

The City of Bridgeport

SMART Solid Waste Management



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The City of Bridgeport Connecticut

SMART Guide Book to Unit Based Pricing Solid Waste Management

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American Big Cities (SMART) Unit Based Pricing Project

1. Introduction

1.1 Summary of Project

A SMART (Save Money and Recycle Trash) residential waste reduction program incentivizes residents to recycle by charging per unit for trash. SMART communities remove all, or part, of the costs associated with waste, from the tax base. Therefore, they treat waste like a utility. The SMART strategy empowers residents to take control of the amount they spend on trash. Approximately 7,000 cities and towns in the U.S, along with many more worldwide, have implemented basic economic principles to address solid waste. When citizens have to pay by the unit they become more aware of the waste being produced, which triggers long term sustainable behavioral change.

The mission of the SMART Guide Book is to:

1. Determine the feasibility of implementing a Unit Based Pricing (UBP) solid waste management program in the City of Bridgeport, understanding that the decision to implement rests on the Mayor and his council.
2. Determine a cost effective approach (or approaches) which best provide sustainable waste reduction, increased recycling volume, and significant cost reductions.
3. Provide the city with options for implementing UBP that work within the existing collection framework and MSW infrastructure in order to limit additional capital expenditures by the City.
4. Provide rate structure design options that create a steady revenue stream to fund all or part of the solid waste budget.

Key Characteristics of a SMART waste management strategy:

Environment — Significant positive environmental impact occurs as a direct result of waste reduction, increased recycling and composting, and reusing or repairing items when possible. UBP helps decrease the cities Carbon Footprint by reducing overall Green House Gases emissions between 3 and 5%. As recycled materials are manufactured into new products, environmental degradation caused by extracting raw materials from the earth is reduced.

Equity — Customers generating smaller amounts of trash because of better waste management or household size, do not subsidize the costs of customers that generate larger quantities of trash.

Economics — Similar to a public utility, individual costs are based on each customer's usage of the service. The opportunity for cost control is now possible by improved waste management.

Education — UBP also encourages consumers to understand local recycling guidelines by prompting them to read, listen, and learn enough to make changes that provide monetary rewards. This financial incentive creates a consequence for inaction. Education about the new program through various media should begin as early as possible to aid in transitioning. Types of media include public meetings, public service announcements, articles published in the local newspapers, and mailings or flyers to each customer. One method is to provide each customer with a start up kit. Examples of items to include in each kit are:

- Detailed explanation and instructions of the new program.
- A small, easy to understand, how to quick reference guide with graphics and short reminders.
- Schedule of curbside pick up and drop off items and dates.
- Other materials for a smooth, simple start up.

Enforcement — An effective plan includes funding and a plan for enforcement of all provisions in the program, including illegal dumping.

1.2 Methodology

The information and suggestions proposed in Bridgeport's SMART Guidebook were determined using the EPA's 6 step planning process:

1. Gather community solid waste and population characteristics.
2. Identify and compile existing municipal solid waste program costs.
3. Identify and compile MSW program revenue sources.
4. Develop alternative rate structures.
5. Project MSW revenues based on alternative rate structures.
6. Evaluate the sustainability of the alternative rate structures based on revenue requirements.

1.3 Waste Minimization Goals for the City of Bridgeport and the State of Connecticut

The City of Bridgeport is currently picking up trash and recycling curbside from 41,262 single and 5,642 condominium and multifamily households. The city has a short term goal for fiscal year 2008/09 of increasing recycling by 10%. An educational campaign by Connecticut Resource Recovery Authority (CRRRA) is aiming for a 15% increase this year. These goals should put Bridgeport between 9% and 10% recycling (commodity materials and yard waste combined). The longer term goal of 58% diversion was set by the State of Connecticut by the year 2024 to comply with its 2006 Solid Waste Management Plan. This diversion includes yard waste.

