



Promoting Recycling and Waste Reduction in Rhode Island: A Methodological Approach

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List of acronyms:

CTDEP: Connecticut Department of Public Works
DPW: Department of Public Works
MADEP: Massachusetts Department of Environmental Protection
MRF: Materials Recycling Facility
MSW: Municipal Solid Waste
PAYT: Pay-As-You-Throw
RFP: Request For Proposal
RHRTS: Rose Hill Regional Transfer Station
RIDEM: Rhode Island Department of Environmental Management
RIRRC: Rhode Island Resource Recovery Corporation

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Executive Summary:

As the costs of disposing of municipal solid waste have increased, as the United States population has continued to grow, and as municipal budgets have continued to be overburdened, state and municipal governments in many jurisdictions have implemented user fees for disposal of residential waste. The internalization of the cost of waste disposal achieves a number of goals: citizens are directly accountable for the waste they produce, creating incentives for waste reduction and creating equity in a system where there was none before; waste reduction and increased recycling are leading to environmental benefits such as allowing for more open space and less mining and production of raw materials; and solid waste budgets are shifted off of the tax roll, reducing the pressure of property taxes for residents and allowing cities more freedom in the decision-making process. Over 6,000 cities in the US have implemented user fee, or “Pay As You Throw” (PAYT) programs.¹

Rather than a PAYT program, automated collection services are being explored in Rhode Island as a way for municipalities to save money on curbside collection and increase recycling. These types of programs are widespread in the southern and western regions of the United States and have led to significant cost savings, but have not proven to be comparable to PAYT in terms of recycling promotion and waste reduction. Automated programs have not yet taken hold in New England because many city planners fear that automated trucks will not be able to function properly in crowded city streets. The only example of an automated program in the region is a successful pilot program in Warwick, RI, which has been functioning smoothly since its inception in August of 2003.

PAYT has not been widespread in Rhode Island due to the artificially low cost of solid waste disposal and fear of political backlash. Rhode Island is an ideal state in which to mandate PAYT on the statewide level because of the shared stake of all municipalities in extending the life of the only functional landfill in the state, and because of the shared interest of town planners, city officials, and environmental groups in reducing municipal solid waste, increasing recycling, and reducing the pressure of property taxes for property owners. Through background research, case study analyses, a large population of interviews, and calculations of projected PAYT programs in various towns, this study concludes that without a state mandate, municipalities are overwhelmingly reluctant to implement PAYT, and that responses to proposed financial incentives will be acted on slowly, if at all. These incentives include raising the municipal tipping fee at the Johnston Central Landfill and incrementally lowering the municipal cap over which municipalities must pay for refuse disposal at the higher commercial rate. Such a mandate should be implemented quickly and require PAYT to be in place and fully functional by 2008.

¹ Skumatz, et al. “Variable Rate or “Pay-As-You-Throw” Waste Management: Answers to Frequently Asked Questions.” Reason Foundation, July 2002.

Introduction

The Central Landfill in Johnston, Rhode Island services 37 of Rhode Island's 39 municipalities, accommodating the waste of 96% of Rhode Islanders. The Rhode Island Resource Recovery Corporation (RIRRC) was established in 1974² by the Rhode Island legislature to provide and coordinate solid waste management services throughout the state through management of the landfill and the Materials Recycling Facility (MRF).

The tipping fee at the Johnston Central Landfill is set by the Rhode Island General Assembly. In 1993, the Assembly raised the tipping fee from \$16 per ton to \$32 per ton, where it has remained until the present day. Section 23-19-13 of Title 23, "Health and Safety," of the RI General Laws, "Municipal Participation in State Program," section (g), states:

The corporation shall charge each municipality with which it has a long-term contract for solid waste disposal services a tipping fee per ton of source separated solid waste excluding separated recyclable materials, sludge, and demolition debris delivered to any corporation facility computed in accordance with this subsection. For purposes of this chapter, "fiscal year" shall mean the twelve-month period, July 1 to June 30. The municipal tipping fee shall be equal to one hundred seven and one-half percent (107.5%) of the prior fiscal year's municipal tipping fee through the end of the 2009 fiscal year. One dollar and ten cents (\$1.10) per ton on all garbage, including recycled garbage, collected by the corporation as tipping fee shall be paid to the town of Johnston. No tipping fee shall be charged for recyclable materials delivered to a recycling facility provided by or through the corporation.³

Despite the stipulation requiring the tipping fee to be set at 107.5% of the tipping fee of the previous year, each year since 1993 the Assembly has voted to hold it at \$32 under pressure from (among others) the League of Cities and Towns and its charismatic director, Dan Beardsley.

In March of 2003, the RIRRC, the Rhode Island Department of Environmental Management, and representatives of other major stakeholders in the field of solid waste management in Rhode Island, began meeting to update the 1996 Comprehensive Solid Waste Management Plan for Rhode Island. The purpose of this plan, according to the RIDEM, is to advise the Rhode Island Resource Recovery Corporation, the Rhode Island Department of Environmental Management and the Rhode Island Statewide Planning Program "concerning the revision of the [1996] plan, which serves as the solid waste

planning blueprint for Rhode Island Resource Recovery Corporation and DEM. This document is also an element of the State Guide Plan, Rhode Island's master plan. The plan is based on an integrated approach to solid waste management and examines strategies to increase recycling rates, to reduce the toxicity of waste generated, to promote waste minimization, and to improve landfilling methodologies."⁴

² It was originally founded as the Rhode Island Solid Waste Management Corporation. The name was later changed to the Resource Recovery Corporation of Rhode Island.

³ Rhode Island General Assembly. § 23-19-13 "Municipal participation in state program."

⁴ Rhode Island Department of Environmental Management website. "Solid Waste Management Plan Working Group. Accessed 3/15/04 from <http://www.state.ri.us/dem/programs/ombuds/outreach/integsw/index.htm>

The Disposal and Disposal Capacity Sub-Committee of the Comprehensive Solid Waste Management Plan Working Group has outlined the following schedule for the closure of the Johnston Central Landfill:⁵

<u>Landfill Phase</u>	<u>Acres</u>	<u>Disposal Status</u>	<u>Started Filling</u>	<u>Projected Completion</u>
Phase II	24	Not in use	June 1993	Piggyback completed August 2002
Phase III	10	Not in use	March 1995	Piggyback completed August 2002
Phase IV	45	On-going	Area 1 & 2: Sept 2000 Area 3: Sept 2002 Area 4: March 2003	Phase IV will be filled by June 2004
Phase V	32	In permitting	May 2004	June 2012
Phase VI	28+/-	Future	Expect 4 year capacity	June 2016

There is an 8-year shortfall between the capacity at the Johnston Central Landfill and the 20-year disposal capacity requirement stipulated by Rhode Island Statewide Planning requirements, and although the RIRRC has developed blueprints for phases VI, VII, and VIII of the landfill, these phases have yet to be licensed. (Phase VI is included in this disposal capacity because there is no foreseeable barrier to its licensing) Therefore, the RIRRC and all stakeholders in the status and costs of waste disposal in Rhode Island must find ways to extend the working life of the landfill and promote waste reduction and recycling in the long-term, and implement them expediently.

In this thesis, I will analyze the feasibility of two approaches to recycling promotion and waste reduction - PAYT programs and automated waste collection programs. I will discuss the advantages and disadvantages of each program individually in the context of Rhode Island and propose a program of implementation and discuss the implications of possible courses of action that relate to refuse and recycling in Rhode Island.

Methodology

My research was carried out from June of 2003 to April of 2004. This study combines historical record analysis, qualitative interviewing, and economic modeling:

- 1. Background research.** Research in the months of June and July of 2003 consisted primarily of collecting data on the historical aspects of PAYT programs in the United States. These data were collected from literature at the RIRRC, from independent studies, from USEPA, and from internet sources. Primary research also included the amassing of data from surrounding communities that have already implemented some form of PAYT. These communities included the five municipalities in Rhode Island that currently offer drop-off PAYT programs and the cities and towns in Massachusetts and Connecticut that have implemented curbside PAYT programs.
- 2. Interviews.** Approximately 75 structured phone interviews provided data from as far away as Seattle, Washington, but were focused primarily on MA, CT, and RI. I conducted person-to-person interviews with DPW officials, city planners, and

⁵ Disposal and Disposal Capacity Sub-Committee. "Central Landfill Disposal Capacity," April 2, 2003. Accessed 3/15/04 from <http://www.state.ri.us/dem/programs/ombuds/outreach/integsw/disp/pdf/clcpcty.pdf>

elected officials that focused on barriers to the implementation of PAYT programs. Over 14 Rhode Island municipalities are represented in these interviews. Automated programs have been the focus of more recent discussion. I have spoken with solid waste managers regarding automated programs in seven states and two countries (Rhode Island, Connecticut, Oregon, Massachusetts, Florida, Seattle, and Vancouver, British Columbia).

3. **Economic modeling.** Economic factors were analyzed for individual municipalities. In some cases, economic models of a potential PAYT program were created and discussed with city planners and DPW officials.

Part I: Pay-As-You-Throw

User Fee, or “Pay-As-You-Throw,” (PAYT) programs are creative, market-based solutions to the waste management issues faced by every city and town. In most U.S. municipalities, each taxpayer is assessed a flat fee for waste collection and disposal based on property value, and this fee is included discreetly in property taxes. There is no economic incentive for any citizen to reduce his or her waste. By charging each household a fee based on how much waste it produces, a municipality can address equity concerns and unfair burdens borne by taxpayers who produce less than the average amount of waste. The United States Environmental Protection Agency (USEPA) outlines three benefits to PAYT programs:⁶

1. **Environmental benefits:** The waste reduction encouraged by PAYT programs decreases reliance on production of raw materials, thereby reducing anthropogenic emissions of greenhouse gases and other pollutants. It also extends landfill life.
2. **Economic sustainability:** PAYT programs are self-funding. Once the infrastructural and educational components are put in place, municipalities can remove the entire previous amount of money devoted to solid waste management from the residential tax rolls.
3. **Equity:** Under a traditional system of solid waste management, frugal residents subsidize wasteful ones. Under a PAYT program, residents who maximize source reduction and recycling are rewarded with savings.

USEPA cites a reported range of between 25% to 45% reduction in the amount of waste shipped to disposal facilities in communities after adopting PAYT.⁷ A 1996 Duke University study that compiled data from over 80 related studies on variable rates and unit pricing, concluded that “In general, communities utilizing variable rates have reported an average reduction in waste of 28%, with a range of 25% to 50%,” and that between 2% and 5% of this reduction in waste is accounted for by source reduction, the rest accounted for by increased recycling.⁸ A survey of 3,040 residents of Tompkins

⁶ USEPA “Pay As You Throw: Introduction,” June 12, 2002. Accessed from <http://www.epa.gov/epaoswer/non-hw/payt/intro.htm>

⁷ USEPA “Pay-As-You-Throw: Lessons Learned About Unit Pricing,” 1994.

⁸ Miranda, et al. “Unit Pricing Programs for Residential Municipal Solid Waste: An Assessment of the Literature,” 1996, School of the Environment, Duke University.

County, New York concluded that as a result of variable collection fees, 39% of the respondents are more attentive to product packaging when they shop.⁹

PAYT rarely, if ever, decreases the amount of money spent on solid waste management as a whole. Importantly, it shifts the costs of solid waste management from property taxes to individual waste generators. This can reduce the amount to which property taxes are raised in a certain year, but generally will not actually lower property taxes. PAYT tends to slightly increase the costs of solid waste management due to the increased recycling that it generates. The costs of increased recycling are often higher than the savings from decreased tipping fees associated with refuse reduction. Recyclables cost more to collect per ton due to the fact that workers who collect refuse are collecting more tonnage per stop than workers who collect recycling, while both are paid the same hourly wage. This accounts for the majority of the differential between the costs of refuse and recycling collection. The higher number of trips to the MRF, brought about due to the lower density of recyclables, accounts for the rest of this differential.

One argument for a large push for increases in recycling is that as recycling rates and collection productivity increase, the incremental cost for recycling decreases. That is, the cost per ton of recyclables decreases as recycling rates go up. In New York City, for example, the incremental cost of recycling (the difference in cost/ton of recycling vs. refuse, where a positive number indicates a higher cost of recycling) dropped from \$275/ton in 1994 to \$46/ton in 2002 as the program expanded.¹⁰ As the cost of solid waste disposal increase, and recycling rates and collection productivity increase, it may be the case in the future that PAYT not only eases the burden of property taxes, but actually reduces the cost of solid waste management overall. This is allegedly already the case in East Providence's proposed PAYT program.¹¹

PAYT Program Types

There are four basic PAYT program types that utilize curbside collection: *bag programs*, *tag or sticker programs*, *can programs*, and *weight-based programs*. Each of these options can be coupled with an annual or semi-annual base fee or tax bill in a *hybrid program*.

1. **Bag Programs:** The municipality oversees production of specially colored and labeled trash bags and delivers them to local retailers, where they are sold to residents at a price that reflects some portion of the cost of waste collection and disposal. A reasonable weight limit (ranging from 20 to 40 pounds) is usually imposed for the amount of garbage allowed in each bag. This allows planners to control for the unknown variable of waste compaction by residents. This type of program is generally favored over the other options because it combines simplicity with a charge for waste that is reflective of actual waste produced.

⁹ Reschovsky, James D. and Stone, Sarah E. "Market Incentives to Encourage Household Waste Recycling: Paying for What You Throw Away," Winter, 1994, Journal of Policy Analysis and Management. Vol. 13, No.1.

¹⁰ New York City Independent Budget Office, 2004.

