DEEP Unit Based Pricing Working Group

Stakeholder Meeting October 28, 2020
# Today’s Presentation
Unit Based Pricing (UBP)

**PAYT:** Pay As You Throw  
**SMART:** Save Money and Reduce Trash

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capacity Crisis</td>
</tr>
<tr>
<td>2</td>
<td>Program Results</td>
</tr>
<tr>
<td>3</td>
<td>Detailed Costs</td>
</tr>
<tr>
<td>4</td>
<td>Vision</td>
</tr>
<tr>
<td>5</td>
<td>Environment &amp; Equity</td>
</tr>
<tr>
<td>6</td>
<td>FAQ’s</td>
</tr>
</tbody>
</table>
# Today’s Presentation Unit Based Pricing

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td><strong>Capacity Crisis</strong></td>
</tr>
<tr>
<td><strong>2</strong></td>
<td>Program Results</td>
</tr>
<tr>
<td><strong>3</strong></td>
<td>Detailed Costs</td>
</tr>
<tr>
<td><strong>4</strong></td>
<td>Vision</td>
</tr>
<tr>
<td><strong>5</strong></td>
<td>Environment &amp; Equity</td>
</tr>
<tr>
<td><strong>6</strong></td>
<td>FAQ’s</td>
</tr>
</tbody>
</table>
According to research firm Waste Business Journal (WBJ):

- The United States is on track to have 18 years of remaining landfill capacity left in 2020
- 85%-95% of US landfills are privately owned up from 36 percent in 1998, according to a report by the Solid Waste Association of North America (SWANA), https://www.waste360.com/landfill-operations/why-some-landfills-are-becoming-privatized-while-others-remain-public

- NIMBY makes landfills more difficult to site
- Of the 30 largest (mega landfills), only 5 are permitted to remain open after 2050
- No new WTE’s sited in US since 2005
- CT’s WTE’s all over 30 years old
New England (ME, VT, NH, MA, RI, CT) Landfill Capacity will Decrease 82% by 2050

Landfill Capacity Through 2050

- 16 million tons of annual landfill disposal capacity in the Northeast projected to decrease to 3 million tons
- Europe 30-year waste management trend – focus on waste reduction

Tipping Fees Estimates Out of State Disposal (between $177 and $292 per ton)

Assumptions:
- *Rail Transport Fees / per ton 300 miles starting at $11.85 per ton with 2% COLA (this varies greatly year to year 2% annual is conservative)
- *Rail Transport Fees / per ton 500 miles starting at $19.75 per ton with 2% COLA (this varies greatly year to year 2% annual is conservative)
- *Truck Transport Fees / per ton (30-60 miles) starting at $6 per ton with 2% COLA (this varies greatly year to year 2% annual is conservative)
- Recycling costs as a percent of waste tip $5 per year flat for $30 years (no source)

*SOURCE MA Material Management Capacity Study February 11, 2019, MSW Consultants
Cumulative Residential Waste Tip Expense through 2050 (Statewide)

Cumulative Waste Disposal Expense through 2050

- Open market disposal prices over time – No MIRA Facility
- No SMART (1) Impact

Prepared by WasteZero, Inc. for MIRA and the CT Dept. of Energy & Environmental Protection, 2020
Today’s Presentation Unit Based Pricing

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capacity Crisis</td>
</tr>
<tr>
<td>2</td>
<td>Detailed Program Results</td>
</tr>
<tr>
<td>3</td>
<td>Detailed Costs</td>
</tr>
<tr>
<td>4</td>
<td>Vision</td>
</tr>
<tr>
<td>5</td>
<td>Environment &amp; Equity</td>
</tr>
<tr>
<td>6</td>
<td>FAQ’s</td>
</tr>
</tbody>
</table>
UBP communities dispose of less residential MSW per capita than most Connecticut cities and towns. Worcester, MA, a large and complex municipality, throws away 324 lbs. per capita.

Note: Figures are calculated using MSW tonnage data provided by the municipalities themselves.
Where is CT Now

The state has been actively encouraging waste reduction for 30 years or more. It has had some impact.

- Bottle Bill (1980)
- Electronics, Paint and Mattress EPR
- Education Campaigns (What’s In, What’s Out)
- Aggressive Waste Reduction Goals
- National Packaging Innovation (down gauging, light weighting)
- National Recycling Campaigns
- Single-Stream Recycling
- Increased Consumer Access (curbside and drop-off recycling)
- Other Programs (yard waste, event recycling days, etc.)

US Average, 1990

900 lbs. per person / yr

Education & Innovation

CT Average, 2019

740 lbs. per person / yr
CT in 2050

On the current trajectory, per capita waste should still drop some. This assumes that additional innovation, education, and other policies will hold back the expected increase in packaging waste from online shopping and convenience/disposable lifestyles.

