







A SMART Way to Avert a Trash Crisis & Save Money

- 1 SMART Overview
- 2 Current Situation in CT
- 3 How SMART Could Work

Kristen Brown
Vice President of Municipal Partnerships
Waste Zero, Inc.

SMART Overview

SMART is a Better Way to Charge for Waste

Public Service	Measuring Device	Pay for What You Use
Electricity		
Water		
Gas		
Trash	<p data-bbox="653 1053 942 1096">Tax or Flat Fee</p> 	<p data-bbox="1122 1100 1765 1210">Those who use less subsidize those who use more.</p>

SMART (Save Money and Reduce Trash)

Two primary ways to achieve a SMART (unit based) rate structure.



Variable-Rate Carts (VRCs)

Residents choose from among different sizes of carts, paying more for larger carts



Bags within Carts

Residents dispose of waste in official municipal bags (the price of which helps pay for trash service). Bags can be used with manual or cart-based collection systems.

SMART programs are designed to reduce waste and save money by

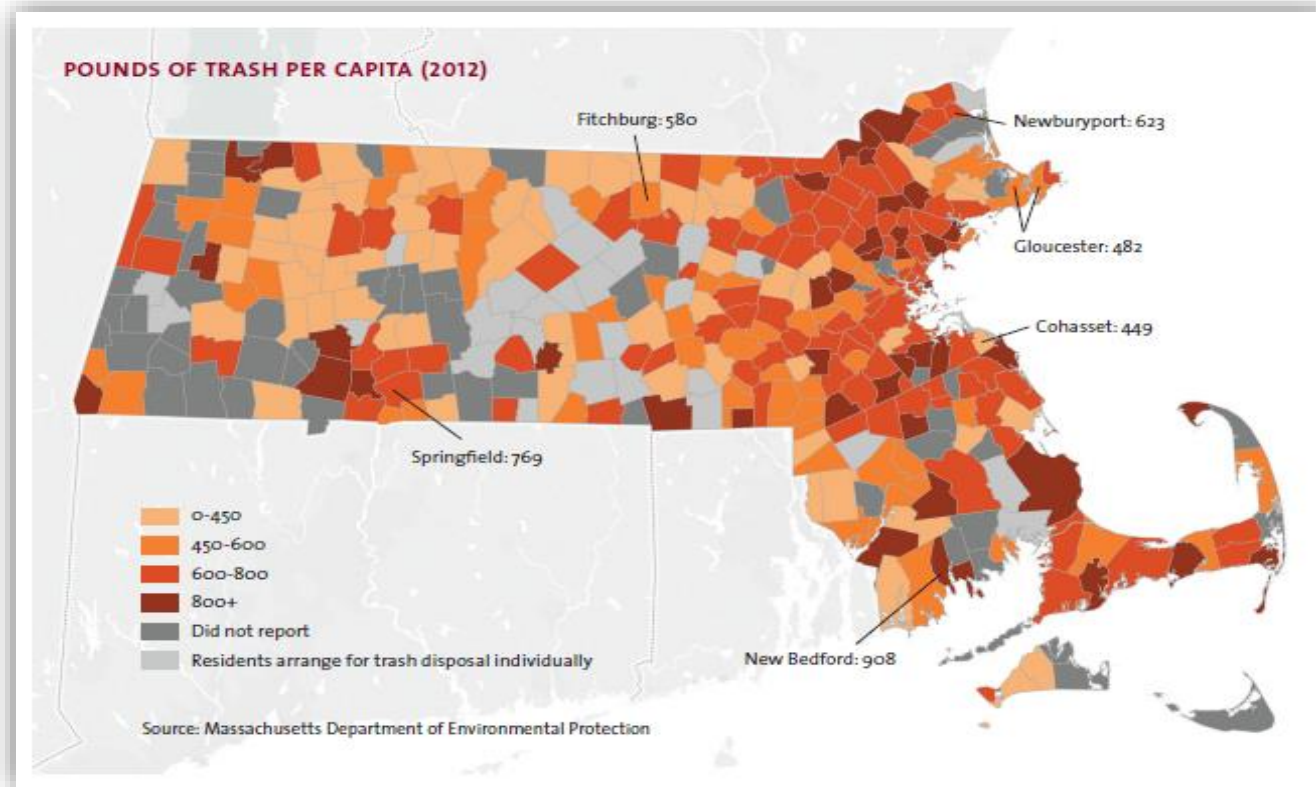
- 1 Charging residents “per unit” for trash service
- 2 Providing recycling “for free”
- 3 Incentivizing residents to reduce waste



Note: VRC pounds per capita data comes from a WasteZero analysis of a range of VRC programs across the US. These programs were highly variable in the waste reduction they were able to deliver. The bag-based data is for the state of MA, and comes from *CommonWealth Magazine*, Jan. 13, 2015. The results of these programs are highly consistent and predictable.

Important Benchmark: Per Capita Disposal

For maximum accuracy, Annual Residential Per Capita Waste Disposal is the best way benchmark the amount of waste disposed after recyclables and other materials are diverted from the waste stream.

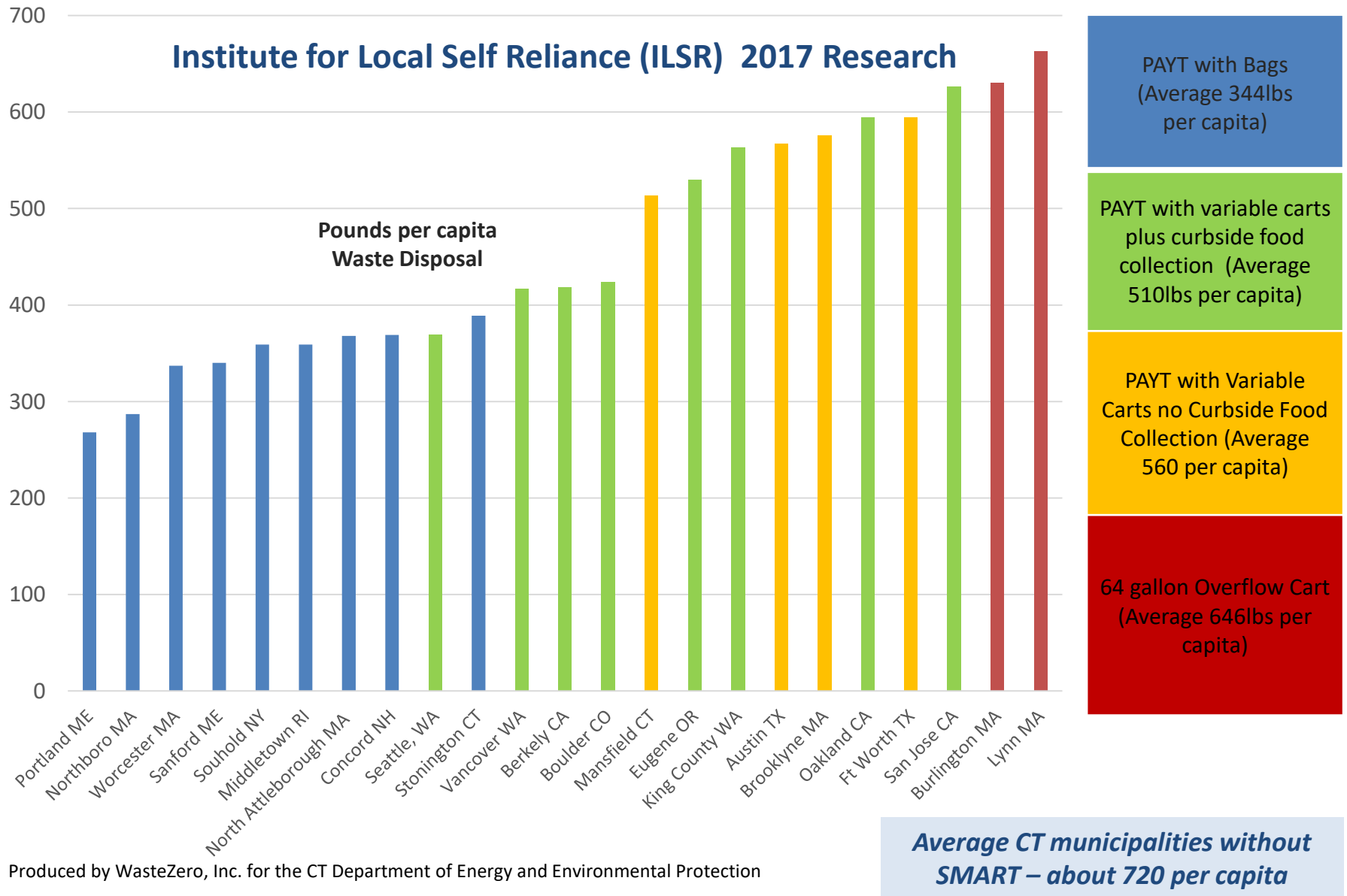


Source: *Seriously, Is This the Best We Can Do?*, Commonwealth Magazine, Winter 2015

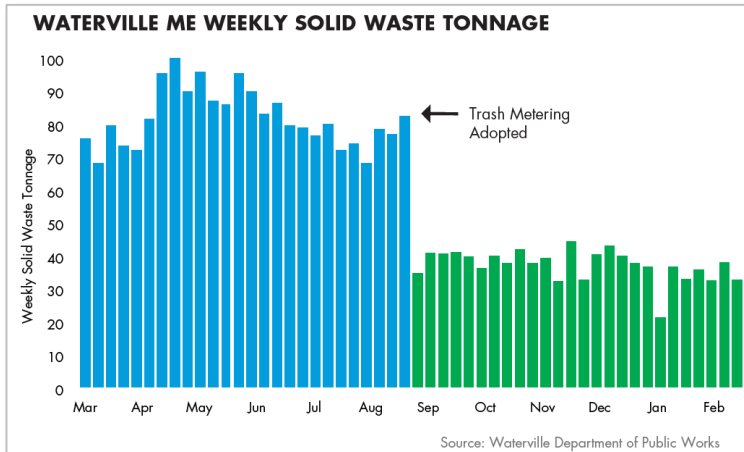
- EPA SMART BET uses per capita disposal.
- Zero Waste Europe uses per capita disposal.
- 432 lbs. per capita is the MA average for PAYT communities.