¹¹ East Providence Department of Refuse and Recycling, 2004.

2. **Tag or Sticker programs:** Instead of buying special bags, residents buy tags or stickers to place on normal trash bags. More expensive tags may be available to place on larger bags, bulky items, or white goods.¹² Tag programs are often cumbersome because tags are difficult to spot at the curb and are susceptible to rain.
3. **Can Programs:** Residents select a certain size or number of containers from which to have garbage disposed of curbside every week, and pay proportionally higher fees for larger cans. This type of program is used widely in the western US, but is not as effective as a bag program at reducing waste due to its larger increments in pricing. The administrator of the Waste Management and Cleanup Division of the Department of Environmental Quality of Oregon stated the general public opinion regarding PAYT cans, that “I’m paying for it [the can], I might as well fill it up,” so that up to a certain point, there is no incentive to reduce waste. If residents do produce more waste than fits in their can, they are charged extra, either per bag or per pound. Can programs are usually combined with automated pickup, discussed in “Part II” of this thesis. A greater number of can size options and a greater jump in price as can size increases are two factors that can lead to more waste reduction in a PAYT can program.
4. **Weight-Based Programs:** Residential waste is weighed as it is collected at the curb, and residents are assessed a bill based on how much weight of waste they dispose of. Technology exists that can weigh the amount of refuse being collected from each household, when standardized toters are used. But this technology is still in its infancy stages, and is subject to erratic performance and breakdown. Another unresolved issue regarding this technology is the measurement of refuse in cans that are partially filled with liquid, as the liquid tends to slosh back and forth and skew the measurements. The technology is progressing, but at the moment, is not reliable enough to implement throughout a municipality or a state.¹³ Municipalities from around the United States have implemented this program only to withdraw it after a short period. Among these communities are Seattle, WA, and Durham and Columbia, NC. Weight-based programs are more popular in communities where residents drop off their own personal waste at a transfer station and assessed a bill on the spot.
5. **Hybrid Programs:** Any form of the above PAYT programs can be combined with a flat fee to create a hybrid program. The flat fee presumably covers the fixed costs of waste disposal, while the variable rate fee covers the variable costs such as tipping fees. This type of program virtually assures that all costs of waste disposal will be covered because municipalities are not attempting to cover both the variable and the fixed costs through variable rates. One initial concern of mine was that because hybrid programs rely partially on the flat fee, residents would be given less incentive to reduce waste. This has not been the case in my case study communities, and I have not come across evidence casting hybrid

¹² Some municipalities only apply PAYT to bulky items such as appliances or mattresses, in which case a tag program is the desired approach. A tag program for bulky items can effectively be combined with a bag program.

¹³ R.W. Beck Consultants, 2003.

programs as inferior to non-hybrid programs in this way.¹⁴ Municipalities can control for uncertainty regarding whether the total costs of solid waste management will be covered by a non-hybrid program by setting the variable rates slightly over what is expected to be necessary to cover the costs of solid waste management, creating a “cushion” effect that prevents unnecessary hikes in the price of the variable rates. Because of the plethora of PAYT case studies around the country, outcomes can be more easily estimated than they could in the 1980s or even the 1990s.

Drop-off programs can easily adopt PAYT, but usually serve small, often rural communities, and are rare in large urban areas. Under a drop-off program, residents transport their own waste to a local or regional transfer station, where bags are counted or weighed. Drop-off programs can utilize any of the above pricing systems, with the exception of the can system. Under most drop-off programs with bag options, residents use regular trash bags and are assessed a bill based on either how many bags or how many pounds are disposed of. Drop-off programs leave open the option of residents hiring a private waste hauler to collect waste curbside, an option chosen by many residents.

PAYT Implementation Costs

The basic implementation costs of a curbside PAYT program include:

1. **Staff time.** Some municipalities hire a program coordinator, while some may assign the task of coordination to the Department of Public Works, which means that extra staff time may be needed. Coordination of implementation includes logistical planning, monitoring, and educational outreach campaigns to inform residents of the pending changes in the trash service.
2. **Bags, tags, etc.** Municipalities must provide the initial layout of revenues to cover bags and/or tags (and sometimes toters), depending on the type of program.
3. **Educational materials.** Successful PAYT programs are preceded by an educational outreach campaign of a few weeks. Mailings are generally the preferred mechanism of information distribution. Town meetings (usually only in small towns) can serve as effective forums in which to address the concerns of residents.

Illegal Dumping

My interviews evidenced illegal dumping as a common fear of elected officials and to a lesser extent, DPW officials, in municipalities with no form of PAYT. In 95% of cases, these fears are held by officials who have had little or no personal experience with PAYT. The remaining 5% of cases pertain to towns that have a partial PAYT program,

¹⁴ Brockton, MA, for example, has instituted a \$280 yearly flat fee that provides for 52 free bags, weekly yard waste collection from April 1 to December 15, weekly collection of one bulky item, and the pick-up of up to five white goods per year. All extra trash is to be put in \$1.00 “Brockton Bags.” This program has led to an increase in recycling from 9% to 29%, and a reduction in solid waste disposal of between 24% and 33%.

only charging for certain items such as appliances. In these cases, illegal dumping can be a concern because it is not combined with a proper educational effort, and appears inconsistent to residents. The only serious case of illegal dumping that I came across in my research is interestingly enough in the city of Cranston, RI, which has implemented a tag program that only applies to bulky appliances. Mystery refrigerators will appear on the lawns of elderly residents in the middle of the night and washing machines will be destroyed by vandals and left on the street with no one to pay for their removal.¹⁵ This phenomenon could have most likely been avoided if a full-scale PAYT program had been implemented and accompanied by a substantial educational campaign that outlined the relevant economics.

With the proper educational effort and enforcement of fines, illegal dumping is not a major problem in PAYT municipalities. Dozens of phone interviews with DPW officials conducted in the summer of 2003 provided evidence that illegal dumping has not been a serious byproduct of the implementation of PAYT in the North East, but that without proper education and enforcement illegal dumping may occur in small amounts, especially in rural areas. This finding can be held in stark contrast with common fears of elected officials and DPW employees that illegal dumping will become a major issue if PAYT is implemented.

Municipalities can take steps to prevent illegal dumping through educational efforts and by enforcing a schedule of fines (it is not difficult to identify a culprit by sorting through his or her trash) for perpetrators. The USEPA issues a guidebook called “Illegal Dumping Prevention Guidebook” that addresses all the facets of this issue.¹⁶

Special Populations

Low Income Residents

One concern regarding PAYT implementation is that it will place a greater financial burden on low income populations. Miranda, et al. (1996) found that given the regressive nature of property taxation and the positive correlation between income and waste generation, PAYT can actually turn out to be a progressive program.¹⁷ In communities where these conditions are not met, it is possible to put in place safeguards to ensure that low-income populations are not given a greater financial burden to bear. Seekonk, MA, for example, grants a 50% abatement on the flat fee portion of its hybrid user fee program to residents who fall below the poverty line. Another option is to include PAYT bags or tags with welfare checks or food stamps. The head of the Worcester DPW said that in order to address the issue of low income residents, during implementation, he “tried to make the bag affordable for everyone,” pricing them at \$0.50 apiece for the first nine years of the program.¹⁸ This left a fraction of the cost of solid waste management in the property taxes, as \$0.50 bags are not expensive enough to cover the full cost of a

¹⁵ Cranston Department of Public Works, interview, 2003.

¹⁶ This guidebook can be accessed online as a pdf file from <http://www.epa.gov/epaoswer/non-hw/payt/pdf/illegal.pdf>

¹⁷ Miranda, et al. “Unit Pricing Programs for Residential Municipal Solid Waste: An Assessment of the Literature,” 1996, School of the Environment, Duke University.

¹⁸ Robert Fiore, Worcester DPW, 2003.

program. If municipalities do attempt to shift all of the costs of solid waste management off of the tax base, it is more prudent to allow for a small financial cushion by slightly over-budgeting in the first year of the program to avoid yearly increases in the bag prices and associated residential indignation.

Elderly Residents

Elderly residents generally produce far less waste than other residents, and stand to benefit the most from a PAYT program, assuming the revenues shifted from the tax base are invested in the general good.¹⁹ The elderly population of a city or town should be considered when implementing PAYT, both in accessibility of disposal mechanisms, and in actual rate structures, for example, if the proposed program includes one free bag per week and elderly residents generally dispose of less than that. Planners should also consider the access of elderly residents to local retail stores where the bags can be purchased.

Renters

In the case of rental units, it is assumed that the costs of property taxes are passed along to the tenant indirectly. PAYT is a more direct way to pass the cost of waste disposal on to renters and provide incentives for waste reduction via source reduction and recycling.

PAYT Case Studies

Massachusetts

PAYT has taken off in Massachusetts in part because of Proposition 2.5, which prohibits property taxes from being raised by more than 2.5% each year.²⁰ This has led city planners to search for other ways to save money in the municipal budget. Today there are over 100 cities in Massachusetts that have implemented PAYT. I focused on the three case studies of Brockton, Worcester, and Seekonk for purposes of understanding the different circumstances in which PAYT has been implemented in Massachusetts, and providing examples of cities close to Rhode Island that have implemented PAYT. These municipalities were chosen for case studies based on two factors alone: 1) the applicability of the individual scenarios of PAYT implementation to cities and towns in Rhode Island, as perceived by four employees of the RIRRC (including myself), and 2) the availability of information regarding the details of each program.

¹⁹ East Providence Department of Public Works, 2003; Cumberland Department of Public Works, 2004; Resource Recovery Corporation, 2003.

²⁰ Katherine L. Bradbury. "Property tax limits and local fiscal behavior: did Massachusetts cities and towns spend too little on town services under proposition 2 1/2?" May 1997, *Journal of Public Economics*.

*Worcester, MA*²¹

The Program

Worcester is unique in the PAYT world because in 1993, it was the first large city (pop. 172,648) on the Eastern Seaboard to implement PAYT. Because of the lack of any similar programs in the Northeast, Worcester truly built its user fee program from the ground up. Unlike most other municipalities, Worcester is responsible for waste collection and subcontracts for collection of recyclables. Commercial hauler Waste Management is currently beginning a five-year recycling contract. During the planning stages of the program, questions arose about low-income and fixed-income residents, which Worcester answered by “attempting to make its bags affordable for everyone.”²² The resulting program centers around the implementation of a “Worcester Bag” program, the goal of which is to eventually cover the entire costs of waste disposal and become financially self-sustaining.²³ Bag prices are in the process of going up incrementally over a matter of years, and this increase will shortly phase out the need to dip into property taxes to cover solid waste collection and disposal costs. The bags, which are distributed to approximately 130 retailers, were originally priced at \$0.25 and \$0.50 for 15-gallon and 30-gallon bags, respectively, and remained at this price until July of 2002, when both prices doubled. The current pricing system allows bag sales to cover approximately 85% of the program, with the remaining 15% paid for in property taxes. One more price increase is expected to make the bag program completely self-sufficient.

Marginal costs included the creation of a curbside recycling program where there was none before, the hiring of four “trash police,” whose main duty was to distribute information to those households not in compliance, and the distribution of information pamphlets and flyers to universities and other transient populations of Worcester.²⁴

Public Acceptance

With such a large population, there were fears that the first few weeks of the PAYT program would be marked with confusion and littered streets. With the use of its “trash police,” Worcester was able to quell most of those fears. This system of monitoring ensured that confused or ill-informed residents were not slapped with large fines. Worcester also accommodates a large transient population, most notably from its nine colleges and universities. After the first year of the program, it became evident that

²¹ Information gathered from Worcester DPW, 2003 and 2004; Executive Office of Environmental Affairs “Commonwealth of Massachusetts: Municipalities with Pay-As-You-Throw Programs,” July, 2000, MA Department of Environmental Protection.

²² Robert Fiore, Worcester DPW, 2003.

¹⁷ Although it has been successfully done, municipalities must be careful when attempting to recover all costs of the program through bag sales. The town of Somerset, MA attempted to recover the full costs of its program through bag sales only, charging residents \$1.50 per bag, and the first year of the program ended with a \$300,000 deficit. This can be attributed to the initial reliance on variable revenues (bags) to pay for fixed costs (collection contract).

²⁴ Worcester Department of Public Works, 2003; Executive Office of Environmental Affairs (July, 2000) “Commonwealth of Massachusetts: Municipalities with Pay-As-You-Throw Programs,” MA Department of Environmental Protection.

universities and their incoming students should be supplied with informational brochures at the start of the school year.

The Upshot

The rate of compliance with the city program is a staggering 99.9%, which can possibly be attributed to the low price of bags and the lack of a flat yearly fee. In the first year of the program, waste disposal decreased 45%, and recycling increased from 3% to 36%.²⁵ The recycling rate has averaged 30% since implementation of the program. These impressive numbers are due in part to the fact that Worcester had no curbside recycling or composting programs before implementing PAYT. The introduction of these programs created a much greater potential for diverting waste than was previously possible. 18% of the solid waste reduction can be accounted for by diverted leaf and yard waste. Because PAYT was relatively new on the East Coast and in large cities, when Worcester made its first bid for a curbside recycling service (the city collects its own refuse), BFI estimated that under the PAYT program, the recycling rate would be no higher than 20%. Worcester cashed in on this underestimation when the recycling rate jumped to 36%. Bob Fiore of Worcester DPW noted that after five years when the BFI contract was up, “the cat was out of the bag,” regarding recycling rates due to the PAYT program. During those years, Worcester was paying approximately \$500,000 per year for recycling collection, and since then, the costs have increased to approximately \$1.2 million per year. A large portion of this increase is due to the fact that recycling rates are “out of the bag,” although it is difficult to say how much. When Worcester implemented its program in 1993, it was paying \$30/ton in tipping fees, a fee two dollars per ton less than the tipping fee charged currently at the Johnston Central Landfill. Despite this low tipping fee, Worcester enjoyed a \$500,000 savings from the reduction in tipping fee costs. Another \$700,000 savings came from decreased labor costs for waste collection. Officials estimate that total savings, including the total costs, were \$700,000. Labor costs are gradually diminishing as PAYT allows haulers to be more efficient. Before the PAYT program, Worcester used eleven 3-man trucks to cover the collection routes. After the program start date, the fleet was reduced to eleven 2-man trucks. In the late nineties, it was reduced to nine 2-man trucks, and the city will shortly reduce it to eight 2-man trucks. The decreased labor costs of collecting refuse are a direct reflection of Worcester’s increase in recycling.

