

NAPCOR

A Comprehensive Guide to Venue and Event Recycling

Single-Serve Recycling Toolkit

TABLE OF CONTENTS

Introduction	2
Overview: The Single-Serve Recycling Toolkit	2
Starting a Single-Serve Recycling Program	4
Step One: Planning	5
Step Two: Analyzing Costs & Benefits	7
Step Three: Identifying Single-Serve Markets	10
Step Four: Collecting, Handling, & Processing Single-Serve PET Bottles	12
Step Five: Educating & Training Staff	18
Step Six: Promoting the Program	19
Step Seven: Monitoring & Evaluating the Program	20
Checklist	22
NAPCOR Contacts	22

Introduction

SINGLE-SERVE PET BOTTLES: AN INTRODUCTION

This **Single-Serve Recycling Toolkit** is a step-by-step guide to establishing recycling programs for single-serve PET bottles at venues and events of various sizes.

The approach presented here emphasizes maximum material recovery in a cost-efficient manner, while recognizing the value of education and promotion as tools to reinforce the importance of recycling in our society.

The yield from successful programs is tremendous, both in the amount of material recovered and in the satisfaction of tackling an area of waste generation that has historically been overlooked.

Overview

OVERVIEW: THE SINGLE-SERVE RECYCLING TOOLKIT

What are single-serve bottles?

Single-serve is the term used to describe polyethylene terephthalate (PET) plastic bottles that are 24 ounces or less in size. Bottles made from PET plastic are marked with the #1 code on or near the bottom of the container, along with the letters PET or PETE.

Single-serve containers represent the fastest-growing segment of beverage container sales today. They are used to package many types of beverages, including carbonated soft drinks, water, sports drinks, juice, milk, tea and beer.

Single-serve bottles are made in many shapes, colors and sizes, and some beverage brands have even developed their own signature bottles.

Most single-serve bottles come in the following colors:

- **Clear** - the most common type of PET bottle; typically used for soft drinks, water, sports drinks, juice, tea and milk
- **Green** - mostly used for soft drinks
- **Blue** - mainly used for water
- **Amber** - usually used for beer, liquor and some juices

Single-serve bottles are portable, lightweight, shatter-resistant, strong and resealable, making them the container of choice in our increasingly mobile and convenience-focused society.

OVERVIEW: THE SINGLE-SERVE RECYCLING TOOLKIT

Larger-size (24 ounces or more) multi-serve PET bottles are also used to package beverages like two-liter soft drinks and liquor. PET bottles and jars are used to package food, cleaning products, beauty supplies and other household items. While these other types and sizes of PET bottles are routinely collected in curbside recycling programs, this guide specifically focuses on recycling programs for single-serve PET beverage bottles that are consumed away from home.

Where are single-serve bottles used?

Beverages in single-serve PET bottles are commonly consumed away from home at places like sports stadiums, arenas and racetracks, special events like fairs, concerts and festivals, amusement parks, colleges and schools, office parks, and convention centers.

To encourage single-serve recycling away from home, collection programs are being implemented at numerous venues around the country.

By following the steps in this guide and adopting a bold action plan, local recycling coordinators, venue and event managers, and service providers can work together to achieve cost-effective solutions to waste generation at venues and events.

Why recycle PET single-serve bottles at venues and events?

Currently, the supply of PET bottles for recycling comes mostly from curbside and drop-off programs. However, even with the success of recycling nationwide, the demand for recycled PET (RPET) bottles is greater than the current supply. The increasing number of single-serve bottles generated at sporting events and festivals is a potentially large supply source for the PET recycling industry. In some communities in populous states, where landfill tipping fees are high and landfills are located far away, institutions and businesses such as stadiums are always looking for ways to reduce their solid waste disposal costs. Well-designed and managed single-serve PET bottle recycling programs can help.

Additionally, consumer product companies are increasingly recognizing the public's demand for their brands' bottles to be recycled. As major sponsors, they may welcome an opportunity for positive public relations offered by a venue or event recycling program.

After collecting, sorting and cleaning, single-serve bottles are recycled into many new products. Recycled PET is made into fleece and other types of polyester for clothing, carpet, fiberfill for sleeping bags and coats, car parts, industrial strapping, and new plastic bottles.

The reclamation industry

Viewed as a whole, the PET reclamation industry is a model of U.S. ingenuity. It began in 1977, when the first PET bottle was recycled, and has grown into a \$500 million industry. While some PET on both coasts is sold into overseas markets, the majority of bottles still find their way to U.S. reclamation companies, which produce clean recycled PET flake or pellet from bales purchased from material recovery facilities (MRFs). The PET recycling industry in the U.S. provides hundreds of jobs in support of communities.

Starting

STARTING A SINGLE-SERVE RECYCLING PROGRAM

This page illustrates a step-by-step process to follow in order to build an effective and efficient single-serve bottle recycling program. It covers the key elements of planning, establishing and managing single-serve recycling. Each step is presented in detail, including key questions, tools to use, and explanations of issues involved.

