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RESOURCE RECYCLING



Innovative rate structures for a zero-waste world BY RICHARD GERTMAN

"No waste" isn't going to come at no cost. An industry expert looks into our zero-waste future and comes up with some inventive ways to see how we can foot the bill.

In a large number of communities, residents and businesses pay for garbage service, but recycling and yard debris collection services are provided for FREE! Oops, I meant at no additional charge.

This means that all of the revenue needed to fund the services provided must be raised from garbage collection fees. As cities move to collect more recyclables and compostables – and, therefore, less garbage – there is less money in the system to pay for more services.

The cities that have asked their hauler to provide these services are not at risk if there is a shortfall; but, the haulers providing service to the cities are seriously at risk. If the haulers are successful in doing what they are asked to do, there will not be enough revenue to cover the costs of their operations.

When there is no more (or much less) garbage, where will the money come from?

Garbage collection fees must generate sufficient revenues to pay for the full range of services that are offered, the city's franchise fee, other program fees, and provide the contractor a reasonable profit.

As we continue to promote an expansion of recycling

programs and add collection of organics other than yard debris to both residential and commercial collection systems, then the amount of garbage service will be reduced. It won't take long for the system to no longer generate sufficient revenues to cover the costs. This means the more successful the program, the more rates would have to be raised. However, in most communities, this would not be sustainable.

Charging for garbage collection only works if the only service covered is garbage collection – and the amount of service provided decreases at the same rate as the revenue decreases. But in fact, in most cities, the same service providers are asked to provide more service for less money. To fairly compensate contractors for all the work they do, we need to change the way we bill their customers for service. There are many options available, and individual cities will need to select the one that best accommodates local conditions.

Among the many options that may work to maintain revenues, as the amount of garbage decreases:

- Alternative 1 – Charge for all collection services
- Alternative 2 – Charge based on weight collected
- Alternative 3 – Increase the cost for higher level of service

- Alternative 4 – Charge based on service type

Each of these alternatives has some advantages. The “ultimate” system for a particular community likely will be a combination of alternatives that combine to provide a workable structure.

Alternative 1 – Charge for all collection services

When residential recycling programs were initially introduced, they were provided for “free” (that is, the costs were included in the rate charged to collect garbage), to encourage residents to recycle. That concept was important because recycling was mostly a new behavior, and organizers wanted to make sure that people would participate. But, recycling is now well-established, so it is no longer necessary to pretend that there is no cost to collecting recyclables.

It is likely that charging for all collection services will not negatively impact participation in recycling programs today.

In Palo Alto, California, for example, the charge for residential garbage service is essentially \$1 per gallon (\$32 for the first 32-gallon container, \$64 for 64-gallons and \$96 for 96-gallons). So, a household with a 32-gallon garbage can, a 64-gallon recycling roll cart and a 96-gallon yard debris roll cart, pays \$31 to cover the cost of all of these services. This is 16 cents per gallon of total service.

If we charged for each cart by size, and a resident began grasscycling and composting at home, and then switched to a 64-gallon roll cart for yard debris, the cost of service would drop by \$5.12 per month (32 x 16 cents). The reduced charge for collection directly translates to a reduced cost of service to the contractor that has less material to collect and process, but \$5.12 per month is more than the amount saved by the hauler.

An alternate rate structure might be to charge one-third of the total for each of the three services, so that collection of 64-gallons of recyclables, and 96-gallons of yard debris, each cost the same as the collection of 32 gallons of garbage. In this alternative, if the average Palo Alto resident switched to a 64-gallon cart for plant trimmings, they would reduce their cost of service by \$3.44 per month (one-third of \$10.33).

It should be noted that it is com-

mon for commercial waste generators to be charged for collection of recyclables, because most franchise agreements do not require the same level of recycling opportunities for businesses as they do for residents. However, as the commercial sector is responsible for a large percent of the revenues and profits of collection companies, programs that reduce commercial garbage collection services, and hence revenues, are rarely encouraged by haulers.

Alternative 2 – Charge based on weight collected

Generally, people have a direct incentive to reduce use of electricity, since turning off an electric light switch immediately saves money. The primary increment of service for residential garbage collection is the 32-gallon can equivalent. This increment is too large to allow the resident much opportunity to reduce their costs. For a 64-gallon roll cart user to reduce their service level, they would have to cut their waste in half. The increment of service needs to be smaller to allow people to make a difference, in the way they can with such metered utilities as electricity, natural gas or water.

Charging by the pound for materials collected reduces the increment to a level that residents and businesses can have a direct impact on the cost – and they will be able to see the direct benefit of changing their behavior.

In a weight-based alternative, each cart would be outfitted with a radio frequency identification (RFID) tag to identify the type of cart and customer. When the cart is emptied, the weight of the contents would be electronically recorded and the customer would be billed the appropriate amount for the type of material set out.

The problem with charging by weight has been that we do not currently have technology that can accurately weigh a load on a moving lift arm, especially after conducting hundreds of starts, stops and lifts each day. The requirement for charging customers based on weight is that the charges cannot exceed the amount owed for the accurate weight.