*Seekonk, MA*²⁶

The Program

Seekonk, with a population of 13,025 (approximately 8% that of Worcester), implemented a flat yearly waste disposal fee of \$115 in 1992 under financial duress. Waste bans were increasing, and the landfill where Seekonk had historically dumped its waste abruptly closed. Because there were no Massachusetts-owned landfills, Seekonk’s

²⁵ Commonwealth of Massachusetts (June 2001) “Pay-As-You-Throw: An Implementation Guide for Solid Waste Unit Based Pricing Programs.”

²⁶ Information gathered from Seekonk Department of Public Works, 2003; Executive Office of Environmental Affairs (July, 2000) “Commonwealth of Massachusetts: Municipalities with Pay-As-You-Throw Programs,” MA Department of Environmental Protection.

waste was then brought to the Fall River Incinerator at \$50 a ton. With Proposition 2.5 placing a cap on property tax increases, there was not enough room in the budget to pay for the rising collection and disposal costs, even with the flat fee in place. Three choices were presented in 1994:

1. Privatize waste collection
2. Vote for an override of Proposition 2.5
3. Implement PAYT

Citizens voted against the Proposition 2.5 override, and the town decided against privatization, leaving PAYT as the most viable option. Blue “Seekonk Bags,” available at local retail stores, were added to the flat fee to create a hybrid PAYT program. Using a full-cost accounting method, the annual fee and bags were priced to be as expensive as necessary to cover the estimated costs of the program, which included monthly bulky trash pick-up (the previous cost was \$15 per load). The annual fee, 50% of which can be waived by low-income residents, is currently \$114. This covers the cost of collection with a small projected surplus, or “cushion.” The bags are now priced at \$1.00 each for the 33-gallon size, and \$0.60 each for the 15-gallon size. Bag price fluctuations have been more gradual than in Worcester, usually between \$0.98 and \$1.14. The price of bags reflects 1) the cost to manufacture the bags, 2) the cost to distribute the bags, and 3) the cost of tipping fees. The 96-97% compliance rate is due to the fact that between 150 and 175 households pay separately for dumpsters, exempting them from the program.

Public Acceptance

Because Seekonk did not have the luxury of time or resources, the program was bound to go forward regardless of public resistance. Complaints were low to moderate in number when the program first started, and have since calmed. One advantage held by municipalities that contract with a private waste hauler is that any complaints about service can be directed to the hauler, who is bound by contract to address those complaints.

The Upshot

Seekonk provides a vivid example of a community that shied away from PAYT until, in the face of financial crisis, there was no other alternative for solid waste management. One Seekonk official characterizes the first year of the program as a “failure year,” and the second year as a “correction year.” Seekonk recently assisted Swansea, MA with the implementation of its PAYT program because of its urgent financial crisis. In retrospect, the program would not have been as technically difficult to implement before there was no alternative, but it would have been more politically difficult to get off the ground.

Brockton, MA²⁷

The Program

Under financial duress, the city of Brockton issued an RFP in 2001, the stipulations of which were centered on its planned multi-tier PAYT program. BFI's low bid with the municipality at \$6 million per year beat the current contractor's price, which was projected to double from \$4 million per year to \$8 million per year. The \$2 million "savings" has cast Brockton, MA as the poster child for PAYT.

The program, which began on October 1st, 2001, includes an annual flat fee of \$280. This fee (which is paid quarterly in the water bill) entitles residents to 52 free bags, weekly yard waste collection from April 1 to December 15, weekly collection of one bulky item, and the pick-up of up to five white goods per year. Anything else that residents choose to throw away must be contained in a 33-gallon "Brockton Bag," which can be purchased in \$5.00 five-packs at one of 40 local retailers. Instructions are included on the packs. \$0.25 for each bag sold goes to the municipality, and an undisclosed amount goes to BFI, who contracts for the bags. In rental units, property owners pay the flat fee, but can opt out of the program by using a dumpster and paying separately for a private hauler.

Public Acceptance

As in Seekonk and Worcester, there was initial public resistance to the program, but as one public official put it, "after a few weeks, [residents] just *did* it." On the first collection date of the program, BFI was to collect *all* trash in order to counter fears of trash-cluttered neighborhoods. Reminder letters were sent to households not in compliance, and by the next week, the participation rate was 92%. It has since climbed to 98%.

The Upshot

The 9% recycling rate before the program jumped to 29% after its implementation. Solid waste disposal has decreased between 24 and 33%. Commingled recycling increased 238%. These impressive results somewhat discredit my original theory that a hybrid PAYT program will not create as great a refuse reduction as a pure bag program. One official in Brockton pointed out that although there was some illegal dumping (e.g. tires, appliances), the streets are far cleaner on trash days than they were before the program began. The success of PAYT in Brockton, which is generally a blue-collar area, has inspired other municipalities to assess the option of user fees. Public officials have traveled from New Hampshire, Connecticut, Rhode Island, and all over Massachusetts to reap information from Brockton officials about PAYT. Brockton has willingly accommodated them with information sessions and flyers.

²⁷ Information gathered from Brockton Department of Public Works, 2003 and 2004; Executive Office of Environmental Affairs (July, 2000) "Commonwealth of Massachusetts: Municipalities with Pay-As-You-Throw Programs," MA Department of Environmental Protection.

Discussion of Massachusetts Case Studies

One unique characteristic affects all three of our case studies, and may have made PAYT a more attractive option to each. Adopted in 1980 as an initiative petition, Proposition 2 ½ of Massachusetts does not allow the property tax in any municipality to be raised more than 2.5% per year. Limits on property tax increases make PAYT an appealing option because solid waste user fees remove significant portions of money from the municipal budget. This would presumably make PAYT an attractive option to cities and towns that are projecting large increases in property taxes and are looking for a way to reduce that increase.

All three municipalities (Brockton, Worcester, and Seekonk) encountered initial public (and even waste hauler) resistance to their respective PAYT program. This resistance generally transitioned into public acceptance after a period of a few weeks with the early implementation of education and outreach programs. Both Worcester and Seekonk report that any increase in bag price has led to telephone complaints and in some cases, to public outrage. Because confusion over costs is the greatest catalyst for public discontent with the program, each municipality attributes much of its success to education and outreach endeavors. Brockton bombarded its residents with advertisements and notices in the months leading up to the start of its program, and currently mails letters of welcome and an explanation of PAYT to all new residents. Seekonk takes pride in the fact that its residents are active participants of the program. Its “source separation” requirement and investment in affiliated education has led to a more cost-effective recycling service. Worcester invested heavily in education and outreach, sending out teams with waste collectors to record compliance rates and educate uninformed residents. It is worth noting that although the public may bemoan the fact that garbage PAYT bags cost more than normal trash bags, each of the three case study areas enjoys compliance rates of over 96%. The struggle for public acceptance is mostly psychological, and when price fluctuations are gradual, so is the amount of resistance.

Of these three case studies, only Seekonk makes special arrangements for residents under the poverty level, allowing them a 50% abatement of the yearly fee. This may be a more feasible option for Seekonk because only 2.4% of its residents live below the poverty line, whereas in Worcester and Brockton, the poverty rates are 17.9% and 14.5%, respectively.²⁸

In sum, all three municipalities report a large increase in waste reduction and an increase in recycling. As the act of paying explicitly and proportionally for personal waste disposal becomes more commonplace, so will the notion that source reduction and recycling are worth the time they take to practice.

Conclusions Regarding Massachusetts PAYT Case Studies

Adapting PAYT to suit the needs of a specific community is becoming a less challenging task because of the examples that can be drawn from the diverse range of communities with PAYT already in place.

²⁸ U.S Census Bureau. “Poverty Status in 1999 (Below Poverty Level),” 2000. Accessed from http://factfinder.census.gov/servlet/QTTTable?_ts=75288878949

Each municipality discussed above made clear to residents the benefits of its proposed program, and made a strong effort to create the capacity to recycle a large range of household items. Diversion of recyclables must be a two-pronged effort, which includes economic incentives for residences to recycle as much as possible, and an adequate capacity to receive those recyclables on the municipal side. Education and outreach must be stressed as an ongoing effort, as new residents move in and confusion can lead to outrage.

All three case study municipalities, especially Seekonk, provide vivid examples of communities that shied away from PAYT until, in the face of a financial crisis, there was no other alternative for solid waste management. This situation is one that each municipality would have rather avoided by planning ahead. As I will discuss, it would be prudent for municipalities in Rhode Island to avoid the unfortunate situation of trying to jump into a full-fledged PAYT program while also attempting to manage other financial woes, such as increased property tax burdens and increased tipping fees. It would be far wiser, as we have seen so vividly across the border in Seekonk, to plan for PAYT far ahead of any expected budget deficits or increases in solid waste management costs. This would also allow more time and capital for education and outreach efforts, which are the cornerstone to residential acceptance of any program.

Additional Case Studies in Connecticut

Ten municipalities in Connecticut have implemented some form of PAYT. Citizen resistance has been higher in Connecticut than in Massachusetts because, according to Judy Belaval of the Connecticut Department of Environmental Management, it is “viewed as another tax.”²⁹ There is also no fallback argument similar to Proposition 2.5 for implementing the program, and educational campaigns have not fully addressed this concern. Stonington, CT, finessed this issue by implementing a PAYT program and only calling for a citizen referendum when the program had been in place for six months. After this time, and after the fears of residents had been calmed, the referendum passed.

Case Study: Putnam, CT

Putnam implemented PAYT in July 1997. Residents purchase stickers at \$0.50 or \$1.00 each at local retail stores. The \$0.50 stickers are placed on 13-20 gallon bags, and the \$1.00 stickers are placed on 30-35 gallon bags. Weight limits are 20 and 35 pounds, respectively. Town officials report that this program is working “very well.” It applies to all curbside pickup for all residential houses 6 family and less.

Surprisingly, there were no major barriers to the implementation of PAYT in Putnam. This can be attributed to a well-planned education program carried out by the vendor—Reliable Refuse. Waste Management bought this contractor, and currently collects Putnam’s waste. The option for renewal is built into the contract, and Putnam has continued renewing it. The cost of pickup (\$325,000/year), which includes leaf and yard waste for three weeks throughout the year, is paid for out of the tax base, while the sticker sales pay for the tipping fee.

²⁹ Connecticut Department of Environmental Protection (CTDEP), 2004.

The impetus for PAYT in Putnam was the closure of the municipal landfill. For this reason, it is difficult to tell how much solid waste disposal was reduced because of the program. Recycling has certainly increased, though. There has been no noticeable increase in litter or illegal dumping.

Flyers are sent out informing residents of curbside recycling options and the schedule for white good pickup and yard waste collection. The municipality provides free pick-up of white goods during the last week of March and the last week of August.

Two red one-dollar stickers must be attached to each tire to be disposed of. Residents bring tires to a disposal site at the Town Public Works Garage.

Case Study: Stonington, CT

“This municipality has had this system in place since September 1992. The original program covered residential customers for the whole town. Residents pay \$0.85 for a 15-gallon bag and \$1.50 for a 33-gallon bag. The funds raised are used to cover program expenses and to pay the \$75.50/ton tipping fee charged at the regional trash-to-energy plant. It did go to referendum as to whether or not the town would continue with this system. Residents voted 2:1 to keep the program. Recently Stonington contracted out commercial trash hauling as well and the non-residential sector is now also covered by a PAYT program. There has been no increase in illegal dumping since the program began; residents have actually commented that ‘things are cleaner’ since the program was implemented; and recycling figures are up since the onset of this program.”³⁰

Failed programs:

PAYT programs that have failed were usually the subject of poor planning, a lack of public education, or extenuating circumstances. The following three municipalities in Massachusetts are examples of the small minority of PAYT programs that have failed, with the reasons why:

West Brookfield, MA

Ironically, the PAYT program in West Brookfield failed due to a landfill closure. Because of the costs of the new transfer station, PAYT was cancelled in favor of a private subscription program. West Brookfield does require private haulers to provide residents with a recycling service. Recycling drop-off centers are also maintained by the town.

Warren, MA

Warren charged \$3.00 per sticker under its program, and stickers were only available three days a week at the Board of Health office. Residents were outraged at the exorbitant cost and inconvenience, and Warren received a permit extension for their landfill, so the program was cancelled.

³⁰ Connecticut Department of Environmental Protection. “Connecticut Towns Which Have Implemented Some Form of PAYT.” Accessed 3/10/04 from <http://dep.state.ct.us/wst/recycle/newpayt.htm>

Political backlash in surrounding states:

There have been no documented cases in surrounding states of severe political backlash that has tipped the results of an election following the implementation of PAYT. One case in Worcester has been the subject of debate: the year the program was proposed, the incumbent mayor was stepping down and two candidates were up for election. The candidate in favor of PAYT lost, and the candidate against PAYT won, only to change his mind soon thereafter. No one has been able to confirm that this issue decided the election, but there has been conjecture.

