Toward Statewide Unit Pricing
In Massachusetts: Influencing the Policy Cycle

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Toward Statewide Unit Pricing in Massachusetts: Influencing the Policy Cycle

Policy Analysis Exercise
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Foreword

Over the course of the last four years, researchers at the John F. Kennedy School of Government have written extensively about the use of market mechanisms to improve environmental quality and lower compliance costs. Greater reliance on user fees has been espoused as an effective means of reducing the volume of municipal solid waste and providing incentives for greater levels of recycling. The Seattle Program which instituted a system of user fees has been consistently held up as a model for other municipalities.

The Massachusetts Executive Office of Environmental Affairs has been an advocate for unit pricing of municipal solid waste. However, under Massachusetts law, decisions on unit pricing are made by the 155 cities and towns, not by the state. This study conducted by three graduate students at the Kennedy School of Government is the first effort to gather empirical evidence on how cities and towns perceive unit pricing. The students surveyed every city or town in Massachusetts and thus, were able to include urban, suburban and rural communities in their sample. This report summarizes their findings and address three questions:

1) What factors influence communities to consider unit pricing?
2) What conditions are necessary for passage of unit pricing by local governments?
3) What are the major obstacles to implementing a system of unit pricing?

This paper was written to fulfill the degree requirements of the Kennedy School It was evaluated by a panel of faculty and was voted the best analytical paper submitted in the 1992-1993 academic year and awarded the Prize for Outstanding Policy Analysis Exercise.

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The authors would like to thank all o f the MSW officials, consultants, and other experts in the field who answered our survey, granted us interviews, or otherwise contributed their insights to this report. We express special appreciation to our client, Leo Roy, and to our advisor, Henry Lee, for their enthusiasm, realism, and healthy cynicism. Finally, we admit a great debt of thanks to Cari, Laura, and Jeff for their patience and support during six months of seemingly non-stop "trash talk."

EXECUTIVE SUMMARY

Problem and Purpose

The 1990s mark the beginning of a new era in environmental policy. In situations where the old command-and-control mandates have proven costly, politically volatile, and difficult to enforce, governments are now discovering that economic incentive policies can achieve the same or superior environmental outcomes in an equitable and cost-effective manner.

One such policy, unit pricing, offers the Commonwealth of Massachusetts an opportunity to confront an environmental problem that threatens its financial, natural, and human resources: municipal solid waste (MSW) management.

In unit pricing, residential producers of MSW pay a fee for every incremental unit of waste that they throw away. Households: thus face an economic incentive to reduce their waste disposal through source reduction, reuse, recycling, or composting.

National experience shows that unit pricing can induce citizens to manage solid waste in a responsible manner. For instance, a recent econometric study credited unit pricing programs in ten communities with reducing MSW disposal by an average of 18%; this reduction rose as high as 30% when accompanied by curbside recycling programs. Such dramatic results help municipalities control spiraling MSW disposal costs, lengthen the life of overburdened landfills, and mitigate the need to site new, controversial disposal facilities. In addition, unit pricing is *fair:* households pay only for the MSW services they consume, rather than subsidize those who require more, or receive subsidies from those who require less.

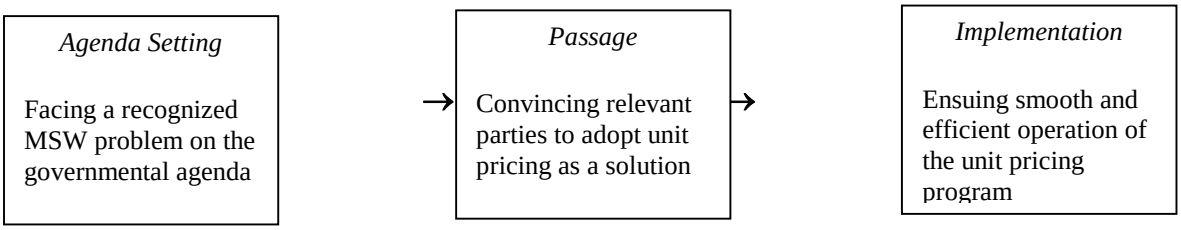
Despite these benefits, relatively few Massachusetts municipalities have adopted unit pricing programs. In order to foster greater acceptance of this policy throughout the Commonwealth, we analyze the perceptional, political, and institutional obstacles that have impeded the spread of unit pricing; we also offer specific recommendations to

the Massachusetts Executive Office of Environmental Affairs (EOEA) to assist cities and towns in overcoming these obstacles.

Methodology and Framework

Out of 155 Massachusetts municipalities responding to our survey, only 34 (22%) utilize unit pricing programs. This survey, and extensive interviews with MSW officials and other experts, revealed the essential conditions that allow unit pricing to succeed. These conditions exist within a "policy cycle" framework. Unit pricing, like any policy, must successfully pass through each of three steps-agenda setting, passage, and implementation-to successfully take root in a municipality.

The Unit Pricing Policy Cycle



Key Findings

Conditions prevalent in each of the policy cycle steps that influence municipal receptiveness to unit pricing include the following:

Place Unit Pricing on the Agenda

- Financial concerns, such as substantial increases in MSW disposal costs or general budgetary pressures, drive municipalities to perceive MSW management problems.
- To a lesser extent, regulations and grassroots lobbying may also push local officials to reassess their existing MSW management programs.

Facilitating Passage of Unit Pricing

- Unit pricing advocates must overcome three misperceptions or *information* shortcomings to facilitate its passage:
  - -- The mistaken belief that trash service should be free
  - -- Ignorance of the benefits of unit pricing

-- Excessive fear of the side effects of unit pricing

Successfully Implementing Unit Pricing

- Customer confusion, selecting appropriate unit pricing systems, and resistance to the loss of "free" MSW service were the most significant problems experienced by Massachusetts municipalities that implemented unit pricing.
- Issues traditionally considered major obstacles to implementing unit pricing for MSW services-multifamily housing, illegal dumping, and rate setting-have not proven to be major concerns for these communities.
- Rural communities in Massachusetts have experienced the least problems in implementing unit-based pricing, while suburban towns have encountered more difficulties than either their urban or rural counterparts.

Recommended Options and Action Plan

Given these findings, we evaluated options that the Commonwealth could pursue along each step in the policy cycle. Our recommended action plan follows, along with the suggested delivery organization.

Step One--Placing Unit Pricing on the Agenda

- Massachusetts Department of Environmental Protection (DEP)
  - -- Compile and publicize municipal rankings on recycling rates
  - -- Consider recycling rates in awarding recycling grants

Step Two -Facilitating Passage of Unit Pricing

- DEP
  - -- Consider enterprise funds and unit pricing in awarding recycling grants
  - -- Promote unit pricing and enterprise funds during routine seminars
  - -- Make unit pricing information developed by MassRecycle available during routine seminars and upon request from municipal officials
  - -- Publicize unit pricing seminars offered by MassRecycle
- MassRecycle
  - -- Facilitate peer matching to link municipal officials with counterparts who have addressed passage concerns

Provide fact sheets and data to help municipalities resolve misperceptions about unit pricing

Host seminars to present general overview of benefits and side effects of unit pricing

Provide educational materials or seminars on enterprise funds

Step Three-Successfully Implementing Unit Pricing

- DEP

  -- Publicize unit pricing assistance services offered by MassRecycle in routine correspondence to municipal officials

  -- Familiarize all relevant DEP staff in Boston and regional offices with MassRecycle's role in promoting unit pricing

  --Meet regularly with MassRecycle to ensure clear communications and common purpose in promoting unit pricing

- MassRecycle

  -- Facilitate peer matching to link municipal officials with their counterparts who have addressed implementation concerns

  --Provide fact sheets with case studies and data to help municipalities overcome specific implementation problems

  -- Prepare unit pricing manual that addresses specific implementation concerns of Massachusetts communities

  --Host seminars to present specific solutions to implementation challenges

  --Prepare public relations guidelines and a prototype strategy to help communities overcome customer resistance and confusion

Our findings show that promoting unit pricing programs in Massachusetts makes sense. The question is how to do it. These recommendations offer EOEA a workable, three-step process that does not attempt "too much too fast" and considers the unique needs of each community. They should help move the Commonwealth toward more proactive, efficient, and equitable MSW management.

I. INTRODUCTION

The 1990s mark the beginning of a new era in environmental policy. Where the old command-and-control mandates have proven costly, politically volatile, and difficult to enforce, governments are now discovering that economic incentive policies can achieve the same or superior environmental outcomes in an equitable and cost-effective manner. Prominent national economic incentive initiatives include sulfur emissions trading to combat acid rain, and the energy taxes that are currently under - discussion to promote more efficient energy consumption.

Likewise, the Commonwealth of Massachusetts can harness the power of the market through one economic incentive policy, unit pricing,, to confront an environmental problem that threatens its financial, natural, and human resources: municipal solid waste (MSW) management.

In unit pricing, residential producers of MSW pay a fee for every additional unit of waste that they throw away. Households thus face an economic incentive to reduce their waste disposal through source reduction, reuse, recycling, and composting.[1] This variable-rate approach differs from the typical property tax or flat user fee financing methods, in which residential solid waste charges remain constant regardless of the amount of services consumed. Such systems offer individuals no incentive to change their waste management behavior; indeed, in tax-based systems, residents often believe that MSW services are "free" because they see no explicit solid waste bill at all.

We believe that unit pricing makes sense. National experience has shown that unit pricing can induce citizens to manage solid waste responsibly. For instance, a recent econometric study by the World Resources Institute found that implementing a $1.50 per-bag fee typically leads to about an 18% reduction in waste. sent for disposal; the reduction can reach as high as 30% when fees are accompanied by a curbside recycling program.[2] Unit pricing experience in such diverse communities as Seattle,

Washington, Perkasie, Pennsylvania, and Ilion, New York, supports such impressive claims. [3]

Such results help municipalities control spiraling MSW disposal costs, reduce pollution threats, and avoid siting new and often controversial disposal facilities by preserving disposal capacity. Moreover, unit pricing is *fair:* households pay only for the MSW services they consume, rather than subsidize households that require more, or receive subsidies from households that require less.

Despite these advantages, relatively few Massachusetts municipalities have adopted unit pricing programs. To investigate possible causes and solutions, we extensively surveyed and interviewed local MSW officials across the Commonwealth, and questioned state policy makers and other experts. (See Appendix A for a description of our research methodology.) This report presents our findings concerning the perceptional, political, and institutional obstacles that have prevented widespread acceptance of unit pricing; and offers specific recommendations to the Massachusetts Executive Office of Environmental Affairs (EOEA) to assist cities and towns in overcoming these obstacles. Our overarching conclusions are as follows:

- As with any governmental initiative, adoption of unit pricing tends to follow a deliberate, multi-stage "policy cycle."
- To promote unit pricing, EOEA must address each stage of the policy cycle to help municipalities successfully negotiate it.
- Although many promising options exist, they must be adapted to the particular objective at hand.
- Given this need for a mixed approach, EOEA must leverage different organizations whose missions, internal resources, and external relationships make them appropriate for specific activities.

The rest of this introduction describes the MSW management problem in Massachusetts, shows how encouraging municipal unit pricing would complement ongoing MSW policies, estimates the current extent of unit pricing across the Commonwealth, and outlines our analytical framework for the rest of the paper.

A: The Problem: MSW Management in Massachusetts

Massachusetts' growing MSW stream has become a considerable problem in financial, environmental, and public health terms. In 1990, Massachusetts generated an estimated 6.65 million tons of MSW. Although slowed by the current recession, general trends suggest that without additional source reduction, MSW generation will approach 7.5 million tons annually by 2000.[4] The Massachusetts Department of Environmental Protection (DEP) estimates that only about 20% of MSW was recycled or composted in 1992, while nearly 50% was combusted and 30% landfilled.[5] Although costs vary across the Commonwealth, municipalities pay anywhere from $25-$75 to dispose of a ton of MSW, while recycling that same ton would generally cost no more than $35.[6] For many Massachusetts cities and towns in the Proposition 21/2 era,[7] which face severely limited taxing authority to finance essential services such as education and police protection, the high cost of MSW disposal has become a "budget buster."

The tendency to landfill or combust MSW, rather than recycle or compost it, exacts environmental and public health costs as well. Improper siting and lack of modem safeguards such as liners and leachate collection systems make many landfills threats to local groundwater supplies. While combustion facilities must meet stringent environmental regulations, their operation poses some air pollution risks and creates potentially hazardous ash that must be landfilled. Further, disposing of materials that could be recycled or composted may unnecessarily deplete natural resources.

B. Major Statewide MSW Policies and the Unit Pricing Link

In light of these concerns, Massachusetts officially established an integrated MSW management hierarchy in its 1990 blueprint, *Toward a System of Integrated Solid Waste Management: The Commonwealth Master Plan.* The hierarchy calls for (1) reducing MSW generation; (2) recycling and composting where possible; (3) burning remaining combustible waste; and (4) landfilling final components in environmentally sound facilities. The *Master Plan* also sets out two ambitious goals for 2000: to reduce MSW

generation by 10% from the 1990 per capita rate, and to recycle and compost 46% of the remaining MSW stream.[8]

1. Statewide Policies

To induce municipalities to follow this hierarchy, the Commonwealth has established several policies. First, recently revised DEP regulations require operators of unlined landfills to cease accepting waste after January 1, 1994, and to complete final closure by July 1, 1995. [9] DEP will temporarily permit unlined landfills to continue disposal after the deadline if their operators document that such a waiver poses no "significant threat to the public health, safety and the environment" and prepare plans to cease disposal and complete closure "as soon as feasible." [10]

Of the Commonwealth's 122 active MSW landfills, more than 80 are unlined. Of these, only three to six will earn closure waivers because they do not threaten highly sensitive water resources, and have completed enough of DEP's elaborate assessment process to meet the application deadline.[11] Thus, about 80 communities will try to increase source reduction, recycling, and composting to offset the increased tipping costs they will soon be forced to incur at private disposal facilities.

Waste bans, a second DEP policy, prohibit disposal of many recyclable or compostable items.[12] Lead-add batteries, whole tires, white goods (large appliances), and leaves were banned over the past two years. Bans begin this spring on more common materials like glass and metal containers and other yard wastes, with paper and some plastics banned starting in 1995. The rule requires disposal facilities to submit plans establishing random inspections of incoming loads; those with more than minimal amounts of banned items must be rejected. However, DEP exempted communities with approved recycling programs from glass and metal container inspections for 1993.[13]

DEP relies on the threat of inspection "spot checks" and record reviews by regional staff to ensure that operators implement their waste ban plans. Moreover, municipalities whose loads frequently contain banned materials can be barred from

further disposal. At least in principle, these rules should make communities encourage residents to increase source reduction, recycling, and composting of banned materials.

A third effort offers financing for integrated MSW management activities. In one program, DEP has for three years awarded a total of $1 million to $2 million annually to municipalities that need recycling bins, trucks, and other recycling equipment.[14] Combined with the establishment of the state-owned Springfield Material Recovery Facility, such financing programs should make recycling and composting more competitive than traditional disposal for all municipalities. Toward this end, the state is also attempting to develop stable recyclables markets locally, regionally, and abroad.[15]

2. The Unit Pricing Link

While these statewide policies create incentives for municipalities as *collective entities* to follow the integrated MSW management hierarchy, they cannot effectively influence the behavior of *individual citizens.* In most cities and towns, only people who are particularly interested in "saving the environment" conscientiously reduce waste, recycle, or compost To more than double Massachusetts' current 20% recycling and composting rate will require that municipalities do more than mandate recycling, offer curbside recyclables pick-up, or run educational campaigns.

Indeed, altering individual behavior requires establishing economic incentives through unit pricing that make source reduction, recycling, and composting *in citizens' own best interests.* Replacing tax or flat user-charge MSW financing with unit pricing (and also offering full recycling and composting options) would make individual and collective interests coincide: households could save money through waste reduction, recycling, and composting, allowing the municipality to reduce disposal costs, comply with the waste bans, and protect the environment.

C. Current Extent of Unit Pricing in Massachusetts

To date, no complete data exists describing how each of Massachusetts' 351 cities and towns structures its MSW program. The Massachusetts Municipal Association

(MMA) surveyed communities on this issue in 1990; our survey updated and expanded this work, focusing especially on municipal interest in, and use of, unit pricing.

Table 1-1 summarizes our survey results concerning MSW financing across the Commonwealth. While many municipalities continue to foster the notion that MSW services are a "basic right" for taxpayers, user fees-including unit-based user fees-are making considerable inroads among certain types of localities.