The basic steps are:

Step 1: Planning

Step 2: Analyzing Costs & Benefits

Step 3: Identifying Single Serve Markets

Step 4: Collecting, Handling & Processing Single-Serve PET Bottles

Step 5: Educating & Training Staff

Step 6: Promoting the Program

Step 7: Monitoring & Evaluating the Program

The single-serve recycling program checklist on page 22 also provides a summary of major issues to address when establishing new collection programs.

Keys to recycling success

- Commitment – Support from top management or lead event organizers, such as a policy statement, memo, funding, or direct involvement.
- Collection – An efficient, easy-to-use, consistent, and prominent collection system.
- Participation – Employees, vendors, contractors and attendees who are aware of the program and supportive of recycling efforts.
- Storage – A temporary holding area for combining recyclables collected from smaller containers for bulk pick-up.
- Recycling service provider – A recycler, waste hauler, or volunteer organization that will provide transportation of recyclables to a recycling facility for further processing and marketing.
- Market – The final destination for the recyclables from the event or venue. The market may be the same entity as your recycling service provider, or may be a different processing facility.

Planning

STEP ONE: PLANNING

Key questions:

- Who's going to assist with planning?
- How does single-serve recycling fit into your waste management and recycling program?

Planning for recycling at some special events begins years in advance, but it is never too late to start. The following tools can help plan for recycling programs at a variety of venues.

Tools for planning

- Involvement – Organize a recycling planning committee to create partnerships and build support from key stakeholders, such as facilities management, administration, vendors, facility users, cleaning and waste services contractors, and recycling processors.

Weight/Volume Conversion – PET Bottles

	WATER	SOFT DRINKS	SPORTS DRINKS, BEER, JUICE
Bottles per case	24	24	24
Pounds per case	1.09	1.5	2.2
Bottles per pound	22	16	11
Bottles per ton	44,000	32,000	22,000
Bottles per cubic yard	768	768	768
Bottles per 30 cubic yards	23,040	23,040	23,040
Pounds per cubic yard	35	48	70
Pounds per 30 cubic yards	1,050	1,440	2,095

NOTE: The weights listed above are true bottle weights - when closures, labels and residual product weights are added, the weight will be higher. The volumes listed above are approximate and will vary depending upon the size and shape of the bottles served at your venue.

- Goals – Set clear objectives to help focus on developing the key elements of an effective program. (i.e., provide education, keep accurate records, set parameters for measuring recovery rates.)
- Flexibility – Plan a program where you can expand recycling or modify your collection and processing to meet the needs of the specific event or location.
- Contracts – Anticipate and meet recycling needs in employment agreements and contracts. Food and beverage vendors, waste haulers, and custodial staff can influence recycling success. Contracts can include provisions to support recycling by providing recycling bins or other financial and promotional support. Limit the use of non-recyclable beverage containers and food service items.

STEP ONE: PLANNING

- **Finances** – Use an accounting system that attributes savings from reduced waste disposal, clean up and litter management costs to help fund recycling efforts.
- **Education & Training** – Promote recycling and educate employees and attendees; teaching visitors and staff to recycle properly is essential to success.
- **Estimating Recovery** – Conducting a “waste audit” and using the results in combination with the table above can provide better data with which to plan your material recovery. The mix of containers actually discarded, including beverage containers brought in by fans or spectators at certain types of venues, can be more accurately determined by sorting the trash prior to implementing recycling.

Types and quantities refresher

Use these steps to determine whether PET bottle recycling is feasible for your event:

1. Quantify the number of PET bottles sold on-site and estimate the number brought in by spectators and attendees. Use sales numbers provided by venue management or the beverage supplier, and check these numbers using an on-site waste audit.
2. Calculate potential recovery using the weight and volume conversions appropriate to the mix of PET bottle types. Choose a realistic recovery rate, considering the culture of the event and your goals. Use these numbers to determine recovery methods, types and sizes of intermediate storage containers, and to provide your recycling service provider with an estimate of the amount of material they can expect.
3. Examine waste collection/disposal methods and issues. Determine how you will partner the recycling efforts with the public and private entities that manage the trash collection and handling.
4. Determine the level of interest and potential cooperation on the part of event organizers and venue managers.
5. Survey the venue’s contracted product and service providers, such as beverage vendors and waste haulers, to determine their interest in contributing as project partners.

Analyzing

STEP TWO: ANALYZING COSTS & BENEFITS

Key questions:

- What are the benefits of single-serve recycling?
- What will it cost to recycle single-serve containers?

Assessing the economics of single-serve recycling requires examining both the benefits and the costs of recycling efforts.

Single-serve recycling programs should be cost-effective if they are to be sustainable. Some venue managers will insist that every penny be accounted for and that recycling programs save money or earn revenue. Other managers may be pleased with a break-even program or even one that costs money if other goals of the facility or event, such as positive public relations, are met. During the planning phase, all stakeholders should agree on how they define a cost-effective program.

