

Food waste and the complexity of New York City's garbage

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Working steadily every day, "New York's Strongest," the city's Department of Sanitation, works to clear our streets of mountains of garbage. The Department is well-managed, and its Commissioner,

Jessica Tisch, is a creative and effective public manager. But waste management is a political backwater, and no mayor ever wants to hold a press conference to cut the ribbon on a new waste transfer station or an anaerobic digester to process food waste. As I often say, most people assume all those green bags somehow magically get transported to solid waste heaven. They do not want a waste management facility of any kind sited near their home.

To achieve environmental sustainability, we will eventually need to use most of what we now call [waste](#) as [raw materials](#) for new products. The implementation of a circular economy—where all materials are reused, and there is no waste—is essential to the future of our species and our planet. Recycling is a building block on the road to a circular economy, but as important as it is as a first step, it is deeply flawed as a long-term solution.

As a first step, it educates the public about waste and its potential reuse, and it can reduce the volume of waste that is dumped in our landfills. The problem though is that recycling rates tend to be low in the United States, and the market for the waste we recover is unstable. The long-term answer is an automated system of waste management that uses artificial intelligence and automation to sort waste and mine it for resources. That technology is under development, but the capital to pay for these facilities and the political noise that must be addressed to site them make waste mining a long-term solution.

The idea is that some of the capital cost of waste facilities could be recovered by generating a revenue stream for resources mined from the waste stream. This would also require an organizational effort to market the products of waste, likely a private firm with experience in mining and marketing raw materials. Sanitation departments are not known for expertise in sales and marketing.

In the short term, we need to develop the capacity to collect and process the forms of waste that are most easily separated from the waste stream. Materials like paper and bottles have somewhat successfully been isolated from mixed waste. A few weeks ago, New York's City Council enacted mandatory residential food recycling.

On June 8th, Mariana Simões reported in City Limits that "the New York City Council passed a long-awaited 'Zero Waste' legislative package on Thursday, which will expand the pick-up of food-based waste citywide and require all residential buildings to participate by fall of 2024. Instead of being dumped in a landfill, the bills mandate that organic waste be reused for environmentally friendly purposes. That includes composting, which is the process of recycling organic material to reuse it as fertilizer for soil and plants, as well as processing waste to generate alternative forms of electricity that emit less greenhouse gasses. The carbon dioxide released from [food waste](#) represents 20% of New York City's overall greenhouse gas emissions, making it the third largest contributor behind buildings (35%) and transportation (21%)."

It is not yet clear if the mayor will sign the bill, but if he does, three questions remain:

1. How can the mandate be enforced?
2. Where will we get the money for the additional weekly waste pick-up?
3. Where will the food waste go?

The enforcement issue relates to the fact that 70% of New Yorkers live in multi-family dwellings where typically the waste from one apartment is combined with the waste from others. It's true that most of the land in New York City sits beneath single-family homes, but most of the people in New York live in apartments. The second issue is how will the cash-strapped city afford city-wide separate food waste pick-ups? The third

issue is that if the mandate were effective, it would overwhelm our region's ability to process food waste in [anaerobic digesters](#) or compost heaps.

If we are really serious about food waste, we will need to build many anaerobic digesters. It makes no sense to build a system that requires us to ship untreated food waste thousands of miles from the city. Instead, we need to build regional anaerobic digesters to treat the waste.

According to the EPA: "Anaerobic digestion is a process through which bacteria break down organic matter—such as animal manure, wastewater biosolids, and food wastes—in the absence of oxygen. Anaerobic digestion for biogas production takes place in a sealed vessel called a reactor, which is designed and constructed in various shapes and sizes specific to the site and feedstock conditions (learn more about AD system design and technology). These reactors contain complex microbial communities that break down (or digest) the waste and produce resultant biogas and digestate (the solid and liquid material end-products of the AD process) which is discharged from the digester."

Digesters produce fuel and fertilizer and can be scaled to the size needed to process the massive amount of food waste produced in New York. However, as noted above, the organizational capacity to collect and process is not the same as that needed to sell the products of a recycling plant. New York should get creative and figure out a way to generate revenues from its food waste. While avoiding landfill tipping fees is a good way to save money, most of those savings will need to be spent on collecting and processing food waste. The next step would be to sell the recycled products to help pay for the waste management system.

The good news about New York's new law is that the impact of mandatory food recycling is likely to be the same as voluntary recycling, and so it's likely that the city's meager food reprocessing capacity will

meet the needs created by the initial food waste stream. New York has had a less than stellar record on food waste recycling to date. In the apartment building I live in, we once had brown and orange sealed containers for food waste that helped train residents to separate their food waste while reducing the rat population.

These early efforts were working, but as I observed back in 2021: "During the height of the COVID crisis, Bill DeBlasio suspended a very promising food waste recycling program that had already reached 500,000 city residents. When the budget gets tight, recycling is an easy target."

The truly sad part of DeBlasio's action was that due to closed restaurants and increased take-out dining, the amount of residential food waste soared at the very same time the city ended its residential food recycling program.

As for the new mandatory food waste recycling included in the City Council's bill, the mandate is relatively harmless if no effort is devoted to enforcement. While I think a voluntary program makes more sense, mandates do communicate seriousness of purpose. The problem with enforcing a mandate is that the only place it is feasible is [single-family homes](#), and it is not difficult to imagine a negative political response from a poorly targeted and arbitrary enforcement effort. The other issue omitted from the City Council bill is recycling the non-residential food waste picked up by the Sanitation Department.

While for the past decade, large restaurants, stadia, catering operations, food retailers, and wholesalers in New York City have been required under Local Law 146 of 2013 to separate their organic waste and have it collected by private recyclers, the new law ignores the nonprofits that have their waste picked up by the Sanitation Department: What happens to their food waste? New York City's [waste management](#) system is

complicated, and food waste recycling mandates add to the complexity.

Despite these design problems, the goal of reusing food waste is worthwhile. The amount of food we waste is stunning and is truly an artifact of our fast-paced lifestyles and incredible plenty. In more traditional societies, there is very little food discarded. In my grandparents' generation, every part of a chicken was cooked, with some parts ending up in soups or stews. Back then, people ate nearly all the food they were fed and saved what they couldn't finish for another meal. In many parts of the world, those traditions continue.

In New York City, a great deal of uneaten food is not discarded but repurposed as meals for people in need. When food is not eaten, it should be reprocessed as fertilizer or fuel. That is the goal of the City Council's new food waste law, and either in its current or revised form, it should be enacted, signed, and implemented as soon as possible.

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