The City of Shelton Connecticut
A SMART Waste Management Plan

Issued by
Green Waste Solutions
For the Connecticut Department of Environmental Protection

The Shelton Connecticut
Feasibility and Implementation Strategies for Unit Based Pricing

City of Shelton 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 City of Shelton 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. For waste residents pay as they go, 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) which best provide sustainable waste reduction, increased recycling volume, and significant cost reductions.
3. Provide the Town 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 Shelton'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.

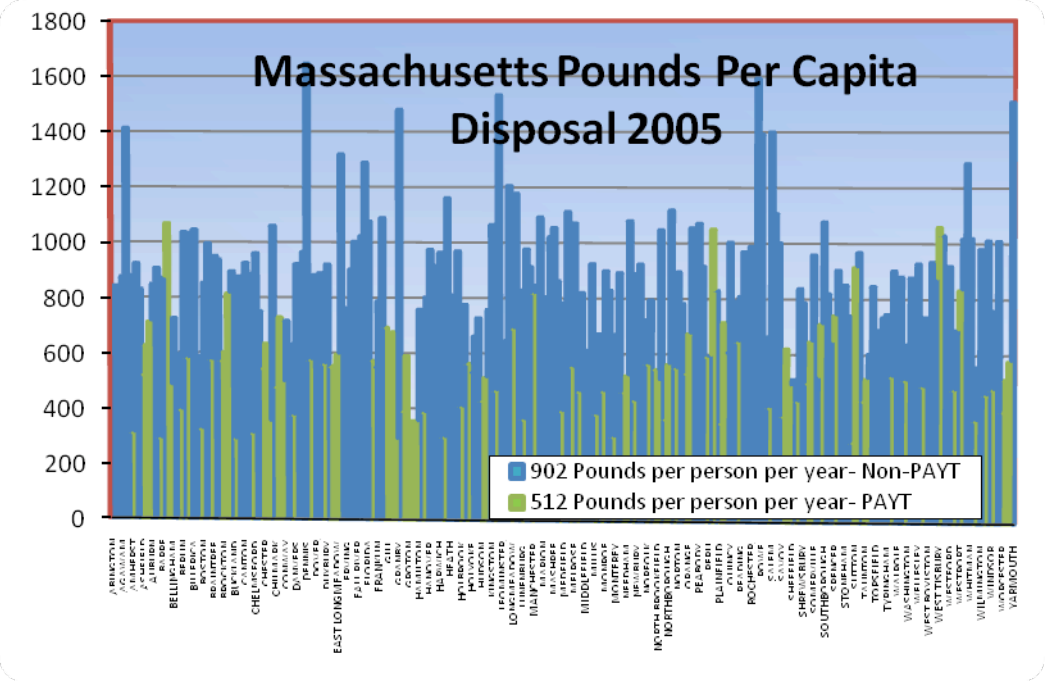
2. Rate Structure and Program Options

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 Sheltons 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 Town 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.	

A proportional program can also be achieved with a container system. Containers would be priced based on the unit cost (per gallon). Each gallon would be priced proportional to the next; therefore, a 64 gallon container would be double the cost of a 32 gallon container. Container systems are billed to the households monthly or quarterly based on chosen container size. A container system requires an accounting and fee collection function and can be difficult to administer in areas of high household turnover. The container system also requires an inventory of multiple container sizes in order to meet changing residential needs. Revenue stream can be risky and difficult to manage because of non-pay households.

***Image 4*. Proportional Rate Container System**

Benefits/Advantages	Risks/Disadvantages
Likely to maximize reduction of waste, so not to purchase additional overflow bag	Potentially higher costs for collection because overflow bags would require manual collection
Automated and semi automated collection	Communities must offer residents a choice of subscription levels, provide them with containers in varying sizes, and bill accordingly. System requires billing and inventory
Potential for decreased labor and workers compensation	These systems might be more expensive to implement and administer
Collection system is clean and organized on the curbside	Revenue Stream can be slightly risky due to non-pay households

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 5.* 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	

Variable Rate - Variable rate pricing means charging different amounts per unit of garbage, in different container sizes. Several container sizes are offered generally from 10 to 96 gallons. The community bills residents based on their container size or subscription level. The program is flexible because the community can charge a higher than subscription level price for additional containers if their goal is to create a strong incentive to decrease waste.

