

Roundtable Four

*Pay As You Throw
For Large Municipalities*

December 11, 2000

Final Report

Conducted by

The Cornell Waste Management Institute

Sponsored by

The U.S. Environmental Protection Agency Region 2

*The New York State Association for Reduction, Reuse and
Recycling*

New York City Department of Sanitation

April, 2001



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The success of this Roundtable on PAYT was due largely to the enthusiastic participation of the attendees who shared their knowledge, ideas and questions. The commitment of the New York State Association for Reduction, Reuse and Recycling (NYSAR³) to furthering waste reduction and the support of US EPA Region 2 were instrumental in the development and implementation of this Roundtable. In particular, I would like to thank Melanie O'Donnell, past president of NYSAR³, and Lorraine Graves, EPA Region 2 Solid Waste Team Leader, for their part in making this project possible.

Many thanks to all involved – Ellen Z. Harrison, Director

The Cornell Waste Management Institute (CWMI) was established in 1987. CWMI addresses the environmental and social issues associated with waste management by focusing University resources and capabilities on this pressing economic, environmental, and political issue. Through research, outreach, and teaching activities, CWMI staff and affiliated researchers and educators work to develop technical solutions to waste management problems and to address broader issues of waste generation and composition, waste reduction, risk management, environmental equity, and public decision-making. The focus for such work is on multi-disciplinary projects that integrate research and outreach. Working in collaboration with Cornell faculty and students from many departments and with cooperators in both the public and private sectors, issues ranging from management of sewage sludges to waste-prevention are the focus of on-going programs.

A copy of this report can be downloaded from the CWMI web site or by contacting CWMI
<http://www.cfe.cornell.edu/wmi/PAYTreport.pdf>

US EPA Pay As You Throw web site
<http://www.epa.gov/epaoswer/non-hw/payt/index.htm>

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Background

A “Plan to Phase Out The Fresh Kills Landfill” was issued by the Task Force established by New York State Governor George Pataki and New York City Mayor Rudolph Giuliani during November of 1996. Central to this plan are strategies intended to maximize the amount of New York City waste that is prevented and recycled, in order to minimize the need to export waste when the Fresh Kills landfill on Staten Island closes at the end of 2001.

The Fresh Kills landfill has long been an inexpensive solid waste disposal option for the City. However, the City’s reliance on this landfill is being dramatically reduced in anticipation of the scheduled closure. Concurrently, New York City is increasing its reliance on waste reduction initiatives, recycling, composting, and out-of-City disposal.

The US Environmental Protection Agency (EPA) participated in the Task Force established by the Governor and Mayor. In the Task Force Plan, EPA offered to fund Roundtable meetings with the City to address waste reduction issues. The Task Force recommended and the City agreed that the Roundtable meetings would include representatives of various City, State, local, and private organizations who have studied or implemented waste reduction strategies and who could share information and experiences at these meetings.

The New York City Department of Sanitation (DOS), Bureau of Waste Prevention, Reuse and Recycling (BWPRR) proposed to EPA Region 2 that Roundtables be convened to discuss various waste reduction strategies. DOS provided EPA Region 2 with a proposal setting forth the respective roles of the two agencies. EPA agreed to this arrangement, and subsequently provided funding for the Cornell Waste Management Institute (CWMI) to provide the needed services. These included providing input regarding agendas and selection of invited participants, sending out invitations and following up as necessary to recruit participants, providing meeting space and refreshments, moderating the sessions, writing summary reports, and related services. CWMI and DOS worked closely in developing agendas and selecting participants.

The first Roundtable was held November 14, 1997 at the offices of Cornell Cooperative Extension in New York City. The “New York City Materials Exchange Roundtable” provided a forum for materials exchange program sponsors from throughout the nation, including New York City program operators and interested parties. The purpose was to discuss issues critical to the success of materials exchange operations that were also being tackled by the new NY Wa\$teMatch Program launched by DOS in April of 1997. A report is available from the Cornell Waste Management Institute which summarizes the findings of that Roundtable (access is available through the world wide web at www.cfe.cornell.edu/wmi/WastRed/MatExch.html).

The second Roundtable, “The Potential for Composting Collected Wastes to Reduce the NYC Solid Waste Stream,” was convened April 3, 1998, also in New York City. This Roundtable was held to explore the possibilities of composting collected wastes. The focus was on large-scale composting, the constraints and issues surrounding composting in a dense urban setting. A report is available from the Cornell Waste Management Institute which summarizes the findings (access is available through the World Wide Web at www.cfe.cornell.edu/wmi/WastRed/NYCRT2.html).

The third Roundtable, “Packaging Waste: Who’s Responsibility is it Anyway?,” was convened on November 6, 1998 at EPA Region 2 in New York City. This Roundtable considered extended

producer responsibility and how that might apply to reducing packaging wastes in New York City. Experts from government, business and organizations in the United States, the United Kingdom, Germany, Canada and the Netherlands participated along with representatives of New York State and New York City agencies and organizations. A report that summarizes the findings is available from the Cornell Waste Management Institute and can be accessed also through the World Wide Web (<http://www.cfe.cornell.edu/wmi/WastRed/NYCRT3.html>).

The potential for Pay-As-You-Throw (PAYT) (also known as variable rates or quantity-based user fees) to increase the diversion of solid waste from disposal has been documented in many municipalities in the U.S. Most such PAYT programs have been implemented in small municipalities. Reaching a larger share of the population by implementing PAYT in large municipalities has large environmental benefits, however there are special concerns regarding the practicality of implementation in large cities and towns.

A fourth Roundtable was convened on December 11, 2000 at EPA Region 2 in New York City to consider PAYT for large municipalities. The New York State Association for Reduction, Reuse and Recycling (NYSAR³) provided partial support for this Roundtable through a grant from the U.S. EPA. Additional support came from U.S. EPA Region 2 and from the Cornell Waste Management Institute. In addition to participants from New York City, invitations were extended to the other 14 New York State municipalities with populations exceeding 100,000. Experts with PAYT experience from around the U.S. shared their knowledge. A list of invitees and attendees can be found in the appendices to this report. This report that summarizes the findings is available from the Cornell Waste Management Institute and can be accessed also through the World Wide Web (<http://www.cfe.cornell.edu/wmi/WastRed/NYCRT4.html>).

Introduction

The session began with a brief explanation of PAYT by Ellen Harrison, director of the Cornell Waste Management Institute (CWMI) and facilitator of the Roundtable. Under PAYT, waste disposal costs are no longer embedded in taxes, rather customers are charged for disposal based on the amount of waste disposed. Studies have demonstrated that implementation of PAYT results in less waste destined for disposal due to increased source reduction (less waste actually generated) and increased composting and recycling, with attendant economic and environmental benefits.

The U.S. EPA actively promotes PAYT, recognizing its potential to reduce greenhouse gases and thus global climate change, among other benefits. Jan Canterbury (U.S. EPA) described the resources which EPA makes available to communities to assist them in evaluating and implementing PAYT. These can be accessed through the World Wide Web at www.epa.gov/payt. Loraine Graves (EPA Region 2) welcomed the group and highlighted the barriers and strategies to overcome those barriers that the Roundtable is to address.

Interviews with the 15 New York State municipalities with populations exceeding 100,000 conducted by CWMI showed that for most, waste disposal is not a current “crisis” and thus there is reluctance to consider significant changes to current practices (such as implementation of PAYT). Particular exceptions are New York City, where the closure of Fresh Kills landfill is necessitating

change and increasing the emphasis on waste reduction and Buffalo, N.Y. where implementation of user fees and review of PAYT systems is underway. Several other large municipalities participated in the Roundtable, indicating a willingness to learn about the potential of PAYT.

