



Waste Diversion and Financial Sustainability

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PRESENTED TO:

NEW HAMPSHIRE HAZ. WASTE AND CONTAMINATED SITES CONF.

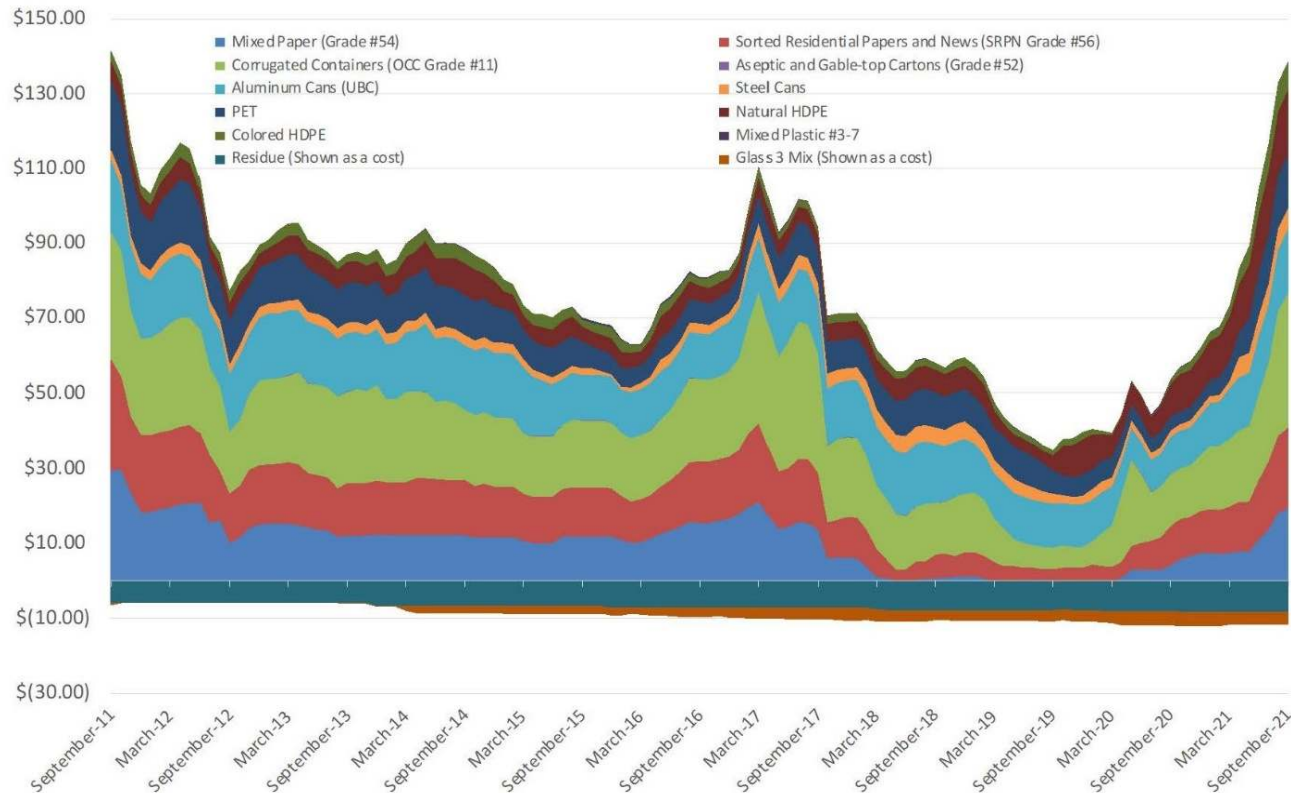
- **Introduction and Overview**
 - Primary Goals and Drivers for Waste Diversion
 - Financial, Operational, and Programmatic Elements
 - Benefits
- **Case Studies**
 - Baltimore City MD
 - Barnstable County / Cape Cod Commission MA
- **Upcoming Challenges for 2022**
- **Closing**

- **State Mandates and Goals:**
 - New Hampshire: Reduce waste disposal by 25% by 2030
 - California (SB 1383): 50% reduction in organic waste disposal by 2020, increasing to 75% reduction by 2025 relative to 2014
- **Zero Waste Plans**
 - Massachusetts: Reduce waste disposal by 30% by 2030 and 90% by 2050 relative to 2018
- **Resource Conservation and Climate Action Plans**
 - Reduce Greenhouse Gas Emissions
- **Limited Landfill Airspace or WTE Capacity**
- **Efficiency and Cost Savings**
- **Social Activism**
- **Revenue Generation**



