Department of
Energy & Environmental Protection

March 2018

Projected Impact of SMART on Torrington, CT

Prepared by WasteZero, Inc. for the CT Department of Energy and Environmental Protection (DEEP)

Today's Discussion

1. Current Situation
2. What is SMART?
3. How SMART Could Work in Torrington
4. Common Concerns
5. Compliance with SMART
6. Next Steps

Torrington

Starting Data

	Key Starting Data
Population	34,646 people in 15,571 served households
Annual Residential Trash Tonnage	13,500
Annual Recycling Tonnage	2,754

- Trash tip fee is $72 per ton.
- Annual residential per capita disposal is 779 lbs.
- Recycling rate is 17%.

Service Type	# Households	Annual Tons
Automated Residential	13,750	12,285
Manual Residential	474	
Condominium - Dumpster	919	810
Housing Authority - Dumpster	428	405
	15,571	**13,500**

Capacity is Decreasing and Costs are Rising

The northeast's capacity for trash disposal is maxing out and it is difficult to site new facilities. Continuing to generate the same amount of waste is a costly option.

Landfills

Americans generate 65% more waste per capita than we did in 1960

Purchasing habits & lifestyles have changed

Products are disposable; 30% of waste is packaging

Incineration

Few landfills remain that accept residential waste in the Northeast

Incineration converts trash to energy, however the process emits more CO_2 per unit than coal-fired power

Incineration capacity in the Northeast is decreasing

Materials Management

The goal is to:

Manage materials differently

Promote a circular economy - jobs

Reuse & recycle

Compost / convert

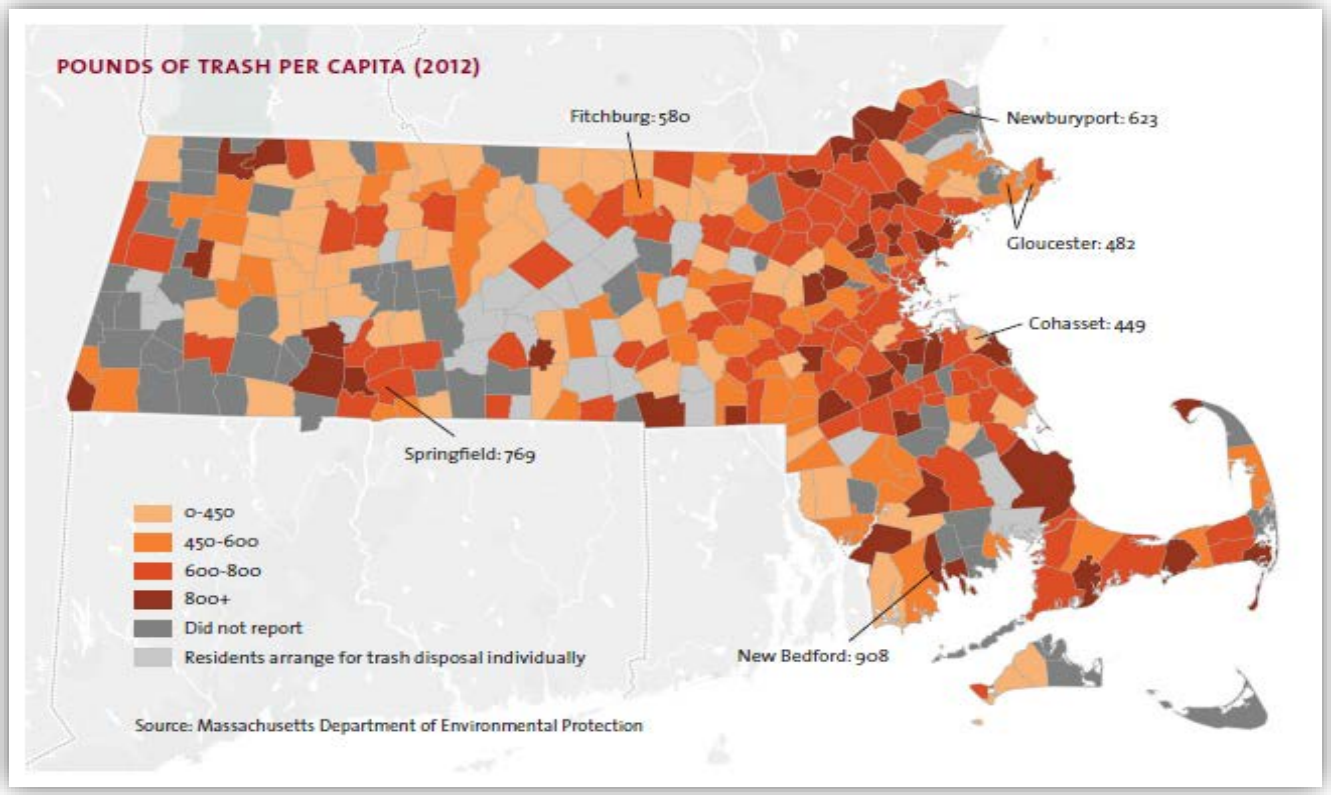
Source: US EPA

What Is SMART?

With SMART, people think twice about what they throw away – and choose to reduce, reuse, donate, recycle, or compost instead.

