



# Pay-As-You-Throw Programs (PAYT)

## FACT SHEET

### Introduction

Traditionally, municipal solid waste collection and disposal services have been financed through property taxes or by fixed annual fees charged to households. At the same time, households are charged according to their rate of use for other utilities such as water and sewer service or electricity. As a result, residents often mistakenly perceive that solid waste services are free because of the separation between cost of services and how they pay for them. Citizens have little direct financial incentive to reduce the amount of waste they produce. Also, because each household is generally charged the same amount, small generators subsidize garbage services for those who throw away more.

Many local governments are adopting **Pay-As-You-Throw (PAYT)** programs for both curbside and drop-off collection systems. With **PAYT**, also known as “variable rate financing” or “unit pricing,” customers are charged by weight, by volume, or by a combination of the two per unit of garbage disposed. Market-based approaches such as these are proving to be important tools for dealing with environmental issues. With only a dozen PAYT programs in the late 1980s, the United States now has more than 4,000 communities with such programs.<sup>1</sup> PAYT programs have been mandated in both Minnesota and Wisconsin. More than 30 North Carolina communities are using or are part of larger (county-run) PAYT programs.

### Benefits of PAYT

Pay-as-you-throw programs offer a myriad of benefits for local governments. Furthermore, PAYT programs can be structured to maximize particular benefits. Some benefits of PAYT are:

- **Equity** – Households and businesses are charged based on the amount of waste generated for disposal. This approach minimizes the need for small generators to subsidize the waste disposal of larger generators resulting in an equitable approach to paying for solid waste management.
- **Economic Incentives to Reduce** – PAYT creates a direct link between waste disposal and cost resulting in a true economic incentive to reduce the amount of waste generated and recycle as much as possible.
- **Reduced Solid Waste Tonnage** – In most communities, the realization of costs associated with waste management results in a decreased tonnage of waste to be disposed. This decrease is attributable to both source reduction and increased recycling. A reduction in the tonnage of waste disposed generally results in savings from reduced tipping fees.
- **Increased Recycling** – The easiest way system users can save money is through increasing recycling. Increases will vary in size based on public education programs and the level of services available. Communities that receive revenues from recycling will see an increase in recycling revenues, however, these revenue increases may be quickly off-set by increased recycling hauling costs.
- **Revenue Stability** – Programs that receive inconsistent funding or revenues can develop revenue stability through directly charging system users. This is particularly true for two-tiered systems that charge a set fee to all users to cover fixed costs and a variable fee to cover costs associated with disposal.

<sup>1</sup> U.S. EPA, Web site, [www.epa.gov/payt](http://www.epa.gov/payt)., December 1998.

- **Extended Landfill Capacity** – In the subtitle D era, landfills are costly to build. PAYT systems can help save disposal airspace and thus future costs associated with landfill development.
- **Environment** – Natural resources and energy are conserved through source reduction and recycling. In addition, these resource and energy savings lead directly to reductions in greenhouse gas emissions.

## **Program Types**

The type of PAYT program developed will ultimately be based on the needs and goals of a community. Although there are many ways to design and operate a program, most programs are usually described based on the collection method (curbside/drop-off), the collection unit (volume/weight) and the pricing system (fully variable/two-tiered). A short discussion of these aspects follows.

**COLLECTION METHOD** – The collection method is simply the manner in which solid waste is collected. There are two basic types, curbside and drop-off, however, there are multiple variations of each type of collection that will dictate other aspects of the program. Other collection types include backdoor collection, shared alley collection, commercial dumpster, etc.

**COLLECTION UNIT** – Since PAYT charges system users based on the amount of waste disposed, a unit base needs to be used to accurately charge system users. Once again, there are two methods for charging by the unit; volume and weight.

**Volume-Based** – Volume-based systems are easily the most common in the United States and North Carolina. Volume-based systems can be curbside or drop-off and generally use either bags, cans, or stickers/tags to charge for solid waste disposal.

**Bags** – Bag systems generally require system users to purchase special bags to dispose of garbage. Bags are purchased from local retail outlets (grocery stores, etc.) or directly through the public works or solid waste department. Bags are marked up to pay for the appropriate costs (e.g., a box of 15 bags may cost \$15) and often have special graphics such as the community's symbol on them so that they are easily distinguished.