Table 1-1—MSW Financing Methods of Massachusetts Municipalities, by Demographic Type, from Survey Data

Municipality type	Total in MA	Surveys received[a]	Unit pricing	Flat financing methods: Tax only	Flat financing methods: Flat fee only	Flat financing methods: Tax and flat fee	Unknown
Urban	45	29 (64%)	4 (14%)	20 (69%)	1 (3%)	1 (3%)	3 (10%)
Suburban	158	76 (48%)	14 (18%)	35 (46%)	13 (17%)	11 (14%)	3 (4%)
Rural	148	51 (34%)	16 (31%)	11 (22%)	14 (27%)	8 (16%)	2 (4%)
Total	351	156 (44%)	34 (22%)	66 (42%)	28 (18%)	20 (13%)	8 (5%)

[a] Percentages in this column refer to surveys received from a given municipality type as a proportion of all such municipalities in Massachusetts. All other percentages in the table use the "Surveys Received" column as their base, e.g., 69% is the proportion of all urban surveys received (29) that indicated "tax only" financing (20). Percentages may not add to 100% due to rounding.

In particular, 34 respondents, or 22%, reported using some form of unit pricing, often supplemented with flat user fees or property tax subsidies.[16] (Ongoing EOEA research suggests that at least 46 municipalities may do so.[17]) The 73% of respondents with "flat financing methods" did not indicate that they used any form of unit pricing. However, 42% of this group reported using a flat user fee, whether alone or with a tax subsidy, rather than funding MSW services through taxes alone.[18] Thus, citizens in over half of the municipalities in our sample pay some explicit fee for MSW services; 41 % of this group pay charges that vary with their demand for disposal.

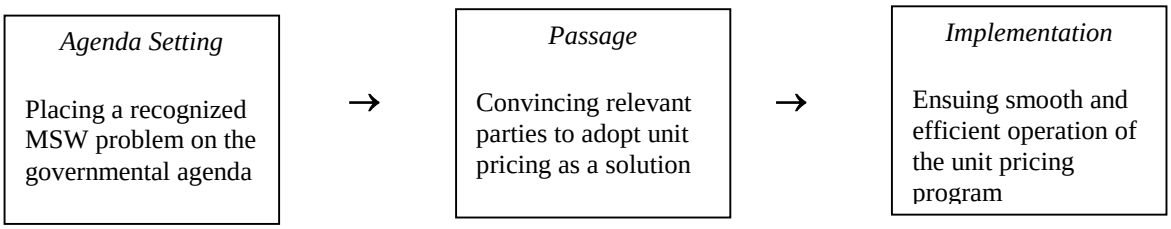
Examining the data by demographic group reveals more mixed success for unit pricing. Only 14% of urban respondents use unit pricing, compared to nearly one-third of rural respondents. The suburbs fall in the middle. Conversely, tax-only MSW financing dominates over two-thirds of urban respondents, while less than one-quarter of rural respondents choose this method (instead opting for flat fees, with or without taxes, when not using unit pricing). Again, the suburbs lie between these extremes.

The following chapters investigate how municipal "urbanness" and affluence may influence receptiveness to unit pricing. Part of the difference may relate to common beliefs and experiences concerning unit pricing's effectiveness and side effects in different settings. Through our research, we have documented perceptions about unit pricing, and compared them to reality. Our findings in these areas drive many of our recommendations.

D. Analytical Framework: Three Steps of the Policy Cycle

We have analyzed our findings in terms of a "policy cycle," that is, the basic steps any policy must complete as it evolves from idea to instituted program. Our model (Figure 1-1) is a simplified model, based on the governmental decision making framework developed by political scientist John W. Kingdon.[19] Our model is limited to three basic steps: agenda setting, passage, and implementation. Unit pricing, like any policy, must successfully complete each step to take root in a municipality. Each step imposes unique demands upon the unit pricing advocate (or "policy entrepreneur"), requiring diverse skills and resources.

Figure 1-1 – The Unit Pricing Policy Cycle



Of course, policies are not really developed in discrete steps. For instance, the "softening up" activities common in the passage stage also occur, to some extent, during implementation. However, our model is useful because it emphasizes that for unit pricing to take root and flourish in a community, the community must experience its own phased educational process and overcome a number of distinct obstacles. To

facilitate this process, EOEA must offer municipalities support tailored to the nature of each obstacle.

Some say that communities need not experience a metamorphosis to embrace unit pricing; instead, they support simply requiring it of local governments. We disagree-particularly for Massachusetts. Only three states have been able to mandate unit pricing, and all enjoyed special advantages or made significant concessions:

- Washington's local officials had already become comfortable with unit pricing through several long-established programs. Further, its law applies only to unincorporated areas of the state.[20]
- Minnesota, with its progressive tradition, has mandated unit pricing statewide. However, it also gave local governments a total of $14 million (raised through a new sales tax) to ease their start-up cost concerns.[21]
- Wisconsin, witnessing neighboring Minnesota's success, also required unit pricing. This law, though, has "encountered stiff opposition" despite its escape clause for communities achieving 25% MSW diversion by 1995. [22]

Among other reasons, Wisconsin's municipal opposition arose because of a "general dislike of state interference in local affairs."[23] Yet local independence is nowhere guarded more fiercely than in Massachusetts, whose citizens still cherish that colonial institution of direct democracy, the town meeting. Further, the Commonwealth lacks the significant unit pricing experience that could overcome fears, and could not raise enough funds to compensate 351 municipalities for their required costs. In short, Massachusetts legislators could not successfully force unit pricing on their constituents.

This report seeks ways to help municipalities select and adopt unit pricing on their own. Chapters II through IV examine conditions that seem to affect unit pricing's success or failure in each stage of the policy cycle. Chapter V evaluates different options EOEA could pursue to influence this cycle, as well as which organizations would be the appropriate implementers of certain options. Chapter VI presents an action plan for EOEA to carry out our recommended options. Appendices and notes follow.

II. STEP ONE-PLACING UNIT PRICING ON THE AGENDA

Like all government officials, local decision makers address numerous policy questions every day; yet, at any one time, they consider only a fraction of the issues that could be on the table. Why some issues appear on decision makers' "radar screens" while others remain ignored is addressed by the first step in the policy cycle, agenda setting. This chapter examines the conditions that lead Massachusetts municipalities to recognize problems with their current MSW management situations, and place unit pricing on their agendas.

At the municipal level, most issues become recognized as problems when they pose a threat to local financial stability. Declining aid from state and federal governments, concurrent with expanding regulatory mandates and population growth, have increasingly challenged the ability of municipalities to provide adequate levels of services to their citizens. In Massachusetts, Proposition 2 1/2 has greatly exacerbated these impacts by restricting the ability of municipalities to raise tax revenue.

Not surprisingly, we found that financial concerns tend to cause municipalities to view their current MSW management programs as problematic. This perception seems to occur either when municipalities face substantial increases in MSW disposal costs, or when general budgetary pressures make cutting tax-supported MSW costs more attractive. These financial concerns produce particularly great agenda-setting power when precipitated by a dramatic "focusing event" that creates a crisis atmosphere.[24]

However, we could not attribute municipal interest in "fixing" MSW management programs solely to financial motives. We asked Massachusetts municipalities that have adopted unit pricing to indicate the extent to which each of six reasons influenced them to enact the policy. Their answers suggest what circumstances drove them to find fault with their former MSW programs. Table 2-1 presents these reasons in order of priority, as indicated by their average ratings.

Table 2-1 -- Prioritized Reasons for Adopting Unit Pricing by Massachusetts Municipalities

Reason	Average ratings [a]	No. of responses
Desire to encourage recycling	4.152	33
Desire to shift costs out of tax base	3.515	33
Impending landfill or incinerator closure	2.900	30
Increasing tipping fees	2.290	31
Desire to subsidize recycling program	1.806	31
Public opposition to siting new disposal facility	1.250	32

[a] Respondents could rate the influence of each reason as "none" or on a 1-5 scale, with 1 indicating "low" influence and 5 "high" influence. "None" was coded as a 0 to calculate the averages.

A desire to encourage recycling, the highest-rated reason, could actually encompass a number of interests. From our survey, we could not tell whether respondents citing this reason were motivated by *regulatory* obligations to meet DEP waste bans, grassroots *environmental* demands, *financial* needs to reduce MSW disposal costs, or other interests. Interviewees did discuss their MSW problems in all three contexts. However, because the other highly rated survey reasons specifically concern finances, and because our interviewees predominantly cited these financial problems, we first focus on financial tensions as the key agenda-setting force. Next, we discuss the impact of regulatory and environmental concerns.

A. Substantial Increases in MSW Disposal Costs

Many Massachusetts municipalities reevaluate their existing MSW programs when disposal costs threaten to rise out of control. Such increases in disposal costs often appear linked to a focusing event, usually a municipal landfill closure that raises the direct marginal cost. of MSW disposal from little or nothing to the rates charged by private disposal facilities. However, any factor leading to sharply increased tipping fees usually causes a municipality to consider new MSW management methods.

Survey respondents rated impending landfill closures third among motivations for their adoption of unit pricing. Many interviewees also said that landfill closures had caused them to reevaluate their MSW programs (although not all adopted unit pricing). For example, Milton saw itself at a critical juncture some five years ago, when DEP required it to modernize or close its unlined landfill. Selectman Marvin Gordon

said that upgrading the facility would have cost $14 million. This daunting prospect caused the selectmen to reassess the town's MSW program, which had not previously merited much attention. It soon became clear that capping and closure, along with construction of a transfer station, would be the cheaper route. Then, Milton had to consider restructuring its MSW program to reduce disposal tonnages-both to stretch closing landfill capacity in the short term, and to reduce the impact of new, higher private tipping fees in the long term.[25]

Similar circumstances forced Gloucester to reconsider its MSW program. A DEP-mandated landfill closure in the late 1980s obligated this lower-income city to begin paying a considerable tipping fee for private disposal. As costs began to escalate, an advisory committee formed to assist the mayor and city council in examining ways to encourage recycling and reduce waste sent for disposal 26 State-mandated landfill closure also thrust MSW management onto the agenda in Ware. [27]

Rather than state-mandated landfill closure, legal and political inability to expand quickly shrinking landfill capacity created the problems that caused North Adams and New Bedford to study new MSW management systems. A 1992 Kennedy - School analysis stated that New Bedford faced an MSW management "crisis" because of the "dramatic cost increases" it would incur by switching to a private disposal facility, necessitating that the city study a new MSW financing approach.[28]

Note, however, that MSW cost problems can fall off of the agenda as quickly as they arrive. New Bedford eventually signed a contract with a disposal vendor, whose fees it could comfortably cover out of its tax base. With the crisis past, the city felt no need to continue examining politically sensitive alternatives such as unit pricing. [29] Similarly, voters can approve MSW-specific overrides to Proposition $2^1/2$ to reduce the strain of increasing disposal costs. Wellesley narrowly did so in 1990, [30] as did Chelmsford in 1992 (repealing a brief unit pricing program begun after an earlier override failure). [31] The tough economy, though, may be making overrides increasingly

rare: the Department of Revenue reports that over half of the 149 municipalities attempting to pass overrides in fiscal 1992 failed to do so, the worst passage rate since 1982.[32]

Just as an impending landfill closure is a vivid event that propels MSW management into the spotlight, we might expect that an abrupt change in an existing private disposal contract would do the same. Respondents rated this reason, "increasing tipping fees," fourth in importance behind their adoption of unit pricing.[33] Scott Cassel, a member of Brookline's solid waste advisory committee, explained in 1991 why his suburb was considering adding unit pricing to its existing flat-fee and tax-supported MSW system: "Brookline's cost of trash disposal has skyrocketed from $18/ton just a few years ago to $88/ton.... Solid waste disposal has become a major budget buster for the Town.... "[34] Unfavorable changes in private disposal contracts made reducing waste tonnage a salient issue.

Conversely, municipalities that have maintained relatively low tipping fees stressed that this has kept MSW management *off* of their agendas. Indeed, the current recession and increased recycling participation have reduced per capita MSW generation by up to 20% since the 1980s,[35] depressing tipping fees in many parts of Massachusetts. John Midwood, Wrentham executive secretary, said that his town paid low tipping fees of $46.84 /ton in 1990-91, $50.63/ton in 1991-92, and $54.47/ ton in 1992-93. He hopes to negotiate even lower fees in his new contract this spring, allowing Wrentham to continue funding MSW disposal through its tax base.[36] In another example, Cambridge officials cited a recent sharp drop in the city's private landfill tipping fee (from $80/ton to $45/ton) as an important reason why restructuring its MSW program has not been seriously discussed.[37]

Whether the Commonwealth's MSW disposal market will remain depressed in the foreseeable future is an open question. However, the region seems to be starting its economic recovery, which experts suggest will boost per capita waste generation as

individuals consume more.[38] Increased generation will bring higher MSW disposal demand and tipping fees. On the supply side, DEP's mandated closure of more than 80 unlined landfills by the spring of 1994 will eliminate only about 10% of statewide disposal capacity, [39] and should not dramatically raise tipping fees *statewide.* Still, *individual municipalities* facing these closures should experience significantly higher disposal costs on the private market, thrusting MSW financing onto their agendas.

B. General Budgetary Pressures

Besides tipping fee increases, another factor influencing a municipality's ability to fund MSW services through its tax base is its overall solvency. Under Proposition $2^1/2$, local governments have struggled to provide adequate levels of *all* basic services. Even if waste disposal costs remain reasonable, increasing demands by other municipal programs, pushing against a firm tax ceiling, may create a general budgetary problem. In such circumstances, municipalities might wish to reduce the cost of their MSW programs to free up some revenue "slack" for other programs.

In our survey, "desire to shift costs out of the tax base" rated as the second most important reason why Massachusetts municipalities adopted unit pricing. The general budgetary problems that generate the call for such action can arise from a single focusing event that galvanizes local attention. For instance, in late 1989, a state-mandated sewer upgrade project suddenly presented Salisbury with a considerable fiscal shortfall. As a result, officials investigated changing the financing method of their tax-supported MSW program to offset the looming sewer costs.[40] Other municipalities, however, face more slowly increasing demands on their resources. For example, in 1991, Natick investigated alternative MSW financing methods to free up tax funds for educational programs.[41] The chairman of Hatfield's board of health described a similar motivation when his town looked to make MSW services self-financing in 1990.[42]

By contrast, municipalities with sufficient tax revenue to finance current (and desired) programs usually do not investigate removing MSW services from the tax base.

Wrentham's Midwood said that, "as long as we're doing well economically, I don't think discussion of unit pricing will be an issue." In his mind, Wrentham-"needs a definite requirement to do unit pricing in order to sell it politically." [43] Cambridge public works director Ralph Dunphy related a similar situation. [44]

Note that just as with MSW-specific Proposition 21/2 overrides, a municipality's ability to obtain a general override affects the amount of budgetary pain it suffers as overall resource demands grow. In Wrentham's case, increasing municipal costs caused officials to consider cutting the MSW tax subsidy a few years ago, but a successful general override eliminated their financial fears.[45] Although the statewide trend may be toward fewer overrides, the likelihood of passage in any specific community depends on factors such as the residents' affluence, their sensitivity to tax increases, the federal deductibility of property taxes (but not user fees), the additional cost of the service, and its importance.

C. Regulatory and Environmental Concerns

The preceding two sections suggested that it is primarily financial concerns that put MSW management on the agenda. To a lesser extent, other motivations might also push municipalities to rethink their MSW programs, particularly in terms of increasing recycling.

First, DEP's waste bans could motivate municipalities to increase recycling. In theory, these regulations mandate that municipalities recycle certain materials at 100% diversion rates. Willa Small Kuh, Director of DEP's Division of Solid Waste Management, asserts that municipalities largely comply with the earlier bans on car batteries, because of their well-known pollution hazards, and appliances, because of their visibility and substantial salvage value.[46] In these cases, local governments have not had to dramatically alter their MSW programs to achieve compliance. However, the new and upcoming rules ban such everyday items as aluminum and glass containers, paper, and plastic. Dramatic changes *would* be necessary to cause Massachusetts

households to recycle these materials at significantly higher rates than they currently do (23%, 18%, 26%, and 2%, respectively).[47] Whether these bans will actually drive municipalities to search for ways to boost their recycling rates will depend on how much local officials fear DEP's waste ban enforcement.

A controversial advisory ruling by the Auditor of the Commonwealth bodes poorly for strenuous enforcement. The Auditor found that the bans constitute a local mandate under Proposition 2 1/2, requiring compensation for municipal compliance costs. According to one waste ban proponent, this ruling has "emboldened cities and, towns to challenge these regulations, and has undermined DEP's efforts to enforce them." [48] Indeed, DEP has waived glass and metal container inspections this year for loads from municipalities that administer DEP-approved recycling programs.. These waivers permit more than 250 cities and towns to postpone more aggressive glass and, metal recycling initiatives in return for "a promise to make a good-faith effort. " [49]

As for the approximately 100 municipalities without approved recycling programs, 30 regional DEP solid waste staffers enforcing a few random truck inspections per month statewide will probably not make these localities take the bans seriously. Consequently, we were not surprised that only one municipality among those interviewed cited the waste bans as a motivation for adopting unit pricing. [50]

The other possible motivator for increased recycling is grassroots environmental lobbying. Only a few municipal officials directly cited citizen demands, as a reason to achieve greater recycling success. However, the existence of volunteer recycling committees in almost every community statewide indicates the potential for significant grassroots pressure. Tapping this potential may provide a necessary force to put MSW management on local agendas when neither financial nor regulatory motivations can do so alone.

