

December 15, 2005



Mr. Jay Vaughan  
Supervisor  
Township of Spring  
2800 Shillington Rd.  
Sinking Spring, PA 19608

**Subject: Analysis of Implementing a Pay-As-You-Throw Program**

Dear Mr. Vaughan:

This letter report is to provide Spring Township with the results of R.W. Beck's evaluation of converting Spring Township's municipal refuse collection service to a Pay-As-You-Throw (PAYT) system. This report describes the methods R. W. Beck used to determine the cost of the Township's current services, and offers a program for implementing a PAYT system for Spring Township's residential refuse collection and disposal.

## EXECUTIVE SUMMARY

Spring Township desires to investigate implementing a variable rate structure for refuse collection, or Pay-As-You Throw (PAYT) as it has become popularly known, in order to help increase the Township's diversion rate and decrease tons of MSW landfilled. A PAYT system, properly designed and implemented, could allow the Township to accomplish the following objectives:

- Increase waste diversion and recycling, as well as environmental awareness;
- Shift some of the costs of waste disposal to those who dispose of more refuse;
- Institute a more fair and equitable rate structure for Spring Township residents; and
- Eliminate the deficit in financing the solid waste and recycling services, and enable the entire program to be self-supporting and sustainable.

Based on our analysis, R. W. Beck concluded the following:

- Implementing a PAYT program could financially benefit Spring Township by between \$26,000 and \$284,500, depending on the structure chosen and the extent to which it encourages residents to recycle.
- Spring Township should evaluate a change to weekly curbside recycling from the current every-other-week collection. Such a change may encourage even more waste diversion, and therefore disposal savings, by making recycling as equally convenient for residents as disposal. It may also help eliminate the potential for illegal dumping.
- Should Spring Township choose to do this, citizens and service providers should be incorporated into the planning process because; (1) residents currently do not pay equally for solid waste collection services and implementation of PAYT will result in greater cost to some residents; and (2) some residents may view PAYT as an attempt to reduce services and increase costs; and (3) the elimination of the recycling fee, and the encouragement to increase utilization of the recycling service provided, are key elements of the program that may not be well understood if residents focus only on the fee aspect.

Details of the current system in the Township, and support for our findings, are provided in the complete report below.

## **CURRENT RESIDENTIAL REFUSE AND RECYCLING COLLECTION**

### **Residential Refuse Collection**

Spring Township contracts with a private service provider to collect, transport, and dispose of refuse materials collected from Township residents. Households are allowed to place up to six bags or containers of refuse at the curb each week. Spring Township limits the size of the containers to 32 gallons and each container is not to exceed 50 pounds.

Under the current contract, Waste Management, Inc is the selected contractor, providing weekly curbside refuse collection for Spring Township's approximately 7,000 households of four or fewer units. The Township's contract with Waste Management originated in 2001 with a three-year term. Since then, two one-year extensions to the contract have been made.

The Township contracts with Zwicky & Son, Inc, to provide special bulky waste collections. These collections are offered to residents twice per year, in the spring and fall.

All Spring Township adult residents (defined as persons 18 years or older) are charged for refuse collection, at a rate of \$50 annually. Bills are issued in March, and the Township billed 13,056 adults in 2005. Township Tax Office officials indicate that this number is monitored and adjusted regularly; currently for September of 2005 the Township counts 13,200 adult residents.

### **Residential Refuse Disposal**

The Township also pays landfill tipping fees of \$55.06 per ton, which are paid directly to the Pioneer Landfill. This landfill is owned and operated by Waste Management, Inc. During 2004, a reported 7,236.06 tons of Township residential waste was disposed, making the total annual disposal cost to Spring Township \$398,417.46 or \$4.74 per household per month.

### **Residential Recycling**

Through Ordinance Number 215, Spring Township instituted mandatory recycling in 1990. Curbside recyclables collection is provided by Waste Management every other week. Waste Management charges Spring Township \$14,758.81 per month (based on a yearly contract amount of \$177,105.72) to collect the recyclables and deliver them to Cougles Recycling in Hamburg, PA. Cougles does not charge the Township a processing fee, nor do they provide any material revenue. Materials collected include:

- Glass containers – clear, green and brown;
- Fiber recyclables, including newspapers, junk mail, corrugated cardboard (flattened and bundled) and magazines;
- Aluminum and steel cans; and
- Plastic bottles coded #1 and #2.

The amount of material recycled curbside in 2003 was 2,229.95 tons.

Given the reported disposal and recycling tonnage, the Township's approximate diversion rate for residential MSW is 23.6 percent.

Spring Township charges a recycling fee of \$20 per year, but instead of charging adult residents, as is done with trash, the recycling fee is charged on a per-household basis..

## Yard Waste Collection

Regular yard waste collection is not offered to Spring Township residents. Brush and limbs may be placed at the curb for the twice yearly bulk waste pick-up, and the Township also operates two grass and yard waste drop-off centers. This yard waste is hauled by W.D. Zwicky & Son, Inc, a local company, to their facility for processing. This service cost the Township \$71,447.50 in 2004 (which would be approximately \$10.21 per year on a per-household basis).

## Total Residential Solid Waste Management Costs

Table 1 summarizes total and per-household solid waste management costs by service area on an annual and monthly basis.