**Tags / Stickers** – Tags and stickers work similarly to bags in that they are purchased from local stores or government departments and are marked up to cover the cost of the program. A tag or sticker is then required to be attached to each bag disposed and can be designated for specific size bags (e.g., 13 gallon, 30 gallon, etc.). Furthermore, tags or stickers also can be attached to bulky items allowing for cost recovery of bulky item programs as well.

**Containers** – In container systems, users pay based on the size and/or number of containers that are placed out for collection. The most common container system is the variable can system in which users subscribe to a specific size container (32, 64, 96 gallon) and must reduce their can size to see any savings. Backdoor or manual collection systems generally use smaller cans (20 or 32 gallon) but allow users to subscribe to multiple cans.

**Other Options** – There are many other methods or hybrid PAYT systems that utilize combinations of the above options. Perhaps the most common are container based systems that allow residents to set out overflow materials, but require special bags, stickers or tags be used.

**Weight-Based** – Weight-based systems, although less common, provide the most equitable approach to charging for solid waste disposal. Weight systems require the collector to weigh garbage at the curb or drop-off center and then charge the generator by the pound collected. Unlike volume-based systems that

may require substantial reductions to decrease the can size or number of bags set out, savings from waste reduction are realized immediately in weight systems.

The main drawback with weight systems is cost. Weight systems require scales to be placed either at the drop-off center or on the collection trucks, raising the capital costs required to implement the system. There are currently four counties in North Carolina that use some type of weight system at drop-off centers. There are no weight-based curbside collection systems in the state.

**PRICING SYSTEMS** – Unlike collection type and collection units which are generally determined by the existing factors and preferences, developing a pricing system requires a little more thought. A survey of the communities using PAYT in North Carolina indicates that although all of the communities' pricing systems can be described as one of four basic types, they are all remarkably different. Explanations of the four most common pricing systems follows.

**Fully Variable** – In fully variable systems, all or most of the programs costs are recovered through the unit fees paid by system users. For example, in a bag system, the fees collected through the sale of bags would need to cover all of the costs of running the solid waste management system. This would include all direct and indirect, fixed and variable (disposal) costs. As can be expected, a fully variable pricing system provides the maximum incentive to reduce, however, given the uncertainties surrounding potential waste reduction, it is more difficult to set the unit costs (bag, sticker, etc.) and requires an in-depth knowledge of all program costs.

**Two-Tiered** – Two-tiered systems are probably the most common pricing systems in North Carolina. These systems charge multiple fees for solid waste management services. The first fee is set to cover the fixed costs of the system such as staffing, capital purchases and general operation. The fixed fee can be recovered through the tax base, utility bills, etc. The second fee is set to cover the variable costs of the system such as disposal and possibly hauling or collection. Hauling and collection costs are generally considered fixed costs, but in some cases are included with variable costs. In many ways two-tiered systems resemble phone bills in that the customer is charged a specific amount (fixed fee) to have the phone service available regardless of use, and variable costs (long distance/disposal) are determined based on use.

Rate setting in a two-tiered system still requires a good understanding of full-costs, but tends to be easier than in fully variable systems and provides some security in that fixed costs are covered regardless of the level of waste reduction that occurs. Because the variable or unit fee charged in two-tiered systems is usually lower than in fully-variable systems, the incentive to reduce is not as strong.

Some two-tiered systems use an alternative method for setting fees in that the fixed fee is set to cover the costs of a particular program such as recycling. This design option can provide a good incentive for reduction, but requires careful rate setting to ensure other program costs are adequately recovered.

**Limited Base Service** – Limited base service is the third and perhaps least common system in North Carolina. In this system, customers pay a set amount per month or year for a basic level of service, such as one 32-gallon container picked up weekly. Any additional service, such as overflow materials, requires additional payment. A good example of such a system is New Bern, N.C. Residents of New Bern are charged a set amount for weekly pick up of a 64-gallon

container. Any volumes set out over the 64-gallon base level require the purchase of special stickers.

**Hybrid Systems** – Hybrid systems can provide a great boost to a local governments recycling efforts. However, they tend to lack incentives to actually reduce the amount of waste generated. Several hybrid systems are in place in North Carolina, and all are successful. The typical North Carolina hybrid system is either incentive-based or penalty-based and may or may not require altering existing financing mechanisms.

In a penalty-based system, system users are charged to dispose waste only if recyclables are found in the waste. This, of course, limits their usefulness to staffed convenience centers. However, penalty based systems are relatively easy to implement and can greatly improve program participation.

