

The Town of Greenwich Connecticut A SMART Path to Zero Waste



**Issued by:
Green Waste Solution
For the Connecticut Department of Environmental Protection**

**The Greenwich Connecticut
Feasibility and Implementation Strategies for Unit Based Pricing**

Town of Greenwich 'SMART' Unit Based Pricing Project

1. Introduction

1.1 Summary of Project

A SMART (Save Money and Reduce Trash) residential waste reduction program means incentivizing residents to reduce and recycle by charging per unit for trash disposal. A community is SMART, if the residents can answer 'YES' to the question - Do residents save money the more trash they recycle? Currently the Town of Greenwich residents are not able to save money by recycling more. The SMART strategy empowers residents to take control of the amount they spend on trash. Generally speaking SMART communities treat waste like a utility.

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 a long term sustainable behavioral change. SMART communities create a proportional unit based pricing structure that includes all costs associated with waste and recycling. Residents pay as they go for trash while unlimited recycling is available to all households with no additional cost.

It is the objective of a SMART waste management program to create a successful, sustainable, user-friendly, cost effective residential recycling program while working within the current collection infrastructure. We define **successful** as a "significant measurable increase in recycling", **sustainable** as a "recycling rate that continues on its own without a great deal of re-education effort", **user-friendly** as "easy to understand and participate", and **cost effective** in that "overall costs are less than alternative recycling programs".

The mission of this study is to:

1. Determine the feasibility of implementing a SMART Unit Based Pricing (UBP) solid waste management program. Compare a SMART UBP program with the current voluntary Town recycling program, as well as with a mandatory curbside Town managed recycling program.
2. Determine a cost effective approach (or series of approaches) that best provides 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 expenditures and changes.
4. Provide rate structure design options that create a steady revenue stream to fund all or part of the solid waste and recycling collection costs

Key characteristics of a SMART waste management strategy:

Environment— a 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 Gas 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 — Residents generating smaller amounts of trash because of better waste management or household size do not subsidize the costs of residents 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 available to residents 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. Inaction costs them more.

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.

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 Greenwich'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.

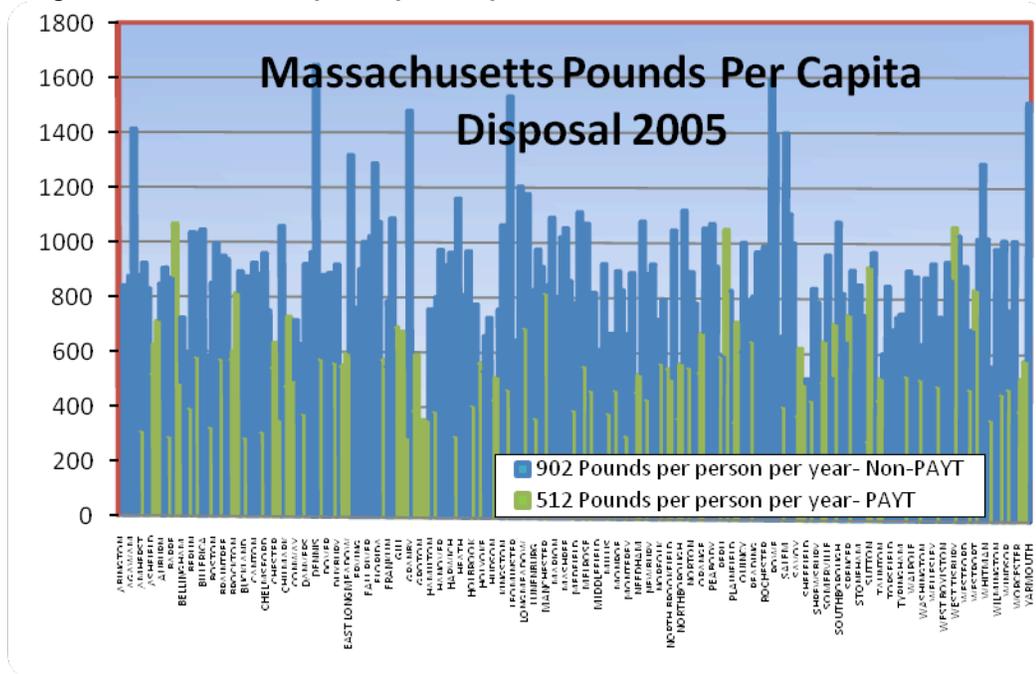
2. Rate Structure and Program Options

2.1 Per Capita Disposal Measurement

The methodology for determining expected disposal reductions from the implementation of a SMART Unit Based Pricing (UBP) waste management program is per capita disposal. Per capita disposal is the total tons disposed divided by the number of individuals participating in the program, then divided by 2000 (pounds per ton). Using per capita residential disposal as the benchmark number allows for an apples to apples comparison, which can be examined state to state or even internationally. The EPA hierarchy for waste minimization prioritizes reduction, reuse, and recycling as the first three options. Measuring only diversion or only recycling can be misleading. Comparing recycling numbers from region to region is like comparing oranges and apples. Per capita disposal is a fair and simple measurement approach. For the purpose of this guidebook, waste disposal for the Town refers to the total residential tonnage brought to the Transfer Station.