Benchmarking Waste: Annual Residential Per Capita Disposal

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



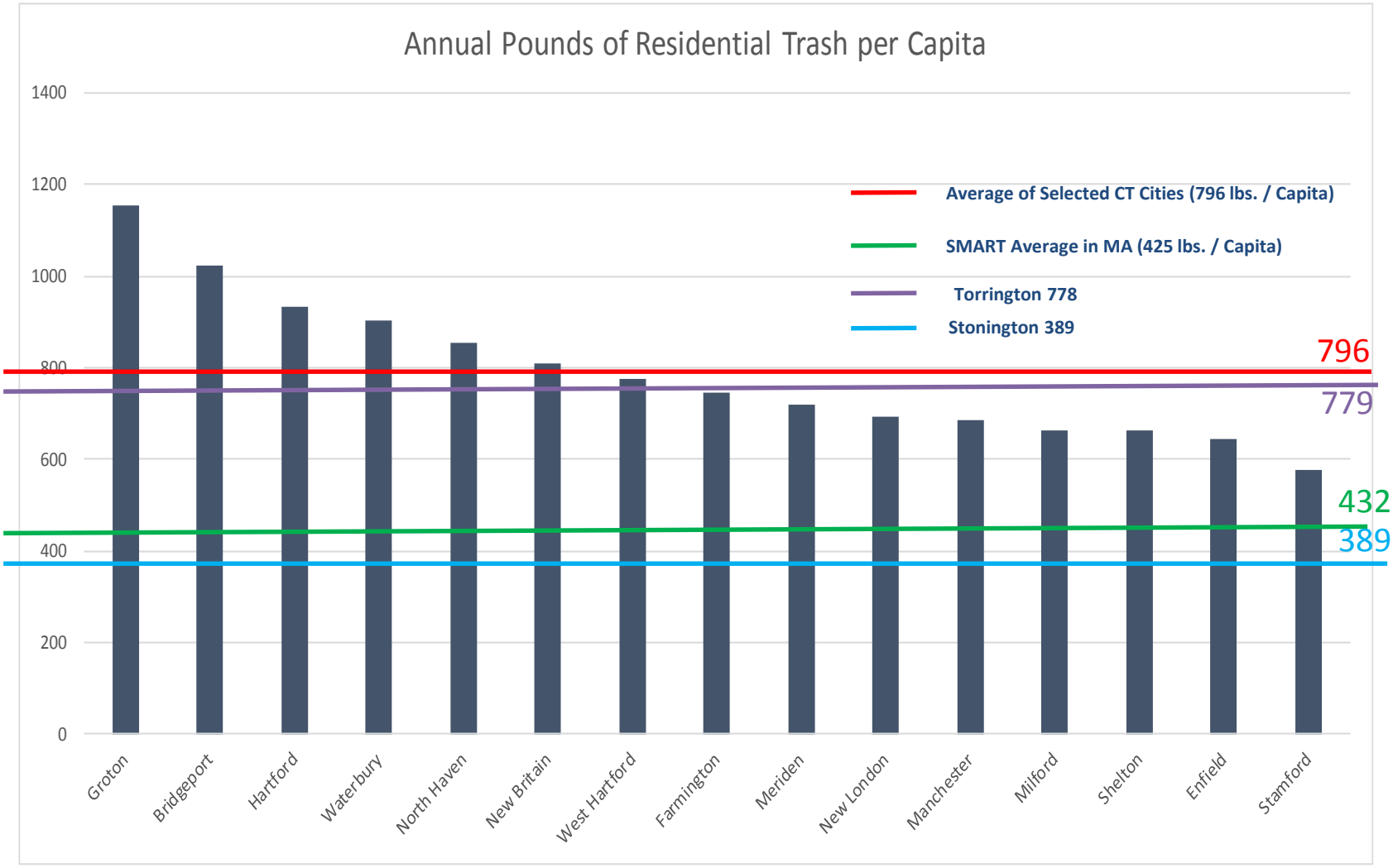
- EPA SMART BET uses per capita disposal.
- Zero Waste Europe uses per capita disposal.
- 432 lbs. per capita per year is the MA average for PAYT communities.

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

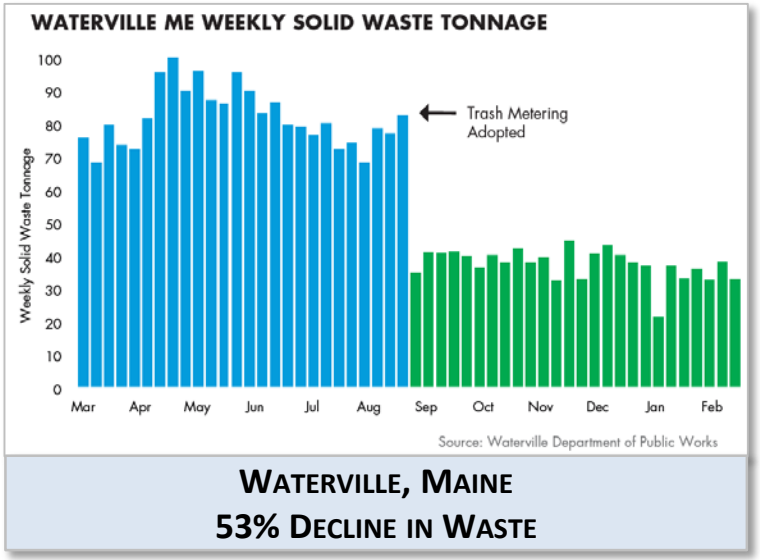
Using recycling rates as a benchmark can create a false sense of accomplishment.

Participating Municipalities

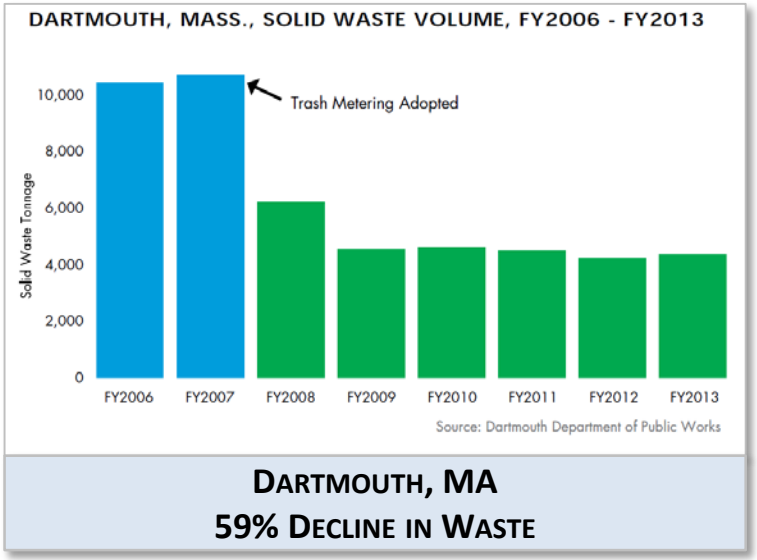
Fifteen municipalities participated in the evaluation process.



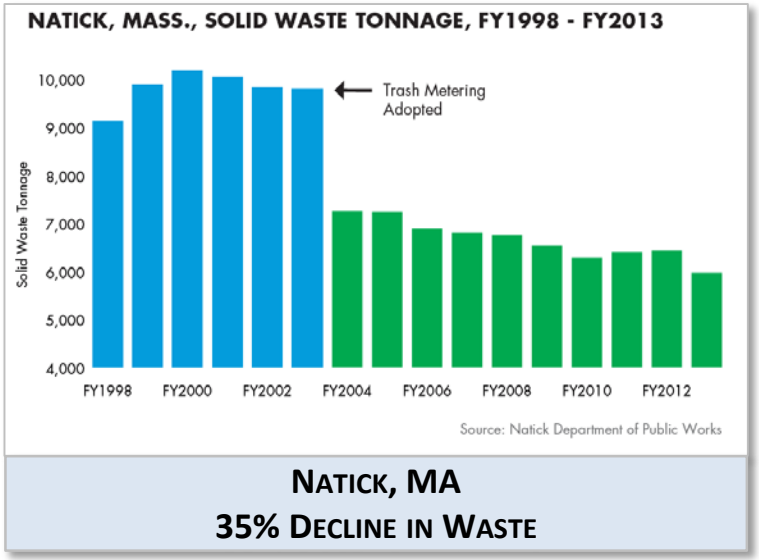
Results: MSW Reduction of 44% on Average