Table 1  
2004 Costs per Ton

| Waste Stream | Tons            | Annual Collection Cost | Annual Tip Fee/Processing Cost | Total Cost            | Annual Cost Per Ton |
|--------------|-----------------|------------------------|--------------------------------|-----------------------|---------------------|
| Refuse       | 7,236.06        | \$421,507.20           | \$398,417.46                   | \$819,924.66          | \$113.31            |
| Recycling    | 2,229.96        | \$177,105.72           | \$0                            | \$177,105.72          | \$79.42             |
| Yard Waste   | \$0             | \$71,447.50            | \$0                            | \$71,447.50           | n/a                 |
| <b>Total</b> | <b>9,466.02</b> | <b>\$670,060.42</b>    | <b>\$398,417.46</b>            | <b>\$1,068,477.88</b> | <b>\$192.73</b>     |

Table 2  
2004 Costs per Household

| Waste Stream | Annual Cost           | Annual Cost per Household <sup>1</sup> | Monthly Cost per Household | Annual Amount Paid per Household for Refuse and Recycling Collection |              |
|--------------|-----------------------|--|----------------------------|--|--------------|
|              |                       |  |                            | 1-Adult HH   | 2-Adult HH   |
| Refuse       | \$819,924.66          | \$117.13                               | \$9.76                     | \$50   | \$100        |
| Recycling    | \$177,105.72          | \$25.30                                | \$2.11                     | \$20   | \$20         |
| Yard Waste   | \$71,447.50           | \$10.21                                | \$0.85                     |  |              |
| <b>Total</b> | <b>\$1,068,477.88</b> | <b>\$152.64</b>                        | <b>\$12.72</b>             | <b>\$70</b>  | <b>\$120</b> |

<sup>1</sup> Based on 7,000 households

## FINANCIAL ANALYSIS

Under the current system, refuse collection and disposal for Spring Township residents yields a total cost to the Township of approximately \$819,924.66. Spring Township recovers approximately \$652,800 through the \$50 yearly charge per adult resident (based on 2005 count of 13,056 residents). This leaves a deficit of \$167,124.66.

Recyclables collection for the Township yields a total cost of approximately \$177,105.72. Spring Township recovers approximately \$140,000 of this amount through the \$20 yearly charge per household, for a deficit of \$37,105.72.

Yard waste collection and processing costs the Township approximately \$71,000 per year (based on 2004 actual figures). This cost is not covered directly by a separate fee, but is assumed to be an item that would be covered by the refuse fee.

The total deficit for residential solid waste services is \$ 204,230.38, excluding the yard waste cost. If the yard waste cost is added, the deficit becomes \$275,677.88.

In addition to the deficit encountered in operating the refuse and recycling program, Spring Township has a systematic inequity built into its pricing structure. While the recycling fee is charged to each household, the refuse fee, or tax, is charged to each adult person. Therefore, as shown in Table 2, a two-adult household pays twice as much for refuse collection as a one-adult household. While it may be assumed that a smaller household will generate less solid waste, this is not necessarily the case, as a two-adult household that regularly recycles may generate less waste than a one-adult household that does not recycle. Also, a one-adult household with multiple children may generate more waste than, for example, the household of a retired couple.

Spring Township does receive Section 904 Performance Grants from PA DEP to assist with recycling. The 2003 grant amount was \$115,574. Applying this amount to the costs of refuse and recycling results in a net deficit of \$160,103.88 using the current system of program funding. The sustainability and continuation of grant funding is not a certainty, however, and it would benefit Spring Township if a funding system were chosen that would not only overcome the deficits, but enable the refuse and recycling collection programs to function without the grants.

## ISSUES

To further increase their diversion rate and manage their disposal costs, Spring Township wants to investigate variable rate structure for refuse collection, or Pay-As-You Throw (PAYT) as it has become popularly known. A PAYT system, properly designed and implemented, could allow the Township to accomplish the following objectives:

- Increase waste diversion and recycling, as well as environmental awareness;
- Shift some of the costs of waste disposal to those who dispose of more refuse;
- Institute a more fair and equitable rate structure for Spring Township residents;
- Eliminate the deficit in financing the solid waste and recycling services, and enable the entire program to be self-supporting and sustainable.

## PAY-AS-YOU-THROW (PAYT)

PAYT is also known as unit-based pricing or variable rate pricing. Under this type of a system, residents pay for municipal waste management services per unit of waste collected rather than through a fixed fee. Recycling is offered alongside trash disposal for no additional charge.

PAYT takes into account variations in waste generation rates by charging households or residents based on the amount of refuse they place at the curb, thereby offering individuals an incentive to reduce the amount of waste they generate and dispose.. It works almost like other public utilities that citizens are familiar with – electric and water, for example, where customers are charged based on the kilowatt-hours or gallons that they actually use. Such a market-based system can encourage reduction in usage of the service, because users who conserve can realize immediate cost savings. Simply put, households generating smaller amounts of refuse pay a lesser rate than those generating larger amounts, and all households always have the option of reducing costs by separating and recycling at no additional charge.

### Potential Benefits of PAYT

Well over 200 municipalities in Pennsylvania have implemented some form of a PAYT program.<sup>1</sup> In fact, Wilkes-Barre has operated a per-bag system for a number of years and reports a significant reduction in the cost of their waste management services. A City representative reported cost reductions of approximately 50 percent due to the per-bag program.

PAYT programs can also yield an increase in recycling. Perkasio Township experienced a 59 percent reduction in the amount of solid waste collected for disposal after implementing a PAYT program, boosting their recycling rate to about 43 percent.

Additional benefits may include:

- Increased waste minimization;
- More equitable waste management fee structure; and
- Increased understanding of environmental issues in general.