Commodity Market Challenges

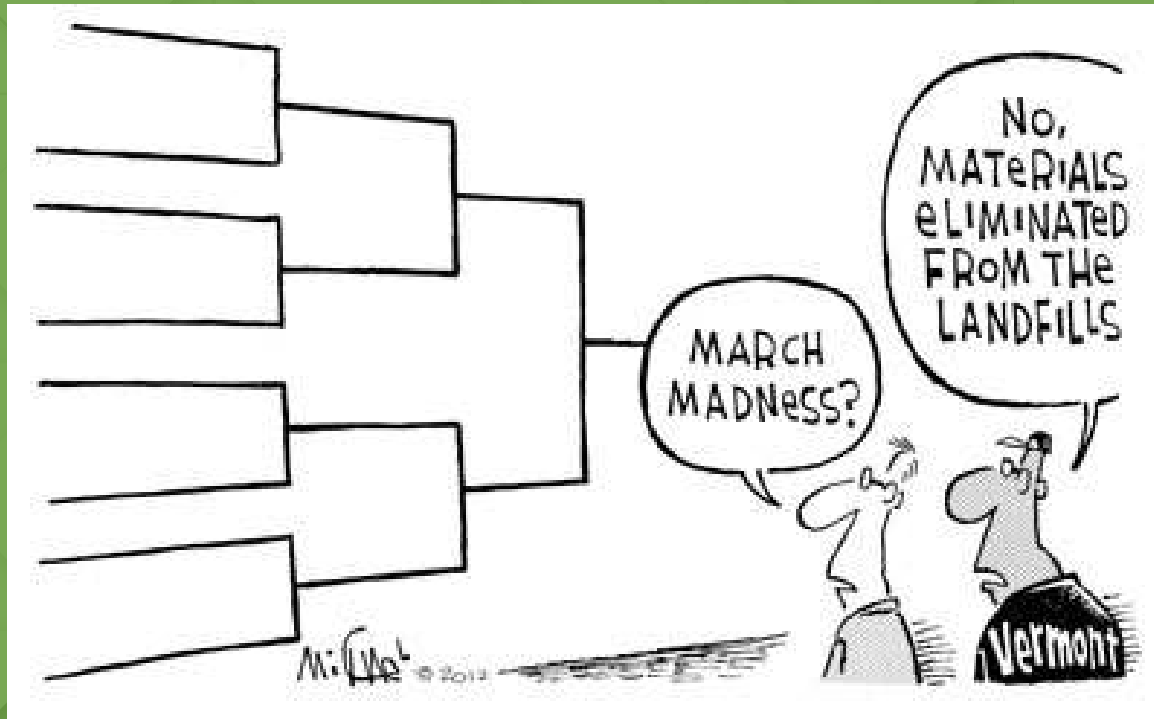
Current Single Stream Composition Average Commodity Revenue



From: THE SOLID
WASTE INDUSTRY IN
THE POST
PANDEMIC WORLD.
Marc Rogoff and
David Biderman
Waste Advantage,
November 2021



- 
- Plan
 - Conduct a Waste Audit
 - Provide Infrastructure and Systems
 - Engage Stakeholders
 - Influence Behavioral Change
 - Standardize and Keep it Simple
 - Measure and Report
 - Communicate
 - Make it Financially Sustainable



Case Study 1



Less Waste, Better Baltimore
Rethinking our waste management future

Solid Waste Management and Recycling Master Plan

June 2020

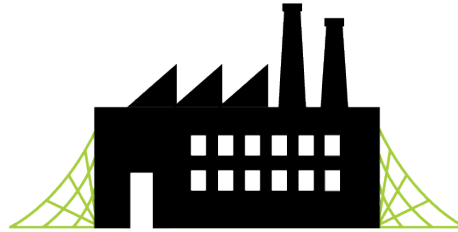
<https://publicworks.baltimorecity.gov/lesswaste>

Project Drivers



Landfill

The City-owned Quarantine Road Landfill—the only solid waste landfill in Baltimore City—is rapidly reaching its permitted capacity, with **approximately seven years remaining** at the current rate of disposal.