Using recycling rates as a benchmark can create a false sense of accomplishment.

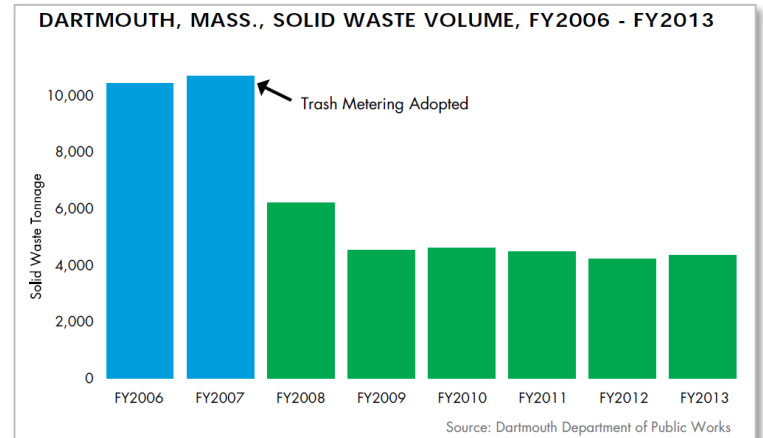
Portland Maine ranked #1, disposing of less waste per person and moving closer to Zero Waste than peer communities.



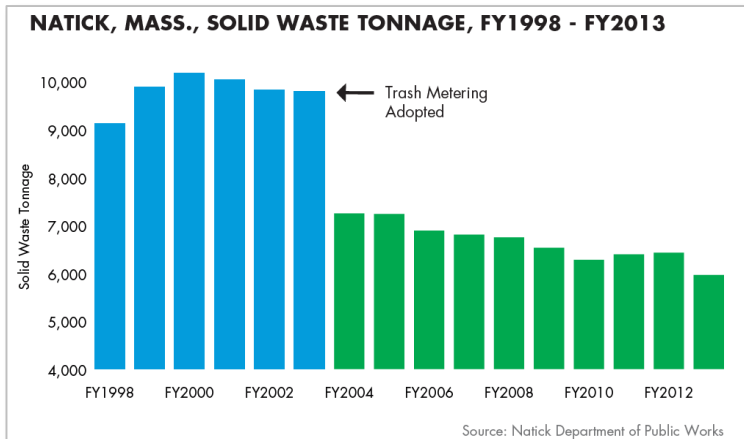
Results: MSW Reduction of 44% on Average



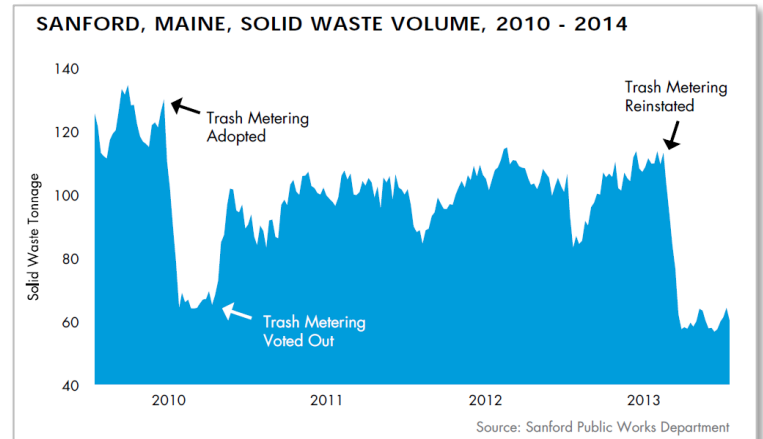
WATERVILLE, MAINE
53% DECLINE IN WASTE



DARTMOUTH, MA
59% DECLINE IN WASTE



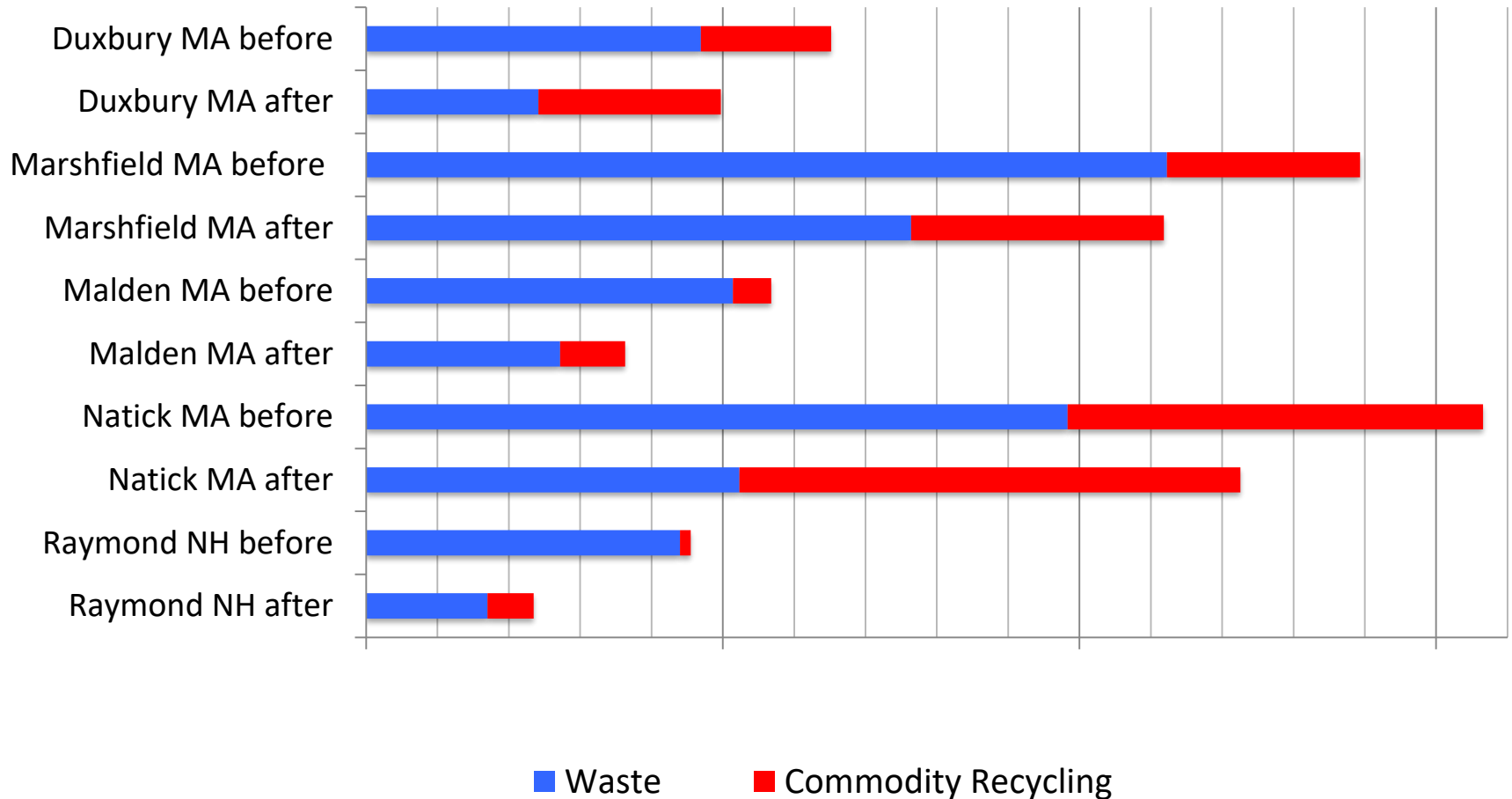
NATICK, MA
35% DECLINE IN WASTE



SANFORD, ME
40%+ DECLINE IN WASTE...TWICE

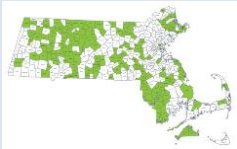




SMART – Decreases Overall Generation – 20+%

SMART's price signal produces source reduction and moves materials into all other programs, increases donations and home composting.



