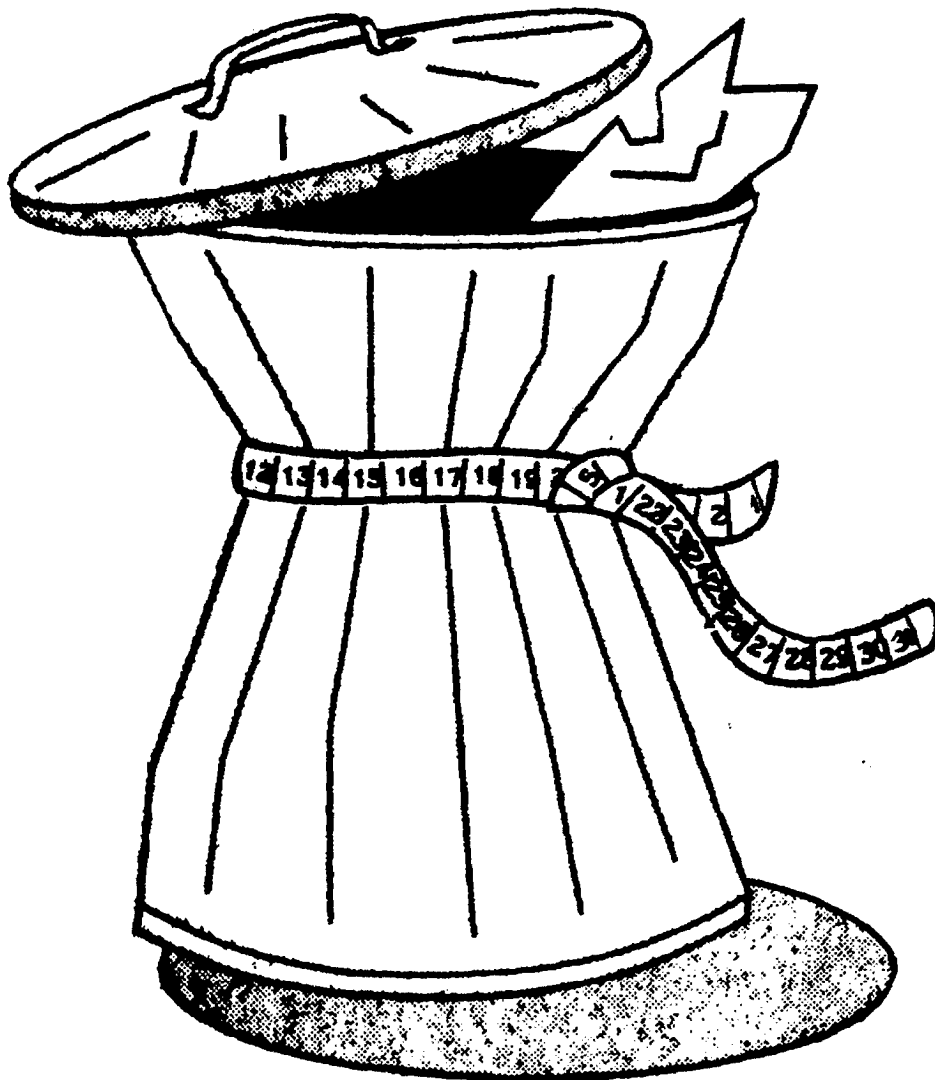**⬧EPA**

Guide To EPA's Unit Pricing Database

Pay-As-You-Throw Municipal Solid Waste Programs in The U.S.

NOTE ON DATABASE AVAILABILITY

The database referred in this document is now available on-line at the following URL:

http://www.epa.gov/payt/comminfo.htm

Acknowledgements

Table of Contents

WHAT IS UNIT PRICING?

Unit based pricing of solid waste refers to a pricing system that charges a household by the *amount* of solid waste it disposes. This method of managing municipal solid waste (MSW) has many variations. In a "pay-per-bag" system, customers are charged for each bag of solid waste, but in a weight-based system, they are charged by the pound. However, in all cases, unit pricing encourages consumers to pay more attention to their waste generation practices. Specifically, they may increase their source reduction/reuse behavior by purchasing goods that are more durable or contain less packaging. They may also step up their recycling efforts, reducing the amount of mixed waste they dispose. Since they pay only for what they throw away, unit-based pricing gives households greater control over and an incentive to reduce the amount they pay for solid waste services. The purpose of this document is to describe the database of information collected from 109 communities with unit-based systems.

ABOUT THE DATABASE

Method for Collection

Data from 109 communities with unit pricing programs were compiled by the Research Triangle Institute (RTI). The database includes a variety of programs across the country. Table 1 lists the number of programs in the database by state. To

identify communities with unit pricing programs, RTI reviewed current literature on

unit pricing and contacted various state and local solid waste officials.