The per capita residential disposal information from the Massachusetts Department of the Environment (including 89 communities that have strict unit based pricing for trash) indicates an average of 512 lbs per person per year disposal in UBP communities. A further review of disposal tonnages from a variety of unit based residential programs across the country indicates similar per capita numbers between 400 and 600 pounds per person per year. The Massachusetts case study is commonly used by the EPA as a baseline for expected results in UBP programs.

Image 1. Massachusetts per Capita Disposal



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.

2.2 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 2. Implementation of a Unit Based Pricing Program

Benefits/Advantages	Risks/Disadvantages
Customers gain a true understanding of the cost of MSW.	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 about the possible proliferation of more fees for other Town services in addition to property tax.

2.3 Rate Structure Systems

Within the unit based pricing programs, three specific rate structure systems are currently in use in similar communities: proportional; two tiered (proportional); and variable. 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. A proportional rate can be achieved either through a special city trash bag or a container, depending on the desired method of collection.

Trash bags are a very effective 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 trash. Thus a fee is paid at the time of service through the cost of the bag. Fairness is assured. Revenues can be 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. However 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 3. Proportional Rate Bag 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.	
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.	
Details of the entire MSW program could be printed on each bag, or bag packaging for customers to easily reference.	

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 base monthly fee. The base charge can be used to cover specific costs of the solid waste program (e.g. personnel, transportation, executive oversight etc.) Residents then pay a ‘second-tier’ based on the amount of waste they put out for collection. The second-tier is unit based and generally covers disposal costs. The two-tiered program is also widely used through out the United States. The base fee assures funding of all fixed costs.

Image 4. Two-Tiered Proportional

Benefits/Advantages	Risks/Disadvantages
Revenue will cover fixed costs.	The requirement of paying an additional fee for second (or multi) tier may be difficult to understand.
Revenue stability is ensured. Program funding is not entirely dependent on bag sales. Success of program does not under fund program.	Collection of fees may require administration expense.
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.	
Can be implemented more quickly and inexpensively than other types	
Allows for maximum flexibility to implement changes	

3. The Climate and Waste Connection

The Earth's surface temperature has risen by about 1 degree Fahrenheit in the past century, with an accelerated rate of warming during the past two decades. Current evidence strongly suggests that it is likely that human activities have contributed to this warming. Human activities have altered the chemical composition of the atmosphere by increasing emissions of greenhouse gases (GHG) - primarily carbon dioxide, methane, and nitrous oxide.

Every stage of a product's life cycle—extraction, manufacturing, distribution, use, and disposal—indirectly or directly contributes to the concentration of GHGs in the atmosphere and potentially affects the global climate. For instance, product manufacturing releases GHGs both directly, from the manufacturing process, and indirectly, from the energy produced to run the plant. Extraction and distribution require gasoline-powered vehicles that release CO₂. Discarded products typically end up in a landfill, which releases methane as products decompose.

Waste prevention and recycling—jointly referred to as waste reduction—offer significant potential for decreasing GHG emissions. *Source <http://www.epa.gov/wastewise/climate/change.htm>* A formal analysis of a data set including 305 municipalities from the state of Massachusetts indicates that a per capita reduction of (.17) MTCE is expected in SMART UBP residential waste reduction programs. *Source ICF International... June 2008.* This factor represents the latest available methodology for estimating the potential effect of implementing a SMART waste management strategy on climate change. This Guidebook will use this factor to determine potential waste reduction benefits.

