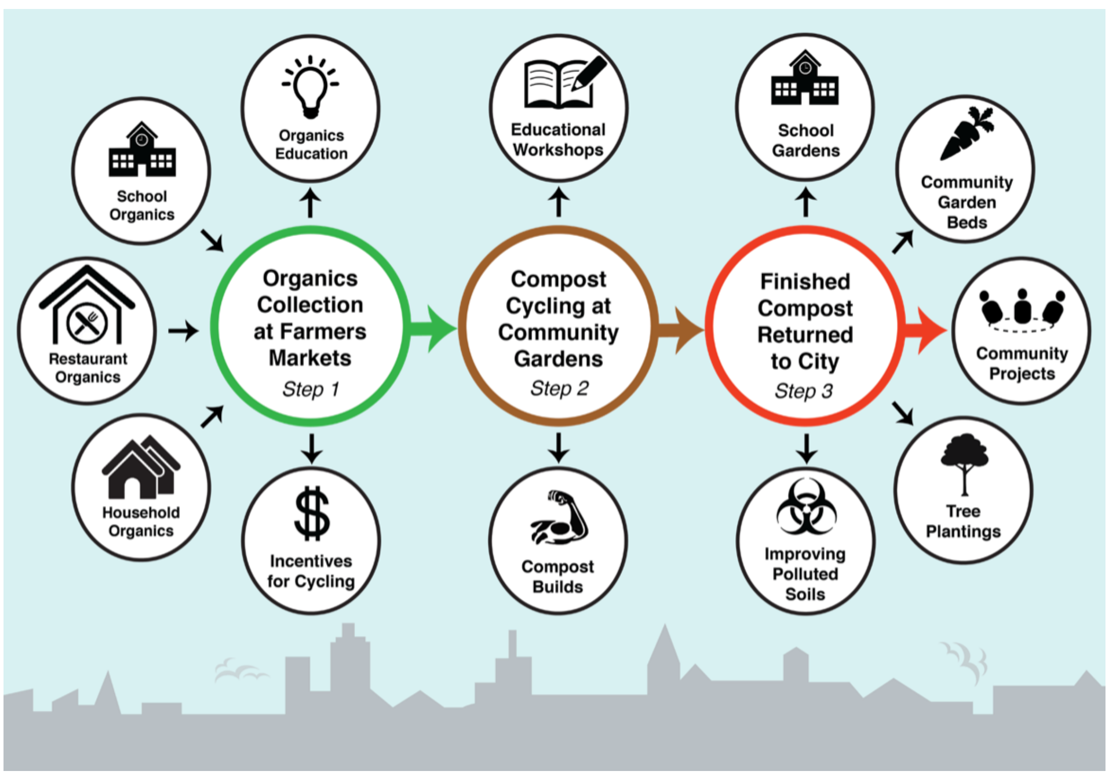


Figure 43. Proposed project's resource cycle and benefits.
Image by the author.

In creating avenues for distribution, this phase of the composting cycle builds a network of residents that participate both in depositing their organic waste at collection sites and receiving finished compost through the project's give-away initiatives. This holistic process of participation is similar to Charles Kibert's closed-loop resource flow illustrated in Section I. Like the waste flow of Kibert's industrial ecosystem, the plant-based organic waste of New Brunswick has transformed into a community connector, fostering partnerships between residents and organizations working to improve the city's health by cycling organic waste and amending the city's soils.

As the proposed composting system handles more incoming organic material, the POP UP Compost Project's team will foster relationships with the city of New Brunswick's commercial restaurants, and institutions. Working with these partners, the project team will train organizational staff to separate and store plant-based food scraps into their designated 27-gallon plastic totters. As totters fill with food scraps and are picked up, project staff will be able to deliver finished compost to these organizations, free-of-charge. Instead of marking the end to the compost cycle, this third step of returning finished compost to the city partners works to garner additional project support from the community and its participation organizations.

At this stage in the project, POP UP Compost Project staff will begin training local residents to become experts in composting through the Community Compost Ambassadors Program (CCAP). This program assigns individuals with the responsibility of overseeing the proper collection of plant-based organic waste at participating collection venues around town. This program will also create a network of trained volunteers who are able to sustain community involvement in the compost project for years to come. Through the completion of eight compost-build work days, this educational series will explain the compost cycling process from start to finish. Participants will gain experience preparing arriving material and maintaining curing compost piles. After finishing this program, residents will assume their respective leadership positions in the community, training others in the science and art of composting and the multiple benefits associated with the community-scale compost cycle in New Brunswick.

