A Presentation on Princeton's Proposed Bid Solicitation for the Collection and Disposal of Solid Waste, Bulk Waste, and Organics

Princeton Council Meeting
August 8, 2022

DeFeo Associates

SUSTAINABLE PRINCETON.
LEADING COMMUNITY CHANGE

Presentation Overview

- Engineers and Waste Consultant will:
  - Discuss the proposed bid solicitation for waste and organics collection
  - Review efforts to contain costs with program changes
  - Detail the next steps

- Sustainable Princeton will:
  - Provide a deeper dive into the emissions reductions to be achieved in this proposed plan

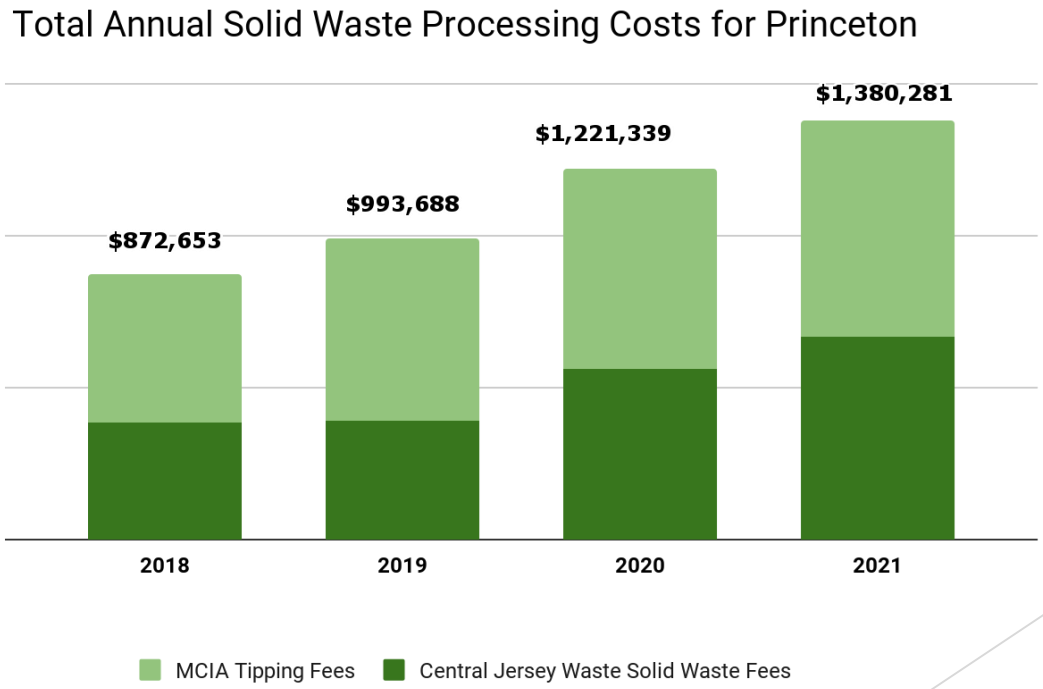
Proposed Solicitation:
Once a Week Collection for 5 Years

- One 64-gallon solid waste cart (provided by the hauler) per dwelling unit
  - Property owner may purchase additional 64-gallon cart(s)
- One 64-gallon organics cart (provided by the hauler) per dwelling unit
- Bulk waste collection by reservation only
- Town-wide for single-family residences and multi-family with four or fewer units (7,129 households)

Photo courtesy of Plainsboro, NJ

Princeton's Costs for Solid Waste

- Solid waste volumes rose from **5,048** tons to **6,025** tons
- Princeton's fees have increased **18%**



Current Trends

- **Municipalities are facing multiple challenges with solid waste**
  - Increased cost of new vehicles
  - Increased residential solid waste volume due to more people working from home
  - Widespread labor shortages
  - Significant production delays with new trucks
  - Increased fuel costs
- **This has led to extreme disruptions in municipal services**
  - Service suspensions are occurring in parts of the country
  - Municipalities are revising collection schedules and making other structural changes in response