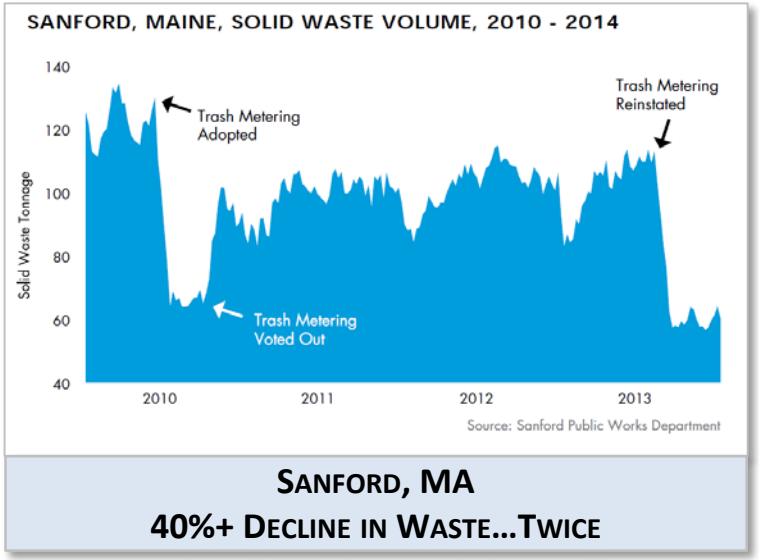
WATERVILLE, MAINE
53% DECLINE IN WASTE



DARTMOUTH, MA
59% DECLINE IN WASTE



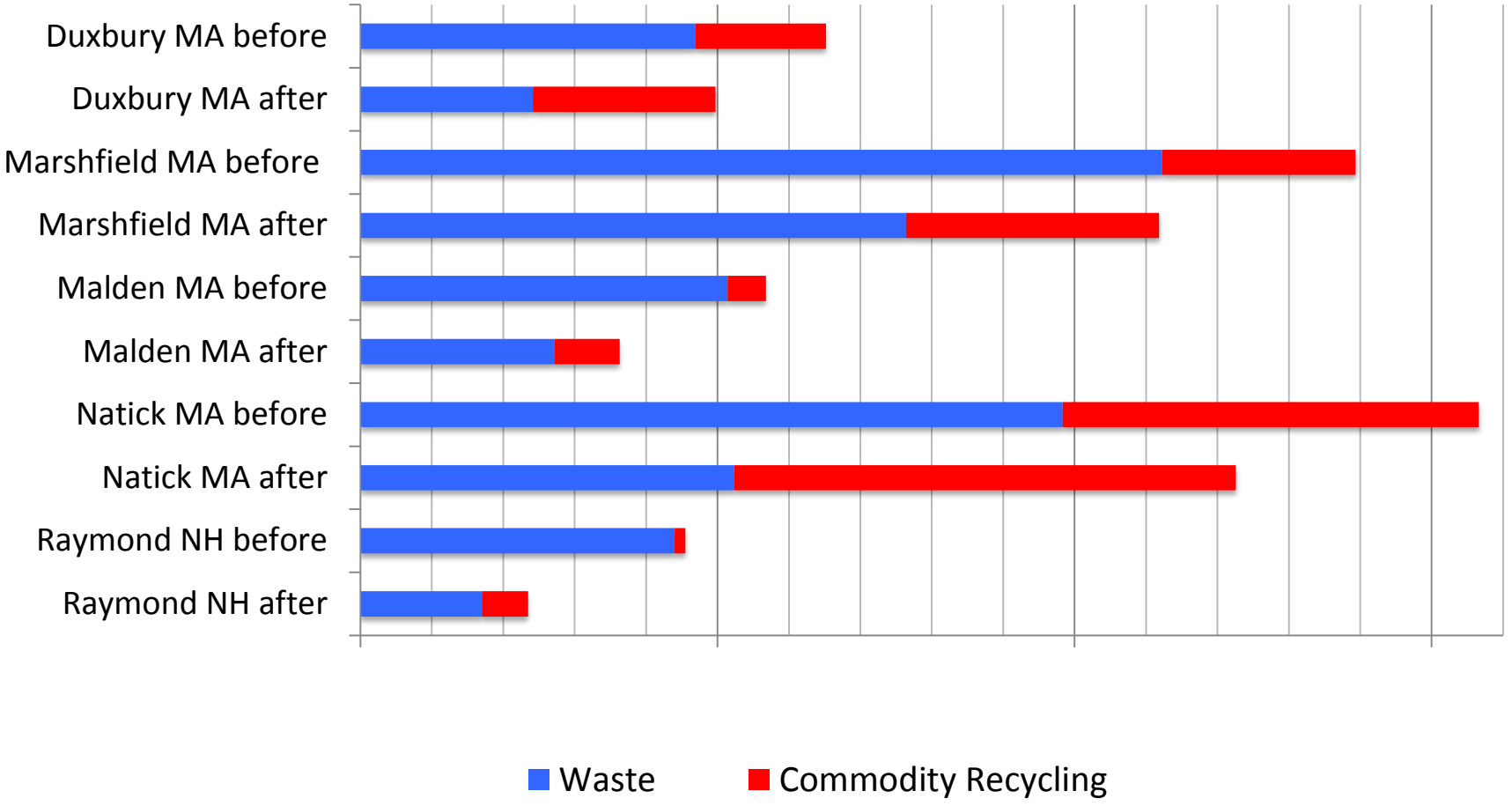
NATICK, MA
35% DECLINE IN WASTE



SANFORD, MA
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 encourages home composting.



Similar Efforts in Other States

Unit-based pricing, also known as PAYT and SMART, has a strong presence in the Northeast. The experience of municipalities in this region can be productively applied in Torrington.

Massachusetts

- 41% of municipalities use SMART.
- Average waste reduction of 44% with bag-based SMART.

Rhode Island

- 6 of RI's 39 municipalities have some form of SMART.
- RI Resource Recovery Corp. (RIRRC) is considering a statewide SMART option.

New York

- Binghamton reduced waste more than 50%
- Southampton reduced trash 44%
- Southold reduced waste 48%
- Multiple communities throughout upstate NY participate in PAYT

Unit-based pricing for solid waste is mandatory in Minnesota, Oregon, Vermont, & Washington.

Global SMART Efforts (Selected Examples)

Europe

- ZeroWaste Europe's 1st Category Municipalities must use SMART.
- Low per capita disposal (300-500 lbs./yr) with SMART in
  - Austria
  - Belgium
  - Estonia
  - France
  - Italy
  - Switzerland
  - Others

South Korea & Japan

- Seoul reduced waste 42%.
- Kyoto reduced waste more than 40%.

Taiwan

- Taipei uses bag-based SMART.
  - Reduced waste by 33%
  - Recycling rate is >50%

SMART – Zurich Reduced Waste 41%

- ***Best Environmental Management Practices in the Waste Management Sector***
  - Report to the European Commission's Joint Research Center
  - May 2016

Success Marketing is Important: Dartmouth, MA

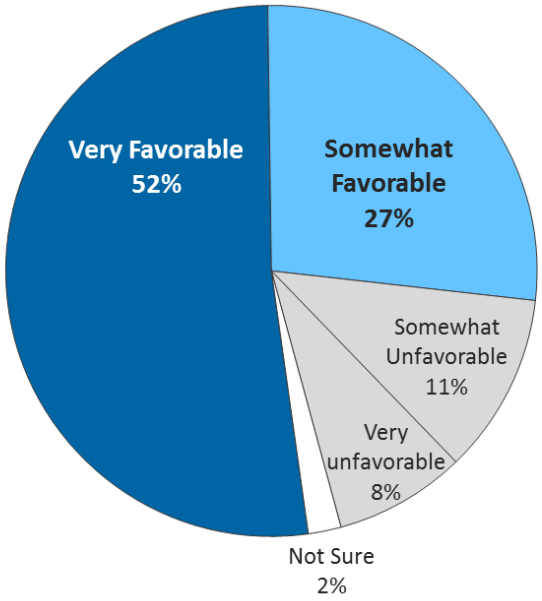
A post-implementation marketing campaign built resident confidence and turned a controversial pre-PAYT debate into a source of pride.