III. STEP TWO -- FACILITATING PASSAGE OF UNIT PRICING

The previous chapter discussed the conditions under which MSW management becomes a recognized problem on the agenda, setting the stage for consideration of unit pricing. In this chapter we review the necessary conditions for *passage of* unit pricing by local governments. For unit pricing to move from a potential solution to an *accepted* one, a successful period of "softening up" must occur-the public and decision makers must overcome their natural resistance to change by understanding this new and different MSW management approach. During this period, unit pricing advocates must educate the community to overcome common misperceptions and a lack of information about unit pricing. Our results suggest that if unit pricing advocates address three issues, passage of unit pricing is more readily ensured. First, the community must understand that trash service should not be "free." Second, residents and decision makers need to recognize the benefits of unit pricing. Third, they must be informed that while unit pricing is not a problem-free process, its problems are often overstated.

Below, we describe these three basic informational challenges to unit pricing; passage, along with factors that seem to make educating the community easier. Throughout the chapter, we refer to examples from two Massachusetts municipalities, Milton and Williamstown, to illustrate successful strategies.

A. Mistaken Belief that Trash Service Should Be Free

As discussed in the introduction, the majority of communities in Massachusetts finance their MSW programs through tax revenues or flat user fees rather than through unit pricing. This predominantly flat price structure cannot reflect the additional disposal costs and loss of landfill capacity associated with throwing out each extra bag of trash. Without variable price signals, most citizens fail to realize that their MSW behavior imposes costs on their neighbors; flat pricing only reinforces the common notion that unlimited trash disposal should be "free" for households.

If residents were educated that their MSW disposal habits impose hidden costs in the form of higher overall municipal expenses, they might be more willing to accept the idea of being charged a variable rate for trash service. For example, residents must visualize that with every extra bag of trash they throw away, they are also throwing away municipal funds for teachers' salaries or road maintenance. However, overcoming opposition to loss of "free" trash service is not easy; most residents feel that as taxpayers it is their right to expect unlimited trash service in the same way that they receive fire and police protection or public education. Our survey results support this claim: respondents that have considered unit pricing named this perception as their single greatest obstacle to successful passage. Respondents who have managed to pass unit pricing found this perception to have been only slightly less troublesome.

Not surprisingly, the problem is worse in urban and low-income communities. The majority of urban communities finance their MSW costs through tax revenues, while suburban and rural communities are more likely to use flat user fees.[51] Because residents at least periodically see explicit trash bills under a flat fee system, they may be less likely to perceive MSW services as their "God-given right." On the other hand, communities with lower per-capita income may worry about charging residents for trash service because lower-income individuals would spend a greater proportion of their total income on each bag of trash hauled away than would more affluent citizens.

Communities that have adopted unit pricing have found ways to educate citizens that their disposal habits impose costs on the community. Williamstown dispelled the myth that trash service should be free by setting up an "enterprise fund" to separately track its MSW disposal costs. In essence, an enterprise fund is an accounting mechanism that fully discloses the finances of a municipal operation and segregates them from general municipal finances. Enterprise funds have several benefits: they identify an operation's direct and indirect costs, provide accountability, offer local

officials more control, and lead to efficient resource use. Also, surplus funds may roll over annually, which nullifies the "use-it-or-lose-it" incentive to spend year-end money.

To set up an enterprise fund, a municipality can either adopt chapter 40, section 39K of the Massachusetts General Laws, or pass special legislation. Before adopting an enterprise fund, though, a municipality should identify the costs of providing the service, determine how revenues will be used to cover these costs, and document and review the process.[52] According to Pat Berdan, Wellesley Director of Public Works, the difficulty associated with creating enterprise funds is not as much a "real hazard as it is a mental hazard." [53]

For Williamstown, until unit pricing was adopted, general revenues increasingly subsidized the MSW enterprise fund. With a visibly separate fund, though, officials and residents could see how their disposal habits directly affected MSW costs. They eventually realized that only unit pricing could make the enterprise fund self-financing.

B. Failure to Recognize the Benefits of Unit Pricing

Unit pricing is the most equitable way to charge citizens for the solid waste costs they impose on the community, and offers better behavioral incentives than other, programs that do not vary fees based on the amount of service provided. Volume-based rates provide several benefits: customers receive a direct incentive to reduce waste, MSW services gain equal footing with other utilities priced on a usage basis, and communities can reduce their immediate needs for additional MSW disposal facilities. However, most communities we contacted did not fully recognize the benefits of unit pricing.

Empirical evidence supports the effectiveness of unit pricing in reducing solid waste generation and boosting recycling. For example, a recent study by the World Resources Institute tracked ten communities nationwide with unit pricing programs over a nine-year period to isolate the impact of unit pricing on MSW disposal tonnages. The authors found that if a community started charging households $1.50 per 32-gallon

bag disposed, it would reduce its MSW disposal needs by 18%. By implementing this unit fee along with a curbside recycling program, disposal would decline by as much as 30%.[54]

Further, since unit pricing was introduced in 1981, households in Seattle, Washington, have reduced their average trash service subscription levels from three and-one-half cans per week to slightly over one. Unit pricing has also boosted Seattle's recycling rates to as high as 85%. Finally, Perkasie, Pennsylvania, and Ilion, New York, have reduced MSW generation by 30% or more, and doubled their recycling rates, through unit pricing.[55]

As these examples illustrate, unit pricing both provides customers with incentives to reduce waste generation, and can lead town extension of landfill life. Unit pricing, therefore, mitigates the economic and environmental costs of customers' disposal habits.

Milton provides an excellent example of how educating the community about unit pricing's benefits can spur decision makers to pass it. Marvin Gordon, one of the town's selectmen, happened to read about successful unit pricing programs in the *New York Times.* At his initiative, he and other town selectmen researched the details of these programs and debated which aspects could work in Milton. [56] After learning about the advantages of variable-rate MSW financing, Gordon became a unit pricing advocate, eventually leading his town to adopt such a program.

C. Excessive Fears of the Side Effects of Unit Pricing

Communities that debate unit pricing typically overstate its potentially negative side effects. Once unit pricing is implemented, anticipated problems often turn out to be manageable. Our survey results support this claim: problems that communities *perceived* as particularly troublesome proved less so once a program was underway.

Table 3-1 ranks respondents' top three concerns with unit pricing programs. We asked them to rate the significance of these concerns, as they perceived them *before*

adopting their programs, and as they currently viewed them during unit pricing implementation.

Table 3-1 --Top Three Prioritized Concerns Before Implementing Unit Pricing, and Subsequent Importance During Implementation, for all Massachusetts Municipalities

Concern/Problem	Avg. rating before implementation [a]	Avg. rating during implementation [a]
Selecting most appropriate system structure	3.200 (n = 30)	2.333 (n = 27)
Customer resistance to loss of 'tree" trash service	3.100 (n = 30)	2.321 (n = 28)
Increased illegal dumping	2.967 (n = 30)	1.929 (n =-28)

[a] Respondents could rate the importance of each concern/problem as "none" or on a 1-5 scale, with 1 indicating "low" importance and 5 "high" importance. "None" was coded as a 0 to calculate the averages. "n" refers to the number of respondents who answered the question.

The data suggest that all three concerns were overstated. Although the top pre-implementation concerns remained in the same order during implementation, their perceived importance declined sharply. The average for each of the issues during implementation is considerably lower than 3.0, suggesting they did not become major problems. Interestingly, communities that have *not* adopted unit pricing, but have still debated it, held the same top three concerns- but gave them higher absolute ratings. Perhaps, communities that eventually adopt unit pricing debate these issues longer, "softening up" the policy community so that problems seem less intractable.

Differences in income and urbanness reveal a few additional insights. While debating unit pricing, lower-income communities reported the same degree of concern about their top three problems as did their higher-income counterparts. Further, urban, suburban, and rural communities do not list the same issues as main concerns. Finally, rural communities have typically had the most success in implementing unit pricing. (See Appendix C.)

Our interviews with local officials support the notion that fears prior to unit pricing adoption are often unwarranted. Selectmen in Milton, for example, thought that unit pricing might bring increased littering, illegal use of dumpsters, and other efforts to beat the system.[57] However, the town has had very few compliance problems. Milton has not had to raise fines or increase enforcement, and businesses have not had to lock dumpsters. As in other communities, citizens police each other.

IV. STEP THREE-SUCCESSFULLY IMPLEMENTING UNIT PRICING

About 46 municipalities in Massachusetts now employ a unit pricing program for residential MSW disposal. Thirty-four of these communities completed our survey, and they overwhelmingly reported positive experiences with unit pricing. This chapter discusses three notable findings revealed by these municipalities' experiences.

First, the biggest problems were customer confusion, difficulty selecting the most appropriate unit pricing system, and customer resistance to the loss of "free" MSW service. Second, issues typically considered key unit pricing implementation obstacles-multifamily housing, illegal dumping, and rate setting-have not proven to be major concerns in Massachusetts. Finally, rural towns have experienced the least problems in implementing unit pricing, while the suburbs have encountered more difficulties than their urban and rural counterparts.

Survey respondents rated their experiences with nine problems commonly associated with implementing unit pricing programs. The significance that the communities attribute to each of these problems is summarized in Table 4-1.

Table 4-1 -- Prioritized Problems During Implementation of Unit Pricing for all Massachusetts Municipalities

Problem	Average rating [a]	No. of responses
Customer confusion with a new system	2.714	28
Selecting most appropriate system structure	2.333	27
Customer resistance to loss of "free" trash service	2.321	28
Unit fee revenues not covering costs	2.111	27
Difficulty in determining proper unit rates	2.037	27
Increased illegal dumping	1.929	28
Addressing needs of low income/elderly customers	1.857	28
Local government resistance to change	1.370	27
Developing approach for multifamily housing	1.036	28

[a] Respondents could rate the importance of each problem as "none" or on a 1-5 scale, with I indicating "low" importance and 5 "high" importance. "None" was coded as a 0 to calculate the averages.

In no case is the average score as great as 3.0. This suggests that none of the problems could be characterized as a major deterrent to unit pricing implementation.

A. Most Significant Problems

The three most significant problems experienced by Massachusetts municipalities that have implemented unit pricing programs are customer confusion,

selecting the most appropriate system structure, and customer resistance to the loss of "free" trash service.

1. Customer Confusion

Residents' confusion over how their unit pricing program works has been the biggest challenge faced by Massachusetts municipalities. Customer confusion received the highest average rating of the nine problems surveyed, and 66% of communities responding to this question ranked it as the most significant problem they faced in implementing unit pricing. [58]

Our findings suggest that three issues commonly confuse households: (1) the purpose of charging variable rates for MSW disposal; (2) practical details, such as where to purchase pre-paid bags or stickers; and (3) what options are available for waste reduction and diversion. For instance, the administrative officer in North Adams reported "tremendous misunderstanding concerning the entire process" of unit pricing, and said that the "public was very confused" when the city's program was first enacted. Even after program details had been discussed several times, some residents still believed that they had to purchase special bags to use with their private haulers.[59]

Similarly, Gloucester residents misunderstood the city's initial proposal to charge a $1 fee for pre-printed trash bags. Because they failed to see that the $1 fee covered both the cost of the bag and disposal of the trash deposited in it, they ardently protested that the city's pre-printed trash bags were priced substantially higher than comparably-sized bags available in local stores. These protests ultimately led city officials to decide on a sticker-based unit pricing program instead of pre-printed bags.[60]

2. Selecting System Type

Selecting the most appropriate variable-rate MSW disposal system was ranked as the second most significant challenge experienced by Massachusetts municipalities. Apparently, Massachusetts municipalities have had difficulty choosing among, the six or

more types of variable rate MSW disposal programs available, due to the complexities of balancing the advantages and disadvantages of each. [61]

For instance, several -communities had difficulty deciding between a program - that would require residents to purchase stickers to be affixed to each bag of rubbish prior to disposal, and one that would require residents to dispose of their rubbish in specially printed bags. Municipalities have found that stickers are easier to store and sell than bags, can be serialized to enable close accounting, are cheaper to produce, and can be placed on any container. On the other hand, stickers can come unglued in cold weather, are easily stolen, are not as easily identifiable, and do not offer the standard unit of measurement provided by pre-printed bags. (See Appendix D for a summary of how frequently each type of unit pricing program is used in Massachusetts.)

Several municipalities also reported that devising a convenient way to distribute pre-printed bags or stickers proved difficult. Of the 25 municipalities that submitted information describing where bags or stickers are distributed, only five towns distribute bags or stickers from the town hall. In small rural communities such as Hatfield (pop. 3,184), where there are no large retail outlets, residents do not appear significantly inconvenienced by having to pick up stickers at the town hall. [62] However, larger communities such as Wilbraham (pop. 12,635) hear numerous complaints from local residents, who want more convenient distribution.[63]

3. Customer Resistance

Residents' resistance to the loss of what they regarded to be "free" rubbish removal service was the third most significant challenge faced by Massachusetts municipalities in implementing unit pricing.

In many communities, residents had always viewed municipal rubbish disposal as a right due them as taxpayers, and saw no link between the amount of rubbish they threw away and their tax bill. In Milton, for example, elderly residents were so adamant in insisting that trash collection was virtually the only municipal service they

received in return for their property taxes that town selectmen agreed to provide one free barrel per week as part of Milton's unit pricing program.[64] Residents of Ware, Hatfield, and Salisbury were less effectual in protesting the loss of their "God-given right to free trash pick-up," and over one-third of town residents switched to more expensive private haulers to protest the imposition of unit fees. [65]

B. Issues of Unexpectedly Low Significance

Three issues that have garnered much attention in the literature as likely obstacles to successful implementation of unit pricing[66]-multifamily housing, illegal dumping, and rate-setting-have not proven to be major problems in Massachusetts.

1. Multifamily Housing

Of the nine potential problems associated with unit pricing that we considered, Massachusetts communities that have implemented unit pricing were least troubled by developing an approach for dealing with multifamily housing (see Table 4-1). This is particularly surprising because there are few workable solutions to problems associated with applying unit pricing to multifamily buildings.[67]

Two reasons may account for municipal success with this issue. First, only some 2% of residential parcels in Massachusetts consist of apartment buildings with four or more units.[68] Second, the handful of communities that previously included multifamily buildings in their MSW programs required those with more than five units to switch to commercial haulers when unit pricing was implemented. This means that cities such as Boston and Cambridge would likely have to exempt multifamily dwellings if they implement unit pricing, as have cities like Seattle. However, since most cities in Massachusetts already require such buildings to use commercial haulers, this issue does not pose a major obstacle to implementing unit pricing.

2. Illegal Dumping

While illegal dumping is one of the most obvious concerns surrounding implementation of unit pricing,[69] the experience of Massachusetts communities does

not support this apprehension. Twenty-seven percent of communities surveyed noted some increase in illegal dumping within the first months of establishing new programs, but in almost all cases enforcement actions quickly brought the problem under control.

Both successful municipal enforcement measures and citizens' willingness to take enforcement actions into their own hands have led to less illegal dumping than many municipal officials predicted. For example, in Gloucester an initial surge in illegal dumping was successfully combated by hiring a full-time enforcement officer, implementing a strict illegal dumping ordinance, locking commercial and municipal dumpsters, and prosecuting violators strictly and visibly. Elsewhere, in communities such as Hatfield and Milton, illegal dumping turned out to be much less of a problem then anticipated, and self-policing by citizens has been sufficient to hold illegal dumping in check.

3. Rate Setting

Though MSW program literature has increasingly discussed the topic of rate setting, and several spreadsheet tools have been developed to help simplify this task,[70] few administrators in Massachusetts consider rate setting a major problem. However, this lack of concern has not been because all Massachusetts municipalities possess a thorough grasp of rate setting techniques.

We found that few municipalities in Massachusetts even attempt to set unit pricing rates so that revenues cover costs, and fewer still use comprehensive financial analysis in rate setting. In fact, only 14 of 22 communities responding to our rate-setting questions considered cost data in setting rates, and several of them experienced a revenue shortfall in the first year of their unit pricing programs. This shortfall was typically caused by a failure to account for a reduction in the volume of waste generated (and therefore the amount of revenue collected) as residents responded to unit fees.

Rate setting has not been a major concern for Massachusetts communities primarily because it has typically been shaped by political forces rather than

sophisticated financial analysis. Of the 23 communities that indicated what factors influenced their selection of a rate structure, more indicated that their rates were selected to encourage waste reduction than to cover projected costs. A significant number indicated that they selected rates partly based on the maximum amount residents were willing to pay, or on rates charged in other communities. For example, the initial $0.50 per-sticker fee in Gloucester was based on what officials thought residents could bear, rather than what would cover costs. In fact, Gloucester's fee only covered about 50% of the city's MSW collection and disposal costs.[71]

Several Massachusetts communities have fully removed MSW services from their tax bases by making their unit-pricing-supported MSW enterprise funds self-financing. Williamstown and Wilbraham achieved their goal of eliminating MSW tax subsidies by implementing a flat annual fee to cover the fixed costs of operating their transfer stations and recycling centers, and a unit fee to cover variable MSW disposal costs. An inability or unwillingness to conduct complex rate-setting analysis or to assess rates high enough to fully fund MSW programs has not prevented other Massachusetts communities from implementing unit-pricing-based MSW programs that are partly subsidized by tax revenues. However, as municipalities gain sophistication in utilizing unit pricing, more will move toward establishing rates that reflect true costs.

