

# Envisioning a Scalable Composting Program for Holland, Michigan



# The Team

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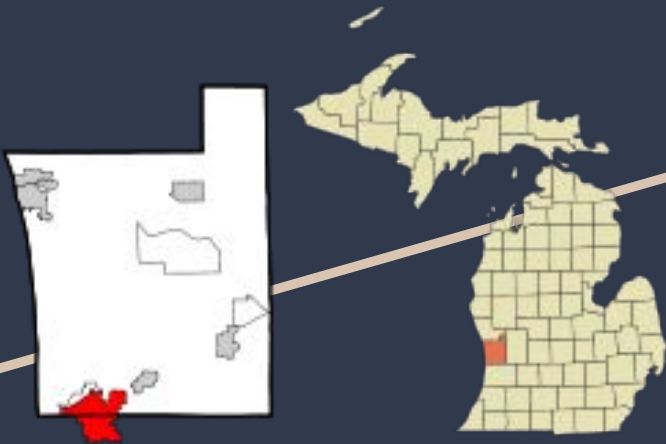
**GRAHAM**  
**SUSTAINABILITY INSTITUTE**  
UNIVERSITY OF MICHIGAN

# Holland, MI Overview

Residents: 35,000

Average Residents Per Household: 2.42

Single-Family Homes: 9,700



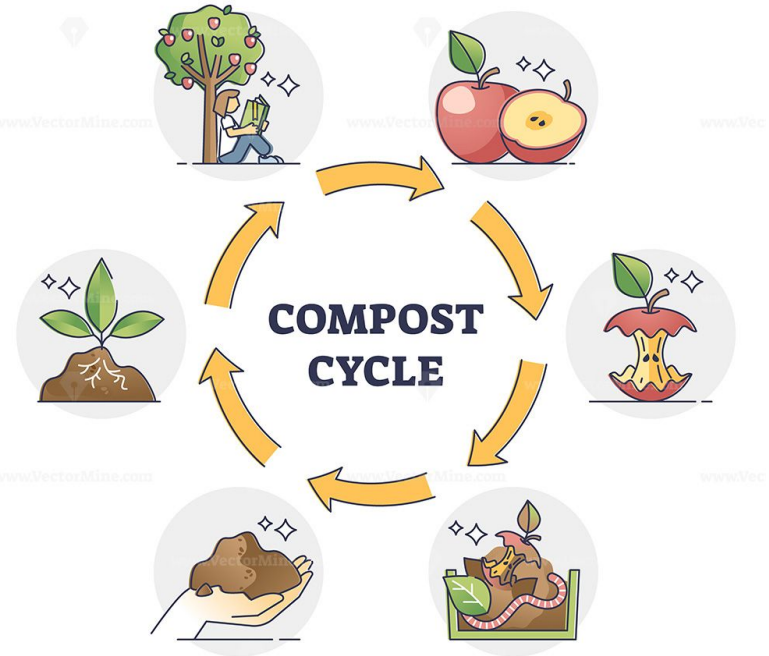
## Current compost infrastructure:

- Curbside leaf pickup
- Lots for waste storage
- Yard waste cart collection
  - 2506 current enrollment

What does the city  
require for  
expansion?

- Equipment
- Site management
- Strategic site location
- Construction of a compost pad

# What is Compost?



# Why Compost?

## Overall Benefits

- Waste Stream Diversion
- Reduced Methane Emissions from Landfills
- Improves Overall Soil Quality

## Holland's Motivations for Composting

- Master Plan Guiding Principles
- Topsoil for Holland at no cost!

## Guiding Principles

Inviting all  
to enjoy...



a thriving...



and resilient  
Holland.



# Method to Calculate Food Waste Projections

$$\begin{array}{ccccccc} .94 & \times & 2.42 & \times & 9,700 & \times & 365 & = & 7,783,456^* \\ \text{Pounds of} & & \text{Average} & & \text{Single Family} & & \text{Days} & & \text{Pounds of food waste per year} \\ \text{food waste per} & & \text{members per} & & \text{Homes in} & & & & \\ \text{person/per day} & & \text{household} & & \text{Holland, MI} & & & & \end{array}$$

\*Assuming a 60% participation rate = 4,670,073 pounds or 2,335 tons of food waste



$$\begin{array}{ccccccc} 2,335 & + & 1,400 & = & 3735 \text{ tons} \\ \text{Tons of estimated} & & \text{Tons of yard waste} & & \text{of potential compostable waste} \\ \text{food waste} & & \text{collected in 2021} & & \text{per year} \end{array}$$

# Method to Calculate Projections of Carbon Benefits

## Waste Reduction Model (WARM)

- Negative values indicate the avoided GHG footprint

## The Social Cost of Carbon

Reducing this level of carbon emission equates to \$62,519 saved yearly in social cost.

Type of Waste	Tonnage of Waste	Landfilled Total MTCO2E	Composted Total MTCO2E	Change (Alt - Base) MTCO2E
Food Waste	2,335.10	1,161.71	-269.90	-1,431.61
Yard Waste	1,400.00	-280.73	-74.98	205.74
Total Change in GHG Emissions <b>-1,225.87 MTCO2E</b>				

## Current Compost Program

**Enrollment:**  
2506 households

**Cart Revenue:**  
\$42,000 monthly

## Projected Compost Program

**Target Enrollment:**  
5820 households  
(60%)

**Cart Revenue:**  
\$98,000 monthly

## Additional Considerations

Dependent on the bids received following Request For Proposal (RFP)

# Revenue Analysis

# Key Takeaways

- Solid Waste Diversion
  - Projected 3700 tons of waste annually.
- Greenhouse Gas Emissions
  - 1,200 metric tons of annual carbon reduction.
- Revenue Analysis
  - Minimum of \$1.2 million annual revenue.

# Recommendations For City Council

- I. Implement this program!
- I. Expand compost cart pickup to year round.
- I. Combine yard waste, food waste, and brush storage into a singular location at the dredged materials site.
- I. Explore ways in which restaurant food waste can also begin to be collected.

Questions?

# Sources

Slide 3:

Map Image: [https://en.wikipedia.org/wiki/Holland,\\_Michigan](https://en.wikipedia.org/wiki/Holland,_Michigan)

Data: <https://www.census.gov/quickfacts/fact/table/hollandcitymichigan/PST045221>

Slide 4:

<https://www.gardeninginla.net/blog/home-composting-garden-gold-from-kitchen-garden-waste>

<https://vectormine.com/item/compost-cycle-with-natural-food-waste-recycling-process-outline-diagram/>

Slide 5:

Image: City of Holland Master Plan Poster

Slide 6:

Image: [www.alamy.com](http://www.alamy.com)

Slide 7:

Data: [www.epa.gov/warm](http://www.epa.gov/warm)