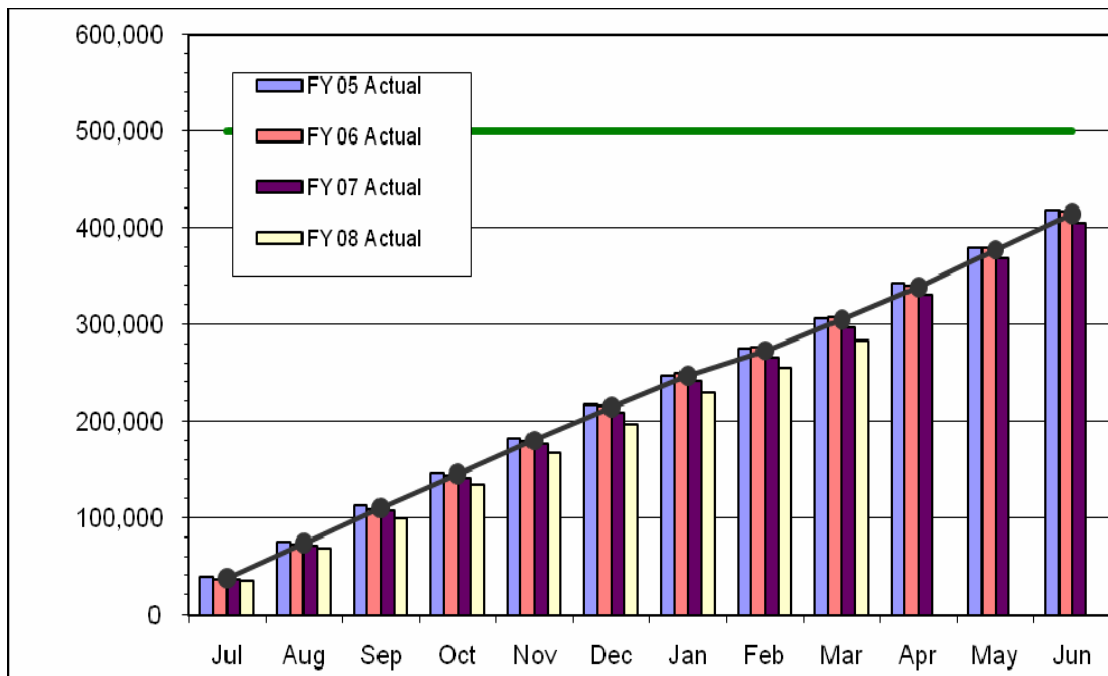
2. Overview

2.1 Existing Waste Collection System

The City of Bridgeport picks up waste using city employees. There are 12 semi-automated trash trucks, 12 routes per day, and 60 routes per week. Garbage pick up requires 24 full time drivers. The city is in the process of changing their collection service to a semi automated roll out container program. The program was implemented to decrease workman's compensation. To date 11,000 containers have been purchased and delivered. There is a further commitment for 30,000 containers. All containers have a 10 year guarantee.

The waste is brought to the Bridgeport Waste to Energy (WTE) Facility. The current tip fee is \$71.61 per ton for residential material and \$76.00 per ton for multifamily material. The projected future tip fee is \$80 per ton.

Image 1. Historical Cumulative Tonnage Chart (CRRA)



The total tonnage of waste has decreased over the last 3 years.

Currently there are 123 multi-family condominium complexes with a total of 5,642 households. These communities currently have dumpster areas for trash and no designated recycling area.

2.2 Existing Recycling Collection System

The City of Bridgeport picks up approximately 2,856 tons of commodity recycling (paper, metal, glass, and plastic) using 9 crew members in a total of 40 routes per week. There are a total of 9 manual/crane trucks picking up dual stream recycling including paper, mixed cans, and bottles bi-weekly. The city is in the process of re-

negotiating their contract with CRRA Municipal Recycling Facility (MRF). Single stream collection is a possibility and an increase in per ton revenue potential will also be addressed with CRRA or any other potential MRF. The city has recently distributed 2,500 additional new containers for recycling.

The City of Bridgeport currently collects: newspaper, cardboard, aluminum, steel, glass, #1 and #2 plastic. It would be in the city's best interest to add new materials to the list while in the negotiation process.

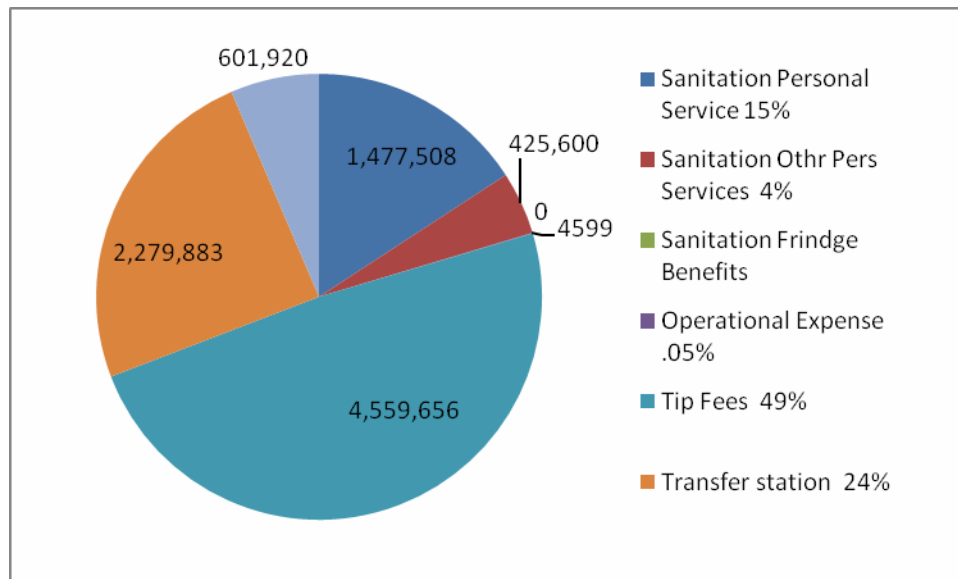
Image 2. City of Bridgeport Recycling Tonnages

Waste Total / tons	58,500
Commodity Recycling / tons	2,868
Metal / tons	1,125
Yard Waste / tons	1,500
Total Generation	63,993
Recycling Commodity Percent	4.9%
Total Recycling / tons	5,493
Total percent	8.6%

2.3 Overall Solid Waste Budget

The total households served by city solid waste services is 47,144 including condominiums. The total 08/09 budget, including the transfer station, is expected to be \$9,399,166 and the cost per household is approximately \$199.37 dollars. Solid waste tip fees of \$4,559,656 represent 49% of the total Sanitation and Recycling budget.