Lisa Skumatz (Skumatz Economic Research Associates (SERA)), has done studies on various aspects of PAYT over many years, including documenting waste reduction impacts (see Appendix E for list of SERA reprints). She provided important contributions throughout the Roundtable including an introductory presentation on PAYT in large cities nationwide. She also provided specific information on Seattle's PAYT program. In addition, Robert Haley (San Francisco, CA) and Kathy Newell (Austin, TX) shared practical knowledge regarding how such programs actually work in large cities. Marc Coppola (Buffalo, NY, City Councilman) and Ed Marr (Buffalo, NY, Director of refuse and recycling) provided insights from a municipality in the midst of implementing a user-based system.

PAYT in the U.S.

Equity, in terms of paying for what you use, is one of largest benefits of PAYT recognized by municipalities and their residents. Just as customers pay for the amount of electricity they use, under PAYT customers pay for the amount of waste they generate. This is recognized as a fairer way of paying for these services than charging everyone the same amount or an amount based on their property values as part of their tax bill.

PAYT provides a link between behavior and bills. According to research done by SERA, tonnage of waste disposed is 16-17% less in PAYT communities, with approximately one third of this reduction attributable to source reduction, one third to increased recycling and one third to composting. PAYT proves to be one of the most cost-effective methods to increase waste reduction.

SERA research determined that five thousand communities in U.S. have implemented PAYT, making it available to 20% of the US population. A number of large municipalities are included (see the EPA PAYT www site for a partial list of PAYT communities). These programs employ different types of programs: cans, bags, and stickers. SERA research showed that currently, 45% of the PAYT population uses cans (automated collection is growing and will increase in part in response to worker health and safety rules). There is more flexibility with cans since you can charge a higher price for additional cans whereas the price of a sticker or a bag stays the same regardless of the number set out.

Haulers play an important role and should be part of the design of municipal PAYT programs. SERA surveys showed that programs can work where the municipality itself collects wastes (the situation in about half of the municipalities in large counties) or where a municipality contracts or licenses haulers, or where residents are responsible for the hauling of their own wastes.

Existing PAYT Programs in Large Cities

Austin, TX

A pilot program begun in Austin in 1991 has developed into a citywide PAYT program. The city, with a population of 560,000 includes 141,000 residential customers and 2,200 business customers. The collection is performed by the City using a 30, 60, and 90-gallon cart system. Originally a twice per week manual collection system became a semi-automated collection once a week when PAYT was implemented. Garbage was billed on utility bill previously and still is. It is easier for residents to accept PAYT if they had previous knowledge about what they were already paying for garbage. On average overall, bills in Austin stayed the same. It is not known how many personally increased or decreased their bill.

Strong backing from the Austin City Council, environmental groups, and significant public involvement facilitated by the Solid Waste Advisory Commission were important to adoption of PAYT. The biggest obstacle was getting people used to change. Eventually residents accepted PAYT because they were positive about the control it gave them over their own waste disposal expenses. PAYT has resulted in significant waste diversion. As a result of PAYT, the diversion rate increased more than 11% in just 14 months. There was no change in the recycling menu that accompanied the adoption of PAYT.

A brief synopsis of the Austin program is in the appendices to this report.

San Francisco, CA

San Francisco faces many of the same challenges which face New York City in considering PAYT. While the residential population is only 790,000, San Francisco is more densely populated than New York City as a whole. It too is home to a diverse ethnic population. Narrow streets (and steep slopes!) present a challenge to collection. The residential population of San Francisco is 790,000 and the percentage of people in multiple dwellings is similar to that in New York City (70%).

San Francisco has had a PAYT in place since 1932. In San Francisco, two private haulers collect all the trash under a city permit system. They are changing to a 3-cart system. A split truck collects recycling and refuse and separate truck collects food waste.

A brief synopsis of the San Francisco program is in the appendices to this report.

Seattle, WA

Seattle has a population of 500,000 and employs a contract system with private haulers for waste disposal. The city changed from a flat fee to PAYT in 1981. They use a can system, providing consumers with the choice of 10, 20, 30, 60 or 90 gallons. Twenty-five percent of residents subscribe to the 20-gallon option.

PAYT Issues For Large Municipalities

The Potential for PAYT in Multi-Family Units

One of the challenges faced by many large municipalities as they consider PAYT is how such a program can be effective in multi-family apartment buildings. In such buildings, residents generally put their trash into communal bins, making it difficult to administer a system whereby they pay for what they dispose. How multiple dwellings are handled in PAYT programs continues to evolve.

In many municipalities, large apartment buildings are considered and handled as commercial entities that are generally handled by private waste carters outside of the municipally organized PAYT system. Since many apartment buildings and businesses pay for disposal on a per-dumpster basis, they are already in some sense part of a PAYT system.

Some programs consider small multi-family units (those containing fewer than 4-6 units) as single households and require participation in the PAYT program, while others omit all apartments from the program. In San Francisco, buildings with 5 or fewer units fall within the PAYT program and represent about 60% of residential units. Buildings with more than 600 rooms are considered commercial entities outside of the municipal program. How buildings falling in between these are dealt with is in flux. Currently the city is working with haulers to go to a volume/frequency rate for large apartments, similar to that for commercial enterprises. Apartment buildings are proposed to be required to subscribe to a minimum of 32 gallons per unit without recycling and a minimum of 20 gallons with recycling. Since waste disposal costs are embedded in the rent, waste generators (the tenants) do not see an incentive to reduce wastes. The city is working on developing such incentives. Even so, the program at least provides an incentive for the landlord to site recycling bins and for educating and promoting waste reduction among the tenants.

In Austin, apartments in buildings with 4 units or less are dealt with individually and fall into PAYT. Anything larger is handled like commercial properties and serviced by private haulers. Recycling is mandatory for apartments with more than 100 units and for larger commercial establishments. The owner is required to provide education and contract with a private hauler. Space to accommodate recycling is required for all new apartment buildings in Seattle.

With 70% of residents in New York City living in multiple dwellings, there are particular challenges. In New York City, about half of the population is housed in units with more than 20 apartments and 30% in buildings with more than 50 units. Wastes from all 3.5 million households, including large apartment buildings, are collected by city crews. Rent control in the City would inhibit the costs of user fees and PAYT from being passed on to tenants.

One technology that has been implemented in a few high-rise apartment buildings in New York and Florida is trash chutes that require the user to specify whether trash or recyclables are being thrown. At the bottom of the chute are different containers into which the different materials will fall. This provides a way for residents to sort their trash and could provide a way for payment to be required for trash disposed. There are several concerns with these systems. The chutes have to be staffed because once the receptacles at the bottom of the chute are full, they will overflow. Many buildings do not have maintenance staff in the evenings, and that is a likely time for significant

disposal. Also, tenants may object to using the chute because only one tenant can use it at a time, requiring others to wait. This, as well as resistance to payment (where required), may result in tenants leaving their garbage in the chute room.

The Potential for PAYT for City Agencies and Institutions

Institutions are responsible for a significant amount of waste. In New York City, institutional waste is estimated at 1,000,000 tons per year, 15% of which is from city agencies (note that these data are more than a decade old). In San Francisco, city and county government is the single largest employer and is responsible for a significant part of the waste stream. Thus, providing incentives to institutions to reduce waste through quantity based fees is worth considering.

In San Francisco, as well as in Austin, agencies are treated as commercial entities, thus having a PAYT element associated with dumpster collection. No entities, including schools and churches, are exempt from PAYT in San Francisco, with the exception of the Department of Public Works. Overall, though, there is no strong generator incentive. In Seattle, all public departments pay and are part of the PAYT program.