A properly designed PAYT program, with an equitable rate structure, ideally will encourage residents to generate less refuse by charging them for the amount they place out for disposal. They become more cognizant of their disposal habits and look for opportunities to generate less or recover a greater portion of the waste stream through alternative management practices such as recycling and composting. A key here is that as they become more conscientious, citizens develop a greater understanding of environmental issues and the impact of their behavior on the environment.

### Potential Barriers to PAYT

While there are clearly benefits associated with the PAYT programs, there are also potential barriers that must be overcome to successfully implement this system. These potential barriers include:

---

<sup>1</sup> See the EPA website <http://www.epa.gov/epaoswer/non-hw/payt/states/pa.htm> for community listings.

- A perception of increased costs to residents for the same level of service;
- Challenges associated with building public consensus;
- Enforcement of the system with a private hauler as refuse collector;
- An increase in administrative costs; and,
- A potential increase in illegal dumping;

Guidance on overcoming these barriers is included in this report.

## TYPES OF PAYT SYSTEMS

Five major types of PAYT systems are available to communities:

**Pre-Paid Bag:** In a pre-paid bag system, residents may only dispose of solid waste in special bags sold by the government agency that is responsible for solid waste management and/or the contracted waste hauler. The bags are distinctively marked, typically hold 20 to 30 gallons, and are usually available at government offices, haulers, or local retailers. The fee per bag is used to cover some or all waste management costs. Some communities offer a variety of bag sizes and corresponding bag prices.

**Pre-Paid Tag or Sticker:** With a pre-paid tag or sticker program, only solid waste containers bearing the correct tag or sticker are collected. As with a pre-paid bag system, the tags or stickers are sold by the government agency, haulers, and designated offices or local retailers. The fee per tag or sticker provides for collection and disposal of a specific size of container with a volume and/or weight limit. Some communities also use tag/stickers for bulky items, such as appliances and furniture, and assign a specific number of stickers to a type of item.

**Subscription/Containers:** In a subscription system, households sign up for collection and disposal of a specific number or size of containers for each billing period or setout. Households generating solid waste beyond their subscribed level of service must purchase additional tags, stickers or cans if they want additional materials to be collected.

Within subscription systems, two sub-systems exist for containers – one that specifies an allowed standard size container and the other, a “variable can” system, which allows residents the option of choosing from graduated can sizes. Typically, in variable can programs, the size of the container can range from 20 to 60 gallons. However, some communities provide containers as small as 10 gallons and as large as 120 gallons.

**Weight-Based System:** With a weight-based system, residents pay a fee per pound of solid waste collected. The solid waste is weighed using scales and possibly electronic identification. The calculated amount is then billed to the household. This program can either require residents to use standard, government-supplied cans or allow them to continue using their own cans.

**Hybrid System:** A hybrid system combines a flat fee with some type of fee per unit. Under this system, residents are charged for a basic level of service and above this level the resident must pay for an additional container or purchase a tag, bag or sticker.

## Advantages and Disadvantages of Each Program Type

No two communities are exactly alike, and therefore numerous variables will impact the process of designing the best program for Spring Township. However, within each of the five types of programs advantages and disadvantages exist. These are summarized in Tables 3 through 7.

**Table 3**  
**Advantages and Disadvantages of Pre-Paid Bag PAYT Programs**

| Advantages   | Disadvantages  |
|--|--|
| <ul style="list-style-type: none"> <li>• Residents find bag systems easy to understand</li> <li>• Bag systems might offer a stronger waste reduction incentive than subscription systems because fees typically are based on smaller increments of waste</li> <li>• Accounting costs are lower than with subscription systems, since no billing system is needed</li> <li>• Bag systems have lower distribution, storage, and inventory costs than subscription systems when bags are sold at local retail establishments and municipal offices</li> <li>• Bag collection tends to be faster and more efficient than non-automated subscription collections</li> <li>• Bags can be used to indicate that the proper fees have been paid for bulky items or white goods, because communities often assess fees for pick up of these items. Communities can ask residents to attach a certain number of bags to the items according to the cost of disposal (for example, two bags for a couch and three-bags for a washing machine)</li> <li>• Opportunity to offset costs by selling advertising on "official" bags</li> </ul> | <ul style="list-style-type: none"> <li>• Greater revenue uncertainty than with subscription system, because the number of bags residents purchase can fluctuate significantly</li> <li>• If bags are sold in municipal offices, extra staff time will be required</li> <li>• Residents might view a requirement to buy and store bags as an inconvenience</li> <li>• Bags are more expensive to produce than tags or stickers</li> <li>• Bags often are incompatible with automated and semi-automated collection equipment</li> <li>• Animals can tear bags and scatter trash, or bags can tear during lifting</li> <li>• Unlike cans, bags are not reused, adding to the amount of solid waste entering the waste stream</li> <li>• Residents currently using containers may object to having to switch to bags</li> <li>• Weight of bags due to "stuffing" might be a problem unless weight restrictions are instituted and enforced</li> </ul> |