Table 1

Number of Programs in Sample by State

State	Number of Programs	Percent of Total
California	32	29.4
Florida	1	0.9
Georgia	1	0.9
Illinois	18	16.5
Michigan	5	4.6
Minnesota	1	0.9
Montana	1	0.9
New Jersey	3	2.8
Ohio	1	0.9
Oregon	7	6.4
Pennsylvania	36	33.0
Vermont	2	1.8
Wisconsin	1	0.9

Worksheet Format

The database is presented by community in one-page descriptions relaying three categories of information[1]. The first category, General Program Characteristics, provides summary information on general traits of a community's unit pricing program. Concurrent Programs, the following section, includes data referring to those programs that are often operated along with a unit pricing program. Lastly, the category Pricing Structure details the financial organization of a community's unit pricing program.

The section General Program Characteristics provides summary information on general traits of each community's unit pricing program, beginning with the *Community* name, *State,* and the date on which unit pricing *Began*[2] in the community. For example, examine Arcadia, California, the first community listed in the database, whose unit pricing program began in 1989. *Area Served* and *Name* refer to the portion and name of an area served by the unit pricing program. All of the community of Arcadia is being served. The *Type* of system that best describes Arcadia's unit pricing program is a subscription can program. *Participation* in the program is voluntary rather than mandatory. There are 19,000 households *(No. of households)* participating in Arcadia. The program is available to multi-family residences *(Multi-residences),* but the maximum number of units *(No. of units)* in the multi-family residences served is

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[1]See Appendix B for a complete view of the Unit Pricing Database Worksheets.

[2]In some instances, the exact date of unit pricing program implementation is unknown. When *Began* is given in terms of the number of years of program operation, use September 1992 as an approximate point of reference.

not known. Arcadia's program allows the mixing of solid waste and yard waste *(Mix yw/sw?).*

The section Concurrent Programs includes data referring to those programs that are often operated in conjunction with a unit pricing program. Under the first heading, *Collection services, Curb-side* and *Drop-off* ask whether the community offers curb-side or drop-off recycling. Both are available in Arcadia, as well as white or oversized waste *(White/oversized)* collection. Special *yard waste* collection is not provided by Arcadia. *Other* collection services the community may offer are also included in this section. *Solid Waste Service, Yard Waste Service, Recycling Service* refer to the number of times per *Period,* weekly or monthly, the related waste is collected. Arcadia services both solid waste and recycling once weekly. The final portion of this section asks if the community has a charge for recycling *(Rc charge),* and if so, the amount of the charge *(Rc fee)* and the period in which the recycling charge applies *(Rc schedule).* Arcadia does not have a recycling charge.

The section Pricing Structure details the financial organization of a community's unit pricing program. The first portion of this section inquires as to whether the community has a *Fixed Charge* for waste collection services, and if so, the amount of that charge *(Fixed fee)* and the period for which the fixed charge applies *(Fixed schedule).* Arcadia does not have a fixed charge for waste collection services. However, if the community does have a fixed charge, the data next answers whether that fixed charge covers any *Base Service* level. If so, then what are the base number of containers covered by the fixed charge *(Base no. containers), the* volume of those

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containers *(Base vol. containers),* their unit volume *(Base gal/lb),* the type of containers such as bag, can or cart *(Base type containers),* and finally, what is the period in which the fixed charge for this base service applies *(Base period)?* The final segment of the section presents incremental pricing information in table form. Arcadia's pricing structure has three increments for the subscription can unit pricing program. In the first, there is a Fee of $7.80 monthly *(Period)* for the first *(To* and *From)* 60 *(Volume)* gallon *(Gal/Lb)* can *(Container)* of solid waste *(SW/YW).* In the second, the *Fee* is $ 9.44 monthly *(Period)* for the first *(To* and *From)* 90 *(Volume)* gallon *(Gal/Lb)* can *(Container)* of solid waste *(SW/YW).* And in the third incremental pricing structure, the *Fee* is $2.27 monthly *(Period)* for each additional *(To* and *From*[3])3) 90 *(Volume)* gallon *(Gal/Lb)* can *(Container)* of solid waste *(SW/YW).*

SAMPLE APPLICATIONS

This section details how a user of the database can retrieve and sort information to answer specific questions. Examples are given of cross-tabulations and possible ways to organize the data.