US Average, 1990: 900 lbs. per person / yr

2020: 740 lbs. per person / yr

2050: 590 lbs. per person / yr

Continued Education & Innovation

Continued Education Campaigns

Better Recycling Technology

Expanded Bottle Bill

Packaging EPR

Waste Bans

Increased Single-Use Bans

Increased Access

Curbside Food Waste Collection
CT with Unit Based Pricing

Stonington, CT (along with 556 communities in New England) throw away 40-60% less waste with SMART programs (there are no exceptions).
CT with Unit Based Pricing plus Food Waste

Curbside food waste collection—and other new program types—can reduce per capita waste even more.

US Average, 1990: 900 lbs. per person / yr
2020: 740 lbs. per person / yr
Stonington, CT Today: 386 lbs. per person / yr
Brattleboro/Curbside Food Waste: 225 lbs.
Comparing Different Methods UBP

Institute for Local Self Reliance (ILSR) 2017 Research
Avg. Annual Pounds Per Capita Residential Trash Disposal (PPC)

CT average without SMART (~740 PPC)

PAYT with Bags (Avg. 344 PPC)
PAYT with Variable Carts plus Curbside Food Collection (Avg. 510 PPC)
PAYT with Variable Carts no Curbside Food Collection (Avg. 560 PPC)
64 gallon Overflow Cart (Avg. 646 PPC)
SBWMA waste generation has plateaued since the addition of single stream recycling and curbside organics collection. The current cart rate structure is not facilitating municipal and state and waste reduction goals.

**Average 480 lbs/capita**

SBWMA (per capita trash generation)
UBP Does Not Increase Recycling Contamination

### ecomaine PAYT Communities

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Population</th>
<th>lbs/capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterville</td>
<td>15,722</td>
<td>235</td>
</tr>
<tr>
<td>Portland</td>
<td>66,318</td>
<td>265</td>
</tr>
<tr>
<td>Windam</td>
<td>17,001</td>
<td>268</td>
</tr>
<tr>
<td>Gorham</td>
<td>16,381</td>
<td>328</td>
</tr>
<tr>
<td>Sanford</td>
<td>20,798</td>
<td>340</td>
</tr>
<tr>
<td>Cumberland</td>
<td>7,211</td>
<td>370</td>
</tr>
<tr>
<td>North Yarmout</td>
<td>3,565</td>
<td>376</td>
</tr>
</tbody>
</table>

- 2017 ecomaine municipalities with PAYT had 44.8% less waste than non-PAYT communities
- Sanford, ME has less than a 5% contamination rate
- ecomaine’s Lissa Bittermann “After 2.5 years of extensive tracking we have seen no correlation between increased contamination and PAYT”
- Rhode Island Resource Recovery Corp has been charging for recycling contamination for the past 3 years. To date Middletown, RI the only curbside PAYT community in the state, has never even had a warning for contamination.
- Waste Management in SW Massachusetts also claims lower recycling contamination from PAYT communities.
Brattleboro VT UBP Waste plus Recycling + Curbside Foodwaste

Brattleboro, VT
Per capita

2015:
- Trash: 584.89
- Recycling: 233.58
- Compost: 61.75

2020:
- Trash: 224.54
- Recycling: 275.37
- Compost: 151.23
MA Program Comparison

MA Waste Program Type
2018 & 2019 lbs per capita

- 189 Towns Reported 2018 and 2019
- Hybrid communities include: 64-gallon and 32-gallon overflow programs, curbside tag programs, and variable cart programs
- Mix of transfer station, subscription and municipal curbside programs

Source: MA DEP Reporting (a combination of 2018 & 2019); data from individual municipalities where there was follow up
Nationwide Program Results are Predictable

MA Waste Program Type
2018 & 2019 lbs per capita

PAYT
Hybrid-PAYT
Non-PAYT

669 lbs/capita
578 lbs/capita
395 lbs/capita

CT Average 740
Mansfield, CT Carts 495
SBWMA Carts + Curbside Food 480
Stonington, CT 389
Brattleboro, VT Bags+ Curbside Food 225

Source: MA DEP Reporting (a combination of 2018 & 2019); data from individual municipalities where there was follow up
Results: Immediate & Predictable

**Waterville, Maine**
53% Decline in Waste

**Dartmouth, MA**
59% Decline in Waste

**Malden, MA**
52% Decline in Waste

**Sanford, MA**
40%+ Decline in Waste...Twice
SMART – Decreases Overall Generation – 20+%  

SMART’s price signal produces source reduction and moves materials into other recovery programs, such as donations and home composting.
Global Bag – Based SMART Efforts (Selected Examples)