Rate increases of 30-40% or more are occurring

Sources: New Jersey Municipalities Magazine, February 2022; Waste Dive, February 2022

Goals for New Waste Contract Program

- **Contain** our waste costs
- **Expand** municipal service to include organics recycling for all
- **Reduce** our carbon emissions throughout this process

Universal Waste System

- An automated cart-based waste collection program will be more **efficient** and **equitable**, and help **contain costs**
- A town-wide residential organics collection program will help **contain costs** by **reducing solid waste** volume which has a **higher tipping fee**
- A town-wide residential organics collection program **will reduce Princeton's carbon footprint**

Bulk Waste Collection Changes

- **100 pounds (6’x3’x4’) of bulk waste will continue to be allowed per week per residence**
- Residents will submit a reservation for bulk waste collection in person, on the phone, or online.
- On any given week, about 6% of residents dispose of bulk waste, requiring crew that can lift bulk waste
- A bulk waste reservation system will allow haulers to schedule the right staffing and vehicles. This translates to more efficient staffing, a safer workplace, contains costs, and lowers emissions.

Lessons Learned from Prior Organics Collection

Princeton offered a subscription-based, subsidized residential curbside collection of source-separated organics for several years until it ended the program in 2019 due to rising costs and uncertainty that the material was being recycled.

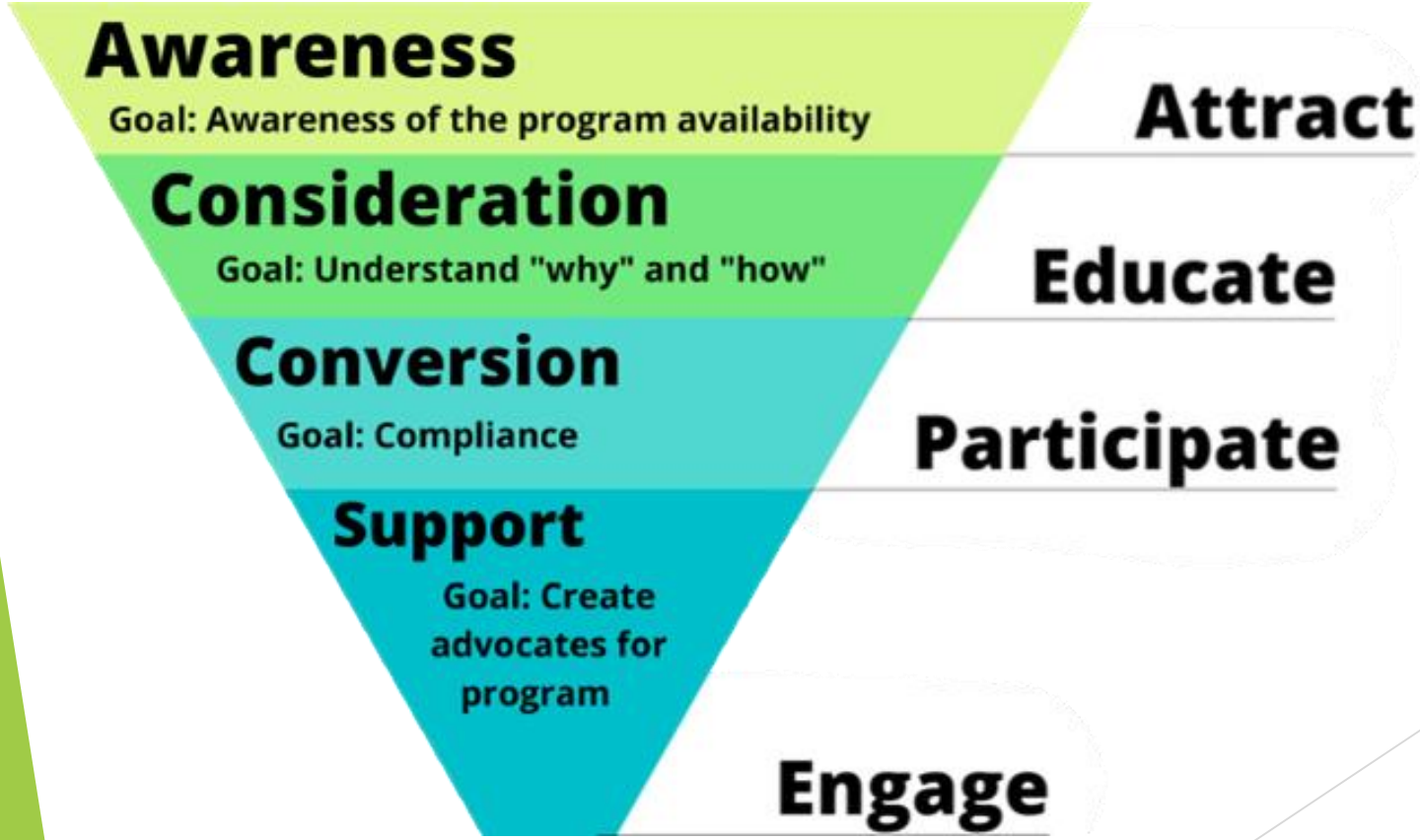
- At its peak, 1,000 households participated. It was inherently inefficient for haulers. With full participation, we are aiming for **improved efficiency**.
- At the time, there was a lack of **local facilities** to manage organics. Over the past few years, this industry has increased competition in our region.
- In our prior pilot there was a lack of **effective communication** between the processing facility and the municipality. Staffing, contract conditions, and a communications plan will address this.