Prior to the implementation of a user fee in Buffalo, solid waste and recycling services were paid for using tax dollars. This was problematic for the City, since 40% of the total properties within the City are tax exempt. This meant that 60% of the property owners were paying for 100% of the costs to provide these services. Now, with the implementation of a user fee, all those who participate in the solid waste and recycling collection program pay for the level of service that they receive, including schools, churches, non-profits and governmental agencies. Public housing in Buffalo operates its own collection vehicles that bring the wastes to a transfer station where they are charged by ton. Recycling education is provided to residents to help them reduce their costs. School districts are charged similarly to commercial entities in Buffalo. In Austin, churches are also subject to PAYT requirements.

Even with PAYT, there are few incentives for municipal or state agencies to reduce their waste. Waste disposal costs would be included in their annual budget. If savings are made through waste reduction, the savings would likely result in a budget reduction the following year.

In New York City, the city Department of Sanitation collects trash from residences and from city agencies and institutions by route, so that they are mingled in the same vehicle. The City is examining the possibility of collecting only from residential and tax exempt properties because an additional challenge is that non-profits and for profit businesses are often located in the same building and so the DOS may unwittingly be collecting from businesses located in the same building as non-profits.

PAYT: What Does it Cost and What Does it Pay For?

Fees charged in PAYT programs can be set to cover part or all of the expenses associated with various aspects of waste management. Setting fees is an important component of program design since revenues are critical to funding the waste management program and costs are important in

motivating reduction among waste generators. Frequent billing rather than annual billing is helpful in reminding customers of the relationship between costs and disposal.

Much of the cost of waste disposal is for collection and is not closely related to the amount of waste set out. The first can of waste collected is responsible for the majority of cost because the cost of getting a collection truck to the site is a large portion of the total cost. The marginal cost for each additional can is significantly less. However, if charges are set to fully reflect this, the cost differential between various quantities disposed may be too small to have the desired impact on waste reduction. One of the biggest current issues in Austin, TX is that there is not a big enough rate gap between the different cart sizes to motivate customers to switch to smaller carts. There is a need to balance incentives and revenues and to find the threshold in each community in order to determine what the rate gap should be.

Many communities are moving towards hybrid systems in which there is a fixed charge for all properties or customers that covers some universal costs not related to the amount of waste disposed. Recycling, closure of a landfill and dealing with illegal dumping are examples of such costs. A PAYT fee based on the amount of waste disposed is also charged in such hybrid systems. They have the advantage of providing some stability and predictability in revenues. In communities where some entities like businesses or institutions are not part of PAYT programs, the hybrid system also provides a means for their contribution towards these expenses since they would pay the fixed user fee. Removing these costs from taxes by establishing a user fee also provides a means for non-taxable institutions to contribute to these expenses.

PAYT pricing options vary. Some use flat fees whereby the amount charged is related to directly to the amount disposed. If you double your trash output, you pay twice as much. As mentioned above, in a system fully funded through PAYT (without a user fee component) this does not clearly reflect the cost structure for that service. The municipality thus can incur revenue risks and must recognize that such a system essentially subsidizes the payment of one group with another. If you are incorrect in estimating how many people will select a particular level of service, you run the risk of not covering your fixed costs.

In Austin, a fee of \$7.00 per month fixed collection fee plus a charge based on the number and size of the totes which a customer selects covers garbage, recycling and yard trimming collection and management (weekly collection) plus the costs for closing a past landfill and administering the program. Bulky and brush collection is paid for as part of an anti-litter fee which also covers costs associated with illegal dumping, street cleaning and litter pick up. This component is not volume based, but is one flat fee for all customers with a utility meter and appears on the utility bill.

In San Francisco, permitted haulers bill customers directly each quarter. The fees are \$7.01 per month for weekly pick up for a 20-gallon container, and \$11.68 for 32 gallons. Large customers can obtain more frequent collection such as twice weekly and they would pay accordingly. The fee covers garbage and recycling collection and management plus hazardous waste education programs. The City receives \$5 million of these fees back from the haulers annually to fund waste reduction programs. Twice annual collection of bulky wastes is built into the rates.

In Seattle the fees cover all costs including education, transfer station costs, recycling and disposal costs. A previous Business and Occupation tax helped to pay for the closing of their landfill. The City sets rates, does the billing and collects revenues. The city then pays the haulers. In addition to typical costs, the revenues cover running the transfer station, buying up property damaged by landfill gas leaks and education programs.

Buffalo's user fee system is based on calculations using fixed and variable rates. A waste generation rate study was performed in the residential sector, while industry standards for commercial waste generators in other like communities were used for non-residential properties. The fixed portion of the fee is the same for everyone, and covers the cost of sending a crew and vehicle to a property within the City once per week for the year. The variable rate reflects the disposal costs for the solid waste that is generated during the year at any given property. The PAYT system to be implemented in the City of Buffalo will likely be that of a hybrid system of variable and fixed rates similar to what is in place at this time.

The user fee has been established as an annual fee that the City allows to be paid on a quarterly basis. For this reason, 85,000 bills are distributed each quarter during the year. The City uses this billing process to show the costs of the system, as well as an educational outreach tool to promote waste reduction, reuse, recycling, composting, and other related waste management issues.

Waste management costs in New York City are estimated to be \$1 billion/year for the Department of Sanitation when the full cost of waste export are included. This comprises about one third of the funds raised through City property taxes. This covers collection and management of waste plus the costs of recycling programs. Also included are costs of snow removal equipment (not personnel) and also street cleaning. A good handle on current waste management costs is an important step in assessing and implementing PAYT.

Does PAYT Increase or Decrease Municipal Costs?

SERA investigated this and found through surveys conducted in Wisconsin and Iowa that administration costs stayed the same or decreased in 2/3 of the municipalities, while they increased in 1/3 of those implementing PAYT systems. All of those surveyed expected to decrease costs in the long run. Skumatz advised that care be taken not to make any costly changes to the waste management system in the same year as PAYT is implemented to avoid the perception that PAYT was responsible for cost increases.

Incentives

The role that incentives and rebates versus fees might play in encouraging waste reduction was discussed. Buffalo is developing an ordinance that would require private contractors doing demolitions of City owned properties to recycle those construction and demolition materials that have a market. San Francisco is examining incentives for haulers to reduce wastes. One California county currently pays a contractor \$10/ton if they take construction and demolition waste to a certified drop-off site. Price of services can also provide waste reduction incentives. In New York City it is less expensive to tip at a C&D transfer center than a regular landfill. Skumatz (SERA) reported that in San Jose, CA construction companies are charged a permit fee and a deposit which

is rebated if they meet recycling percentages and a city in Canada requires a “three day sale” of materials.

Barriers

Illegal Dumping

A frequently voiced concern in adopting PAYT is fear of increased illegal dumping. Changes in illegal dumping resulting from implementation of PAYT programs are complicated to measure because very few communities monitor illegal dumping before implementing PAYT. Of PAYT communities surveyed by SERA, only approximately 25% had a problem and those that did responded that it was short lived due to enforcement. Enforcement actions ranged from publishing in newspaper lost and found columns the names of illegal dumpers and the wastes that were dumped to sending policemen to homes. Skumatz noted that of the dumped trash, 85% was not of household origin. This indicates that it was not attributable to PAYT which was only applicable to residential wastes. The SERA research showed that white goods comprise the largest residential portion of illegally dumped materials indicating that provision for collection of bulky waste may be a means to reduce such dumping. Another related concern is the dumping of trash in with recyclables. However, no additional contamination of collected recyclables was found with adoption of PAYT.

A question was raised regarding illegal dumping into a neighbor’s container in small multi-family dwellings in San Francisco which are covered by the PAYT system. Findings paralleled those above. Most illegal dumping is commercial in origin or is tires and appliances. Education and enforcement can help. What there is in the way of illegally dumped residential trash often ends up in public receptacles, especially as locked or secure waste containers are becoming more prevalent in other locations. There is no evidence that PAYT is cause of additional illegal dumping.