<table>
<thead>
<tr>
<th>Europe</th>
<th>South Korea</th>
<th>Taiwan</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ZeroWaste Europe’s 1st Category Municipalities must use SMART.</td>
<td>• Seoul reduced waste 42%.</td>
<td>• Taipei uses bag-based SMART.</td>
</tr>
<tr>
<td>• Low annual per capita disposal (300-500 lbs.) with SMART in:</td>
<td></td>
<td>– Reduced waste by 33%</td>
</tr>
<tr>
<td>– Belgium</td>
<td></td>
<td>– Recycling rate is &gt;50%</td>
</tr>
<tr>
<td>– Austria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Switzerland</td>
<td><strong>SMART – Zurich</strong>&lt;br&gt;Reduced Waste 41%</td>
<td></td>
</tr>
<tr>
<td>– Estonia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– France</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Italy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Others</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scandinavia</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Seoul reduced waste 42%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Kyoto reduced waste more than 40%.</td>
</tr>
</tbody>
</table>
Today’s Presentation Unit Based Pricing

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capacity Crisis</td>
</tr>
<tr>
<td>2</td>
<td>Program Results</td>
</tr>
<tr>
<td>3</td>
<td>Detailed Costs of UBP Programs</td>
</tr>
<tr>
<td>4</td>
<td>Vision</td>
</tr>
<tr>
<td>5</td>
<td>Environment &amp; Equity</td>
</tr>
<tr>
<td>6</td>
<td>FAQ’s</td>
</tr>
</tbody>
</table>
Comparing UBP Program Types: Waste Reduction

Bag programs achieve lower disposal rates, averaging 44% waste reduction. Cart systems vary greatly in effectiveness, depending on the billing strategy, averaging 17% waste reduction.

The average reduction in trash for cart programs is 17%.
UBP Carts Pay for Disposal (plus a portion collection costs)

With cart programs, the cart size should be the responsibility of the property renter and not the property owner or the behavior will not change. The average home will spend $91 on cart fees annually.

Cart cost covers trash incineration+ some operational costs

<table>
<thead>
<tr>
<th><em>Cart Size (gallons)</em></th>
<th>Distribution</th>
<th>Number</th>
<th>Annual Revenue per Cart*</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>25.0%</td>
<td>1,188</td>
<td>48</td>
</tr>
<tr>
<td>32</td>
<td>41.0%</td>
<td>1,949</td>
<td>74</td>
</tr>
<tr>
<td>64</td>
<td>26.0%</td>
<td>1,236</td>
<td>122</td>
</tr>
<tr>
<td>96</td>
<td>8.0%</td>
<td>380</td>
<td>216</td>
</tr>
</tbody>
</table>

*Based on achieving the same per capita as Mansfield, CT. Mansfield is an aggressive target.

Cart programs where the landlord chooses the size are less fair to renters because they have no control of their true costs. Landlords simply add the annual fee to the rent.
With UBP, the average home will use less than one 33-gallon bag per week.

Based on data collected from hundreds of UBP programs:

- Residential trash will drop by 44% (from 5,014 tons/yr. to 2,808 tons/yr.)
- 2,808 tons per year equals
  - 1,056 lbs. per home per year
  - 20.31 lbs. per home each week
- A 33-gallon bag collected through a UBP program contains about 21.25 lbs. of trash
- That’s less than one bag per week per hh
# How the Bags Pay for Trash

The average home will spend $71 on bag fees annually (plus reduced expense on standard trash bags).

| 33 – gal. | 13- gal |

<table>
<thead>
<tr>
<th><strong>$1.50 per Bag</strong></th>
<th><strong>$.80 per Bag</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bag &amp; Bag Distribution</td>
<td>$0.31</td>
</tr>
<tr>
<td>Trash Incineration+ some operational costs</td>
<td>$1.19</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1.50</strong></td>
</tr>
</tbody>
</table>
Comparing SMART Program Types: Up-Front Costs

Carts require an upfront investment, bag programs do not.

<table>
<thead>
<tr>
<th>Cart Size (gal.)</th>
<th>Purchase Cost (per unit)</th>
<th>Distribution Costs (per unit)</th>
<th>Direct Costs</th>
<th>Including Start up Logistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>$32.00</td>
<td>$5.00</td>
<td>$43,965</td>
<td>$50,560</td>
</tr>
<tr>
<td>32</td>
<td>$50.00</td>
<td>$5.00</td>
<td>$107,180</td>
<td>$123,257</td>
</tr>
<tr>
<td>64</td>
<td>$60.00</td>
<td>$5.00</td>
<td>$80,326</td>
<td>$92,375</td>
</tr>
<tr>
<td>94</td>
<td>$70.00</td>
<td>$5.00</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>$231,471</td>
<td>$266,192</td>
</tr>
</tbody>
</table>

Cart Program

Cart sizes not currently in the municipal inventory must be purchased.

Carts must be distributed to every home.

The logistics of the roll-out must be carefully planned and managed.

Bag Program

An upgrade to camera or software for trucks to monitor compliance is @ $2,500

+ @$5,000 for compliance during start up for either program

A SMART Bag program requires minimal start up expense.

Based on same cart mix as Mansfield, CT
Comparing SMART Program Types: Ongoing Costs

Ongoing costs are the expenses required to run and maintain a SMART program.