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.



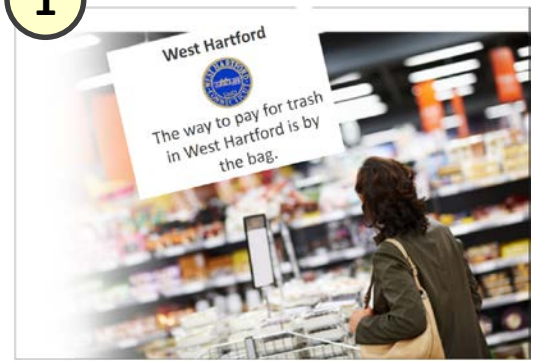
Do you have a favorable or unfavorable opinion of pay-as-you-throw?

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.

How SMART Could Work in Torrington

How SMART Bags Work

1



Residents purchase official SMART trash bags at the same stores where they buy trash bags today.

2

Put trash in official SMART trash bags.

3

Place trash in container, same as today.

4

Place recycling in container, same as today.

1. Trash collection works the same as today (from the hauler).

2. Recycling collection works the same as today (from the hauler).

3. SMART trash bags would cost $1.70 cents for 15-gal. kitchen bags and $2.70 for large 30-gal. bags and $1.20 cents for an 8 gallon bag. They would be available at convenient retail locations.

4. The SMART bags draw attention to waste. Their cost provides an economic incentive for residents to recycle more and throw away less.

SMART Bags Pay for Trash Disposal (tip + Collection)

$2.70 per Bag	
Bag & Bag Distribution	$0.31
Trash Disposal Cost	$2.39
Total Cost	**$2.70**

$1.70 per Bag	
Bag & Bag Distribution	$0.21
Trash Disposal Cost	$1.49
Total Cost	**$1.70**

$1.20 per Bag	
Bag & Bag Distribution	$0.18
Trash Disposal Cost	$1.02
Total Cost	**$1.20**

Estimated Annual Financial Impact of SMART

High

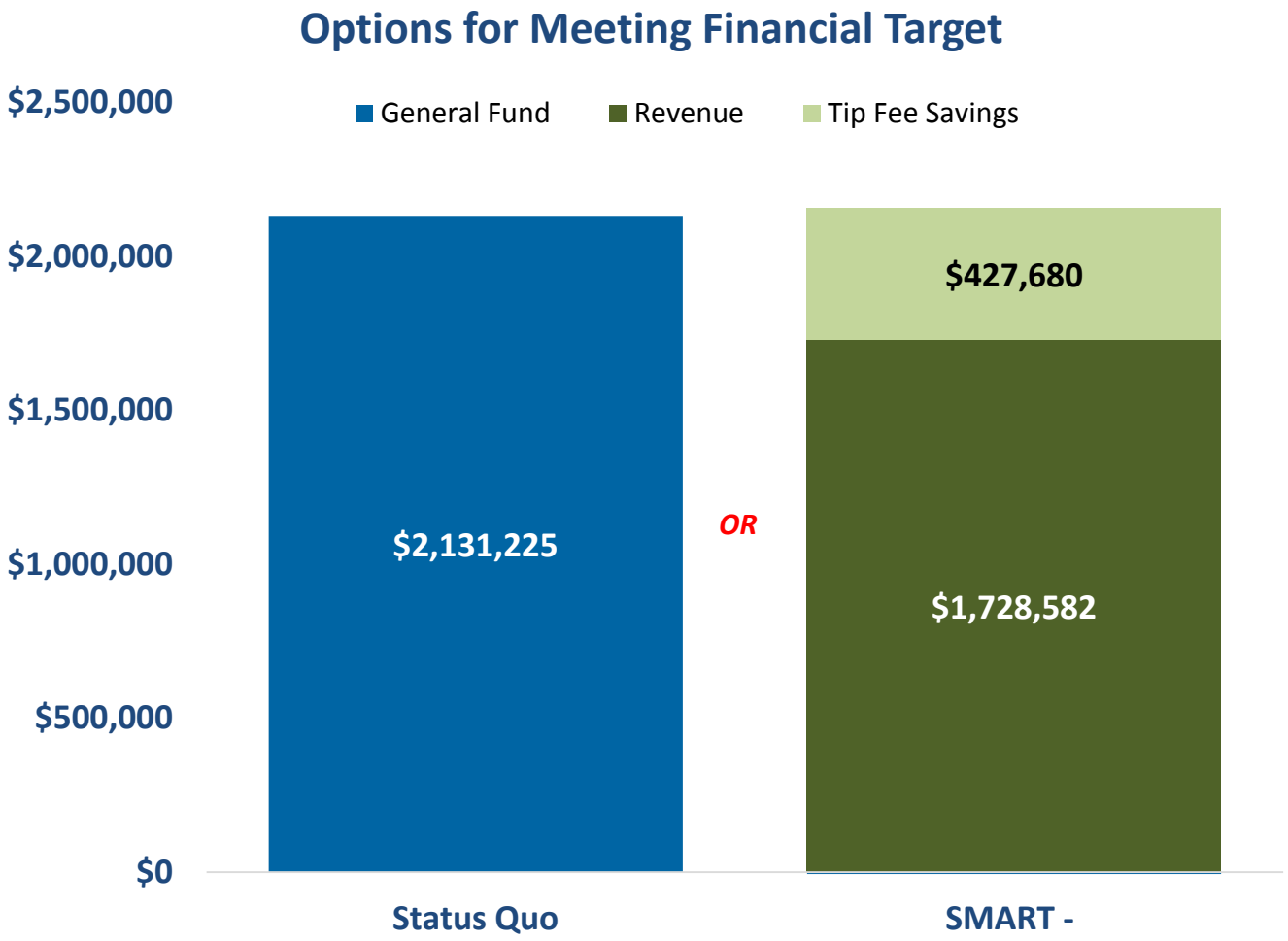
Bag purchase price:

Large:	$2.70
Medium:	$1.70
Small:	$1.20

SMART Results: Municipal Financial Impact (Cumulative)				
	1 Yr	**3 yrs**	**5 yrs**	**10 Yrs**
# Bags Sold	866,674	2,600,023	4,333,372	8,666,743
Net Revenue	$1,728,582	$5,185,746	$8,642,910	$17,285,819
Trash Tip Svgs	$427,680	$1,283,040	$2,138,400	$4,276,800
Add'l Recycle Tip Svgs (Cost)	$0	$0	$0	$0
Net Benefit	**$2,156,262**	**$6,468,786**	**$10,781,310**	**$21,562,619**

Notes:
1. Benefits and Savings for Years 3,5, and 10 are cumulative
2. Revenues are net of estimated program services and supplies
3. Assumes 0% average annual population growth