**Table 4**  
**Advantages and Disadvantages of Tag and Sticker PAYT Programs**

| Advantages   | Disadvantages  |
|--|--|
| <ul style="list-style-type: none"> <li>• Tag and stickers are easier and less expensive to implement than subscription systems</li> <li>• Residents often find tag or sticker systems easier to understand than subscription systems</li> <li>• These systems offer a stronger waste reduction incentive than subscription systems because fees are based on smaller increments of waste</li> <li>• Accounting costs are lower than with subscription systems, since no billing system is needed</li> <li>• Selling tags or stickers at local retail establishments and municipal offices offers lower distribution, storage, and inventory costs than subscription systems</li> <li>• The cost of producing tags or stickers for sale to residents is lower than for bags</li> <li>• Stickers can be used to indicate payment for bulky items or white goods, because communities often assess fees for pickup of these items</li> <li>• Residents can choose between bags or cans</li> </ul> | <ul style="list-style-type: none"> <li>• There is greater revenue uncertainty than with subscription systems, because the number of tags or stickers residents purchase can fluctuate significantly</li> <li>• To avoid confusion among residents, the municipality must establish and clearly communicate the size limits allowable for each sticker</li> <li>• If tags or stickers are sold in municipal offices, extra staff time will be required</li> <li>• Residents might view a requirement to buy and store stickers or tags as an inconvenience</li> <li>• Tags and stickers often do not adhere well in rainy or cold weather</li> <li>• Extra time might be needed at the curb for collectors to enforce size limits. In addition, there may be no incentive for strict enforcement if haulers are paid based on the amount of waste collected</li> <li>• Tags left on trash at curbside could be removed by vandals or by other residents hoping to avoid paying for waste services</li> <li>• Tags and stickers are not as noticeable as bags or other prepaid indicators and may slow down collections</li> </ul> |

**Table 5**  
**Advantages and Disadvantages of Subscription/Container PAYT Programs**

| Advantages   | Disadvantages   |
|--|---|
| <ul style="list-style-type: none"> <li>• Revenues are fairly stable and easier to forecast.</li> <li>• Unlike bags, containers work well with semi-automated or automated collection equipment</li> <li>• In a manual collection system, residents already own containers of roughly uniform volume, new containers might not be required</li> <li>• Containers may be labeled with addresses or unique indicators to assist in enforcement</li> </ul> | <ul style="list-style-type: none"> <li>• Subscription systems often have higher implementation costs, including the purchase and distribution of containers</li> <li>• Customers have a limited incentive to reduce waste. Because residents are usually charged on a subscription basis, there is no incentive not to fill containers already purchased. In addition, no savings are possible below the smallest size trash container</li> <li>• Relatively complex billing systems are needed to track resident's selected subscription level and bill accordingly</li> <li>• Complex storage, inventory, and distribution systems are required to provide new containers to households that change their subscription level</li> <li>• A method of collecting and charging for waste beyond subscription levels and for bulk waste collections needs to be established</li> <li>• At the outset, residents may find it difficult or confusing to select a subscription level</li> <li>• There may be disputes with residents on the number of containers set out</li> <li>• Manual collection with containers usually requires greater time and effort on route than collecting waste in bags</li> <li>• A cash flow problem may exist due to lag time between paying waste contractor and collecting fees for service based on use</li> </ul> |

**Table 6  
Advantages and Disadvantages of Weight-Based PAYT Programs**

| Advantages   | Disadvantages  |
|--|--|
| <ul style="list-style-type: none"> <li>• Weight-based systems measure more precise increments of waste generation than volume-based systems, which offer better recycling incentives</li> <li>• Encourages waste reduction at all waste-generation levels</li> <li>• Fair and easily understood. Favorable customer survey reaction</li> </ul> | <ul style="list-style-type: none"> <li>• At present, weight-based residential systems exist only in pilot program form in the U.S.</li> <li>• Requires more complicated billing system</li> <li>• Special trucks, labeling of cans require extra expense</li> <li>• Compatibility between onboard scales and computers and other operational systems can be challenging</li> </ul> |

**Table 7  
Advantages and Disadvantages of Hybrid PAYT Programs**

| Advantages  | Disadvantages   |
|---|---|
| <ul style="list-style-type: none"> <li>• Offers communities a transition from the traditional financing system to a variable rate option</li> <li>• Mitigates revenue risk by recovering some costs through traditional financing method</li> <li>• Allows time for customers and officials to develop system familiarity</li> <li>• Doesn't "lock-in" a community to a specific type of system</li> <li>• Can be implemented quickly, inexpensively, and easily, and can be later replaced or modified into a full subscription, bag, or tag system, under a hand dump, semi-automated, or fully automated system</li> <li>• Allows time for further planning</li> <li>• Allows time for data collection</li> <li>• No new billing system may be needed</li> </ul> | <ul style="list-style-type: none"> <li>• Customer incentives to reduce waste are truncated at the lowest service level</li> <li>• Full costs of household waste collected and disposal of may not be explicitly reflected to customers</li> <li>• Customers may not understand why they have to pay two fees for disposal of solid waste</li> </ul> |

### **Recommended PAYT System for Spring Township: Hybrid**

Since Spring Township contracts with a private company for refuse and recycling services, it must use a fee system that will cover the fixed costs of the contract. In a total PAYT system, revenues are subject to fluctuations not common to the flat fee system because the revenue is raised through a fee attached to a unit that varies with the level of usage. With a system of this type, it can be difficult to balance the program budget. Finally, a total PAYT system may limit the number of service providers who bid on the contract.

For these reasons, R. W. Beck recommends that Spring Township combine a per-household fee and a per-container fee into a hybrid PAYT system. The per-household fee should cover the costs of both the refuse and the recycling services provided, and should eliminate the separate recycling fee.