Image 6. Variable Rate System

Benefits/Advantages	Risks/Disadvantages
Automated and semi automated collection	More complicated.
Rate is based on the amount of rubbish generated by each customer.	Too many variables in a program cause it to be more difficult to implement and operate.
Potential for decreased labor and workers compensation	Potentially higher costs because collection is slower
Authorities can charge a price for additional containers that is higher or lower than subscription level depending on the community	Communities must offer residents a choice of subscription levels, provide them with containers in varying sizes, and bill accordingly.
Collection system is clean and organized on the curbside	These systems are be more expensive to implement and administer

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 CO_2. 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.

City of Shelton Overview

4.1 Existing Waste Collection System

The City of Shelton offers municipal service for trash collection. Trash is picked up by one contracted hauler for the City. According to the city budget there was 24,000 tons of trash collected at the transfer station in 07/08 calendar year. For the purpose of this guidebook the ratio of 70% residential and 30% commercial will be used. This number is consistent with the 16,806 provided by the city as the actual residential waste generated from households (under 5 units). It is estimated that approximately 16,806 tons is associated with residential and 7,200 tons are from multi-family waste and transfer station users. This SMART guidebook will only address reducing the residential tonnage number. In fiscal year 07/08 the annual residential per capita disposal for the City of Shelton was 890. This number falls in line with peer communities in Connecticut and Long Island with similar income demographics and current recycling rates.

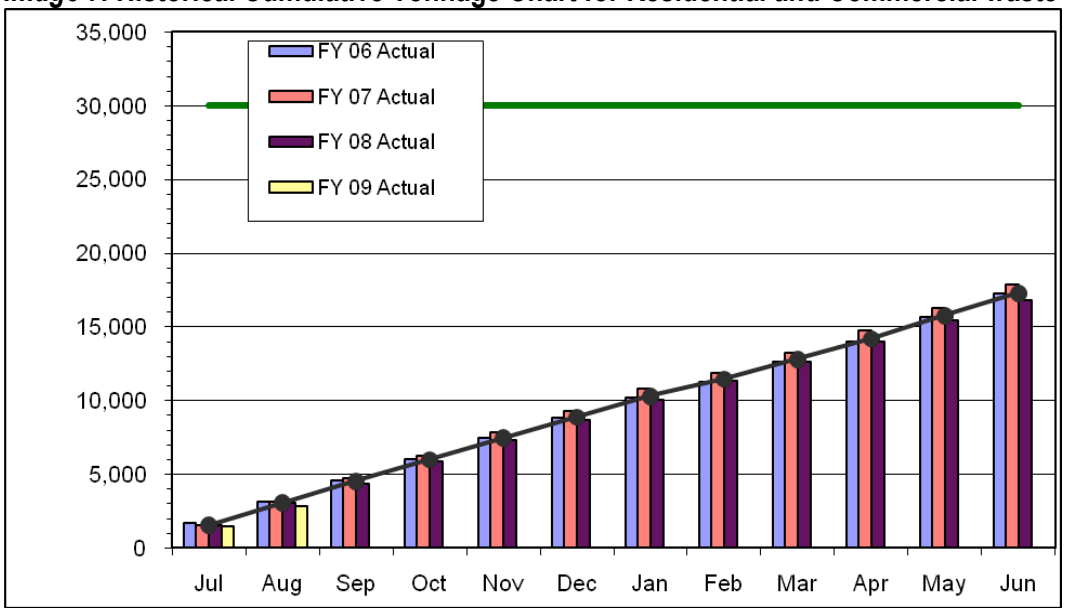
The residents of Shelton may also use the Transfer Station to drop off trash and bulky items. Bulky items are free to residents. The town also offers free pick up of bulky items. . There is no cost for unlimited use of the Transfer Station and there is no sticker required for residential users.