Image 3. Breakdown of Sanitation and Recycling Budget

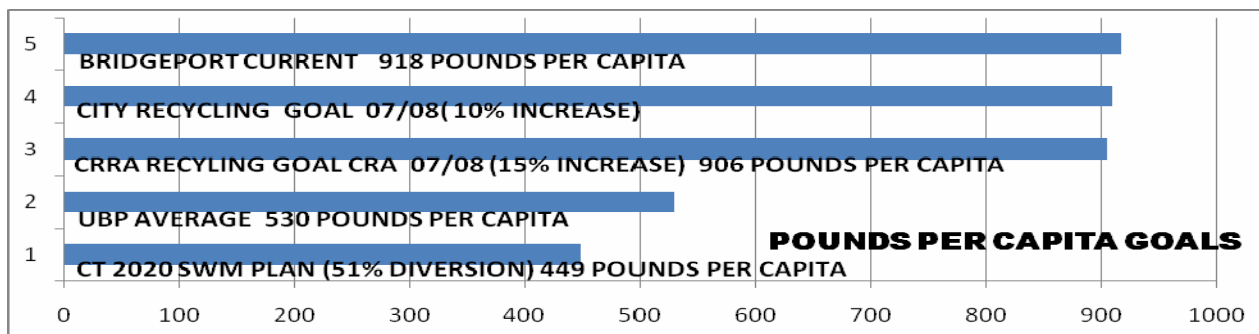


The average resident in a UBP community within the state of Massachusetts disposes of 44% less waste than residents in communities without a unit based structure for garbage. Source MA DEP 2005

3.2 Projected per capita disposal change

The City of Bridgeport's 07/08 residential waste tonnage, including bulk items is 58,500, which equals 918 pounds of trash per capita. The current city recycling goal is a 10% increase and CRRA has a goal for the city through their educational campaign of increasing recycling 15%. The State of Connecticut Solid Waste Management Plan calls for a 58% diversion by 2024. The following per capita breakdown demonstrates the expected change with a UBP SMART program compared to current city recycling and diversion goals.

Image 5. The City of Bridgeport per Capita Waste Reduction Goals

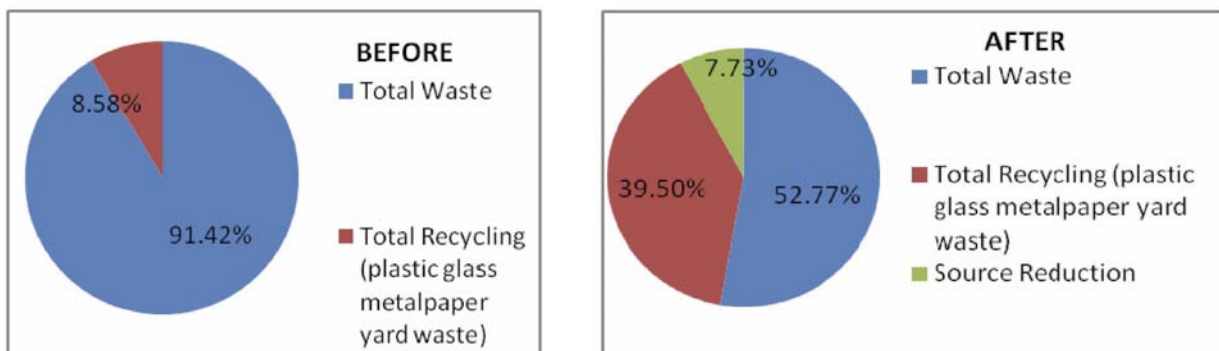


Where does the waste go? EPA studies have shown that 30% is source reduced, 35% composted, 35% recycled.

Source: Skumatz, Lisa A., and David J. Freeman, "Pay As You Throw (PAYT) in the US: 2006 Update and Analyses", USEPA (Washington DC) and Skumatz Economic Research Associates, Inc. (Superior, CO), December 30, 2006.

The following before and after charts demonstrate the potential change in the waste stream, after the implementation of a SMART UBP waste plan.