Two types of hybrid systems are currently used in the Commonwealth, the significant difference being whether any refuse disposal is included in the per-household fee:

- Residents pay a standard base rate per household that covers fixed collection costs — i.e., the contract costs — and purchase bags or stickers, or use specific containers at a set rate per container. The base rate does not include any stickers or bags. The cost to residents still varies by the amount of waste they dispose, but because the fixed costs are spread equally among households, differences in cost per household are less than that of a classic PAYT system.
- Residents pay a base rate per household that includes a fixed number of bags, stickers or containers, then purchase additional bags or stickers, or use specific containers at a set rate per container. Depending on the number of containers allowed, many residents may be able to manage all their wastes without purchasing additional bags or stickers. Limiting the number of containers allowed during a given collection provides some incentive for residents to recycle, compost, or reduce waste generation as a means of avoiding additional cost for collection and disposal.

Some communities using PAYT offer price reductions to low and fixed income residents.

### Recommended Type of Container/ Stickers/ or Tags

Spring Township residents are currently permitted to set out six containers or bags of refuse per week. Any type or size of container may be used. In order to implement a PAYT system, two changes must occur: the type and size of bag or container will be specified and its use strictly enforced, and a limit must be set on the number of bags or containers allowed before special stickers or bags are required.

To address this issue, R. W. Beck recommends that Spring Township mandate the use of containers, plastic bags or tags that clearly identify the refuse as being generated in Spring Township, and indicate whether the refuse has been paid for under the program. Several vendors specialize in supplying bags and tags that have been designed for use with PAYT systems.

The advantage of bags over tags or stickers is that they can be ordered in custom colors and printed with the name of the Township and even information about the program. They are easily seen by the trash truck driver and easily identified as paid-for, program bags. The disadvantage of bags is that they can be expensive, and the Township will have to charge a per-bag fee that covers the bag cost, plus whatever additional fee is needed to pay for the program.

The advantage with tags or stickers is that they are generally less expensive, and they allow residents to use the trash containers they are accustomed to – they may be attached to any refuse bag or container. The main disadvantage is that they are harder to see, and, in the case of trash cans where the can is left behind, the tag must be removed from the container by the trash collector so that it cannot be re-used.

## Hybrid Case Studies

### Elizabethtown Township

Elizabethtown Township in Lancaster County initially implemented a PAYT program in which revenues were solely dependent on the sale of bags. Elizabethtown experienced a significant decline in the sale of bags and the program's costs began to outweigh its revenues. Township officials quickly realized that raising the cost of bags would only compound the problem.

Consequently, Elizabethtown modified their program to a hybrid subscription/tag program. Under the new system, all homeowners are assessed \$114 per year and are permitted to set out one 32-gallon bag or container per week. If homeowners set out more than this amount, they must purchase a \$2.00 tag for each additional bag or container. Homeowners are permitted to set out one bulky item per week, also requiring a \$2.00 tag. Tags can be purchased at Township offices or designated retail outlets. Tires and white goods are collected curbside twice per year. Each tire requires on \$2.00 tag, but white goods require a special \$12.00 tag.

Bagged leaf collection occurs six times per year. Bagged leaves do not require a tag. However, homeowners must contain the leaves in Kraft paper bags which are distributed at a Township park eight days a year.

### South Middleton Township

South Middleton Township in Cumberland County contracts with Waste Management, Inc to provide weekly collection of refuse, recyclables and one bulky item. All single-family homes and multi-family establishments with less than three units are either charged \$37.43 per quarter (\$149.72 per year) and provided with a 90-gallon wheeled cart, or may purchase tags, which are to be placed on each bag of refuse, for \$2.60 each. If residents opt for the 96-gallon container, they must purchase a tag for each additional bag of refuse that can not be contained in the cart. If residents exclusively use tags rather than the 96-gallon cart, each household must purchase a minimum of 18 tags per year. Tags may be purchased from the Township or Waste Management. Yard waste in the past was collected loose by Township crews, but now is also collected in bags.

## Potential Impact of Hybrid PAYT System on Spring Township

Residential solid waste management services, including recycling, annually cost Spring Township a total of approximately \$1,068,477.88 or \$152.64 per household. Currently the charge for a two-adult household is only \$120 per year, and for a one-adult household only \$70 per year, failing to meet the costs. The challenge for Spring Township will be to balance the yearly household fee with a bag or tag system that will not seem to be a huge cost increase for residents, but will cover the current solid waste management costs, the costs of bags or stickers, and the new administrative costs of the PAYT program.

By implementing a PAYT program, the primary source of savings for Spring Township would be reduced landfill fees, as residents have an incentive to provide greater refuse diversion.

To illustrate, Table 7 shows that approximately 25 percent or 1,792 tons of the annually disposed waste stream is currently comprised of materials that are collected through the curbside recycling

program. If the institution of a PAYT program annually diverts an additional 20 percent or an approximate 358 tons of these materials, Spring Township’s disposal costs could be reduced by \$19,712 (358 tons at \$55 per ton tip fee). In addition to the avoided disposal costs, Pennsylvania’s 904 Performance Grant provides funding to municipalities based on the tonnage of recyclables that they report as being recovered. The amount per ton varies, but averages around \$10. Thus, Spring Township could generate an additional \$3,580 in revenue by increasing their diversion quantity, generating a total of \$23,292 in savings/revenues.