Schedule

- August 2022: Release bid for solid and and bulk waste and organics collection contract
- August 2022: Release request for proposals for organics processing contract
- September 2022: Open proposals for organics contract
- October 2022: Open bids for collection contract; award organics processing contract; and award collection contract
- November 2022: Introduce and adopted new solid waste regulations
- August - January 2022: Conduct outreach and public education
- February 2023: New contract begins

Note: delivery of carts is contingent upon availability; cart distribution could occur in 8-24 weeks after contract award

Proposed Education & Outreach Plan

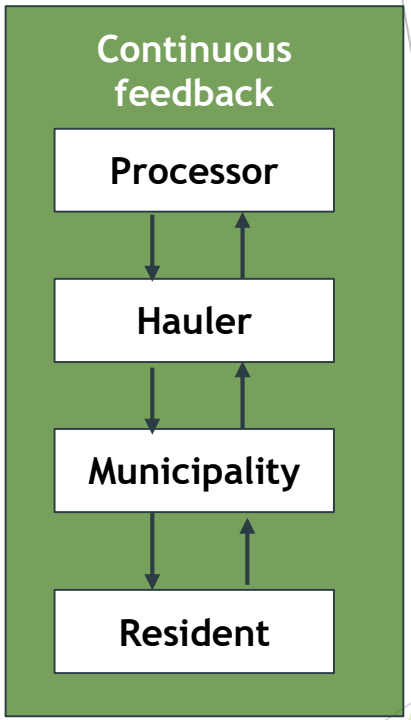


Possible tactics to be deployed during each phase:

- Surveys
- Website
- Email newsletters
- Social media
- Simple infographics
- Town-wide mailer
- Flyers
- Newspapers
- Outreach at community events
- Partnerships with community organizations
- Reverse 911 calls

Ensuring Success of the Program

- Communicate consistently with the organics processor to ensure community compliance with contamination levels
- Provide consistent education and encouragement to manage contamination
- Monitor recycling bins to ensure recycling contamination does not increase
- Update ordinances to reflect changes in our waste management



Emissions Impact of Organics Recycling

August 8, 2022

WASTE FACILITY IN OUR REGION.