Potential benefits

- Avoided costs of waste collection and disposal, including materials, labor, trips to solid waste disposal facility, container pull charges and tipping fees.
- Reduced litter and clean up costs.
- Revenue for single-serve bottles.

Recycling costs

- Labor beyond existing solid waste handling and disposal, to service recycling bins, conduct post-event picks, sort commingled recyclables, and perform other recycling tasks.
- Collection bins. (Note: This cost may be shared or amortized if used at other events or multiple years.)
- Supplies for collection, such as clear liner bags for recycling bins.
- Rental and pull charges for intermediate storage containers, if needed, such as roll-offs, trailers or compactors.
- Transportation to markets, if a fee is charged.
- Processing fees, if a fee is charged.
- Promotional and educational materials.

Understanding and assessing the costs vs. benefits of a single-serve recycling program requires a full understanding of the costs to collect and dispose of the bottles with the trash.

STEP TWO: ANALYZING COSTS & BENEFITS

Avoided costs

As you examine the costs, it is important to remember that recycling eliminates some of the cost of waste handling and disposal. The eliminated costs are called the “avoided costs.” In most cases, labor and supply substitutions occur. For example, the number of clear bags used for collecting recyclables reduces an equivalent number of bags used for trash collection.

Calculating cost/benefit

The following schematic illustrates the method for determining the cost/benefit of a single-serve plastic bottle recycling program:

$$\begin{aligned} & \text{THE COST (\$ per ton or lb.) OF COLLECTING AND DISPOSING} \\ & \text{OF ALL SINGLE-SERVE BOTTLES AS TRASH} \\ & \qquad \qquad \qquad + \text{ PLUS} \\ & \text{THE COST (\$ per ton or lb.) OF RECYCLING X\%* OF SINGLE-SERVE BOTTLES} \\ & \text{(extra labor, amortized bin cost, extra supplies, etc.)} \\ & \qquad \qquad \qquad - \text{ MINUS} \\ & \text{THE COST (\$ per ton or lb.) OF COLLECTING AND DISPOSING OF X\%* OF} \\ & \text{SINGLE-SERVE BOTTLES IF THEY WERE INCLUDED IN THE TRASH} \\ & \text{(This is the “AVOIDED COST”)} \\ & \qquad \qquad \qquad = \text{ EQUALS} \\ & \text{THE FINANCIAL BENEFIT (\$ per ton or lb.) OF RECYCLING X\%*} \\ & \text{OF SINGLE-SERVE PLASTIC BOTTLES AT YOUR VENUE OR EVENT} \end{aligned}$$

* X% = your estimate of the venue or event’s recycling rate

Cost benefit analysis for ABC Festival

Your community decides to recycle PET beverage containers from the annual ABC weekend festival. Through conversations with the festival organizers, vendors and beverage distributors, you learn that the three day festival generates 100,800 single serve bottles. This is the equivalent of 4,200 total cases of beverages, or 5,600 lbs. (2.8 tons) of containers, assuming 18 PET bottles/lb. You determine that 65% percent of these containers can be recovered for recycling (65,520 bottles or 1.82 tons), with a good education program, an adequate number of the appropriate recycling bins, and strong support from the festival organization.

Below is a hypothetical example of how to conduct a simple cost/benefit analysis for recycling the PET beverage containers that would otherwise be managed as trash. This example is for general illustrative purposes only - each event and location will have differing parameters that will impact the economics and success of the program.

STEP TWO: ANALYZING COSTS & BENEFITS

Recycling equipment costs

Recycling bin selected will hold 200 PET single serve 20 oz. bottles, and each bin is serviced four times per day.

100,800 bottles x .65 (recycling rate) = 65,520 bottles.

65,520 bottles / 800 (200 bottles per bin x 4 servicing of bins daily) = 81.9

81.9 / three (number of days of festival) = 27.3 (round up to 30)

Thirty bins are needed for this size festival

Thirty bins @ \$35 each = \$1,050

Annualized cost of 30 bins, assuming seven year useful life = \$150 per festival

Clear recycling bags for bins

4 x 3 x 30 x .17 = \$61.20

Recycling labor cost

\$100/ton x 1.82 = \$182

Processing fee** charged at MRF for processing segregated loose bottles

\$35/ton x 1.82 tons = \$63.70

Total Recycling Costs *	
Annualized bin cost	\$150.00
Annual plastic bag liner cost	\$61.20
Recycling labor cost	\$182.00
Processing Fee	\$63.70
Total	\$456.90

Recycling revenues/savings

Revenue from selling 1.82 tons of segregated loose PET bottles

Assume value of \$.04 /lb. (\$80/Ton) x 1.82 tons = \$145.60

Avoided costs of disposing of PET bottles as trash***

Savings calculated from diverting 72.8 cubic yards of bottles as trash, assuming two 40 cubic yard dumpsters @ \$125 per placement and servicing \$250.00

Trash bag savings 30 x 4 x 3 x .12 \$43.20

Grounds clean-up, litter cost savings of \$100/ton = \$182.00

Total revenue and avoided costs \$620.80

NET SAVINGS (Recycling costs minus recycling revenues/avoided cost s) \$163.90

*Assumes educational/PR costs/signage are donated by local businesses or the festival organizers.