Waste-to-energy

The privately-owned Baltimore Refuse Energy Systems Co. (BRESCO) waste-to-energy (WTE) plant, where most of the City's waste is currently handled, is aging and **may not be a viable long-term option.**



Recycling

While the City does provide a variety of recycling options, the City's **recycling rates are among the lowest in Maryland.**

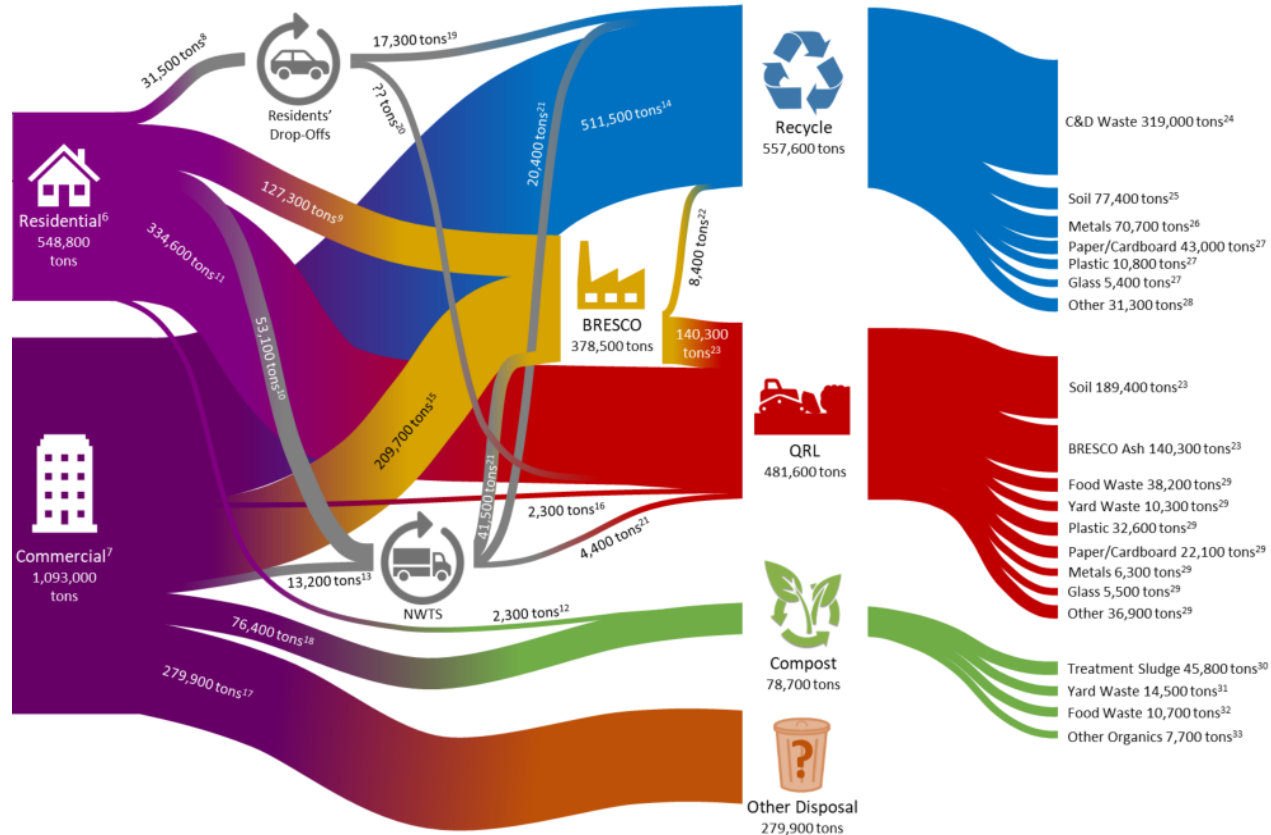
Options for Increasing Waste Diversion



How can we go about analyzing the City's waste flows in order to understand how to reduce waste generation and divert more material from disposal?