Austin echoed this, suggesting that the barrier of illegal dumping is perception and not reality. They saw no significant increase in illegal dumping when PAYT was instituted. Typical dump sites do not contain household garbage. Excess garbage (that doesn’t fit into the cans) will get put out without stickers, though. This mainly occurs at low-income apartment multi-family units serviced by PAYT.

In New York City currently illegal dumping consists mainly of commercial trash. Illegal disposal is even a business enterprise whereby rented trucks are filled with trash and abandoned. In Brookhaven, N.Y. there is no PAYT and there is curbside collection of garbage, yet they do have a problem with residential dumping.

Collection Issues

The practicality of cans/totes was discussed in the context of congested urban areas with on-street parking. Such waste containers provide potential benefits not only for semi-automated or automated collection, but also have been found to significantly reduce rat problems. In Buffalo an 80% decrease in rodent problems was attributed to a change to totes.

A pilot run in New York City in 1991, however, showed significant problems in getting the totes to the trucks given that parked cars prevent access to the curb. However, in San Francisco which also has parking issues, they are increasing their use of totes and semi-automation collection, in part to prevent worker injuries. Semi-automated collection in which workers wheel totes to the truck which then automatically lifts and empties the tote was found to work well for containers larger than 30 gallons, while smaller cans are managed manually. Buffalo has totes and semi-automated collection for garbage but not for recycling (which uses small blue boxes). Seattle uses totes and semi-automated collection for containers larger than 30 gallons. Austin uses totes for automated and semi-automated collection, with 30, 60 and 90 gallon sizes.

Low Income Residents

The change from paying for garbage service through taxes to a PAYT system may shift some costs to residents. Concerns about the ability of low income residents to pay have resulted in the adoption of subsidy programs in about 10% of PAYT communities according to SERA research. These include a number of different approaches. Some communities provide a senior citizen discount (San Francisco). Others like Tompkins County, NY provide a discount to persons enrolled in other assistance programs like WIC or welfare. In Austin, all municipal utility services are charged on one monthly bill. A program is in place to assist customers who cannot afford to pay any or portions of the bill. The assistance program is managed by the Austin Energy Department of the City.

Avoiding different colored bags or stickers which identify those with subsidized disposal is recommended so as not to stigmatize those participants. Rather than a subsidy, establishing a cap such as that for water meter charges in New York City might be considered. It was suggested that if a subsidy is adopted, that disposal not be “free” so that an incentive for waste reduction remains. In contrast to these approaches to the variable PAYT charges, in Buffalo it was found that charging rates based on things other than waste generation rates (i.e., age, income, etc.) opened the fixed user fee up to legal challenges.

In Austin, education is used to help low income residents reduce waste. At the request of the household, a waste auditor is sent to the home and educates residents about what they could be pulling out for waste reduction and recycling. Garbage is monitored 2-3 times before providing education and 3-4 weeks after to make sure re-education was not needed. Collection crews can also ask for the waste audits of homes.

Enforcement

Because of health and safety considerations, simply “turning off” garbage collection for non-payment is not an easy option (unlike water or electric service). Buffalo has the authority to take over properties for non-payment, but they have not exercised that option. Unpaid bills can also be rolled over onto the tax bill for the property. Buffalo also administers tickets and is looking into applicability in PAYT. A late fee is also assessed for late payment and use of a collection agency has helped decrease non-payment. In Seattle the water and trash bills are issued jointly. If only partial payment is received, it goes towards trash so that if necessary, water can be shut off for non-payment.

Political Issues

Revenues were a significant motivation for adoption of the user fee and move towards PAYT in Buffalo. Among other factors, the city was seeking ways for the large percentage of property classified as tax exempt to cover their share of waste management expenses. Getting the public used first to the user fee, which helped them identify waste management costs and then stressing equity and fairness helped the transition to PAYT in Buffalo.

Waste reduction impacts are well documented with the adoption of PAYT programs and that can be an important motivation. In addition, PAYT is seen as more fair. A push from general public calling and complaining that the system was not fair was an important motivation in Austin for adopting PAYT. Interestingly, a survey done for the New York City Department of Sanitation reported that 57% of polled residents are at least interested in exploring PAYT options. Concern about opposition to PAYT is a significant barrier for municipal governments, but these results may indicate less political risk than many assume.

Pilot Programs and Next Steps

Implementation of pilot programs prior to full-scale implementation is highly recommended. They help avoid unanticipated problems (like the fact that Seattle's mini-cans tended to blow away). Pilots should address different demographic sectors and be of a scale and duration to give good data. Austin's pilot encompassed 3000 homes representing different demographics (such as income, distance from landfill) and ran for 14 months. In retrospect, a longer pilot with a larger number of participants might have been useful. Buffalo similarly performed a pilot which tested the program in many demographic settings. It helped to educate the public as well as providing a test for equipment.

Other large cities currently engaged in piloting PAYT programs include New Orleans, LA and Fort Worth, TX.

Discussion regarding piloting a PAYT program in New York City elicited varied comments. The "crisis" regarding the closure of the Fresh Kills landfill may provide an opportunity to try something new, such as PAYT. One suggestion was to begin a program with city agencies. Gathering data from such a pilot would face the challenge of co-collection of agency waste with residential waste. Implementing separate collection would likely incur significant costs since truck travel/collection is a large share of waste management costs. Better access to data is needed to help citizens and decision-makers see the true costs of waste collection and management in the City. Data generated by any pilots need to be accessible to interested parties.

In Brookhaven on Long Island there are more than 30 collection districts with many carters. They are in the middle of a five year contract with the haulers. Portland, OR is a major PAYT city and it operates with approximately 60 different haulers. Brookhaven and Islip are also concerned about maintaining revenues from tip fees generated by disposal at their landfills.

An important driver for semi or automated collection in the future is worker ergonomic standards. This could also favor implementation of PAYT programs.

Roundtable Handouts

- PAYT programs in San Francisco, Austin and Binghamton:

San Francisco (see Appendix C, pg 22):

1. *"San Francisco Solid Waste Management Overview"*
2. *"City and County of San Francisco Refuse Collection and Disposal Rate Board"*

For copies contact:

Solid Waste Management Program
Recycling Program • Hazardous Waste Management Program
1145 Market St, Ste 401
San Francisco, CA 94103
415-554-3400

Austin (see Appendix D, pg 26):

3. *"City Of Austin, TX, Solid Waste Services, 'Pay-As-You-Throw'- A Volume-Based Pricing System"*

For copies contact:

City of Austin Solid Waste Services
PO Box 1088
Austin, TX 78767
512-499-1935

Binghamton:

4. *"City of Binghamton Finds Recycling Success Through User Fee Program"*

For copies contact CWMI at cwmi@cornell.edu

- SERA Consulting (see Appendix E, pg 32)

5. *"Illegal Dumping: Incidence, Drivers, and Strategies"*
6. *"How Can Low Income Programs Work? Addressing Special Populations Under Variable Rates Systems"*
7. *"Info Request of 'Factoids' on Variable and Weight-based Rates in Solid Waste"*

For copies contact:

SERA Consulting
762 Eldorado Dr
Superior, CO 80027
303-494-1178; skumatz@ix.netcom.com

- Resource Recycling Magazine articles

8. *"Source Reduction Can Be Measured,"* by Lisa Skumatz (Aug 2000, pg 22)
9. *"Who's Paying by the Unit?"* by Jonathan Burgiel and Raymond Randall (Mar 1999, pg 24)

For copies contact:

Resource Recycling
PO Box 422070
Portland, OR 97242
503-227-1319; resrecycle@aol.com

- US EPA

10. *"PAYT Bulletin,"* EPA530-N-00-001, Winter 2000
11. *"Pay-As-You-Throw, Throw Away Less and Save,"* EPA530-F-96-028, April 1997

For information on PAYT log on to:

www.epa.gov/payt

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Appendix B

Agenda

“PAYT for Large Municipalities”

Sponsored by The Cornell Waste Management Institute, U. S. EPA, Region 2,
The NYS Association For Reduction, Reuse and Recycling, NYC Department of
Sanitation

December 11, 2000 • 8:30 AM - 5 PM • US EPA, 290 Broadway, Rm A, 27th Fl

8:30-9:00 Registration, coffee and pastry

Issue to consider throughout: practicality in densely urban setting

9:00-10:30 Welcome and Introduction–NYSAR³, EPA, CWMI

Overview of the Roundtable - CWMI

Summary of findings from around the US

Representatives from PAYT municipalities (~5-10 min each)

What are the big issues? • Why implement PAYT? • What are the benefits? • How does PAYT differ from privatization?