Image 6. Before and After SMART



Trash represents 91% of Bridgeport's total 2008 residential stream (before UBP) and only 52% after implementation. An estimated decrease of 42% in waste brought to the Wheelabrator WTE facility would equal approximately 1.9 million in avoided disposal costs. The overall recycling rate (including commodities and yard waste) could increase over 400%.

Waste reduction (i.e., through reducing and reusing) provides an added environmental benefit to PAYT. When faced with financial incentives, consumers actually make better purchasing decisions at the source or retail level. Therefore, products that are packaged better, smaller or with recyclable materials are chosen over those that do not fit the new environmentally inspired criteria. EPA studies show that approximately 70 to 75 percent of diversion in PAYT programs is recycled or composted, but 25 to 30 percent can be categorized as source reduction.

3.3 SMART Design for Bridgeport

A SMART waste management plan for the City of Bridgeport would utilize the current collection vehicles in order to minimize additional expense. To date Bridgeport has purchased and delivered 11,000 roll off semi-automated Toter containers and is committed to 30,000 more. In both of the following options it is possible that the city could change container size to a smaller container, or even change container type to a clear container.

There are two design options:

Design Option 1: The most cost effective option is utilizing the 96 gallon Toters which are in the process of being rolled out throughout the city in conjunction with an official colored city trash bag for garbage.

Recycling would remain exactly the same. This also allows all the trucks and routes to remain the same. A similar system is used in Middletown RI. As damaged containers are replaced, over time, the size could be adjusted to 32 or 64 gallon to save long term cost. Enforcement would take place as the attendant is rolling the container to the automated arm. Toters containing non-compliant bags would be left at the curb without being emptied. This option provides opportunity to evolve the system in the future to include single stream collection of trash, recycling, and compostable materials in the same truck, using color coded bags with different incentive price points. Combination pick up of all materials allows for a decrease in labor, transportation costs, and overall GHG. A long term plan for separation of bags at the Wheelabrator facility or a transfer station would have to be in place.



Picture 1: Colored bag could be placed in 96 gallon container and monitored by the attendant by lifting the lid before placing the container on the automated arm.

Variation: A clear container could be used in place of the remaining (not yet acquired) 96 gallon containers. The clear container would still be 96 gallon but would allow the attendant to easily see the contents of the container without lifting the lid. The clear container may be more costly but would readily allow a long term expansion to multi-stream collection program using the same container.



Picture 2: Clear container allows the attendant to monitor compliance more easily.

Design Option 2: Switch trash and recycling routes and trucks. This option may require some capital expense for additional vehicles, but has been done successfully in other cities. A similar design model is in the cities of Worcester MA and Springfield MA. The decreased volume of trash and increased volume of recycling would allow the current trash trucks to pick up recycling either single or dual stream using the current Toter containers. The waste would be placed in official City of Bridgeport city trash bags and picked up using the current manual recycling trucks. The volume of trash will decrease to an average of 1.5 bags per household, thus allowing the trash to be picked up in the recycling trucks. The CRRA facility would have to be able to accommodate single stream recyclable material or a modified single stream process where the paper and cardboard is placed in a clear plastic bag tied off. This may require some re-organizing of the routes and crew and could possibly be accomplished without additional vehicle expense. Within this design option there are two options for future recycling: dual stream or single stream. The CRRA MRF currently only accepts dual stream material. There are two options for dual stream collection with the 96 gallon containers:

1. Continue to collect dual stream material using an every other week collection pattern. Every even number week is for paper recycling and every odd number week is mixed cans and bottles. This program could be communicated to residents at the start of the program and throughout the year. Warwick, RI is a model of this design option.
2. Collect the mixed cans and bottles in the 96 gallon container and use a clear plastic bag for the paper and cardboard. The clear plastic bag is tied off and placed with the mixed material in the 96 gallon container and separated at the MRF into 2 clean streams. Similar systems are seen in NYC, St Peters, MO and Holland, MI.




Picture 3: Recycling would be picked up on specified day in the large 96 gallon container with the semi automated trucks and trash would be picked up in manual trucks.

Since the operation for garbage collection would be manual, this option would allow a standard container to be used along with the trash bags. This would protect the bags from rodents, however may also slow down the curbside productivity of dumping.

Variation: The clear container could also be used for recycling to allow the attendant to monitor the contents and compliance.

Image 7. Summary of Design Options

	Design Option 1	Design Option 2
Trash Vehicle	Current Trash Truck	Either Trash or Recycling Truck
Trash Container		
	Official trash bag in current semi-automated container	Official Trash bag no container
Recycle Vehicle	Current Recycle Truck	Either Trash or Recycling Truck
Recycle Container		
Recycle Type	Duel Stream	Single Stream
Additional Expense	Weekly Recycling Required; Purchase of special City Trash Bags (residents most likely purchase a trash bag anyway)	Weekly Recycling Required; Purchase of special City Trash Bags (residents most likely purchase a trash bag anyway)
Other	Easier to implement immediately: without completion of container roll out; without single stream recycling in place	Reduce Trash routes because you are not limited by semi automated arm; increase recycling collection productivity through automation

4. Rate Structure and Program Options

4.1 Unit Based Pricing

In this section the Rate Structure Systems are presented in terms of benefits/advantages and risks/disadvantages. The use of a table format allows for clearer understanding and easier comparison among systems.

