

Residential Composting Program

The plan is to implement an aggregated residential composting program for food waste. The objective is to create a mitigation activity that augments the existing waste collection and management services provided by the city. Household renters and property owners alike will be able to benefit from the community level activity and it aims to reap the benefits from economies of scale through lowering costs of waste collection and increasing volume of waste.

Services currently provided by the Public Works Department (PWD):

1. **Recycling** – this is a property tax funded service provided in two cart sizes. Higher recycling leads to less payment for waste collection service
2. **Trash collection services**¹ - this operates on the Pay as you Throw (PAYT) program (Houtven and Morris 1999) wherein the household pays more for a larger cart size for pick up. A smaller cart works better if the amount of recyclable waste is higher than trash.

Size of cart	Family size	Cost per use (as of Aug,22)
32 gallon cart	For a single person	\$3.30
64 gallon cart	For a small to medium size family	\$5.50
96 gallon cart	For a large family	\$7.70

3. Yard waste collection services - this runs from April to December and it includes grass, leaves, brush, twigs, garden plants, tree limbs, logs.

Existing composting facilities in the city

According to the Manager of the City's Public Works Department (PWD), which handles waste management, roughly 40 percent of all municipal waste is organic and has the potential to be composted.

A third-party contracting organization called *Wormies* is currently operating in the city in the business of vermicompost. *Wormies* was established in 2017 and serves households and businesses. As of 2021, 300 households were part of their program (Wynder 2021). Another waste management company called *We Care Denali* was contracted by the city government to establish a composting operation at the city's yard waste drop-off site in 2019. They started their operations in 2021 with a designated curbside collection location.

<https://www.grandrapidsmi.gov/Government/Departments/Public-Works-Department#:~:text=Give%20us%20a%20call%20at%20311%20or%20616%2D456%2D3000>.

Both the services operate at the household level. Wormies provides pick up service for a fee and in return every subscriber household receives a complimentary vermicompost bag for every eight pickups. We Care Denali operates through the government's waste collection services. The City pays a fee for specified cubic yards of yard waste, and in return, earns a proportion of the yard compost sales. The City owned and operated composting facility reduces the burden on landfill and creates opportunity for investment in agriculture inputs, hence creates a win-win situation for the government and the community (Hicks 2019).

Proposed mitigation activity

According to the EPA (EPA 2016), every 1,000 tons of recycled material can be attributed to 1.57 jobs, \$76,030 in wages, and \$14,101 in tax revenue. Out of the total waste recycled, food waste can generate 50,000 jobs and about 1,000,000 in wages in 2016.

Given the current level of waste operations in the city, there is potential for initiating and implementing a community-level program that does not increase the cost burden on PWD by utilizing the existing waste collection services and utilizes the manpower of a private entity for composting. The proposed activity is a business model that could capitalize on aggregation of individual demand to generate bulk discounts for households instead of an individual subscription model. The objective is to reduce the cost of waste collection for the company while at the same time create opportunities for LMI and BIPOC households to participate in this sustainability activity by monetizing food waste.

Participating Stakeholders

Neighborhood associations: The neighborhood associations in Grand Rapids (GR) have the social networks within their community to inform, create, and provide the support to participate in this program. Each neighborhood association has a community space that can serve as the place of engagement and meetings with Wormies. The first step would be to organize meetings within the neighborhood to educate and spread awareness on the importance of segregating food and yard waste and its monetary value.

Wormies: The entity identified for this project is Wormies, which has existing operations in the city and operates with a business model that can be afforded by only high-income households. Through this aggregated collection program Wormies can reduce the cost of subscription through group purchase while having a higher supply of waste for each period collection. Currently there are 400 households on subscription model with Wormies and there are challenges to scaling up because of contamination of waste at source and lack of education and awareness on composting.

Restaurants: Discussion with the composting company and PWD have shown that inclusion of commercial establishments that generate food waste can cross subsidize the cost of collection for households and add to the volume of waste collected. Restaurants, coffee shops

and other eating places are more efficient in their waste segregation at source and have a high volume of waste generated in shorter time intervals. The business model can benefit by servicing eatery establishments on a per unit basis (as per existing subscription model) at current costs that can subsidize the cost of collection for households.