Used Nationally and Internationally

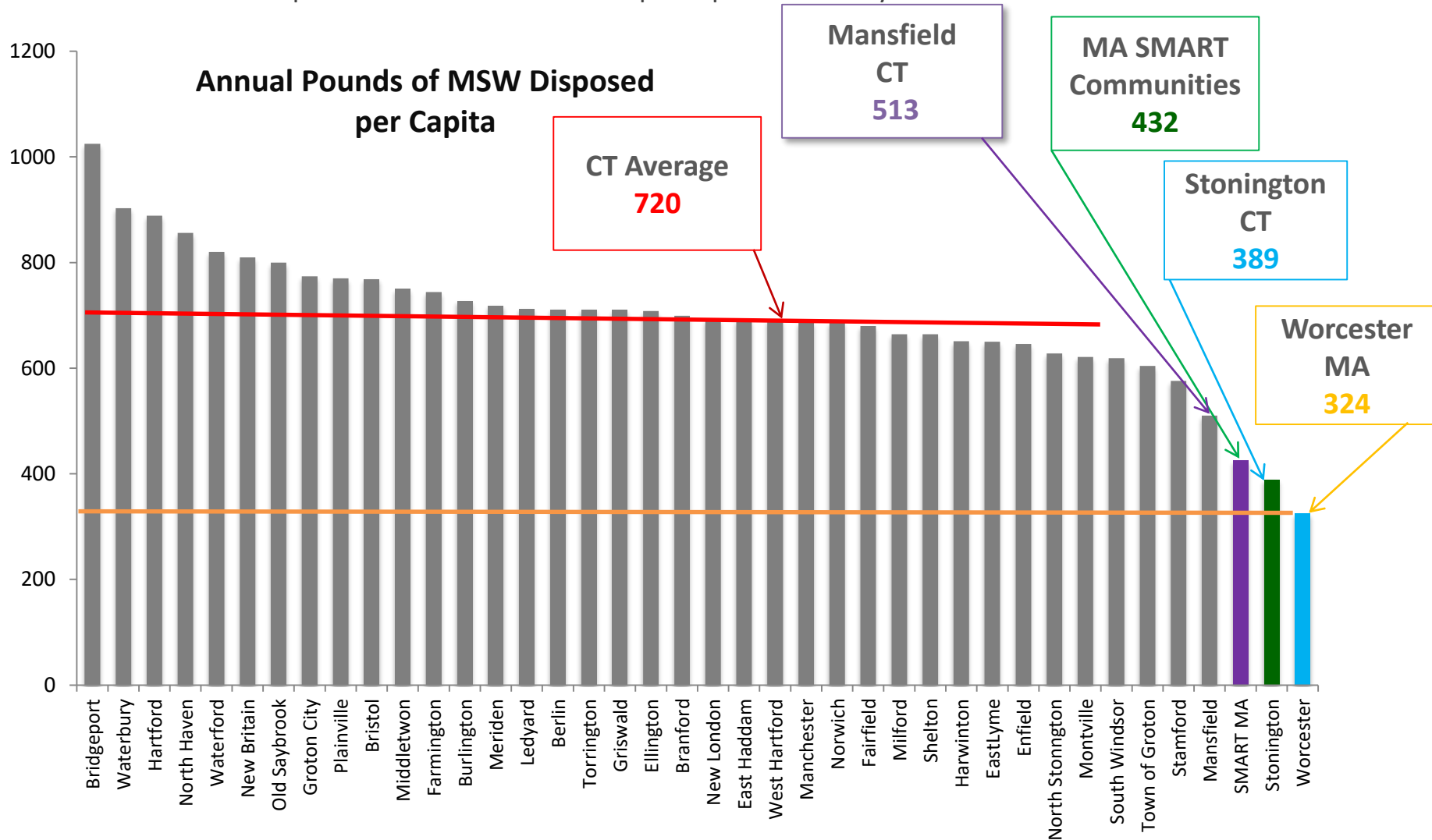
In the US, SMART is mandatory in WA, OR, MN, and VT. Most CA municipalities also have SMART-type programs. It is also successful throughout Europe and Asia.

United States	Europe	Asia
<p>Massachusetts:</p> <ul style="list-style-type: none"> • 43% of municipalities use SAYT • Average waste is 50% below the national average in those cities & towns 	<p>Zurich, Switzerland:</p> <ul style="list-style-type: none"> • Over 50% Diversion 	<p>Seoul, South Korea: Dropped Waste 42%</p> 
<p>Connecticut:</p> <ul style="list-style-type: none"> • CT DEEP is intensely studying and promoting SMART 	 <ul style="list-style-type: none"> • ZeroWaste Europe's 1st Category Municipalities must use SMART • Low per-capita disposal (200-400 lbs./year) with SMART in 	<p>Kyoto, Japan:</p> <ul style="list-style-type: none"> • Waste dropped 40%
<p>Hong Kong:</p> <ul style="list-style-type: none"> • Beginning an SMART program for residential & commercial trash in November 2019 		<p>Taipei, Taiwan:</p> <ul style="list-style-type: none"> • Recycling rate is > 50% • Dropped waste over 30% 

Current Situation

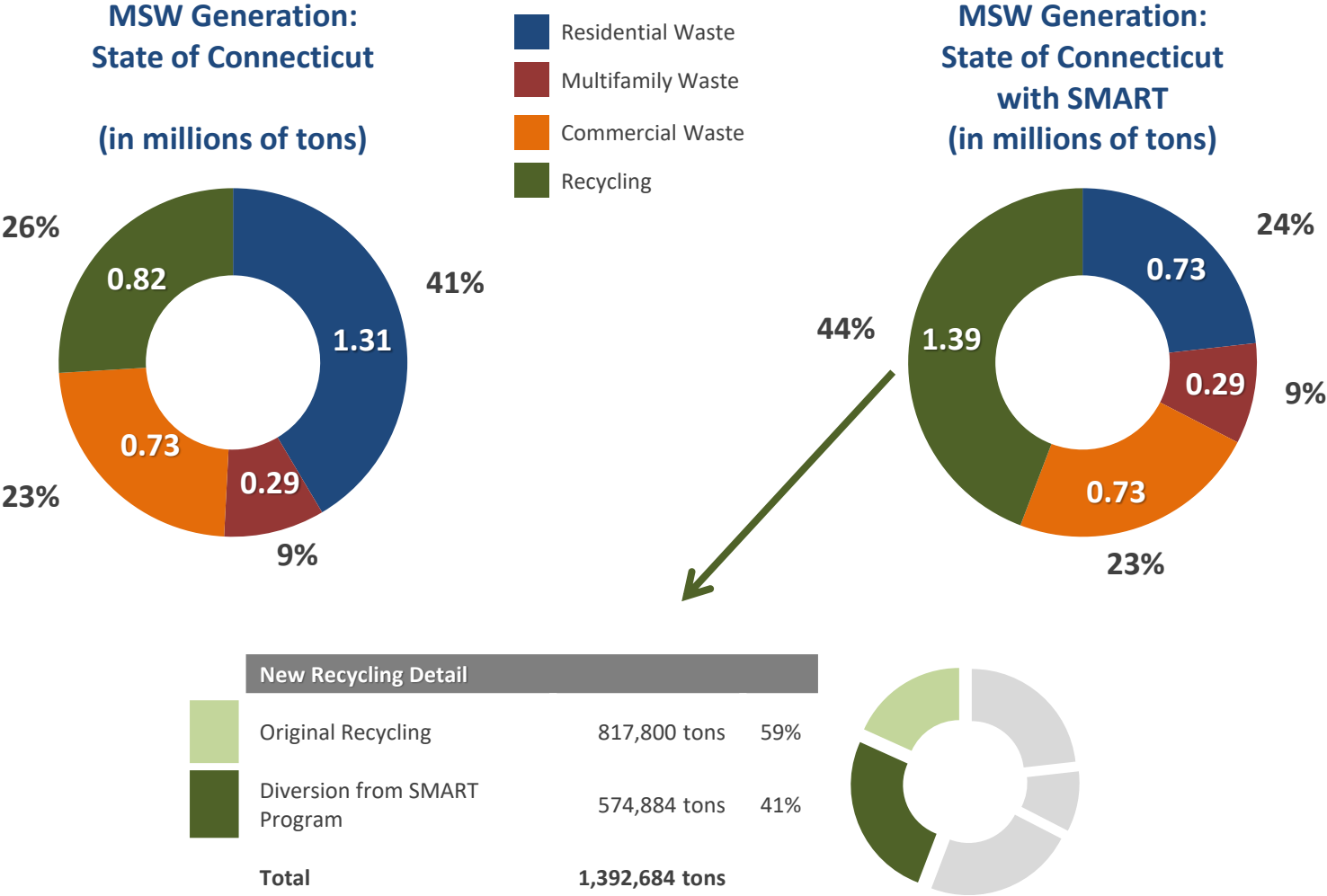
Disposal /Capita

SMART Communities dispose of less residential MSW per capita than many other Connecticut cities.