The City is responsible for collection of single family waste (5households and under) which is brought to the Transfer Station. 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 estimated tip at $75.00 per ton and includes an additional fee of 5$ per ton. For the purpose of this guidebook a tip fee of $85.00 per ton is

used as an average estimate for the next 5 years since there is a price escalator clause in the the Connecticut Resource Recovery Authority contract.

The average household income is 7 and about 80% of residences are owner occupied. 3.2 % of residents are at poverty level.

Image 7. **Historical Cumulative Tonnage Chart for Residential and Commercial waste**



4.2 Existing Recycling Collection System

Recycling in the City is handled by one contracted hauler. The City offers weekly recycling. The recycling is collected with 6 union employees form all single family households. The total recycling tonnage was 3,233. The recycling tonnages and breakdown are from fiscal year 06/07 DEP report, so this number may vary slightly. The residential breakdown indicates no material from leaves and yard waste. The town does not provide pick up of yard waste. However, both the State of Connecticut and the EPA consider this diverted material as recycling. In neighboring municipalities yard waste is included in recycling rates. The Shelton overall recycling rate appears low because there is no recorded yard waste.

The City of Shelton currently recycles 3,233 tons through the residential duel stream curbside program this equals approximately a 16% commodities curbside recycling rate. The City's current recycling contract is through the Connecticut Resource Recovery Authority. This contract will expire 2011. The Connecticut Resource Recovery Authority currently has plans for single stream recycling by 1010 and options with other recycling facilities are being considered. The City 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 8. Historical Recycling Tonnage chart

Recycling Rates

Waste Total / tons	16,809
Commodity Recycling / tons	3,200
Metal / tons	
Yard Waste / tons	0
Total Generation	20,009
Recycling Commodity Percent	0.159928
Yard Waste percent	0
Total Recycling / tons	3200
Total percent	0.159928

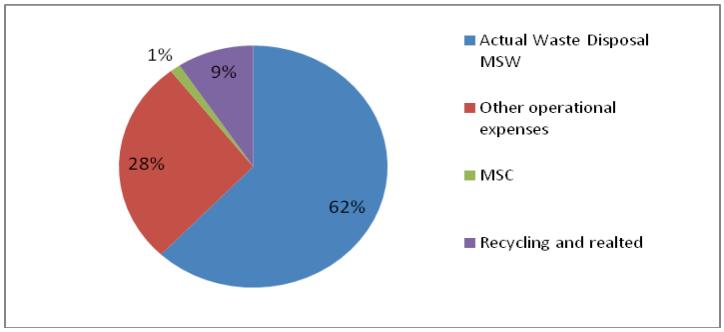
4.3 Overall Solid Waste Budget

There are a total of 14,707 households serviced by curbside collection in the City of Shelton. The condominiums and multifamily units are service through commercial haulers. Based on the projected 08/09 budget the approximate total cost to the residents of Shelton for the disposal area of Public Works is 2,505,188. This includes MSW tip fees, put or pay, fees, and disposal of misc. items. The average annual cost to each household is $178 for tipping of trash and related items. The 08/09 Solid Waste Budget is 4,037,000 or an average of $288 per household. Disposal or tip fees represent about 28% of the City budget.

In past budgets the tip fee has also included at 'put or pay' penalty, with the new Connecticut Resource Recovery Authority contract there is no municipality specific 'put or pay' only a regional commitment. The estimated tip cost with CPI increases is estimated at $85.00 per ton over the next 5 years.

Currently the City of Shelton 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. The Connecticut Resource Recovery Authority plans to begin a profit split with the towns of $10 to $15 per ton for commodity materials. It would be in the best interest for the City of Shelton to negotiate a more extensive rebate or profit share in the next contract.