Torrington More Efficient Revenue Generation



Source: Torrington FY 2018 Budget: Residential Tip, Collection, & Equipment

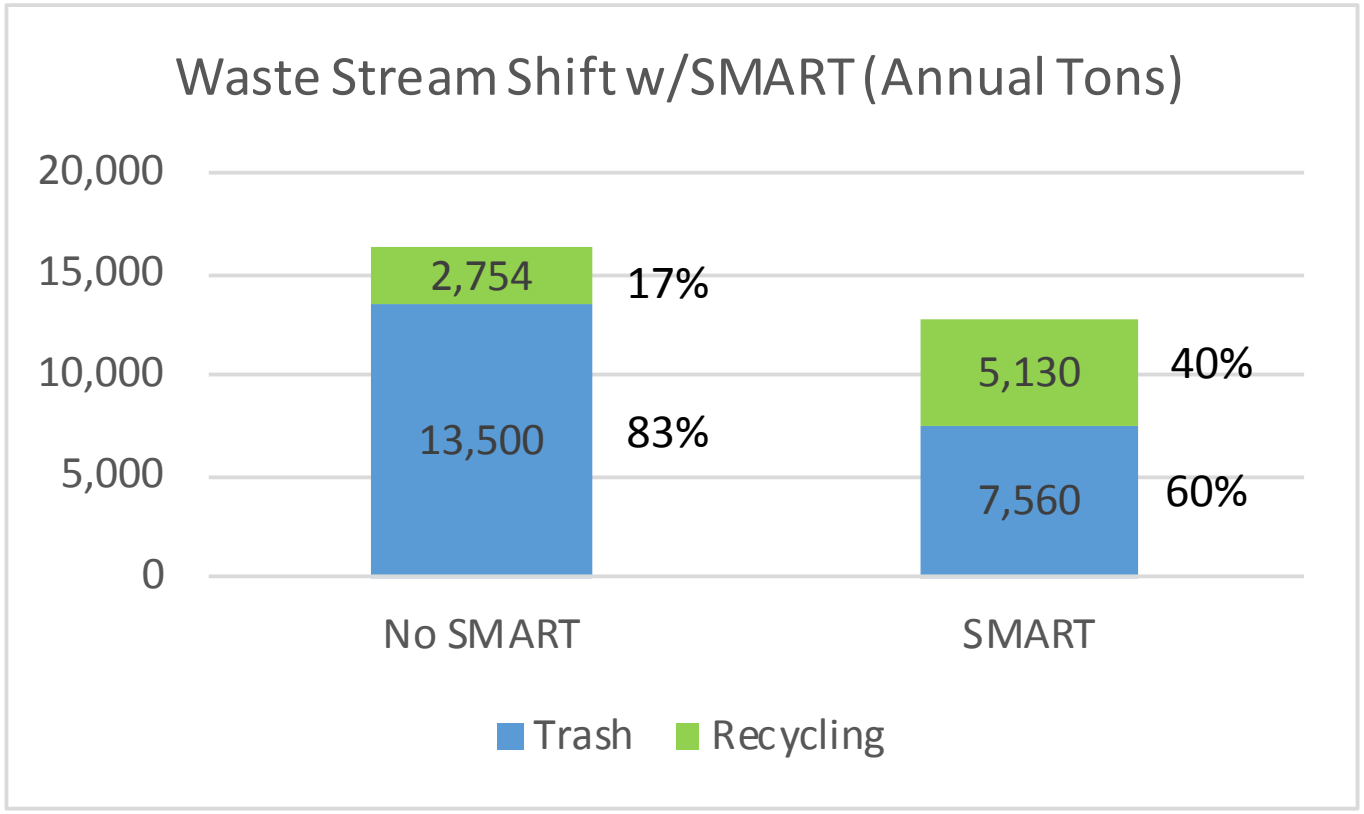
Positive Return on Investment (ROI) of 40%

A SMART program asks residents for less. In all scenarios, the annual cost to residents is significantly less than the annual benefit to the community.

Average HH SMART bag annual expense		$125.79
Average HH regular trash bag annual expense	minus (-)	$27.00
Average additional out of pocket (since regular trash bags are no longer needed)	equals (=)	$98.79
Total out of pocket cost from all 15,571 homes	times (x)	**$1,538,259**
Annual Community Benefit		**$2,156,262**
Return on investment for residents		**~40%**

Project Waste Stream Shift with SMART

In Torrington, SMART would reduce annual trash tonnage by 44%, or 5,940 tons. This equates to annual tip fee savings of $427,680 at $72 per ton.



Annual Environmental Impact of SMART

CO_2e (Greenhouse Gas)

Annual Reduction	11,000 Metric Tons

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

Equivalent to:

Removing

2,200

passenger vehicles from the road

or

Reducing gasoline consumption by

1,256,000

gallons

BTUs (Energy Used)

Annual Reduction	93,000 Million Units

- Reduced costs
- Reduced carbon footprint
- Increased energy security

Equivalent to:

Powering

830

residential homes

or

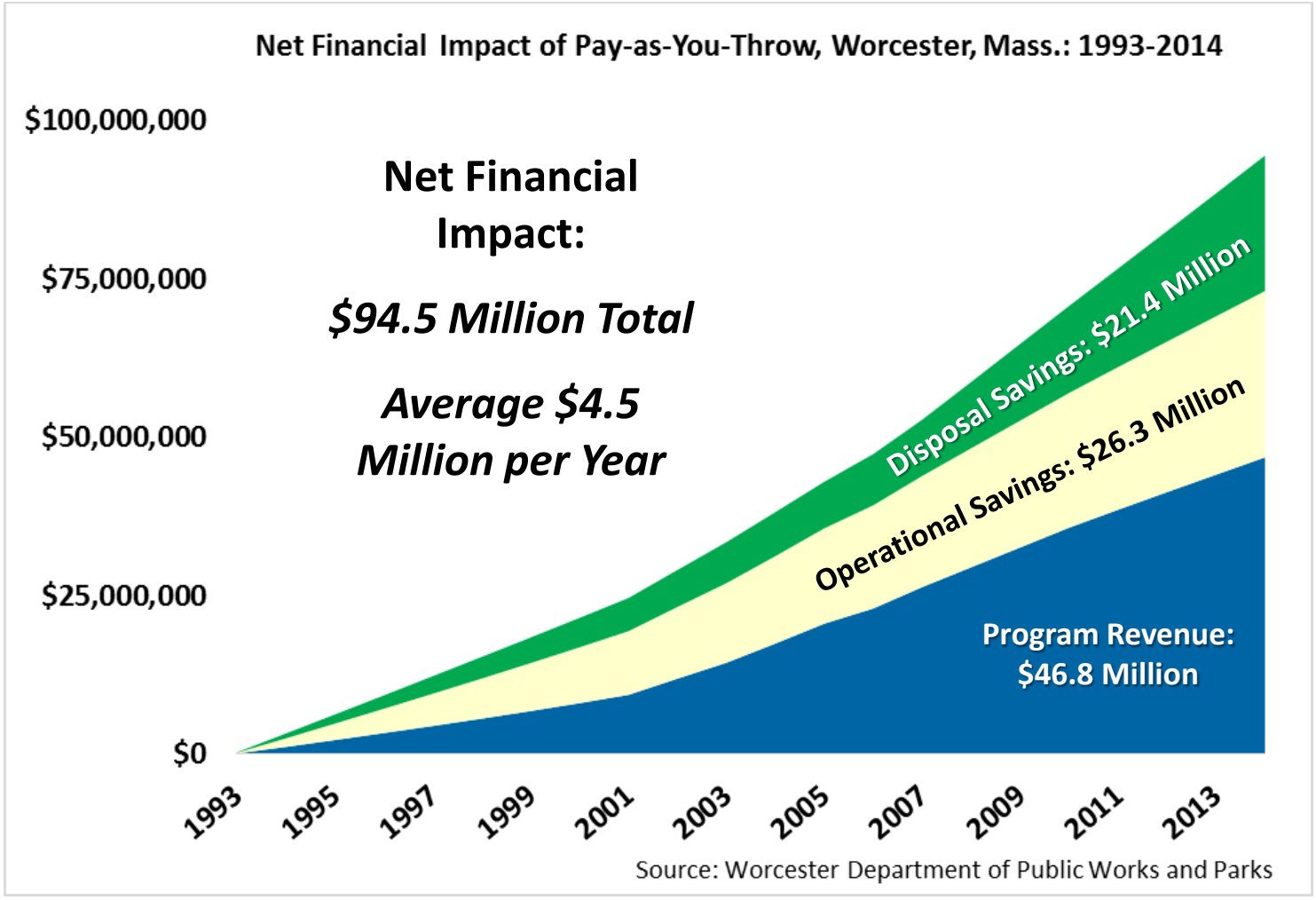
Installing

12,000

rooftop solar panel arrays

Source: EPA WARM Model

SMART in Worcester—Financial Results



Common Concerns Raised on Social Media

Common Concern 1

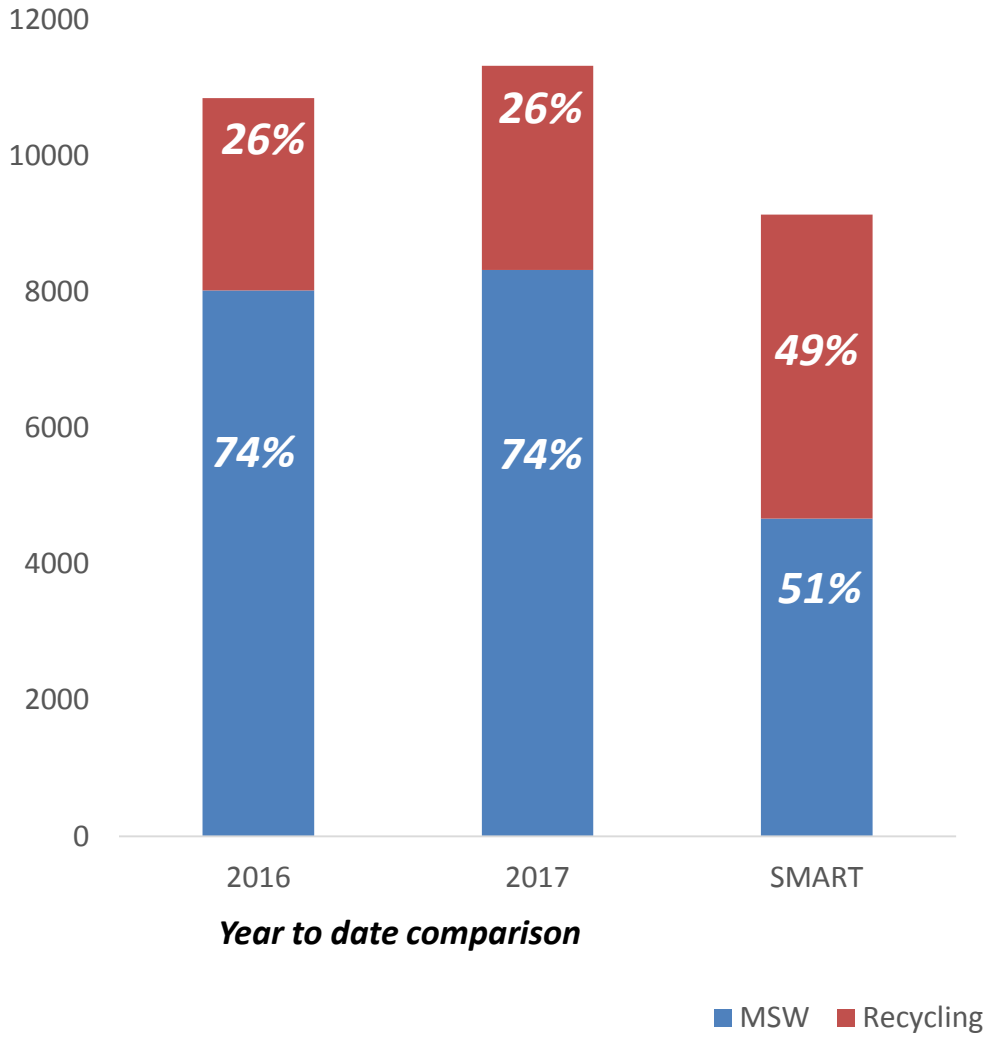
There must be a better way. We should study this more thoroughly and try other solutions first.

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.

Common Concern 1: Supporting Data

Switching from Bi-Weekly to Weekly Recycling: West Hartford's Experience



Common Concern 1: Supporting Data

Banning Plastic Bags: Westport's Experience

Westport banned plastic bags about 10 years ago. Banning plastic bags is also a difficult political action. Although the ban was important for multiple reasons, it's 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

Common Concern 2

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.

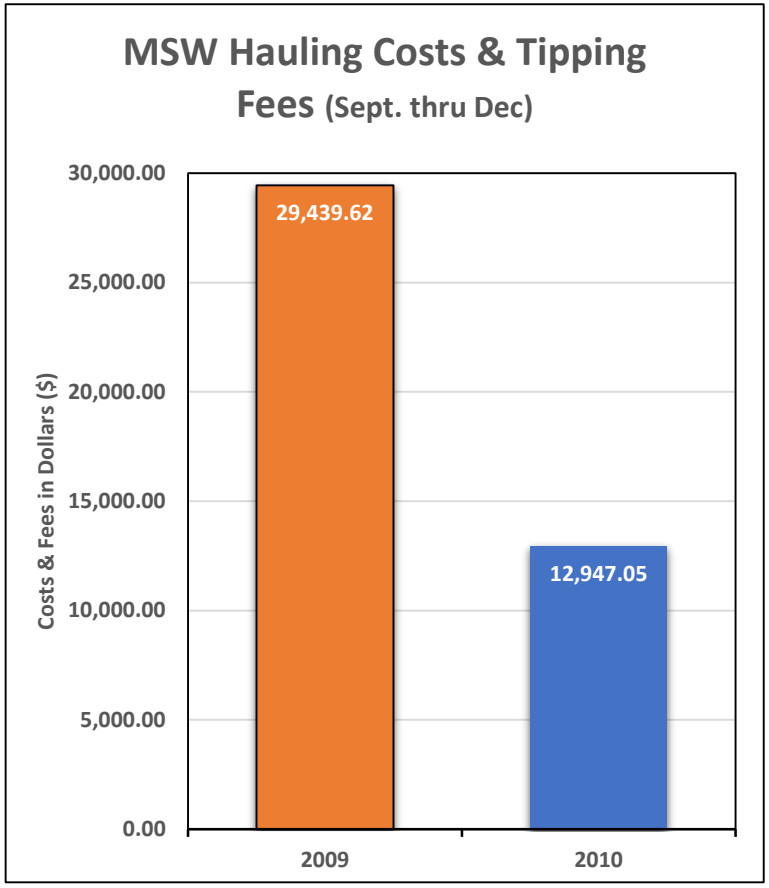
Only a handful of programs have been discontinued. Two are located in Connecticut. The programs were discontinued for political reasons, not because of poor results.