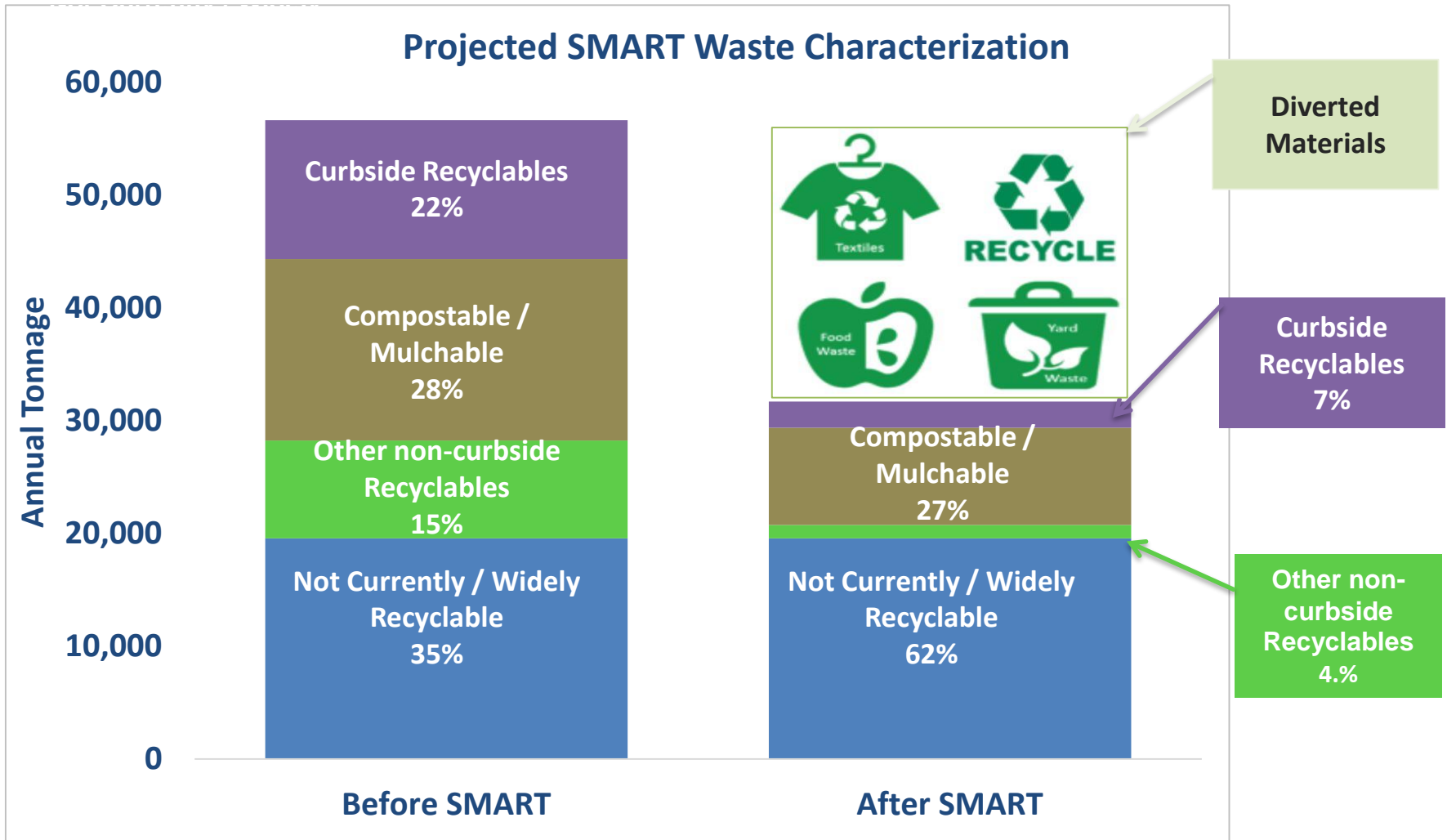
Projected Annual Tonnage Shift with Statewide SMART

Assuming that 2.8 million residents of Connecticut have residential trash service, we estimate that a statewide SMART program will have the following impacts:



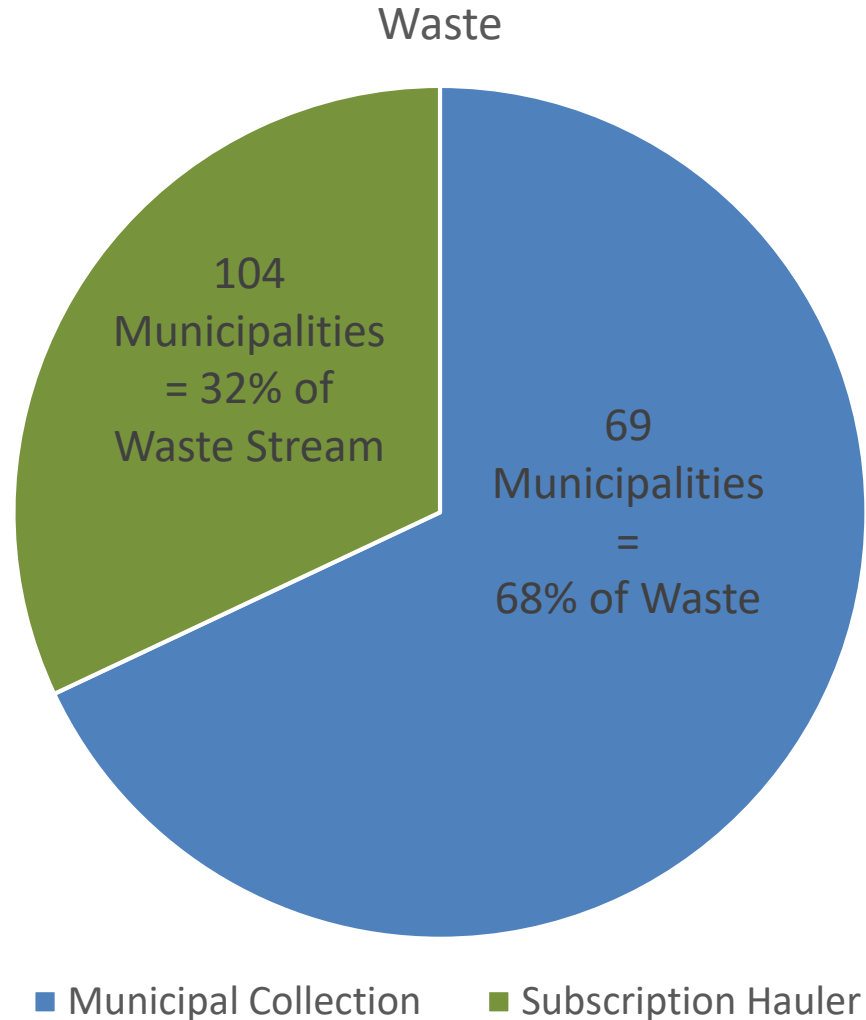
Estimated Waste Characterization Change with SMART?

With SMART, approximately 40% of diverted materials will move into curbside recycling and 30% will move into backyard compost, home mulching, non-curbside recycling, and reuse.



CT Residential Waste Make Up

Two types of communities: Subscription and non-Subscription.



Estimated Annual Environmental Impact of Statewide SMART

CO₂e (Greenhouse Gas)

Annual
Reduction

1,084,000
Metric Tons

- Reduced carbon footprint
- Less pollution
- Healthier environment for residents



Equivalent to:



Removing
212,550
passenger vehicles from the road

or

Reducing gasoline consumption by
21,525,000
gallons



BTUs (Energy Used)

Annual
Reduction

9,019,000
Million Units

- Reduced costs
- Reduced carbon footprint
- Increased energy security



Equivalent to:



Powering
80,220
residential homes

or

Installing
1,119,100
rooftop solar panel arrays



Source: EPA Warm Model

How SMART would work

SMART Is Easy for Residents (not much has to change)



How SMART Works: How the Bags Pay for Trash

The average home will spend \$61 on bag fees annually.