Instructions for Decompressing Data Files

The enclosed disk is a high-density (1.2 MB) 5.25" floppy disk. The data files on the

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[3]The number 99 in the From column represents a place holder, meaning that there is no constraint on additional numbers of containers that a household may purchase.

disk are self-extracting compressed files in the following formats in Table 2:

Table 2

File Type	Compressed File Name	Data File Names
ASCII (comma-delimited)	SW_ASC.EXE	SW.TXT and SWFLDS.TXT
Lotus 1-2-3 (all releases)	SW_123.EXE	SW.WK1 and SWFLDS.WK1
Paradox 4.0	SW_PX4.EXE	SW.DB arid SWFLDS.DB[4]

In order to decompress any or all of the data files, follow these steps:

1. Insert the disk in the appropriate floppy disk drive (usually A or B).

2. Make the floppy disk drive the default drive by entering the command

A: (or B:) <Enter>

3. At the A:> prompt, enter *[filename] [path]* (substitute the appropriate file name and

path without brackets). For example, suppose you want to decompress the

delimited ASCII file to a directory named "DATA" on your C: drive. Type

SW-ASC C: \ DATA <Enter>

4. At the A:> prompt, type "DIR" [path]. In our example you would enter

DIR C:\DATA <Enter>

On the monitor you will see file information for the file SW.TXT and

SWFLDS.TXT.

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[4]There are a number of other files, including report and screen formats. While they are not necessary for use of these two databases, they give the option of printing reports without redesigning them.

5. Since the data file names are unique, you can decompress all the files into the same directory without fear of overwriting any of the other data files in that directory (assuming, of course, that you have no other files by that name from previous decompressions).

6. Remove the floppy disk and save it in the event you need to decompress any of the files in the future.


General Program Characteristics

Program Types

All unit pricing programs represented in the database are variants of volume-based systems. Within this general category, it is useful to group the programs into four sub-categories: simple bag/tag, fixed fee with no base service, fixed fee with base service, and subscription can (see Figure 1). Each of these sub-categories presents households with a different price signal and thus, affects the incentive for households to engage in source reduction practices, as well as other measures to reduce the amount of trash they send to the landfill.

Of the 109 programs in the database, 48 are simple bag-tag programs. In this type of program, the hauler collects a customer's waste only if it is properly bagged or tagged. Household service charges are collected as the proceeds from the sale of official program bags or stickers (tags). Since it offers customers the most flexibility in reducing solid waste fees through waste reduction, the simple bag tag program is the purest form of unit-based pricing of the four variants of volume-based programs

Figure 1

Classification of Unit Pricing Programs
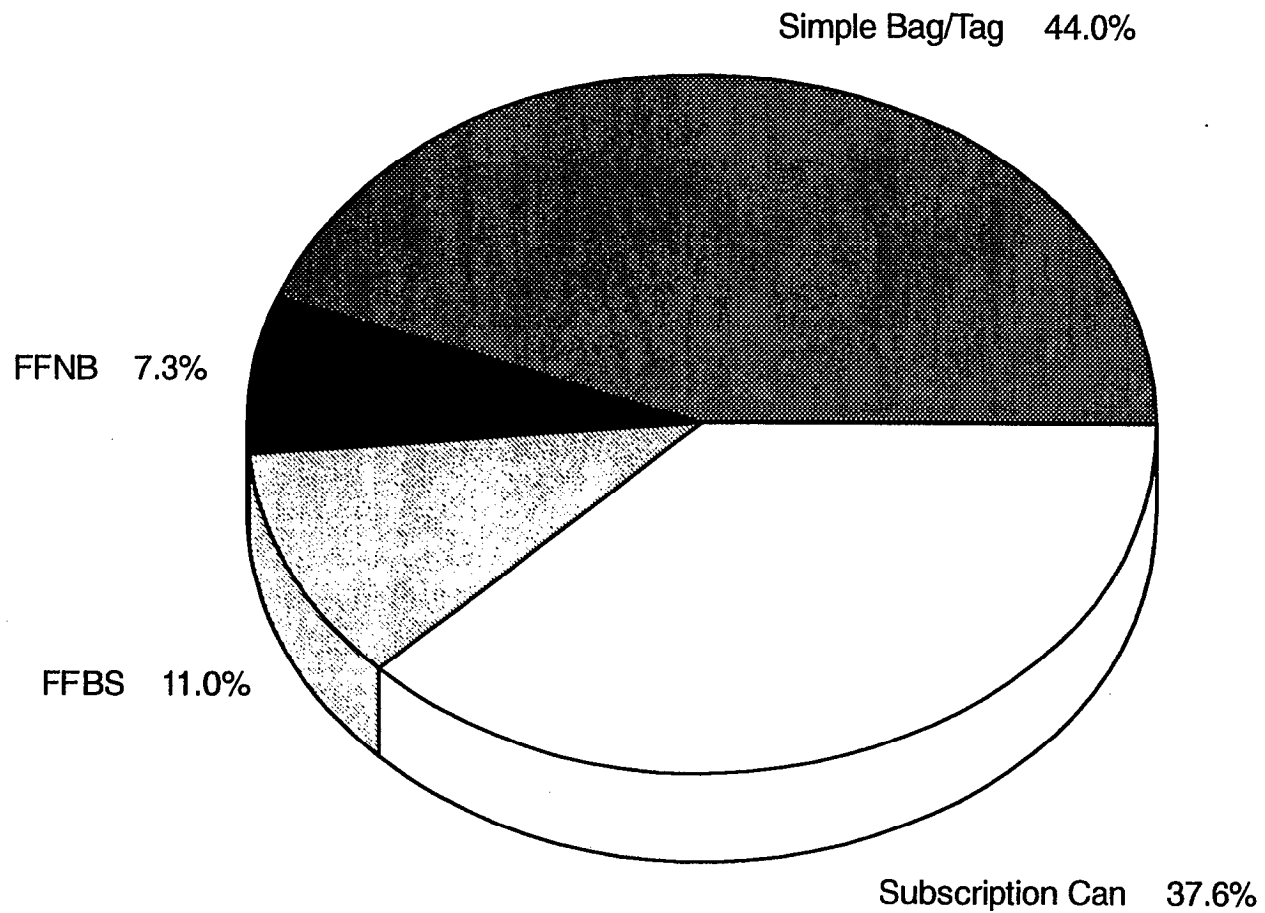
Simple Bag/Tag   44.0%