Town of Greenwich Overview

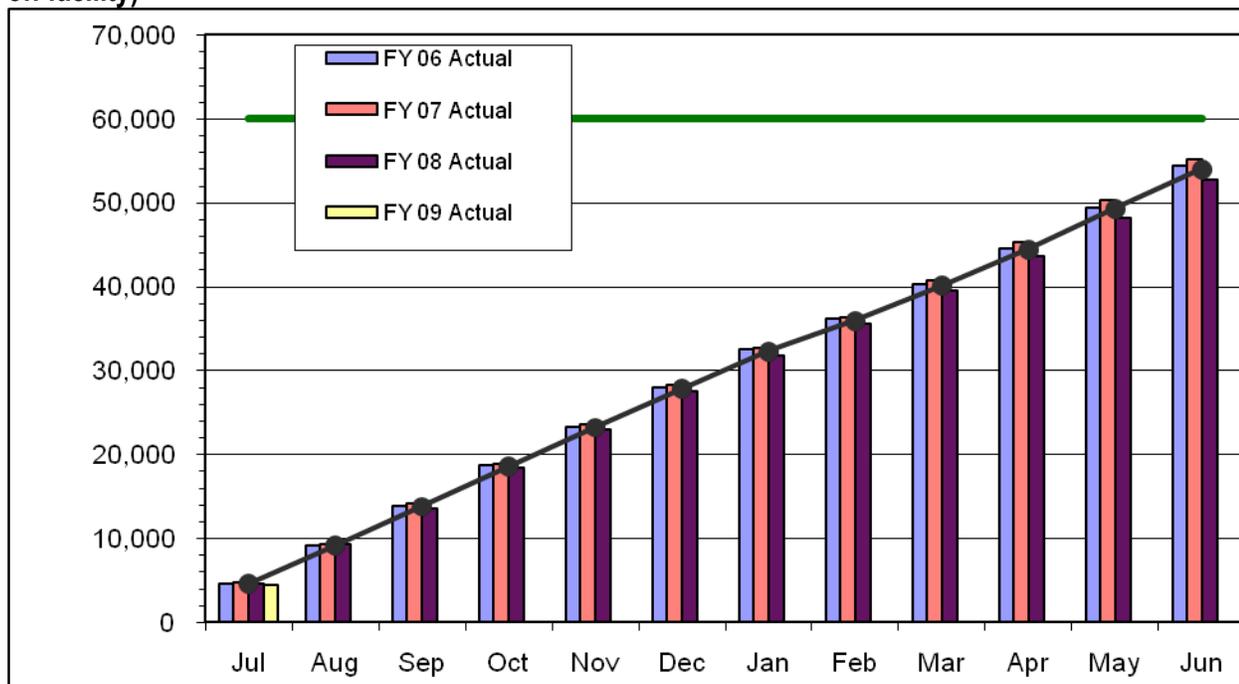
4.1 Existing Waste Collection System

The Town of Greenwich offers no municipal service for trash collection. Trash is picked up by approximately 30 local haulers individually contracted by Town residents. The haulers charge a monthly or quarterly fee for collection ranging from \$50.00 to \$75.00 per month. Trash is collected once or twice per week from the back yard of each household. Multi-family residences and businesses contract with local haulers as well. There was 52,683 tons of trash collected in 07/08 calendar year. The commercial businesses and residential trash tonnages are not separated. It would be extremely difficult to determine this exact number, so for the purpose of this guidebook the national ratio of 60% residential and 40% commercial will be used. This percentage is reviewed by the EPA and Biocycle Magazine every few years, and should be accurate enough for this evaluation. It is estimated that approximately 31,582 tons is associated with residential waste and 21,055 tons are from commercial generators. This SMART guidebook will only address reducing the residential tonnage number. In fiscal year 07/08 the annual residential per capita disposal for the Town of Greenwich was 1033. This number falls in line with peer communities in Connecticut and Long Island with similar income demographics and current recycling rates.

The residents of Greenwich may also use the Transfer Station to drop off trash and bulky items. Bulky items are free to residents as long as they fit in a car or SUV. If they are larger then the charge is \$95.00 per ton. There is no cost for unlimited use of the Transfer Station and there is no sticker required.

The haulers are responsible for collection of single and multi-family waste and bringing it to the Transfer Station. There is no tip fee to the haulers. The cost of the trash tipping is covered in the tax base. The trash that is collected at the Transfer Station is currently brought to the Bridgeport WTE facility where the tip cost is currently \$98.50 per ton. The contract will switch hands from the Connecticut Resource Recovery Authority to Enviro in January of 2009. The estimated tip is \$75.00 and includes an annual price escalator. For the purpose of this guidebook a tip fee of 78.00 is be used as an average estimate for the next 5 years.

Image 5. Historical Cumulative Tonnage Chart for Residential and Commercial waste (Haulers and drop off facility)



4.2 Existing Recycling Collection System

Recycling in the Town of Greenwich is handled by Greenwich Recycling contracted by the Town. Recycling is sometimes collected by other haulers on behalf of Greenwich Recycling. The recycling is also combined between business and commercial and not recorded separately between the two generators. The overall tonnage of trash collected in 07/08 at the transfer station was 52,638. The total recycling tonnage was 28,465 equaling a total overall generation of material from both the residential and commercial sectors of 82,465' yielding a 35% overall recycling rate for 07/08. The residential recycling is estimated at 25,390 tons of material or 44% of the overall residential generation. The following four assumptions have been made to determine the total residential recycling tonnage: Most of the paper / newspaper and comingled materials have been attributed to residential curbside recycling; The cardboard has been divided between the two in accordance with the DEP information; and the bulk items are assumed to be from homes not businesses; the scrap metal material is assumed to be primarily from the commercial sector. This number may be off slightly, giving the benefit to the residential sector, but should not effect the conclusions in the SMART guidebook.

The Town of Greenwich currently recycles 25,390 tons through the residential curbside program. There is no collection of cardboard residentially. Town residents must drop off cardboard at the transfer station or make a private deal with the hauler Greenwich Recycling. The Town's current recycling contract is through the Connecticut Resource Recovery Authority. This contract will expire 2010. The Connecticut Resource Recovery Authority currently has plans for single stream recycling by 1010 and options with other recycling facilities are being considered. The Town currently collects commodity recyclable materials, including plastic #1 and #2, paper, newspaper, magazines, chipboard and cardboard, metal, aluminum, and glass. There are opportunities for the collection of additional items and this should be considered with any new contract.