** Not all projects will have a processing fee.

*** Service provider may charge per ton rather than on a volume basis.

Identifying

STEP THREE: IDENTIFYING SINGLE-SERVE MARKETS

Key questions:

- What are your markets for recycled single-serve bottles?
- What are the market requirements?
- Are there fees or costs associated with the market?
- What is the potential revenue?

Your recycling program can direct its single-serve bottles to two basic types of markets. Most single-serve recycling programs use haulers or processors as recycling service providers (RSPs). Larger venues with full recycling programs may be able to sort and bale material for sale to reclaimers, brokers, and end users.

Balancing the economics

Quantity and efficiency are the keys for access to recycling markets. Most recycling programs aren't large enough to process materials cost-effectively for sale directly to an end user. Haulers and processors take on the job of accumulating material from a variety of sources and processing it for sale in truckload quantities to reclaimers or end markets.

Recycling service providers

- May already be collecting the trash or recycling at your location.
- Will pay or charge for materials based on the quantity and quality, how it is prepared, and current market prices.
- May pick up materials or may require delivery.
- May provide intermediate storage containers or receptacles (and may require their use).
- May sort and bale materials for sale to a reclaimer, broker or end user.
- May be a large full-service MRF (public or private); small merchant or nonprofit multi-materials processor; paper dealer; or metals scrap yard.

Loose bottles & cans

> Recycling Service Providers

- Appropriate for smaller volumes
- Less on-site handling and processing

Baled plastic bottles

> Reclaimers, Brokers & End Users

- Appropriate for larger, consistently generated volumes
- More on-site handling and processing

STEP THREE: IDENTIFYING SINGLE-SERVE MARKETS

Questions to ask recycling service providers

- Will they accept loose (unbaled) material?
- Will they accept the material in plastic bags?
- Will they accept mixed or unsorted (commingled) cans and bottles?
- What contamination level are they willing to accept?
- Are there any restrictions? (e.g., caps need to be removed, liquids emptied, etc.)
- Will they pick up the recyclables at your venue and will there be a hauling charge?
- What charges will be incurred? (e.g., tipping fees or processing fees)
- Will any revenue be paid for the single-serve bottles?
- Do they supply recycling collection containers? What kind and at what cost?
- Who are their markets?
- Can you have a tour of the facility?
- Can they provide data on how much PET and other materials they recycle?

Whether you receive payment for recyclables or pay to have them collected depends on how the materials are processed, the quantity, and the current market value. The price received for smaller quantities of materials will likely be less, as the hauler and processor have additional costs and profit margins to factor into the price you are quoted. Markets are affected by numerous factors and they vary throughout the country.

Bottle bills and single-serve markets

Some areas have laws that specify deposits at the time of purchase and establish bring back requirements to obtain redemption values.

Most bottle bills affect only carbonated beverage containers, but some laws are more inclusive. In most cases, bottle bills do not allow for “bulk redemption” – which means that the only way to get deposits back is by returning individual containers through designated retailers or depots.

If bulk redemption is allowed, however, it may mean that you can get a significantly higher price for your single-serve containers. Be sure to investigate the requirements as you set up your recycling program.

Things to know if you want to sell plastic containers to reclaimers or end-users

- Require plastic bottles to be sorted and baled to their specifications.
- Usually require truckload quantities to purchase (20 tons).
- Will negotiate transportation arrangements and payment.
- Selling to them requires baling equipment and substantial storage space for large volumes.

Collecting

STEP FOUR: COLLECTING, HANDLING & PROCESSING SINGLE-SERVE PET BOTTLES

Key questions:

- What is your collection strategy?
- How will you handle the bottles?
- Is pre-market preparation necessary or desirable?
- What other equipment and labor do you need?
- How many recycling bins/receptacles do I need for my event?

Collection strategies

Your collection strategy will depend on the type of event or venue, the amount of single-serve bottles available for recycling, your initial resources, and the requirements of your market. Your collection methods need to be easy for the public to use, easy to service or implement by collection personnel, and able to deliver the expected material to market, free of contaminants.

Recycling collection bins of various types remain the fundamental collection tool for recycling, providing a program identity as well as a method. However, bins may be supplemented with other efforts to recover bottles. In some cases, bins may not be used at all.

Using recycling bins

For events such as fairs and festivals, recycling bins are an obvious choice. They can be placed next to trash cans for attendees to use as they walk the grounds. Combining recycling bins with one or more trash cans will reinforce the collection message as well as improve the aesthetics of the refuse collection system.

There are many functional and attractive recycling bins on the market. Choosing the correct bins for your specific needs is important. In general, bins need to be visually distinct from trash cans, appropriately sized and durable enough to handle the demands of your event environment.