After implementing a large-scale educational outreach campaign, communities can take further steps to prevent public ire over PAYT. Cities such as Worcester, MA have experienced great success with the use of a monitoring crew to educate residents throughout the opening weeks and months of the program. Another successful strategy that can be combined with the monitoring crew is to ensure that every trash bag in the first week is collected, and leave those households not in compliance with a warning note explaining that from this date forward, only trash in compliance will be collected. This ensures that ill-informed residents are not penalized.

State of PAYT in Rhode Island³¹

In the early 1990s, RIDEM provided grant assistance, at \$5,000 per grant, to five Rhode Island municipalities—Westerly, Pawtucket, Barrington, Narragansett, and South Kingstown—to undertake PAYT feasibility studies. All of these studies recommended PAYT and outlined recommendations for implementation. The three municipalities that decided to implement drop-off programs, Narragansett, South Kingstown and Westerly, were given \$5,000 implementation grants by RIDEM.³² The other two, Barrington and Pawtucket, did not follow the recommendations of the studies.

On February 23 and 24, the Rhode Island Department of Environmental Management's Ocean State Cleanup and Recycling (OSCAR) program conducted a series of focus groups made up of Rhode Island residents and elected officials, funded with a grant from USEPA. Among the main findings of the focus groups were that:

- Residents were overwhelmingly enthusiastic about the environmental benefits of PAYT, but somewhat resistant to change and skeptical about the role of PAYT in reducing the burden of property taxes. They were in favor of transparency in such a program and the allocation of the funds formerly allotted to solid waste management to programs that would benefit the entire community as opposed to one specific group. Residents agreed that public education would be a necessary step in implementation and expressed fears about illegal dumping and backyard

³¹ For a more detailed analysis of the state of PAYT in Rhode Island, see Appendix III: "History of PAYT in RI."

³² Ihenacho and Proulx. "User Fee System for Waste Collection in the City of Pawtucket, Rhode Island: Feasibility Study," November, 1994); Eco2 Solutions, Inc. "Feasibility Study: Implementation of a 'Pay-By-The-Bag' Program in Barrington, Rhode Island;" December, 1993; RIDEM, 2004.

burning. There was no consensus on whether the decision to implement PAYT should be left to the community or to the state.

- Elected officials support the concept of PAYT, both as a more equitable way of funding solid waste disposal, and for the environmental benefits, but expressed significant reluctance at making such a drastic change in their own solid waste management systems. Their main concerns included citizen resistance and the possibility that PAYT would negatively impact some populations, such as low-income households or large family households. Elected officials eventually came to the consensus that *a state mandate would make PAYT easier to implement* and it would reduce illegal dumping concerns because of consistency in policy throughout the state.³³

Curbside Programs:

There are no curbside PAYT programs within Rhode Island. In 2003, the RIRRC offered to pay for startup costs for the first two municipalities to implement PAYT, up to \$240,000 per municipality. Two cities, East Providence and Cumberland, considered the offer but neither was successful in final implementation due to political apprehension. The individual case studies of these two municipalities are described below, in addition to a case study of Cranston and Burrillville, both of which are considering PAYT as a feasible option in the near future:

a. East Providence

Under the PAYT model proposed by the recycling coordinator in East Providence, even large families “save” on yearly waste disposal costs. Residents are currently paying \$190 per year for waste disposal in their property taxes, with an estimated \$2.65 per \$1000 of assessed value included in the property tax. Under the PAYT program, the cost would average approximately \$166 per year, and one would have to produce 102 full bags of waste (with a weight limit of 40 pounds each) per year simply to break even. (This is assuming that the city government shifts the entire solid waste management budget off of the property taxes) The recycling coordinator estimates that the only additional costs associated with PAYT would be those associated with one extra recycling truck, which would be offset by the savings in tipping fees. The proposed program would charge residents an \$88 yearly “refuse utility fee,” in addition to charging \$1.00 for 32 gallons bags which would be picked up curbside. The bags cost \$0.17 to produce, so for the estimated necessary 1.3 million bags, an initial \$221,000 would have to come out of the town’s budget initially, to be countered by the shift of \$2.6 million from the tax base. Although the total town budget of \$111 million was projected to increase approximately 5 or 6% over the next year, the PAYT program would lower that increase 2.3% if the entire solid waste management budget were removed from property taxes.

After a member of the RIRRC and the local recycling coordinator presented this proposed curbside program to the East Providence city council, the council was one vote short of approving it. In an interview with one of the city council members (ccp)

³³ Rhode Island Department of Environmental Management. (OSCAR) “Pay As You Throw Qualitative Research Study,” February, 1999.

opposed to the program, who described it as “anti-family” at the time of the final vote, the ccp stated a number of reasons for opposing it:

1. “PAYT would only encourage more government spending. The \$300,000 or so it would take to implement the program comes as an extra cost to consumers, while taxes do not decrease.” This is a curious comment coming from a city councilor, since the city council controls the city’s budget. In addition, under a PAYT program, taxes would only increase by approximately half of the amount that they would have increased by had PAYT not been put in place.

2. There is a “growing trend in this country for fragmenting services,” as in the cases of the water use fee, the sewer use fee, and PAYT would make waste disposal the third item in this list. The ccp stated that the government should be less of an “a la carte” program and more like an insurance company, where people invest in the whole and receive services back. The ccp regards it as a slippery slope to start paying for what you use, and carry it out to the extreme. “Will we charge senior citizens to use the senior centers?” the ccp asked. “Will families pay based on how many kids they have in public schools?”

An important point the ccp brought up was that the ccp doesn’t think that the community or the state has done a good job of educating about waste management and the projected life of the landfill, and has done very little to present information about programs such as PAYT. This could be expanded with editorials in the newspaper and briefings from SWM officials. The presentation of PAYT was in essence, one person saying, “Here’s the problem, here’s the solution.” There was not enough lead-up or background info given out for this city council member to be convinced right away.

All of the information concerning cost savings was presumably available to all of the city council members who opposed the program. This strengthens the argument that an elected official can have an inherently visceral and negative reaction when presented cold with this program, and that the mode of presentation is of the utmost importance to how any audience receives it. To counter the phrase “anti-family,” the recycling coordinator used the phrase “pro-elderly.” A more prudent approach would have been to explain that this program is pro-family and pro-elderly, using the equity and environmental arguments. Those who produce less than the average amount of trash pay less than those who produce more than the average. There is certainly something to be said for the preservation of landfill space and the reduction in emissions of greenhouse gases and other pollutants as a product of high recycling rates for the children and grandchildren of such families. In addition, by prolonging landfill life, the inevitable enormous jump in tipping fees that will accompany construction of a new landfill is postponed.

Perhaps most importantly, if the recycling coordinator and the RIRRC member presenting the PAYT program had been able to convince the city council that the entire \$2.6 million savings from a program would be removed from the tax base, the council would have been much more likely to vote for it. This is an important point to remember whether PAYT is implemented through a mandate or voluntarily. If under a mandate,

there may need to be some sort of provision that ensures that the savings are either removed entirely from the tax base or allocated to the general good in a transparent way.

b. Cumberland

The recycling coordinator of Cumberland proposed PAYT to the local government, providing economic models of seven possible scenarios of PAYT, including some hybrid models. This type of modeling approach is important to consider when a PAYT must be adapted to fit the specific needs of a community. (Amount removed from tax roll in parentheses)

1. *Recycling collection only on tax roll.* Under this model, all costs associated with refuse collection and disposal would be covered by bags at \$1.25 each, while recycling costs remained in the property tax base. (\$1,599,224)
2. *All costs removed from the tax roll.* Under this scenario, all solid waste costs would be covered by the PAYT program, at \$1.65 per bag. (\$2,075,282)
3. *All costs removed from the tax roll and charge a yearly administration fee.* A yearly fee of \$50.00 per household and bags at \$1.25 each would cover the entire costs of solid waste management. (\$2,075,282)
4. *All costs removed from the tax roll, annual fee, and one free bag per household per week.* This would include a \$50.00 annual fee, and additional bags past the weekly free one would cost \$2.00 each. (\$2,345,082)
5. *Trash collection and free bags on program, recycling costs on tax roll.* Under this scenario, additional bags would cost \$2.00 apiece. (\$1,869,024)
6. *Trash collection on program, recycling costs and free bags on program.* Bags would cost \$1.80 under this scenario. (\$1,594,224)
7. *All costs removed from tax roll, free bags for seniors.* Bags would cost \$1.50 each. (\$2,092,962)

PAYT was squelched in Cumberland due to political apprehensions. Because there was no similar case of PAYT implementation, elected officials had no way to gauge the amount of resistance that residents would put up. An interview with the assistant to Mayor McKee of Cumberland, who was very familiar with the inner-workings of PAYT, revealed the following findings:

The mayor's assistant viewed the following as barriers to the implementation of PAYT in Cumberland:

1. Municipal government has a "trifecta" of duty to its citizens: 1) to plow the roads, 2) police the streets, and 3) pick up the trash. (S)he did not acknowledge public education. Trash pickup, which has been going on for 30 to 40 years in Cumberland since the municipal landfill closed, is the "only door to door service left," and citizens view it as a "right rather than a courtesy." The mayor's assistant did acknowledge that door-to-door pickup would continue under PAYT. This "right" was somewhat of a sticking point.
2. The mayor's assistant was not convinced that voters would understand the "savings" of removing approximately \$2 million from the tax base, and was

dubious that such a concept could ever be translated to voters, especially because of the “creepage” upwards in municipal budgets. The two-year election cycle, coupled with the potential resistance that could be felt from residents worried him/her.

3. Time, initial implementation cost, and energy were also limiting factors. The administration was more interested in PAYT during the flux when the previous waste hauler was fired and there was more uncertainty. Now the town has a contract with a new hauler (Coastal) that is running smoothly.
4. Fear of the unknown was a barrier to PAYT implementation. No other town in Rhode Island has implemented PAYT.

According to Mayor McKee’s assistant, the mayor is open to any way of saving money in the municipal budget, in this case, by shifting the cost of municipal solid waste from the property tax base. He would be in favor of a public forum to discuss PAYT. By May or June, he will know if he will run for re-election uncontested and if so, would more readily consider PAYT.

Right now, the mayor’s assistant imagines that PAYT is inevitable in RI, but faintly hopes that it will be implemented by a future mayor that the current mayor’s assistant doesn’t work for. The mayor’s assistant would in fact welcome a state mandate on PAYT as it would take the political heat off of the mayor. This point is critical to my recommendations, and is fleshed out further in that section.

The major selling points of PAYT for Cumberland’s current administration are as follows:

1. \$2 million shifted off of the solid waste management budget.
2. Equity. This was an “overriding” selling point for the mayor’s assistant.
3. Environmental benefits. (More of a nice side effect)

Of the 10-12 municipalities I have been involved with for this project, Cumberland appears to be a likely early candidate for curbside PAYT, if not the first candidate. This is due to a mayor who is open to new ways of saving money. The addition of an open-minded assistant and a driven recycling coordinator only add more weight to this proposition. If Mayor McKee emerges the clean victor in the elections of November 2004, this would be an ideal time to implement the first curbside PAYT program in Rhode Island. It does not seem that the city council would oppose the proposal, although this is something to look into further.

c. Cranston

Because of the current fiscal crisis in Cranston, and the presence of a mayor with seemingly no inhibitions about making bold decisions, that city appears to have potential for PAYT. Consequently, I interviewed two members of the Cranston city council, the director of DPW, a DPW employee, and the city planner.

I found that the political climate in Cranston is quite amenable to the idea of PAYT implementation. In addition to the presence of a mayor who favors bold decisions, the town planner and the two members of the city council that I interviewed knew the basics of PAYT and favored its implementation in Cranston. The environmental benefits alone gained their support of the program. The city is currently considering the implementation of a sewer use fee, which could presumably be combined with a PAYT effort. The DPW is in the process of reviewing the economic model of PAYT shown in Figure 1.

Figure 1:

Cranston	2002	20% decrease in trash resulting from diversion to recycling and 5% source reduction projected from a curbside PAYT program
Total Population	79,269	79,269
Population of renters	19,691	19,691
Households (HH) Served (includes rental units)	28,177	28,177
Rental units served	10,283	10,283
Tons recycled	7,438.94	15,512.42
Recycling Collection Cost	\$743,000.00	\$1,115,844.44
Tons disposed	33,383.23	25,037.42
Recycling Rate	18%	38%
Garbage Collection cost	\$1,517,800.00	\$1,138,350.00
Garbage Disposal cost	\$1,069,351.95	\$802,013.96
Cost of PAYT implementation	\$0.00	\$300,000.00
Estimated total refuse and recycling program cost	\$3,330,151.95	\$3,356,208.41
Tons/HH/year	1.18	0.89
Tons/HH/week	0.0228	0.0171
Pounds/HH/week	45.57	34.18
Bags/HH/week (@ 20 lbs./bag)		1.7
Bags/Year/HH		88.86
Bags/Year Total		2,503,742
Cost of bag under PAYT program		\$1.34
Cost of bag to cover program + \$100,000 cushion		\$1.38
Total removed from tax base at \$1.40/bag		\$3,430,151.95
Total cost to Cranston property owners	\$3,330,151.95	\$1,940,866.42
Direct cost to Cranston renters	\$0.00	\$1,415,341.98
Direct per capita cost to Cranston property owners	\$55.90	\$42.34

Direct per capita cost to Cranston renters	\$0	\$42.34
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Although very open-minded and interested in considering PAYT implementation, the Cranston DPW is currently understaffed and overworked and would require additional staffing for such a move. Once city council member I interviewed believed that the city was too overburdened with issues such as lawsuits to consider PAYT, and that although he/she supported PAYT on purely environmental grounds, economic and equity arguments would have to be made to convince the entire city council of the benefits of the program. This would be not difficult, presumably, considering the financial crisis currently in place in Cranston, and the \$3.4 million that would be removed from the tax base under PAYT.