- Understand waste flows and materials**
- Look at what options are available and would be supported by residents and other stakeholders**
- Objectively assess different options in terms of expected performance**

Waste Flows in Baltimore City



Stakeholder Input



Support for Potential Policies and Approaches



96%

of people surveyed agree or strongly agree that they **support policies that lead to improved waste reduction, recycling and reuse**

The City should:



Provide literature that focuses more on waste reduction and reuse



73%

agree or strongly agree



Increase access to curbside recycling (e.g., provide recycling bins/carts to every single-family homes, provide multi-unit buildings with assistance in implementing recycling)



84%

agree or strongly agree



Encourage reduced waste from construction and demolition



90%

agree or strongly agree



Provide more alternatives to waste disposal like curbside collection of organics for composting, even if these alternatives cost residents more



66%

agree or strongly agree



86%

of people surveyed agree or strongly agree that they **support policies that ban single-use plastics or other manufacturer/retailer responsibility laws**

Methodology for Assessment



Waste Diversion Potential:

Total tonnage
Materials
Interaction with Other Options



Costs:

Capital
Operation and Maintenance
Labor



Timeline:

Short – Medium – Long Term
Time Lag before Seeing Benefits



Benefits:

Social/Environmental
Greenhouse Gas Emissions
Job Creation
Revenue/Cost Offsets



Challenges to Implementation:

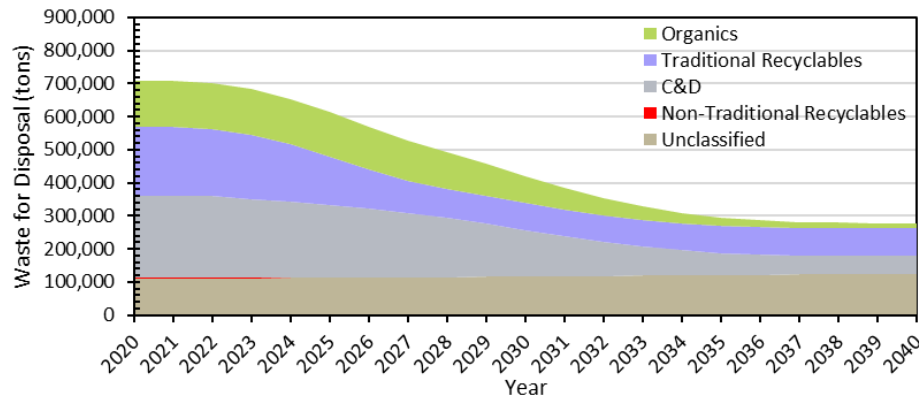
Permits
Infrastructure and Land
Required
Training



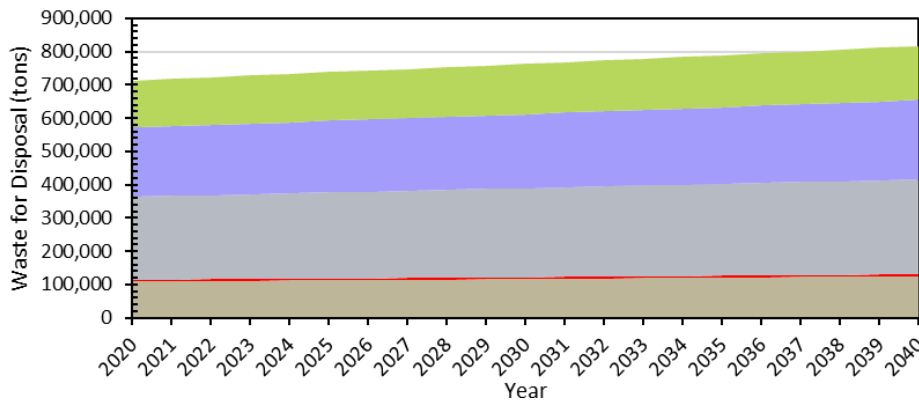
Experience:

DPW's Experience
Local Private Sector Experience
Other Jurisdictions

Expected Changes in Waste Disposal



If City achieves 100% of its Maximum Diversion Potential by 2040



If City maintains the status quo

Expected Maximum Diversion Potential (MDP)



| Diversion/Recycling Option | Maximum Diversion Potential (tons) | Expected Performance Timeframe (years) |
|--------------------------------|------------------------------------|--|
| Food Waste Reduction | 72,400 | 20 |
| Residential Organics Diversion | 42,800 | 20 |
| Commercial Organics Diversion | 35,500 | 20 |
| Improved Curbside Recycling | 84,200 | 10 |
| Expanded Recycling Collection | 69,300 | 10 |
| C&D Reuse and Reduction | 28,400 | 10 |
| C&D Diversion | 200,100 | 20 |
| Bulky Waste Diversion | 4,100 | 10 |
| Drop-Off Center Improvements | 16,100 | 5 |
| TOTAL | 552,900 | - |