Common Concern 2: Supporting Data

Columbia, CT 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 $7,482 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.



Common Concern 2: Supporting Data

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

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

  East Lyme's current annual per capita trash is 650 lbs.

- 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 lbs.

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

  Stonington has saved approximately 4.5 Million dollars since the program's inception.

Common Concern 3

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.

Common Concern 4

Residents will hate it.

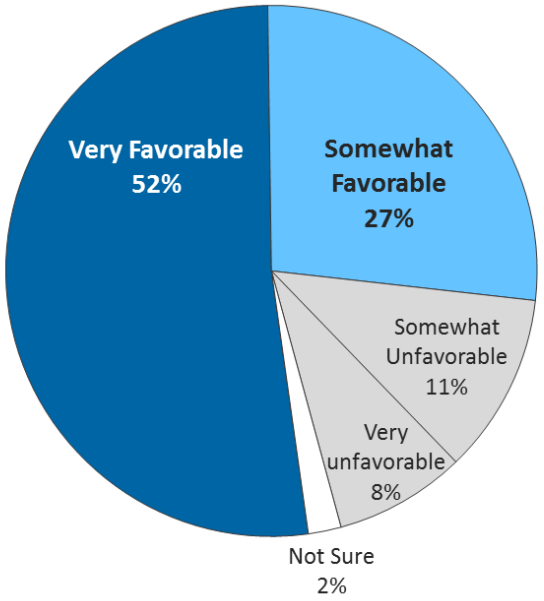
Actually, residents like the program once they have given it a try.

Common Concern 4: Supporting Data

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.

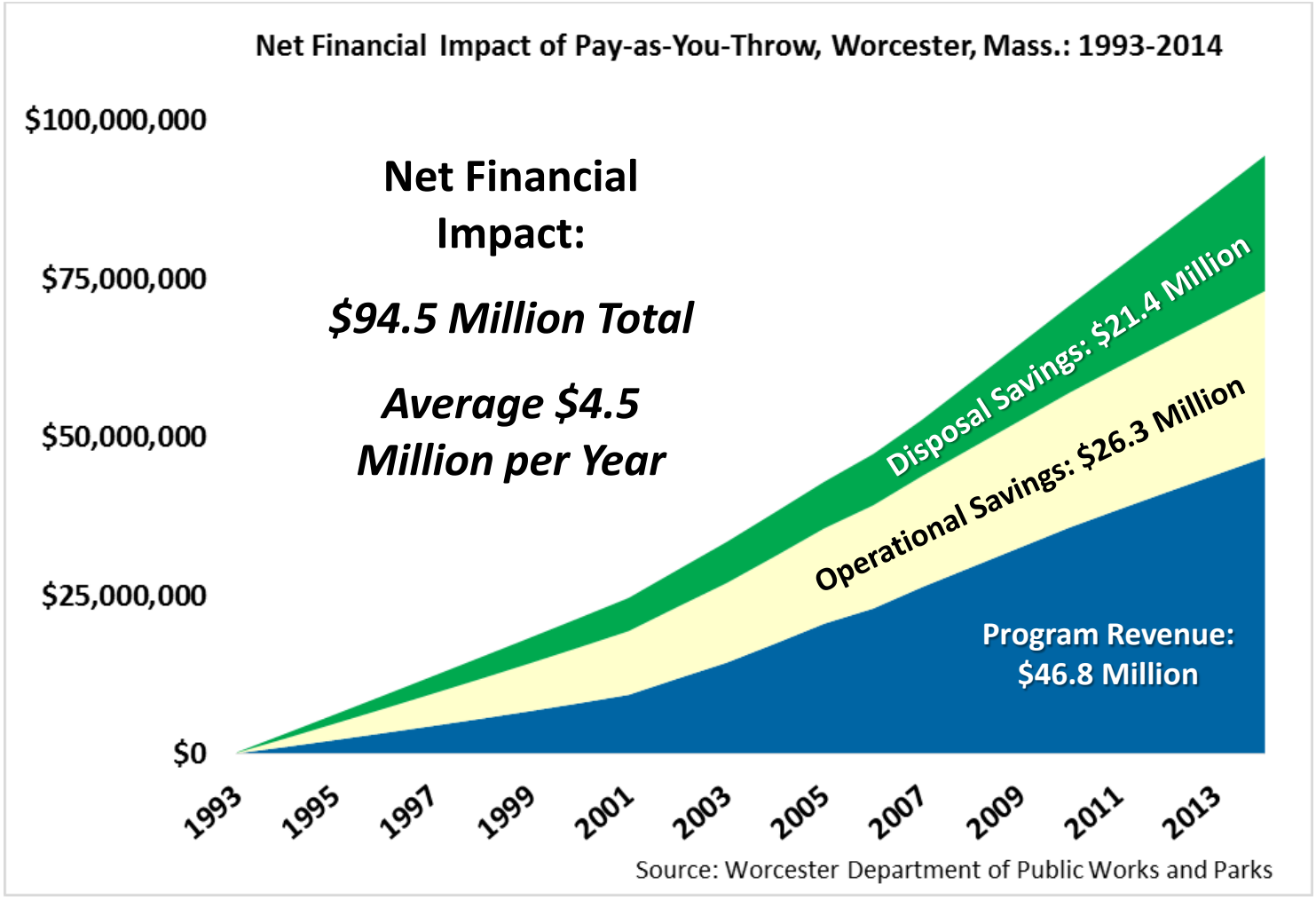
THE WALL STREET JOURNAL

‘Kicking the Cans’ July 29, 2008

Should people who throw out more trash pay higher disposal bills?

84% - YES 16% - NO

SMART in Worcester—Financial Results



Compliance with SMART

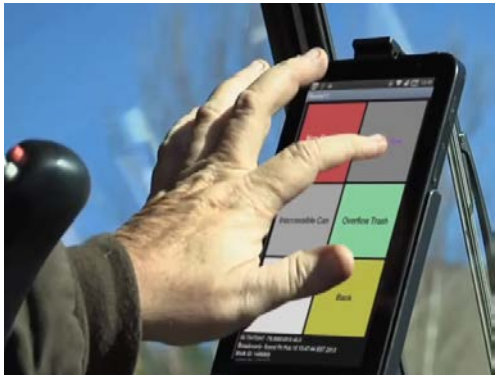
How Does Enforcement Work with Automated Collection?