Projected Annual Ongoing Costs

<table>
<thead>
<tr>
<th>Projected Annual Ongoing Costs</th>
<th>$0</th>
<th>$4,000</th>
<th>$8,000</th>
<th>$12,000</th>
<th>$16,000</th>
<th>$20,000</th>
<th>$24,000</th>
<th>$28,000</th>
<th>$32,000</th>
<th>$36,000</th>
<th>$40,000</th>
<th>$44,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carts</td>
<td>$44,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bags</td>
<td>$1,200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cart Program

Residents must have the option to change cart size, in order to continue to reduce waste. Approximately 5% per year.

The municipality must set up a regular billing mechanism for each home based on cart size. Approximately $0.33 per month per household.

Progress toward program goals requires ongoing outreach and education. Approximately $0.25 per month per household.

Bag Program

There is a nominal cost to review monthly statements. GPS services $1,200 per year.

A SMART Bag program can be managed with minimal effort and cost to the town.

Projected costs based on Austin, TX VRC per HH program costs.
# Comparing SMART Program Types

<table>
<thead>
<tr>
<th></th>
<th>Current Waste Program</th>
<th>UBP Bag</th>
<th>UBP Cart</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenues</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Bag Revenue</td>
<td>$0</td>
<td>$261,579</td>
<td>$0</td>
</tr>
<tr>
<td>Net Cart Revenues</td>
<td>$0</td>
<td>$0</td>
<td>$434,139</td>
</tr>
<tr>
<td>Tax Revenue</td>
<td>$937,250</td>
<td>$528,267</td>
<td>$490,125</td>
</tr>
<tr>
<td>Total Revenues</td>
<td>$937,250</td>
<td>$789,846</td>
<td>$924,264</td>
</tr>
<tr>
<td><strong>Expenses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curbside Disposal</td>
<td>$335,008</td>
<td>$187,604</td>
<td>$278,057</td>
</tr>
<tr>
<td>Recycling Disposal</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Cart Management (Billing, Change Outs, Marketing)</td>
<td>0</td>
<td>0</td>
<td>$43,965</td>
</tr>
<tr>
<td>Other Solid Waste Costs</td>
<td>$602,242</td>
<td>$602,242</td>
<td>$602,242</td>
</tr>
<tr>
<td>Total Expenses</td>
<td>$937,250</td>
<td>$789,846</td>
<td>$924,264</td>
</tr>
</tbody>
</table>

*Total department costs are 16% less with UBP Bag Program*
Comparison SMART Bags and SMART Carts?

SMART (unit based pricing) is the single best way to reduce waste.

<table>
<thead>
<tr>
<th>Category</th>
<th>SMART Bag Program</th>
<th>SMART Cart Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Generation</td>
<td>285-435 lbs / per capita</td>
<td>480-630 lbs / per capita</td>
</tr>
<tr>
<td>Average Annual HH Expense (new out of pocket)</td>
<td>*$71.00</td>
<td>$91.00</td>
</tr>
<tr>
<td>Startup Expense</td>
<td>$5,000 Cameras and software</td>
<td>$266,192 Carts and distribution of additional sizes</td>
</tr>
<tr>
<td>On Going Annual Expense</td>
<td>$2,400 Enforcement and compliance management</td>
<td>$43,000 Monthly HHbilling, cart switch outs and marketing</td>
</tr>
<tr>
<td>Total Net Annual Expense (Tip and Collection)</td>
<td>$798,846</td>
<td>$924,264</td>
</tr>
</tbody>
</table>

*The average home spends $27 per year on regular and will likely save on this expense*
Considerations for SBWMA

- SBWMA cart rate structures are not sustainable
  - California Law Proposition 218 indicates that if a municipality charges for a program, than full cost accounting must demonstrate that the charges are directly linked to the services that are being provided. The current cart rates may not be in compliance.

- The current cart program does not maximize Vehicle Miles Traveled (VMT)
- Cart rates are less fair to renters that don’t select their own size and actually disincentivize waste reduction when landlords simply choose a larger cart as the default and add that cost to the rent without giving the renter the option.

- Waste reduction has Plateaued in SBWMA communities
- In order to reduce waste, create fair and legally compliant rate structures, cover the cost of new diversion programs and reduce VMT’s, SBWMA communities should consider working toward a co-collection system with a two tiered rate structure. Using one single large cart with PAYT garbage bags along with bags designated for other materials such as hard to recycle plastics, food waste and other recyclables. The basic principals of such a program are as follows:
## Today’s Presentation Unit Based Pricing

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capacity Crisis</td>
</tr>
<tr>
<td>2</td>
<td>Program Results</td>
</tr>
<tr>
<td>3</td>
<td>Detailed Costs</td>
</tr>
<tr>
<td>4</td>
<td>Vision</td>
</tr>
<tr>
<td>5</td>
<td>Environment &amp; Equity</td>
</tr>
<tr>
<td>6</td>
<td>FAQ’s</td>
</tr>
</tbody>
</table>
What We Know: CT Residential Waste Make Up is Complicated

Communities with curbside collection are the most straightforward to implement. Other communities have financial incentives and control mechanisms that would allow for a SMART rate structure such as subscription communities that pay tip fees through property taxes or communities where all of the waste is run through the municipal transfer station.