C. Significance of Demographic Attributes

Experiences with unit pricing in Massachusetts have differed for various kinds of communities. Rural communities have experienced the fewest problems, while the suburbs have experienced the most, especially in selecting the most appropriate system structures and setting rates. Surprisingly, cities attributed less significance than did suburban towns to all but two of the nine potential unit pricing implementation problems. However, high- and low-income municipalities did not report significantly different experiences. (See Appendix E for more detail.)

V. EVALUATION OF ALTERNATIVE OPTIONS

The previous three chapters explored the steps of the policy cycle based on information gathered from our survey respondents and interviews. Chapter II described the conditions that place unit pricing on a municipality's agenda as a potential solution to a recognized problem. Chapter III discussed the need to "soften up" local decision makers through education and other means as a prerequisite to passing unit pricing, and Chapter IV outlined the most significant problems Massachusetts communities have experienced in implementing unit pricing.

This chapter evaluates options for addressing the challenges highlighted in our findings. First, we define criteria against which each option can be weighed. Next, we outline the mechanism used to score options within each criterion. Finally, we apply the criteria and scoring mechanism to evaluate sets of alternatives that could be used to address the most significant problems identified in our findings. Note that we have evaluated each option on its intrinsic merits, independent of which organization or organizations would implement it; the last section analyzes potential providers for some alternatives.

A. Evaluation Criteria

Three broad criteria are used to evaluate each option: political feasibility, affordability, and administrative feasibility. These criteria were selected because they capture the qualities that we believe are essential for viable options. They must be politically acceptable to local and state decision makers in order to be adopted and sustained once in place. In the currently austere budget climate, they must also be of relatively low cost in order to compete successfully against other proposals vying for limited funds. Finally, they cannot place unmanageable administrative demands on the organizations that must implement them. The essential elements of each criterion are as follows:

- *Political feasibility* assesses whether or not an alternative is likely to be acceptable to a wide variety of affected parties. Alternatives not apt to generate much resistance receive high marks. Alternatives likely to generate a high degree of resistance from the state legislature, the governor's office, the press, or the general public receive low marks.
- *Affordability* measures how much an option would cost relative to the funding that will likely be available to promote unit pricing. Obviously, expensive options receive lower marks than less expensive ones.
- *Administrative feasibility* measures the amount of administrative effort and resources an alternative would require to be implemented. Alternatives that require greater overhead or personnel time receive lower marks than those that place smaller demands on resources.

B. Scoring Mechanism

Given the strongly qualitative nature of these criteria and the limits of this report, we could not assign quantitatively precise scores in evaluating options. Nevertheless, we have assigned one of three broad scores to each option based on its ability to meet the objectives of each of the three criteria. These scores are represented by the symbols ✓-, ✓, and ✓+. A ✓- is assigned when an option fails to satisfy a criterion. Options that adequately satisfy a criterion are assigned a d, while those that clearly excel receive a ✓+. An aggregate of the three scores appears in the overall evaluation column. Options that receive an overall evaluation of ✓ or ✓+ are discussed as recommendations in Chapter VI.

C. Options for Placing Unit Pricing on the Agenda

As discussed in Chapter II, municipalities must recognize MSW management problems in order to place unit pricing on their agendas. We showed that two financial conditions primarily drive localities to find their current MSW programs problematic: substantial increases in MSW disposal costs, or general budgetary pressures. We also discussed two other conditions that might motivate reevaluation of MSW programs: satisfying DEP waste bans and addressing grassroots demands for improved recycling.

Unlike our findings in the other two policy cycle steps, we cannot suggest many plausible options for EOEA to influence municipalities in the agenda-setting phase. The first condition, increasing tipping fees, occurs as a function of many economic variables. Signs of resumed economic growth suggest that tipping fees will begin to rise statewide over the next year or two. EOEA cannot take direct action itself to increase tipping fees for its municipalities, nor would it want to be perceived as doing so. Moreover, our findings showed that the one EOEA activity, that *indirectly* influences tipping fees-DEP closures of unlined landfills-appears to be moving as aggressively and rapidly as possible. Assuming that state legislators sympathetic to local complaints cannot successfully challenge DEP's regulations,[72] some 80 communities will have to seek alternative disposal options-and, probably, ways to reduce disposal tonnages at more expensive private facilities-by the end of 1993.

Clearly, the Commonwealth should not try to exacerbate the second condition, general budgetary pressures on municipalities. Under Proposition 2 1/2) increased demands for education, police protection, and other services will likely drive municipalities to consider shifting MSW management to user fee financing on their own- In addition, the recent trend toward fewer successful override campaigns may cause municipalities to consider unit pricing.

We had hoped to leverage the third possible condition, desire to comply with DEP's waste bans. Regulations that require municipalities to recycle or compost certain materials at or near 10090 diversion rates seemed to offer a prime motivation for local officials to consider unit pricing- By giving their households economic incentives to reduce, recycle, and compost banned materials, municipalities would come much closer to complying with the regulations. Unfortunately, the current political climate prevents the waste bans from serving as strong motivators for local recycling and composting. Municipal-lobbying against these bans, supported by a favorable state auditor ruling, has undermined DEP's ability to enforce them. Consequently, current rules exempt

over two-thirds of Massachusetts municipalities from adhering to the bans on items that constitute substantial portions of the waste stream, such as glass and metal bottles. Nor will communities lacking waste ban waivers have to fear strong enforcement. Indeed, the Massachusetts legislature may make the waste bans a moot point entirely.[73]

The last potential condition for placing MSW programs on the table for debate, grassroots support for improved recycling, does suggest two feasible options that EOEA could pursue. EOEA's challenge would involve building sufficiently large and vocal citizen recycling constituencies to make local officials pay attention. The widespread popularity of environmental causes in general suggests that many potential recycling advocates exist, if only the Commonwealth could find ways to make them active. Table 5-1 evaluates two possibilities that capitalize on basic community interests: civic pride and the need for resources.

Table 5-1—Evaluation of Alternatives to Activate Grassroots Support for Improved Recycling

	Evaluation Criteria			
Alternative	Political Feasibility	Affordability	Administrative Feasibility	Overall Evaluation
Compile and publicize municipal rankings on recycling rates	✔	✔+	✔+	✔+
Consider recycling rates in awarding DEP recycling grants	✔	✔	✔	✔

Description of Alternatives: The first option taps *civic pride* to incite support for improved recycling. DEP would use its existing data to compile a ranking of all Massachusetts municipalities by their success in recycling participation and diversion rates for various materials, and would distribute this list to the media. On their own initiative, journalists would publicize the rankings (as would environmental groups). Although not likely to be as prominent as the environmental "state of the states" report exploited during the 1992 presidential campaign, these rankings would incite considerable discussion. Residents not previously active in grassroots recycling lobbying would discover in their own media how their community compared with its

neighbors, perhaps becoming energized by local partisanship (if not environmental concerns) to demand better recycling success.

In the second solution, DEP would consider recycling success along these same measures in awarding its annual recycling grants, and alert the general public through the media that good recycling track records can help their municipalities earn additional state grants for recycling infrastructure.

Political Feasibility Evaluation: Both of these options seem relatively acceptable politically. With the recycling ranking, some lower-ranked municipalities might challenge DEP's data. However, the Department could diffuse accusations of bias by emphasizing that its recycling data are reported by the municipalities themselves, and by defining its variables consistently across municipalities. Also, by allowing media and advocacy groups to publicize the rankings, DEP would appear as a neutral clearinghouse of public information, rather than an agency out to praise or shame local governments.

As for adding recycling success as another criterion in DEP's recycling grant award process, municipalities with lower recycling rates need only realize that this criterion alone would not make or break their applications. Indeed, while communities whose citizens actively recycle might deserve grants to enhance their proven programs, other communities with less active citizens might also merit grants to jump-start their dormant programs.

Affordability Evaluation: Although both options should be affordable, consolidating a list of municipal recycling rates would cost DEP almost nothing: DEP already collects this data from municipalities. Disseminating periodic lists to the media would only require a standard press release; advocacy groups would then pick up the information from media outlets. By contrast, evaluating recycling grant applications under an additional criterion would impose some extra costs in staff time during DEP's application review.

Administrative Feasibility Evaluation: Mirroring the affordability evaluation, collecting and disseminating a list of municipal recycling rates would exploit existing DEP resources and activities: the agency already collects this data, and has established vehicles for informing the media. Outside actors in the press and advocacy groups would conduct the more involved publicity work Including recycling rates as a grant criterion, though, would add an extra layer of complexity to the evaluation process.

D. Options for Facilitating Passage and Implementation of Unit Pricing

We identified six obstacles that must be overcome for a municipality to successfully pass and implement unit pricing. As discussed in Chapter III, unit pricing advocates must address three potential misconceptions or information shortcomings in the community to ensure unit pricing's passage: (1) the mistaken belief that trash service should be free, (2) failure to recognize the benefits of unit pricing, and (3) excessive fears of its side effects. Chapter IV described three key challenges that municipalities must overcome to successfully implement unit pricing: (1) mitigating' customer confusion, (2) selecting the most appropriate system structure, and overcoming customer resistance to the loss of "free" trash service.

Five of these six issues involve misperceptions or a lack of information, which' can best be overcome by direct education. The sixth problem-addressing decision makers' misperception that MSW services should be "free"-can best be tackled by using indirect means of education. This section first evaluates some direct educational approaches relevant to both passage and implementation of unit pricing, and then assesses indirect educational options that apply just to the passage stage. Finally, we examine other options relevant to the challenges of implementation.

1. Alternative Educational Approaches for Addressing Passage and Implementation Issues

Three common alternatives-facilitating peer matching, providing fact sheets, and hosting seminars-offer ways to address misconceptions and information problems inherent in both the passage and implementation stages. However, while the form of

these alternatives is the same, their objectives would differ depending on whether an approach is being used to facilitate passage or implementation. (See Table 5-2.)

Table 5-2—Objectives of Educational Alternatives to Facilitate Passage and Implementation of Unit Pricing

Alternative	Step Two—Facilitating passage of unit pricing	Step Three—Successfully implementing unit pricing
Facilitate peer matching	Link municipal officials with counterparts who have addressed passage concerns	Link municipal officials with counterparts who have addressed implementation concerns
Provide fact sheets	Provide case studies and data to help municipalities resolve misperceptions about unit pricing	Provide case studies and data to help municipalities overcome specific implementation problems
Host seminars	Present general overview of benefits and side effects of unit pricing	Present specific solutions to implementation challenges

The educational alternatives that EOEA could use to overcome misperceptions and information problems associated with both the passage and implementation of unit pricing are evaluated below in Table 5-3.

Table 5-3—Evaluation of Educational Alternatives to Facilitate Passage and Implementation of Unit Pricing

	Evaluation criteria			
Alternative	Political feasibility	Affordability	Administrative feasibility	Overall evaluation
Facilitate peer matching	✔+	✔+	✔	✔+
Provide fact sheets	✔+	✔	✔	✔
Host seminars	✔+	✔−	✔	✔

Description of Alternatives: Of the three options, matching local officials faced with passing and implementing a unit pricing initiative with experienced and successful counterparts from similar communities best meets our criteria. However, the other two alternatives may be successful as well. Fact sheets can be of two different types, as outlined in Table 5-2. First, to overcome municipal fears during the passage stage, fact sheets could briefly describe how Massachusetts communities have successfully dealt with commonly perceived unit pricing problems. Alternatively, they might list sources of materials, such as pre-printed trash bags, that communities must evaluate during the implementation stage.

Hosting seminars would likely involve six to eight one-day presentations per year at various locations across the Commonwealth to provide general information to municipal officials during the passage stage, and more specific information during the implementation stage.

Political Feasibility Evaluation: All three of these services are politically feasible. Each would only be provided to communities that request them, and thus would not evoke opposition from municipalities or the legislature.

Affordability Evaluation: The three options differ more in affordability. Facilitating a peer matching process would require few costs. These would likely consist of travel expenses for local officials who volunteer to share their unit pricing experiences with others, and minimal administrative costs required to develop and maintain a database of mentors. Providing fact sheets might be slightly more expensive; the costs would include collecting and updating information, and preparing and publishing the reports. Hosting six one-day seminars across the state would cost somewhat more, based on a proposal to provide similar services recently submitted to EOEA.[74] This would include the cost of preparing and updating seminar materials, scheduling and publicizing each event, and providing meeting facilities.

Administrative Feasibility Evaluation: All three educational alternatives would be administratively feasible. Peer matching between solid waste officials is currently done on a limited, informal basis. Formalizing the process statewide would require creating a small database to keep track of potential mentors, advertising the telephone number of a centralized contact point, and several hours of administrative time per week. Preparing fact sheets and planning and scheduling seminars would likely require the part-time services of several employees year-round.

2. Additional Alternatives to Help Municipalities Pass Unit Pricing

Many communities hold the common misperception that household trash service should be free. This misperception arises because citizens generally fail to realize that

their community pays an additional tipping fee for each additional bag of trash` thrown away. However, as discussed in Chapter III, communities that use enterprise funds to separately track their MSW costs can dispel this misperception. Thus, enterprise funds can serve as an intermediate educational step on the path to unit pricing. Mandating that municipalities break out household MSW costs on their property tax bills can also achieve this end.

However, our research suggested that some municipalities (especially those with flat-fee MSW financing systems) may not need the educational benefits of enterprise funds or tax bill breakouts. In these communities, residents see explicit MSW bills, and municipal officials have moved MSW financing out of the general revenue fund. Residents in these communities would probably understand that MSW services should not be free, and would already be "softened up" to the concept of unit pricing.

Table 5-4 evaluates approaches EOEA can take to help both types of municipalities pass unit pricing.

Table 5-4—Evaluation of Additional Alternatives to Help Municipalities Pass Unit Pricing

	Evaluation criteria			
Alternative	Political feasibility	Affordability	Administrative feasibility	Overall evaluation
Consider enterprise funds/unit pricing in awarding recycling grants	✔+	✔+	✔+	✔+
Provide educational materials or seminars on enterprise funds	✔+	✔	✔	✔
Require that citizens' tax bills show amount paid for MSW services	✔–	✔+	✔	✔
Mandate enterprise funds	✔–	✔–	✔–	✔–

Description of Alternatives: Our evaluation suggests that considering the establishment of enterprise funds or unit pricing in awarding DEP recycling grants is the best option: municipalities that have or agree to set up enterprise funds or unit pricing programs would be given higher priority to receive recycling grant moneys. This option fares well in part because of its high visibility. The recycling grants program gets publicity throughout the state and many municipalities compete for awards.

In addition to this incentive approach, materials clearly outlining how enterprise funds could be implemented would help educate communities about the mechanism. Finally, mandating a tax bill itemization for MSW costs, while less attractive overall than these two options, could also provide the necessary education.

Finally, EOEA could mandate enterprise funds statewide, but this option faired worst in our evaluation.

Political Feasibility Evaluation: Linking enterprise funds or unit pricing to the state's recycling grant program has already received attention from DEP.[75] Under such a system, DEP would award a community money that could be used to finance MSW services if the municipality met existing recycling grant criteria and agreed to establish an enterprise fund or unit pricing as well. A second option, educational seminars on enterprise funds, has also received political backing from the Commonwealth. For example, DEP discussed enterprise funds with municipal officials in a recent series of landfill assessment and closure seminars.

The remaining options, however, have little precedent within DEP, and are not politically acceptable to local officials. Massachusetts municipalities have a long tradition of independence, and dislike state mandates. Therefore, options that conflict with the "home rule" tradition cannot fare well politically.[76] Mandating enterprise funds or a tax bill breakout accordingly received low scores under this criterion.

Affordability Evaluation: Although giving out money in conjunction with the recycling grant program is expensive, a portion of the approximately $1.5 million the state distributes annually in the grant program could easily be used to promote implementation of enterprise funds or unit pricing. Further, the administrative costs associated with adding additional criteria in awarding recycling grants are minimal. Administrative costs of a tax bill breakout are minor as well; it involves little more than a computer programming change.

The other two options cost more and therefore received lower scores. While literature exists on enterprise funds, no document addresses the topic in a "user- friendly" way. Providing this type of information would require research and editing time, but costs should not be exorbitant since the task is simply to present existing information in a more accessible way. Proper delivery of the educational material is of greater concern, and is addressed in a later section. Mandating that municipalities --adopt enterprise funds is the most costly of the four options. For example, this option might require substantial state funding to finance municipalities' implementations-- expenses as proscribed by Proposition 21/2.[77] In the absence of additional state:: funding, it scored poorly on the affordability criterion.