Image 6. Recycling Tonnage chart

Residential Recycling Rates

Waste Total / tons	31,582
Commodity Recycling / tons	8,636
Metal / tons	
Yard Waste / tons	16,754
Total Generation	56,972
Recycling Commodity Percent	0.151583
Total Recycling / tons	25390
Total percent	0.445658

4.3 Overall Solid Waste Budget

There are a total of 24,511 households including 3,600 condominiums serviced by haulers in the Town of Greenwich. Based on the 07/08 budget the approximate total cost to the residents of Greenwich for Public Works was \$20,800,000. This includes transfer station; collection of residential recycling; tipping of trash for the residential and commercial sectors and tipping of residential recycling. The average annual cost to each household is \$815 for Public Works; of this \$250 is related to the tipping of trash. Reducing trash will have a significant impact on the overall budget for the Town.

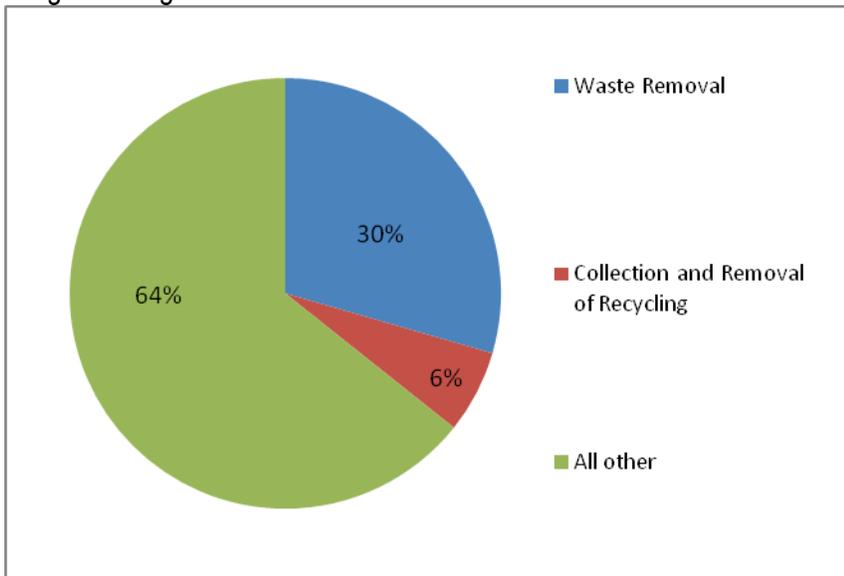
Overall Solid Waste Budget / Costs

The Town of Greenwich is extremely unique. The general fund pays for the tipping of trash for both residential and businesses users. The total cost of tipping trash is \$5,323,000 at the Bridgeport WTE. Based on the 60% to 40% split \$3,193,000 is associated with the residential disposal of 31,000 tons and \$2,129,000 associated with commercial disposal of 21,055 tons. The budget also includes \$1,300,000 annually for weekly household recycling services, for all items except cardboard. In past budgets the tip fee has also included at 'put or pay' penalty. The estimated tip cost with the new waste contract for 08/09 should be reduced from \$98 to approximately \$75.

Currently the Town of Greenwich is not paying a tip fee for recyclable materials nor are they receiving a rebate or profit share for materials. The Connecticut Resource Recovery Authority does give a percentage of recycling profits to the two Garbage Museums located within the state. It would be in the best interest for the Town of Greenwich to negotiate a more extensive rebate or profit share in the next contract.

Including the average cost of collection the average Greenwich household is paying \$1,535 annually for all services related to waste and recycling. The cost of Waste disposal / removal represents 30% of the total Public Works Budget.

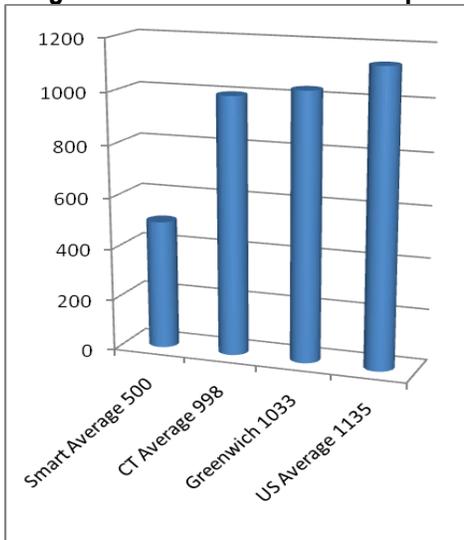
Image 7. Budget overview



4.4 Waste Minimization Goals for the Town Greenwich and the State of Connecticut

The Town of Greenwich has a short term goal for fiscal year 2008/09 of increasing recycling by increasing participation. This is a difficult goal to measure. An educational campaign by the Connecticut Resource Recovery Authority is aiming for a 15% increase in area recycling this year. The longer term goal of 51% diversion by the year 2020 was set by the State of Connecticut in the 2006 in the Solid Waste Management Plan. This diversion includes yard waste.