**Table 8**  
**Waste Stream Composition**

| Material                      | Percent of Waste <sup>1</sup> | Tons Disposed |
|-------------------------------|-------------------------------|---------------|
| Newspaper                     | 4.10%                         | 297           |
| Corrugated Cardboard          | 7.52%                         | 544           |
| Office Paper                  | 4.73%                         | 342           |
| Magazine/ Glossy              | 2.50%                         | 181           |
| Polycoated/Aseptic Containers | 0.50%                         | 36            |
| Mixed Paper                   | 4.40%                         | 318           |
| Non-Recyclable Paper          | 10.42%                        | 754           |
| <b>All Paper</b>              | <b>34.18%</b>                 | <b>2,472</b>  |
| #1 PET Bottles                | 0.83%                         | 60            |
| #2 HDPE Bottles               | 0.58%                         | 42            |
| #3-#7 Bottles                 | 0.15%                         | 11            |
| Expanded Polystyrene          | 0.80%                         | 58            |
| Film Plastic                  | 3.99%                         | 289           |
| Other Rigid Plastic           | 3.50%                         | 253           |
| <b>All Plastics</b>           | <b>9.85%</b>                  | <b>713</b>    |
| Clear Glass                   | 1.61%                         | 116           |
| Green Glass                   | 0.74%                         | 53            |
| Amber Glass                   | 1.16%                         | 84            |
| Non-recyclable Glass          | 0.63%                         | 46            |
| <b>All Glass</b>              | <b>4.14%</b>                  | <b>299</b>    |
| Steel Cans                    | 0.76%                         | 55            |
| Aluminum Cans                 | 0.58%                         | 42            |
| Other Ferrous                 | 2.85%                         | 206           |
| Other Aluminum                | 0.41%                         | 30            |
| Other Non-Ferrous             | 0.53%                         | 38            |

| Material                  | Percent of Waste <sup>1</sup> | Tons Disposed |
|---------------------------|-------------------------------|---------------|
| <b>All Metals</b>         | <b>5.13%</b>                  | <b>371</b>    |
| Yard Waste- Grass         | 1.23%                         | 89            |
| Yard Waste- Other         | 5.78%                         | 418           |
| Wood- Unpainted           | 5.53%                         | 400           |
| Wood- Painted             | 1.63%                         | 118           |
| Food Waste                | 10.55%                        | 763           |
| Textiles                  | 3.51%                         | 254           |
| Diapers                   | 2.05%                         | 148           |
| Fines                     | 0.93%                         | 67            |
| Other Organics            | 1.90%                         | 137           |
| <b>All Organics</b>       | <b>33.10%</b>                 | <b>2,394</b>  |
| Electronics               | 2.44%                         | 177           |
| Carpet                    | 1.84%                         | 133           |
| Drywall                   | 0.92%                         | 67            |
| Other C&D                 | 5.72%                         | 414           |
| HHW                       | 0.23%                         | 17            |
| Other Inorganics          | 2.08%                         | 155           |
| Furniture                 | 0.37%                         | 27            |
| <b>All Inorganics</b>     | <b>13.61%</b>                 | <b>990</b>    |
| <b>All Disposed Waste</b> | <b>100%</b>                   | <b>7,239</b>  |

<sup>1</sup> Composition derived from data provided in PA DEP Waste Characterization Study, 2002.

## IMPLEMENTING A PAYT PROGRAM

When developing a program that will result in a significant change it is important to have a solid plan of action. Presently, Spring Township offers generous refuse collection, twice yearly yard waste and bulky waste collection, plus curbside recycling twice monthly to its residential customers at a cost to Spring Township of \$152.64 per household per year. Currently households pay only \$70 or \$120 per year. Suggesting a change to this system could be met with strong public opposition – residents may feel they are getting less service at a greater cost. Therefore, it will be imperative to involve the public in the process that ultimately structures the new system.

## Selecting The Preferred System

Regardless of the system selected, the collection of refuse in Spring Township will not functionally change. Refuse trucks will still need to drive by each residence on a weekly basis.

The amount of refuse collected from each household may decrease, but material will still need to be collected weekly. The real choice is which system is best for increasing waste reduction by recycling in Spring Township while covering costs.

This is where Spring Township will need to consider the goals of the change and evaluate the costs and benefits of the different options. Ultimately, Spring Township wants a program that will be generally acceptable to the public at large.

### **Determine Current Set-Out Rates**

It is important for Spring Township to determine the average number of containers that households currently set out for refuse collection. By determining the average set-out rate, Spring Township can decide the number of containers that will be permitted under the base fee. This number should accurately reflect the current need for refuse set-out capacity for the residents, but take into account, and give residents an incentive to use, the recycling program as a way to discourage excessive set-outs.

For example, in Titusville, Pennsylvania approximately 70 percent of the residents set out an average of two or three containers bags or containers per week. Thus, the City decided that residents could set out up to three bags per week for the base fee and additional bags would cost \$1.25 each. This approach meant that the majority of residents would not be affected by the PAYT program, but the larger solid waste generators would need to pay a higher fee. Conversely, communities that are aggressively trying to increase their recycling rate have established a set-out limit that is below what the majority of residents set out.

A quick determination of set-out rates could be done by the refuse truck driver quickly jotting down how many bags or containers are in front of each household. Interviewing truck drivers will most likely reveal which days of the week are the heaviest set-out days. The Township could then decide whether to survey these days to get a theoretical maximum set-out rate, or to use lighter days. It should be considered when calculating set-out rates that PAYT, if it works as it should, will reduce the number of trash containers set out and increase the recycling set-outs.

### **Decide on Program Structure and Rates**

If a per-household fee plus a per-bag or per-container fee is chosen, the Township will need to decide if the base fee will include any bags or containers “for free,” and, if so, how many will be included, and then what the price will be for extra bags or containers. The price will need to cover the cost of the bag or tag, the cost of administering the distribution of the bags or tags, and the amount that will be attached to support the entire system costs.

Table 9 shows estimates of the possible rates for two different program structures, each based on a type of hybrid PAYT system. Detailed discussion of the options follows the table.