Achieving the MDP would increase the overall diversion rate for all waste in Baltimore to about 83%



Residential Organics Diversion



BALTIMORE FOOD WASTE & RECOVERY STRATEGY

Goal

80-90% food waste
diversion by 2040

Developed by The Baltimore
Office of Sustainability



CATHERINE E. PUGH
2018














2018



Encourage Backyard and
Community Composting



Separate Curbside Collection

| | |
|-----------|---|
| Diversion |   |
| Costs |    |
| Timeframe |     |
| Benefits |     |
| Mechanism | Public-Private Partnership |













Goal: 43k TPY over 20 yrs



New Composting Capacity

Improve Residential Curbside Recycling

- Provide free recycling carts with secure covers to residents to increase participation in curbside recycling
- Maintain weekly collection
- Significant education and outreach to minimize contamination and improve recycling habits
- Investigate transition from sending recyclables to out-of-jurisdiction MRF to developing in-city “mini-MRFs”

| | |
|-----------|---|
| Diversion |     |
| Costs |    |
| Timeframe |   |
| Benefits |    |
| Mechanism | Public-Private Partnership |

Goal: 84k TPY over 10 yrs



Workers at a Simple Mini-MRF Sorting System
(Source: Revolution Systems)

Bulky Waste Recycling and Reuse



Support Donations



Reuse Store



Diversion



Costs



Timeframe



Benefits



Mechanism

Private + City

Goal: 4k TPY over 5-10 yrs

Develop Recycling Capacity for Bulky Items

Fix-It/Repair Clinics



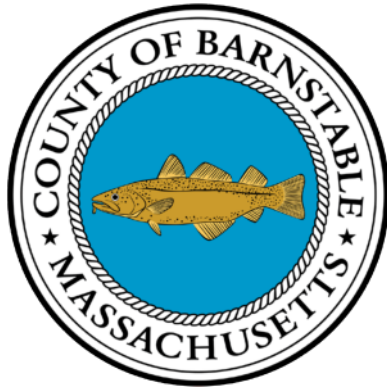


"Of all the luck. We fly all the way
up the coast, and now this?!
...Worst vacation ever!"