Image 8. State and National compared with SMART communities



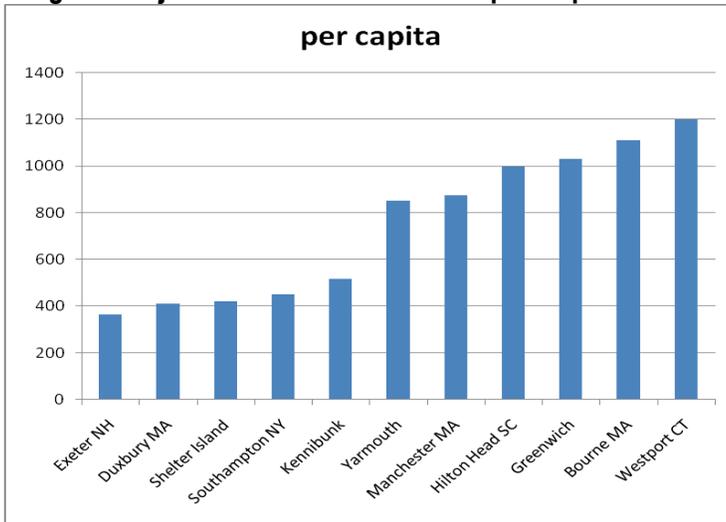
5. SMART Unit Based Pricing (UBP) Program Projections and Design

5.1 Projected per capita disposal change

The Town of Greenwich 07/08 residential waste tonnage, including bulk items is 31,582 which equals 1033 pounds of trash per capita. Unit Based Pricing (UBP) could decrease the disposal to approximately 500lbs per person per year. Based on the population numbers a decrease in disposal of 533 lbs per person per year would yield a total reduction of 16,284 tons annually for Greenwich. This is a decrease of 51% per year in the estimated residential waste stream, or a 31% in the total waste stream including residential and commercial.

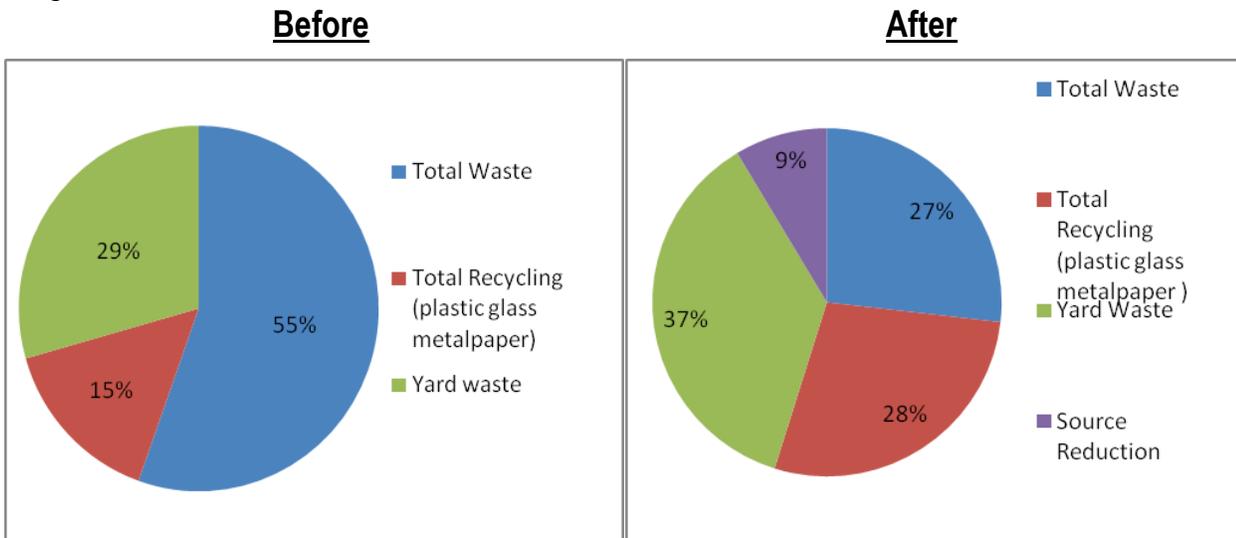
The following chart is a look at other communities with similar populations; all with curbside programs or PAYT programs. This chart also reflects the type of recycling program offered. This comparison demonstrates the waste reduction that Greenwich may achieve through unit based pricing. The Towns on the left all have (UBP) unit based pricing with weekly recycling. The Towns on the right just offer weekly recycling.

Image 9. Projected Town of Greenwich per Capita Waste compared with peer communities



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

Image 10. Waste Stream Before and After SMART



Trash represents 55% of Greenwich's total 2008 residential stream (before UBP) but reduces to only 27% after the implementation of a SMART program. An estimated decrease of 51% in waste brought to the transfer station would equal approximately \$1,600,000 in avoided disposal costs annually for the Town. This is a decrease in the estimated disposal costs of 26% and a decrease in the overall solid waste budget of 8%.

The overall residential recycling rate (including commodities and yard waste) could increase from 45% to 65%; an increase of over 45%. Waste reduction (i.e., through reducing and reusing) provides an added environmental benefit. 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.

5.2 SMART Design for Greenwich

A SMART waste management plan for the Town of Greenwich would utilize the current trash and recycling collection structure in order to meet the needs of the Town and residents. With the implementation of unit based pricing it is best to keep the same collection system in place to avoid too much change at one time. After implementation the Town would have the ability to upgrade or change the actual collection system at a later date.

Program Design

The Town of Greenwich is not responsible for the hauling of trash but is responsible for the tipping cost. Taking the cost of tipping out of the tax base would allow residents the ability to be SMART (save money when they reduce trash). The estimated residential tip cost over the next 5 years is \$ 3,193,000 or \$130 per household. Reducing taxes and creating a per-bag charge would incentivize residents to recycle more instead of paying for trash bags. This design option would require the use of an Official Town of Greenwich Trash bag. The Official Greenwich bag would be priced to cover the cost of tipping.