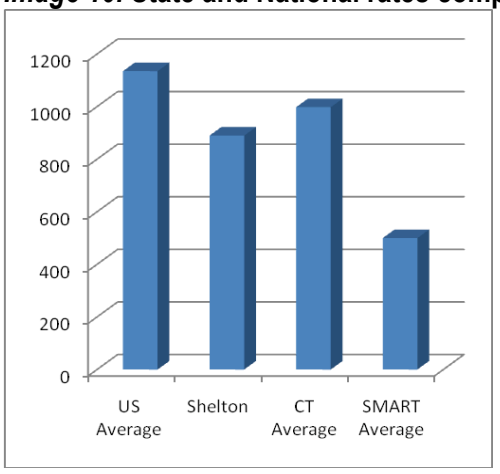
Image 9. Overview of Residential Waste Costs



4.4 Waste Minimization Goals for the City of Shelton and the State of Connecticut

The City of Shelton has no short-term goal for fiscal year 2008/09 of increasing. However, they been actively working to educate the residents. 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 10.* State and National rates compared with SMART communities**



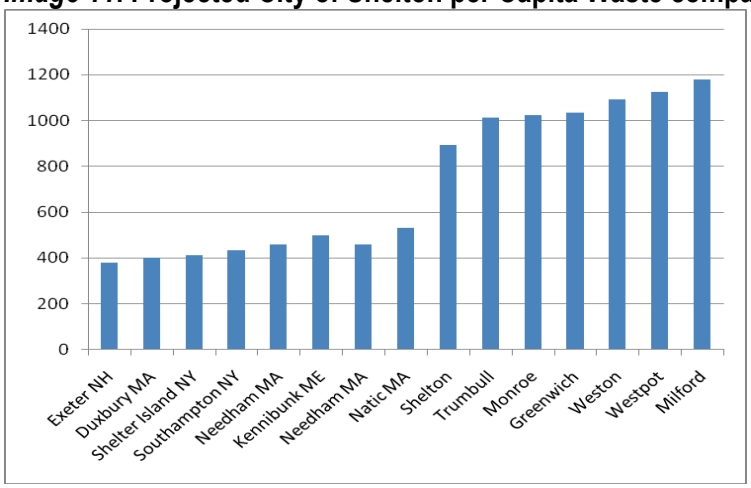
5. SMART Unit Based Pricing (UBP) Program Projections and Design

5.1 Projected per capita disposal change

The City of Shelton 07/08 residential waste tonnage was 16,806, which equals 890 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 390 lbs per person per year would yield a total reduction of 9,525 tons annually for Shelton. This is a decrease of 43% per year in the estimated residential waste stream.

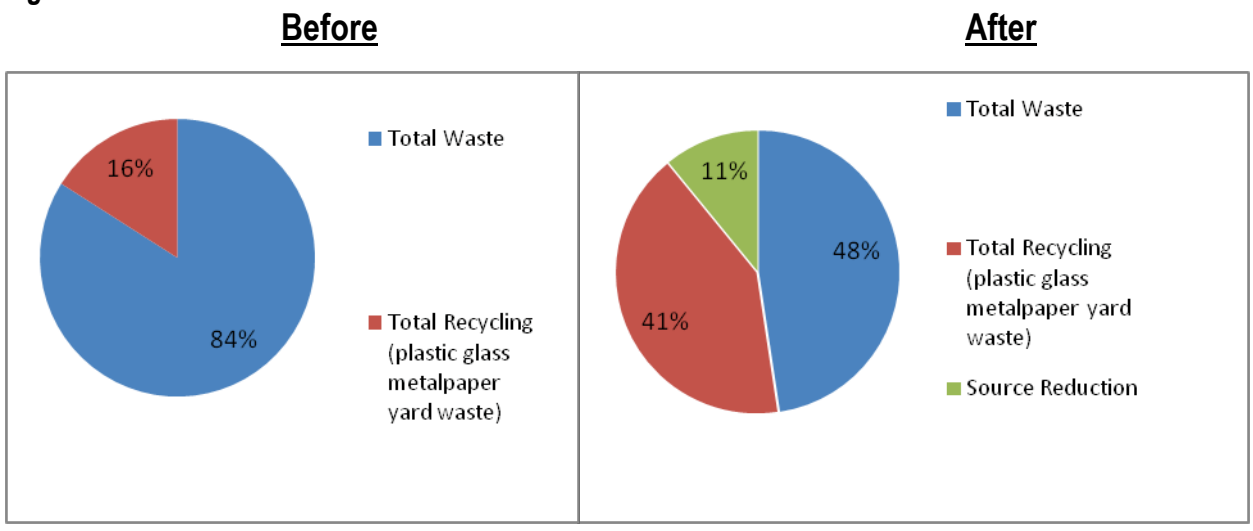
The following chart is a look at other communities with similar populations; all with curbside programs or PAYT programs. This chart also reflects the type of recycling program offered. This comparison demonstrates the waste reduction that Shelton may achieve through unit based pricing. The Towns on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