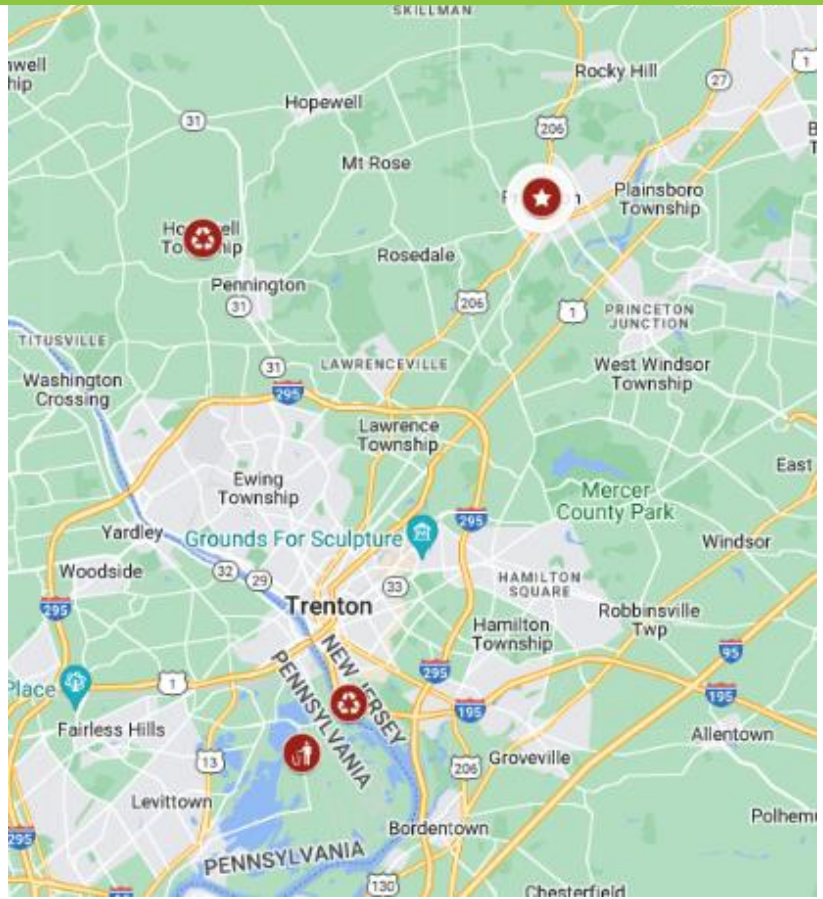
Landfill: Fairless Landfill is located in Bucks County, PA is managed by WM, Inc.

ORGANICS FACILITIES IN OUR REGION.*

Anaerobic Digestion: Trenton Renewables utilizes anaerobic digestion and generates electricity

Composting Facilities: Several farms in and around Hopewell, NJ utilize composting.

*We won't know if these facilities or others will bid to accept the town's organics until the request is released



BASELINE: ALL WASTE TO THE LANDFILL

- Landfill gas is a natural byproduct of the decomposition of organic material in landfills and is composed of primarily of methane and CO_2, in roughly equal parts.
- **Methane is a potent greenhouse gas** – 28 to 36 times more effective than CO_2 at trapping heat in the atmosphere.