\$1.50 per Bag

Bag & Bag Distribution	\$0.31
Trash Incineration+ some operational costs	\$1.19
Total	\$1.50



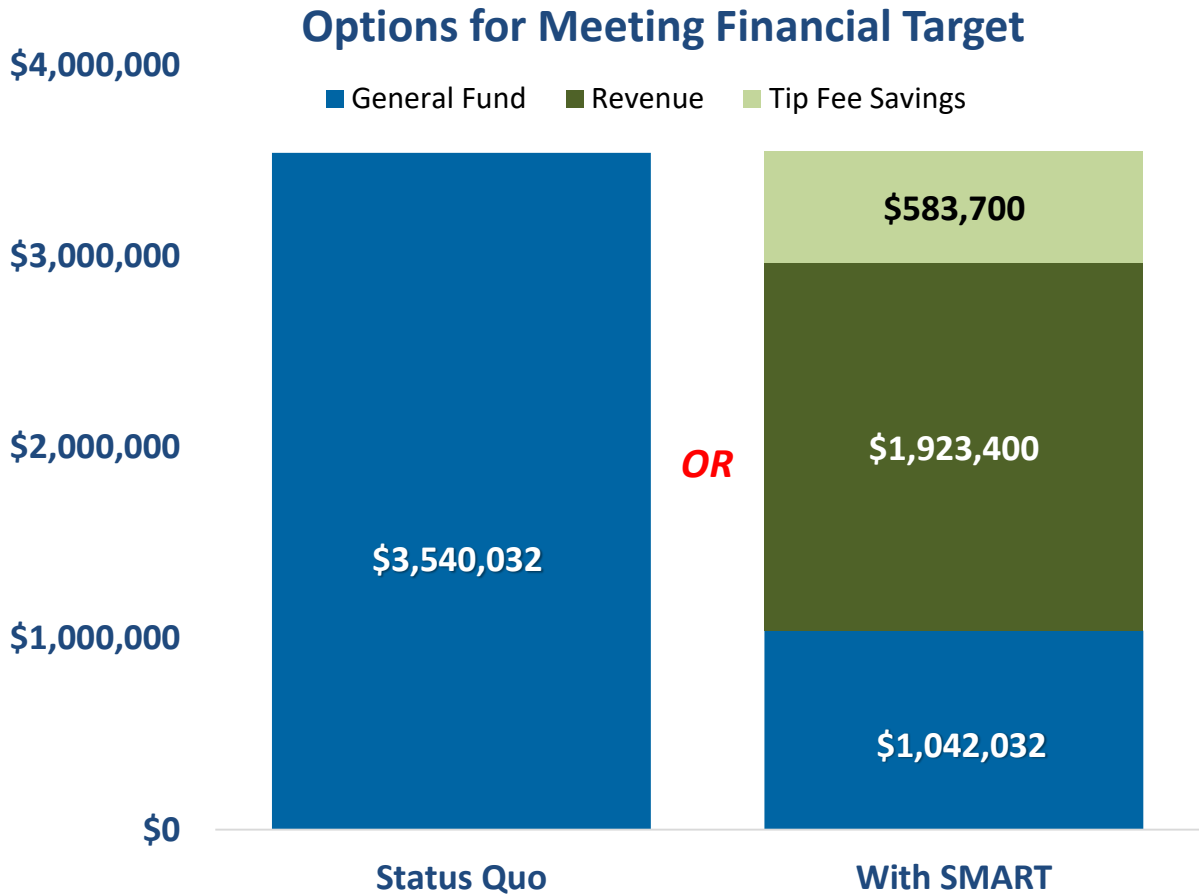
New Britain CT Example
Two-tiered rate structure

\$.80 per Bag

Bag & Bag Distribution	\$0.21
Trash Incineration + some operational costs	\$0.59
Total	\$0.80

More Efficient Revenue-Generation

SMART can help New Britain cover solid waste costs while asking 13% less from residents to fund the solid waste budget.



Solid Waste Budget	\$3,540,032	\$2,965,432
---------------------------	--------------------	--------------------

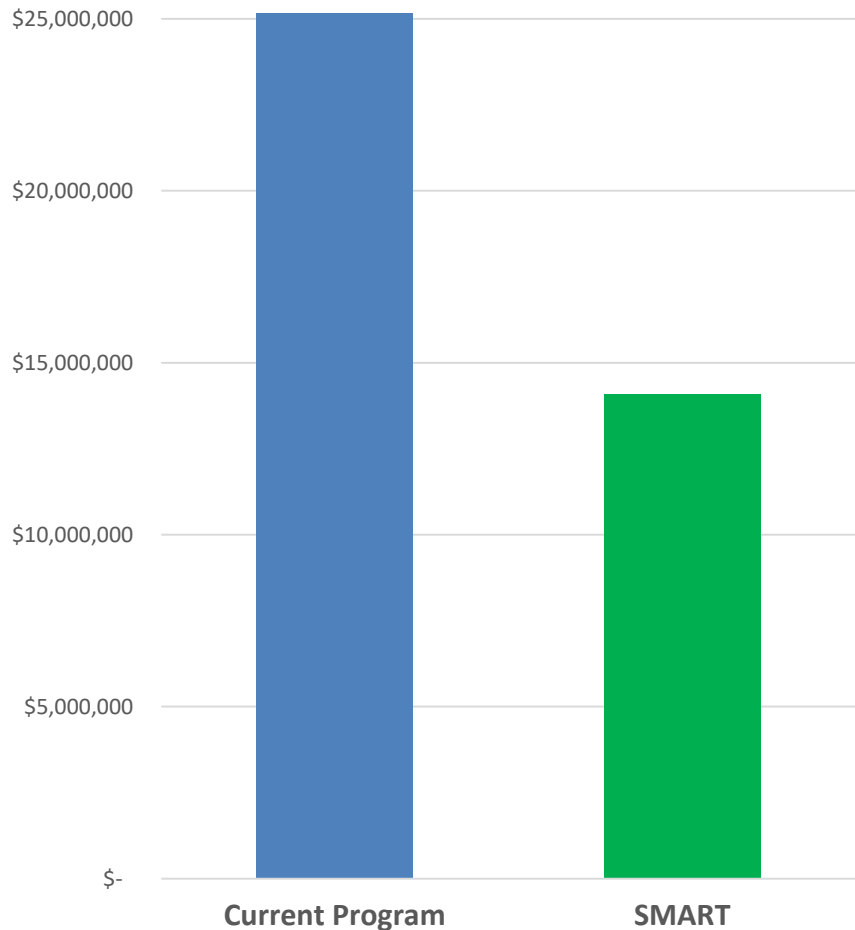
New Britain CT Example Two-tiered rate structure

- ✓ Lower burden on taxpayers
- ✓ More fiscally responsible
- ✓ Less dependence on property tax