Other participants briefly introduce themselves (~1 min)

Why are you here? • What are your plans in re PAYT?

10:30-11:30 The potential for PAYT in multi-family units

How are apartment buildings handled? • How is it working? • Are there other options?

Issue: Incentives to landlords, tenants; enforcement

11:30-12:30 The potential for PAYT for city agencies and institutions

How is waste disposal charged for agencies and institutions? • How could cost savings accrue to the agency if PAYT were implemented for this sector?

Issue: Incentives to agencies

12:30-1:15 LUNCH – provided

1:15-2:30 What does it cost and what does it pay for?

Cost to the consumer? • How does consumer pay and who do they pay? • Bags, tags or cans? • What do the revenues pay for? • Cost to the municipality including administrative costs?

Issues: What are the most economical ways to go? Does PAYT cost more than it saves?

2:30-2:45 BREAK

2:45-3:45 Barriers and how to overcome them

Illegal dumping, does it get worse with PAYT? Can it be managed? • What are the political barriers to implementation and how to overcome them? • Getting the funding back to the solid waste program

Issues: Illegal dumping in dense urban setting; Perception of additional costs to taxpayers

3:45-4:45 What are the options and steps towards adoption?

Pilot in one or several locations within the municipality • Pilot or implement one sector at a time (e.g. single family, then small apartment buildings, then small commercial, etc.) • Implement for single family only • Implement for institutions/agencies only

Issues: Fairness; complexity of education

4:45-5:00 UNFINISHED BUSINESS

Technical assistance needs and opportunities

Appendix C

San Francisco Solid Waste Management Program



SOLID WASTE MANAGEMENT PROGRAM RECYCLING PROGRAM • HAZARDOUS WASTE MANAGEMENT PROGRAM

WILLIE L. BROWN, JR.
MAYOR

PAUL A. HIRSCHER
DIRECTOR

San Francisco Overview

Demographics

<u>Population</u>		<u>Households</u>	
Residential Population	790,000	Residences (in 1-3 unit buildings)	260,000
Businesses	22,000	Apartments (in 4 or larger buildings)	133,000
Day-time Population	1,300,000	Total Households	393,000

Ethnicity

Caucasian	40%
Asian	29%
Hispanic	14%
African American	11%
Other	6%

Language

English	58%
Chinese	17%
Spanish	1%
Tagalog	0%
Other	13%

PAYT Programs

Established	PAYT was practiced before San Francisco's 1972 refuse ordinance that is still in effect.
Collection	Two permitted private haulers collect weekly from residences and at least weekly from apartments and businesses.
Containers	Residences use 20 and 32 gallon cans. Apartments and businesses use 32 gallon cans up to 40 yard roll-off containers provided by haulers are ten-gallon cans provided by generators.
Sectors	PAYT applies to residences and businesses. Improvements are proposed for apartments.
Costs	Customers are billed directly by haulers for service (see attached approved residential and proposed apartment schedules).

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**CITY AND COUNTY OF SAN FRANCISCO
REFUSE COLLECTION AND DISPOSAL RATE BOARD**

The Refuse Collection and Disposal Rate Board hereby issues the following order:

"Whereas, the Sunset Scavenger Company and the Golden Gate Disposal and Recycling Company have applied for increases in the rates to be charged for refuse collection service rendered to residences, flats, and apartments; and

"Whereas, the Director of Public Works has investigated this application and has reported that an increase in rates to be charged for refuse collection from residences, flats, and apartments is justified at this time; and

"Whereas Sanitary Fill Company has not filed a new rate application since its application of September 20, 1996, with rates that would take effect on or before March 1, 1999; now therefore,

"Be it ordered that the following schedule of refuse collection rates shall be charged by the Sunset Scavenger Company and the Golden Gate Disposal and Recycling Company in the City and County of San Francisco, effective March 1, 1999:

"1) MONTHLY RATES FOR RESIDENCES AND FLATS

- (a)* For once a week collection of one container not exceeding thirty-two gallons in capacity and 60 pounds in weight from street level, not more than twenty-five feet from the curb
.....\$11.68
- (b)* For once a week collection of one container not exceeding twenty gallons in capacity and 40 pounds in weight from street level, not more than twenty-five feet from the curb
.....\$7.01
- (c)* Where the usual volume of refuse exceeds the capacity of a single thirty-two gallon container, or where the weight of the container exceeds 60 pounds, an additional monthly charge for additional volumes not exceeding thirty-two gallons and an additional weight not exceeding 60 pounds of.....\$10.51
- (d)* For each additional container of capacity not exceeding thirty-two gallons and 60 pounds in weight collected weekly, an additional monthly charge of.....\$10.51

"2) ALL OTHER RATES.

- (a) All other rates that were in effect on February 28, 1999, as specified in the Rate Board order, shall be reduced by 0.55%.

REFUSE COLLECTION AND
DISPOSAL RATE BOARD

APPROVED: February 14, 1997

Rates Effective March 1, 1999

Page

MONTHLY RATES FOR APARTMENT HOUSES: (PROPOSED)

Charge Per Can for	Collections Per Week.....						
	1	2	3	5	4	6	Sat/Sun
	Weekdays Only..... ***With Saturday***						
32 gal can	11.68	23.36	35.04	58.40	53.73	80.59	110.38
40-55 gal can	20.08	40.16	60.24	100.40	92.37	138.55	189.76
56-80 gal can	29.20	58.40	87.60	146.00	134.32	201.48	275.94
64 gal toter	16.19	32.38	48.57	80.95	74.47	111.71	153.00
96 gal toter	25.12	50.24	75.36	125.60	115.55	173.33	237.38
1 yd bin	79.17	158.34	237.51	395.85	364.18	546.27	748.16
1.5 yd bin	111.95	223.90	335.85	559.75	514.97	772.46	1,057.93
2 yd bin	144.88	289.76	434.64	724.40	666.45	999.67	1,369.12

Special Conditions for Apartments:

- (a) Rates are subject to a minimum weekly service requirement of 32 gallons per apartment unit, however, a minimum weekly requirement of 20 gallons per unit is possible if each unit also recycles a weekly minimum of 12 gallons. Customers wishing to conform with this alternate minimum service requirement must request this special service and are subject to audit and potential backbilling to ensure adequate recycling volumes.
- (b) Rates in the above schedule apply to buildings with six units or more and are predicated upon landlord responsibility for payment of service and upon a single street level location for all refuse container serving the building.
- (c) Wherever individual containers are provided for each apartment unit, or there are fewer than six apartment units, apartment rates and service shall not apply and the rate and service for residences and flats shall be applicable to all units.
- (d) Containers shall be located at street level where the service truck must park for access to the customer's service location and shall be of types and sizes, each not exceeding 80 gallons in capacity, suitable for emptying the contents into the collector's can, or shall be appropriate 64- or 96-gallon tofers or 1-, 1.5-, or 2-yard bins. Buildings deviating from any of these requirements, including those requiring entrance through trap door (as defined below), clearing of

disposal chute, or a container located on a ledge one foot or more above the surrounding surface level, shall, for each such deviation, be subject to an additional charge of 50% of the rate that would otherwise apply for that location. For any building with "rake out service," the rate shall be determined based on the rake-out volume times 1/32 of the 32-gal rate times 1.5. A trap door is defined as a container located below ground level, where the collector must access the container by lifting off a cover and pulling the container up to street level for servicing.