Table 9  
Examples of PAYT Costs and Revenues

| Rate Structure      | Program Costs | Revenue Generated<br>from Fees | Difference:<br>Revenue minus<br>Costs |
|---------------------|---------------|--------------------------------|---------------------------------------|
| Current System      | \$1,068,478   | \$792,800                      | (\$275,678)                           |
| Hybrid System Ex. 1 | \$1,048,766   | \$1,074,500                    | \$25,734                              |
| Hybrid System Ex. 2 | \$1,038,888   | \$1,323,000                    | \$284,112                             |

Note: All figures are approximations.

### Hybrid System 1

The figures presented for Hybrid System 1 in Table 9 above are derived from the following assumptions:

- The refuse rate is changed to be more equitable by charging it per household, instead of per adult resident. The separate recycling fee is eliminated by inclusion into the one fee.
- The refuse/recycling fee is fixed at \$95 per household, which is \$25 less per year than a two-adult household currently pays, but \$20 more per year than a one-adult household is charged.
- Two 30-gallon size trash bags or containers are included each week for each household in that base fee.
- Extra trash bags or containers would cost the household \$2.25 each. Residents could set out as many of these per week as they needed, provided they used the required bags, tags, or stickers. These special bags or stickers would be purchased from the Township or the contract hauler.
- Under this scenario, it is estimated that 50 percent of the Township's households would purchase one of these extra trash bags per week.
- The program costs for this system assume that it motivates residents to recycle more, resulting in a 10 percent increase in curbside recycled materials diverted from the waste stream and therefore a savings of the tip fee of \$55 per ton for the 358 tons of material.

Hybrid System 1 would generate sufficient revenue to cover the current costs of the refuse and recycling system, with approximately \$26,000 additional revenue for program administration costs or program expansion. Because two 30-gallon refuse bags are included in the base rate, the rate is somewhat high at \$95 per household per year, and each additional bag costs a relatively high amount - \$2.25.

## Hybrid System 2

The figures presented for Hybrid system 2 in Table 9 above are derived from the following assumptions:

- The refuse rate is changed to be more equitable by charging it per household, instead of per adult resident. The separate recycling fee is eliminated by inclusion into the one fee.
- The refuse/recycling fee is fixed at \$85 per household, which is \$35 less per year than a two-adult household currently pays, but \$10 more per year than a one-adult household is charged.
- The base fee does not include the disposal of any refuse.
- Each 30-gallon trash bag or container would cost the household \$1.00 each. Residents could set out as many of these per week as they needed, provided they used the bag, tag, or sticker required. These special bags or stickers would be purchased from the Township or the contracted hauler.
- Under this scenario, it is estimated that 25 percent of the Township's households would purchase one trash bag per week; 50 percent of the households would purchase two trash bags per week, and 25 percent of the households would purchase three trash bags per week (this assumption is somewhat arbitrary, but attempts to account for family size and varying disposal habits).
- The program costs for this system assume that it motivates residents to recycle even more than Hybrid System 1, resulting in a 20 percent increase in curbside recycled materials diverted from the waste stream and therefore a savings of tip fee costs (\$55 per ton) for 538 tons of material.

As described above, Hybrid System 1 would generate sufficient revenue to cover the current costs of the refuse and recycling system, with approximately \$26,000 additional revenue for program administration costs or program expansion. Because two 30-gallon refuse bags are included in the base rate, the rate is somewhat high at \$95 per household per year, and each additional bag costs a relatively high amount - \$2.25.

Hybrid System 2 would generate additional revenue of about \$284,000 over and above the costs of managing the solid waste system currently. Under this scenario, with no "free" bags or containers, the least a household could pay would be the \$85 flat rate per year, plus the choice of one 30-gallon bag per week, for a total of \$137 per year. Because no bags are included in the base rate, the cost of bags is relatively low at \$1.00 each, and the per-household fee is also lower than that of Hybrid System 1..

Table 10 summarizes the assumptions and revenue generated from these two hybrid PAYT systems.

**Table 10**  
**Assumptions and Revenue from Hybrid PAYT Systems**

| Rate Structure      | Assumptions   | Fees                  | Estimated Revenue Generated |
|---------------------|---|-----------------------|-----------------------------|
| Hybrid System Ex. 1 | HH rate changed to be more equitable                            | \$95 per HH per year  | \$1,074,500                 |
|                     | 2 30-gallon bags per HH per week "free" - included in rate      | \$0                   |                             |
|                     | 50 percent of HH choose extra 30-gallon bag each week at \$2.25 | \$117 per HH per year |                             |
| Hybrid System Ex. 2 | HH rate changed to be more equitable                            | \$85 per HH per year  | \$1,323,000                 |
|                     | No "free" bags included in rate                                 | \$0                   |                             |
|                     | 25 percent of HH choose 1 30-gallon bag per week at \$1.00      | \$52 per HH per year  |                             |
|                     | 50 percent of HH choose 2 30-gallon bags per week at \$1.00     | \$104 per HH per year |                             |
|                     | 25 percent of HH choose 3 30-gallon bags per week at \$1.00     | \$156 per HH per year |                             |

To be conservative, these scenarios do not include the additional revenue provided by the Township's 904 grant. If the 904 grant program were to be discontinued for some reason, the revenue generated by either PAYT option would be able to cover costs without the grant. However, if the Township is confident that the 904 grants will continue, this revenue could be factored into the fee structure and possibly subsidize the program to allow lower rates.

The purpose of presenting these scenarios is to illustrate to Township officials how different options can be used to balance the need for revenue with the other important need of charging the residents a fair and equitable fee and allowing them to choose to save costs by recycling.