An interesting anecdote regarding the mayor of Cranston: Although Mayor Laffey is not known for championing environmental causes, he declared that the plans for a new police station were to be cancelled because the land on which it was to be built was contaminated, although the former director of RIDEM “spoke highly” of the property. Perhaps if the shifting of \$3.4 million from the tax base were enough to put him in favor of PAYT, he would use the environmental argument in defense of the program.

d. Burrillville

The recycling coordinator of Burrillville characterizes the political climate in this town to be amenable to the idea of a curbside PAYT program, and plans to move forward with a proposal within the next year.

Figure 2:

Burrillville	2002	20% decrease in trash resulting from diversion to recycling and 5% source reduction projected from a curbside PAYT program
Total Population (includes renters)	15,796	15,796
Population of renters	2,827	2,827
HH Served (includes rental units)	5,559	5,559
Rental units served	1,290	1,290
Tons recycled	1453	3,063.56
Recycling Collection Cost	\$310,464.00	\$480,464.00
Tons disposed	6,609.00	4,956.75
Recycling Rate	18%	38%
Garbage Collection cost	\$428,736.00	\$321,552.00
Garbage Disposal cost	\$211,489.00	\$169,191.20
PAYT stipend for recycling coordinator	\$0.00	\$10,000.00
Coordination costs	\$0.00	\$60,000
Cost of PAYT implementation	\$0.00	\$154,264.75

Estimated total refuse and recycling program cost	\$950,689.00	\$1,125,471.95
Tons/HH/year	1.19	0.89
Tons/HH/week	0.0229	0.0171
Pounds/HH/week	45.73	34.29
Bags/HH/week (@ 20 lbs./bag)	2.29	1.7
Bags/Year/HH	118.89	89.17
Bags/Year Total	660,900	495,675
Cost of all bags		\$84,265
Cost of bag under PAYT program		\$2.27
Cost of bag to cover program + \$50,000 cushion		\$2.37
Cost of bag with one free bag/week for elderly residents (no \$50,000 cushion)		\$2.63
Total removed from tax base at \$2.63/bag		\$1,050,689.00
Total cost to Burrillville property owners	\$950,689.00	\$864,299.29
Direct cost to Burrillville renters	\$0.00	\$261,172.66
Direct per capita cost to Burrillville property owners	\$73.30	\$71.25
Direct per capita cost to Burrillville renters	0	\$71.25

The high cost of bags in the Burrillville model is due primarily to the high differential in the costs of refuse and recycling per ton. In 2002, refuse cost \$65/ton to collect and dispose of, while recyclables cost \$214/ton. Increasing the efficiency of recycling collection could significantly reduce the cost of bags under a PAYT program in Burrillville.

Drop-off Programs:

Presently, five municipalities in Rhode Island offer drop-off PAYT programs. These are Narragansett (unknown participation rate), New Shoreham/Block Island (100% participation), North Kingstown (50% participation), Richmond (20% participation), South Kingstown (unknown participation rate), and Westerly (15% participation).³⁴ In addition to the \$5,000 implementation grants given to Narragansett, South Kingstown, and Westerly by RIDEM, RIDEM also provided North Kingstown with \$5,000 worth of materials (bags, brochures, etc.) in the opening phase of its program.³⁵ It is difficult to estimate participation rates in Narragansett and South Kingstown because the two towns collaborate in the operation of the Rose Hill Transfer Station, where both drop-off programs occur.

³⁴ Narragansett Department of Public Works, 2004; New Shoreham Department of Public Works, 2003; North Kingstown Department of Public Works, 2003; Richmond Department of Public Works, 2003; South Kingstown Department of Public Works, 2004; Westerly Department of Public Works, 2003.

³⁵ RIDEM, 2004.

Case study: North Kingstown:

North Kingstown's drop-off program has been the biggest success politically of any of the other in-state drop-off programs. Implementation began in 1999 at the urging of the city council, and the diversion rate at the transfer station jumped from 15-18% to 30%. The 50% participation rate is the greatest of any of the five Rhode Island municipalities with drop-off programs besides New Shoreham/Block Island, which does not provide an applicable case study for non-islanders. North Kingstown provides only curbside recycling pickup, not refuse collection, one possible reason there are such high recycling rates and participation rates at the transfer station. The town only collects curbside recycling because according to one former city council member, it would be "cost prohibitive" to provide a refuse collection program.

At least two city council members in North Kingstown anticipated political heat from PAYT implementation, heat which never came about. One council member stated: "We had more calls when high schools wanted to put Astroturf on the football fields [than when we implemented pay-as-you-throw]," and only remembers one call of complaint regarding the program.

Comparison between North Kingstown's drop-off program and other towns that may consider a curbside program is difficult because residents had always dropped off trash at the transfer station for a yearly sticker fee.³⁶ The problem the town had with the sticker fee was that stickers would be stolen, or shared, or people would use solvent to remove the writing so that they could be used by more than one person. (It would be hard to complain to the city council that you can no longer break the law) Also, in this case, people who did buy yearly stickers could very easily see that they were in fact saving money. The cost of the stickers was \$1.00 each at the start of the program, and was recently raised to \$1.20 each. Residents can dispose of any bag of garbage that contains up to 35 pounds of garbage. Each additional pound costs \$0.06.

The only people who had trepidations about the programs were the elderly residents who asked, "How am I going to do this?" But one city council members said that their fears were laid to rest early in the program through educational efforts. The main thrust of the educational efforts were that the program was 1) easy, 2) economically sound/equitable, and 3) environmentally friendly.

For town planners who would rather look in-state for an example of a successful PAYT program instead of right across the border in Seekonk, MA, the only option right now is to look at drop-off programs, and the greatest lessons can be drawn from North Kingstown.

Case Study: Westerly

³⁶ PAYT programs are always easier to implement politically when a flat fee for waste collection is already in place. This enables citizens to track their savings more directly.

Known for its casual accounting practices in the area of waste management,³⁷ Westerly, RI, is home to the only bag PAYT program in Rhode Island. (Block Island/New Shoreham runs a weight-based program, and North Kingstown, Narragansett, and South Kingstown run sticker programs) Westerly runs a transfer station where, until 1994, residents could dump unlimited waste with the purchase of a \$64 sticker. In 1994, the PAYT system was implemented. Residents bought orange bags at \$0.75 for 15 gallons and \$1.33 for 33 gallons, and only these bags were allowed to be dumped. Bag prices are now \$0.60 for 15 gallons and \$1.20 for 33 gallons. RIDEM assisted with start-up costs, including education efforts. Only 15% of Westerly's population participates in this program, while the rest hire private contractors for curbside pickup. The most notable problem with the program is the lack of monitoring and dumping of illegal, non-orange bags at the transfer site. The demonstrable fact that a town as challenged by waste management issues as Westerly has implemented as relatively progressive program as PAYT goes to show that any municipality in Rhode Island is capable of it, the vast majority of them on a far grander scale, complete with detailed accounting.

Findings and Recommendations (Part I)

PAYT programs lead to increased recycling, decreased refuse production, and if implemented statewide in Rhode Island, would increase the life of the Johnston Central Landfill by 1.5 months per year.³⁸ Although successful in surrounding states such as Massachusetts and Connecticut, PAYT programs have yet to take off in Rhode Island due to political apprehension, an artificially low tipping fee for residential waste, and lack of interest on the part of local planners. Incentives proposed by the Economics Subcommittee to the Comprehensive Solid Waste Management Plan Working Group alone (namely, the incremental lowering of the municipal cap by 35% by 2008) are insufficient to encourage a significant proportion of Rhode Island municipalities to consider PAYT implementation. The effects of these incentives will also be disproportional: Cranston will face the greatest financial incentive at \$104,419 per year,³⁹ but at least six municipalities will be provided with no incentives whatsoever under this 35% cap decrease. Many more will be faced with insignificant incentives to implement PAYT. **Pay-as-you-throw will not be implemented in Rhode Island unless there is a state mandate or significant incentives to do so. I recommend that a state mandate be implemented that requires all municipalities to implement some form of PAYT by 2008.**

The following outline the conclusions drawn from the data discussed above:

- The only significant opposition to PAYT in Rhode Island came from fear of political heat. There is a significant apprehension to being the first municipality in

³⁷ See "Town Can't Keep Track of its Trash," Providence Journal, by Megan Matteucci, 3/18/03. Also, the municipal surveys carried out by the RIRRC in 2003 recorded Westerly's refuse disposal as nearly three times that of the next greatest disposer due to commingling between residential and commercial waste.

³⁸ See Final Report by the Economics Sub-Committee to the Comprehensive Solid Waste Management Plan Working Group (19 November 2003)

³⁹ According to the numbers, it is Westerly that stands to see the greatest incentive, but we have already seen that Westerly is a radical case of faulty accounting and should probably be subject to an audit of its practices by the RIRRC.

Rhode Island to implement a curbside PAYT program. Four of the eight elected officials interviewed *actually welcomed a state mandate of PAYT* because they were in favor of such a program, but did not want to potentially upset constituents. Note that there have been no cases of political backlash in any of the 15+ municipalities I surveyed, except for an alleged, but unconfirmed case in Worcester.

- Two of the eight interviewed elected officials said that no incentive program would be sufficient for them to implement PAYT, strengthening the argument that PAYT must be mandated for it to succeed.
- DPW officials are generally amenable to the idea of implementing PAYT, but are often understaffed and unmotivated to do so.⁴⁰ With a state mandate, municipal governments would be forced to work with the DPW to implement PAYT.
- Although there is significant evidence that the savings to municipal budgets under PAYT programs would far exceed what elected officials and DPW administrators claim to be their minimum required savings to implement PAYT, and despite the fact that this reality has been made clear to them, there still is no demonstrable motivation to implement PAYT.
- PAYT programs have been moderately successful in Massachusetts because Proposition 2.5 does not allow yearly property tax increases to exceed 2.5%, and tipping fees average approximately \$71/ton. It is clear that with significant financial constraints, some municipalities will implement PAYT. In the case of Rhode Island, these types of constraints have yet to take hold. Evidence collected in Massachusetts suggests that a state mandate for PAYT in Rhode Island would accelerate the implementation of a program that is seemingly inevitable due to increases in the costs of waste disposal in communities that are currently paying far below tipping fees found in any other surrounding state and are only holding back because of political apprehension.
- Hybrid programs in the North East do not seem to provide *less* incentive for residents to reduce waste than do non-hybrid programs, although this could be the focus of future research. It seems that as long as residents are assessed a variable rate fee for waste produced over a set limit of waste that is collected with funding from a flat fee or from property taxes (i.e. no more than 52 free bags per year), recycling and refuse rates will be comparable to those in municipalities with non-hybrid programs.

Fiscal Transparency

This mandate should be implemented with a provision requiring transparency in the process that identifies where the savings of the municipal solid waste budget are allocated. These savings should either be removed in full from the local property taxes, or allocated to the general good in a socially acceptable way. A full report of accounting should be provided to all residents of the given municipality as well as to the RIDEM and RIRRC.

Implementation Schedule

⁴⁰ One DPW employee in a Rhode Island municipality is so overburdened with tasks that the prospect of overseeing PAYT implementation would clearly put him in an early grave.

This mandate should be implemented within the 2004 calendar year. Three to four years, the amount of time municipalities would have to plan and implement PAYT under a 2004 mandate, is more time than it has taken any municipality with a curbside PAYT program presented in this report to plan for and execute PAYT. Skumatz, et al. report that some communities have been able to implement the program in less than three months, but that it usually takes a bit longer.⁴¹ Minnesota took the step of implementing a state mandate in 1994 by adopting statute that requires pricing by weight or volume as a condition for receiving a license for solid waste collection, with exemptions granted in special cases. The statute reads as follows:

A local government unit that collects charges for solid waste collection directly from waste generators shall implement charges that increase as the volume or weight of the waste collected on-site from each generator's residence or place of business increases.⁴²

Now over 1800 municipalities in Minnesota have implemented some form of PAYT. This mandate offers exemptions to communities that already achieve recycling rates greater than 70% (or the recycling rate of the county in which it is located, whichever is higher). A more practical approach to the Rhode Island mandate that focuses more on refuse reduction would be to allow exemptions to communities that dispose of residential refuse under a municipal cap calculated with a 70% recycling rate.

The recommendation of a state mandate for PAYT in Rhode Island is in keeping with the recommendation of the Economics Sub-Committee Report, which outlines the following schedule for a PAYT mandate with increasing incentives for implementation:

“The current caps are set by population and statewide waste generation rates, and then adjusted by a factor to account for reduction by recycling - this was a reduction of 15 percent in 2002 and has recently been changed to 20 percent for FY2004 municipal contracts. We recommend that this cap be *further reduced* by 15 percent in keeping with results expected under PAYT programs, bringing the total reduction to 35 percent. This reduction will need to be phased in over time, so municipalities have the time to put PAYT programs in place. It is recommended that the municipal caps be reduced from the current 20 percent to 35 percent in 2008, in increments of 5 percent over four years, according to the following schedule.