(e) For any building where the collector must travel above and/or below street level in order to gain access to the container, an additional charge of the rate that would otherwise apply for that location shall be made in accordance with the following schedule:

Travel Distance Above and/or Below Street Level	Added Charge Percent of Otherwise Applicable Rate
4 feet to 8 feet	25%
8 feet to 16 feet	50%
16 feet to 24 feet	75%
24 feet or more	100%

(f) For collection made from a container located more than 100 feet traveling distance from the curb, an additional charge of 25% of the otherwise applicable rate for that location shall be made.

(g) For each time use of a key (including key, key pad, combination lock, automatic door opener, or other entry mechanism) is required to enter or leave the container location, an additional monthly charge shall be made according to the frequency of collection service, *i.e.*, for one time per week, \$3.75; for two times per week, \$7.50; for three times per week, \$11.25; four times per week, \$15.00; for five times per week, \$18.75; for six times per week, \$22.50; and for seven times per week, \$26.25.

(h) For each check returned unpaid by the maker's bank, a minimum service charge of \$15.00 shall apply.

(i) Access to containers shall be unobstructed. Containers shall be placed at locations adequate to permit the refuse collectors free and clear access to and from the containers so that they can be serviced in a normal and safe manner.

Appendix D

City of Austin's Volume-Based Pricing System

City of Austin, Texas

Solid Waste Services

"Pay-As-You-Throw" – A Volume-Based Pricing System

The cancellation of a proposed waste-to-energy project in 1988 in conjunction with concerns over premature closure of the city's landfill due to the volume of garbage being disposed, led the Austin City Council to pass the Comprehensive Recycling Resolution in January 1990. This action formed the basis for the subsequent proposal of a new variable rate program that came to be known as "Pay-As-You-Throw" and was a critical component of reaching the State of Texas' goal of reducing the amount of residential garbage going to landfills by 50%.

The Pay-As-You-Throw program involved fundamental changes in the way the City of Austin collects, handles, and disposes of solid waste, with the goals of: conserving landfill capacity by increasing recycling and composting; converting waste service to a more equitable, consumption-based billing, like other utilities, with incentives for waste reduction; and promoting cost-effectiveness and safety through the reduction of crew size and lifting injuries.

Operationally, the plan called for changing waste collection from twice-a-week manual garbage collection with three person crews, to once-a-week semi-automated collection with two person crews. Along with retaining once-a-week recycling collection, a third weekly collection was added for yard trimmings, which was to be composted through expansion of the city's wastewater biosolid (sludge) composting program ("Dillo Dirt"). The plan offered customers their choice of a 30, 60, or 90 gallon wheeled cart based upon the amount of garbage they generated, with extra garbage stickers which could be bought for use during weeks when their volume exceeded their cart capacity. Solid Waste Services enlisted over 1,000 volunteer Block Leaders to act as neighborhood contacts for the program, talking to neighbors, distributing literature, and displaying yard signs that gave notice of recycling collection days. Solid Waste Services also developed an on-going program of public education to promote curbside recycling and waste reduction through various educational materials, utility bill inserts, media coverage, public service announcements, billboard advertising and paid ads in the radio, television and print media.

From July 1991 through July 1992, the Solid Waste Services Department conducted a one year Pay-As-You-Throw pilot with 3,000 households that tested all of the elements of the new program, including different cart sizes and rates. Fourteen-gallon recycling bins were given to all households participating in the pilot. Distribution of recycling bins continued until the entire City had received bins. Based on the results of the pilot, the City Council approved a three year, phased conversion of the entire city to Pay-As-You-Throw beginning in 1993. In the interest of equity during the phase-in period, the Council directed that all customers would continue to pay a flat rate for collection services until the entire city was on the new system. A key element of the conversion process was to aggressively pursue new recycling opportunities in terms of additional materials that would make it easier for customers to comply with impending volume limits on garbage.

In 1993, newspaper inserts and magazines were added to the recycling program. In 1994, soda bottles (PET) and milk jugs (HDPE) were also added to the container mix for recycling. In the Fall of 1995 Solid Waste Services banned the use of plastic bags for yard trimmings, requiring residents to use paper yard waste bags or open containers instead, because plastic bags could not be composted into "Dillo Dirt."

Toward the end of the conversion process, Solid Waste Services conducted another four-month pilot project, called "Austin Recycles Plus." Seventy-eight hundred (7800) households participated from April through July of 1996 to determine the volume of additional diversion that could be achieved through the collection

of all residential mixed paper (“anything that tears”) as well as plastic bottles #1-#7 (except Styrofoam), and whether or not these new materials could be successfully sold in the marketplace. The goal was to maximize diversion opportunities so that the vast majority of Solid Waste Services customers who were willing to recycle could avoid excess garbage charges after full implementation of volume-based pricing.

Based upon poor or non-existent markets during the pilot for plastic numbers 3 –7, as well as the lower grades of mixed paper, Solid Waste Services decided to expand their curbside program to only include all plastic bottles made of blow-molded PET (#1) and HDPE (#2), and to add junk mail and home office paper starting in October, 1996. The additional plastic represents nearly 90% of the total plastic waste stream by weight which includes many larger bottle types such as bleach and detergent containers that consume greater space in a garbage cart. The junk mail/home office paper had tested as compatible with the current mix of newspapers and magazines.

With the conversion of the whole city to the new system in 1996, Solid Waste Services received approval for the extra garbage sticker charge to take effect in March 1997. Under the plan, no stickers would be required during the week after Christmas or during “Clean Sweep” week (“spring cleaning”) in April of each year. The actual implementation of a true variable rate system was scheduled for September 1997 to allow time to upgrade the City’s billing system.

To promote and educate customers about the additional recyclables in order to avoid the extra garbage sticker charge, new guideline brochures were distributed as an insert in the Austin American-Statesman during the last week of September and twelve billboards highlighting the new materials were unveiled at strategic locations throughout the City. Solid Waste Services also distributed 15,000 recycling bins to selected areas with high percentages of rental housing and low recycling participation to coincide with the start of the new program.

Public education overall was critical to the success of the sticker program and Solid Waste Services developed a range of strategies to reach its customers. Throughout the Fall and Winter of 1996-97 customers were notified about the stickers through a utility bill insert, press briefings, multiple paid advertisements in the Austin American Statesman and weekly community papers, and billboards. The educational message “Recycle or Pay-As-You-Throw - It’s Your Choice” was a clear message, strongly supported by paid radio ads. Solid Waste Services also mailed out six complimentary stickers to all of its customers (130,000) to ease the transition to the new system and mitigate the public’s anxiety. Using for comparison the data previously collected from the Additional Materials Pilot in 1996, Solid Waste Services staff studied the impact during the first three months of the Extra Garbage Sticker program in the same pilot areas. The data revealed that the average number of households with excess garbage for all pilot areas declined from 17.5% of all set-outs in 1996, to a little over 5% in 1997, representing an overall decrease of -71%. Of the households that did have excess garbage, the majority of these set-outs (58%) had only one extra bag. Recycling participation in terms of bin set-outs increased by over 20% in what had been the lowest participation area the previous year, with overall recycling participation increasing by nearly 11% on average from 1996. The results of the Extra Garbage Sticker program in terms of Austin’s overall diversion rate was even more dramatic. Prior to the sticker program this rate had been relatively constant at approximately 20%. However, after only six months under the Sticker Program, the rate had increased to over 25%.