Administrative Feasibility Evaluation: DEP already has proven its administrative capacity to coordinate a recycling grant program. Adding additional award criteria contributes only a minimal extra step to DEP's process. Supplying better educational materials about enterprise funds is slightly more burdensome, despite the many materials already available. Consolidating technical information into a "user-friendly" manual could take a few months. Requiring a tax bill breakout might be more administratively burdensome still, because it requires changes at the state and local levels. The Department of Revenue might have to field questions about this new requirement from each municipality. By mandating enterprise funds, DEP might also become inundated with phone calls from towns that want to understand their responsibilities. This option received the lowest score on administrative feasibility because it requires administering an entirely new program, rather than building on an existing structure.

3. Additional Alternatives to Help Municipalities Implement Unit Pricing

In addition to the joint options discussed in Section D.1 of this chapter, there are several alternatives that could help communities overcome the challenges unique to the

implementation of a unit pricing program. These alternatives are evaluated below in Table 5-5.

Table 5-5—Evaluation of Additional Alternatives to Help Municipalities Mitigate Customer Confusion, Select Most Appropriate System Structure, and Overcome Customer Resistance

Alternative	Evaluation criteria: Political feasibility	Affordability	Administrative feasibility	Overall evaluation
Provide unit pricing manual	✔+	✔–	✔+	✔
Provide public relations plan/strategy and supporting materials	✔	✔–	✔	✔
Provide consulting services	✔	✔–	✔–	✔–

Description of Alternatives: Of the three approaches evaluated, providing a unit pricing manual best meets our evaluation criteria. Such a manual would furnish municipal officials with the information they need to implement a unit-based pricing system in their communities. The manual would include answers to commonly asked questions such as, "What type of unit pricing system is most appropriate to meet a community's specific needs?" and "How much should a community charge per bag?" Providing municipalities with a prototype public relations plan is also a viable alternative. Such a plan would include ways to encourage residents to support unit pricing, and options for educating the public through the media and other forms of public outreach. Underwriting consulting services to address the unique challenges; faced by each community is not a viable option for implementing unit pricing; resources are too limited to accommodate such a customized approach.

Political Feasibility Evaluation: All three options would be politically feasible. Providing a unit pricing manual is clearly feasible; similar manuals are currently provided to municipalities for other solid waste issues, such as DEP's *Landfill Assessment and Closure Guidance Manual.* The provision of state-sponsored public relations guidance and consulting services is also unlikely to meet substantial local resistance. However, since there is little precedent for providing these types of services by the Commonwealth, they might face opposition from state officials.

Affordability Evaluation: Each alternative is relatively costly. They would require a significant effort to pull together existing information on unit pricing, conduct research into what types of programs would work best within the Commonwealth, and present the information in a "user-friendly" format.

Administrative Feasibility Evaluation: The three alternatives differ dramatically in terms of administrative feasibility. While it would require a significant time commitment, preparing a unit pricing "how-to" manual for Massachusetts communities has precedent. Both DEP and other solid waste organizations have prepared similar documents as part of their routine functions. Drafting a prototype public relations plan would be equally time-consuming, but less feasible because it reaches beyond the expertise of DEP and other solid waste organizations. Providing consulting services to assist municipalities in implementing unit pricing on an individual level is the most resource-intensive of the three options. It is unlikely DEP or other MSW organizations within the Commonwealth could provide the resources necessary for such an endeavor.

E. Alternative Organizations to Implement Educational Options

We have not yet considered which organization or set of organizations should carry out the majority of our recommendations. Some of the recommendations; such as expanding DEP's recycling grant program to include the criterion of enterprise funds, have dear actors. However, for the educationally oriented recommendations, it is less dear which organization should carry them out. Who should be responsible for, facilitating peer matching, providing fact sheets, hosting seminars, and providing public relations strategies and supporting materials? Without assigning these recommendations to a specific organization, they are not likely to be implemented.

1. Evaluating Possible Organizations

Three factors determine the effectiveness of an organization in delivering a, product or service-its mission, its internal capacity, and its external operating

environment. We used these three criteria to evaluate how effectively four organizations could deliver a portion of our action plan: the Massachusetts Municipal Association (MMA), the solid waste districts and cooperatives, DEP, and MassRecycle.

MMA is a coalition that represents the interests of municipalities on issues as varied as solid waste, education, and transportation. The organization is funded by fees from its members. MSW districts and cooperatives are loosely knit, regional organizations that assist municipal members on solid waste issues. MassRecycle is a non-profit volunteer organization comprised of over 200 members that aims to advance solid waste reduction and recycling. It is headed by a 21-member board of directors consisting of representatives from business, community groups, and local and state governments.

MMA and the solid waste districts and cooperatives are not viable candidates for conducting a major unit pricing educational campaign. MMA does not explicitly endorse unit pricing; therefore, it would be not be appropriate for MMA to act as an advocate for this policy. In addition, its constituency has strongly opposed the DEP waste bans; MMA would not likely recommend any option, such as unit pricing, that appears to support these state mandates.[78] The solid waste districts and cooperatives have neither the experience nor the capacity to provide a wide range of educational services.

The remaining two organizations, DEP and Mass Recycle, are evaluated below by each criterion.

Mission: By mission, we mean the organization's overriding goal that unifies its efforts. The organization whose mission more closely aligns with community outreach and providing educationnal assistance on the municipal level will be favored.

DEP's mission is primarily regulatory-it is the state agency responsible for ensuring clean air and water and the safe management, disposal, and cleanup of solid and hazardous waste. As such, providing technical assistance to municipalities is not

central to DEP's function. MassRecycle, on the other hand, is not regulatory, but relies on an educational approach. The organization describes itself as "dedicate to bringing together individuals, local and state governments, industry, and environmental groups-a broad base of business and community interests-for the purpose promoting and facilitating waste reduction, reuse and recycling."[79] MassRecycle's goal closely match those of our educational recommendations.

Internal Capacity: Organizational capacity refers to an organization's "machinery." This includes both the perceived and actual capabilities of the organization, as well as its organizational agenda. The organization that has the desire and capacity to deliver our recommendations will be favored.

DEP has four regional offices in addition to its headquarters in Boston. Thirty staff members in the regional offices and 20 in the Boston office address solid was management issues. By and large, these staff members are devoted to providing support for existing and future regulations. [80] Their duties include writing technical reports, managing computer databases, fielding questions about environmental regulations, and enforcing those regulations. Within the Boston office, only a few staff members conduct seminars and educational outreach on solid waste issues. In addition, the DEP-wide public affairs office only has only one press officer, who covers all, policy issues. Seminars sponsored by the public affairs office-separate from those conducted by the solid waste division--are done only annually, and may not address solid waste policy issues.[81] Finally, given the regulatory nature of the organization, most of. its reports on solid waste are technical in nature, and may be difficult for non-experts to understand.

By contrast, MassRecycle's expertise lies in local government and public outreach. It consists of a core group of over 50 volunteers. The organization holds monthly education meetings, publishes a newsletter, holds forums, and conducts annual conferences and exhibits, all under the rubric of promoting MSW reduction and

recycling at the community level. Its biggest drawback is a lack of full-time staff. Since it is staffed by volunteers and lacks permanent office facilities, responding to requests for information on a daily basis may be problematic (see below).

External Operating Environment: The organization with a good rapport in dealing with municipal officials and other members of the policy community (business leaders, municipal decision makers, and citizens) will be favored.

Our research has shown that communities have varying impressions of DEP. Some do not feel that DEP provides enough technical support to accompany its regulations. In our interviews, municipalities expressed an unwillingness to go to DEP with problems and difficulties. Still others find DEP staff turnover a barrier to developing a long-term relationship with the organization. Overall, municipalities feel that DEP may not be as aware of their problems and concerns as it ought to be.

MassRecycle is a better candidate. Since 1989, when it was started, MassRecycle has developed a reputation for working directly with local governments and understanding their perspectives on MSW issues. This volunteer organization will be better able to build working relationships with municipal officials if its organizational capacity is improved and if municipalities become aware of its existence. Its membership includes representatives from industry, citizen, government, and nonprofit groups, bringing a diversity of opinion to understanding solid waste issues. Because of this diversity, MassRecycle is well respected throughout the policy community.

2. Bolstering MassRecycle's Internal Capacity

The previous analysis shows that for two criteria-mission and external operating environment MassRecycle is the preferred organization to carry out our educational recommendations. However, regarding its internal capacity, MassRecycle has four key weaknesses: personnel, office facilities, marketing, and long-term viability. We suggest that before EOEA commits to any cooperative arrangement with

MassRecycle to provide unit pricing support services, it should consider how to help bolster the organization in the following ways:

Personnel:

- MassRecycle should hire at least one full-time staff member with expertise in unit pricing to manage the central office on a daily basis.

Office Facilities:

- MassRecycle should have a fully equipped office with phones, facsimile, copying machine and computers.
- This office should be centrally located, perhaps in Boston, to promote interaction with DEP, EOEA, MMA, and other organizations.

Marketing:

- MassRecycle should distribute literature to every municipality statewide to introduce unit pricing and promote its unit pricing services.

Long Term Viability:

- MassRecycle should have adequate funding (perhaps from EOEA or an EPA grant) to provide 3+ years of ongoing support to municipalities as they deliberate and begin to implement unit pricing programs.
- MassRecycle's contract for any unit support services should contain an option for renewal on an annual basis.

VI. RECOMMENDATIONS AND ACTION PLAN

In the previous chapter, we evaluated options and organizations that EOEA could leverage to promote widespread use of unit pricing within the Commonwealth. For educational options without a clear implementer, we also assessed the strengths of possible implementing organizations.

Options that received overall scores of ✓ or ✓ + form the basis of our recommendations. Below, we summarize these as an action plan that lists specific actions EOEA should take to help municipalities promote unit pricing as they move through the agenda setting, passage, and implementation stages. We also show the preferred deliverer for each action-either DEP or MassRecycle. Secondary recommendations that were not specifically evaluated against our criteria are printed in italics.

Step One-Placing Unit Pricing on the Agenda

- DEP
  - -- Compile and publicize municipal rankings on recycling rates
  - -- Consider recycling rates in awarding recycling grants

Step Two -Facilitating Passage of Unit Pricing

- DEP
  - -- Consider enterprise funds and unit pricing in awarding recycling grants
  - -- *Promote unit pricing and enterprise funds during routine seminars*
  - -- *Make unit pricing information developed by MassRecycle available during routine seminars and upon request from municipal officials*
  - -- *Publicize unit pricing seminars offered by MassRecycle*
- MassRecycle
  - -- Facilitate peer matching to link municipal officials with counterparts who have addressed passage concerns
  - -- Provide fact sheets and data to help municipalities resolve misperceptions about unit pricing

- -- Host seminars to present general overview of benefits and side effects of unit pricing
- -- Provide educational materials or seminars on enterprise.

Step Three-Successfully Implementing Unit Pricing

- DEP
  - -- *Publicize unit pricing assistance services offered by MassRecycle in routine correspondence to municipal officials*
  - -- *Familiarize all relevant DEP staff in Boston and regional offices with MassRecycle's role in promoting unit pricing*
  - -- *Meet regularly with MassRecycle to ensure clear communications and common purpose in promoting unit pricing*
- MassRecycle
  - -- Facilitate peer matching to link municipal officials wit their counterparts who have addressed implementation concerns
  - -- Provide fact sheets with case studies and data to help municipalities overcome specific implementation problems
  - -- Prepare unit pricing manual that addresses specific implementation concerns of Massachusetts communities
  - -- Host seminars to present specific solutions to implementation challenges
  - -- Prepare public relations guidelines and a prototype strategy to help communities overcome customer resistance and confusion

Our findings show that promoting unit pricing programs in Massachusetts makes sense. The question is how to do it. These recommendations offer EOEA a workable, three-step process that does not attempt "too much too fast" and considers the unique needs of each community. They should help move the Commonwealth toward more proactive, efficient, and equitable MSW management.

APPENDICES

Appendix A

Research Methodology and Selected Data on Respondents

For this report, we sought information from the people responsible for MSW programs across the Commonwealth: public works directors, selectmen, members of boards of health, city managers, and other relevant decision makers. Our primary tool was a mail survey sent in November 1992 to the lead MSW official in each of Massachusetts' 351 municipalities. DEP records served to identify these lead officials.

The survey consisted of three parts. The first section, intended for all respondents, asked questions on the structure of MSW collection services and percentages of MSW handled through recycling, composting, and disposal. Respondents whose municipalities finance their primary MSW services through unit pricing were asked to complete the second section. This section asked about their unit-pricing program in detail, the circumstances influencing its adoption, their experiences under the program, and any technical or other assistance they would find or had found useful concerning unit pricing. More typical respondents, whose municipalities finance MSW services through general tax revenues or flat user fees, were asked to complete the third section. This section asked about the extent to which they had considered unit pricing, their concerns during any unit pricing debate, experiences under any former unit pricing program, and any technical or other assistance they would find or had found useful on the subject The survey form follows in Appendix B

We received 156 responses (44%). Table A-1 describes the 34 respondents who reported using unit pricing. Table A-2 describes the 114 respondents who reported non-unit-pricing financing, and the eight with unknown financing types.

Because the Commonwealth's municipalities are so diverse, we wanted to analyze trends in unit pricing attitudes or experiences that seem linked to demographic characteristics. To facilitate this analysis, we categorized the municipalities by two key

demographic characteristics likely to influence the adoption and success of unit pricing: degree of urbanness and income.

Our first categorization was based on a classification scheme developed in 1985 by the Massachusetts Department of Education.[82] This scheme assigns municipalities to one of seven categories based on an elaborate statistical technique using 15 socioeconomic and demographic variables. The seven categories are (1) urbanized centers, (2) economically developed suburbs, (3) growth communities, (4) residential suburbs, (5) rural economic centers, (6) small rural communities, and (7) resort/ retirement and artistic communities. To simplify our analysis, we redefined category one as "urban," two through four as "suburban," and five through seven as "rural."

In addition, we used Massachusetts Department of Revenue 1989 per-capita income information to categorize municipalities as either high- or low-income compared to the statewide average. Using such a rough scale of household income no doubt masked important economic features. For instance, a primarily "blue collar" municipality may have a relatively high per-capita income due to a relatively small percentage of wealthy "outliers." However, current income statistics by percentiles were not readily available, and their use would have unnecessarily complicated our analysis. We believe that our approach, though somewhat simplistic, is sufficient to reveal any basic influences of income on unit pricing attitudes and experience.

To draw conclusions on the impacts of demographic attributes, however, required that our data include municipalities from each "cell" defined by these characteristics: (1) urban, suburban, or rural; (2) high or low income; and (3) currently using unit pricing or not. Unfortunately, the survey responses did not sufficiently cover all 12 cells, most particularly the cell of high-income, urban municipalities that use unit pricing-because few such municipalities exist in the Commonwealth. Therefore, we supplemented our survey data through on-site and telephone interviews with officials representing municipalities from all twelve cells (including some who did return our

survey). These interviews also added personal insights that the survey could convey. Table A-3 lists our major municipal interview subjects by degree of urbanness, income, and use of unit pricing.

Table A-1—Survey Respondents Reporting Use of Unit Pricing Programs, with Descriptive and Demographic Information

				Unit pricing program type						Plus...	
Municipality	Category	1990 pop	1989 inc per cap	Tag/ stk	Pre-prnt bag	Sub can	Per-vhcl fee	Vhcl wht	Std unit fee	Tax	Flat fee
Amherst	Suburban	35,228	$11,144			x					
Ashburnham	Rural	5,433	$15,595		x				$1.50		
Athol	Rural	11,451	$12,444		x				$1.00		
Belchertown	Suburban	10,579	$15,493		x				$1.10		x
Boxford	Suburban	6,266	$30,634	x					$0.70		
Brimfield	Rural	3,001	$13,563		x						
Clinton	Urban	13,222	$15,328	x					$0.75		
Concord	Suburban	17,076	$31,655		x	x		x	$1.75		
Gill	Rural	1,583	$14,329	x							
Gloucester	Urban	28,716	$16,044	x					$1.00		
Halifax	Rural	6,526	$15,233	x	x				$1.00		
Hardwick	Rural	2,385	$13,387	x			x		$1.00		
Hatfield	Rural	3,184	$17,713	x					$2.00		x
Hudson	Suburban	17,233	$18,327				x				
Mendon	Suburban	4,010	$19,823	x					$1.25		
Millis	Suburban	7,613	$20,241		x						
Milton	Suburban	25,725	$22,444	x		x			$1.50	x	
Montague	Rural	8,316	$13,491	x		x	x				x
Norfolk	Suburban	9,270	$19,044	x					$1.35		x
North Adams	Urban	16,797	$10,963		x						x
North Reading	Suburban	12,002	$19,100	x							
Northampton	Urban	29,289	$14,623	x					$1.00		
Palmer	Rural	12,054	$14,648	x					$1.00		
Pelham	Suburban	1,373	$19,640			x				x	
Petersham	Rural	1,131	$17,542	x					$1.00		
Russell	Rural	1,594	$14,209		x				$1.00		x
Salisbury	Suburban	6,882	$14,455	x			x		$0.80		
Shelburne	Rural	2,012	$13,378		x				$1.00		
Tisbury	Rural	3,120	$17,107	x							
Ware	Rural	9,808	$13,082	x					$1.00		x
Wendell	Suburban	899	$11,990	x					$0.50		
Wilbraham	Suburban	12,635	$21,748	x					$0.60		x
Williamstown	Rural	8,220	$14,728	x	x				$1.50		x
Worthington	Rural	1,156	$17,745	x					$1.00		x

Key to abbreviations for unit pricing program types: tags/sticker, pre-printed bag, subscription can, per-vehicle fee, vehicle weight (see Appendix F for descriptions). Standard unit fee refers to the fee charged for a 30-gallon bag of trash, or equivalent. "Plus..." columns indicate municipality finances its MSW program through tax revenues and/or flat user fees in addition to unit fees.