FFNB   7.3%

FFBS   11.0%

Subscription Can   37.6%

FFNB=Fixed fee with no base service
FFBS=Fixed fee with base service

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represented in the database.

Eight of the programs are fixed fee with no base service programs. These are similar to the simple bag/tag programs with the exception of an additional periodic fee for participation in the program. The fixed fee ranges from $1.25 to approximately $17 per month, averaging about $6.50 per month.[5] The fixed fee, in and of itself, will not inhibit household response to volume-based rates. However, communities that assess a fixed fee in order to maintain lower volume-based rates are likely to observe a lower aggregate reduction in the amount of waste sent to the landfill. At lower prices, the typical household is likely to purchase more solid waste disposal services.

Twelve programs are fixed fee with base service programs, another variant of bag/tag pricing. In addition to the bag/tag charges and fixed fee, customers are provided with some base level of service. For these programs, the fixed fee ranges from $2.08 to about $17 per month, averaging $9.68 per month. The base level of service varies quite considerably. For example, sometimes the base level may be quite small, two 32 gallon bags per month, or as large as six 32 gallon bags per week. Provision of a base level of service dampens the price incentive mechanism, since households are not rewarded for reducing their waste below the base service level. Thus, the greater the base service level, the greater the dampening effect on the price incentive.

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[5]The fee may be charged on an annual, quarterly, or monthly basis. For purposes of comparison all fixed fees were converted to a monthly equivalent.