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

SMART Bags Pay for Trash Disposal (plus some collection)

High	**Retail Cost**	**$2.50**	**$2.00**	**$1.50**
	Bag & Bag Distribution	*$0.31*	*$0.21*	*$0.18*
	Trash Disposal	*$2.19*	*$1.79*	*$1.32*

Medium	**Retail Cost**	**$1.75**	**$1.25**	**$0.80**
	Bag & Bag Distribution	*$0.31*	*$0.21*	*$0.18*
	Trash Disposal	*$1.44*	*$1.04*	*$0.62*

Low	**Retail Cost**	**$1.00**	**$0.80**	**$0.60**
	Bag & Bag Distribution	*$0.31*	*$0.21*	*$0.18*
	Trash Disposal	*$0.69*	*$0.59*	*$0.42*

Estimated Annual Financial Impact of SMART

High

Bag purchase price:

- Large: $2.50
- Medium: $2.00
- Small: $1.50

SMART Results: Municipal Financial Impact (Cumulative)				
	1 Yr	**3 yrs**	**5 yrs**	**10 Yrs**
# Bags Sold	866,674	2,600,023	4,333,372	8,666,743
Net Revenue	$1,728,582	$5,185,746	$8,642,910	$17,285,819
Trash Tip Svgs	$427,680	$1,283,040	$2,138,400	$4,276,800
Add'l Recycle Tip Svgs (Cost)	$0	$0	$0	$0
Net Benefit	**$2,156,262**	**$6,468,786**	**$10,781,310**	**$21,562,619**

Medium

Bag purchase price:

- Large: $1.75
- Medium: $1.25
- Small: $0.80

SMART Results: Municipal Financial Impact (Cumulative)				
	1 Yr	**3 yrs**	**5 yrs**	**10 Yrs**
# Bags Sold	866,674	2,600,023	4,333,372	8,666,743
Net Revenue	$1,080,743	$3,242,229	$5,403,714	$10,807,429
Trash Tip Svgs	$427,680	$1,283,040	$2,138,400	$4,276,800
Add'l Recycle Tip Svgs (Cost)	$0	$0	$0	$0
Net Benefit	**$1,508,423**	**$4,525,269**	**$7,542,114**	**$15,084,229**

Low

Bag purchase price:

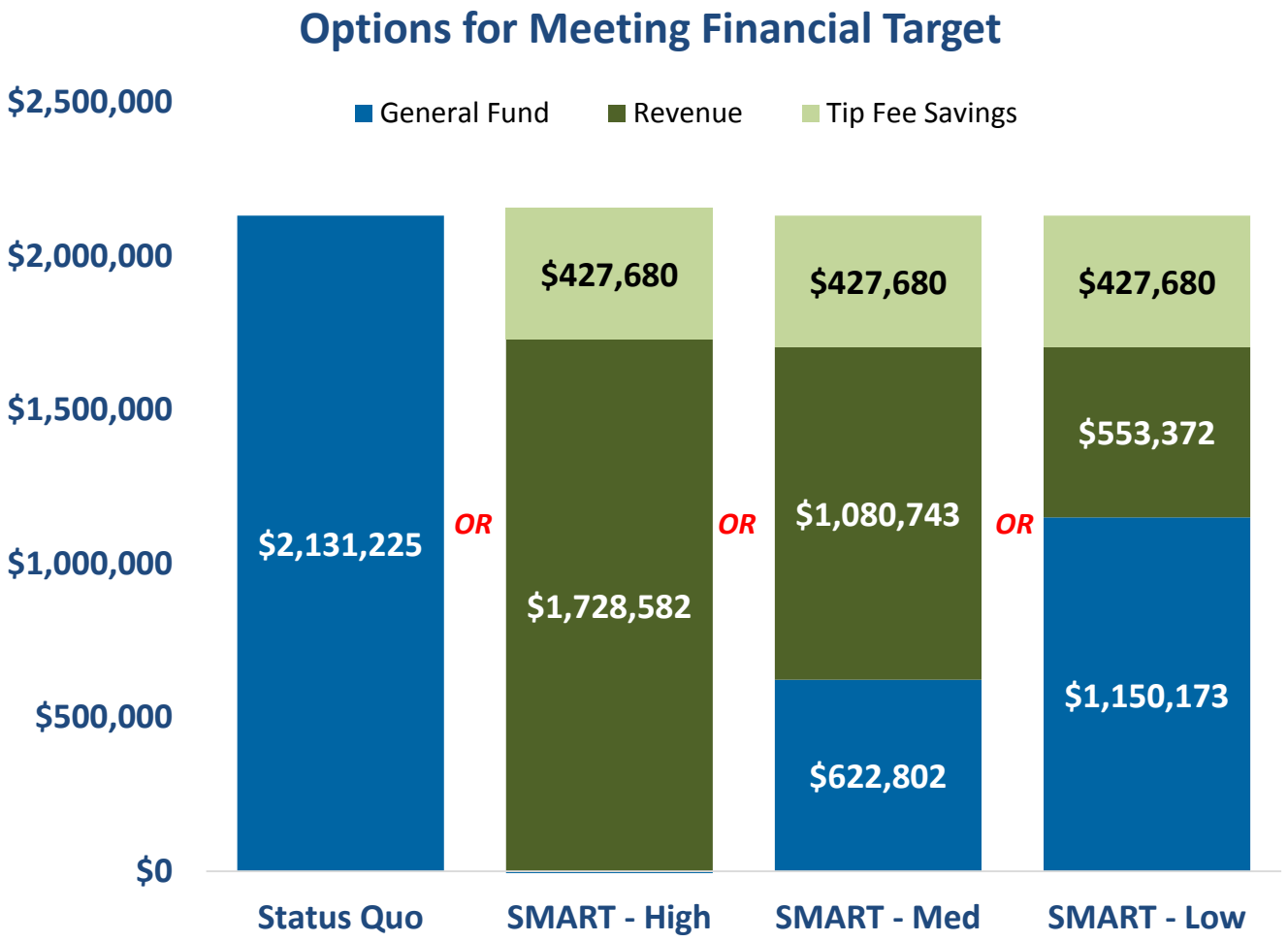
- Large: $1.00
- Medium: $0.80
- Small: $0.60

SMART Results: Municipal Financial Impact (Cumulative)				
	1 Yr	**3 yrs**	**5 yrs**	**10 Yrs**
# Bags Sold	866,674	2,600,023	4,333,372	8,666,743
Net Revenue	$553,372	$1,660,115	$2,766,858	$5,533,715
Trash Tip Svgs	$427,680	$1,283,040	$2,138,400	$4,276,800
Add'l Recycle Tip Svgs (Cost)	$0	$0	$0	$0
Net Benefit	**$981,052**	**$2,943,155**	**$4,905,258**	**$9,810,515**

Notes:

1. Benefits and Savings for Years 3,5, and 10 are cumulative
2. Revenues are net of estimated program services and supplies
3. Assumes 0% average annual population growth

Torrington More Efficient Revenue Generation



Source: Torrington FY 2018 Budget: Residential Tip, Collection, & Equipment

Positive Return on Investment (ROI) of 40% to 170%

A SMART program asks residents for less. In all scenarios, the annual cost to residents is significantly less than the annual benefit to the community.

		High	Medium	Low
Average HH SMART bag annual expense		$125.79	$84.19	$50.32
Average HH regular trash bag annual expense	minus (-)	$27.00	$27.00	$27.00
Average additional out of pocket (since regular trash bags are no longer needed)	equals (=)	$98.79	$57.19	$23.32
Total out of pocket cost from all 15,571 homes	times (x)	**$1,538,259**	**$890,505**	**363,116**
Annual Community Benefit		**$2,156,262**	**$1,508,423**	**$981,052**
Return on investment for residents		**~40%**	**~69%**	**~170%**