In commerce, a customer cannot be charged more for a weighed item than the price (per pound) times the number of pounds. But, the customer can be charged *less*. So the solution to this problem is to charge for less than the weight the scale

records. For example, if the scale records the weight of the contents of a cart at 100 pounds, and the accuracy of the scale is within 10 percent, then the contents are expected to weigh at least 90 pounds. Further, to insure that the customer is not being overcharged – say if there were really only 89 pounds in the cart, the charges could be set at 80 percent of the recorded weight (80 pounds), which is well below the actual weight. To recover the revenue needed to fund the operations, the price per pound that is charged would then simply be set at 1.25 times (= 100/80) the amount of the weight recorded.

The RecycleBank program provides incentives to residents based on the number of pounds of recyclable materials set out for collection. The system uses on-board scales on trucks and RFID tags on the carts. The collection industry is working to make this technology an integral part of future collection contracts.

Alternative 3 – Increase the cost for higher level of service

In this alternative, service charges would not increase in a straight line; instead, customers with larger service volume would pay proportionally more than those with smaller volumes.

In an electric or water utility fee structure, it is common for there to be a base charge or a baseline use charge, with higher charges per unit of service above that baseline to encourage conservation. This type of fee structure might have some positive applications in the waste management industry.

The fixed-base service charges would cover the hauler’s customer service functions, the cost of billing the customers and other base administrative costs. The variable rates would cover the collection and processing of recyclables and compostables, and the collection and disposal of garbage. In this alternative, when a customer shifts service level, they are still paying for the full cost of the services they receive.

A “conservation” price signal can be sent by charging more for larger generators. So, the first increment would be at the base rate (one times); the second increment might be at 1.25 times the first increment; and the third increment would be 1.5 times the first increment. So, if the first 32-gallon equivalent is \$32, the second 32-gallon equivalent would be \$40, and 64-gallons of

service would be \$72 (instead of \$64); and the third increment would be \$48. Altogether, the three-can rate might be \$120 instead of \$96.

These higher rates would not be expected to create a direct increase in revenue, as it would be expected that some residents would opt for lower levels of service in response to the fees. If this response includes a reduction from the current amount of garbage generated by the customer, and an increase in recycling rates, then the conservation signal would be successful.

Alternative 4 – Charge based on service type

The cost of collection and processing of the recyclables and compostables is generally higher than the cost of collection and disposal of garbage. In this alternative, charges for collection would be based on the cost of the recyclables and compostables processing system employed.

The cost of processing a wide variety of mixed recyclables is higher than the cost of processing a relative few different material types. Along the same line, the cost of processing mixed organics is higher than for processing only clean plant trimmings. But, these higher-cost options also yield a higher recovery rate. Clearly, it costs more to sort eight material types than to sort five materials at a materials recovery facility; and, clearly, it costs more to process mixed food scraps and plant trimmings than plant trimmings only.

As higher recovery rates become more important to communities, the rate structure must be adjusted to provide these higher revenues to pay for the higher diversion. So, the program design should dictate the charges for service. The higher cost of processing a wide stream of recyclables, and the full range of organics, will cause higher rates. If communities elect to maximize recovery through expanded collection and processing programs, they will have to require residents and businesses to subscribe for the full range of services. They will not be able to make these programs work if individuals can opt out of paying for the full program. This may also allow us to include the value of

the loss of resources, in the cost of collection and disposal of materials in a landfill, in the calculations of the costs of collection services.

When cities first started collecting recyclables at the curb, the unit cost of recycling was much higher than the unit cost of garbage, because only a few pounds of recyclable materials were recovered at each stop, and many pounds of garbage were collected. Now, with expanded recycling and plant trimming collection programs in place, the unit cost of collecting the remaining garbage is higher than the unit cost of collecting recyclables.

Alternative 5 – The ultimate rate system

Rather than a single factor rate (volume), the ideal rate structure might include:

- Base service charge
- Charges for the type of material collected
- The number of pounds of material collected
- Charges for processing the collected materials (not landfilling them)
- Transfer fees and landfill fees.

Charging for these multiple factors allows garbage rates to more directly reflect the cost of service.

The base service charge would include the cost of setting up service (e.g., the cost of getting the truck and driver to the household or business, customer service and billing, administration, franchise fee, and other factors).

Charges by material type would reflect the cost of managing recyclable and compostable materials and disposal of the residue at a landfill.

Charges by the pound sends the message that the individual can make a difference, and that no change is too small to matter.

And, the loss of resources to landfills would be included in the charges for collection.

Alternatives that are designed to minimize the increment of service allows the customer to more easily affect the amount they pay for service; and, charging for garbage service by the pound provides the

smallest increment of service.


As for the electric utility fees, there can be a base charge and a baseline charge that ensures a minimum revenue when the customer's service is reduced.

No zero waste without commercial recycling

Much of this discussion is directed at residential services, since most communities focus on residential services when making decisions about services provided and charges for services. However, these rate structures apply equally to commercial services. In fact, since the focus is generally on residential services, the recovery rates for commercial recyclables are often very low. In many communities, haulers have given up their profits from residential collection services by providing collection of recyclables and compostables without being fully compensated for these additional services.

They are, therefore, reluctant to provide commercial collection of recyclables, because that would further reduce their income while adding costs. To make the haulers partner in expanding recovery rates, service charges need to be set to recover the cost of the programs.

Communities should evaluate their program goals and how the achievement of these goals is affected by their rate structure. They should change the rate structure now, and not wait for the end of the current contract. If the changes are a win-win for the city (more diversion) and the hauler (appropriate payment for services), then the contract can easily be amended.

The zero-waste future is coming – it just needs to be paid for. 

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