Image 8. Implementation of a Unit Based Pricing Program

Benefits/Advantages	Risks/Disadvantages
Customers gain a true understanding of the cost of MSW. No longer perceived as free.	Some confusion during start up of program is likely to occur.
Customers have the ability to reduce their own cost of waste collection and disposal through improved waste management.	Perceived fear and possible impact of the proliferation of more fees for other town services in addition to property tax.

4.2 Rate Structure Systems

Within the unit based pricing programs, two specific rate structure systems are currently in use in similar neighboring communities: proportional and two tiered (proportional). A SMART waste management strategy builds all the costs associated with trash, recycling, and management into the pricing structure.

Proportional Rate. Proportional systems create the most direct relationship between trash volume and price. Residents are charged the same amount of money for each unit of trash they set out for collection. The City of Bridgeport would use a bag as the unit base. Customers pay a fee by purchasing "official" distinctively marked, standard-sized trash bags. Bags can be purchased from municipal offices or retail stores. Only official bags are collected.

Trash services require bags to be purchased for all disposal of rubbish. A fee is paid at the time of service through the cost of the bag. Fairness is assured. Revenues are uncertain until the program is established and its history can be used to project future costs and revenues. Funding for the entire program is dependent on bag sales. The cost of the program is reduced because billing and opting out is eliminated. This program carries the highest financial risk. Success actually reduces revenue and program costs may not be met. It is important to price the bags correctly from the start, leaving a financial cushion is important, especially during the first year.

Image 9. Proportional Rate System

Benefits/Advantages	Risks/Disadvantages
Easiest system to understand and comply with because the bag causes the volume and weight limits to be more apparent.	Revenue uncertainty and cash flow when program first begins.
The size of the official bag will clarify the volume limit. The strength of the bag will clarify the weight limit by bursting when the weight limit is grossly exceeded.	The more the community decreases the waste the less revenue is generated from bags sales.
Customers purchase only bags, which are needed for disposal anyway.	
Increased flexibility by offering more than one bag size. A smaller size bag could be offered to customers who generate small amounts of rubbish or wish to add an additional smaller bag beyond the included unit.	
Any future changes to unit weight or volume can be easily implemented by changing the size of the bag(s).	
Fastest and most efficient means of collection. Official bags are easily identified and conform to size and weight limits.	
Official bags are more difficult to counterfeit than stickers or tags.	
Illegal waste containers are more easily identified.	
Although collection would be somewhat slower, an option could be to allow bags to be placed inside of containers for collection as added protection against animals tearing bags.	
Details of the entire MSW program could be printed on each bag, or bag packaging for customers to easily reference.	
Widely used system in Massachusetts.	

Two-Tiered Proportional. Two-tiered systems help communities achieve revenue stability. Residents receive a base level of service, for which they pay a flat fee. The 'first-tier' fee can be assessed through the tax base or through a fee included in another municipal service like a quarterly or monthly water bill. The base charge can be used to cover the fixed portion of the solid waste program (e.g. personnel, transfer station, transportation, executive oversight etc.) Residents then pay a 'second-tier' based on the amount of waste they put out. The second-tier is proportional and covers disposal costs.

The two-tiered program is also widely used in neighboring Massachusetts communities. The base fee assures funding of all fixed costs. In some cases one bag of rubbish per week is also included in the base fee. In this case the base fee is higher to also cover part of the disposal.

Image 10. Two-Tiered Proportional

Benefits/Advantages	Risks/Disadvantages
Revenue will cover fixed costs.	When base price is included in property tax, customer is unaware of the true cost of MSW program.
Revenue stability is ensured. Program funding is not entirely dependent on bag (or sticker) sales. Success of program does not under fund program.	The requirement of paying an additional fee for second (or multi) tier may be difficult to understand
Waste reduction, reuse and recycling are encouraged. Residents use the goal of reducing trash to one bag to avoid buying additional bags, thus reducing waste.	
Administration and enforcement of a trash fee could be complex, leaving the base in the assessed property tax is a more efficient option	
Can be implemented more quickly and inexpensively than other programs.	
Allows maximum flexibility to implement changes.	
Inclusion of all MSW services and one bag of rubbish encourage the most environmentally sound and cost effective method of collection and disposal. Customer is not penalized, through additional fees, for doing the right thing by recycling and using the drop off center.	
Disincentive for illegal dumping.	
Most strongly recommended by MA DEP.	
Most widely used system in Massachusetts.	

4.3 Rate Structure Options

The following rate structure options use 530 pounds per capita as a benchmark. This equals a 42% reduction in waste for the City of Bridgeport. The guide book also makes assumptions on 3 other benchmarks: a waste reduction to 400, 600, and 700 lbs per capita, representing: 56%, 35%, and 24% waste diversion respectively. Several cities throughout the US have achieved per capita disposal of 400 pounds and under.