Finally, 41 of the 109 programs are subscription can programs. In the subscription can programs, households specify in advance, the level of service they desire. For example, a household may request a service level of two 32 gallon containers per week. Because households are not able to adjust this level instantaneously, the price incentive is not as fully transmitted as is the case in the bag/ tag programs. For example, if customers subscribe to two cans of service per week, but only generate one can of garbage, they still have to pay for the second can. Because of this "lumpiness" problem, the subscription can variant of volume-based pricing is less flexible than the bag/tag variant of unit pricing.
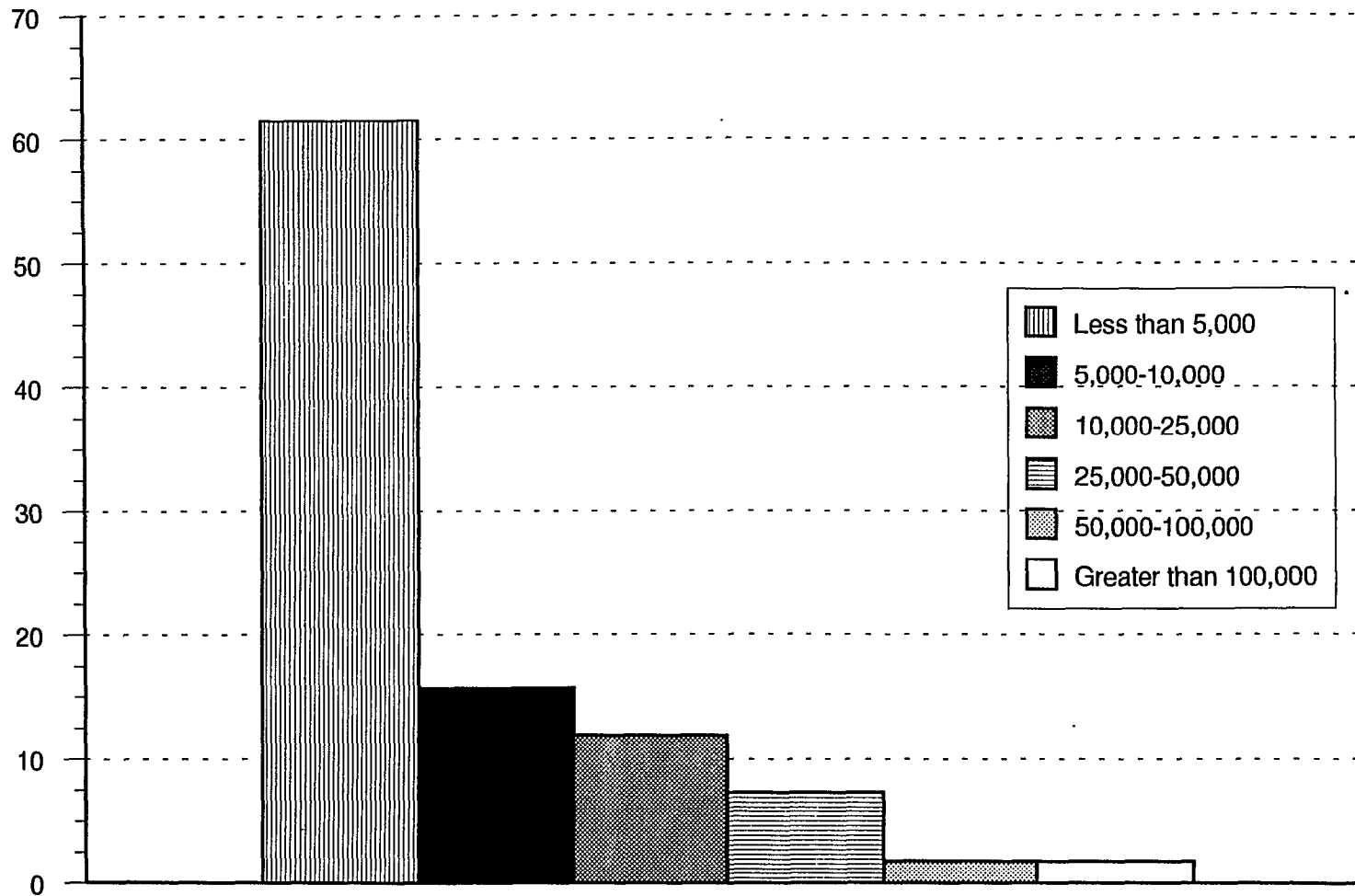
Program Size and Age

The average number of households served in the programs is 10,605. The smallest program applies to 200 households and the largest applies to 140,000 households.[6] Figure 2 depicts the distribution of the size of the programs. Note that over half (59 percent) fall in to the less than 5,000 households range. Over 96 percent, a total of 99 programs, serve less than 50,000 households while only four programs apply to more than 50,000 households. The data, then, supports the notion that unit pricing programs have been adopted predominately by smaller communities.

The average age of the programs is nine years, the newest being about five

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[6]Six of the communities were unable to estimate program size and are excluded from the tabulation.

Figure 2
Distribution of Program Size

Legend:
- Less than 5,000
- 5,000-10,000
- 10,000-25,000
- 25,000-50,000
- 50,000-100,000
- Greater than 100,000

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months old and the oldest program being almost 77 years old.[7] In fact, two

California communities have programs over 50 years old; Richmond's program began

in 1916 and Berkeley's in 1924. Thus, while unit pricing has become increasingly

popular in recent years, the concept is not new. Table 3 lists the age structure of unit

pricing programs in the database.

Table 3

Age Structure of Unit Pricing Programs in Database

Program Type	Minimum	Maximum	Mean	Median
All Programs	5 months	77 years	9 years	8 years
Simple Bag/Tag	10 months	22 years	4 years	3 years
Fixed Fee Without Base Service	1 year	13 years	4 years	5 years
Fixed Fee With Base Service	11 months	23 years	8 years	2 years
Subscription Can	5 months	77 years	17 years	5 years

Of the four types of programs, the subscription can programs are, on average,

the oldest and largest with an average size of 20,036 households and average age of

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[7]Eight communities were unable to estimate program age and are excluded from these calculations.