***Image 11*. Projected City of Shelton 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 12*. Waste Stream Before and After SMART**



Trash represents 84% of Shelton's total 2008 residential stream (before UBP) but reduces to only 48% after the implementation of a SMART program. An estimated decrease of 43% in waste brought to the transfer station would equal approximately $620,000 in avoided disposal costs annually for the City. This is a decrease in 25% of the estimated 08/09 disposal budget and 15% of the overall solid waste budget.

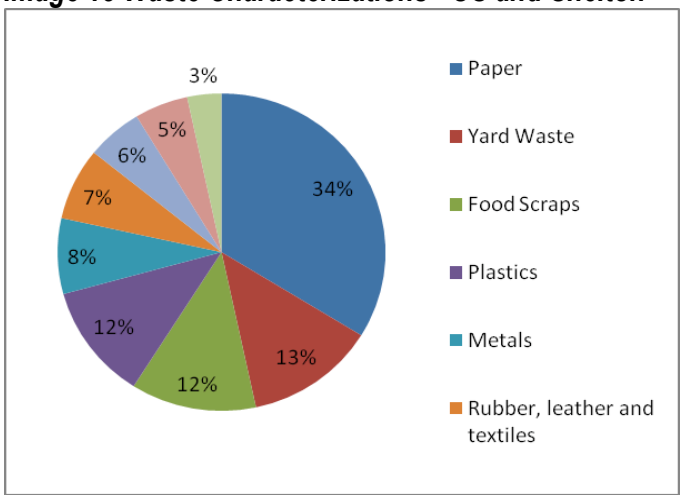
The overall residential recycling rate (including commodities and yard waste) could increase from 16% to 41%; an increase of over 150%. This number includes additional yard waste diversion which most likely will not be actually measured. It will also not account for the previously diverted yard waste. The source reduction number will reflect the additional 11% diversion. The recycling number will still appear lower than surrounding communities. The total waste generation will be 43% lower and this is the ultimate measurement of a successful program.

Recycling is considered by the EPA and the state of CT to be both commodities materials and yard waste. 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. Approximately 2,918 tons of the diverted material will go toward increased commodity recycling, and 2,185 tons toward increased yard waste or back yard composting. The commodity tonnage has the potential to create significant revenue based on the average price per ton from the Connecticut Resource Recovery Authority.

The remaining diversion comes from waste reduction (i.e., through reducing and reusing). This is 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.

The City of Shelton does not have an official waste characterization study. The EPA uses a *Franklin Associates* waste characterization study from 2005 as a benchmark. There are some differences in regional waste. And the percentages of individual materials can vary from the national average. The SMART guidebook will use the national average to extrapolate an estimate of the Shelton residential waste stream. Based on the EPA report *Solid Waste in the United States Facts and Figures,* the following is a look at the estimated per person generation of each material in the City of Shelton.