Rate Structure Option 1 (Image 11). Proportional per bag cost can be used in either design option 1 (colored bag in current container) or design option 2 (reverse system with recycling in large container). In

order to cover a better than average reduction in waste (to 400 lbs per person), the bag cost for a proportional system would have to be \$3.00 each. The more you decrease waste the less bags are sold therefore, less revenue is generated to cover the program costs.

Image 11. Proportional

Projected Per Capita Disposal	530	530	530	400	400	400	600	600	600	700	700	700
Bag price	2.00	2.50	3.00	2.00	2.50	3.00	2.00	2.50	3.00	2.00	2.50	3.00
Revenue/\$												
Trash Fee / base	-	-	-	-	-	-	-	-	-	-	-	-
Sale of Trash Bags	6,753,684	8,442,105	10,130,526	5,097,120	6,371,400	7,645,680	7,645,680	9,557,100	11,468,520	8,919,960	11,149,950	13,379,940
Increased Recycling Revenue	86,524	86,524	86,524	115,514	115,514	115,514	70,914	70,914	70,914	48,614	48,614	48,614
Total Revenue	6,840,208	8,528,629	10,217,050	5,212,634	6,486,914	7,761,194	7,716,594	9,628,014	11,539,434	8,968,574	11,198,564	13,428,554
Cost Reductions												
Avoided Disposal Cost	1,854,089	1,854,089	1,854,089	2,475,304	2,475,304	2,475,304	1,519,588	1,519,588	1,519,588	1,041,730	1,041,730	1,041,730
Reduction Labor	-	-	-	-	-	-	-	-	-	-	-	-
Total Cost Reductions	1,854,089	1,854,089	1,854,089	2,475,304	2,475,304	2,475,304	1,519,588	1,519,588	1,519,588	1,041,730	1,041,730	1,041,730
Total Source of Funding	8,694,297	10,382,718	12,071,139	7,687,939	8,962,219	10,236,499	9,236,183	11,147,603	13,059,023	10,010,305	12,240,295	14,470,285
Cost of PAYT												
Trash Bag Cost	844,211	844,211	844,211	637,140	637,140	637,140	955,710	955,710	955,710	1,114,995	1,114,995	1,114,995
Cost of additional containers	-	-	-	-	-	-	-	-	-	-	-	-
Cost of additional vehicles	-	-	-	-	-	-	-	-	-	-	-	-
Total cost of program	844,211	844,211	844,211	637,140	637,140	637,140	955,710	955,710	955,710	1,114,995	1,114,995	1,114,995
NET	7,850,087	9,538,508	11,226,929	7,050,799	8,325,079	9,599,359	8,280,473	10,191,893	12,103,313	8,895,310	11,125,300	13,355,290
Budget	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166

Rate Structure Option 2 (Image 12). A two-tiered program would continue to include a base charge within the tax rate. The tax base is an easier option since a fee would require a separate billing and collection function. This base fee would cover fixed costs. The additional money would be captured through the sale of official trash bags. The cost of 1.50 per bag would allow a tax rebate of 50% of the current \$200 rate per household. This would also create some surplus cash.

Rate Structure Option 2 – Variation of Two-Tiered System (Image 13). The contents of one standard bag each week could be included (free) the base fee. This bag could be provided by the city through a coupon, or voucher or credit card system. The bags would be official city bags and would be purchased at the local grocery store using the coupon. (Example: Brunswick, ME). The 'One Free Bag' system could be continued annually or it could be done just for the first year as an initial kick off. With 'One Free Bag' the residents would have an opportunity to minimize trash and have no additional cost. If the household creates more trash they must put the trash in an official overflow trash bag. This system is flexible. The city could decrease the number of free bags each year in order to raise revenue. In this case the tax rate would remain the same. In this case the tax rate would remain the same and a surplus of 2 million dollars annually would be generated from the sales of overflow bags. A charge of \$1.00 for additional overflow bags this would be enough of an incentive to deter waste without adding a costly burden for extra disposal.

