

Prioritizing recovery efforts, part 2:

Opportunities for increased beverage container recovery



With so many beverage containers being consumed, why are recovery rates so low? Answering this question also reveals a number of opportunities to improve recovery.

by Ted Siegler, Natalie Starr and Marc Daudon

The first part of this two-part article concluded that "the majority of beverage containers are consumed where we can readily collect them – in the home, at work, and in bars and restaurants. Many of these locations already have recycling in place, and many of those that do not have recycling at least have trash collection service."

The question then becomes, if recycling collection programs already exist for most beverage containers in non-bottle bill states, then why is the recycling rate so low? The answer is more complex than one might think, but answering it yields some interesting insights into what might be accomplished to increase the container recovery rate.

Recovery at home

One key to high beverage container (or paper) recovery rates from households is parallel refuse and recycling collection service. That is, if a household receives weekly curbside refuse collection, then recyclables will be recovered at the highest rate if the household also receives weekly curbside recycling collection, at no additional cost to the household, on the same day as refuse collection. Data

shows that recovery rates of 50 percent to 70 percent are achievable given well-run programs with parallel access.

Conversely, if a household with curbside refuse collection must drive to drop off recyclables – even to a conveniently located shopping center – then participation rates for recycling typically will fall to 10 percent to 15 percent. Similarly, if the household must voluntarily pay extra for curbside collection of recyclables (i.e., subscription service), participation rates will be even less, ranging from five percent to 10 percent. While in both cases those households who do participate will typically separate most of their recyclables, the low participation rates result in single-dig-it recovery levels.

Unfortunately, data on the number and/or type of curbside refuse or recycling programs are extremely limited and not very precise.

Based on estimates, roughly 80 percent of U.S. households have curbside refuse collection, with the remaining 20 percent using landfills, transfer stations or other drop-off locations for refuse disposal. Therefore, the key to high recovery of recyclables is assuring that households with curbside refuse collection have access to parallel curbside recycling programs, and that households with drop-off refuse collection have access to recycling at the drop-off location.

Based on limited data, a slightly lower percentage of households in non-bottle bill states have access to curbside collection of refuse (78 percent). Because bottle-bill states already have relatively high recovery rates for beverage containers, the analysis focused on increasing recovery in non-bottle bill states, especially from the large percent of households with curbside refuse collection.

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BioCycle magazine, which publishes the only aggregate data on access to curbside recycling, reported in its January 2004 survey (based, primarily, on 2002 data) that 56 percent of households have some type of access to curbside collection system for recyclables. However, using this estimate presents two significant problems. First, the data is based on state officials' best estimates of curbside access, which in many cases are little more than educated guesses, because most states do not maintain this data.

Second, and more importantly, the *BioCycle* survey does not report on the type of access. In some cases, subscription service may be counted as access to recycling, and, as stated above, participation in recycling where the household must subscribe and pay extra for the service is typically very low.

Other factors also diminish the effectiveness of some of the non-subscription curbside recycling programs, including inconsistent scheduling (different day than refuse or less frequently than refuse collection), limited range of materials accepted (for example, no glass collection or limited plastics accepted) and inadequately sized bins or carts to accommodate recyclables. Table 1 summarizes refuse and recycling system access for all households in non-bottle bill states.

Of the 80 million households in non-bottle bill states, 78 percent have curbside refuse and could have parallel, high-performing curbside programs. Yet, it appears that 35 million of those households either have drop-off recycling or subscription curbside, both of which have very low participation (and recovery) levels.

From conducting recovery rate studies around the U.S., households with parallel curbside recycling programs can be further categorized by the level of performance of their programs – high, medium and low. Those with low and medium performing programs also have potential to improve recovery by upgrading their systems.

Using participation and recovery rate data from the programs analyzed, and applying these average recovery rates to each type of program listed in Table 1, the current recovery levels for the different systems have been estimated and are illustrated in Table 2. Given the low recovery projected under many of these scenarios, there is lots of room to improve current recycling collection from households.

Improving beverage container recycling

Using Tables 1 and 2 as guides, the potential for additional recovery at home can be estimated, assuming a commitment is made by all the stakeholders to substantially increase material recovery (beverage and non-beverage containers and paper). This

Table 1 Current refuse and recycling system estimates (non-bottle bill states)

Collection systems	Households (in millions)	Percentage
<i>Curbside Refuse (78 percent overall)</i>		
Drop-off recycling	26.2	33
Subscription curbside recycling	9.2	11
Non-subscription curbside recycling		
High performing	5.5	7
Medium performing	16.5	21
Low performing	5.5	7
<i>Drop-off refuse (22 percent overall)</i>		
Drop-off recycling	13.1	16
No recycling	4.4	5
Total, non-bottle bill states	80.4	100

Source: DSM Environmental Services, Inc., 2006.