Public Works Department (PWD): The role of PWD will be oversight and facilitation of the engagement with associations. PWD could encourage the meeting of the associations with the contractor, and bridge the information gap between the two contracting parties. The role of PWD will be to provide information response services on their portal regarding the composting service and how it can benefit households through the aggregate demand model.

According to discussions with the treasurer of Boston Square Neighborhood Association, and the community organizer of Creston Neighborhood Association, the main challenge would be to generate the habit of sorting, dumping food and yard waste separately at their homes and then carrying it to a central drop off location. The suggested alternative would be to add food and yard waste collection to the existing waste pick-up service for Wormies. Another challenge foreseen would be to drive the engagement by the associations because of cost constraints to conduct such engagements. Thirdly, previous initiatives of waste segregation and recycling have not worked in the past because of behavioral inertia from the households toward such endeavors. Their main concern was adding an additional activity of segregation, sorting, and dumping food and yard waste will be deterred by the households

Considering the cost challenges and behavioral challenges, the proposed mitigation model would be based on aggregating individual household participation, scaling it up to bulk demand for composting services. The pickup service will cater to the cluster of households on a weekly basis. The cost of subscription can be negotiated by the neighborhood association for the cluster to realize cheaper costs compared to individual subscription and reap the economies of scale from bulk participation. Equity in this activity can be brought about by:

Charging in proportion to income levels – residential neighborhoods with higher percentage of LMI and BIPOC households (McVicar 2022) can benefit from bulk subscription to reduce costs. On the other hand, commercial establishments can be subscribed at current rates or premium rates depending on the frequency of waste generated (higher the frequency of collection, higher the cost).

Monetary incentive to participate – there is behavioral inertia towards segregation, and composting since food waste is treated as troublesome to be managed, attracts pests and insects, and causes disturbance in the lifestyle of households. One way around this situation is to monetize waste such that food and other organic food waste holds monetary value for households. This can be done by treating the neighborhood associations as suppliers of input in the production process of compost. For the given number of households from one neighborhood who subscribe to the model, their association can be rewarded with a proportionate share in revenue from the final sale of compost.

In the current model, households receive a bag of compost after a certain number of pickups. This incentive may or may not work for all households. Based on the discussions with the two associations, not all households have the space and capabilities for utilizing compost in their household. Hence the solution is to provide a monetary incentive for the households to participate. The proportionate earnings from sale of compost could be appropriated by their respective associations and utilized for community development activities.

The core component of this activity is the continuous engagement and education of individual households in each neighborhood. The associations could undertake an education program within their community at designated physical locations, along with farmers on the following parameters -

- The importance of segregation of waste at household from a monetary perspective (treating waste as a resource that has monetary value).
- Better segregation at home influences waste generation since the households will have an incentive to reduce general trash and divert to more fresh produce.
- The end product compost can be made accessible to agricultural producers, including community gardeners, school gardens which finally serves as inputs for the community hence creating an ecosystem of waste management.
- Long term food waste reduction strategies including innovative food recovery efforts such as food gleaning, storage and preservation techniques.

Challenges in community-level composting

Based on the inputs provided by officials from the Public Works department and private contracting entity Wormies, the following challenges have been identified -

- Given the current financial costs of trash collection, it will be difficult to generate interest for subscribing households from all income classes to the composting program. The current incentive in the form of free compost (either in 1-liter bags from Wormies or 1 cubic yard of compost from the city) is not helpful for all households who do not have the opportunity to utilize the compost. This constraint will specifically impact renters who do not invest in house gardens but are paying for trash services through the property owners.
- The challenge is to make information on the value of composting accessible to households who have rented homes, and low-income households from the point of reducing their time and money cost of waste segregation while at the same time reducing their level of solid waste.
- The third challenge is to ensure that the role of PWD is not cost-prohibitive so that they can act as the oversight and information provision partner in this engagement. In order to ensure that, the current model limits the scope of their involvement and allows the private company, the associations, and the businesses to lead the engagement using the principles of market-determined forces.

Conclusion

In spite of the potential challenges, this project can become a pilot model for achieving the twin objectives of creating awareness of waste contamination and the process of composting among the community as well as creating a business model for private contractors to benefit from waste. In the long run, this model should lead to a reduction on non-compostable waste, and create a self-sustaining food ecosystem starting from farm produce and ending in farm compost.

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