Image 12. Two-Tiered Proportional

Projected Per Capita Disposal	530	530	530	400	400	400	600	600	600	700	700	700
Bag price	1.00	1.50	2.00	1.00	1.50	2.00	1.00	1.50	2.00	1.00	1.50	2.00
Revenue/\$												
Trash Fee / base 100/HH	4,719,600	4,719,600	4,719,600	4,719,600	4,719,600	4,719,600	4,719,600	4,719,600	4,719,600	4,719,600	4,719,600	4,719,600
Sale of Trash Bags	4,221,053	5,065,263	5,909,474	3,185,700	3,822,840	4,459,980	4,778,550	5,734,260	6,689,970	5,574,975	6,689,970	7,804,965
Increased Recycling Revenue	86,524	86,524	86,524	115,514	115,514	115,514	70,914	70,914	70,914	48,614	48,614	48,614
Total Revenue	9,027,177	9,871,387	10,715,598	8,020,814	8,657,954	9,295,094	9,569,064	10,524,774	11,480,484	10,343,189	11,458,184	12,573,179
Cost Reductions/\$												
Avoided Disposal Cost	1,854,089	1,854,089	1,854,089	2,475,304	2,475,304	2,475,304	1,519,588	1,519,588	1,519,588	1,041,730	1,041,730	1,041,730
Reduction Labor	-	-	-	-	-	-	-	-	-	-	-	-
Total Cost Reductions	1,854,089	1,854,089	1,854,089	2,475,304	2,475,304	2,475,304	1,519,588	1,519,588	1,519,588	1,041,730	1,041,730	1,041,730
Total Source of Funding	10,881,266	11,725,476	12,569,687	10,496,119	11,133,259	11,770,399	11,088,653	12,044,363	13,000,073	11,384,920	12,499,915	13,614,910
Cost of / \$ PAYT												
Trash Bag Cost	844,211	844,211	844,211	637,140	637,140	637,140	955,710	955,710	955,710	1,114,995	1,114,995	1,114,995
Cost of additional containers	-	-	-	-	-	-	-	-	-	-	-	-
Cost of additional vehicles	-	-	-	-	-	-	-	-	-	-	-	-
Total cost of program	844,211	844,211	844,211	637,140	637,140	637,140	955,710	955,710	955,710	1,114,995	1,114,995	1,114,995
NET	10,037,055	10,881,266	11,725,476	9,858,979	10,496,119	11,133,259	10,132,943	11,088,653	12,044,363	10,269,925	11,384,920	12,499,915
Budget	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166
Difference	637,889	1,482,100	2,326,310	459,813	1,096,953	1,734,093	733,777	1,689,487	2,645,197	870,759	1,985,754	3,100,749

Image 13. One Free Bag

Projected Per Capita Disposal	530	530	530	400	400	400	600	600	600	700	700	700
Bag price	1	1.25	1.50	1	1.25	1.50	1	1.25	1.50	1	1.25	1.50
Revenue/\$												
Trash Fee / base 200/HH	9,439,200	9,439,200	9,439,200	9,439,200	9,439,200	9,439,200	9,439,200	9,439,200	9,439,200	9,439,200	9,439,200	9,439,200
Sale of Trash Bags	922,650	1,153,313	1,383,975	94,368	117,960	141,552	1,368,648	1,710,810	2,052,972	2,005,788	2,507,235	3,008,682
Increased Recycling Revenue	86,524	86,524	86,524	115,514	115,514	115,514	70,914	70,914	70,914	48,614	48,614	48,614
Total Revenue	10,448,374	10,679,037	10,909,699	9,649,082	9,672,674	9,696,266	10,878,762	11,220,924	11,563,086	11,493,602	11,995,049	12,496,496
Cost Reductions/\$												
Avoided Disposal Cost	1,854,089	1,854,089	1,854,089	2,475,304	2,475,304	2,475,304	1,519,588	1,519,588	1,519,588	1,041,730	1,041,730	1,041,730
Reduction Labor	-	-	-	-	-	-	-	-	-	-	-	-
Total Cost Reductions	1,854,089	1,854,089	1,854,089	2,475,304	2,475,304	2,475,304	1,519,588	1,519,588	1,519,588	1,041,730	1,041,730	1,041,730
Total Source of Funding	12,302,463	12,533,126	12,763,788	12,124,387	12,147,979	12,171,571	12,398,351	12,740,513	13,082,675	12,535,333	13,036,780	13,538,227
Cost of PAYT / \$												
Trash Bag Cost	844,211	844,211	844,211	637,140	637,140	637,140	955,710	955,710	955,710	1,114,995	1,114,995	1,114,995
Cost of additional containers	-	-	-	-	-	-	-	-	-	-	-	-
Cost of additional vehicles	-	-	-	-	-	-	-	-	-	-	-	-
Total cost of program	844,211	844,211	844,211	637,140	637,140	637,140	955,710	955,710	955,710	1,114,995	1,114,995	1,114,995
NET	11,458,253	11,688,915	11,919,578	11,487,247	11,510,839	11,534,431	11,442,641	11,784,803	12,126,965	11,420,338	11,921,785	12,423,232
Budget	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166	9,399,166
Difference	2,059,087	2,289,749	2,520,412	2,088,081	2,111,673	2,135,265	2,043,475	2,385,637	2,727,799	2,021,172	2,522,619	3,024,066

5. Recommendations

Design Option 2 with Rate Structure Option 3 (One Free Bag) with overflow bags priced at \$1. The new SMART program should be implemented along with single stream recycling. If single stream is not available, the second choice would be Design Option 2 with Rate Structure Option 3.