Table 2 What percentage of containers are we recovering? (in percent)

Collection system	Participation	Capture	Recovery
Curbside refuse, drop-off recycling	15	60	9
Curbside refuse, subscription recycling	10	80	8
Curbside refuse and recycling (parallel collection)			
High performing	80	80	64
Medium performing	60	75	45
Low performing	40	60	24
Drop-off refuse and recycling	65	75	49
Drop-off refuse, no recycling system	5	75	4

Source: DSM Environmental Services, Inc., 2006.

Table 3 Potential changes to current collection to increase recovery

Current service	Action step
Curbside refuse, drop-off recycling	Change to curbside recycling (weekly)
Curbside refuse, subscription recycling	Change to municipal curbside (weekly)
Curbside refuse and recycling (parallel collection)	
High performing	60-gallon carts, education program
Medium performing	Some 60-gallon carts, education, PAYT
Low performing	Increase service to every week collection, education
Drop-off refuse and recycling	Education, some PAYT
Drop-off refuse, no recycling	No action

Source: DSM Environmental Services, Inc., 2006.

commitment, which would involve significant up-front financial support, would have two components.

First, there would be a commitment to providing parallel collection of recyclables to all households currently receiving curbside refuse collection. That would mean that roughly 35 million curbside refuse households, who currently are provided only with drop-off or subscription curbside (at an additional cost),

would be provided with curbside recycling collection on the same day as refuse collection, with the cost included in the overall collection system cost.

Second, there would be a commitment to moving the low- and medium-performing programs up to medium- and high-performing programs, respectively. This would entail implementation of some mix of the following activities or programs:

- ◆ Properly sized recycling set-out containers with enough volume to hold accumulated recyclables between collections
- ◆ Unit-based refuse pricing (pay-as-you-throw) or other financial incentives to separately set-out recyclables
- ◆ Simple, consistent recycling messages
- ◆ Inclusion of all beverage containers in the collection mix
- ◆ Single-stream recycling collection
- ◆ Adequate education and promotional budgets.

Table 3 illustrates how these changes might look.

Applying recovery rates for medium- and high-performing parallel programs (45 percent and 64 percent, respectively, from Table 2) to the 35 million additional households new to parallel access, and increasing the performance of the existing medium- and low-performing households with parallel access would produce dramatic results; beverage container recovery would increase by roughly 1.9 million tons (approximately 20 percentage points). Just as importantly, because this same collection infrastructure also collects paper, paper recovery would increase by an estimated five to seven million tons per year.

Plenty of low-hanging fruit is left in household refuse for beverage container recovery. Making the necessary financial investment in expanding parallel curbside access would not only substantially boost recycling rates for beverage containers but also for paper, as well as move our nation toward a more sustainable materials recovery system.

Recovery at work

A significant fraction of recyclable containers are consumed at the workplace – 17 percent of polyethylene (PET) bottles and 12 percent of aluminum cans. Most workplace recycling efforts, however, have focused on fiber.

Fiber recycling is profitable – the fiber-reprocessing infrastructure is well-established and the supply of high-quality paper and container-board from the workplace is abundant. Still, successful examples of container recovery from the workplace do exist, and model programs and key success factors will be discussed below.

Given the high rates of beverage consumption at the workplace, but low prevalence of container recovery programs, the potential for new recovery from this sector is significant. In particular, the workplace represents a higher proportion of containers still disposed than it does of containers consumed. For example, an estimated 20 per-

Table 4 Containers consumed in the workplace per year

	<u>Fraction of total consumption</u>	<u>Estimated containers per employee</u>	<u>Fraction of remaining potential in the waste stream</u>
PET	20%	90+	24%
Aluminum	12%	100+	19%
Glass	2.3%	<10	2.5%

Source: Cascadia Consulting Group, 2006.

Table 5 Largest 44 metropolitan areas classified by bottle bills and recycling programs

	<u>Deposit</u>	<u>Non-deposit</u>	<u>Totals</u>
More commercial infrastructure	7	15	22
Less commercial infrastructure	6	16	22
Totals	13	31	44

Source: Cascadia Consulting Group, 2006.

cent of all PET bottles are consumed at the workplace (an estimated 90 bottles per employee per year, on average), but 24 percent of all PET bottles disposed are from the workplace (see Table 4).