### Introducing the Program

A significant change in the solid waste management system will be implemented much more smoothly if there is public consensus in favor of the change. It is imperative to make sure the

public knows what is going on, how the program will work and what the benefits are to them. The Township may want to consider forming a committee to oversee the planning and implementation of a program change to PAYT. The committee's role would include:

- Developing a public information strategy; and
- Overseeing implementation.

### **Educating the Public on the Need for PAYT**

It is essential that the public understand the issues and reasons for considering a modification to the existing solid waste management system. Thus, it is important to convey the following messages:

- Spring Township is mandated by Pennsylvania law to provide curbside recycling. However, Pennsylvania law also enables Spring Township to receive 904 grant funding based on the performance of the recycling program. Thus, developing a system, such as PAYT, that encourages people to recycle is financially beneficial to Spring Township.
- Residential refuse collection will be equitably priced (i.e., those requiring fewer container set outs will pay less for them, thereby encouraging diversion by recycling.)
- Recycling service will no longer carry its own fee; instead, the costs of the entire solid waste system will be covered by a base refuse fee, and charges for additional disposal.

It is suggested that a wide range of avenues be used to communicate these messages to the public, including newspaper articles, local radio and television interviews, public meetings, brochures and fliers, and other media.

### **Educating the Public on the PAYT Program**

If Spring Township implements a PAYT program, it is essential that a comprehensive education campaign be developed that includes the following informational materials:

- PAYT brochure that clearly explains how the program works and what its benefits are; and,
- New recycling instructional and educational flyers that explain the connection between the new fee structure for refuse and the possible savings, both to the individual and to the Township, from increasing recycling participation.

In addition, Spring Township may want to establish an environmental task force during the first year whose members communicate with residents who have questions or concerns about the PAYT program for the first year. They should be given the authority to speak to citizens on the phone, to meet with them in person individually or in groups, and to set up an e-mail account specific to PAYT concerns.

### **Develop a proactive campaign to prevent illegal dumping**

Illegal dumping may not be a significant problem. In fact, a study of 14 cities<sup>2</sup> found 42 percent of communities with PAYT programs reporting no problems, 29 percent reporting minor

---

<sup>2</sup> Daniel Blume, *Under What Conditions Should Cities Adopt Volume-based Pricing for Residential Solid Waste Collection?*

problems, and another 29 percent reporting notable problems. The analysis of contributing factors found that three of four communities with problems were rural. Not all rural communities in the sample, however, had problems with illegal dumping. Openly illegal dumping may be somewhat notable when there is no base level of curbside refuse or recycling service. These communities report that some residents illegally dump refuse due to economic constraints. Spring Township may want to investigate the possibility of providing curbside recycling collection every week, on the same day as trash day, to make recycling as convenient as possible and eliminate any incentives for illegal dumping.

Even though illegal dumping should not be an issue, even one instance can be a problem if it is reported in the media and is linked to the PAYT program. Therefore, the Township may wish to introduce a proactive campaign concurrently with the implementation of the PAYT program.

This initiative could include:

- “Report illegal dumping” decals to be distributed public locations, and used on public vehicles including the refuse collection trucks used by the Township’s contractor;
- “3 Strikes And You’re Out” crew enforcement;
- Shared databases with Housing, Health, Street, Zoning, and Police Departments;
- Shared interdepartmental violation notifications that serve to identify chronic “illegal dumpers”;
- Monday morning “Garbage” conference calls; and
- The ability for Township Staff to issue civil citations.

### Amending Ordinance 215

If Spring Township opts to implement a PAYT program, Ordinance 215 will need to be amended to authorize the new system and specify language that limits the amount of refuse that residential units may set out for the base fee, and specifies that set-outs that exceed that limit will not be collected without the specified tag or sticker.

## RECOMMENDATIONS

- To increase recycling, Spring Township should strongly consider implementing a PAYT program. A PAYT system should provide an incentive for residents to be more conscientious about recycling and improve participation and compliance with Spring Township’s recycling guidelines.
- A hybrid system is recommended for Spring Township, where Spring Township households pay for a basic level of weekly service and a per-unit fee is paid for by the households for set outs that exceed basic service levels.
- Implementing a PAYT program could financially benefit Spring Township by between \$26,000 and \$284,500, depending on the structure chosen and the extent to which it encourages residents to recycle.
- Spring Township should evaluate a change to weekly curbside recycling from the current every-other-week collection. Such a change may encourage even more waste diversion, and

therefore disposal savings, by making recycling as equally convenient for residents as disposal. It may also help eliminate the potential for illegal dumping.

- Should Spring Township choose to do this, citizens and service providers should be incorporated into the planning process because; (1) residents currently do not pay equally for solid waste collection services and implementation of PAYT will result in greater cost to some residents; and (2) some residents may view PAYT as an attempt to reduce services and increase costs; and (3) the elimination of the recycling fee, and the encouragement to increase utilization of the recycling service provided, are key elements of the program that may not be well understood if residents focus only on the fee aspect.

A number of Pennsylvania municipalities have found PAYT to be a useful tool in reducing waste, controlling costs, and boosting recycling rates. PAYT will provide an incentive for Township residents to reduce waste generation. The greatest hurdle, if Spring Township decides to implement PAYT, will be avoiding the view that PAYT is an attempt to reduce services and increase costs. It is a decision that will require significant attention to citizen concerns and consideration of citizen input to ensure that it is accepted and embraced by Township residents.

Sincerely,

Karen M. Luken  
Senior Director