Case Study 2

STUDY AREA



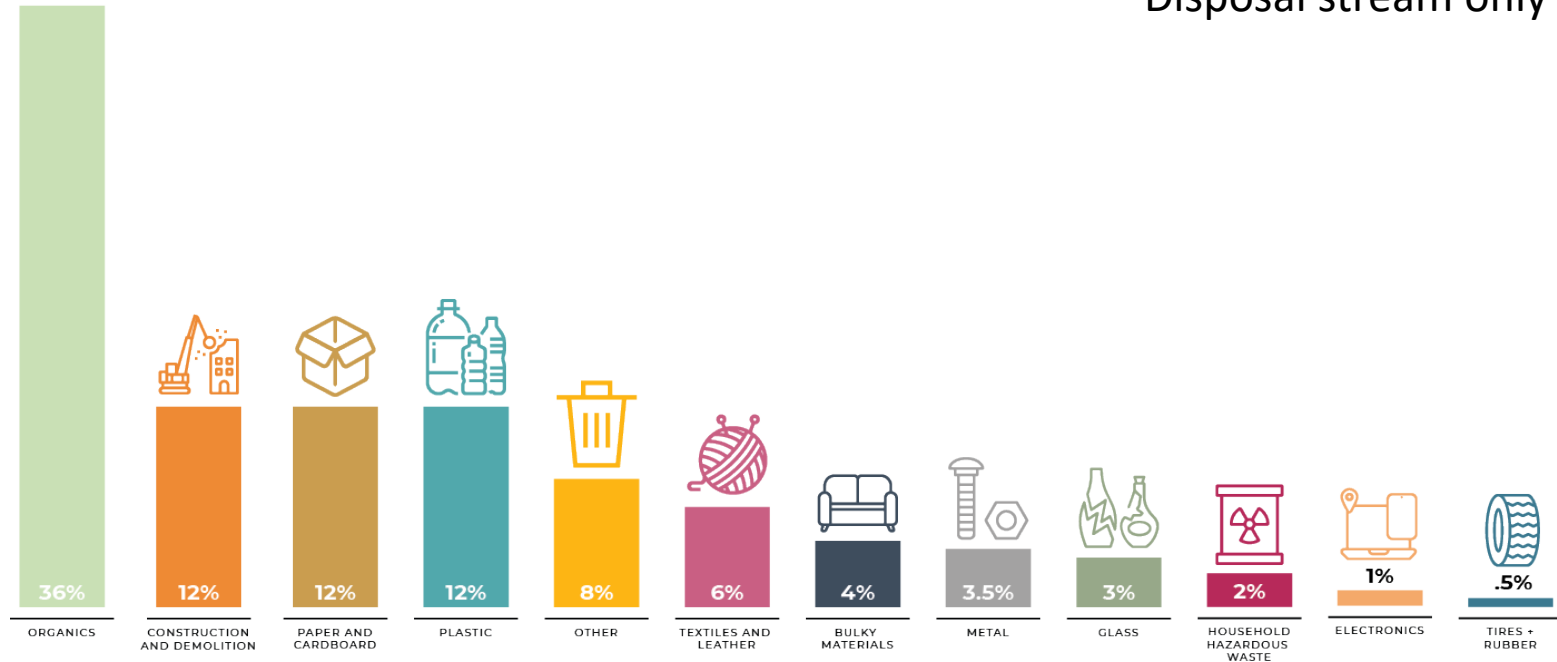
CAPE COD
COMMISSION

- Solid waste disposal capacity decreasing throughout MA
- Meeting zero waste goals
 - State Solid Waste Master Plan strives to divert 30% of the waste stream from disposal to recycling and reuse by 2030 (90% by 2050)
 - The Cape Cod Regional Policy Plan has objective to reduce waste and waste disposal by promoting waste diversion and other Zero Waste initiatives
- Other challenges
 - Towns seeing disposal contract prices increasing two-fold
 - Transportation costs are rising
 - Inconsistent markets for recyclables