Year:	2002	2004	2006	2007	2008
Cap:	15%	20%	25%	30%	35%

⁴¹ Skumatz, et al. *Variable Rate or “Pay-As-You-Throw” Waste Management: Answers to Frequently Asked Questions*; pg. 1, Reason Foundation (July 2002).

⁴² Minnesota Statutes, 2003; Chapter Title: WASTE MANAGEMENT Section: 115A.9301. Accessed 3/25/04 from http://www.revisor.leg.state.mn.us:8181/SEARCH/BASIS/mnstat/public/www/DDW?W%3DTEXT+PH+WORDS+%27variable+rate%27+ORDER+BY+SORT_KEY/Ascend%26M%3D18%26K%3D115A.9301%26R%3DY%26U%3D1

The cap reduction should serve as an incentive to municipalities to institute PAYT programs and when implemented in this staggered manner will create incentives for the various municipalities to act at different time periods.”⁴³

In addition to the Economics Sub-Committee of the Comprehensive Solid Waste Management Plan, the Source Reduction Sub-Committee strongly recommends the implementation of PAYT as a solution to the top waste management priority of the USEPA and the Resource Recovery Corporation: source reduction.⁴⁴

If the goal of incrementally lowering the municipal cap as outlined above is to create incentives for municipalities to implement PAYT, it would make sense to 1) take the perceived political heat off of local officials and 2) ensure that PAYT is in fact implemented in every municipality by putting a state mandate in place.

The following recommendation should go directly to cities and towns in Rhode Island: PAYT programs should be implemented in one fell swoop, as opposed to through a period of “easing in” by adding charges incrementally. Cranston has experimented with the “easing in” of PAYT only to find that residential outrage is kindled most when some items of disposal carry a charge on the spot and some do not. PAYT is most effective when it is implemented on a full scale, accompanied by a strong educational campaign and monitoring program.

Whether or not the Comprehensive Solid Waste Management Plan of 2004 makes its way to the printing press, the recommendations of these two sub-committees represent the voices of a diverse range of experienced planners representing a broad cross-section of the general population of Rhode Island, all coming to a consensus on the importance of the implementation of this program. These planners include Harold Ward, Dan Beardsley, Susanne Greschner, Angie Macera-Briggs, Mike McGonagle, Chris Ratcliffe, Shim Silverstein, John Trevor, John Rambone, Tom Getz, Carol Bell, Geoff DiCenso, Sarah Kite, Eugenia Marks, Steve Mutter, Jeanne Tracey-McAreavey, and Terri Bisson.

Start-up grants:

Offering start-up grants to target communities such as Cumberland and Cranston described above could be coupled with the early stages of the incentive program leading up to the state mandate to encourage communities to act sooner rather than later. These grants should cover the entire start-up costs of the respective programs. A grant of \$250,000 would cover the cost of bags in Cumberland and provide for some additional administrative costs, and a grant of \$450,000 would be required to do the same in more-populated Cranston. As elected officials may be up for re-election before the cut-off date for the state mandate, a positive incentive to quell their unfounded fears of political

⁴³ Final Report of the Economics Sub-Committee to the Comprehensive Solid Waste Management Plan Working Group. (November 19, 2003) Accessed from <http://www.state.ri.us/dem/programs/ombuds/outreach/integsw/econ/pdf/finalrep.pdf>

⁴⁴ Draft Report of the Source Reduction Sub-Committee. (June 3, 2003) Accessed from <http://www.state.ri.us/dem/programs/ombuds/outreach/integsw/source/pdf/draftrep.pdf>

backlash would be to provide a working example within Rhode Island by as early as 2005. Given the political resistance to PAYT based solely on the fact that no Rhode Island municipality has yet implemented a curbside program, a large grant to assist in implementation costs of a willing municipality would be an excellent investment.

Effects of a state mandate on PAYT and other initiatives

Given that the existing life of the Central Landfill under a “business as usual” approach will take Rhode Island to June of 2016, and accounting for other factors such as commercial waste and the entrance of out-of-state waste and recyclables into the landfill, a state mandate on PAYT beginning in 2008 would extend the working life of the landfill by 12 months for every eight years of operation and would lead to a long-term reduction in the waste stream that would continue regardless of where refuse is deposited. Coupling this mandate with the diversion of commercial waste out of state, as recommended by the Economic Sub-Committee to the Working Group of the Comprehensive Solid Waste Management Plan, would decrease annual disposal at the landfill by 570 KT/year. This means that implementation of both of these measures in 2008 would extend the remaining life of the landfill to 2025.

The Economic Sub-Committee reports on the implications of such a large increase in statewide recycling:

“It is very likely that the MRF would need to be expanded to handle an increase in volume of over 100 percent (~ 90 KT).⁴⁵ Since current recycling revenues cover the cost of the existing facility, it might be reasonable to assume that also will be the case for the expanded facility, but lacking estimates of the cost of expansion, we can’t confirm that assumption.”⁴⁶

The RIRRC has made it clear that it is no longer considering moving towards single-stream recycling at the MRF.⁴⁷ This shift was proposed by various members of the Working Group for the Comprehensive Solid Waste Management Plan of Rhode Island, with the suggestion that a shift to single stream entail removal of glass from the recycling stream. Removal of glass would enable compaction of recyclables during collection routes and prolong the life of MRF equipment, as well as add significant tonnage to the refuse stream. The RIRRC should keep municipalities abreast of any change in this plan,

⁴⁵ According to Patrick Fingliss, the existing MRF is not equipped to handle an increase of this magnitude and in order to handle ~90 KT of additional material, there would have to be a major retrofit of the MRF’s processing systems, buildings and grounds. The existing MRF was designed only to handle the materials collected in the Maximum Recycling Program. The MRF has two processing systems – one for bottles and cans and one for paper. The MRF’s bottle and can processing system is at capacity and presently operates 16 processing hours a day, 5 days a week and the paper processing system is at approximately 55 percent of capacity assuming 8 processing hours a day, 5 days a week. The yearly capacity of the present MRF operating 16 hours a day, 5 days a week is approximately 34,000 tons yearly for bottles and cans and approximately 93,600 tons yearly for paper. The composition of the material and the products to be sorted and marketed are extremely important in any discussion of capacity.

⁴⁶ Final Report of the Economics Sub-Committee to the Comprehensive Solid Waste Management Plan Working Group. (November 19, 2003)

⁴⁷ Smithfield DPW, 2004; RIRRC, 2004.

especially as cities and towns may become interested in implementing automated collection for PAYT can programs, which require the purchase of two recycling bins per household for double stream recycling, and only one recycling bin per household under a regimen of single-stream recycling.

Part II: Automated Collection

Automated collection is a growing trend in the southern and western regions of the United States, but has yet to gain serious footing in the North East. It is defined for all intents and purposes as the curbside collection of refuse and/or recyclables from standardized toters with trucks that use automated arms to dump the contents of the toters into the back of the truck. Ideally, these programs require one worker per truck, who never needs to leave his seat at the wheel.

Benefits:

1. **Increased recycling rates.** One striking discovery that has been made with the advent of automated waste collection in Rhode Island is that larger recycling bins induce greater recycling rates. Eureka Recycling reports that double-stream large toters that are collected bi-weekly lead to the highest recycling rates, and that contrary to their initial hypothesis, double-stream recycling rates were higher than those of single stream.⁴⁸ Rhode Island's Maximum Recycling Program includes such a wide variety of recyclable material that an eager environmentalist could quite feasibly attain a personal recycling rate of 80% or higher. This is a difficult prospect with the 16 and 22-gallon recycling bins currently provided by the RIRRC for mixed paper and mixed containers, respectively. (See the case of Warwick, below, where recycling containers have been elevated from 12-gallon "bins" to 60-gallon "toters.") Automated programs need not be the only reason a municipality promotes larger recycling bins, but these programs actually make larger bins necessary, both for efficiency's sake (it is more cost-effective to collect more recyclables per stop) and because the bins must be standardized to fit the grappling hooks and lifting arms of the automated trucks. Larger recycling bins would also quickly become too heavy to lift, necessitating some form of automated collection.
2. **Cost savings.** Most automated trucks only require one worker to operate, as opposed to two or three in a non-automated truck. This leads to large cost savings. In rare cases where towns operate their own waste collection service, workers can be reassigned to other departments as was done in Warwick. Automated trucks generally make heavy lifting a thing of the past, extending the number of years a trained waste hauler can work and decreasing the number of work-related injuries. This allows a municipality to save on worker's compensation for injuries and decrease the amount spent on payroll. Jim Celenza,

⁴⁸ Eureka Recycling. "To Be or Not To Be... Recycled: Evaluating Saint Paul's Program," Presented November 5, 2002 by Tim Brownell. This study included a study sample of 5 routes of 400 households for 4 months in St. Paul, MN.

director of the Rhode Island Committee on Occupational Safety and Health (RICOSH), noted some additional safety benefits that may come with an automated program: workers can remain in their seats with their seatbelts fastened at all times instead of jumping in and out and not bothering with a seatbelt, and workers can avoid being injured or killed trying to collect waste from the other side of the road. Automated collection also allows either refuse or recycling to be collected in the same type of truck. If implemented with a focus on encouragement of recycling (i.e. providing larger recycling totes and smaller trash bins), municipalities can save money in tipping fees. As the costs of waste disposal will inevitably increase over time, investment in increasing diversion rates is a fiscally prudent move.

Drawbacks:

1. **Little evidence of actual refuse reduction.** In the vast majority of my interviews with DPW officials and solid waste planners, the notion that automated collection without some form of variable pricing through can sizes could actually reduce refuse rates was completely foreign.⁴⁹ The general consensus was that even with a PAYT can program that included automated pickup, refuse reduction would not be as great as another form of PAYT. This is due to the fact that once residents have purchased a can size, there is no incentive to reduce waste beyond what fits in the can.
2. **Logistical difficulties.** Some cities are not built to accommodate automated refuse and recycling trucks. It might be impractical, for example, to run automated trucks through some areas in Providence, home to countless apartment complexes and a heavy practice of parking on the street. However, the experience in Warwick belies the previously held theory that automated trucks could not practically operate in New England cities, and future research and experimentation could tell us more. Another logistical difficulty lies with variable rate can programs that include automated pickup: when residents produce waste greater than will fit in the can, although they pay for it with a bag or sticker option, the waste hauler must exit the cabin of the truck to collect the bag, defeating the point of the automated trucks.

Case study: Warwick, RI

Mechanics

In early August of 2003, the city of Warwick implemented the first phase of an ambitious program of automated collection that will eventually provide each one of its 28,000 households with refuse and recycling totes to be picked up curbside by automated trucks. These trucks are equipped with automated arms that lift totes from the curbside and

⁴⁹ Recycling Coordinator, Gainesville, FL; Waste Management and Cleanup Division, Oregon Department of Environmental Quality; Manchester, MA DPW; Town Planner, Vancouver, British Columbia; Department of Environmental Quality, CTDEP.

INSERT: AUTOMATED COLLECTION IN WARWICK, RI

(Pictures taken 3/24/04)



dump their contents into the truck's belly, where they are compacted. (Different trucks are designated to refuse and recycling, and both types compact their contents) The recycling trucks can fit either 8 tons of paper and cardboard or 4 tons of bottles and cans in one load. Above each automated arm a camera is mounted that monitors recycling practices of residents. If residents are not recycling properly, they are notified and asked to increase personal diversion rates. Under the program, Warwick purchases three totes for each household: one for mixed containers, one for paper and cardboard, and one for trash. Residents can choose from three sizes of container in both the refuse and recycling categories (35, 65, or 95-gallon), but the sanitation department encourages households to opt for large recycling bins and smaller trash cans. Using footage from the mounted cameras, the department will not allow a household with great potential to increase recycling to increase the size of their trash bin. Serial numbers are included on all bins, so that theft will be kept to a minimum and trade-ins can be accepted. Collection occurs weekly; the trash bin is placed curbside next to one of the two recycling bins, which alternate weekly in the collection schedule. There is a 10-year warranty on the totes, but some cities in the US have reported a lifetime on the same totes of 15 years or more.

Each phase of the program is preceded by a one-month educational outreach effort, which includes informational mailings and the distribution of color-coded calendars (with the two alternating colors signifying the color of recycling bin to be picked up in a given week) to every household within the given phase. The first phase of the program, implemented in August of 2003, services 3,850 households, a group of households chosen for the sole reason that they lie on the flattest ground. No other demographic considerations were taken into account. April 12th, 2004 marks the second phase of the program, which will cost the same amount as Phase I and service another block of approximately 4,000 households. Implementation will continue with Phase III of the program adding 8,000 households in October of 2004. By the time all 28,000 households are phased in, the city plans to drop one route of collection because the automated trucks are more efficient: In a six-hour period, the non-automated trucks could cover 700-750 households. The automated trucks can cover 800-900 households in the same time period. Residents call in for free pickup of bulky items, which amount to about 12 per day on average. By the end of implementation of the program, there will be one truck entirely devoted to bulky item pickup.

Costs

The automated refuse and recycling trucks are more expensive than the trucks previously used for refuse and recycling collection: where Warwick paid \$130,000 for recycling trucks and \$145,000 for refuse trucks, the automated trucks cost \$170,000 each, for both refuse and recycling. Only one worker now operates the refuse trucks as opposed to the previous number of two before the automated program took effect. The totes were purchased in bulk for Phase I at \$444,000, and cost \$35, \$39, and \$45 for the 35, 65, and 95-gallon sizes, respectively.⁵⁰ Advertising and other miscellaneous costs amounted to

⁵⁰ The least expensive totes that a municipality had purchased for an automated program that I came across in my study were in Manchester, MA, where totes cost \$30, \$35, and \$40 for the 35, 65, and 95-gallon sizes, respectively.

only approximately \$1,000. Not including labor expenses, the total cost of Phase I implementation was \$954,810.