Image 13 Waste Characterizations - US and Shelton



Shelton	Per Capita
Paper	299
Yard Waste	114
Food Scraps	110
Plastics	104
Metals	68
Rubber, leather and textiles	65
Wood	49
Glass	47
other	30
	886

5.2 SMART Design for Shelton

A SMART waste management plan for the City of Shelton would utilize the current trash and recycling collection structure in order to meet the needs of the City 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 City would have the ability to upgrade or change the actual collection system at a later date.

Program Design

The City of Shelton residential taxes pay for the hauling and tipping trash. Taking the cost of collection and tipping out of the tax base would allow residents the ability to be SMART (save money when they reduce trash). The estimated residential disposal and solid waste costs over the next 5 years is $178 to $288 (+) per household annually. 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 City of Shelton trash bag. The Official Shelton bag would be priced to cover the cost of tipping and collection.

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

This is actually a simple solution to waste reduction within the City. A SMART program will not affect the structure/ style of collection. Residents will still place bags at the curbside or cans to place their bags in (if they prefer). The City will most likely have to adjust routes due to the change in waste stream. It is estimated using data from the Massachusetts department of Environmental Protection and the US EPA (Skumatz research) that approximately 30% of material will go to source reduction. This will mean an overall reduction to the City in actual materials transported. This reduction will allow the hauler to make logistical changes that should be favorable to their bottom line. The hauler will adjust routes and possibly trash and recycling days in order to adapt to the new material streams.

The haulers will 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 City for the employees to use. If household trash is not in Official City of Shelton Trash Bags the employees will label it and leave it behind. Employees will be accountable for compliance and there will have to be a penalty / fine set up for non-compliance by residents.

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 / fee. For example last year it cost each household an average of approximately $178 to $288 in disposal (within the tax payment). This year your taxes will be $178 to $288 less and instead residents will pay as you go for what they use.
2). The state of MA has been very successful with a strategy of 'not' reducing 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). Another option is to give a rebate for the overall savings one year after inception. This allows the City 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 City 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 a specific community projects.

It is important to take into consideration rental properties. Approximately 80% of households in Shelton are owner occupied. Approximately 20% of households that are participating in the SMART program would be renters. There are ways to make SMART more equitable to renters. Landlords can give a rent rebate or discount to tenants, landlords could also purchase some number of bags for residents as in the city of Binghamton NY. There are other ways to create recycling rebates.

Alternative or future design option. The City of Shelton uses one municipal contractor and their trucks to collect trash and recycling. The above design option does not limit the ability for the City to add automated collection of either trash or recycling. Adding automated collection may decrease labor and workman's compensation costs. The above design can be adjusted if the City decides to invest in automated trucks for either type of collection.

5.3 Rate Structure Options

The following rate structure options use 500 pounds per capita as a benchmark. This equals a 43% reduction in waste for the City of Shelton. This analysis also makes assumptions on 3 other benchmarks: a waste reduction to 400, 600, and 700 lbs per capita, representing: 55%, 32%, and 21% 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 SMART 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 14. **Rate Structure Option 1 (covers all residential solid waste costs from proposed budget)**