Calculated Waste Composition for Analysis



Total Tonnage = 84,500 tons (2020)
Disposal stream only

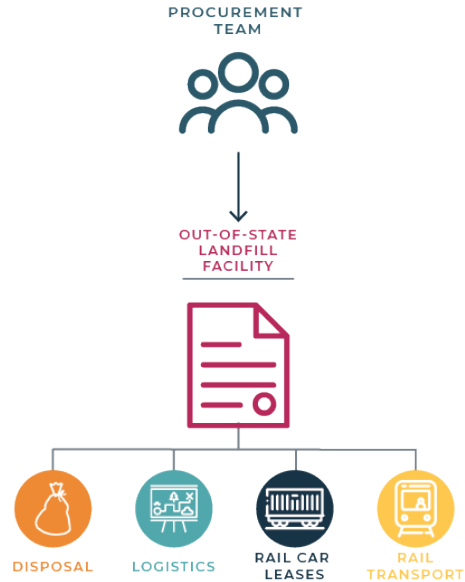


Source: Geosyntec Task 1, Table 5 Credit: Cape Cod Commission



Waste-by-Rail Study

CONTRACT STRUCTURE ASSUMED FOR ANALYSIS: CONSOLIDATED CONTRACT



Credit: Cape Cod Commission
Source: Geosyntec Task 2-3, Section 2



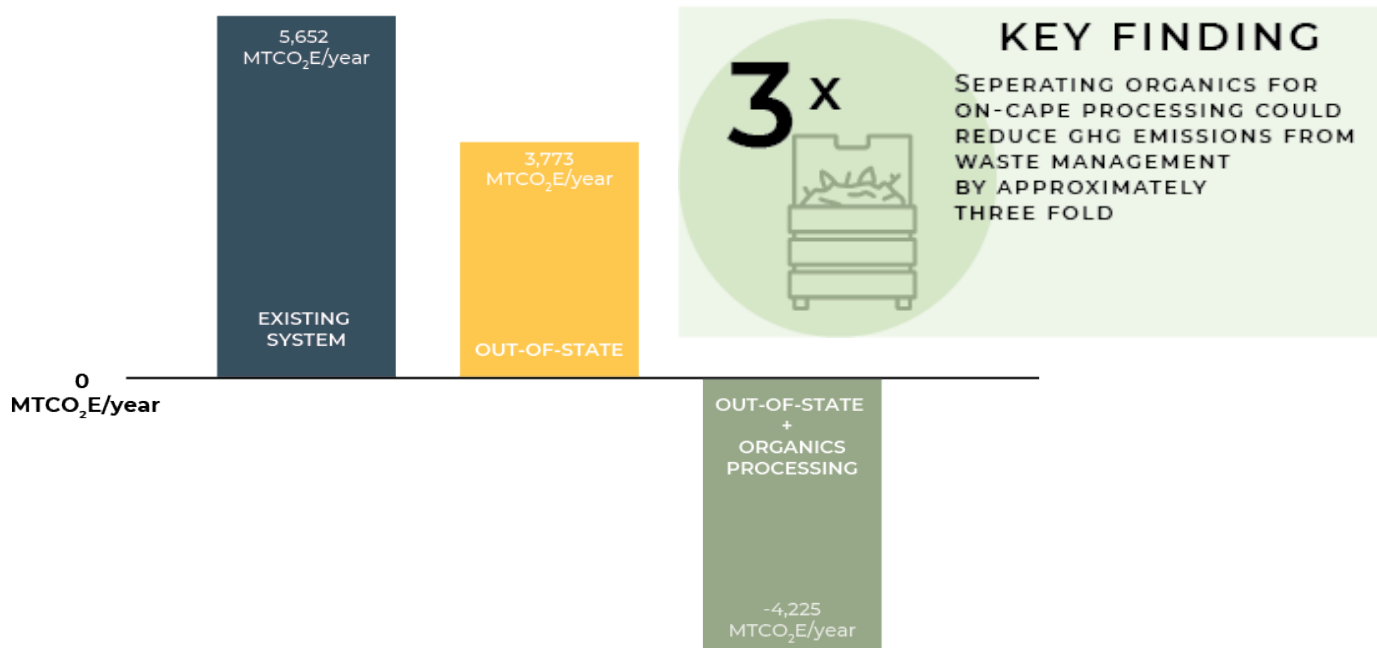
| No. | Landfill | State | Operator | Distance (miles) |
|-----|-------------------------|----------------|-------------------|------------------|
| 1 | King George | Virginia | Waste Management | 560 |
| 2 | Atlantic Waste Disposal | Virginia | Waste Management | 660 |
| 3 | Sunny Farms | Ohio | Waste Innovations | 800 |
| 4 | Tunnel Hill Reclamation | Ohio | Waste Innovations | 800 |
| 5 | Lee County | South Carolina | Republic Services | 920 |
| 6 | Taylor County | Georgia | GFL Environmental | 1,200 |

Source: Geosyntec Task 2-3, Figure 2-1



Projected Environmental Performance

Upper-bound greenhouse gas emissions estimated using EPA's WARM Model, based on life cycle analysis including transportation, processing, and disposal



Projected Costs Savings through 2035

OUT-OF-STATE DISPOSAL:
15-YEAR PROJECTED COST SAVINGS



WITH EXPECTED
COST ESTIMATE

WITH HIGH
COST ESTIMATE

Source: Geosyntec Task 4, Table 2-1, 2-2, 2-9, and 2-10

Credit: Cape Cod Commission

OUT-OF-STATE DISPOSAL
WITH DECENTRALIZED COMPOSTING:
15-YEAR PROJECTED COST SAVINGS*



WITH EXPECTED
COST ESTIMATE

WITH HIGH
COST ESTIMATE

*Projected savings adjusted for costs of program implementation
Source: Geosyntec Task 4, Table 2-1, 2-2, 2-9, and 2-10
Credit: Cape Cod Commission

BACKYARD COMPOSTING:
15-YEAR PROJECTED COST AVOIDANCE*



WITH EXPECTED
COST ESTIMATE

WITH HIGH
COST ESTIMATE

*Projected savings adjusted for costs of program implementation

Source: Geosyntec Task 4, Table 2-9 and 2-10
Credit: Cape Cod Commission



- **Uncertain Labor Market**
 - Impacts reliability and cost of services
- **Supply Chain Disruption**
 - Challenges ordering new equipment and parts
 - Prioritizing of large accounts
- **Rising Inflation and fuel costs**
- **Volatility in Commodities Markets**
- **Safety Impacts of E-Waste**
 - Lithium batteries

THE SOLID WASTE INDUSTRY IN
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Waste Advantage, November 2021



Thank you



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