Official Town bags would be purchased by the Town and then made available at local retailers (there are companies that handle this for the Town so it is virtually hands off). The Town may be required to create an ordinance stating that residential trash must be placed in Official Town Trash Bags. The bags are purchased in lieu of the portion of property tax previously covered by disposal costs.

This is actually a simple solution to waste reduction within the Town. A SMART program will not affect the haulers because they will continue to be contracted separately by residences. They will however be asked to monitor compliance. Since it is the haulers responsibility to collect trash from the household, it will ultimately fall on their shoulders to make sure residents are following the ordinance. Stickers for non compliance should be provided by the Town for the Hauler to use. If household trash is not in Official Town of Greenwich Trash Bags the haulers will label it and leave it behind. Haulers will be accountable for compliance and there will have to be a penalty / fine set up for non-compliance.

The new SMART program will possibly increase the number of recycling routes, and therefore the cost of recycling collection may also go up. This additional cost may ultimately be offset by the value of the additional recycling through a profit share in the next recycling contract.

Taking the cost of trash disposal out of the tax base could be achieved in a number of ways:

- 1). The most well received method is to publically show a reduction on the property tax or to rebate a portion of the tax at the start of the program or one year after the programs inception.
- 2). The state of MA has been very successful with a strategy of not reducing or refunding the tax. Instead, municipalities explain to residents that there will be no tax increase this year and the money that was going toward disposal costs will now be used for other public services (additional library hours, police or fire services etc).
- 3). Other states like NY prefer to give a discount on taxes. For example last year it cost each household an average of approximately \$250 in disposal (within the tax payment). This year they will not collect this money, instead you will pay as you go for what you use.
- 4). Another option is to give a rebate for the overall savings one year after inception. This allows the Town to use the current tax budget to cover any start up costs such as bags, additional recycling containers, and educational costs. Any remaining ear marked disposal monies, can be used for other Town services, or added to an enterprise fund. The buildup of funds from bag sales can also be added to the enterprise fund. This account can be directly rebated back to each resident or used for specific community projects.

5.3Rate Structure Options

The following rate structure options use 500 pounds per capita as a benchmark. This equals a 51% reduction in waste for the Town of Greenwich. This analysis also makes assumptions on 3 other benchmarks: a waste reduction to 400, 600, and 700 lbs per capita, representing: 61%, 42%, and 32% waste diversion respectively. Several cities throughout the US have achieved per capita disposal of 400 pounds and under. The projected decrease in residential waste due to PAYT is of critical importance since an overly optimistic projection will result in underestimating the projection of waste. Conversely an overly conservative waste reduction projection will result in lower revenues than necessary to fund the program costs. All of the design options continue to provide free drop off at the transfer station for recycling or trash. Some communities also use the unit based pricing system for trash at the transfer station.

There are two possible rate structure options:

Image 11. Rate Structure Option 1 (covers residential disposal costs and recycling)

Rate Structure

Projected Per Capita Disposal	500	500	500	400	400	400	600	600	600	700	700	700
Bag price	\$ 3.00	\$ 3.50	\$ 4.00	\$ 3.00	\$ 3.50	\$ 4.00	\$ 3.00	\$ 3.50	\$ 4.00	\$ 3.00	\$ 3.50	\$ 4.00
Revenue												
Trash Fee / base	0	0	0	0	0	0	0	0	0	0	0	0
Sale of Trash Bags	\$ 4,582,500	\$ 5,346,250	\$ 6,110,000	\$ 3,666,000	\$ 4,277,000	\$ 4,888,000	\$ 5,499,000	\$ 6,415,500	\$ 7,332,000	\$ 6,415,500	\$ 7,484,750	\$ 8,554,000
Increased Recycling Revenue	56,992	56,992	56,992	67,685	67,685	67,685	46,299	46,299	46,299	35,607	35,607	35,607
Total Revenue	4,639,492	5,403,242	6,166,992	3,733,685	4,344,685	4,955,685	5,545,299	6,461,799	7,378,299	6,451,107	7,520,357	8,589,607
Cost Reductions												
Avoided Disposal Cost	\$ 1,603,917	\$ 1,603,917	\$ 1,603,917	\$ 1,904,839	\$ 1,904,839	\$ 1,904,839	\$ 1,302,994	\$ 1,302,994	\$ 1,302,994	\$ 1,002,072	\$ 1,002,072	\$ 1,002,072
Reduction Labor	-	-	-	-	-	-	-	-	-	-	-	-
Total Cost Reductions	\$ 1,603,917	\$ 1,603,917	\$ 1,603,917	\$ 1,904,839	\$ 1,904,839	\$ 1,904,839	\$ 1,302,994	\$ 1,302,994	\$ 1,302,994	\$ 1,002,072	\$ 1,002,072	\$ 1,002,072
Total Source of Funding	\$ 6,243,408	\$ 7,007,158	\$ 7,770,908	\$ 5,638,524	\$ 6,249,524	\$ 6,860,524	\$ 6,848,293	\$ 7,764,793	\$ 8,681,293	\$ 7,453,178	\$ 8,522,428	\$ 9,591,678
Cost of PAYT												
Trash Bag Cost	\$381,875	\$381,875	\$381,875	\$305,500	\$305,500	\$305,500	\$458,250	\$458,250	\$458,250	\$534,625	\$534,625	\$534,625
Cost of additional containers	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cost of additional vehicles	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total cost of program	\$381,875	\$381,875	\$381,875	\$305,500	\$305,500	\$305,500	\$458,250	\$458,250	\$458,250	\$534,625	\$534,625	\$534,625
NET	\$5,861,533	\$6,625,283	\$7,389,033	\$5,333,024	\$5,944,024	\$6,555,024	\$6,390,043	\$7,306,543	\$8,223,043	\$6,918,553	\$7,987,803	\$9,057,053
Budget	4,990,000											
Difference	\$871,533	\$1,635,283	\$2,399,033	\$343,024	\$954,024	\$1,565,024	\$1,400,043	\$2,316,543	\$3,233,043	\$1,928,553	\$2,997,803	\$4,067,053