Incentive based systems more truly reflect typical PAYT systems. Users are required to pay for materials disposed. However, if the generator of the waste chooses to recycle, free or discounted disposal may be received for a set amount of material (e.g., 30-gallon bag). Once again, these systems tend to be limited to staffed convenience centers.

### **Advantages/Disadvantages**

Each program type and the specific options for each program discussed thus far all have advantages and disadvantages. What may work well in one community may not work well in another. A critical aspect of designing a PAYT program is to identify the goals of the system as well as the advantages and disadvantages of each design element. This process should help identify which program will work best in a community as well as which areas may create problems. These problems will need to be addressed early to ensure a successful program. Table 1 identifies some advantages and disadvantages associated with various design elements.

### **Implementation Issues**

The ease or difficulty experienced while implementing a PAYT program will vary greatly from community to community. The following items are issues important to program implementation. Thoroughly addressing these issues early in the process will greatly increase the chance of a smooth conversion.

- **Elected Officials/Public Buy-in** – Educating and gaining the support of both elected officials and the public is perhaps the most critical component of implementing a PAYT program. Without support for the program, the chances of successful implementation will be minimal. A good public/elected official education program will start very early and continue throughout program development. Expect resistance to PAYT initially. Over time, however, a good education program can decrease public resistance.
- **Program Goals** – To design a program that properly fits a community, the goals of the program need to be identified early in the planning process. Program goals will vary from community to community and can range from revenue stability to meeting waste reduction goals to providing more equitable service.
- **Staffing Resources** – Depending on the type of program implemented, additional staff resources may be necessary. It is important to identify the level of additional resources necessary and the area(s) in which they are needed (e.g., administrative, illegal disposal enforcement, etc.)

**TABLE 1: Advantages and Disadvantages of PAYT Program Elements**

<b>Collection Unit</b>	<b>Advantages</b>	<b>Disadvantages</b>
Bag Programs	<ul style="list-style-type: none"> <li>– Easy for residents to understand.</li> <li>– Lower distribution, storage, and inventory costs.</li> <li>– Inexpensive to implement.</li> </ul>	<ul style="list-style-type: none"> <li>– Uncertain revenues as citizens purchase on an as-needed basis.</li> <li>– Potential for bag to rip or may be incompatible with automated collection systems.</li> <li>– Bags are not reused and, unless recycled, contribute to the waste stream.</li> <li>– Bags can be torn by animals.</li> </ul>
Sticker/Tag Programs	<ul style="list-style-type: none"> <li>– The cost of producing stickers/tags for sale to residents is cheaper than bags.</li> <li>– Easy for residents to understand.</li> <li>– Inexpensive to implement.</li> </ul>	<ul style="list-style-type: none"> <li>– Potential for poor sticker adhesion in bad weather and possible counterfeiting.</li> <li>– Uncertain revenues.</li> </ul>
Variable Can System	<ul style="list-style-type: none"> <li>– Constant revenue stream.</li> </ul>	<ul style="list-style-type: none"> <li>– Little flexibility between can sizes. Citizen must lower needs to next can size or reduce collection frequency.</li> <li>– Need method to deal with waste beyond subscription level like bulky items or extra waste such as on holidays.</li> <li>– Higher start-up costs for can purchase.</li> <li>– May require specialized equipment.</li> <li>– Higher administrative costs for storage of cans, distribution, and billing.</li> </ul>
Weight-Based Program	<ul style="list-style-type: none"> <li>– Citizen realizes immediate savings from reduction.</li> </ul>	<ul style="list-style-type: none"> <li>– High equipment demands for trucks outfitted with certified weighing devices and equipment to record weights and addresses.</li> <li>– At staffed drop-off centers, requires more staff time to weigh garbage.</li> <li>– Specialized curbside or drop-off equipment.</li> <li>– Higher start-up costs.</li> </ul>
<b>Pricing Systems</b>	<b>Advantages</b>	<b>Disadvantages</b>
Fully-Variable Pricing	<ul style="list-style-type: none"> <li>– Greatest waste reduction incentive.</li> </ul>	<ul style="list-style-type: none"> <li>– More difficult to set rates.</li> <li>– Some risk associated with not recovering all program costs.</li> </ul>
Two-Tiered Pricing	<ul style="list-style-type: none"> <li>– Guaranteed recover of fixed costs.</li> <li>– Rates setting is not as complicated as fully-variable.</li> </ul>	<ul style="list-style-type: none"> <li>– Lower unit charge decreases the waste reduction incentive.</li> </ul>
Limited Base Service Pricing	<ul style="list-style-type: none"> <li>– Relatively easy to implement.</li> </ul>	<ul style="list-style-type: none"> <li>– No incentive to reduce below the base level of service.</li> </ul>
Hybrid Systems	<ul style="list-style-type: none"> <li>– Requires little or no financing changes to implement.</li> <li>– Provides strong incentive to recycle.</li> </ul>	<ul style="list-style-type: none"> <li>– Limited incentive to reduce and reuse.</li> </ul>