There are 17 (estimated) subscription communities where the tip fee is paid through taxes. These communities have an incentive to use a SMART system to prevent subsidizing waste from neighboring towns.
What We know: Organics Make up 35%

UBP would reduce residential MSW disposals by 44% overall. ~290,000 tons of food and yard/organic would still remain, which could be targeted for removal leveraging SMART’s pricing incentives.
What We Know: Unit Based Pricing will Cost Less

SMART costs residents less. Without SMART, the cost of disposal is hidden in the taxes or flat subscription fees, so residents still pay it.
Vision

The ultimate materials management system would:

- Achieve 60% diversion by 2024 and create a foundation for success of other waste reduction programs.
- Incentivize reuse and source reduction.
- Minimize costs to municipalities and residents.
- Minimize vehicle miles travelled (VMTs).
- Prioritizes social justice (minimizes dependence on incineration).
- Provide consistent feedstocks to attract investment in the local circular economy.
- Aggregate resources so that CT residents have the benefit of scaled buying power.
How Co-Collection Works

1. Resident separates material types at home into official, color-coded bags

2. All bags go into one cart

3. All material goes into the same truck on the same collection route

4. Materials are separated at transfer station

5. Waste streams are illustrative:
   - To materials recovery facility (MRF)
   - To compost facility
   - To glass recycler
   - To single-use plastics (SUPs) recycler
   - To landfill

Prepared by WasteZero, Inc. for MIRA and the CT Dept. of Energy & Environmental Protection, 2020
Co-Collected Materials Could be Sorted at Central Locations
(Starting with Food and Trash Only)

1. Resident separates material types at home into color-coded bags.

2. All bags go into the same curbside cart.

3. All material goes into the same truck on the same collection route.

4. Materials are unloaded and separated at the transfer station or sort facility.

5. Possible other recycling (e.g. glass) is separated:
   - To AD facility
   - To WTE

Prepared by WasteZero, Inc. for MIRA and the CT Dept. of Energy & Environmental Protection, 2020
Co-collection is a single solution for materials management system that would:

- Residents would use an official food waste bag and place it in their current receptacle along with the official unit-based trash bag.

- Institute a UBP pricing structure that would work in both municipal subscription collection systems equally well

- Create sufficient infrastructure so that universal food waste collection could be available to all residential homes, multi-family units, and businesses within the state.

- UBP pricing structure would incentivize participation on all waste diversion programs

- Food waste collection would not require any operational change for the hauler or municipality (same trucks, same receptacles, and no additional cost for collection).

- No additional VMTs, as all food and trash are currently collected together as trash.

- Aggregate resources so that CT residents have the benefit of scaled buying power.
High-Level Description of a MIRA SMART Program

1. The program would be:
   a. Unit based – using different bag sizes to cover different levels of disposal
   b. Administered by MIRA
   c. Offered regionwide or statewide

2. Municipal participation would be voluntary, as additional legislation would be needed to mandate.

3. Participating municipalities or haulers would pay $0 tip fees because:
   a. MIRA would collect revenue from the sale of official SMART trash bags within the region or around the state.
   b. MIRA would use the revenues to pay for trash disposal costs

4. Excess revenues above the cost of disposal could be rebated back to municipalities and haulers or used to pay for infrastructure (depending on the outcome of the facility), or alternative disposal infrastructure or programs.

5. The program would start with residential trash, but could later be expanded to include commercial trash.

6. The program would establish an infrastructure to which additional waste reduction innovations could be added. It would also improve their effectiveness:
   a. Food waste
   b. Glass
   c. Hard-to-recycle plastics
   d. Other
The AD capacity needed in CT to handle all food waste is equal to 13 additional Quantum (sized) facilities. To process all organics, an additional 24 Quantum sized facilities would be necessary.
Results with UBP and Universal Food / Organics Collection

Impact of UBP + Universal Food / Organics Waste Programs on the Waste Stream
(Thousands of Tons Disposed Annually)

- **No SMART**
  - Residential (Single-Family): 1,035.0
  - Commercial & Multi-Family: 1,265.0

- **Residential SMART**
  - Residential (Single-Family): 579.6
  - Commercial & Multi-Family: 1,265.0

- **Add Commercial SMART**
  - Residential (Single-Family): 579.6
  - Commercial & Multi-Family: 885.5

- **Add Residential Food Waste Collection**
  - Residential (Single-Family): 463.7
  - Commercial & Multi-Family: 885.5

- **Add Commercial Food Waste Collection**
  - Residential (Single-Family): 463.7
  - Commercial & Multi-Family: 659.7

Overall waste reduction from current.