Table A-2-Survey Respondents Reporting Tax and/or Flat Fee MSW Financing, or with Unknown Financing, with Descriptive and Demographic Information

Municipality	Category	1990 pop	1989 inc per cap	Tax	Flat fee	Unknown	Extent considered unit pricing[a]
Agawam	Suburban	27,323	$16,111	x			CR
Afford	Rural	418	$24,613	x	x		NC
Amesbury	Rural	14,997	$15,423	x			NC
Andover	Suburban	29,151	$26,327	x			CR
Auburn	Suburban	15,005	$17,500				CR
Ayer	Urban	6,871	$14,586	x	x		CC
Barre	Rural	4,546	$14,012	x	x		CC
Belmont	Suburban	24,720	$26,793	x			NC
Berlin	Suburban	2,293	$19,118	x	x		NC
Beverly	Suburban	38,195	$18,436		x		NC
Billerica	Suburban	37,609	$16,395	x			CR
Boston	Urban	574,283	$15,581	x			CR
Bourne	Suburban	16,064	$14,962	x	x		
Brewster	Rural	8,440	$16,552		x		CR
Brookline	Suburban	54,718	$29,044	x	x		CR
Buckland	Rural	1,928	$14,508	x			CC
Canton	Suburban	18,530	$22,035	x			CR
Chatham	Rural	6,579	$18,471		x		
Chelmsford	Suburban	32,383	$21,814	x			AR
Chicopee	Urban	56,632	$13,525	x			NC
Cohasset	Suburban	7,075	$31,166	x	x		NC
Dalton	Rural	7,155	$17,061	x			NC
Danvers	Suburban	24,174	$18,776	x			NC
Dartmouth	Suburban	27,244	$15,389			x	
Dedham	Suburban	23,782	$19,045	x			NC
Dennis	Rural	13,864	$15,436	x	x		
Dighton	Rural	5,631	$15,479	x	x		CC
Douglas	Rural	5,438	$14,660		x		NC
Dracut	Suburban	25,594	$16,508	x			CR
Duxbury	Suburban	13,895	$24,770		x		NC
Eastham	Rural	4,462	$16,004	x			
Easthampton	Rural	15,537	$15,193		x		NC
Egremont	Rural	1,229	$17,752		x		NC
Essex	Rural	3,260	$19,211	x			CR
Fairhaven	Urban	16,132	$13,114	x			CR
Fall River	Urban	92,703	$10,966	x			
Fitchburg	Urban	41,194	$12,140	x			
Framingham	Suburban	64,989	$20,407	x			CR
Freetown	Suburban	8,522	$15,603		x		
Grafton	Suburban	13,035	$17,313	x			NC
Greenfield	Urban	18,666	$13,693	x			CR

Table A-2 Continued

Municipality	Category	1990 pop	1989 inc per cap	Tax	Flat fee	Unknown	Extent considered unit pricing[a]
Hanover	Suburban	11,912	$17,789	x			NC
Harvard	Suburban	12,329	$17,937	x	x		CC
Haverhill	Urban	51,418	$15,464	x			NC
Hingham	Suburban	19,821	$25,726	x			CC
Holbrook	Suburban	11,041	$15,469	x			CC
Holland	Rural	2,185	$14,471		x		NC
Holliston	Suburban	12,926	$21,225	x	x		NC
Holyoke	Urban	43,704	$11,088	x			CR
Ipswich	Rural	11,873	$20,175			x	
Kingston	Suburban	9,045	$16,647	x	x		NC
Lancaster	Suburban	6,661	$14,619		x		AR
Lawrence	Urban	70,207	$9,686	x			CR
Leicester	Rural	10,191	$15,806			x	
Leominster	Urban	38,145	$15,960	x			NC
Lexington	Suburban	28,974	$30,718	x			CR
Leyden	Rural	662	$13,678		x		CC
Littleton	Suburban	7,051	$19,560		x		NC
Lynn	Urban	81,245	$13,026			x	CR
Malden	Urban	53,884	$15,820	x			CR
Manchester	Suburban	5,286	$29,417			x	
Marion	Suburban	4,496	$21,876	x			NC
Marlborough	Suburban	31,813	$18,471	x			NC
Mashpee	Suburban	7,884	$14,526	x	x		NC
Mattapoisett	Suburban	5,850	$19,955			x	
Maynard	Urban	10,325	$19,202	x			CC
Medford	Urban	57,407	$16,941	x			CC
Melrose	Suburban	28,150	$20,202	x			CR
Merrimac	Rural	5,166	$16,327	x	x		CR
Middleton	Suburban	4,921	$19,933	x	x		NC
Millbury	Rural	12,228	$15,474		x		NC
Monroe	Rural	115	$12,225	x			
Nantucket	Rural	6,012	$20,591		x		CC
Natick	Suburban	30,510	$22,176	x			CR
Needham	Suburban	27,557	$27,935	x	x		CC
New Bedford	Urban	99,922	$10,923	x			CC
New Braintree	Rural	881	$15,409		x		NC
New Salem	Rural	802	$14,762		x		NC
Newton	Suburban	82,585	$28,840	x			NC
North Andover	Suburban	22,792	$22,957	x			CR
Oxford	Rural	12,588	$14,337	x			CC
Peabody	Suburban	47,039	$17,002	x			NC
Pepperell	Rural	10,098	$17,374	x	x		NC

Table A-2 Continued

Municipality	Category	1990 pop	1989 inc per cap	Tax	Flat fee	Unknown	Extent considered unit pricing[a]
Pittsfield	Urban	48,622	$15,426	x			CR
Princeton	Suburban	3,189	$21,386		x		NC
Quincy	Urban	84,985	$17,436			x	
Rochester	Suburban	3,921	$15,807	x			CR
Rockport	Rural	7,482	$19,882	x	x		CR
Rowe	Rural	378	$15,352	x			CR
Sandisfield	Rural	667	$13,745	x			CR
Scituate	Suburban	16,786	$22,156	x			NC
Seekonk	Suburban	13,046	$17,345		x		CC
Shrewsbury	Suburban	24,146	$20,508	x			NC
Somerville	Urban	76,210	$15,179	x			CR
Southbridge	Urban	17,816	$12,924	x			
Spencer	Rural	11,645	$14,222	x	x		CC
Stockbridge	Rural	2,408	$18,215	x			NC
Stoneham	Suburban	22,203	$18,220	x			NC
Stow	Suburban	5,328	$25,244		x		NC
Sudbury	Suburban	14,358	$33,441		x		CC
Swampscott	Suburban	13,650	$25,576	x			
Swansea	Suburban	15,411	$15,100	x			CR
Tewksbury	Suburban	27,266	$18,224	x			CR
Uxbridge	Rural	10,415	$16,531		x		CC
Wakefield	Suburban	24,825	$19,009	x			CR
Waltham	Urban	57,878	$16,777	x			
Warwick	Rural	740	$12,181		x		
Watertown	Urban	33,284	$20,382	x			CR
Wayland	Suburban	11,874	$34,646		x		NC
Webster	Urban	16,196	$14,624			x	
Wellesley	Suburban	26,615	$32,253	x			CC
Wellfleet	Rural	2,493	$14,581		x		
West Boylston	Suburban	6,611	$17,416	x			CR
West Springfield	Urban	27,537	$15,905				NC
Westborough	Suburban	14,133	$20,922	x	x		CR
Westfield	Urban	38,372	$14,225	x			CR
Westford	Suburban	16,392	$21,878		x		CR
Westminster	Suburban	6,191	$16,798	x			NC
Westwood	Suburban	12,557	$26,241	x			NC
Weymouth	Suburban	54,063	$18,392	x			NC
Wrentham	Rural	9,006	$15,856	x			CC
Yarmouth	Suburban	21,174	$15,042		x		CC

[a] Key to entries under extent considered unit pricing: AR =adopted but later repealed, CC = currently under consideration, CR= considered but rejected, NC= never considered.

Table A-3—Interviewees by Demographic and MSW Financing Categories

	Urban	Suburban	Rural
High Income:			
Unit pricing	n/a	Milton Wilbraham	Hatfield
No unit pricing	Cambridge	Wellesley	Rockport
Low Income:			
Unit pricing	Gloucester North Adams	Salisbury	Williamstown
No unit pricing	Brockton	Swansea	Wrentham

Appendix B

Survey Form

SECTION A. GENERAL INFORMATION

Please return completed survey in the enclosed, self-addressed envelope, or mail to:
Henry Lee
Executive Director, Environment and Natural Resources Program
John F. Kennedy School of Government, Harvard University
79 John F. Kennedy Street, Room B-302
Cambridge, MA 02138
ATTN: MASSACHUSETTS MSW SURVEY

FEEL FREE TO USE THE MARGINS AND BACKS OF PAGES TO ELABORATE ON ANY ANSWER.

Part 1. Municipal Identification and MSW Management Contact

1. Name of municipality: _____

2. Designated municipal solid waste (MSW) management contact:

   Name: _____

   Title: _____

   Organization: _____

   Building, Suite, Box: _____

   Street: _____

   City, State, Zip: _____

   Telephone: ( ) _____

   Fax: ( ) _____

3. Would you be willing to speak to us in more detail about your solid waste program? ❑ yes ❑ no

Part 2. Current MSW Management Conditions

1. How much MSW did your municipality generate in 1991 (or in the most recent year for which data exist)?

   Tons: _____ Year: _____

2. Please indicate who collects each waste stream component in your municipality by checking the appropriate boxes. If this table cannot accommodate some aspect of your collection system, please explain in the following space.

	COMPONENT OF WASTE STREAM				
COLLECTION PROVIDER	Mixed Waste (trash)	Recyclables	Yard Waste	Bulk Trash (furniture)	White Goods (appliances)
Municipality					
Munic'ly Contracted Private Firm(s)					
Customer Contracted Private Firm(s)					
Self-Hauled					

SECTION A. GENERAL INFORMATION

Additional explanation of collection system (if necessary):

_____

_____

_____

_____

3. For each component of the waste stream collected at curbside, please indicate the collection frequency. Or, where appropriate, please indicate the days and hours that dropoff centers are open for customers to bring any self-hauled wastes (e.g., Saturdays 10 am-3 pm).

Component of Waste Stream	Customer Collection Frequency	Dropoff Days and Hours
Mixed Waste (trash)	_____ times per _____	
Recyclables	_____ times per _____	
Yard Waste	_____ times per _____	
Bulk Trash (furniture)	_____ times per _____	
White Goods (appliances)	_____ times per _____	

4. In your recycling program (if applicable), which materials do you collect at curbside, and which are accepted at a dropoff center? Please check and circle all that apply.

- ❑ Curbside (*circle:* glass, newspaper, cans, plastics, other _____)
- ❑ Dropoff (*circle:* glass, newspaper, cans, plastics, other _____)
- ❑ No recycling program

5. How does your municipality currently dispose of its MSW? Please give the approximate percentages disposed of through each method and the year for which these figures apply.

_____ % Recycled

_____ % Composted

_____ % Other, please explain _____

_____ % Incinerated

_____ % Landfilled

Year for which disposal percentages apply: _____

If you are unsure about how or where your solid waste is disposed, please explain:

_____

_____

WHERE SHOULD YOU GO FROM HERE?

- **Municipalities *currently using any unit pricing system (i.e., charging a per-bag or other variable fee) for mixed waste (trash)* should continue with (GREEN) "Section B. Municipalities Using Any Form of Unit Pricing for Mixed Waste."**
- **Municipalities *not currently using any unit pricing system for mixed waste* should continue with (BLUE) "Section C. Municipalities Not Using Unit Pricing for Mixed Waste."**

SECTION B. MUNICIPALITIES USING ANY FORM OF UNIT PRICING FOR MIXED WASTE

Part 1. Unit Pricing Program Structure

1. Please indicate the types of unit pricing programs used in your municipality (regardless of hauler) for each waste stream component by checking the appropriate boxes.

	COMPONENT OF WASTE STREAM				
UNIT PRICING PROGRAM TYPE	Mixed Waste (trash)	Recyclables	Yard Waste	Bulk Trash (furniture)	White Goods (appliances)
Tags/Stickers on Bags					
Pre-Printed Bags					
Subscription Can or Dumpster					
Per Truck- or Carload Fee at MSW Facility					
Weigh Truck or Car at MSW Facility					

If this table does not closely match one or more of your unit pricing programs, please explain.

_____

_____

_____

2. Please indicate the prices your municipality charges for a unit of each waste stream component, and define the unit size by its related volume or weight. If you offer more than one unit size, please list each separately. Ignore waste stream components not financed by unit pricing.

Component of Waste Stream	Price(s) Per Unit	Related Volume(s)/Weight(s)
Mixed Waste (trash)		
Recyclables		
Yard Waste		
Bulk Trash (furniture)		
White Goods (appliances)		

3. For any subscription can program, how do customers sign up for, and change, their service level?

_____

_____

_____

How frequently are cans collected under your subscription can program? _____

How are subscription can accounts maintained and bills distributed?

- ❑ Through a separate accounting and billing system
- ❑ As part of another utility accounting and billing system (please explain)

_____

_____

SECTION B. MUNICIPALITIES USING ANY FORM OF UNIT PRICING FOR MIXED WASTE

4. For a tag/sticker or pre-printed bag program (either as the primary program or supplementing a subscription can program), where are these items sold? Please check all that apply.

- ❑ At retail outlets in community
- ❑ At town/city hall
- ❑ At public works department
- ❑ Other _____

5. For customer dropoff at transfer station, landfill or incinerator (where volume- or weight-based fees are *not* pre-paid through tags/stickers or pre-printed bags), how are fees collected?

- ❑ Collected on site (e.g., punch card, cash) _____
- ❑ Periodic billing (please explain) _____

Part 2. Adoption of Unit Pricing Program

1. When was your unit pricing program adopted? _____

2. How strongly did each of these reasons influence your municipality to adopt unit pricing? Please try to reflect the positions of all key parties to the decision (e.g., citizens, elected officials, environmental groups, solid waste managers).

Reason	Influence in decision to adopt unit pricing					
		Low		Mid		High
Impending landfill or incinerator closure	None	1	2	3	4	5
Increasing tipping fees	None	1	2	3	4	5
Desire to shift costs out of tax base	None	1	2	3	4	5
Desire to encouraging recycling	None	1	2	3	4	5
Desire to subsidize recycling program	None	1	2	3	4	5
Public opposition to siting new disposal facility	None	1	2	3	4	5
Other _____	None	1	2	3	4	5
Other _____	None	1	2	3	4	5

3. How long did your municipality debate unit pricing before its adoption? _____

4. How strongly was your municipality concerned about each of the following potential problems *before* initiating unit pricing? Again, please try to reflect concerns of all key parties.

Problem	Degree of concern during unit pricing debate					
		Low		Mid		High
Selecting most appropriate system structure	None	1	2	3	4	5
Difficulty in determining proper unit rates	None	1	2	3	4	5
Increased illegal dumping	None	1	2	3	4	5
Developing approach for multifamily housing	None	1	2	3	4	5
Customer confusion with a new system	None	1	2	3	4	5
Customer resistance to loss of "free" trash service	None	1	2	3	4	5
Addressing needs of low income customers	None	1	2	3	4	5
Local government resistance to change	None	1	2	3	4	5
Unit fee revenues not covering costs	None	1	2	3	4	5
Other _____	None	1	2	3	4	5
Other _____	None	1	2	3	4	5

SECTION B. MUNICIPALITIES USING ANY FORM OF UNIT PRICING FOR MIXED WASTE

Part 3. Experience under Unit Pricing Program

1. In Part 2, we asked questions about your concerns *prior* to implementing unit pricing. Now, we would like to ask you about your actual *experiences* under unit pricing. Please indicate how seriously each of the following problems affected (or does affect) your unit pricing program.