17 years. In contrast, the average sizes for the simple bag/tag, the fixed fee with no base service, and the fixed fee with base service are 5,013, 7,002, and 2,436 households, respectively. The average ages for the simple bag/tag, the fixed fee with no base service, and the fixed fee with base service are 4.4, 8.2, and 3.8 years. Figure 3 depicts a comparison of average age and average size across the program types.

Elements of Community Solid Waste Programs

Typically, communities implement other types of programs when they adopt unit pricing. The data include information regarding whether the communities in the database have four of the most common types of programs operated in conjunction with unit pricing: curbside recycling, drop-off recycling, a yard waste program, and an oversize goods program. Figure 4 shows the percentage of communities across all programs and within each of the four types of programs that have adopted these concurrent programs.

Across all programs, 84.4 percent have implemented curbside recycling. The subscription can programs are most likely to have curbside recycling with 98.6 percent of these programs in the database operating a curbside recycling program. The fixed fee without base service programs are least likely to have curbside recycling; only 62.5 percent. On average, drop-off recycling programs are less popular than curbside recycling. Roughly 44 percent of the programs in the database operate drop-off recycling programs.

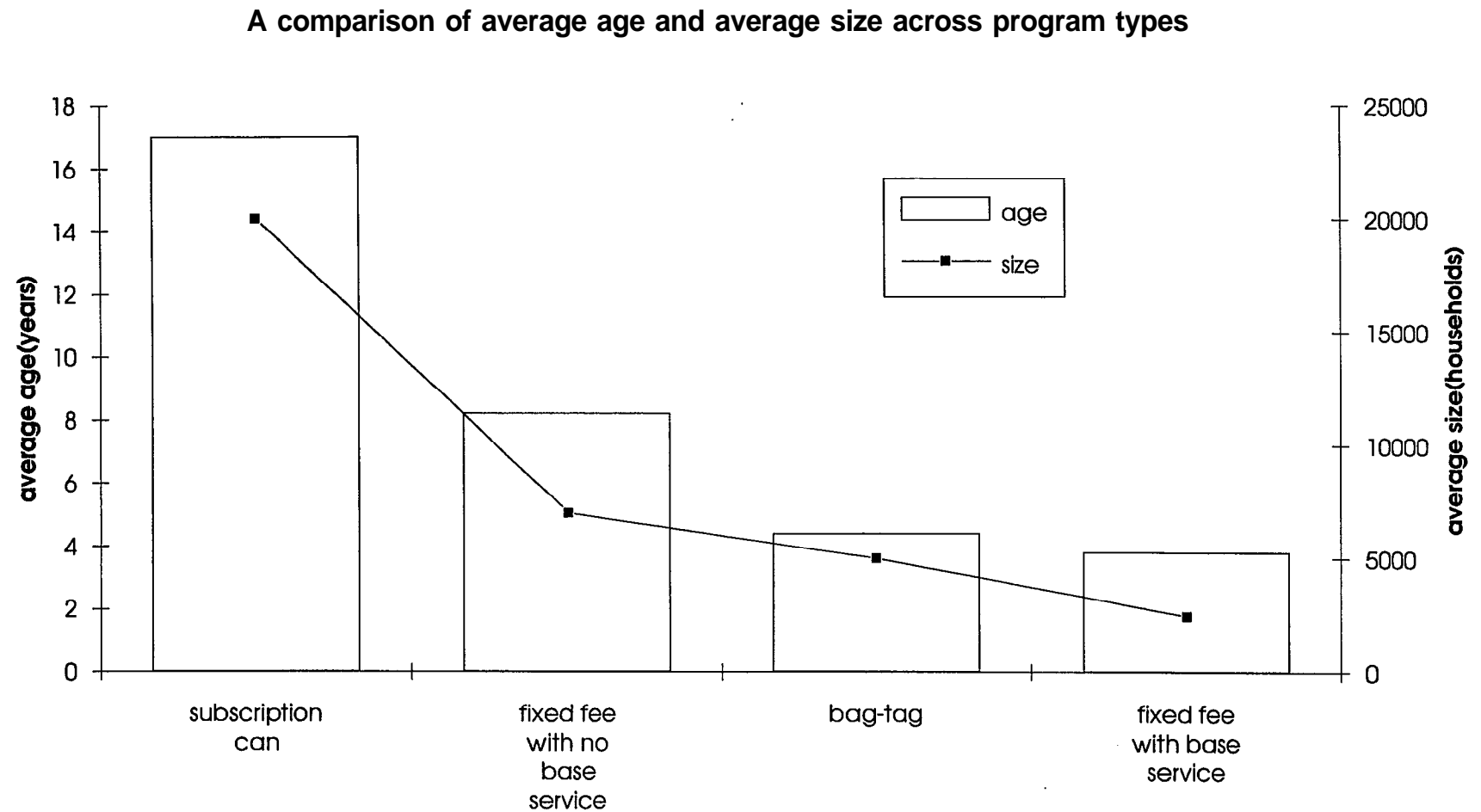Approximately 53 percent of the programs have implemented a special