Annual Capacity without Mid-CT (MIRA)
WTE: 1,539,497 tons
Today’s Presentation Unit Based Pricing

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Capacity Crisis</td>
</tr>
<tr>
<td>2</td>
<td>Program Results</td>
</tr>
<tr>
<td>3</td>
<td>Detailed Costs</td>
</tr>
<tr>
<td>4</td>
<td>Vision</td>
</tr>
<tr>
<td>5</td>
<td>Environment &amp; Equity</td>
</tr>
<tr>
<td>6</td>
<td>FAQ’s</td>
</tr>
</tbody>
</table>
The estimated trash reductions below assume full participation by all municipalities.

<table>
<thead>
<tr>
<th>Annual Enviro. Impact</th>
<th>Tons of Trash Reduced</th>
<th>Metric Tons of CO2 Reduction</th>
<th>Cars Removed from Roads</th>
<th>Gallons of Gas Saved</th>
<th>Homes Powered</th>
<th>Solar Panels Installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential SMART Only</td>
<td>455,400</td>
<td>859,000</td>
<td>168,000</td>
<td>96,267,000</td>
<td>64,000</td>
<td>887,000</td>
</tr>
<tr>
<td>Res. + Commercial SMART</td>
<td>834,900</td>
<td>1,574,000</td>
<td>309,000</td>
<td>176,490,000</td>
<td>117,000</td>
<td>1,625,000</td>
</tr>
</tbody>
</table>
Waste Management Choices Disproportionately Affect Underserved Communities

174 million tons of trash from 325 million Americans in 40,000 municipalities is funneled into just over 1,000 landfills and 85 incinerators.

• UBP would eliminate the need to replace closing landfills and incinerators, helping reverse the legacy of injustice in historically burdened neighborhoods.

• As municipal waste disposal costs increase so do property taxes. Landlords pass on these costs through increased rents. In today’s system, renters bear the cost of community members that don’t bother to recycle. Whereas a UBP system would give these families control of their own expenses, and they would not be subsidizing the wasteful behavior of others.
# Today’s Presentation Unit Based Pricing UBP

**PAYT**: Pay As You Throw  
**SMART**: Save Money and Reduce Trash

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td>Capacity Crisis</td>
</tr>
<tr>
<td><strong>2</strong></td>
<td>Program Results</td>
</tr>
<tr>
<td><strong>3</strong></td>
<td>Detailed Costs</td>
</tr>
<tr>
<td><strong>4</strong></td>
<td>Vision</td>
</tr>
<tr>
<td><strong>5</strong></td>
<td>Environment &amp; Equity</td>
</tr>
<tr>
<td><strong>6.</strong></td>
<td>FAQ’s</td>
</tr>
</tbody>
</table>
Frequent Objections

Is a UBP bag program worth it, when we are trying to eliminate single use plastics?

Pounds of Household Waste Per Year

- **Current Waste**: 1850 pounds per year (7 lbs of trash bags per year)
- **UBP with Variable Rate Carts**: 1535 pounds per year (5 lbs of trash bags per year)
- **UBP with Bags**: 1036 pounds per year (6 lbs of trash bags per year)

*Average home uses about 3 bag per week at about 1.0 mil thick ($27 annual expense)*

**Average home uses .95 PAYT bag per week at 1.5 mil thick**
With Recycling Prices on the Rise is it a Good Time to Implement SMART?
Is Recycling here to stay?

The recycling industry is made up of multiple sectors.

- The US recycling industry generates an economic impact of $117 billion annually
  - Equal to the publishing industry, dental industry and the automotive repair industry. (ISRI)
- The recycling industry has seen economic growth for the past 113 months
- The waste industry generates an economic impact of $50 billion dollars annually
- Based on the respective tonnages:
  - Every ton of recycling recovered from disposal yields a positive economic benefit of $801
  - Every ton of material disposed yields an economic impact of $109.
- The delta of $692, means that for every ton we dispose instead of divert there is a negative economic impact of $692.

Converting and manufacturing create between 18 and 93 jobs per every 10,000 tons recycled including: Paper, metals, plastic and glass industries ISLR

Sources ISRI, USEPA Fact and Figures, RW Beck, Environmental Research Foundation, Institute for Local Self Reliance
Recycling markets have been weak for the past few years due to single stream contamination and China’s policy. The recycling infrastructure in the US is adjusting and markets are predicted to rebound. Recycling is a commodity and there will always be highs and lows. SMART is the best way to manage waste regardless of the recycling costs because it promotes source reduction and reuse. The recycling tip fee could go as high as $170 per ton, and a SMART system will still cost less money.