	Significance of Problem in Actual Experience					
Problem		**Low**		**Mid**		**High**
Selecting most appropriate system structure	None	1	2	3	4	5
Difficulty in determining proper unit rates	None	1	2	3	4	5
Increased illegal dumping	None	1	2	3	4	5
Developing approach for multifamily housing	None	1	2	3	4	5
Customer confusion with a new system	None	1	2	3	4	5
Customer resistance to loss of "free" trash service	None	1	2	3	4	5
Addressing needs of low income/elderly customers	None	1	2	3	4	5
Local government resistance to change	None	1	2	3	4	5
Unit fee revenues not covering costs	None	1	2	3	4	5
Other _____	None	1	2	3	4	5
Other _____	None	1	2	3	4	5

2. Please describe why your municipality chose its particular unit pricing program type(s) (e.g., tag/sticker, subscription can), and what other types were considered.

_____

_____

Where did your municipality get information on unit pricing program types (e.g., available options, other communities' experiences)? Was it hard to get?

_____

_____

3. Why did your municipality choose its particular unit fee rate structure? Check all that apply.

❑ Most customers would pay ❑ To cover projected costs ❑ To encourage waste reduction

❑ Based on other communities' rates ❑ Other _____

Do you have MSW cost data? ❑ yes ❑ no Did you use it to set unit fee rates? ❑ yes ❑ no

Did you reduce property taxes or flat user fees to offset the new unit charges? ❑ yes ❑ no

If no, why not? _____

Were you aware of any rate setting aids (guidance, seminars, spreadsheets)? ❑ yes ❑ no

Did you use any of these aids? ❑ yes ❑ no If yes, explain; if no, why not? _____

_____

Did your original unit fee rates meet your desired objectives? ❑ yes ❑ no Please explain.

_____

4. Did your municipality enact any of the following measures *concurrent* with implementing unit pricing to prevent potential increases in illegal dumping? Check all that apply.

❑ New or strengthened littering ordinances ❑ Increased enforcement

❑ Other (e.g., locking dumpsters) _____

SECTION B. MUNICIPALITIES USING ANY FORM OF UNIT PRICING FOR MIXED WASTE

If you *did* enact such measures concurrent with unit pricing, did these prevent noticeable increases in illegal dumping? ❑ yes ❑ no If you *did not* enact them concurrent with unit pricing, did illegal dumping noticeably increase? ❑ yes ❑ no If it did increase noticeably, did you *later* enact any such measures (check all below). Did they help? ❑ yes ❑ no

❑ New or strengthened littering ordinances ❑ Increased enforcement

❑ Other (e.g., locking dumpsters) _____

If you enacted any of these measures (regardless of the timing), how did you learn about them (e.g., through model ordinances)? _____

5. Are multifamily buildings exempted from unit pricing? ❑ yes ❑ no Explain _____

What measures, if any, have you used to implement unit pricing in multifamily buildings?

_____

_____

How did you learn about these measures? _____

Have these measures been successful? ❑ yes ❑ no

6. Does your unit pricing program offer discounts/exemptions? Check all that apply and explain.

❑ Elderly _____ ❑ Low income _____

❑ Other _____

7. If applicable, what types of *public* resistance did your municipality face in implementing unit pricing (e.g., to losing "free" service or to purchasing special bags or tags)?

_____

_____

How did you address these concerns (e.g., town meetings, ad campaigns)? _____

_____

If applicable, what types of resistance *within your local government* did you face in implementing unit pricing (e.g., to changing billing procedures or expanding responsibilities)?

_____

_____

How did you address these concerns (e.g., hiring new personnel, offering training)? _____

_____

8. If applicable, what kinds (topics, formats) of unit pricing technical assistance *did you receive* from Massachusetts DEP? How were they helpful or not helpful?

_____

_____

9. What kinds (topics, formats) of DEP unit pricing technical assistance would you *like to receive*?

_____

_____

SECTION C. MUNICIPALITIES NOT USING UNIT PRICING FOR MIXED WASTE

Part 1. Current Solid Waste Management Program Financing

1. Please check the appropriate box(es) to indicate how customers pay for collection and disposal of each portion of the waste stream—either through flat user fees or property taxes. If you use either method to finance *all* solid waste programs, please check in the first row only. Waste stream components financed through unit pricing should be addressed in Question 2 (below).

Component of Waste Stream	Flat User Fee	General Tax Revenues
All Components		
Mixed Waste (trash)		
Recyclables		
Yard Waste		
Bulk Trash (furniture)		
White Goods (appliances)		

2. If your municipality uses unit pricing for any waste stream component other than mixed waste (trash), please explain the mechanism (e.g., $1 sticker per bag of yard waste).

_____

_____

Part 2. Consideration of Unit Pricing for Mixed Waste

1. To what extent has your community considered implementing unit pricing for mixed waste?
   - ❑ Never considered **(go to Question 6)**
   - ❑ Considered but rejected
   - ❑ Currently under consideration
   - ❑ Adopted but later repealed

2. If applicable, what *type* of unit pricing program was/is being considered, or was implemented?

_____

_____

3. How strongly was your municipality concerned about each of the following potential problems *while considering* unit pricing? Please try to reflect the positions of all key parties to the decision (e.g., citizens, elected officials, environmental groups, solid waste managers).

	Degree of concern during unit pricing debate					
		Low		Mid		High
Problem						
Selecting most appropriate system structure	None	1	2	3	4	5
Difficulty in determining proper unit rates	None	1	2	3	4	5
Increased illegal dumping	None	1	2	3	4	5
Developing approach for multifamily housing	None	1	2	3	4	5
Customer confusion with a new system	None	1	2	3	4	5
Customer resistance to loss of "free" trash service	None	1	2	3	4	5
Addressing needs of low income customers	None	1	2	3	4	5
Local government resistance to change	None	1	2	3	4	5
Unit fee revenues not covering costs	None	1	2	3	4	5
Other _____	None	1	2	3	4	5
Other _____	None	1	2	3	4	5

SECTION C. MUNICIPALITIES NOT USING UNIT PRICING FOR MIXED WASTE

4. If applicable, what kinds (topics, formats) of unit pricing technical assistance *did you receive* from Massachusetts DEP while considering unit pricing? How were they helpful or not helpful?

_____

_____

5. What kinds (topics, formats) of technical assistance would you *have liked to receive* from DEP while considering unit pricing?

_____

_____

6. For municipalities that have never considered unit pricing, what kinds (topics, formats) of DEP technical assistance would help to better acquaint you with unit pricing and its potential uses in MSW management?

_____

_____

If your municipality at one time adopted some form of unit pricing system for mixed waste, but later repealed it, please complete the next part below.

Part 3. Experience with Unit Pricing Program (Later Repealed)

1. How long was your municipality's unit pricing program in place? _____

2. To what extent did each of the following problems experienced *while your unit pricing system was in place* cause your municipality to repeal unit pricing? Please try to reflect the positions of all key parties to the decision (e.g., citizens, elected officials, environmental groups, solid waste managers).

Problem	Importance in decision to repeal unit pricing				
	Low		Mid		High
Selecting most appropriate system structure	None	1	2	3	4	5
Difficulty in determining proper unit rates	None	1	2	3	4	5
Increased illegal dumping	None	1	2	3	4	5
Developing approach for multifamily housing	None	1	2	3	4	5
Customer confusion with a new system	None	1	2	3	4	5
Customer resistance to loss of "free" trash service	None	1	2	3	4	5
Addressing needs of low income customers	None	1	2	3	4	5
Local government resistance to change	None	1	2	3	4	5
Unit fee revenues not covering costs	None	1	2	3	4	5
Other _____	None	1	2	3	4	5
Other _____	None	1	2	3	4	5

To avoid repeating questions printed elsewhere, communities that had and later repealed unit pricing for mixed waste should continue with "Part 3. Experience under Unit Pricing Program," in (GREEN) "Section B. Municipalities Using Any Form of Unit Pricing for Mixed Waste."

Appendix C

Top Three Prioritized Concerns Before Implementing Unit Pricing, and Subsequent Importance During Implementation, for Massachusetts Municipalities by Demographic Category

The following table ranks the three greatest pre-implementation concerns of survey respondents from five demographic categories that adopted unit pricing, and indicates how they evaluated these concerns as actual problems during unit pricing implementation. Communities rated these issues on a scale from 0 to 5, with higher numbers indicating greater concern. See Appendix A for definitions of the demographic categories.

Table C-1—Top Three Prioritized Concerns Before Implementing Unit Pricing, and Subsequent Importance During Implementation, for Massachusetts Municipalities by Demographic Category

Concern	Avg. rating before implementation[a]	Avg. rating during implementation[a]
Low-income municipalities:		
Customer resistance to loss of "free" trash service	3.222 (n = 18)	2.250 (n = 16)
Selecting most appropriate system structure	3.222 (n = 18)	1.938 (n = 16)
Increased illegal dumping	3.111 (n = 18)	1.750 (n = 16)
High-income municipalities:		
Selecting most appropriate system structure	3.167 (n = 12)	2.909 (n = 11)
Unit fee revenues not covering costs	3.167 (n = 12)	2.818 (n = 11)
Customer confusion	3.000 (n = 12)	3.083 (n = 12)
Urban municipalities:		
Selecting most appropriate system structure	3.667 (n = 3)	1.667 (n = 3)
Customer loss of "free" trash service	3.333 (n = 3)	2.333 (n = 3)
Customer confusion	3.000 (n = 3)	2.333 (n = 3)
Suburban municipalities:		
Selecting most appropriate system structure	3.615 (n = 13)	3.167 (n = 12)
Increased illegal dumping	3.308 (n = 13)	2.231 (n = 13)
Difficulty in determining proper unit rates	3.308 (n = 13)	2.667 (n = 12)
Rural municipalities:		
Customer resistance to loss of "free" trash service	3.143 (n = 14)	1.917 (n = 12)
Customer confusion	2.786 (n = 14)	1.917 (n = 12)
Increased illegal dumping	2.714 (n = 14)	1.500 (n = 12)

[a]Respondents could rate the importance of each concern/problem as "none" or on a 1-5 scale, with 1 indicating "low" importance and 5 "high" importance. "None" was coded as a 0 to calculate the averages. "n" refers to the number of respondents who answered the question.

Appendix D

Types of Unit Pricing Programs Used by Survey Respondents

Table D-1—Types of Unit Pricing Programs Used by Survey Respondents

Unit pricing program type	Frequency[a]
Stickers on bags	22
Pre-printed bags	11
Subscription cans	5
Per-vehicle fee	4
Per vehicle weight	1
Punch card per bag	1

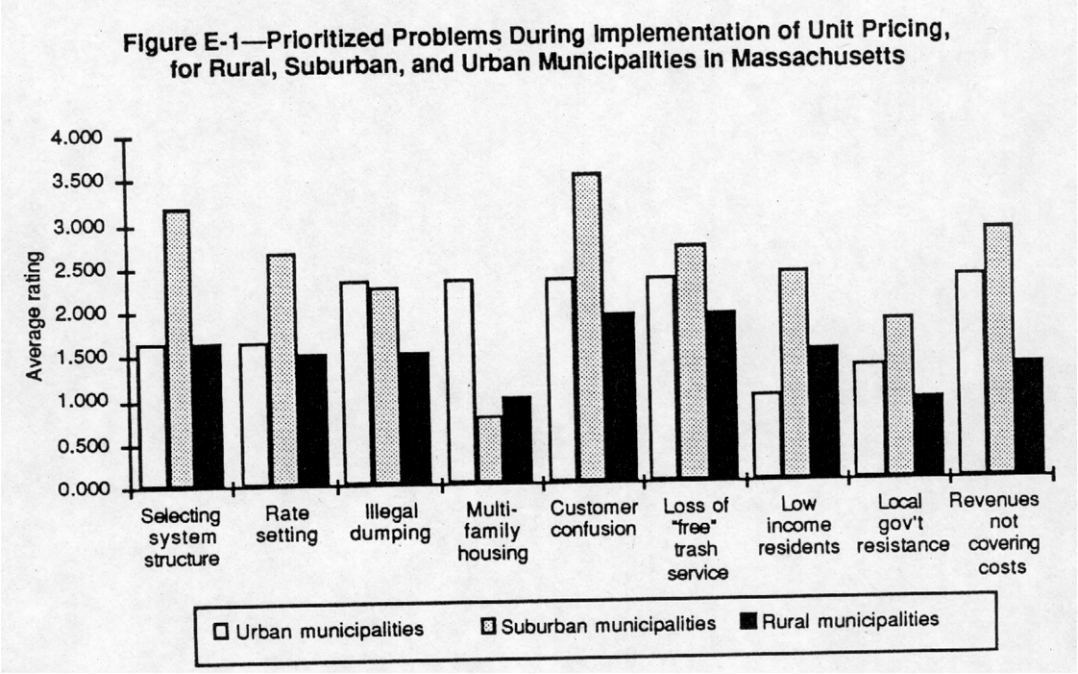
[a] Numbers do not sum to 34 (the total number of survey respondents reporting unit pricing programs) because several municipalities use a combination of program types.

Appendix E

Demographic Differences in Experiences with Unit Pricing Reported by Massachusetts Municipalities

Our survey data suggest that rural communities in Massachusetts have experienced significantly fewer problems with unit pricing than have urban communities, while suburban communities have experienced the most In contrast, neither high- nor low-income communities' experiences with unit pricing revealed any significant differences. Below we elaborate on these differences in detail.

A. Differences by Degree of Urbanness



1. Rural Communities

The 16 rural communities in Massachusetts with unit pricing programs generally experienced better success than have their suburban or urban counterparts. Of the three community types, rural towns attributed the least significance to six of the nine problems commonly associated with unit pricing.

There are several reasons for rural communities' success. First, in small, rural towns, unit pricing advocates can easily provide comprehensive education to overcome residents' confusion and resistance to change. Second, despite the many back roads, illegal dumping has not frequently occurred in close-knit communities. While they have strict illegal dumping ordinances, small towns like Hatfield "have not [found them] necessary since "everyone knows each other."[83] Lastly, unlike larger communities, rural towns usually do not offer curbside trash collection. Without added collection costs, rural towns can more easily set rates that fully cover their MSW costs.

2. Suburban Communities

The 14 suburban towns in Massachusetts that have adopted unit pricing have experienced more difficulty with seven of the nine common unit pricing problems than have their urban or rural counterparts. They have had particular trouble selecting an appropriate program structure. This difficulty may arise because while urban communities are usually limited to a curbside subscription can or bag program, and rural towns must choose between some type of drop-off bag or per-vehicle fee program, suburbanites can choose from the whole array of curbside and drop-off options.

The suburbs also find difficulty with selecting rates and ensuring that revenues fully cover costs. Curbside collection provided by suburban communities is often more expensive per household than in urban areas whose residences are closer together, and considerably more costly than in rural communities that typically offer only drop-off services rather than curbside pick-up. Thus, officials in suburban municipalities are faced with the difficult prospects of charging higher rates to their residents or finding supplemental ways to cover costs.

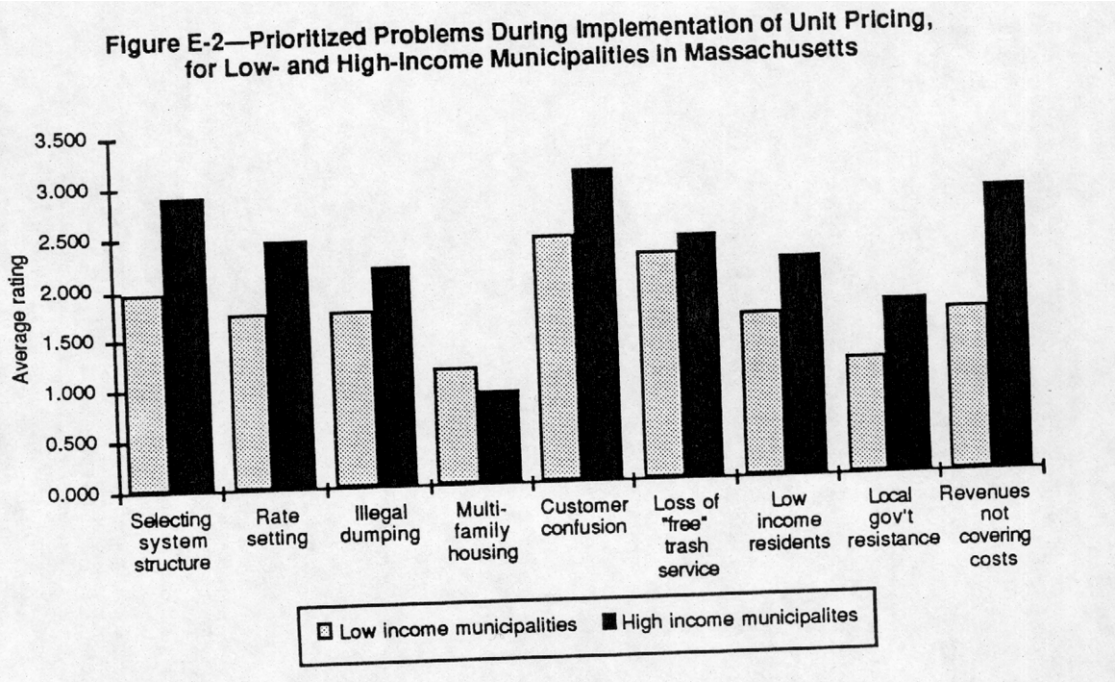
3. Urban Communities

As one would expect, the four urban municipalities in Massachusetts that have implemented unit pricing programs and completed our survey experienced more problems with illegal dumping and multi-family housing issues than did other types of

communities. Surprisingly, however, urban municipalities attributed less significance to the other types of common unit pricing problems than did suburban municipalities.