Source: New Britain 2015 Budget

If New Britain Saves Money – Residents Save Money

Comparison of Projected Tip Fee Costs – Current vs. SMART

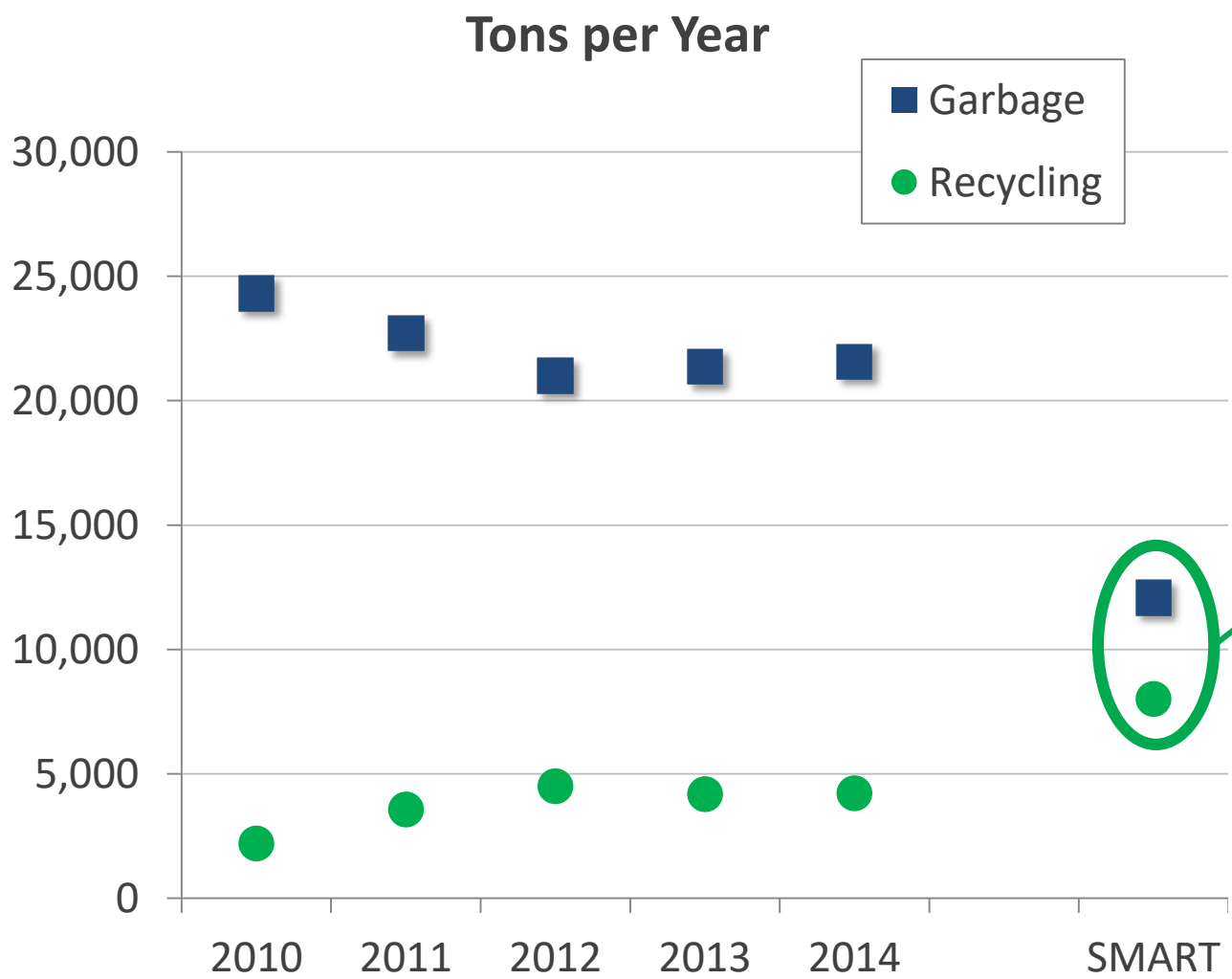


New Britain CT Example
Exponential Tip savings

**SMART SAVES
\$11 Million**

¹ New Britain and WasteZero analysis. Projection assumes a one time tip fee price increase of \$100/ton in 2022; an annual increase of 2.5% in all other years beginning with 2017; and that MSW volumes remains constant. Source: New Britain and WasteZero

Environmental Impact of SMART

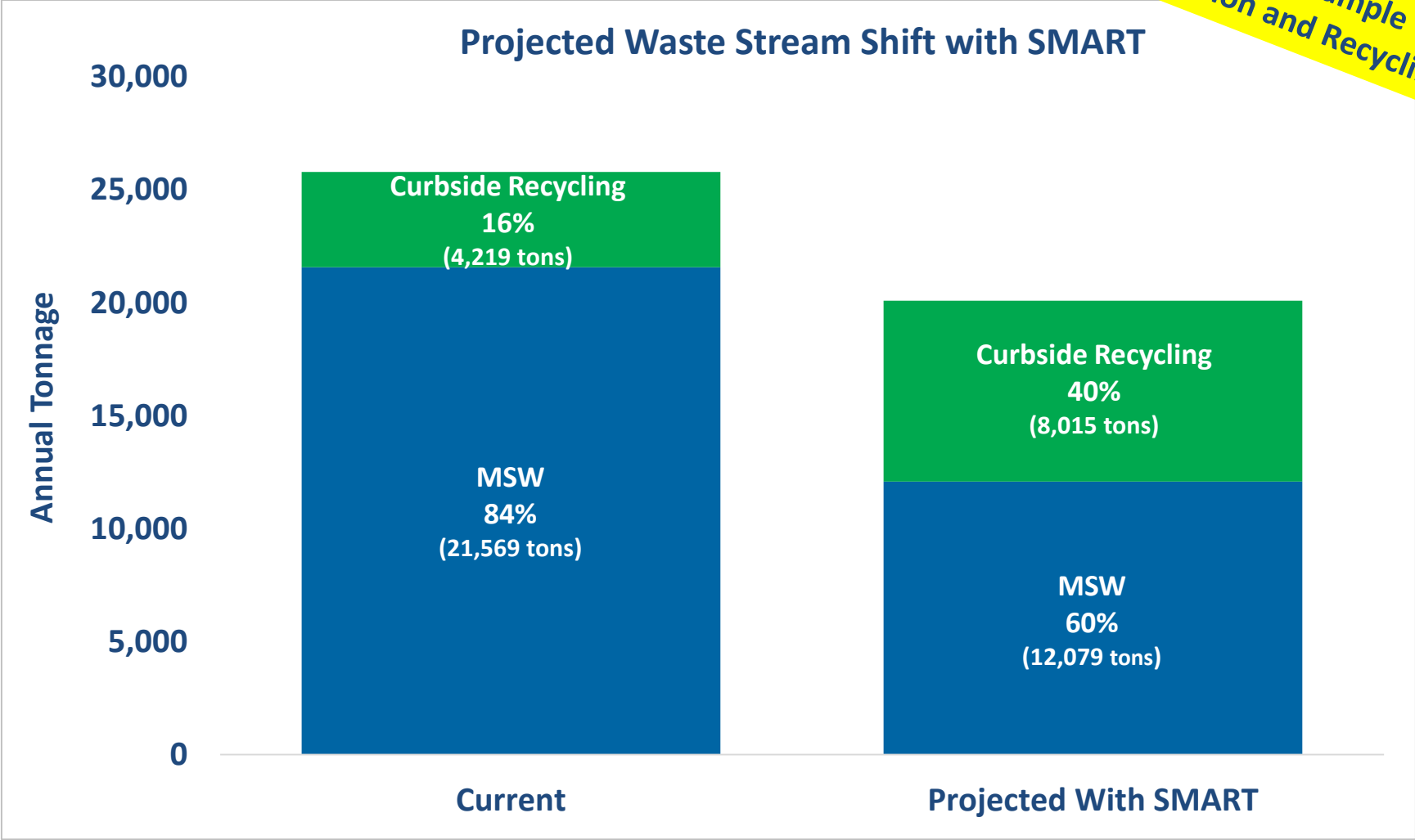


**New Britain CT Example
Waste Trend with SMART**

A SMART program could increase recycling by 89% and decrease waste by 44%

Environmental Impact of SMART

**New Britain CT Example
Source Reduction and Recycling**



SMART Project Status

Year	Municipality	Interest Level		Status		
		Highest Level Official	DPW / Other	Serious Internal Discussion	Multiple Public Meetings	Current Position
3	Branford	Strong	Strong	Yes	Planning	Applied for Grant
3	Ledyard	Strong	Medium	Yes	Planning	Starting Process
3	Montville	Strong	Strong	Yes	Yes	Starting Process
3	Old Saybrook	Strong	Strong	Yes	Planning	Starting Process
2	Stamford	Strong	Strong	Yes	Planning	Applying for Grant
3	Torrington	Strong	Strong	Yes	Yes	Applying for Grant
3	East Haddam	Strong	Strong	Yes	Planning	Evaluating
1	Farmington	Strong	Strong	Yes		Council Turnover
3	Harwinton	Strong	Strong	Yes	Planning	Evaluating
3	Middletown	Strong	Strong	Yes	Planning	Evaluating
2	New London	Strong	Strong	Yes	Yes	Back to Committee to Study
2	North Haven	Strong	Strong	Yes		Evaluating
2	Plainville	Strong	Strong	Yes	Planning	Evaluating
1	West Hartford	Strong	Strong	Yes	Yes	Looking for Resident Support
1	Bridgeport	Strong	Strong	Yes		Mayor Turnover
2	Enfield	Low	Strong			Town Turnover
2	Groton (City)	Strong	Strong			Mayor Turnover
2	Hartford	Medium	Strong			Mayor Running for Gov
2	Manchester	Strong	Strong	Yes		DPW Turnover
2	Meriden	Strong	Low			
1	Milford	Low	Strong	Yes		
1	New Britain	Strong	Strong	Yes	Yes	Mayor running for LT Gov.
2	Shelton	Medium	Low			
3	Waterbury	Low	Medium			

- 79% strong support from Town Manager/ Mayor
- 83% strong support from Public Works
- 75% strong support from both Town Manager/ Mayor and DPW
- 42% have had or plan to have public meetings
- 6 more communities will likely also start public discussion

Anticipated Objections (specifically from Social Media)