<table>
<thead>
<tr>
<th>No SMART</th>
<th>SMART</th>
<th>No SMART</th>
<th>SMART</th>
<th>No SMART</th>
<th>SMART</th>
<th>No SMART</th>
<th>SMART</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Tonnage</td>
<td>1,019,367</td>
<td>570,778</td>
<td>1,019,367</td>
<td>570,778</td>
<td>$1,019,367</td>
<td>$570,778</td>
<td>$1,019,367</td>
</tr>
<tr>
<td>Recycling Tonnage</td>
<td>268,067</td>
<td>449,136</td>
<td>268,067</td>
<td>449,136</td>
<td>$268,067</td>
<td>$449,136</td>
<td>$268,067</td>
</tr>
<tr>
<td>Waste Tip</td>
<td>$75</td>
<td>$75</td>
<td>$75</td>
<td>$75</td>
<td>$75</td>
<td>$75</td>
<td>$75</td>
</tr>
<tr>
<td>Recycling Tip</td>
<td>$0</td>
<td>$0</td>
<td>$40.00</td>
<td>$40.00</td>
<td>$80.00</td>
<td>$80.00</td>
<td>$170</td>
</tr>
<tr>
<td>Trash Disposal $</td>
<td>$76,452,541</td>
<td>$42,808,335</td>
<td>$76,452,541</td>
<td>$42,808,335</td>
<td>$76,452,541</td>
<td>$42,808,335</td>
<td>$76,452,541</td>
</tr>
<tr>
<td>Recycling $</td>
<td>$10,722,665</td>
<td>$17,965,440</td>
<td>$21,445,331</td>
<td>$35,930,879</td>
<td>$45,571,328</td>
<td>$76,353,118</td>
<td></td>
</tr>
<tr>
<td>Total Cost</td>
<td>$76,452,541</td>
<td>$42,808,335</td>
<td>$87,175,206</td>
<td>$60,773,774</td>
<td>$97,897,871</td>
<td>$78,739,214</td>
<td>$122,023,869</td>
</tr>
<tr>
<td>Savings - Comparison</td>
<td>$33,644,206</td>
<td>$26,401,432</td>
<td>$19,158,658</td>
<td>$2,862,416</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Waste tip fees are expected to rise significantly over the next decade. The average waste tip fee for the 40 DEEP DIVE communities was $75 per ton. Most communities are tied to a CPI price escalator. Communities that have negotiated new contracts since the start of the program have seen much greater increases than CPI.
Has PAYT worked in Massachusetts?
Massachusetts Waste Generation vs Population and Economic Growth

Gross Domestic Product Grew 16% since 2008.

Sources: Beyond 2000 Solid Waste Plan, Solid Waste Pathway to Zero Waste April 2013, MA 2030 Solid Waste Master Plan September 2019, US Census. Based on total population (ie multi-family is not factored out)
SMART – Decreases Overall Generation – 20+% 

SMART’s price signal produces **source reduction** and moves materials into all other programs, including donations and home composting.

**Already covered this slide**
Frequent Concerns

Will the Recycling will be Contaminated?

*Some observe recycling is less contaminated in communities with unit based pricing because residents pay attention to the program and its rules.*
SMART Will Not Increase Recycling Contamination

ecomaine PAYT Communities

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Population</th>
<th>lbs/capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterville</td>
<td>15,722</td>
<td>235</td>
</tr>
<tr>
<td>Portland</td>
<td>66,318</td>
<td>265</td>
</tr>
<tr>
<td>Windam</td>
<td>17,001</td>
<td>268</td>
</tr>
<tr>
<td>Gorham</td>
<td>16,381</td>
<td>328</td>
</tr>
<tr>
<td>Sanford</td>
<td>20,798</td>
<td>340</td>
</tr>
<tr>
<td>Cumberland</td>
<td>7,211</td>
<td>370</td>
</tr>
<tr>
<td>North Yarmout</td>
<td>3,565</td>
<td>376</td>
</tr>
</tbody>
</table>

- 2017 ecomaine municipalities with PAYT had 44.8% less waste than non-PAYT communities
- Sanford, ME has less than a 5% contamination rate
- ecomaine’s Lissa Bittermann “After 2.5 years of extensive tracking we have seen no correlation between increased contamination and PAYT”
- Rhode Island Resource Recovery Corp has been charging for recycling contamination for the past 3 years. To date Middletown, RI the only curbside PAYT community in the state, has never even had a warning for contamination.
- Waste Management in SW Massachusetts also claims lower recycling contamination from PAYT communities.

Already covered this slide
Anticipated Concerns

Does waste simply shift from the residential stream into the commercial stream—

Bob Moylan, former Commissioner of Public Works  
(Worcester, MA):

“Some businesses had to be careful about locking or securing their dumpsters behind fences, however most businesses had no issues. There was no noticeable increase in the overall commercial waste disposed after PAYT implementation. The City included all city facilities in the PAYT program including police, fire etc.”
There must be a better way. We should study this more thoroughly and try other solutions first?

The State of Connecticut, as well as other states and cities around the country have worked for decades to find programs that increase recycling and reduce waste.