There have been no injuries since the start of the program, and no overtime. This is in stark contrast to the conventional program, which led to injuries on a regular basis and included overtime as a standard practice. Workers who have not yet used the automated system, especially the older ones, are eager for its arrival. Workers who drive the automated trucks are very satisfied. One worker exclaimed, "I did it the other way for six years... picking everything up by hand... this way is so much nicer."

The offset labor costs are difficult to quantify because of the lower number of hours worked and the virtual disappearance of workers compensation for injuries. I estimate the offset labor costs in the waste management department for Phase I of the automated program to be somewhere between \$140,000 and \$200,000, which includes the reassignment of three workers to other departments, the lower hours, and the lack of injuries. The head of the sanitation department expects the largest savings to occur when all of the households are serviced and one collection route is dropped entirely.

Cost Savings

There are no data yet from Warwick on how expensive automated trucks are to keep up, or how long they last. The only real difference might come from the moving arm. To remediate any potential problems, trucks are equipped with an auto-lube system that pumps lubrication into the moving parts 800 times per day. With the 2002 advent of the transfer station at the Central Landfill (meaning trucks no longer have to drive up the landfill itself), it is even more difficult to tell how upkeep costs will compare.

The program has increased recycling rates in the Phase I geographic area from 24% before the program to 34% in the first few months of the program, with a 45% increase in paper recycling and a 36% increase in mixed container recycling. The head of the sanitation department estimates that the reduction in refuse due to the program may be somewhere between 7% and 10%, although with considerable uncertainty. Refuse reduction as it relates to cost savings at the landfill is an important factor to consider, especially when modeling programs in other municipalities after that of Warwick, and should be the subject of further examination. Another important consideration regarding cost savings is the expected spike in refuse disposal costs when the Johnston Central Landfill closes. Any significant drop in refuse production due to increased recycling would mean big cost savings for Warwick.

The program has been well-received politically, and very well-received overall. The only problems have been a few cases of confusion with regards to which recycling bin to put out on which week, and cases where residents will simply leave their toters out on the curb all week. Initially the cost factor scared the city council, but "they love it now."⁵¹ The head of the sanitation department gave the example of one resident who was adamantly against the program at first, and recently called the department back to say that

⁵¹ Head of the Sanitation Department, Warwick, RI.

he had been wrong and that he loved the program. Expansion of the program is in demand, especially from residents in areas that border Phase I.

Case Study: Smithfield, RI

Project Summary

The Department of Public Works in Smithfield, RI plans to implement a self-run automated collection system. From the department's point of view, the potential benefits of such a program are:

1. **Quality control.** Allows for close monitoring of workers and program as a whole.
2. **Local workers.** Employing local workers is beneficial for a number of reasons: first, it means investing in the community, which is politically attractive. It also means that workers will not be racing to beat the clock, as they would be employed for a standard work day regardless of how long they spend picking up trash. The typical waste hauler may employ workers who don't speak English, or share trucks between towns, which can compromise collection services in both towns.
3. **Long-term savings.** The roughly estimated start-up costs for the first year of the program would be \$3,857,000, of which about \$3,396,000 would be up-front costs, including a new garage, automated trucks, totes, and educational materials. That leaves Smithfield with a nine-year time horizon where waste management costs approximately \$461,000/year. (This assumes a 10-year time horizon before trucks must be replaced) Based on initial calculations from the Smithfield DPW, I estimate the direct cost savings on labor to be approximately \$280,000/year. (This assumes that personnel costs for truck operators is cut in half)

The drawbacks of a self-run automated program according to the Smithfield DPW are:

1. **Headaches.** Under a contract, the commercial hauler is responsible to run the show. When problems arise, the DPW can direct complaints directly to the hauler. A self-run program requires constant oversight and discretion.
2. **Initial startup costs may serve as a barrier to implementation.** Especially considering the brief election cycle for municipal government, the up-front cost of nearly \$4 million would not typically appear appetizing for an elected official.

Findings and Recommendations (Part II):

There are three requirements for the implementation of an automated collection system:

1. **A dedicated staff.** The sanitation department of Warwick takes great pride in its program and works hard to see that it is a success. This is the cornerstone of the automated system.
2. **A favorable political climate.** This factor should be easier to come by now that there is an example of a successful automated program in Rhode Island.

3. **Maneuverable streets.** Counter to the initial instincts of many who have been in the waste management industry for years, there have been no real logistical difficulties maneuvering the automated trucks in Warwick. No assumption about the impracticality of an automated collection program should be made without some form of experimentation.

Recommendations:

My initial hypothesis that an automated program would lead to a reduction in refuse comparable to that of a PAYT program was proven incorrect. The estimation of a 7-10% refuse reduction in Warwick due to the automated collection program, presented by Warwick's sanitation coordinator, was well above that of any other program in this study. In fact, the majority of solid waste representatives I interviewed were not aware of any form of waste reduction stemming from an automated collection service, unless it included a PAYT can program, and argued that this type of collection may very well lead to *increased* refuse production. PAYT can programs have shown mixed results, but in general, are not comparable to bag programs in refuse reduction. Can programs are generally more effective when there are 1) significant jumps in price as can sizes increase, and 2) the provision of large recycling totes, something that could be provided by an automated collection service. Warwick's automated program should serve as an example for any municipality interested in cutting costs on waste disposal. Automated collection can foster diversion of recyclables, but it should be kept in mind that even such a recycling-vigilant city as Warwick acquires less than half of the diversion rate required by the Minnesota statute on PAYT for an exemption. Automation alone, as it operates now, should in no way serve as an alternative to PAYT, only as a mechanism used to service a PAYT can program.

Next Steps

Actors and stakeholders in the waste management industry should undertake decisive action to implement the state mandate of PAYT outlined in the recommendations of Part I of this report. The concerted effort to encourage the implementation of PAYT should be carried out by both the RIRRC and the RIDEM. The following bullet points outline opportunities for further research, and recommendations for the future.

Opportunities for further research:

- As the implementation schedule in Warwick progresses, determine the precise amount of refuse reduction, if any, brought about by the new automated program. Another factor to track will be how the system fares on less level ground than that of Phase I.
- As Rhode Island municipalities plan to implement PAYT in accord with the recommended state mandate, planners can draw from the wide variety of PAYT program types across the US to determine the most effective path of individual implementation.

Recommendations for the future:

1. **Implement the state mandate that requires PAYT to be implemented in every municipality by 2008, complete with an incentive schedule of incrementally decreasing caps.** This is the central recommendation of this thesis, and is outlined in Part I.
2. **Scrutinize data on a case-by-case, municipality-by-municipality basis.** Generalized, blanket data collection for municipalities in Rhode Island has grossly misrepresented the functioning aspects of solid waste management in cities and towns in Rhode Island. One example of this case was found with the case of the city of Warwick, in which officials from the RIRRC and other statewide actors were led to believe that recycling collection cost less per ton than refuse collection because the accounting department had grouped the entire payroll under the heading of “refuse.” Examples such as this are abundant in the planning process on municipal solid waste.

Literature Consulted

Bradbury, Katherine L. "Property tax limits and local fiscal behavior: did Massachusetts cities and towns spend too little on town services under proposition 2 1/2?" *Journal of Public Economics*, May 1997.

Commonwealth of Massachusetts "Pay-As-You-Throw: An Implementation Guide for Solid Waste Unit Based Pricing Programs," June 2001.

Disposal and Disposal Capacity Sub-Committee to the Comprehensive Solid Waste Management Plan Working Group. "Central Landfill Disposal Capacity," April 2, 2003. Accessed from <http://www.state.ri.us/dem/programs/ombuds/outreach/integsw/disp/pdf/clcpcty.pdf>

Eco² Solutions, Inc. "Feasibility Study: Implementation of a 'Pay-By-The-Bag' Program in Barrington, Rhode Island," December 1993. Prepared for: Town of Barrington.

Economics Sub-Committee to the Comprehensive Solid Waste Management Plan Working Group "Final Report by the Economics Sub-Committee to the Comprehensive Solid Waste Management Plan Working Group," 19 November 2003. Accessed from <http://www.state.ri.us/dem/programs/ombuds/outreach/integsw/econ/pdf/finalrep.pdf>

Ihenacho and Proulx. "User Fee System for Waste Collection in the City of Pawtucket, Rhode Island: Feasibility Study," November, 1994; Eco2 Solutions, Inc. "Feasibility Study: Implementation of a 'Pay-By-The-Bag' Program in Barrington, Rhode Island," December, 1993.

Miranda, et al. "Unit Pricing Programs for Residential Municipal Solid Waste: An Assessment of the Literature," School of the Environment, Duke University, 1996.

Reschovsky, James D. and Stone, Sarah E. "Market Incentives to Encourage Household Waste Recycling: Paying for What You Throw Away." *Journal of Policy Analysis and Management*. Vol. 13, No.1, Winter, 1994.

Rhode Island General Assembly. § 23-19-13 "Municipal participation in state program."

Rhode Island Department of Environmental Management; OSCAR "Pay As You Throw Qualitative Research Study," February, 1999.

Rhode Island Department of Environmental Management. "Pay as You Throw in Rhode Island," accessed 7/15/03 from <http://www.state.ri.us/dem/programs/bpoladm/stratpp/payt/payt.htm>

Rhode Island Department of Environmental Management website. "Solid Waste Management Plan Working Group. Accessed 3/15/04 from <http://www.state.ri.us/dem/programs/ombuds/outreach/integsw/index.htm>

Rhode Island Resource Recovery Corporation. "Annual Report 2002."

Skumatz, Lisa A. "Variable Rates for Municipal Solid Waste: Implementation Experience, Economics, and Legislation." Reason Foundation Publication No. 160, June 2003.

Source Reduction Sub-Committee to the Comprehensive Solid Waste Management Plan Working Group. "Draft Report of the Source Reduction Sub-Committee," June 3, 2003. Accessed from <http://www.state.ri.us/dem/programs/ombuds/outreach/integsw/source/pdf/draftrep.pdf>

USEPA "Illegal Dumping Prevention Guidebook," 1998. Accessed online as a pdf file from <http://www.epa.gov/epaoswer/non-hw/payt/pdf/illegal.pdf>

USEPA “Pay As You Throw: Introduction,” June 12, 2002. Accessed from <http://www.epa.gov/epaoswer/non-hw/payt/intro.htm>

USEPA “Pay-As-You-Throw: Lessons Learned About Unit Pricing,” 1994.

U.S. Environmental Protection Agency. “Pay-As-You-Throw Programs by State.” (Last updated on Wednesday, June 12th, 2002) Accessed from <http://www.epa.gov/epaoswer/non-hw/payt/comm-2.htm>

APPENDICES

APPENDIX I

History of PAYT in the United States

1912

Richmond, CA (current pop. 87,425) implemented what has been called the first PAYT program in the United States, a variable rate can program.

1920

Berkeley, CA (current pop. 102,724) also implemented a variable rate can program.

1979

USEPA conducted a study in which they found no statistically significant relationship between variable rates and garbage generation. This study would later be proven erroneous.

1980

Proposition 2.5 was enacted in Massachusetts. By setting a cap on the annual increase in property taxes at 2.5%, this proposition creates a positive incentive for PAYT as town officials in MA are often forced to look for other sources of waste management revenue. To date, over 100 municipalities in Massachusetts have implemented some form of PAYT.

Seattle, WA implemented a PAYT program, which, in the first six years, increased recycling tonnage by 60%.

1982

Athens, Ohio, (Pop. 21,342) facing a state-mandated 25% waste reduction goal, was one of the first communities in the nation to implement an automated billing service for waste disposal. For \$4.50 per month, residents can have one 30-gallon container collected per week, and for \$5.50 per month, residents can have two 30-gallon containers collected per week. \$2.00 per month is assessed for weekly curbside recycling, and the entire amount is added to the residential water bill.

1986

By this time, at least 129 cities and towns in the U.S. had implemented some form of PAYT. These municipalities represented 4,065,945 citizens in 1,615,803 households.

1988

The small town of Perkasio Borough, PA (pop. 8,000) implemented a markedly successful PAYT bag program, which reduced solid waste by 54% and increased recycling by 50%. 40-pound bags were priced at \$2.35 (now \$2.60), and 20-pound bags were priced at \$1.35 (now \$1.60).

1992

The U.S. Environmental Protection Agency (USEPA) organized a gathering of experts and local officials involved with unit-based waste management programs in order to assess the benefits and potential barriers to PAYT. With information from this roundtable, the USEPA published PAYT pamphlets, videos, and implementation guides for municipalities.

1993

San Jose, CA, the nation's eleventh-largest city (pop. 850,000), implemented a variable-rate can PAYT program with fully automated curbside pickup. Prior to 1993, the city had charged households a monthly fee of \$12.50 for unlimited curbside pickup. Under the program, residents were to choose from four different sizes of trash carts from which to have their waste picked up. 87% of residents chose the smallest size. Low-income residents were offered a 30% discount on their waste disposal bill. With the help of this program, San Jose has reduced costs by over \$4 million annually through contract renegotiations.

Worcester, MA (pop. 169,759) began its curbside PAYT bag program, the first large-scale citywide PAYT program on the East Coast. With rigorous education and enforcement programs, Worcester was able to accommodate a large transient population of students and implement the program across a wide range of incomes and age strata, reaching a compliance rate of 99.9%. The city experienced a \$1 million savings in the first year of the program.