- **Public Education** – As with any program change, educating the public is crucial. Public education campaigns should cover: what PAYT is, new requirements that they will have to meet, and additional means such as backyard composting that will allow them reduce their disposal costs.
- **Existing Waste Reduction Programs** – The comprehensiveness of existing waste reduction programs should be reviewed. A community with a limited recycling program and no source reduction or reuse options available to the public may need to add programs to help residents reduce, reuse and recycle as much as possible.
- **Rate Setting** – Rate setting is a critical step in implementing a PAYT program. It is extremely important to understand your full costs prior to trying to set rates. Two key concerns are: 1) setting rates too low, not recovering necessary costs, and 2) setting rates too high, creating public resistance to the program.
- **Subsidies** – Some communities will choose to offer subsidies to low income residents and senior citizens while other communities will feel that subsidies are inappropriate. Although this decision will likely be left up to elected officials, it is wise to design the program with enough flexibility to handle either option.
- **Illegal Disposal** – Illegal disposal is likely to be one of the larger concerns surrounding PAYT programs. Case studies and research from around the country indicate that, in reality, illegal disposal does not create the problems that one would expect. Nonetheless, it is important to have an enforcement program in place to deal with the issue if it does arise.
- **Multi-Family/Commercial** – Although not an issue for every community, multi-family housing and, to a lesser extent, commercial establishments may create problems during program design. There is no one answer as to how to plan to PAYT program that includes multi-family housing and may require considerable attention prior to implementation.
- **Neighboring Communities** – In rural areas, neighboring communities or drop-off centers in other counties may notice an impact from a community implementing a PAYT system. It is a good idea to discuss plans to switch to PAYT with other communities in the area.
- **Other Issues** – Depending on program design, community demographics, and other aspects, other issues can and will arise.

### **How PAYT May Affect a Community**

Pay-as-you-throw will affect communities differently based on program design, community receptiveness, and existing waste reduction programs. A community with high recycling participation and a comprehensive waste reduction program may not see huge changes in tonnages, while a community with low participation and a more standard waste reduction program may see substantial changes in disposal and reduction. In general, however, most communities can expect the following:

- increased recycling tonnage
- increased source reduction and reuse
- an overall reduction in the amount of waste destined for disposal

Another area in which a community may potentially be affected is cost. It is hard to determine how overall programs costs will be affected by PAYT. Most research indicates that costs are likely to stay about the same. However, it is likely that programmatic shifts in cost will occur. A community that is implementing PAYT is likely to see the following:

- increased education costs
- decreased solid waste hauling costs
- decreased disposal costs (i.e., tip fees)
- increased recycling hauling costs

Once again, these changes will vary greatly from community to community and will be dependent on current tip fees and hauling distances. With a careful review of existing operations, it may be possible to estimate how costs will change with program implementation.

### **Need More Help or Assistance**

The North Carolina Division of Pollution Prevention and Environmental Assistance (DPPEA) supports the use of PAYT as an effective and equitable method to reduce the amount of waste disposed in the State. For assistance in determining if PAYT is right for your community, how it may affect your community, or for assistance with program implementation, please contact Jim Hickman of DPPEA at (919) 715-6528.

### **Communities using PAYT**

The following table lists North Carolina communities currently using PAYT. The table provides basic information about these communities including, contact info, populations, households served, program attributes, and additional information.