SMART is the single most effective way to reduce trash while also saving money.
West Hartford Switch from Bi-weekly to Weekly Recycling

Year to date comparison

2016: 26% MSW, 74% Recycling

2017: 26% MSW, 74% Recycling

Compared to SMART

Legend:
- MSW
- Recycling
Westport banned plastic bags about 10 years ago. Although the ban was important for multiple reasons, its effect on waste volume is minimal.

10-Year Estimated Plastic Bag Ban Results:
- 390 tons
- $27,300 in disposal savings

10 Year Estimated SMART Results:
- 80,000 tons
- $7 million in disposal savings
This information does not tell the entire picture. What about all the programs that failed?

*There are hundreds of SMART bag programs around the world.*

*Only a handful of programs that have been discontinued. Two are located in Connecticut. The programs were discontinued for political reasons, not because of poor results.*
Case Study: East Lyme, CT

The East Lyme Selectman Decided to Discontinue the Program in 1998 for political reasons

- When East Lyme’s Selectman discontinued the program, trash went up from 4,571 tons (1997) to 7,179 tons (1998).

- **East Lyme’s current per capita trash is 650.**

- Stonington implemented the program at the same time as East Lyme, has a similar demographic make up, and nearly the same population. **Stonington’s current per capita trash is 389.**

- Stonington had a referendum and the strong majority of residents chose to keep the program.

- Stonington has saved approximately $6.5 million dollars since the program’s inception.
Case Study: Columbia, CT

Columbia voted at a Town Hall Meeting to Eliminate the Program

Program Results:

- Municipal Solid Waste Decreased by 54%
- MSW Hauling Costs and tipping fees reduced by 49%
- Recycling hauling costs and tipping fees reduced by $7,481.72 in just four months
- Bag Revenue exceeded previous expectations:
  - $25,000 was budgeted for the entire 6 month trial and, only 4 months into the trial, net bag revenues exceeded this number at $28,000
- Recycling rate increased from 27% to 41%
- Despite the SWRAC recommendations, and overall program results, the Town voted to eliminate the program in February 2011

MSW Hauling Costs & Tipping Fees (Sept. thru Dec)

- 2009: $29,439.62
- 2010: $12,947.05

Costs & Fees in Dollars ($)
Frequent Concerns

My neighbors will not comply and therefore it will cost me more and not them.

*Compliance from neighboring state programs, as well as Stonington, is approximately 99%.*

*Studies also show that there is no notable increase in illegal dumping.*
How Can the Town Enforce the SMART Program?

SMART compliance is very high and enforcement is usually not a challenge.

Most compliance issues happen during the first 6 weeks of a new program.

Most communities manage these with existing staff.

- Additional support can be provided if compliance is a concern.

A tiered enforcement system is recommended where one is not in place.

In all instances, the cost of enforcement has been a fraction of the financial savings related to SMART.

<table>
<thead>
<tr>
<th>Sanford, ME – City-Reported Compliance Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1</strong></td>
</tr>
<tr>
<td>96.3%</td>
</tr>
</tbody>
</table>
Automated Collection
Typical Ongoing Compliance Process

Official bags are placed in automated carts for collection

Trucks are equipped with video cameras mounted to the hopper (standard on most automated trucks)

Camera clearly shows what goes into hopper – driver can easily see bags on camera inside truck

Driver pushes one button on Tablet / app (or similar solution) if non-compliant bags are spotted

Non-compliant addresses are auto-uploaded to central database so notices (or citations) can go out.

Loads can easily be spot checked during start up phase.
Residents will not like it.

Residents tend to like the program once they have given it a try.
Strong Support for Pay-as-You-Throw

In a Public Policy Polling survey of ~1,000 PAYT participants from 10 communities, significant majorities said they are satisfied with PAYT, see it as fair and easy, and believe it is effective.

- **Favorability**
  79% have either a very or somewhat favorable opinion of PAYT, with a majority (52%) having a very favorable opinion.

- **Fairness**
  More than two-thirds—68%—see the program as fair.

- **Ease of Participation**
  74% think it is not difficult to take part in PAYT.

- **Effectiveness**
  89% said PAYT is performing better than or as well as they expected.

- **Minimal Political Impact**
  77% said they are either more likely to vote for leaders who brought in PAYT or that it does not make a difference in their vote.

![Participants in Pay-as-You-Throw Programs Have a Highly Favorable View of Them.](chart)

Do you have a favorable or unfavorable opinion of pay-as-you-throw?

WasteZero Overview

- In business since 1991 and driven to **cut trash in half in the US**
- **National leader** in municipal waste reduction:
  - ~$1.7B in savings and financial impacts
  - Support nearly 800 municipal waste reduction programs nationwide
- Deep experience with a **full range** of waste reduction approaches
- Certified **B Corp (Benefit Corporation)**, meeting rigorous social and environmental standards

*Our programs are effective, reducing waste by 44% on average, with some surpassing 50%.*