1. With this combination there is very little change to the current system or structure. The same equipment and vehicles can be used to pick up trash and recycling without many logistical changes.
2. The assessed tax rate for solid waste and recycling would remain the same at approximately \$200 per household.
3. Residents get something free. Residents feel as though they are getting something free with the new system (a bag). The cost of additional official city overflow trash bags would be \$1 so it would not seem as burdensome to buy an occasional overflow bag.
4. Surplus revenue is created of approximately \$2,000,000 dollars is created annually. This new revenue could be held in an enterprise account. The additional funds from the overflow bags along with the revenue from increased recycling could be used for a 'Recycling Rewards Fund'. Based on 2 million dollars there are various options to consider: each household could receive approximately a \$45.00 rebate creating a sense of community pride, the enterprise fund could be used for other town services (such as libraries, more fire or police staff, parks, city events, or services) benefiting the entire community.
5. This rate structure provides long term flexibility to absorb increasing solid waste management costs without raising rates. The 'One Free Bag' program also allows for a decrease in free bags over time. Year one may include 50 free bags, year two 40 free bags and so on. This could encourage further diversion increases to meet the cities changing goals.
6. Less impact on low income households. Families can learn to recycle, minimize trash and have no additional cost.
7. This program is perfect for the elderly since they generally create far less trash.
8. The 'One Free Bag' program is slightly complicated for the administration, but smooth and simple for the residents.
9. The Two-Tiered system eliminates potential cash flow problems from bag revenue.

6. Implementation Suggestions

A volunteer advisory committee should be formed to carry out the implementation. This committee would be a communications link between the needs and concerns of both residents and the city officials. The members should be comprised of a combination of residents, town officials and employees and should monitor and advise on the current implementation and the future practices of the program.

The committee would:

1. Assess the best way to handle low income families qualification and voucher plan.
2. Decide on the public relations and education leading up to implementation.
3. Help decide on bag color, design, choose participating grocery stores.
4. Create multifamily enforcement suggestions and guidelines.
5. Suggest additional items to be added for recycling collection. Investigate other state recycling lists.
6. Create up-stream producer responsibility by educating local restaurants, grocery, and convenience stores about 'one way carry out packaging' which meets recycling regulations.

Illegal dumping penalties should be consistent with those currently in existence, such as the ordinance that says the City of Bridgeport has the authority to impound vehicles that are caught dumping illegally. The city will need no extra staff in the beginning to educate local businesses about the possibility of illegal dumping and encourage them to lock dumpsters and report problems.

Source reduction is a great benefit of unit based pricing. Residents are motivated to think before they act by pulling items out of the waste stream that used to be trash but have value to someone else. Two economical solutions are reduce and reuse. Samples of source reduction seen in communities with unit based communities are bringing clothes, shoes, small appliances, and electronics to the Salvation Army; bringing your own bag or mug back to the retailer; giving furniture and toys to relatives or friends; or using a local 'Swap Shop'. Many successful programs have a means for customers to exchange usable items at a 'Swap Shop'. This allows customers to drop-off items and staff will sort and store items at the facility preparing them for a future owner. Technology has been used to simplify this process. A web site, or a section of the town's web site, could be dedicated for customers to post usable items no longer needed as well as posting items wanted. Supplier and receiver make their own arrangements for pick up or delivery. Items can be exchanged for further use, reducing waste and costs for all parties, removing the need for use of town facilities. Only one person (a few hours a month) is needed to set up the site and monitor it.

Bulky Items should also be addressed. The city should utilize the current transfer station as a free drop off location. Since the current \$200 tax rate includes bulky items, some free disposal should be available. Stickers could be sold for picked up bulky items.

7. Suggested Sources for Information

Rate Structure Design: Setting Rates for a Pay-As-You-throw Program, Handbook United States Environmental Protection Agency, January 1999,

Pay-As-You-Throw: Lessons Learned About Unit Pricing, United States Environmental Protection Agency, April 1994

Pay-As-You-Throw success Stories, United States Environmental Protection Agency, April 1997

Pay-As-You-Throw: Throw Away Less and Save., United States Environmental Protection Agency, April 1997

Pay-As-You-Throw: A Fact Sheet for Elected Officials, United States Environmental Protection Agency, April 1997

Pay-As-You-Throw: A Fact Sheet for MSW Planners, United States Environmental Protection Agency, April 1997

Pay-As-You-Throw: A Fact Sheet State Officials, United States Environmental Protection Agency, April 1997

Pay-As-You-Throw: An Implementation Guide for Solid Waste Unit-Based Pricing Programs, Commonwealth of Massachusetts, Department of Environmental Protection, January 2004

Municipalities with Pay-As-You Throw Programs, Commonwealth of Massachusetts, Department of Environmental Protection, Bureau of Waste Prevention, January 2005

Websites

http://www.resourceexchange.org/payt/payt_idx.php

http://www.ct.gov/dEP/cwp/view.asp?a=2714&q=324920&depNav_GID=1646