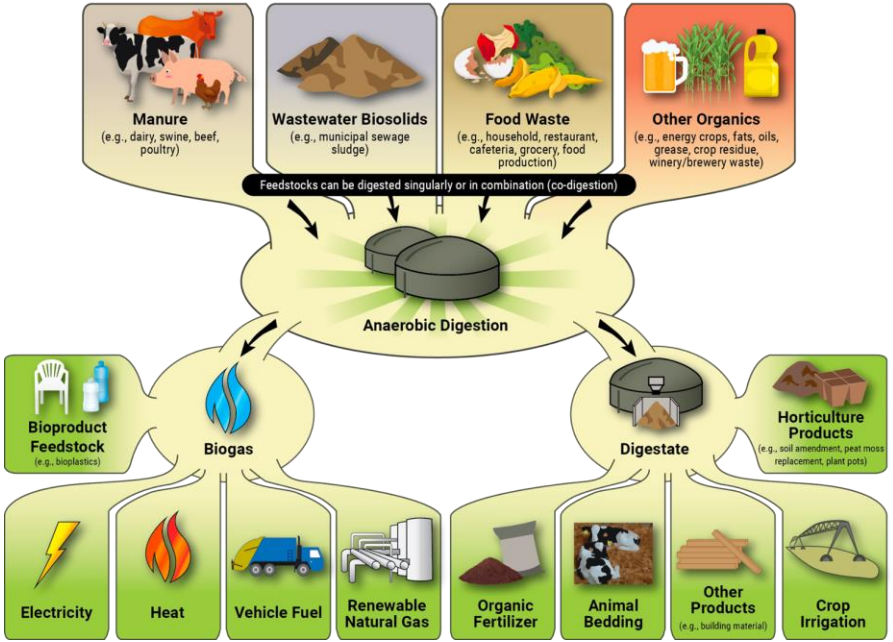
- There are solutions to trap and utilize landfill gas; however, LFG energy projects capture roughly 60 to 90 percent of the methane emitted from the landfill.
- Our landfill, Fairless Landfill, has indicated a planned renewable gas project involving vehicle fuel use and pipeline injection; however, there are no reports that they've made this transition. Current reports suggest they are flaring captured methane.

www.epa.gov/lmop/basic-information-about-landfill-gas
www.epa.gov/lmop/project-and-landfill-data-state
www.epa.gov/lmop/benefits-landfill-gas-energy-projects

PATHWAY A: DIVERSION TO ANAEROBIC DIGESTION

Anaerobic Digestion (AD) is a process through which bacteria break down organic matter in the absence of oxygen and produce:

- **Biogas** can be used like like natural gas to provide heat, generate electricity, and power cooling systems, among other uses.
- **Digestate** can be used for animal bedding, nutrient rich-fertilizer, a foundation for bio-based products, or soil amendments.



www.epa.gov/agstar/how-does-anaerobic-digestion-work

PATHWAY B: DIVERSION TO COMPOSTING FACILITY

Composting is a form of waste disposal where organic waste decomposes naturally under oxygen-rich conditions and produces:

- **Compost** can be used as a soil amendment, nutrient-rich fertilizer, and acts to store carbon.

www.epa.gov/sites/default/files/2020-12/documents/warm_background_v15_10-29-2020.pdf

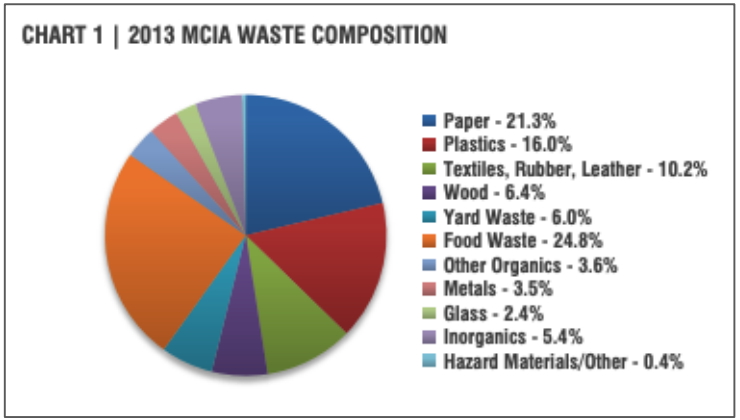
CALCULATING EMISSIONS REDUCTIONS.

In 2021, Central Jersey Waste reported that Princeton residents produced **6,025 tons of landfill waste**.

From the MCIA Waste Characterization Study, we know that **24.8% of landfill deposits are food waste**.

We can estimate that Princeton sent approximately **1,500 tons of food waste to landfill** in 2021.

The EPA's WARM tool allows us to analyze the estimate greenhouse gas emission reductions and more from several different waste management practices, including landfilling, composting, and anaerobic digestion



Mercer County Improvement Authority Solid Waste and Recycling Quantification and Characterization Study

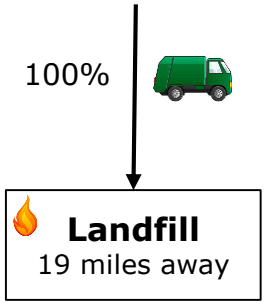
www.epa.gov/warm

www.mcianj.org/filestorage/133/154/T%26M_Final_Waste_Study_-_Sept._2015.pdf

EMISSIONS REDUCTION POTENTIAL.