Efforts to recover containers from the workplace can benefit from the high concentration of the nation's workforce in urban areas and in larger companies. Since more employees equal more containers, focusing on a smaller number of large workplaces in select metropolitan areas can provide significant results for the least overall program cost. In particular, companies with more than 20 employees represent more than 80 percent of the nation's workforce, while companies with

sis of the extent of recycling infrastructure for the nation's metro areas was beyond the scope of this analysis, the nation's largest 44 metro areas (representing half of the country's workforce) were assessed for existing commercial recycling opportunities.

Twenty-two metro areas with a central city were identified that either mandate access to commercial recycling or itself provides a commercial recycling service. Fifteen of these metro areas were not in bottle-bill states and are, therefore, estimated to have the greatest remaining potential, as summarized in Table 5. Since bottle-bill states already have container recovery in place, gains from a new program may not be as significant as in non-bottle-bill states.

Potential recovery from these 15 metropolitan areas is substantial. Table 6 summarizes the estimated container recovery potential by weight for businesses with 20 or more employees in the selected 15 metro areas. Businesses in the restaurant, hotel and construction industries were excluded from the analysis.

Improving beverage container recycling at work

Data on best practices, number of businesses served and participation rates for beverage container recycling from the commercial sector is limited. Nevertheless, prior experiences from existing programs do offer several best practices and successful models.

Adding containers to existing paper recycling is most efficient. This paper-back model, which leverages the existing infrastructure, is generally the least-cost solution and

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more than 100 employees represent more than 60 percent of the nation's workforce. In addition, 25 percent of the workforce is located in just a dozen metropolitan areas, with 50 percent located in the largest 44 metro areas.

New workplace container recovery efforts also would benefit from the prior existence of recycling collection and processing infrastructure in the area. Although a full analy-

can build on existing employee recycling habits. However, this method does require processing infrastructure to separate and process containers from paper.

Embedded recycling provides incentives for business participation. Such programs package recycling and refuse services and fees such that recycling appears free. Businesses can save money by diverting material to the recycling bins and downsizing their dumpsters. Some local governments have required embedded recycling with successful results.

Residential curbside service can be expanded to small businesses.

This can be effective particularly in areas outside central business districts. Haulers servicing residential curbside could bid for commercial curbside pickup contracts. City ordinances requiring commercial recycling or bans on the disposal of recyclable material would complement curbside pickup.

Resource management contracting. The waste reduction and financial goals of businesses and waste haulers can be aligned with such contracts for mutual gain. Resource management contractors typically are paid to manage a company's entire waste stream and are compensated in part on their ability to reduce disposal costs. One common model is for the business and the contractor to split any cost savings, a method which provides incentives to both parties to reduce waste and increase recycling.

Management and employee support are essential. For workplace recycling programs to be long-lasting, support of management is critical. Recycling bins at each work station and meeting area also are

Table 6 Potential recovery (in tons)

	<u>Estimated disposal</u>	<u>Estimated potential recovery</u>
Aluminum cans	19,000	7,000
PET containers	31,000	11,000
Total (excluding glass)	50,000	18,000

Source: Cascadia Consulting Group, 2006.

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essential to capture the highest fraction of both containers and fiber.

Challenges of moving forward

Despite the potential for recovering containers from the workplace, efforts to expand workplace recycling are not without challenges. A particularly significant challenge may be resistance on the part of haulers and processors to add containers, especially glass, to existing paper recycling programs, particularly if the extra cost of sorting is not offset by increased revenue from containers.

Removing glass from a fiber stream can also be technically difficult and require significant, new investment in processing sys-

tems, with minimal (or negative) return from sale of recovered glass to a recycling market. Even when programs are put in place, soliciting business participation and implementing internal systems to capture a high fraction of containers can be difficult and require substantial resources from the haulers, local governments or other technical assistance staff.

Significant potential exists for increasing beverage container recovery from the workplace. Our analysis suggests that focusing on larger businesses in larger metropolitan areas would target a substantial fraction of these containers. Furthermore, metropolitan areas with significant recycling infrastructure in place, but low commercial recovery, would be natural places to begin building cost-effective infrastructure for recycling workplace containers. Partnerships and investments by local government, businesses and processors in each area will help build locally appropriate programs to effectively capture these containers. **RR**

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