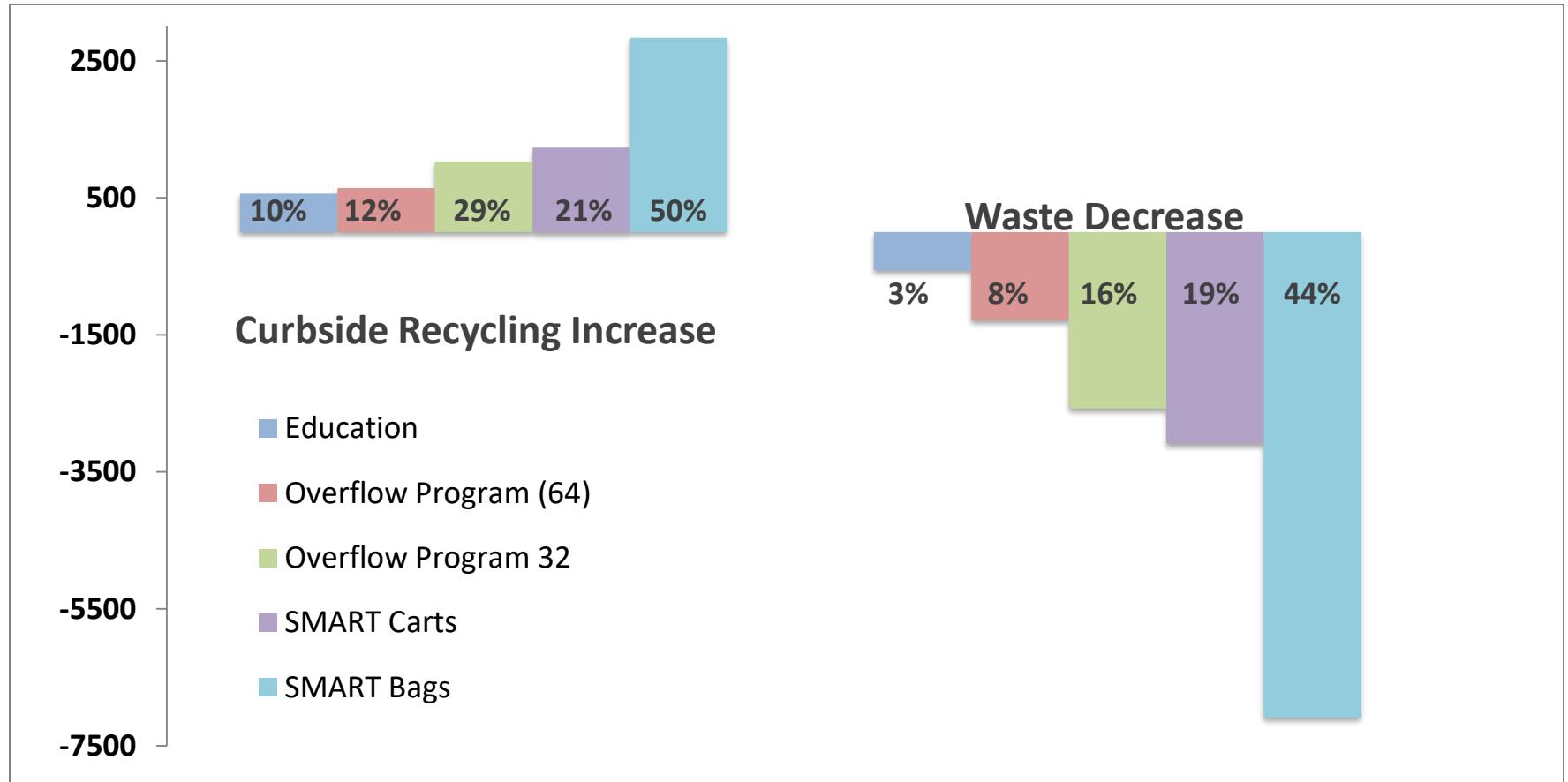
Anticipated Objections

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 cities around the country have worked for decades to find programs that increase recycling. SMART is the single most effective way to reduce trash while also saving money.

Waste Reduction Program Comparison

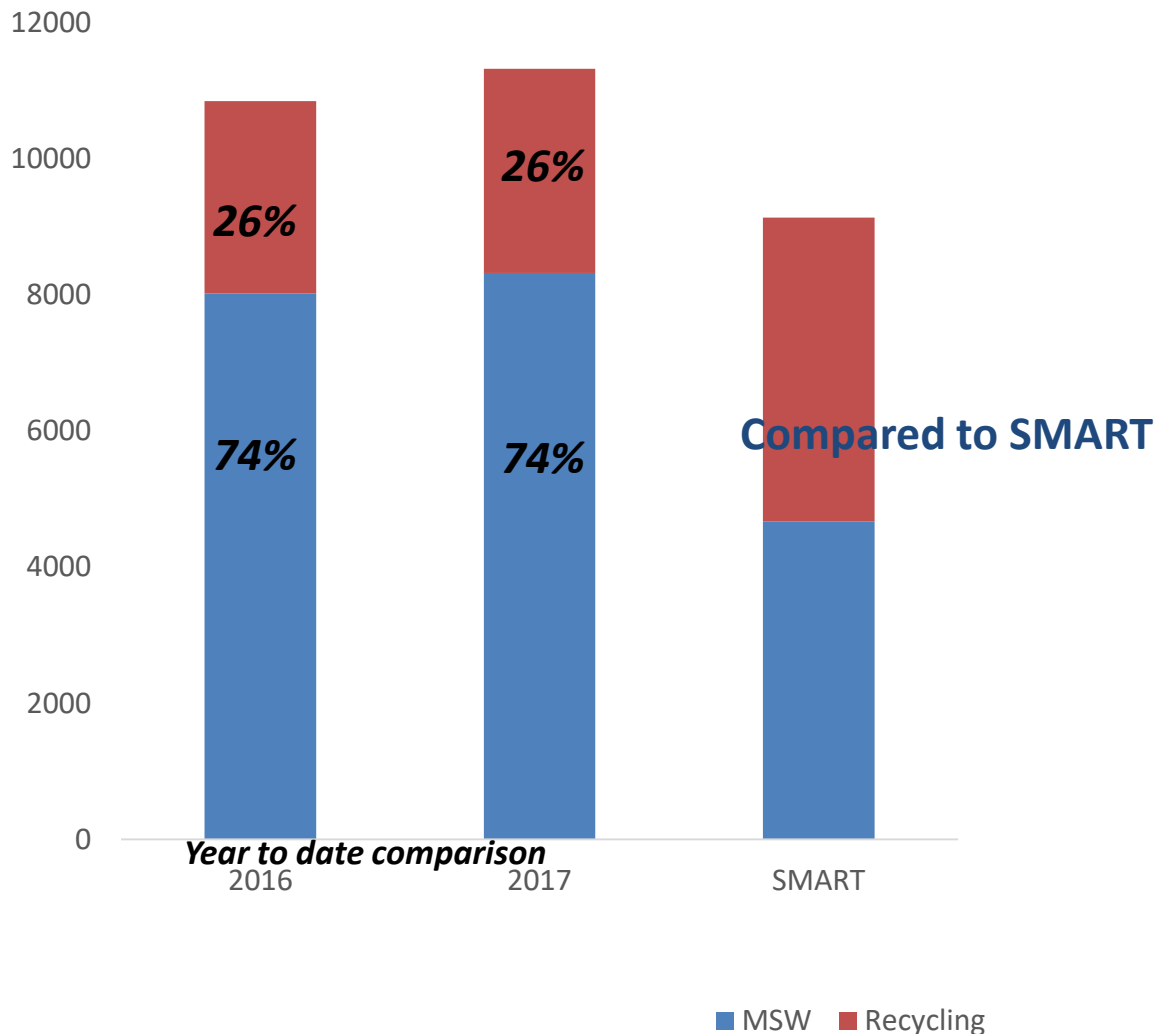
Based



Its important to compare apples to apples when evaluating recycling programs

West Hartford Switch from Bi-weekly to Weekly Recycling

If we recycle weekly we will not have to do this stupid program. We don't have enough opportunity to recycle but if we had more we would do it.



All other efforts are like wildling a wood with a plastic knife. The tool is a SMART rate structure.

SMART: Big Impact

Westport banned plastic bags about 10 years ago. Banning plastic bags is also a difficult political lift. Although the ban was important for multiple reasons, if you look at waste reduction alone, the diversions pales in comparison to a policy

10 Year Estimated Plastic Bag Ban Results

390 tons

\$27,300



10 Year Estimated SMART Results

80,000 tons

**7 Million Dollars in avoided
disposal**



Anticipated Objections

Residents will hate it.

*Actually, residents 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 an outright 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.

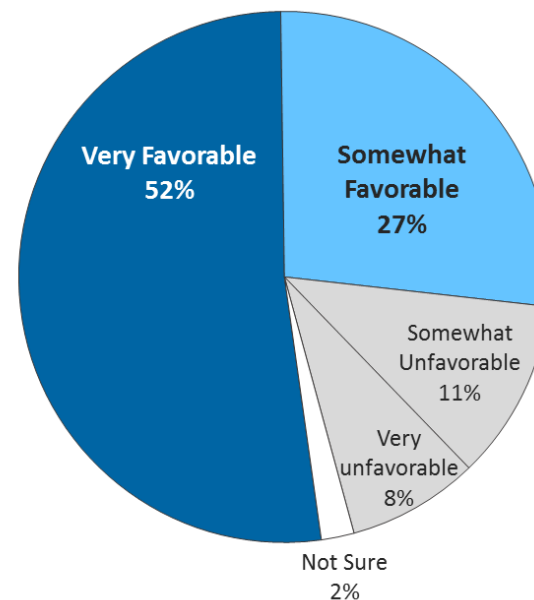
- ***Effectiveness***

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.



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

Source: Automated telephone survey of 991 residents of communities with bag-based pay-as-you-throw programs, conducted by Public Policy Polling Feb. 21-25, 2014.

Anticipated Objections

The recycling will be contaminated.

Actually, recycling is less contaminated in communities with unit based pricing because residents have an incentive to read the directions.