Baseline: All Waste to Landfill

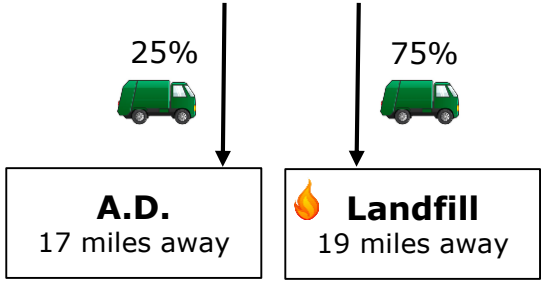
- 7,129 households
- 6,025 tons MSW/ year to the landfill



2,777 $MTCO_2e$

Pathway A: Diversion to Anaerobic Digestion*

- 4,530 tons MSW/year to the landfill
- 1,494 tons food waste/year to A.D.

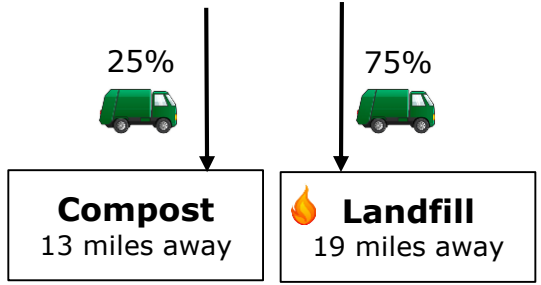


1,888 $MTCO_2e$

-890 $MTCO_2e$ + 389 MWh of electricity

Pathway B: Diversion to a Composting Facility*

- 4,530 tons MSW/year to the landfill
- 1,494 tons food waste/ year to compost



1,758 $MTCO_2e$

-1,020 $MTCO_2e$

* Analysis assumes facilities are able to successfully bid to manage this amount of food waste.

ADDRESSING QUESTIONS WITH THIS ANALYSIS.

- **What about the impact of adding another truck for organics collection?** The emissions of a short-haul diesel trucks are included in this analysis, but represent a very small fraction of the emissions.
- **What if the hauler converts their trucks to natural gas or even electric?** This will reduce the emissions, but because transportation represents a fraction of the overall emissions, the change is slight and organics diversion is still preferred.
- **What if the landfill implements a landfill gas recovery project according to the strictest standards?** The emissions will be reduced farther, but there will still be a reduction of 450-600 $MTCO_2e$ per year with organics diversion.

"When food goes to the landfill, it's similar to tying food in a plastic bag. The nutrients in the food never return to the soil. The wasted food rots and produces methane gas."

www.epa.gov/warmwww.epa.gov/sustainable-management-food/sustainable-management-food-basics

EMISSIONS REDUCTION POTENTIAL SUMMARY.

- Using the EPA's WARM tool, we can estimate annual emission reductions of **890 to 1,020 MTCO$_2$e** if we divert food waste from the landfill to local anaerobic digestion or composting facility.
- Using the EPA's Greenhouse Gas Equivalencies Calculator, we can state these reductions are **equivalent to:**
  - Growing **15,000 to 17,000 tree seedlings** for 10 years OR
  - Removing **190-220 passenger vehicles** from the road
- **Diverting food waste from our landfill is an environmentally-sound decision.**

www.epa.gov/warm

www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

Thank you!

Email us:
info@sustainableprinceton.org

Call us:
609-454-4757

Visit us:
One Monument Drive
Princeton, NJ 08540

Christine Symington
Executive Director

Jenny Ludmer
Program Manager

Elana Berk
Communications and Outreach Manager

Madeline Stahl
Program Assistant

Becca Goldman
Administrative Assistant

Jordana Composto
CAPERS Team Lead