Using bins with other methods

Recycling bins at fairs, festivals and similar events have many benefits, but also significant limitations. The positive aspects include providing program identity and avid recyclers with a tool to make them feel like the event planners are “doing the right thing.” Over the long run, the presence of recycling bins at events and venues may change wasteful behavior.

Bins alone often collect a small amount of recyclables at venues and events compared to other recovery methods, according to NAPCOR research and experience. Recent trials at NASCAR races have revealed that even large, well-placed and attractive recycling bins collect comparatively small volumes.

STEP FOUR: COLLECTING, HANDLING & PROCESSING SINGLE-SERVE PET BOTTLES

A complementary method used by some recycling project managers is a “pass the bag” program, where bags for recyclables are passed into the stands during a break in the action, such as the seventh-inning stretch or halftime. An alternate version asks fans to pass their recyclables to bag holders in the central aisles. Often this activity is promoted by announcements on the public address system and done by a local charity or Scouts organization. Unfortunately, this good concept does not always work well, because fans often don’t pay attention and assume that the bag is for trash. Once trash has been passed down the row to the bag holder in the aisle, it is very unpopular to have it passed back, so the recycling bags tend to be heavily contaminated by trash.

For events that take place in stadiums or similar venues, such as ball or motor sports, bins can be combined with a post-event pick of the entire stadium to recover recyclables that fans leave at their seats. Supplementary picks can employ clean-up workers who pick recyclables from the ground litter separately from trash. A large volume of material can be recovered from these picks.

Recycling without using bins

For stadiums that are very large and have huge crowds, bins are often not practical at all. The ability of recycling program managers to successfully educate the fans and monitor recycling bins is limited, often resulting in bins with heavy contamination that render the material non-recyclable.

The “culture” of certain events allows fans to leave their trash at their seats, with the expectation that it will be cleaned up. For these events, recycling bins capture very little of the available material, simply because people who are not in the habit of using trash cans are highly unlikely to use recycling bins, even if they are avid recyclers at home. In these situations, post-game picks alone, if properly planned and managed, have been proven to recover a significant amount of recyclables with very little, if any, added labor cost. Stadium picks can typically recover 90% of the single-serve bottles sold or generated at the venue.

Getting the most from your recycling bins

- Choose the appropriate bins for your event. Consider indoor or outdoor use; moderate or heavy crowds; aesthetics or requirements of the venue.
- Ideally, place one recycling bin or receptacle next to each trash container. If resources are limited, determine from a waste audit or by talking to cleaning/custodial staff which trash containers receive the most volume of trash and the highest percentage of plastic bottles. Concentrate your recycling bins in areas adjacent to the high use trash bins.
- Make recycling bins easy to identify and use properly.
 - + Use concise, easy-to-understand signs and labels both on and near the recycling bins. Be sure your collection message is clear. Images of bottles will reinforce the message.
 - + Use clear bags for collecting recyclables inside the bins.
 - + Put your recycling message near the opening of the container.

STEP FOUR: COLLECTING, HANDLING & PROCESSING SINGLE-SERVE PET BOTTLES

- Bins should be visually distinctive from trash receptacles.
 - + Recycling bins should have openings that are no larger than 4" in diameter to accommodate beverage containers and discourage trash disposal in them.
 - + People normally consume their beverages and dispose of the containers away from the place where they bought them, so plan your recycling locations accordingly.
- Service the recycling bins consistently as they fill up
 - + Check the recycling bins periodically for contamination. If they start to overflow, they are more likely to be used as trash receptacles.
 - + Station volunteers or others near the bins to instruct the public about proper usage during busy times. While this is not always possible or affordable, the educational value is high.
- Make certain to consider handling and processing procedures as well as markets to determine which system will work best at your venue.
 - + Even a source-separated system may need additional sorting, and a commingled system may increase recovery of recyclables.
 - + Cups create a high risk for contamination from other plastic types – such as polyvinylchloride (PVC #3) or polystyrene (PS #6). Cup colors, anti-stick coatings, and leftover drinks can also contaminate recyclables. Even #1-coded PET cups are usually not recyclable in PET bottle recycling programs.

Getting the most from post-event picks

The work is typically done by the cleaning crew who may be venue employees, outside contractors, or even sub contractors. In some cases volunteers or a community group may be used to conduct a separate pick for PET bottles. It is very important to have strong support of the recycling program at all levels of management and throughout the chain of command.

Most picks are modifications of the clean-up, and do not require unusual effort from the crew or its supervisors. However, it is still something different than their usual routine, so be persuasive and make a good case, supported by facts and management endorsement.

- Organizing the post-event pick crew
 - + The crew is split into two groups. The first group, the recycling crew, is equipped with different plastic bags, usually clear and perhaps tinted blue or green, to differentiate them from trash bags. The second group, the trash crew, uses the familiar trash bags.
 - + The recycling crew gets a 15- to 30-minute head start. They move through the seats in their usual manner, but pick up ONLY recyclables - PET bottles and, if desired, aluminum cans. The trash crew follows, picking up all the remaining trash.
 - + As the recycling crew fills their bags, they leave them in the aisles. A supervisor or other laborer collects the recycling bags and keeps them separate from the trash bags that also pile up.
 - + When the recycling crew is finished, they immediately pick up trash bags that have been left for them, and revert to picking up trash as they "bounce back " to the trash crew.
 - + Usually, one person can manage two seating rows, recovering containers from the row they are in and the one above them. The full bag handler should also monitor the progress of the crews and keep them supplied with bags, to avoid delays.