Figure 3

A comparison of average age and average size across program types

Figure 4

Elements of Unit Pricing Programs

Legend:
- Curbside Recycling
- Drop-off Recycling
- Yardwaste Program
- Oversize Goods Program

All Programs:
- 84.4
- 47.7
- 53.2
- 80.7

Simple Bag/Tag:
- 77.1
- 50
- 58.3
- 87.5

FFNB:
- 62.5
- 62.5
- 62.5
- 75

FFBS:
- 83.3
- 25
- 50
- 100

Subscription Can:
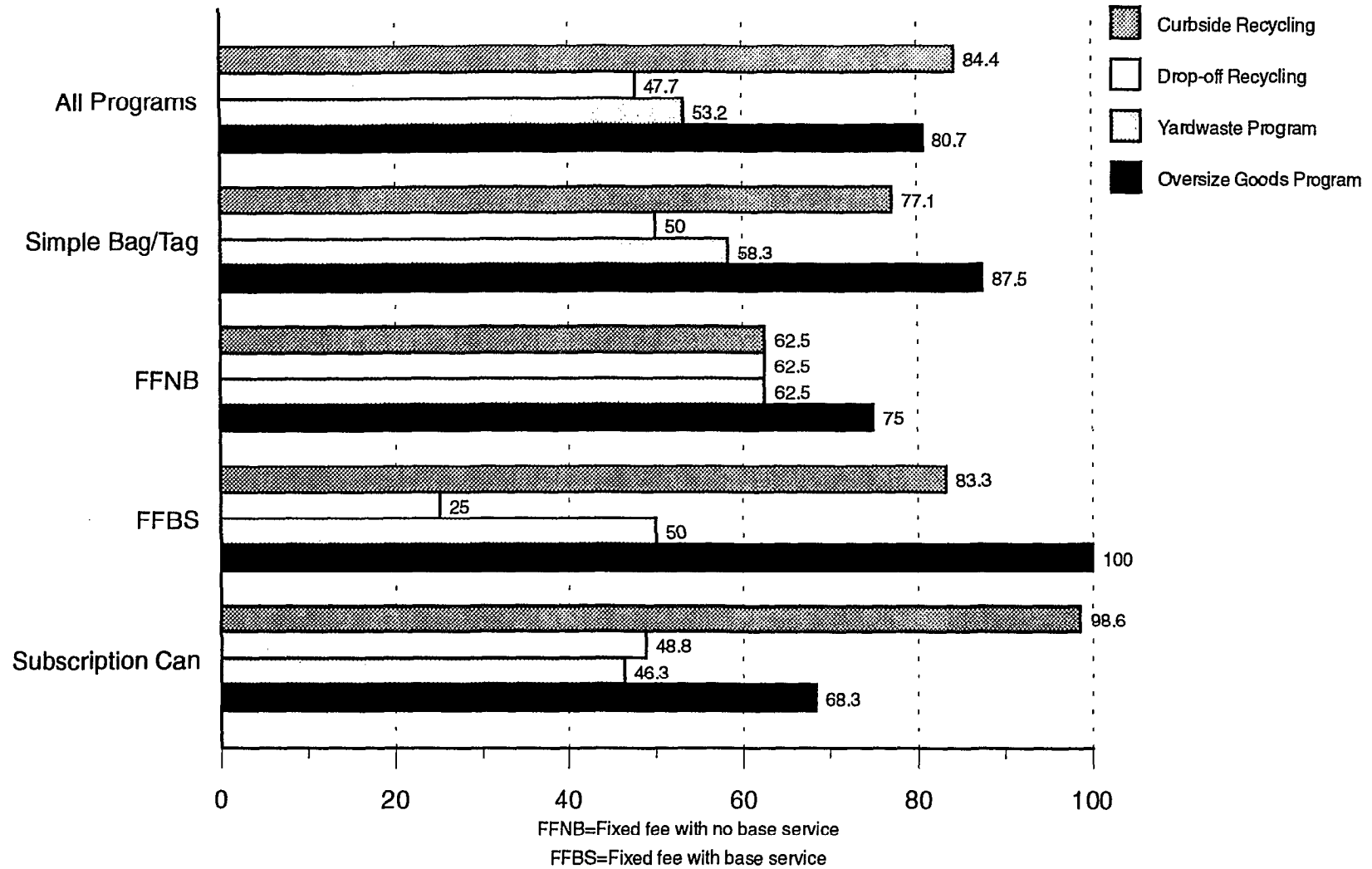- 98.6
- 48.8
- 46.3
- 68.3

FFNB=Fixed fee with no base service
FFBS=Fixed fee with base service

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program for yard waste.   Again, the fixed fee without base service programs are most likely to operate such a program with 62.5 percent collecting yard waste under a special program. Subscription can programs are least likely to have a yard waste program. Only 46.3 percent of the subscription can programs in the database run such a program.