Projected Per Capita Disposal	500	500	500	400	400	400	600	600	600	700	700	700
Bag price	3.75	4.00	4.25	3.75	4.00	4.25	3.75	4.00	4.25	3.75	4.00	4.25
Revenue/$												
Trash Fee / base	-	-	-	-	-	-	-	-	-	-	-	-
Sale of Trash Bags	3,571,875	3,810,000	4,048,125	2,857,500	3,048,000	3,238,500	4,286,250	4,572,000	4,857,750	5,000,625	5,334,000	5,667,375
Increased Recycling Revenue	25,494	25,494	25,494	32,162	32,162	32,162	18,827	18,827	18,827	12,159	12,159	12,159
Total Revenue	**3,597,369**	**3,835,494**	**4,073,619**	**2,889,662**	**3,080,162**	**3,270,662**	**4,305,077**	**4,590,827**	**4,876,577**	**5,012,784**	**5,346,159**	**5,679,534**
Cost Reductions												
Avoided Disposal Cost	619,140	619,140	619,140	781,065	781,065	781,065	457,215	457,215	457,215	295,290	295,290	295,290
Reduction Labor	-	-	-	-	-	-	-	-	-	-	-	-
Total Cost Reductions	**619,140**	**619,140**	**619,140**	**781,065**	**781,065**	**781,065**	**457,215**	**457,215**	**457,215**	**295,290**	**295,290**	**295,290**
Total Source of Funding	**4,216,509**	**4,454,634**	**4,692,759**	**3,670,727**	**3,861,227**	**4,051,727**	**4,762,292**	**5,048,042**	**5,333,792**	**5,308,074**	**5,641,449**	**5,974,824**
Cost of PAYT												
Trash Bag Cost	238,125	238,125	238,125	190,500	190,500	190,500	285,750	285,750	285,750	333,375	333,375	333,375
Cost of additional containers	-	-	-	-	-	-	-	-	-	-	-	-
Cost of additional vehicles	-	-	-	-	-	-	-	-	-	-	-	-
Total cost of program	238,125	238,125	238,125	190,500	190,500	190,500	285,750	285,750	285,750	333,375	333,375	333,375
NET	**3,978,384**	**4,216,509**	**4,454,634**	**3,480,227**	**3,670,727**	**3,861,227**	**4,476,542**	**4,762,292**	**5,048,042**	**4,974,699**	**5,308,074**	**5,641,449**
Budget	4,037,176	4,037,176	4,037,176	4,037,176	4,037,176	4,037,176	4,037,176	4,037,176	4,037,176	4,037,176	4,037,176	4,037,176
Difference	(58,792)	179,333	417,458	(556,950)	(366,450)	(175,950)	439,366	725,116	1,010,866	937,523	1,270,898	1,604,273

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 City 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 City to build some padding into the budget and perhaps create a recycling education account to promote recycling in other areas of the City. Projected bag cost covers the entire annual budget. The entire reduction is passed on and residents pay as they go for service and disposal

Image 15. **Rate Structure Option 2 (covers disposal cost only, based on projected budget)**

Projected Per Capita Disposal	500	500	500	400	400	400	600	600	600	700	700	700
Bag price	2.25	2.50	2.75	2.25	2.50	2.75	2.25	2.50	2.75	2.25	2.50	2.75
Revenue/ $												
Trash Fee / base												
Sale of Trash Bags	2,143,125	2,381,250	2,619,375	1,714,500	1,905,000	2,095,500	2,571,750	2,857,500	3,143,250	3,000,375	3,333,750	3,667,125
Increased Recycling Revenue	25,494	25,494	25,494	32,162	32,162	32,162	18,827	18,827	18,827	12,159	12,159	12,159
Total Revenue	**2,168,619**	**2,406,744**	**2,644,869**	**1,746,662**	**1,937,162**	**2,127,662**	**2,590,577**	**2,876,327**	**3,162,077**	**3,012,534**	**3,345,909**	**3,679,284**
Cost Reductions /$												
Avoided Disposal Cost	619,140	619,140	619,140	781,065	781,065	781,065	457,215	457,215	457,215	295,290	295,290	295,290
Reduction Labor	-	-	-	-	-	-	-	-	-	-	-	-
Total Cost Reductions	**619,140**	**619,140**	**619,140**	**781,065**	**781,065**	**781,065**	**457,215**	**457,215**	**457,215**	**295,290**	**295,290**	**295,290**
Total Source of Funding	**2,787,759**	**3,025,884**	**3,264,009**	**2,527,727**	**2,718,227**	**2,908,727**	**3,047,792**	**3,333,542**	**3,619,292**	**3,307,824**	**3,641,199**	**3,974,574**
Cost of / $ PAYT												
Trash Bag Cost	238,125	238,125	238,125	190,500	190,500	190,500	285,750	285,750	285,750	333,375	333,375	333,375
Cost of additonal conatianers	-	-	-	-	-	-	-	-	-	-	-	-
Cost of additonal vehicles	-	-	-	-	-	-	-	-	-	-	-	-
Total cost of program	238,125	238,125	238,125	190,500	190,500	190,500	285,750	285,750	285,750	333,375	333,375	333,375
NET	**2,549,634**	**2,787,759**	**3,025,884**	**2,337,227**	**2,527,727**	**2,718,227**	**2,762,042**	**3,047,792**	**3,333,542**	**2,974,449**	**3,307,824**	**3,641,199**
Budget	2,505,188	2,505,188	2,505,188	2,505,188	2,505,188	2,505,188	2,505,188	2,505,188	2,505,188	2,505,188	2,505,188	2,505,188
Difference	44,446	282,571	520,696	(167,962)	22,539	213,039	256,854	542,604	828,354	469,261	802,636	1,136,011