Recycling Bin Type	Advantages	Disadvantages	Applicable Locations	Dimensions/ Capacity/Features
Narrow plastic opaque bin (e.g., Rubbermaid Slim-Jim)	Restricted opening; readily available; works well in corridors, corners	Limited capacity; non-distinct design	Indoor use, schools, offices & commercial or institutional setting	
Open rack with hanging bag (e.g., Re-sourceful Bag and Tag X-Stream Bin, Link-A-Bag)	Visible clear bags, easy to set-up and service; restricted opening; minimal space required for storage	Less durable than solid bins, can be knocked over or blown over if not anchored	Indoor and outdoor use, especially festivals and special events	40" x 24" x 18" Bag locks securely over frame
Corrugated plastic opaque bin (e.g., Hex Cycle Bin Intermarket Technology)	Lightweight, easy to transport; multiple colors, restricted opening and hinged flap	Indoor use OK with liner; temporary outdoor event use if anchored or weighted	Indoor use or outdoor use	40" x 17" x 17" Can be ordered with custom lithographed graphics on bin surface
Corrugated plastic opaque large event bin	Lightweight, easy to transport; height, size of bin makes it stand out above a crowd; very large capacity	Large size may require bin anchoring in windy conditions; no liner, liquid seepage may occur	Outdoor use	70" x 37" x 37" Can be ordered with custom lithographed graphics and colors
Bottle-shaped opaque bin (e.g., NSDA/Paul Flum bottle bin)	Unique, distinctive shape; restricted openings with rubber gasket	Bins do not nest for shipping or storage; capacity is somewhat lessened by location of hinged opening	Indoor use or outdoor use	35-gallon capacity; Coca-Cola and Pepsi beverage bottlers can obtain at lower price
Gable top opaque bin (e.g., Iowa Rotorcast Plastic recycling bin)	Very durable; gable top prevents use for trash placement, restricted opening.	Bins/tops do not nest for shipping/storage	Indoor use or outdoor use	43" x 22" x 22" 65-gallon capacity
Toters	Available from a variety of vendors; wheels	Used for trash cans in many applications, which may lead to higher percentage of contamination	Indoor use or outdoor use	Various sizes and shapes; common sizes are 65- or 90-gallon
Syrup barrels	Low/no cost	Similar in appearance to trash bins, which may lead to higher percentage of contamination	Outdoor use	
Corrugated cardboard bins	Low cost	Deteriorate in wet weather, can be easily blown or knocked over	Indoor use or temporary outdoor use	

"This is not a complete list of recycling bin manufactures or models, but rather a representative sample of bins. Recycling bins can be identified through search engine research on the internet or through solid waste publications. NAPCOR's web site (www.napcor.com) has a page with additional information on selected recycling bins and links to manufacturer's web sites."

STEP FOUR: COLLECTING, HANDLING & PROCESSING SINGLE-SERVE PET BOTTLES

When organized properly, a post-event pick can recover significant numbers of PET bottles for recycling with no increase in clean-up costs.

Consider:

- It's the same number of workers
- The same amount of trash
- The same number of bags (some in different colors)
- The same amount of time, if organized efficiently

Collection logistics

Efficiency is the key to a cost-effective recycling program. Minimizing the handling of the material and integrating the collection of single-serve into the current solid waste or recycling collection system will help reduce program costs.

Tools for improving collection logistics

- Use clear plastic bags as liners for recycling bins. Clear bags reduce the need for frequent cleaning of bins, allow for identification and removal of contaminants, and keep bin contents visible and easy to identify. Bags should be of sufficient size to reach the bottom of recycling bin and allow bag "overhang" to fit over the rim of the bin.
- Use clear bags or opaque bags of a different color than the trash bags for post-event picks. Putting garbage in opaque black bags makes it visibly distinct from recyclables.
- Make sure the crew has access to pickup vehicles with separate compartments or trailers for garbage and recyclables, tailored to your program. Modified flatbed trucks, trailers, or golf carts work well for collecting recyclables. Some programs have been able to work with their beverage vendors for transportation assistance.

Storing recyclables

Whether a recycling service provider picks up your collected recyclables or you transport them to a facility, your program will incur pick-up or transportation costs. Stockpiling recyclables can reduce the frequency of hauling or pick-up and minimize costs, but it requires storage containers or facilities.