An oversize goods program is the second most popular program with 80.7 percent of the communities collecting oversize goods under special conditions. All of the fixed fee without base service programs in the database have oversize goods programs. The subscription can programs are least likely to have an oversize goods programs, about 68 percent.

The data also include information on various other aspects of the communities' solid waste programs. In the database, sixteen of the 109 communities have extended the concept of volume-based pricing to the yard waste component of the solid waste stream. Further, eight of the communities charge a fee for participation in the recycling program--the fee ranges from $.21 to $1.84 per month. Finally, in 32 of the communities, household participation in the unit pricing programs is purely voluntary.

Pricing Structure

The communities in the database have adopted a spectrum of schemes for volume-based pricing. The rates structure varies across the four types of programs; the variation is especially distinct between the bag/tag variants of unit pricing and

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the subscription can programs. There is also variation within program types. Possible reasons for the variation within program types may be found in cost differences of providing solid waste disposal services or perhaps in the number and type of concurrent programs available.[8]

At the simplest end of the spectrum, the simple bag/tag programs assign a single price to a standard size container (e.g., bag or can). The standard container size typically falls in the 30-33 gallon range. The standard size is 30 gallons in 19 of the communities, 32 gallons in 13 of the communities, and 33 gallons in 13 of the communities. In one case, Dillsburg, Pennsylvania, customers are given the option of using a 20 or 30 gallon bag, the price being $1.00 and $1.25 per bag, respectively.

On average, in the simple bag/tag programs, the price for a 30 gallon container is $1.45, ranging from $.70 to $2.00. For a 32 gallon container the average is $1.35 with $.75 the minimum and $2.00 the maximum price charged. Finally, the 33 gallon container price ranges from $.50 to $1.83, averaging $1.24.

The fixed fee both with and without base service programs have volume-based pricing structures quite similar to the simple bag/tag programs. In the fixed fee without base service programs, the standard size container falls between 30 and 33 gallons in all cases. Again, in one instance, in Bozeman, Montana, customers are offered the choice of a 20 gallon bag at $.65 each or a 33 gallon bag at $.90 each. For the fixed fee with base service programs, the most popular standard container size is

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[8] Analysis of the reasons behind the variations is beyond the scope of this document.

30 gallons, seven of twelve programs using this as the standard. The price for the 30 gallon container ranges from $.75 to $1.80, averaging $1.36.

The subscription can programs have adopted, by far, the widest range of pricing schemes. The schemes range from the very simple, much like the bag/tag programs, to the very complex, with price varying across two or more dimensions. The first difference between the subscription can and bag/tag programs is that in the subscription can programs, the volume-based charges are assessed per unit of time. That is, customers are charged, say a monthly rate. This monthly rate is determined by the volume of service provided.

Beyond the time aspect, some of the subscription programs have rate structures quite similar to the bag/tag programs. In Fairfax, California, for example, households pay $15.10 per month for each 32 gallon can (collected weekly). This rate structure is similar to the bag/tag, rate structures in that it involves: 1) one standard container size and 2) a rate that is charged uniformly across increments in service level.

The rate structures in other subscription can programs are more complex. In some communities, the households are assessed a rate which varies according to the increment in service level. For example, in Hillsborough, California, households pay $11.95 per month for the first 32 gallon can of service (collected weekly). Households are assessed a rate of $10.16 per month for each additional can. In other communities, the rates vary according to container size. In Gladstone, Oregon, households pay $13.55 per month for each 32 gallon can (collected weekly) and $10.16

per month for each 20 gallon can. Finally, some subscription programs apply rate structures which vary both according to the increment in service level and container size.

SUMMARY

Unit pricing systems of municipal solid waste charge households by the volume or amount of waste disposed; thus, in unit pricing systems, disposal practices favor greater incentive to reduce waste. This document recounts the Environmental Protection Agency's Unit Pricing Database, a collection of information from 109 communities with unit pricing systems of managing waste. The database describes three sections of each communities unit pricing program: General program characteristics, Elements of community solid waste programs, and Pricing structure. Each of the three sections are outlined in detail, as well as possible methods for retrieving and organizing the data to answer specific questions. The database is available on diskette in ASCII, Lotus 1-2-3, and Paradox 4.0.

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