Beginning in September 1997, Solid Waste Services implemented variable rate pricing by charging \$11.75 for a 30 gallon cart, \$14.50 for a 60, and \$17.25 for a 90. Customers always have the option to change to a different sized cart, however, after having switched one time, a charge of \$15.00 is added to the Solid Waste Rate if going to a larger cart. Customers may have as many carts as they are willing to pay for. The extra garbage sticker remains in effect for overflow situations at any size level. Over the first year most residential customers were able to successfully adjust to volume-base pricing and complaints have decreased significantly

as most customers have realized that they will only need the extra stickers on rare occasions. The \$2.00 stickers are available at most local convenience and grocery stores, with approximately 206,500 stickers having been sold to local vendors as of May 31, 1998.

By April of 1998, fourteen months after volume-based pricing went into effect, the diversion rate was over 31%, an increase of 11% over what had been achieved with flat-rate pricing. Garbage as a percentage of the total waste stream has declined from nearly 80% to less than 69%. At the end of September, 2000, the diversion rate was 29%.

With this significant increase in diversion in such a short time, the City of Austin is well on its way to meeting the State of Texas' goal of diverting 40% of residential garbage from landfills by the year 2005.

Austin, Texas — Population: 560,000

Number of Residential Customers Served FY00-01: 141,015

Number of Commercial Customers Served FY00-01: approximately 2200

Austin Pay-As-You-Throw Program applies to City of Austin residential single-family to four-plex units. It applies to commercial customers in that they receive garbage and recycling collection, not yard-trimmings, and are charged according to the number of carts and frequency of collection (either 1 or 2 times per week). Collection is provided by the municipality.

The majority of the garbage carts are manufactured by Toter, Inc.

Current Customer Fees are based on cart sizes and number. This fee is billed monthly as part of the customers utility bill. The customer receives once a week garbage, recycling, and yard-trimmings collection, as well as twice a year brush and bulky collection. The fee covers the cost of garbage disposal and the processing of recycling materials.

Customer base per cart size and fee for one cart:	Additional cart fees (per cart):
12%, 30 gallon cart \$11.75 /month	30 gallon - \$4.75 per month
83%, 60 gallon cart \$14.50 / month	60 gallon - \$7.50 per month
5%, 90 gallon cart \$17.25 /onth	90 gallon - \$10.25 per month

Approximate Number of Apartment Units: 100,000

Number of Apartment Buildings with more than 100 units: 341 with a total of 80,189 units.

Apartment units are serviced by private haulers for garbage collection. Multi-family properties with 100 units or more are required by Ordinance to provide on-site recycling for tenants. A copy of this ordinance and other information will be available at the Roundtable.

Ethnicity (based on 1990 Census Data):