The proportional rate option would require some start up funding for bags, possibly additional recycling containers and education. One option would be to begin the program in March 09 since the taxes have already been collected to cover the tip fees from March 09 through June 09. The Town would then have two options reducing taxes in the next fiscal year by the entire estimated residential tip cost or rebating taxes based on the actual value of the diverted tonnage in the following year. Delaying the actual rebate for one year would enable the Town to build some padding into the budget and perhaps create a recycling education account to promote recycling in other areas of the Town. At a cost of \$3.00 per bag the town would have additional annual revenue between \$350,000 and \$875,000. The revenue could be used for other town recycling projects or added to a rebate to residents.

Image 12. Rate Structure Option 2 (covers residential disposal costs)

Rate Structure 2

Projected Per Capita Disposal	500	500	500	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	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Sale of Trash Bags	\$ 3,055,000	\$ 3,818,750	\$ 4,582,500	\$ 2,444,000	\$ 3,055,000	\$ 3,666,000	\$ 3,666,000	\$ 4,582,500	\$ 5,499,000	\$ 4,277,000	\$ 5,346,250	\$ 6,415,500
Increased Recycling Revenue	56,992	56,992	56,992	67,685	67,685	67,685	46,299	46,299	46,299	35,607	35,607	35,607
Total Revenue	3,111,992	3,875,742	4,639,492	2,511,685	3,122,685	3,733,685	3,712,299	4,628,799	5,545,299	4,312,607	5,381,857	6,451,107
Cost Reductions												
Avoided Disposal Cost	\$ 1,603,917	\$ 1,603,917	\$ 1,603,917	\$ 1,904,839	\$ 1,904,839	\$ 1,904,839	\$ 1,302,994	\$ 1,302,994	\$ 1,302,994	\$ 1,002,072	\$ 1,002,072	\$ 1,002,072
Reduction Labor	-	-	-	-	-	-	-	-	-	-	-	-
Total Cost Reductions	\$ 1,603,917	\$ 1,603,917	\$ 1,603,917	\$ 1,904,839	\$ 1,904,839	\$ 1,904,839	\$ 1,302,994	\$ 1,302,994	\$ 1,302,994	\$ 1,002,072	\$ 1,002,072	\$ 1,002,072
Total Source of Funding	\$ 4,715,908	\$ 5,479,658	\$ 6,243,408	\$ 4,416,524	\$ 5,027,524	\$ 5,638,524	\$ 5,015,293	\$ 5,931,793	\$ 6,848,293	\$ 5,314,678	\$ 6,383,928	\$ 7,453,178
Cost of PAYT												
Trash Bag Cost	\$381,875	\$381,875	\$381,875	\$305,500	\$305,500	\$305,500	\$458,250	\$458,250	\$458,250	\$534,625	\$534,625	\$534,625
Cost of additional containers	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cost of additional vehicles	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total cost of program	\$381,875	\$381,875	\$381,875	\$305,500	\$305,500	\$305,500	\$458,250	\$458,250	\$458,250	\$534,625	\$534,625	\$534,625
NET	\$4,334,033	\$5,097,783	\$5,861,533	\$4,111,024	\$4,722,024	\$5,333,024	\$4,557,043	\$5,473,543	\$6,390,043	\$4,780,053	\$5,849,303	\$6,918,553
Budget	3,690,000	3,690,000	3,690,000	3,690,000	3,690,000	3,690,000	3,690,000	3,690,000	3,690,000	3,690,000	3,690,000	3,690,000
Difference	\$644,033	\$1,407,783	\$2,171,533	\$421,024	\$1,032,024	\$1,643,024	\$867,043	\$1,783,543	\$2,700,043	\$1,090,053	\$2,159,303	\$3,228,553

At a cost of \$2.00 per bag the town would have additional annual revenue between \$425,000 and \$650,000. The revenue could be used for other town recycling projects or added to a rebate to residents.

6. Recommendations

The Town of Greenwich is a great candidate for a SMART waste management program. SMART can be achieved with very little change to the current system, and meets the Town's objective of creating a successful, sustainable, user-friendly, cost effective residential recycling program while working within the current collection infrastructure.