Tools for storing recyclables

- Store collected containers on-site to limit how often the materials need to be transported to the processing facility. Identify a central location for each building or area, for storage and inspection of recyclables.
- Bulk storage containers are available in various sizes and prices.
- If your facility has limited space for storage containers, consider storing recyclables in bags at a loading dock or creating a fenced-in "corral" for bagged bottles.
- Investigate any requirements due to security, health regulations, or fire codes.
- Distinctively mark temporary storage units as designated for recyclables only. This will help avoid others mistaking the storage unit for a trash dumpster or a waste hauler inadvertently pulling the unit for disposal rather than recycling.

STEP FOUR: COLLECTING, HANDLING & PROCESSING SINGLE-SERVE PET BOTTLES

Preparing containers for recycling service providers

Your recycling service provider will handle and process loose, commingled recyclables or source-separated single-serve bottles for sale to end markets. Facilities that collect single-serve and use recycling service providers as markets shouldn't need to do much on-site handling or processing. For markets with experience with PET bottles, such as full-service material recovery facilities (MRFs), options may be broader than for markets such as paper or scrap dealers that have limited PET bottle experience. In general, your goal should be to provide material that meets their specifications in order to develop a relationship with the processor. It may be beneficial, but optional, to do some material preparation if resources allow – for example, removing the bottles from the plastic collection bags may reduce processing fees or expand your choice of market outlets.

Recycling service providers may or may not charge for their services – or they may provide payment for the recyclables – depending on market pricing, the quantity and quality of PET bottles generated, and handling and marketing agreements.

Tools for working with recycling service providers

- Work with your markets to organize a collection program that limits the amount of handling you are required to do, while still providing a high recovery rate and perhaps a payment or rebate.
- If possible, shop around to find a market that will accept the materials with no on-site prior preparation or sorting.
- Consider delivering single-serve directly to the market. Some markets will negotiate better terms for single-serve if delivered.
- If you will have a consistent supply, you may be able to negotiate a better deal, such as free pick-up of materials or credits.
- Be aware of “contamination” fees. If the loads contain more than a set amount of contaminants, you may be charged. The type of contamination may also be a factor. Bottles contaminated with a few cups, napkins or other containers are less problematic than when the contaminants are food waste, diapers or broken glass. Periodic inspections can help avoid charges.
- If you need to sort materials before the recycling service provider will accept it, consider volunteer labor or low-tech sorting solutions.
- Sorting can be done in different ways, using either “negative” or “positive” sorts. A negative sort involves removing unwanted items (such as cups) from a mix of materials, while a positive sort entails selecting specific materials (such as single-serve bottles). A processing system may involve both types of sorting.

Commingled vs. source-separated recycling

Commingled is a collection method in which more than one type of material is collected in a single bin or during the pick.

- Commingled systems include:
 - + All beverage containers (aluminum, plastic)
 - + Plastic bottles (#1 and #2)
 - + Glass, plastic and aluminum containers

Research has shown that contamination rates are lower and recovery rates are higher in commingled recycling streams. However, commingled recyclables may require sorting after collection.

STEP FOUR: COLLECTING, HANDLING & PROCESSING SINGLE-SERVE PET BOTTLES

Source-separated recyclables are collected in bins labeled specifically for each type of material (e.g., “#1 PET Plastic Bottles Only”). Generally, even in locations where the public supports recycling, source-separated systems often require some sorting after collection to remove contaminants. If your market requires separated material, it may not be cost effective to collect commingled and then be forced to sort material on-site.

Educating

STEP FIVE: EDUCATING & TRAINING STAFF

Key questions:

- What methods will you use to educate and train staff in your recycling program?
- What will your training consist of?

Experience shows that recycling is easier, and problems are minimized, when proper education and training are provided to the recycling or cleaning staff. Proper training helps maximize the amount of single-serve recovered and minimizes contamination. The goal of training is to make sure custodial staff or volunteers know where to put materials to avoid contamination or inadvertent disposal of recyclables.

Tools for staff education & training

- Involve staff members in the planning process. Solicit their input on where to place bins, what signs to use, and how to collect recyclables most efficiently. Involvement helps employees take ownership of the program and gives them a stake in making it a success.
- Ongoing staff training sessions and orientations for new staff should include discussion of the recycling program.
- Training should be as specific as possible and include clear examples of what to do and what not to do when collecting and handling recyclables. Use examples of the types of beverage bottles that will be collected in the recycling program.
- Many of the people who work custodial or cleaning jobs often do not speak English or speak it as a second language. You may need a translator for training or supervision. Training materials and signs may need to be printed in several languages.
- Complement your written policies, manuals, and instructional signs with hands-on training.
- Prepare “recycling report cards” for buildings or locations to provide feedback on success and stimulate healthy competition to increase recycling efforts.

Promoting

STEP SIX: PROMOTING THE PROGRAM

Key questions:

- How will you publicize the program?
- How will you educate facility users?

Simple signage that includes visuals and consistent color-coding of containers are key elements of successful programs that educate users and create lasting behavior change.