--Unemployment 6%

Population: 465,622

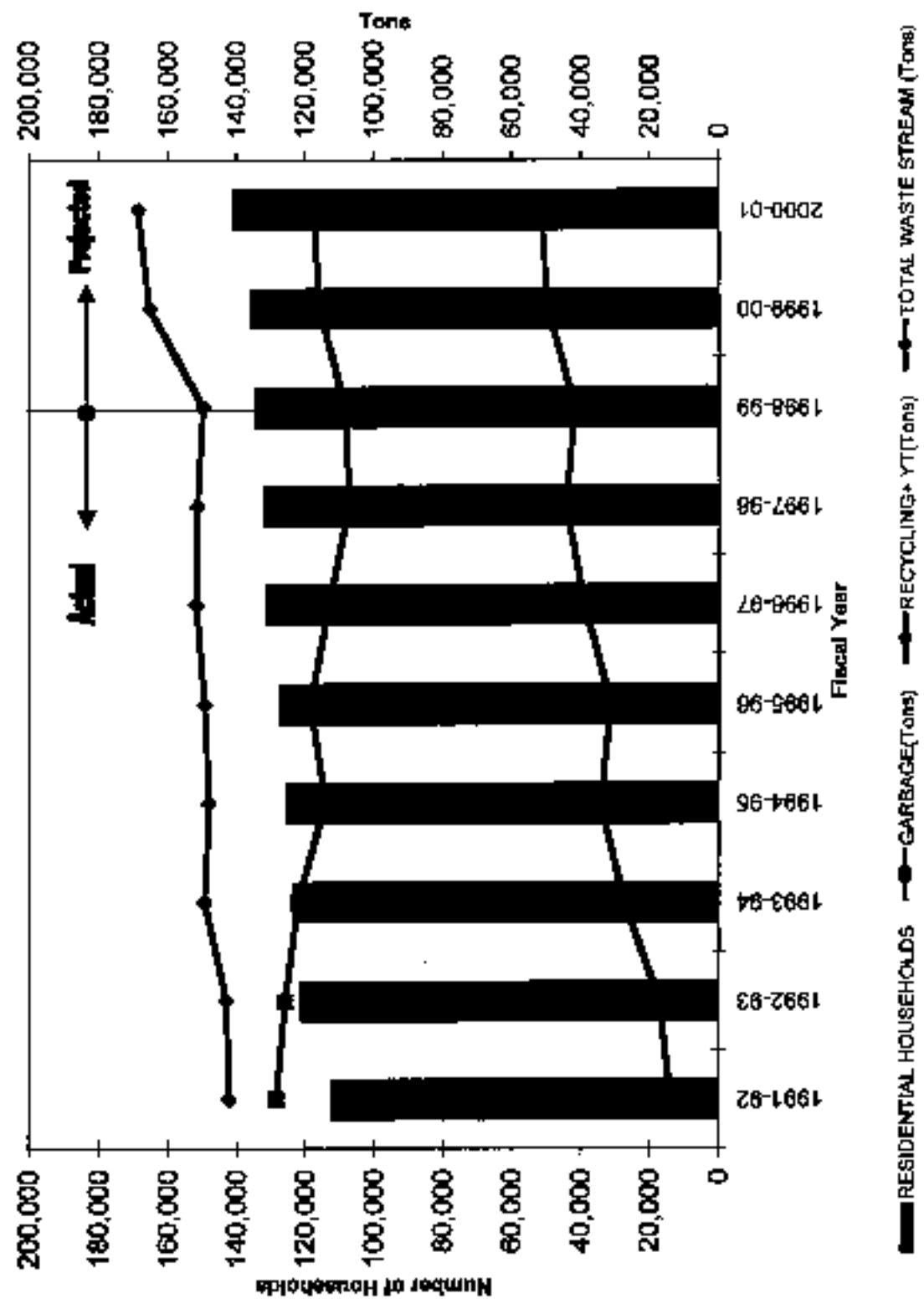
Minority: 32%

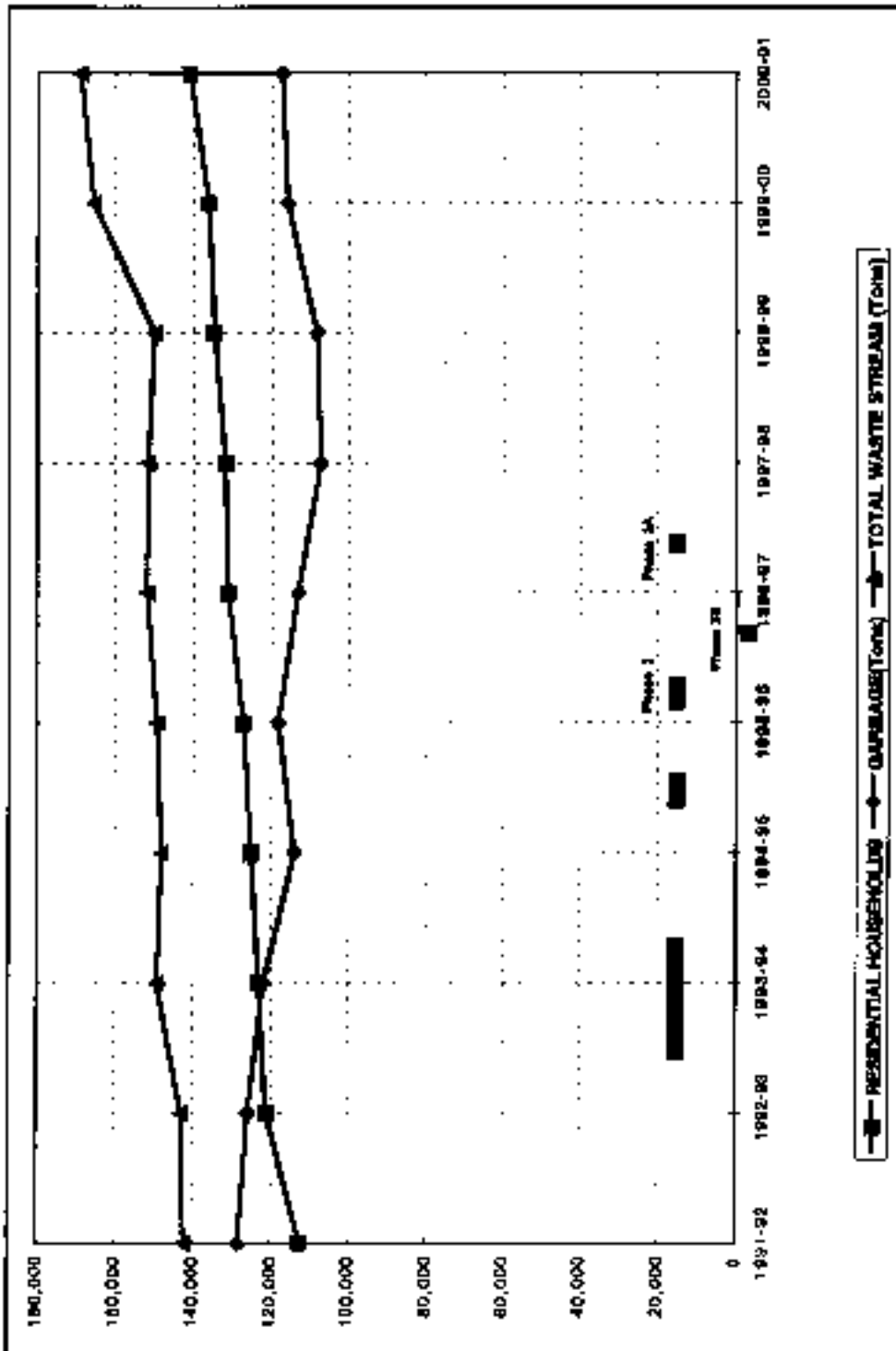
Poverty Rate: 16%

City of Austin

Solid Waste Services

Household Growth, Garbage Tonnage, Recycling Tonnage, and Total Waste Stream Comparison





FISCAL YEAR	RESIDENTIAL HOUSEHOLDS	GARBAGE(Tons)	RECYCLING+ Y(Tons)	YARD TRIMMING	TOTAL WASTE STREAM(Tons)	GARBAGE: TONS PER HOUSEHOLD (C/B)	GARBAGE: LBS PER HA-WEEK PER HOUSEHOLD (0.2K/52)	TOTAL WASTE: TONS PER HOUSEHOLD (F/B)	DIVERSION RATE (%) (D+E)
1991-92	112,400	128,333	13,899	0	142,232	1.1418	1.2654	1.2854	8.77%
1992-93	121,700	125,981	17,045	0	142,926	1.0995		1.1902	11.93%
1993-94	123,500	122,000	27,286	0	149,286	0.8888		1.2108	18.28%
1994-95	126,500	114,567	34,039	0	148,109	0.9104		1.1620	22.98%
1995-96	127,200	118,298	31,076	0	149,373	0.8300		1.1743	20.85%
1996-97	131,200	113,060	38,609	0	151,669	0.8617	33.14	1.1553	25.60%
1997-98	132,000	107,272	44,348	0	151,621	0.8127	31.26	1.1486	29.25%
1998-99	134,643	106,226	41,697	0	148,923	0.8036	30.92	1.1135	27.81%
1999-00	138,200	115,874	49,754	0	165,628	0.8508	32.72	1.2161	30.04%
2000-01	141,016	117,324	51,593	0	168,917	0.8320	32.00	1.1678	30.54%

SERA MATERIALS LIST AND ORDER FORM

Thank you for your interest in our work. Please mark the materials you are interested in receiving and fill out your address information. We hope the information is helpful. Feel free to call if you have any questions. We can be reached at (206) 624-8508 or fax at 206/624-2950, or email at skumatz@serainc.com (web site is serainc.com). MARK CLEARLY IF YOU WANT MORE THAN ONE COPY.

PROGRAM EVALUATION AND STRATEGIC PLANNING

- "Achieving 50% in California: Analysis of Recycling, Diversion, and Cost-Effectiveness", (SERA/California Chapters of SWANA)
 _____ \$10 for SWANA members; \$20 for non-SWANA members
- "Recycle 2000: Recommendations for Increasing Recycling in the Commonwealth of Massachusetts"
 _____ \$15
- "Nationwide Diversion Rate Study - Quantitative Effects of Program Choices on Recycling and Green Waste Diversion: Beyond Case Studies"
 _____ \$15
- Papers on Program Evaluation
 _____ \$5

VARIABLE RATES / PAY AS YOU THROW

- Variable Rates and Weight-Based (Garbage by the Pound) articles
 _____ \$5
- "Garbage by the Pound: On the Streets" (for Reason Foundation)
 _____ \$15
- "Model Variable Rates Legislation: Elements, Options, and Considerations for State-Level Legislation in Solid Waste"
 _____ \$15
- "Variable Rates for Municipal Solid Waste: Implementation, Experience, Economics, and Legislation" (for Reason Foundation).
 _____ \$15
- "How Can Low Income Programs Work? Addressing Special Populations Under Variable Rates Systems"
 _____ \$15
- "Legal Guttering: Incidence, Drivers, and Strategies"
 _____ \$15

ECONOMICS / PLANNING/OTHER

- "Moving on Up" - Strategies for Increasing Multi-family Recycling"
 _____ \$15
- "Economic Alternatives to Flow Control for Solid Waste and Recyclables"
 _____ \$10
- Revenue/Financing Options Papers
 _____ \$5
- "Forecasting Solid Waste Tonnage: Techniques and Alternatives to Estimate Tonnage, Revenues, Source Reduction, and Program Performance"
 _____ \$10
- "Local Resource Audit/Conservation Programs: Providing Customers with Better, More Cost-Effective Service" (also energy)
 _____ \$15

VARIABLE RATES MANUALS

- "Variable Rates in Solid Waste: Handbook for Solid Waste Officials, Volume I Executive Summary" (40 pp).
 _____ \$15
- "Variable Rates in Solid Waste: Handbook for Solid Waste Officials, Volume II Detailed Manual" (310 pp).
 _____ \$45
- Other variable rates manuals - call for ordering instructions.

ENERGY STUDIES

- Skumatz, Lisa A., Ph.D. and Hans Van Dusen, "Local Resource Audit/Conservation Programs: Providing Customers with Better, More Cost-Effective Service", SERA, 1995.
 _____ \$15
- "Non-Energy Benefits" papers
 _____ \$10
- Papers on "Measure Retention"
 _____ \$10
- Residential and Non-residential Standard Performance Contract Program Evaluation Papers
 _____ \$10
- Paper on Energy Use by Minority/Ethnic Groups
 _____ \$5
- Paper on Methods to Reduce Bias in Surveys/Implication
 _____ \$5

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- Copy of presentation from conference (specify topic and _____ \$2 conference).
- Copy of SERA Qualifications/Project Experience (free)

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