Urban communities' relatively successful experiences with unit pricing are partly due to the proactive measures they have taken to mitigate potential problems. For example, North Adams was one of the few municipalities that addressed the needs of low-income residents, by giving away ten free disposal bags to all citizens below a certain income level. Similarly, North Adams and Gloucester were two of only a handful of municipalities that took early and decisive action to combat illegal dumping.

B. Differences by Income



As depicted in Figure E-2, the difference between the experiences with unit pricing reported by communities with average incomes above and below the 1989 median are not substantially different. Therefore, similar policies and programs may be applicable to promote unit pricing in both high- and low-income municipalities.

Appendix F

Brief Evaluation of Unit Pricing Program Types

As indicated in Appendix D, Massachusetts municipalities currently use six types of unit pricing programs. None of these optimally meets the needs of all communities. Based on our research, we briefly describe the strengths and weaknesses, of each program type. This outline should provide a foundation for more extensive analysis of program attributes to assist communities in choosing a suitable program.

Stickers on Bags: Residents purchase special stickers from the solid waste jurisdiction or its agents that must be affixed to their waste for it to be collected.

Strengths

- Provides fairly immediate price incentive to reduce waste: residents pay for volume disposed
- Does not require customer billing
- Provides residents much flexibility to adjust amount of waste generated

Weaknesses

- Somewhat inconvenient for customers to purchase stickers and ensure they have adequate supply to meet weekly waste needs
- Stickers can be stolen and often do not stick well in cold weather

Pre-Printed Bags: Residents put out waste for collection or drop off waste in official bags that they purchase from the solid waste jurisdiction or it agents.

Strengths

- Provides fairly immediate price incentive to reduce waste: residents pay for volume disposed
- Several sizes of bags can be used to meet specific needs of residents
- Does not require customer billing
- Provides residents much flexibility to adjust amount of waste generated

Weaknesses

- Pre-printed bags add additional plastic to landfill
- Somewhat inconvenient for customers to have to purchase bags and ensure they have adequate supply to meet weekly waste needs
- Bags are bulky and require substantial storage space at distribution outlets

Per Carload Fee: Residents pay a fee per carload of MSW disposed of at drop-off facility

Strengths

- Simple and easy to administer program
- No billing or prior purchases required

Weaknesses

- Does not provide residents incentive to make incremental reductions in volume of MSW disposed.
- Does not differentiate between large carloads and small carloads

Subscription Cans: Customers pay for garbage service based on a fixed number or size of can(s) to be picked up on a regular basis

Strengths

- Reduces need to use disposable plastic bags
- Provides municipality with predictable MSW revenues in advance

Weaknesses

- Customers required to pay subscription rate for periods when they do not put out allotted amount of garbage
- May motivate residents to overstuff barrels
- Time consuming and complicated to implement
- Must be supplemented to accommodate variations in weekly amount of garbage generated by customers

Per Weight of Carload: Residents' vehicles are weighed before and after MSW is offloaded and fee is calculated based on weight differential

Strengths

- Provides strong incentive to reduce MSW since *any* reduction results in direct savings to the customer
- Very fair because fee is based directly on amount of MSW disposed

Weaknesses

- Requires capital-intensive investment in scales and billing system
- May cause delays at transfer station

Punch Card per Bag: Residents purchase a punch card that is good for disposal of a certain number of bags of trash. The card is punched by an attendant at the disposal facility for each bag disposed.

Strengths

- Residents do not have to use pre-printed bags or affix tags to trash
- Attendant at disposal facility does not need to handle cash
- Discounted rate can be given for low income/elderly residents

Weaknesses

- Punch cards are only available in fixed denominations

NOTES

[1] Unit pricing programs can take several forms. We discuss specific types starting in Chapter IV, and in Appendix F. Within the growing unit pricing literature, useful overviews can be found in Lisa A. Skumatz and Cabell Breckinridge, *Variable Rates in Solid Waste: Handbook for Solid Waste Officials, vol.* II (Seattle, WA: U.S. Environmental Protection Agency, June 1990); and U.S. EPA, *Charging Households for Waste Collection and Disposal: The Effects of Weight or Volume-Based Pricing on Solid Waste Management* (Washington: U.S. EPA, September 1990).

[2] Robert Repetto, Roger Dower, Robin Jenkins, and Jacqueline Geoghegan, *Green Fees: How a Tax Shift Can Work for the Environment and the Economy* (Washington: World Resources Institute, November 1992) 16.

[3] We discuss these examples in more detail in Chapter III.

[4] Massachusetts Department of Environmental Protection, *Toward a System of Integrated Solid Waste Management: The Commonwealth Master Plan* (Boston: DEP, June 1990)1, 8.

[5] DEP, draft data for future *Commonwealth Master Plan* update.

[6] DEP, *Commonwealth Master Plan 1*. These figures are averages. For any given municipality, recycling may prove more or less cost-effective than disposal depending on factors such as disposal contract terms, recycling collection and processing costs, access to recyclables purchasers, and current recyclables market conditions.

[7] Proposition $2^1/_2$, passed via statewide referendum in 1980 [MGL ch. 29, § 27C(c)], caps total municipal property tax increases at 21/2% per year, and prohibits tax levies on any individual piece of property from exceeding $2^1/_2$% of its assessed value. An individual municipality may, through referendum, pass an "override" to finance either general services or a specific expenditure. However, as discussed in Chapter II, public opposition to increased taxation has thwarted many override attempts in the past decade. This sentiment, combined with declining intergovernmental aid, has forced many Massachusetts communities to cut services or seek alternative revenue sources, such as user fees.

[8] DEP, *Commonwealth Master Plan 3-4.*

[9] 310 CMR 19.000.

[10] Willa Small Kuh, Director, Division of Solid Waste Management, DEP, "Requirements, Timetable and Variance Procedure for Closure of Unlined Landfills," Oct. 1992,1-3.

[11] Different sources give somewhat inconsistent data regarding the numbers of unlined MSW landfills and those that have completed various steps in the assessment

process. See Philip Weinberg, Division of Solid Waste Management, DEP, memorandum to DEP Commissioner Dan Greenbaum on "Closure of Unlined Landfills," 13 Jan. 1993; --, memorandum to Tom Collins, Office of the Commonwealth Auditor, on "Landfills with Apparent Capacity beyond December 31,1993," 8 Mar. 1993; and Scott Allen, "Most Landfills Expected to Close by Year's End," *Boston Globe* 25 Mar. 1993: 26.

[12] 310 CMR 19.017.

[13] DEP, Division of Solid Waste Management, "Guidance to Solid Waste Disposal Facilities for Implementation of Waste Bans Covering Glass and Metal Containers, and Yard Waste," SWM-7-9/92, Sept. 1992.

[14] This grant program uses part of the Commonwealth's Clean Environment Fund, which consists of about $21 million per year in abandoned beverage container deposits and is intended to finance solid waste management activities. DEP cannot be assured of receiving an allocation for its Recycling Equipment Grant Program from year to year. However, the Massachusetts Supreme Judicial Court recently denied the bottling industry's claim that it, not the Commonwealth, owns abandoned beverage container deposits (Scott Allen, "Top Court Rejects Bottlers on Deposits," *Boston Globe* 2 Mar. 1993: 22). Therefore, more money may be available for this and other grant programs in the future.

[15] DEP, *Commonwealth Master Plan* 41.

[16] We could not confidently determine from our responses the number of municipalities where unit fees *fully* finance MSW programs. Municipalities with MSW enterprise funds would be the most likely candidates. However, we believe that most of our 34 respondents using unit pricing supplement these revenues to some extent with either flat fees or tax subsidies, usually because political considerations preclude charging a "true" cost unit fee.

[17] This figure includes the 34 responding communities that clearly reported unit pricing programs, and 12 other non-respondents that EOEA believes practice unit pricing. Leo Pierre Roy, Director of Waste Policy and Planning, EOEA, "Massachusetts Municipal Use Fee Survey," 8 March 1993.

[18] These flat financing data were also the result of some interpretation because of vague or confusing survey responses. While we believe that they reflect our respondents' basic flat financing methods, there may be some error concerning the distribution of respondents within the three flat financing approaches.

[19] John W. Kingdon, *Agendas, Alternatives, and Public Policies* (Boston: Little, Brown and Co., 1984). Kingdon's framework blends several well accepted models of governmental behavior.

[20] Lisa A. Skumatz and Philip Alan Zach, "Variable Rate Initiatives at the State Level," *BioCycle Dec.* 1992: 67.

[21] Cathy Moejer, Minnesota Pollution Control Agency, telephone interview Mar. 1993.

[22] Skumatz and Zach 68.

[23] *Ibid.*

[24] For a general discussion of focusing events, see Kingdon 99-105.

[25] Marvin Gordon, Selectman, Milton, Massachusetts, personal interview, 20 Nov. 1992.

[26] Erin Battistelli, Recycling Coordinator, Gloucester, Massachusetts, personal interview, 21 Jan. 1993.

[27] Judy Marino, Board of Health, Ware, Massachusetts, telephone interview, 2 Feb. 1993.

[28] William S. Bailey and Raymond J. LaRaja, *Solid Waste Management Strategies for the City of New Bedford: User Fees and "Bag and Tag," policy* analysis exercise, John F. Kennedy School of Government, Harvard University, April 1992, 1.

[29] Scott Alphonse, City Planner, New Bedford, Massachusetts, telephone interview, 28 Jan. 1993.

[30] Pat Berdan, Director of Public Works, Wellesley, Massachusetts, personal interview, 24 Nov. 1992.

[31] Barbara Scavezze, Solid Waste Coordinator, Chelmsford, Massachusetts, telephone interview, 11 Feb. 1993.

[32] Jordana Hart, "Upscale Suburbs Say No to $2^1/2$ Overrides, Following Years of Yes," *Boston Globe* 5 April 1993: 20.

[33] The reasons "increasing tipping fees" and "impending landfill or incinerator closure" may have overlapped to some extent for survey respondents, because a facility closure that forces a municipality to utilize a private disposal vendor would likely increase its tipping fees (often from zero). We had hoped that respondents would read these as two different reasons, with the former referring specifically to increases in existing private disposal contracts.

[34] Scott Cassel, "Gaining Acceptance for a Residential Variable Rate Trash Fee: The Brookline, MA Experience," presentation at the New England Environmental Expo, 22 May 1991,1.

[35] Larry Tye, "Catch-22: Waste Not, Pay More," *Boston Globe 17* Jan. 1993: 36.

[36] John D. Midwood, Executive Secretary, Wrentham, Massachusetts, personal interview, 26 Jan. 1993.

[37] Ralph Dunphy, Director of Public Works, Cambridge, Massachusetts, personal interview, 24 Nov. 1992.

[38] For instance, an EPA report notes that "...changes in the economy (e.g., booms and recessions) ... affect the municipal waste stream." U.S. EPA, *Characterization of Municipal Solid Waste in the United States: 1992 Update* (Washington: U.S. EPA, July 1992)4-1.

[39] Willa Small Kuh, personal interview, 12 Mar. 1993.

[40]David Keithley, Director of Public Works, Salisbury, Massachusetts, personal interview, 27 Jan. 1993.

[41] DEP, *Sample Massachusetts Solid Waste Fee Programs and Fee and Rate Setting Guidance*, Oct. 1992, 25.

[42] Cory Bardwell, Chair, Board of Health, Hatfield, Massachusetts, telephone interview, 1 Feb. 1993.

[43] Personal interview.

[44] Personal interview.

[45] Midwood, personal interview.

[46] Personal interview.

[47]1992 estimates from DEP, draft data for future *Commonwealth Master Plan* update.

[48] Kenneth L. Kimmel, "Waste Bans Under Siege," *The Mass Recycler*, winter 1993.

[49] Scott Allen, "Dump Cleanup Hits Home Today," *Boston Globe* 1 April 1993: 26.

[50]Tony Curd, Assistant Town Manager, Wilbraham, Massachusetts, personal interview, 22 Dec. 1992.

[51] See Table 1-1 and following discussion.

[52] Further information on enterprise funds can be found in Massachusetts Department of Revenue, Division of Local Services, *Handbook on Implementing an Enterprise Fund Established Under Chapter 40 Section 39K*, (Boston: DOR, September 1990); David R. Bean, Government Finance Officers Association, "Enterprise Funds: Government Accounting and Financial Reporting," Accounting Topics Series no. 1, March 1987; and Edward Lynn and Robert Freeman, *Fund Accounting Theory and Practice* (Englewood Cliff, NJ: Prentice Hall, 1974).

[53] Pat Berdan, Wellesley Director of Public Works, telephone interview, 25 March 1993.

[54] Repetto, *et. al.* 16.

[55] U.S. EPA, *Charging Households for Waste Collection and Disposal;* and Skumatz and Breckinridge.

[56] Marvin Gordon, Selectman, Milton, Massachusetts, personal interview, 20 Nov. 1992.

[57] *Ibid.*

[58] Since survey respondents rated the importance of each problem by assigning it a value from zero to five, instead of ranking them in relation to each other, there were often ties between several problems considered to be the most significant.

[59] Fred Holmes, Administrative Officer, North Adams, Massachusetts, survey response, Jan. 1993.

[60] Erin Battistelli, personal interview.

[61] See Appendix F for a description of the six types of unit pricing systems currently used in Massachusetts.

[62] Debra Levelle, Board of Health, Hatfield, Massachusetts, personal interview, 21 Dec. 1992.

[63] Tony Curd, Assistant Town Engineer, Wilbraham, Massachusetts, personal interview, 21 Dec. 1992

[64] Marvin Gordon, personal interview.

[65] Judy Marino, telephone interview; Debra Levelle, personal interview; and David Keithley, personal interview.

[66] See, for instance, Skumatz and Breckinridge; and G. H. Horn, "Appeal Grows for Bag-Tag," *Waste Dynamics of the Northeast*, Feb. 1993.

[67] For a review of the difficulties involved in encouraging residents of multifamily buildings to abide by the requirements of a unit pricing program, and the lack of success achieved by various efforts to apply unit pricing to multifamily buildings, see Skumatz and Breckinridge.

[68] Massachusetts Department of Revenue, Division of Local Services, Municipal Data Bank (data file).

[69] Horn 27.

[70] See Skumatz and Breckinridge pt. III; and DEP, *Landfill Assessment and Closure Guidance Manual* (Boston: DEP, May 1992) 88-114.

[71] Erin Battistelli, personal interview.

[72] State legislators such as Rep. Frank Hynes (D-Marshfield) are investigating ways for the state to compensate municipalities for landfill closure. Without such funds, legislators may seek to alter or delay the landfill closure regulations. See Allen, "Most Landfills Expected to Close by Year's End."

[73] Sympathetic to municipal complaints, the House recently passed legislation that would postpone the newest bans for another two and one-half years. While the governor would likely veto such legislation should it successfully leave the legislature, he lacks the votes to prevent a veto override. Leo Pierre Roy, personal conversation, 9 April 1993.

[74] MassRecycle, "Promoting Unit Based Pricing for Solid Waste in Massachusetts: Proposal to the Executive Office of Environmental Affairs," 1 March 1993, 5.

[75] Robin Ingenthron, Director of Recycling Programs, DEP, personal interview, 18 March 1993. One difficulty with implementing this option would be the subjective nature of awarding grants. This problem does not exist with the current recycling equipment grant program since awards are primarily based on equipment need, a relatively objective criterion.

[76] One local MSW manager suggested, "You know how sensitive towns are to local aid issues; I suggest offering an incentive of extra local aid for towns that institute unit priced solid waste policies." Robert Rottenberg, Administrator, Franklin County (Massachusetts) Solid Waste Management District, letter to Leo Pierre Roy, 14 Oct. 1992. Rottenberg's main message is that communities accept incentive measures much more readily than state mandates.

[77] Massachusetts now legally owns all unclaimed bottle and can deposits (see n. 14), possibly allowing the state to spend an estimated $21 million per year on MSW programs. If this money can go toward this mandated policy option, then it would fare much better under the affordability criterion.

[78] Bill Stanwood, Chairman, MassRecycle, telephone interview, 23 March 1993.

[79] MassRecycle literature.

[80] Willa Small Kuh, personal interview.

[81] Tia Leone, Press Officer, DEP, personal interview, 16 March 1993.

[82] Massachusetts Department of Education, "A New Classification Scheme for Communities in Massachusetts," 1985.

[83] Debra Lavelle, personal interview.