1). Begin a SMART Program on March 09. The timing is perfect because the Town will be at the start of a new contract with no penalty for waste reduction. The savings is significant both financially to the Town and its residents but, also the environment. There are no logistical changes that need to be made for collection of trash. Recycling collection may require a few additional routes depending on the current capacity and arrangements.

2).Begin an enterprise fund in March 09. Determine how to handle the new revenue stream. The enterprise fund could also be used to capture additional recycling revenue form the increased stream of material. It is up to the

administration to decide the best use of the additional funds. Should money be rebated (given back) to residents or used for Town services? It is also up to the administration to convey a clear message to the public. Residents need to know that this is a program saving both money and natural resources. They need to understand that their efforts are worthwhile and are making a difference. If this message is well delivered residents will be very satisfied and happy to participate in a SMART program

3). The Official Town Bag method of SMART has the possibility of further development over time. The next recycling contract could include single stream collection of multiple materials which are pre-separated in bags. Following a Canadian model Greenwich could begin a path toward **Zero Waste** though a separation process which would be easy for residents to understand and easy to process. Recyclable materials could be separated into many different streams and collected in one truck. Included could be streams such as: compost; used clothing; electronics; 3-7 plastics. This is a good long term strategy because it would reduce cost to residents and also reduce traffic congestion due to the elimination of multiple trucks. It would reduce carbon emissions and air pollution as well.

4). As another step toward **Zero Waste**, the Town should consider extending the SMART program to commercial businesses. It would actually be easy to implement since the tip fee is covered within the taxes. Implement the residential program first and add the commercial program about one year later. Commercial SMART has been successful in cities like Seattle, WA and Miami, FL.

5). In order to maximize the SMART program the Town needs to consider a way to add cardboard to the recycling stream immediately. One possibility is collecting these materials along with the other recycling in a clear plastic drawstring trash bag. This style of separation is done successfully in several cities including St. Peters MO, Holland Michigan and NYC. The current recycling hauler would collect the clear plastic bags of cardboard along with the newspaper and mixed paper. When they reach the transfer station these bags could be placed in a trailer provided by one of the local paper recyclers. There would be some labor required at the transfer station. The Town could make a deal directly with a paper recycler for market value of the collected material and this would offset additional cost of separating the bags. The greatest benefit would be the savings achieved through the avoided disposal cost of the related tonnage. Cardboard and chipboard packaging are very heavy.

7. Implementation Suggestions

An ordinance will be needed that requires residential trash must be contained in an 'official' Town of Greenwich Trash Bag.

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 Town officials. The members should be comprised of a combination of residents, Town officials and employees. Committee members should bring experience in areas like legal, PR, marketing, and education. The committee should monitor and advise on the current implementation and the future phases of the program.

The committee should:

2. Decide on the public relations and education leading up to implementation. Design a tool kit to be distributed to all residents. 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.
3. Help decide on bag color and design; choose participating grocery stores.
4. Create multifamily enforcement suggestions and guidelines.
5. Suggest ways to recycle cardboard for residents

6. Suggest additional items to be added for recycling collection. Investigate other state recycling lists.
7. Create up-stream producer responsibility by educating local restaurants, grocery, and convenience stores about 'one way carry out packaging' which meets recycling regulations.
8. Address the potential of illegal dumping. Penalties should be consistent with those currently in existence, such as litter. The Town will need extra staff in the beginning to educate local businesses about the possibility of illegal dumping and encourage them to lock dumpsters and report problems.
9. Address bulky items at transfer station drop off. The Town should utilize the current transfer station as a drop off location and consider charging for car loads.
10. Deal with renters and create penalties for those not following the ordinance so that home owners or management companies don't bear the burden of noncompliance.

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 considered trash but actually have value to someone else. Two economical solutions are to 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.

8. Timeline to Implementation

The first step is to say **YES to SMART** waste management and decide on details of program such as: rate structure; cash flow; and how additional bag revenue will be handled.

The next step for the Town of Greenwich is to create an advisory committee made up of some Town employees, residents, and council members (as suggested above). The advisory committee can guide the Town through the implementation process. Generally a 4 to 6 month period is ideal.

Phase 1 October / November / December

1. Create a clear message to sell the SMART program to residents.
2. Create bid specifications for Official Town of Greenwich trash bags and related services.
3. Present RFP specifications for approval by Town.
4. Send specifications out through internet and by mail allow 3 weeks for return of RFP
5. Check into recycling containers. Do residents have enough containers to maximize recycling?
6. Determine a specific start date by working backwards from bag delivery time. Ideally Official Town bags should be in stores 3 to 4 weeks before start date.
7. Create public education and relations strategy

Phase 2 January / February

1. Public relations through local newspaper, advertorials, interviews, PSA, flyer for households etc
2. Possible school education program

3. Mail information in tax bill / show discount or disclosure of disposal costs.
4. Address the issues listed in above section (illegal dumping, cardboard recycling, producer responsibility etc)

Phase 3 Implementation / March

1. Continue public relations so residents understand where to purchase bags and what items can be recycled etc,

See Appendixes for additional information