1994

In January, a Minnesota statute requires pricing by weight or volume as a condition for receiving a license for solid waste collection went into effect, although exemptions have been granted. Today over 1800 communities in Minnesota have implemented some form of PAYT.

1996

Duke University carried out a nationwide study on PAYT and review of the literature. One important finding from this study is that on average, PAYT programs reduce annual waste disposal by 28%, with a range of 25-50%. A previous Duke study had placed the average waste reduction between 14% and 27%, and the average increase in recycling between 32% and 59%.

The largest-scale PAYT program in the country went into effect in Los Angeles, with a population of 3,485,398 and households numbering 1,219,770. The program, a multi-tier can system, remains the largest in the U.S. today.

2001

Brockton, MA gained widespread media attention with the implementation of its PAYT bag program. Savings in the first year were reported to be \$2 million, an amount that demanded the attention of other municipalities interested in cutting waste management costs.

2004

Approximately 6,000 cities and towns across the United States participate in some form of PAYT, whether it be a multi-tiered curbside program with 100% participation, or a weight-based drop-off program with 20% participation. The only states where no PAYT programs have been implemented are Wyoming, Mississippi, Alabama, and Kentucky. Four states (Pennsylvania, Minnesota, Wisconsin, and Washington) have over 200 programs.

APPENDIX II

History of PAYT in Rhode Island

1974

The Rhode Island Legislature established the Rhode Island Solid Waste Management Corporation, a quasi-governmental corporation that would provide and coordinate solid waste management services throughout Rhode Island. Later dubbed the Rhode Island Resource Recovery Corporation, this organization would be instrumental in the push for PAYT programs in Rhode Island.

1983

South Kingstown began the operation of the Rose Hill Regional Transfer Station (RHRTS) with its regional partner, Narragansett. Residents could either purchase annual unlimited vehicle passes to the transfer station or hire a private hauler to pick up their waste curbside. The RHRTS would later become the site of one of Rhode Island's first drop-off PAYT programs.⁵²

1984 (Approximately) New Shoreham implemented a weight-based drop-off system where residents drop off their waste at the transfer station at \$0.07 per pound. The transfer station is operated by a private contractor, Block Island Recycling Management (BIRM), and accepts all commercial and residential waste excluding rental units.⁵³

1987

The RI Legislature voted the Mandatory Recycling Program into place based on DEM's recommendations. This program was to apply to all municipalities and all public buildings. This program took hold first in East Greenwich and Cranston.

1988

East Providence implemented the Mandatory Recycling Program in November. Education and outreach efforts were remarkably successful; postcards calling for a "mandatory meeting" were sent to all residents, and turnout was in the thousands. Residents were given the choice of which of four nights to attend. Information on the Mandatory Recycling Program was presented and a question and answer period followed.

⁵² South Kingstown Department of Public Works, 2003.

⁵³ New Shoreham Department of Public Works, 2003.

Efforts to promote PAYT could quite feasibly follow suit with this education and outreach tactic.⁵⁴

The statewide recycling program gained international attention when officials from around the country and the world visited Rhode Island to learn from its example.

1989

Richmond began a voluntary weight-based user fee drop-off program, charging residents \$3.00 for the first 50 lbs. and \$2.00 for each additional 50 lbs. Recyclable drop-off was free. Only 20% of Richmond's 6000 residents would participate in this program. The remaining 80% would hire private contractors to pick up waste curbside.⁵⁵

The RIRRC was granted the power of eminent domain.

1990

In conjunction with Brown University, the Rhode Island Resource Recovery Corporation drafted a bill that, if passed, would mandate a statewide PAYT program. Due to public outcry at the behest of talk show hosts, the bill was not even scheduled to be heard by the legislature.

1991

East Providence began a mandatory collection of segregated yard waste and began its composting program.⁵⁶

1992

A statutory statewide ban on incineration was adopted by the Rhode Island General Assembly.

1993

The RI General Assembly raised the tipping fee at the Central Landfill from \$16 to \$32, where it has remained until the present day. This low tipping fee is one of the largest obstacles to implementing PAYT in Rhode Island because it creates little financial incentive to reduce solid waste disposal.

RIDEM granted the Public Works Department of Barrington, RI \$5,000 to undertake a feasibility study of a "Pay-By-The-Bag" program, in hopes that Barrington would serve as a model PAYT community for the rest of Rhode Island. This study accounted for a projected rise in tipping fees, which, ten years later, has still not occurred. It also took into account the notion that volume-based rates would possibly be mandated throughout Rhode Island in the near future. Barrington's paper bag yard waste program suggested that its residents might have been more open to a PAYT program than residents of other municipalities. The study found that Barrington could eliminate expenditures from the solid waste management budget of between \$142,500 to \$404,700. The proposed bag

⁵⁴ East Providence Refuse and Recycling, 2003.

⁵⁵ Richmond Department of Public Works, 2003.

⁵⁶ East Providence Refuse and Recycling, 2003.

program (\$0.48 per 15-gallon bag, \$0.85 per 33-gallon bag) would pay only for the cost of disposal, while all other costs associated with waste disposal would continue to be funded through the tax base. Stickers would be purchased for \$1.00 and placed on bulky items (the larger the item, the more stickers required) for curbside pickup.⁵⁷ The plan was not presented to the town council and has not been revisited.

A test program of Rhode Island's proposed maximum recycling program was piloted on 100 homes in Foster. This program has grown to include every municipality in the state, and provides the recycling framework for a statewide PAYT program; when municipalities have the capacity to recycle a wide array of materials, residents are provided with ample opportunities for diversion of recyclables from their solid waste stream, and avoidance of disposal costs.

The original 121-acre unlined section of the Central Landfill was closed; the State Planning Council certified a new landfill site for development in Johnston.

1994

Seekonk, MA, in the face of a continuing financial crisis and concerns about equity of the yearly flat fee and the lack of incentives for residents to reduce waste, implemented a Pay-Per-Bag program, in addition to lowering the flat fee from \$115 to \$86 per household. 30-gallon bags were sold in packs of ten at six local grocery and retail stores. Resident who could prove financial hardship could receive a 50% abatement on the flat fee. The program is self-sustaining in that it pays for the tipping fees, collection costs, the price of producing the bags, and handling fees for the vendors who sell the bags. In the first twelve months of the program, nearly 1,000 tons of waste was diverted, leading to a \$35,000 savings in tipping fees.⁵⁸ This program is the most geographically proximate successful curbside PAYT system Rhode Island has encountered.

On August 1, South Kingstown constructed new recycling facilities at the RHRTS. Directly accessible to residential users, these facilities have been instrumental in the high recyclable capture ratios of the RHRTS.⁵⁹ Recyclable capture rates are as high as 60%, including yard waste collection, and consistently reach 40%.⁶⁰

Westerly began its drop-off user fee program in November, after a voter referendum passed by a three-to-one margin. Residents who participate in the program are required to purchase special orange bags, available at \$0.50 for a 15-gallon bag or \$1.00 for a 33-gallon bag, and drop them off at the transfer station. Town officials estimate that recycling increased by 13 percent and that solid waste decreased by 11 percent during the first six months of the program.⁶¹

⁵⁷ Eco² Solutions, Inc. "Feasibility Study: Implementation of a 'Pay-By-The-Bag' Program in Barrington, Rhode Island," December 1993. Prepared for: Town of Barrington.

⁵⁸ Seekonk Department of Public Works, 2003.

⁵⁹ South Kingstown Department of Public Services – Solid Waste. "Mission Statement," accessed 7/27/03 from http://www.southkingstownri.com/code/pw_solidwaste.cfm

⁶⁰ South Kingstown Department of Public Works, 2003.

⁶¹ Westerly Department of Public Works, 2003.

RIDEM issued a \$5,000 grant to Pawtucket, RI, to undertake a user fee feasibility study. Using a five-category scoring system, a pre-paid bag user fee system was deemed the most worthy of implementation.⁶² This plan has gone nowhere.

A number of RI municipalities implemented leaf and yard waste composting programs.

1995

In July, South Kingstown began its “Bag and Tag” program at the Rose Hill Regional Transfer Station in collaboration with Narragansett. Before the program, there was a \$92 car sticker that served as a yearly flat fee. Moving from a flat fee into a PAYT sticker program proved to be extremely successful, and as one official put it, “Everyone ended up saving money.” Start-up costs were negligible, consisting mainly of the cost of producing the stickers. Residents were to purchase \$1.00 stickers that could be placed on bags limited to 33 gallons and 35 pounds for disposal at the RHRTS. Education and outreach programs included spots in the local newspaper, press releases, and a cable program, which showed the benefits of recycling. Because South Kingstown collaborates with Narragansett, it is difficult to estimate a participation rate with the program, but it is assumed that a large amount of residents hire out to a private hauler in lieu of the weight-based drop-off system.⁶³

The RIRRC implemented full-scale maximum recycling programs in Foster and Scituate after the Foster pilot proved successful. This program has since grown to include every municipality in the state, and provides the recycling framework for a statewide PAYT program; when municipalities have the capacity to recycle a wide array of materials, residents are provided with ample opportunities for diversion of recyclables from their solid waste stream, and avoidance of disposal costs.

1996

The 1996 Rhode Island Comprehensive Solid Waste Management Plan included section 8-7, which outlines the basics of PAYT and details the status of PAYT in Rhode Island.⁶⁴

The RIRRC began to offer the option of a \$250,000 start-up grant to any city or town in Rhode Island interested in implementing a PAYT program. No community expressed interest in this opportunity.⁶⁵

1997

The Rhode Island Department of Environmental Management (RIDEM), Office of Strategic Planning and Policy (OSPP), Ocean State Cleanup and Recycling (OSCAR) Program received a United States Environmental Protection Agency (USEPA) grant to encourage adoption of PAYT programs in all of Rhode Island's thirty-nine communities.

⁶² City of Pawtucket. “User Fee System for Waste Collection in City of Pawtucket Rhode Island: Feasibility Study,” November 1994.

⁶³ South Kingstown Department of Public Works, 2003.

⁶⁴ Rhode Island Comprehensive Solid Waste Management Plan, November, 1996, section 8-7, “Municipal Financing of Solid Waste.”

⁶⁵ Rhode Island Resource Recovery Corporation (RIRRC), 2003.

The grant provided funding to promote PAYT to the general public as an environmentally and economically sustainable solid waste management tool. The RIDEM offered support and technical assistance to communities in the form of informational workshops and consensus building community meetings for PAYT. RIDEM also maintains a wealth of information that includes statistics, articles of interest, case studies, and guidebooks.⁶⁶

1998

The Maximum Recycling Program was under performing in East Providence, so the town began looking for methods of increasing diversion rates.⁶⁷

1999

In July, North Kingstown implemented its drop-off PAYT program in response to the national success of PAYT, and to residents' abuse of the flat yearly sticker rate of \$125, which provided unlimited access to the transfer station. Recycling was still to be collected curbside, but residents were to buy \$1.00 stickers to affix to trash bags, which could be dropped off at the transfer station. One half of North Kingstown's residents participated in the program, the other half hiring private contractors. This program has increased the rate of diversion of recyclable from 15-18% to 30%, and has not led to any illegal dumping of note.⁶⁸

2000

The idea of a volume-based user fee program was brought up in East Providence, but made it no farther than the Department of Public Works. (At that point, the DPW was pushing for the sewer use fee to be put into place, and didn't want to overload residents or scare council members)⁶⁹

Because no communities had contacted the RIRRC regarding the \$250,000 start-up grant opportunity, the RIRRC eliminated this option.⁷⁰

2002

In April, RIRRC constructed a new tipping facility at the Central Landfill, which can accept up to 5000 tons per day. This new facility provides safer and easier access and monitoring than the previous system of trucks directly onto the face of the landfill.⁷¹ The new facility would also make the enforcement of a statewide PAYT program plausible.

By July, all cities and towns in Rhode Island, with the exception of Narragansett, were in compliance with RIDEM's recycling regulations.⁷²

⁶⁶ Rhode Island Department of Environmental Management. "Pay as You Throw in Rhode Island," accessed 7/15/03 from <http://www.state.ri.us/dem/programs/bpoladm/stratpp/payt/payt.htm>

⁶⁷ East Providence Refuse and Recycling, 2003.

⁶⁸ North Kingstown Department of Public Works, 2003.

⁶⁹ East Providence Refuse and Recycling, 2003.

⁷⁰ RIRRC, 2003.

⁷¹ RIRRC. "Annual Report 2002."

⁷² RIRRC, 2004.

2003

A budget crunch led East Providence to look for ways to minimize taxes. PAYT was proposed to five council members. Two were in favor of the idea, two were against the idea, and one member was on the fence. The idea was eventually voted down.

The RIRRC budgeted \$280,000 for the initial bag costs of the potential PAYT programs in Cumberland and East Providence. At \$0.17 per bag, this would have allowed for the purchase of 1 million bags for each municipality. Neither Cumberland nor East Providence took them up on the offer.

By April in East Providence, there was little public support for the proposed PAYT program, so the town council voted it down. The \$140,000 budgeted by the RIRRC for the program will go towards municipal recycling participation grants.⁷³

2004

Both the economic sub-committee and the disposal and source reduction sub-committee of the Working Group on the Comprehensive Solid Waste Management Plan of Rhode Island placed recommendations of PAYT as a high priority in their final reports. The economic sub-committee recommends a statewide mandate of PAYT in 2008, with a schedule of incremental reductions in municipal caps until that date.

⁷³ RIRRC, 2002.