Section III: Part VII
## Project Conclusions

This section identifies two project conclusions. The first responds to observations from Section I's national waste review and from Section II's New York City Compost Project case studies. The second conclusion focuses on Section III's proposal for POP UP Compost Project - reflecting on anticipated challenges and opportunities that will evolve as the project is implemented and tested into New Brunswick over Summer 2016 and beyond.

In addressing the first conclusion, this project acknowledges the need for further studying community-scale composting as a response to America's Waste Epidemic and as an emerging form of landscape architecture and tactical urbanism.[88] While the community compost movement continues to grow, little has been published to quantify the social and economic benefits associated with this movement. Addressing this lack of analysis, landscape architecture should rigorously assess community waste sites and the impacts that these spaces have on their surroundings. The profession should specifically apply its spatial analyst tools - cross sections, elevations, and plan view drawings - to better understand how the site design of each waste space relates to the quantifiable benefits of these sites on their surrounding.

As Engler writes, the idealized mission for public waste spaces is to "invite people to see a fresh interaction of nature and culture--a process in

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[88] Mike Lydon and Anthony Garcia, *Tactical Urbanism: Short-term Action for Long-term Change,* (Washington D.C., Island Press, 2015), 2.

which citizens play an integral role, in which their participation in the management of waste is as inevitable as their consumption of material goods."[89] Responding to Engler, the primary purpose of community composting sites may not be to maximize organic material cycling in the city. Rather these sites empower residents with the experiences of cycling food waste with their own hands in the city - shift their perception of waste management from that of a problem to an opportunity.[90] As the potential designers of additional community compost sites, it is important for landscape architects to explore how to best design these spaces to frame their intricate missions and paradigm-shifting potentials.

While Engler's *Designing America's Waste Landscape* was published over a decade ago, landscape scholars are slowly beginning to "recognize the study of waste as legitimate investigations into the landscape."[91] As the community composting movement continues to grow across the country, the profession should also embrace these sites as critical urban landscapes required as part of the 21st century urban landscape matrix. As Engler writes, the "rich and healthy landscapes are those which include waste places [which] functions as integral parts of their make up."[92]

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[89] Mira Engler, "Waste Landscapes: Permissible Metaphors in Landscape Architecture" *Landscape Journal (Madison: University of Wisconsin Press, 1998)* 24.
[90] Ibid.
[91] Mira Engler, "Repulsive Matter: Landscapes of Waste in the America Middle-Class Residential Domain, *Landscape Journal (Madison: University of Wisconsin Press, 1997) 77*.
[92] Ibid.

At this part in the conclusion, some readers may still be asking themselves - why again are waste places so integral to the urban landscape? One additional reason is informed by Engler's argument that waste places "represent the polar opposite of landscape designs associated with great cultural centers."[93] These sites have the potential to educate on the compost cycle while empowering residents with the shared experience of turning unkept piles of plant-based organic material into contained compost cycles. But exploring this site function further, waste sites provide a designated space in the city for people to collectively indulge in messy behavior. By producing soil amendment in the city - by getting one's hands dirty with other residents in the city - these sites allow people to experience activities associated with the agrarian or fringe landscape - in the city.

In addition to expanding the permissible activities that can occur in a city, decentralized community compost sites further inform new approaches to urban design. As Engler proposes, community waste sites "experiment with new formal, spatial and programmatic possibilities that create practical, lively, and congruous public landscape."[94] As additional community compost sites are integrated into cities, and demonstration compost spaces become more accepted, it is important that each waste sites remains as a unique expressions of the compost cycle. Instead of working to create one overarching approach to designing these sites, landscape architecture may

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93 Mira Engler, "Waste Landscapes: Permissible Metaphors in Landscape Architecture" *Landscape Journal (Madison: University of Wisconsin Press, 1998)* 24.

94 Mira Engler, *Designing America's Waste Landscapes*, (Baltimore: The Johns Hopkins University Press, 2004), 41.

consider applying its spatial tools to better understand the subtle variations of existing community composting sites and the impact that these differences have on how the community perceives and engages with these spaces.