Residents in SMART communities know the rules, so contamination is not an issue

Southern ME towns w/ curbside collection (2017)

Municipality	Population	lbs/capita
Waterville	15,722	235
Portland	66,318	265
Windam	17,001	268
Gorham	16,381	328
Sanford	20,798	340
Cumberland	7,211	370
North Yarmouth	3,565	376
Augusta	19,136	428
South Portland	25,002	491
Hollis	4,281	514
Scarborough	18,919	619
Jay	4,851	667

- SMART communities had 44.8% less waste than non-SMART communities
- SMART communities had much lower recycling contamination

SMART
non-SMART

- Rhode Island Resource Recovery Corp has been charging for recycling contamination for the past 3 years. To date Middletown RI the only curbside SMART community in the state, has never even had a warning for contamination.
- Waste Management in south western Massachusetts also claims lower contamination from SMART communities.

Anticipated Objections

Why Recycle – The media (New York Times) says recycling is costing money? – Why bother?

Actually, now is the best time for a SMART program because the overall lower waste generation offsets the new recycling costs – even when recycling increases.

Now is the Best Time for SMART

		No SMART - \$80 per/ton Recycling Tip			With SMART		
		Tonnage	Cost	Tonnage with SMART	Net Savings (Recycling \$0)	Net Savings (Recycling \$40)	Net Savings (Recycling \$80)
New Britain	Waste	21,569	\$1,337,278	12,079			
	Recycling	4,219	\$0	6,376			
	Total	25,788	\$1,337,278	18,455	\$588,380	\$502,100	\$415,820
West Hartford	Waste	18,824	\$1,280,032	10,541			
	Recycling	6,852	\$0	9,751			
	Total	25,676	\$1,280,032	20,292	\$563,214	\$447,258	\$331,302
Torrington	Waste	13,500	\$972,000	7,560			
	Recycling	2,268	\$0	4,644			
	Total	15,768	\$972,000	12,204	\$427,680	\$332,640	\$237,600
Old Saybrook	Waste	2,268	\$149,688	1,270			
	Recycling	535	\$0	884			
	Total	2,803	\$149,688	2,154	\$65,863	\$51,892	\$37,921
Branford	Waste	9,663	\$672,545	5,411			
	Recycling	1,436	\$0	2,380			
	Total	11,099	\$672,545	7,791	\$295,939	\$263,176	\$227,805
New London	Waste	10,177	\$590,266	5,699			
	Recycling	2,269	\$0	4,060			
	Total	12,446	\$590,266	9,759	\$259,724	\$188,084	\$116,444
Ledyard	Waste	4,958	\$287,564	2,776			
	Recycling	1,468	\$0	2,340			
	Total	6,426	\$287,564	5,116	\$126,556	\$91,676	\$56,796

Strong Investment in US for Processing

- **Jerry Powell, Resource Recycling Magazine "China's recent crackdown has led to new investments in U.S. plastics recycling facilities, will help soak up a lot of the supply of used plastics previously headed to China. Long-term, these investments will provide a more stable *domestic* market for recycled materials and also increase the number of U.S. jobs in plastics recycling."**
- **GDB International Inc., for example, plans "very, very sizable investments" to set up factories in New Jersey and Ohio to make pellets from recycled plastics that it previously exported to China.**
- **Recology, which operates waste management systems for more than 700,000 homes and 100,000 business on the West Coast, is seriously exploring setting up its first plastics factories, which would include extrusion lines to make pellets.**
- **Ecomelida is a subsidiary of Zhangzhou Sanlida Environmental Technology Corporation, will process food and beverage packaging into pulp and pellets.**
- **Longtime Chinese plastics processor to launch a new facility in Alabama. Roy Tech Enviro**
- **A subsidiary of China-based Nine Dragons Paper has agreed to purchase two U.S. paper mills in Maine and Wisconsin for high-growth packaging paper and pulp products.**
- **Chinese operators are decreasing investment in China and expanding aggressively overseas. Tranlin Paper (Virginia) and Sun Paper (Arkansas).**
- **July 2018 Birch Paper VA to reopen the plant because of undersupply**
- **Reopening of abandoned mills that still have their papermaking equipment, in Pacific northwest.**
- **Chinese firms that used to import plastic waste from developed countries have now started investing in recycling operations in the United States.**
- **SC Department being courted by companies from China, Japan and Taiwan**

Anticipated Objections

This information does not tell the entire picture. What about all the programs that failed?

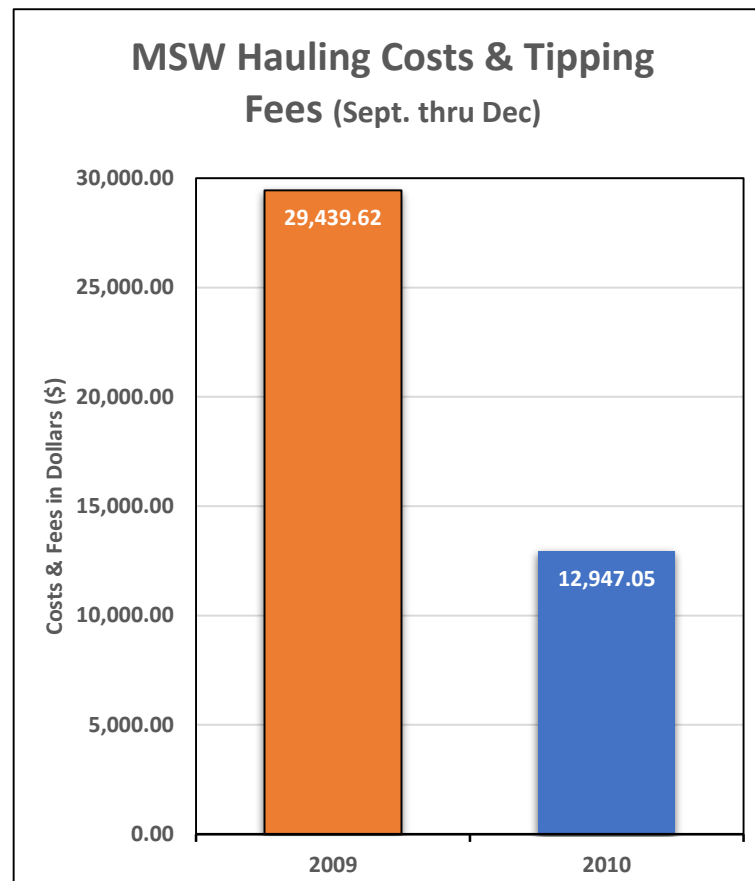
There are hundreds of SMART bag programs around the world. Only a handful of programs that have been discontinued – two are located in Connecticut. The programs were discontinued for political reasons not because of poor results.

Case Study: 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 of Columbia voted to eliminate the program at a local town meeting in February 2011



Case Study: East Lyme

The East Lyme Council Decided to Discontinue the Program in 1998

- Trash went up from 4,571 (1997) tons to 7,179 tons (1998)
- Current per capita trash is 650
- Stonington current per capita trash is 389
- Stonington had a referendum and the strong majority of residents chose to keep the program
- East Lyme Council decided to discontinue the program
- Stonington has saved approximately 4.5 Million dollars since the programs inception

Anticipated Objections

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.

Anticipated Objections

The City does not have the ability to enforce the program.

Actually, most residents comply as soon as they understand the rules and a monitoring and warning process should be enough to achieve close to 99% compliance. Some cheating can be built into the model to make sure that compliance costs are covered.

Compliance is easy to handle through geolocation.

See [video](#)



Official bags are placed in the carts



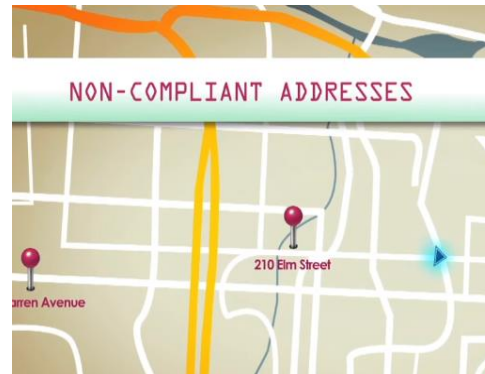
Trucks have video cameras on the hopper



Camera shows driver what goes into hopper



Driver pushes button on app if non-compliant bags are spotted



Non-compliant addresses auto-upload to database



Loads easily spot checked during start up phase

Anticipated Objections

This will cost so much. I will use 5 bags a week and this will cost me hundreds?

Actually, based on a database of 800 communities, the average home will only use .9 bags per week. Statistically it would be impossible for the average home to spend hundreds of dollars.

Current Situation

ILSR Rate Comparison Portland Maine and Seattle Washington

Seattle, WA (369 lbs/capita)	
Cart Size	Monthly Cost
96 Gallon Waste Cart:	\$111.45
64 Gallon Waste Cart:	\$74.20
32 Gallon Waste Cart:	\$37.15
20 Gallon Waste Cart:	\$28.55
12 Gallon Waste cart:	\$23.30

Portland, ME (268 lbs/capita)



Official Portland City Bags
 30 Gallon \$2.70
 15 Gallon \$1.37

According to ILSR research Seattle and Portland (268 lbs/capita) ranked best cart program. Both cover all costs in rate structure.