## North Carolina Communities with Pay As You Throw (PAYT) Collection Systems

Community/ Contact	Implemented	Population	House	Collectio	Containe	Pricing System
<b>Alamance County</b> <b>Mike Garner</b> <b>(336) 376-0411</b>	1989	47,218	n/a	drop-off	bags	two tiered
<b>Alexander County</b> <b>Kim James</b> <b>(828) 632-1101</b>	1997	28,772	4,000	drop-off	bags	two tiered
<b>Buncombe County</b> <b>Bob Hunter</b> <b>(828) 250-5460</b>	1994	107,827	38,000	drop-off	bags	two tiered
<b>Catawba County</b> <b>Tom London</b> <b>(704) 462-2750</b>	1991	68,580	12,800	drop-off	bags and truck volumes	close to fully variable (97% of operating costs)
<b>Clay County</b> <b>Terry Daily</b> <b>(828) 389-0089</b>	n/a	7,684	2,500	drop-off	weight	two tiered
<b>Craven County</b> <b>Bobbi Waters</b> <b>(252) 636-6659</b>	1991	35,427	33,005	curbside	sticker	fully variable
<i>Craven County's program includes River Bend, Havelock, Trent Woods, Bridgeton, and Cove City</i>						
<b>New Bern</b> <b>Danny Meadows</b> <b>(252) 636-4025</b>	1994	22,032	9,455	curbside	sticker hybrid (64 gal carts with sticker for volume above cart)	limited base service
<b>Dover</b> <b>Randall Creel</b> <b>(252) 523-9610</b>	1994	456	175	curbside	sticker	two tiered
<b>Eden</b> <b>Jerome Adams</b> <b>(336) 627-7783</b>	1998	15,493	2,000	curbside	subscription container	two tiered (covers 87% of operating costs)
<b>Gaston County</b> <b>Karen Moore</b> <b>(704) 866-3081</b>	1988	75,125	11,000	drop-off	punch cards	two tiered
<b>Hendersonville</b> <b>Don Sides</b> <b>(828) 697-3084</b>	1994	9,624	4,084	curbside	subscription container	two tiered
<b>Jones County</b> <b>Norman Robinson</b> <b>(252) 448-8000</b>	1972	7,593	3,600	curbside	sticker	two tiered
<i>Jones County's program includes Tenton, Maysville, and Pollocksville</i>						
<b>Madison County</b> <b>Jim Brown</b> <b>(828) 649-2311</b>	1997	15,353	5,000	drop-off & curbside	tags	two tiered



## North Carolina Communities with Pay As You Throw (PAYT) Collection Systems

<i>Madison County's program includes Hot Springs, Marshall, and Mars Hill</i>						
<b>Mitchell County</b> <b>David Forbes</b> <b>(828) 765-1160</b>	1995	12,485	6,200	drop-off	bags	hybrid
<b>Onslow County</b> <b>Dave Clark</b> <b>(910) 455-6911</b>	1991	68,739	n/a	drop-off	bags	fully variable
<b>Randolph County</b> <b>David Townsend or</b> <b>J.D. Smith</b> <b>(336) 318-6608</b>	1991	78,456	47,296	drop-off	bags	two tiered
<b>Rowan County</b> <b>Sherri Argabright</b> <b>(704) 638-3078</b>	1989	69,344	48,000	drop-off	weight	two tiered
<b>Scotland County</b> <b>Jim Blackwell</b> <b>(910) 277-2406</b>	1994	17,338	5,775	drop-off	weight	two tiered (covers 85% of operating costs)
<b>Transylvania County</b> <b>Will Sagar</b> <b>(828) 884-6830</b>	1995	21,317	10,000	drop-off	tags and/or weight	two tiered
<b>Union County</b> <b>Jim Gordon</b> <b>(704) 296-4215</b>	1991	59,558	34,000	drop-off	bags	two tiered
<b>Wilkes County</b> <b>Thomas Livingston</b> <b>(336) 696-3867</b>	1994	55,730	5,000	drop-off	bags	two tiered
<b>Wilmington</b> <b>Jack Freeman</b> <b>(910) 341-7875</b>	1992	64,513	22,000	curbside	subscription containers	fully variable
<b>Yadkin County</b> <b>Larry Adams</b> <b>(336) 679-4243</b>	1994	27,903	16,500	drop-off	sticker	two tiered

**Notes:**

Two-tiered pricing systems consist of both a collection fee and some source of external funding (such as an enterprise fund or general fund sources).

Fully Variable pricing systems require 100 percent of operating expenses to be funded by solid waste collection fees.

Population data from the State Office of Planning as of July 1, 1997. County data does not include municipal populations.