This project's second conclusion shifts its focus to POP UP Compost Project and the anticipated challenges that will emerge through project implementation. POP UP Compost Project's staff plan to maintain strong connections with the network of compost leaders associated with New York City's Compost Project. As project obstacles emerge during implementation, the POP UP Compost Project team will be able to ask established community composting leaders for their advice on how to overcome project obstacles - challenges most likely experienced by other composting initiatives.

The New York Community Compost Project's 2014 Composting Report[95] lists suggestions for how community composting projects can best implement their waste initiatives. This report also includes common challenges experienced by start-up compost projects, listing them as the following:

- Recruiting and managing site volunteers.
- Securing funding.
- Securing a steady supply of carbon-rich materials.
- Accessing advanced training on compost site management.
- Understanding City and State regulations related to compost sites.

95 Kathryn Garcia, "2014 NYC Community Composting Report," *The City of New York Department of Sanitation*, 42, last modified January 2015, 33, www1.nyc.gov/assets/dsny/docs/about_2014-community-composting-report-LL77_0815.pdf.

Recognizing these common challenges, the POP UP Compost Project team can begin proactively addressing each of these bullet points, preparing action plans for how to overcome each obstacle as it emerges.

As a learning experience, POP UP Compost Project offers an opportunity for a soon-to-be graduating Masters of Landscape Architecture student to implement a compost cycling system engaging community collaboration for the betterment of New Brunswick's urban landscape. (Figure 44) The success of this project is paramount, addressing the nation's formidable waste epidemic through the integration of creative waste cycling sites. This project works to redefine the concept and potentials of community composting - a 21st century waste solution benefiting the community from the ground up.

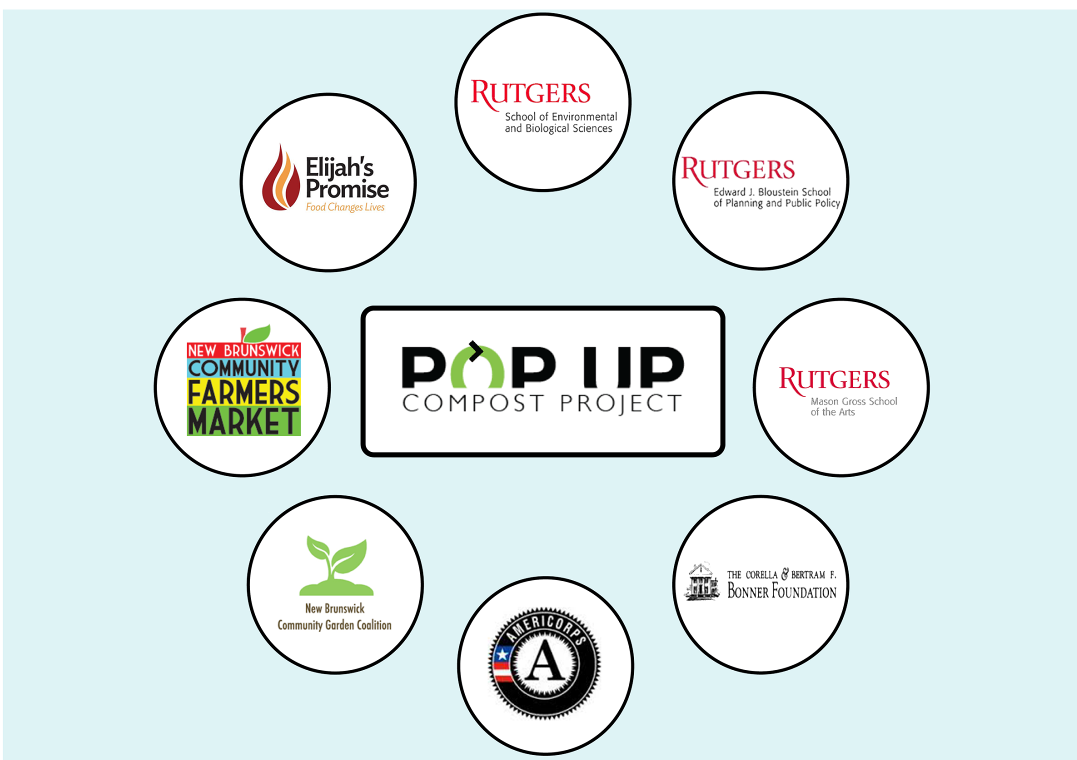


Figure 44. Project's Collaboration Matrix. Image by the author

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Figure 20

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