The two tiered option leaves all fixed costs in the tax base and proposes that bag sales cover the disposal / tip costs.

6. Recommendations

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

1). Begin a SMART Program in March 2009. The timing is perfect because the City will be at the start of a new contract with no put or pay penalty for waste reduction. The savings is significant both financially to the City and its residents but, also the environment. There are very few logistical changes that need to be made for collection of trash and recycling.

2). An ordinance will be needed that requires residential trash must be contained in an 'official' City of Shelton Trash Bag. Create enforcement guidelines and also stickers for hauler to use non compliant bags.

3).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 City services?

4) 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

5). Create a volunteer advisory committee 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, City 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:

1. 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.

2. Help decide on bag color and design; choose participating grocery stores.
3. Create multifamily enforcement suggestions and guidelines.
4. Suggest ways to recycle cardboard for residents
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.
7. Address the potential of illegal dumping. Penalties should be consistent with those currently in existence, such as litter. The City 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.
8. Address bulky items at transfer station drop off. The City should utilize the current transfer station as a drop off location and consider charging for car loads.

10. Encourage source reduction. 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.

- Work with Salvation Army, Goodwill and local charities to create additional drop off locations or a bag system such as NJ.
- Create a Swap Shop in town. A means for residents to exchange usable items. This can also be achieved through a website a "City EBay.
- Work with groups like Got Books, and electronics manufacturers to take back additional items that can be reused.

11. Update City Website
12. 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.

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

Phase 1 Oct / Nov

1. Create a clear message to sell the SMART program to residents.
2. Create official timeline and outline goals for committee
3. Plan meeting calendar with dates to speak with local groups.
4. Check into recycling containers. Do residents have enough containers to maximize recycling?
5. Create public education and relations strategy target dates and costs. Much of this will be free because this is big news, however some planned adds will be helpful
6. Develop materials for residential tool kit
7. Fine tune details of low income families
8. Determine if ordinances are needed / fines / penalties

Phase 2 Dec

1. Public relations through local newspaper, advertorials, interviews, PSA, flyer for households etc
2. Address the issues listed in above section (illegal dumping, cardboard recycling, producer responsibility et
3. Determine how to handle bulky items that are picked up at household stickers / design order stickers
4. Determine weight limits on items or bags
5. Create bid specifications for Official City of Shelton trash bags and related services.
6. Present RFP specifications for approval by Shelton.
7. Send specifications out through internet and by mail allow 3 weeks for return of RFP
8. Determine a specific start date by working backwards from bag delivery time. Ideally Official City bags should be in stores 4 to 5 weeks before start date.

Phase 3 Jan

1. Work on Website information / links to other programs and EPA
2. Possible school education program / contest for website and bag art

Phase 4 Feb

1. Continue public relations so residents understand where to purchase bags and what items can be recycled etc,
2. Mail information in tax bill / show discount or disclosure of disposal costs.
3. Mail out starter Kit
4. Distribute additional recycling containers if necessary
5. Order stickers for bulky items

Phase 5 Implementation and follow up March

1. Continue positive press during first year to reinforce the decision of the council.
2. Appear on morning shows or other local or CT state news shows over the first quarter to boast about the success of participation and compliance.