Tools for promotion

- Publicize efforts on event web site
- Use various media, such as public service announcements, pins, posters, banners and T-shirts to promote the recycling program.
- Include recycling information in press releases, event flyers, facility maintenance bulletins, and all vendor-related publications.
- Have vendors, ticket takers and admission personnel wear pins or stickers that publicize the recycling program.
- Beverage companies can often incorporate a recycling message into their existing marketing and advertising budgets for your event.
- Polls, focus groups, or other methods can provide information about the attitudes and behaviors of facility users. This information can help you tailor effective messages for educating users and promoting recycling.
- For some types of venues and events, such as campgrounds, music festivals and minor league sports facilities, it may be appropriate to evaluate methods to reward attendees for recycling containers. For example, at minor or amateur league sports facilities, incentives such as drawings for prizes or low cost giveaways can be rewarded to youth that bring empty beverage bottles to designated collection sites. Similarly, attendees at music festivals can be rewarded with chances to enter drawings for prizes or receive themed items for bringing bags of recyclable containers to manned “redemption” centers. This can be a significant incentive to minimize littering of grounds and to reduce cleanup costs.

Messages

Certain educational messages are crucial to maximizing recovery and minimizing contamination:

- Recycle single-serve plastic beverage bottles (or commingled bottles and cans) only, no cups.
- Do not put any plastic products besides bottles in the recycling bins.
- Do not put food or any type of trash in the recycling bins.
- Empty the bottle (finish the beverage) and discard the cap before recycling.

Minimizing the number of bottles that still contain liquid reduces the weight of full bags, potential spills and contamination.

Monitoring

STEP SEVEN: MONITORING & EVALUATING THE PROGRAM

Key questions:

- What are the indicators of the program's success?
- How will you monitor and evaluate the program?
- How often will you monitor and evaluate?

When starting a recycling program, defining a system for monitoring and evaluation early in the process will help determine its strengths and weaknesses. Recycling bottles removes them from the waste stream and reduces the volume and weight of trash disposed – a sizeable benefit that accurate measurements and assumptions can help quantify.

Proven high levels of recovery can help maintain strong support from top management, markets, and corporate vendors.

Unfortunately, many strong recycling programs are weak in the area of monitoring and evaluation. The following tools can foster improvement in this area:

- Keep accurate volume and weight records.

Try to determine this information as close to the point of generation as possible. For example, while it may not be practical to weigh bags in the field at a music festival, it is certainly possible to determine an average PET bag weight and then count the bags. If your material travels to a processing center in a dedicated truck, investigate the possibility of an independent scale weight.

- Calculate diversion rates

A diversion rate indicates what percentage of material, by weight, is diverted from the waste stream. It is calculated using the following formula:

$$\text{DIVERSION RATE} = \text{AMOUNT RECYCLED} / (\text{AMOUNT RECYCLED} + \text{AMOUNT DISPOSED})$$

In order to accurately account for diversion, you must obtain the disposal weight from the trash hauler. Diversion rates are only marginally useful for single-serve recycling, since the weight of the single-serve bottles are usually minimal compared to the weight of other trash. This rate is most useful when volumes instead of weight are used, but obtaining accurate volume figures is difficult. Estimating volume is acceptable, as long as you have a justifiable base for the estimation, but make sure to account for trash compaction.

STEP SEVEN: MONITORING & EVALUATING THE PROGRAM

- Calculate recovery rates

Recovery rates compare the amount of single-serve recycled with the amount consumed on-site. In many cases, the amount consumed will be the same as the amount sold. Sales figures are relatively easy to obtain provided the beverage suppliers are partners in the recycling effort. You can use the chart on page 5 to calculate both volume and weight from case sales. The equation is:

$$\text{RECOVERY RATE} = \text{AMOUNT RECOVERED} / \text{AMOUNT SOLD}$$

If the public is allowed to bring containers into the venue or event, calculate a figure to account for those containers as well. They will impact both the quantity recycled and the quantity disposed.

Financial analysis

To sustain the program over time, single-serve recycling should achieve the lowest possible cost per ton or cubic yard of material recovered. Success depends on both maximizing the amount recovered and minimizing the costs to do so. Implementing a recycling program without maximizing its capacity may result in a costly, ineffective program that won't achieve the desired results over the long run.

To measure a recycling program's costs in a comparable manner, the program manager must have a clear understanding of the solid waste collection and disposal system at the venue. Ongoing accurate measurement of both the weight and volume of single-serve bottles recycled represents the space saved in the trash container and the weight diverted from the landfill. Both diverted volume and weight have dollar values that accrue positively to the recycling program. The program manager must also consider the benefits and savings associated with volunteers, in-kind services, publicity, community relations benefits, donations, and other less tangible contributions.

Sharing the costs of collection with the solid waste management system will reduce recycling costs.

Conducting a waste audit before initiating the recycling program will provide benchmark figures for comparison. Frequent evaluation of costs and benefits can provide information to troubleshoot problems, improve recycling logistics, increase recovery, and reduce costs.

Checklist

- ___ Organize a planning committee (page 5)
- ___ Survey existing waste management system (page 6)
 - Cleaning contractor
 - Waste collection/hauling contractor
 - Any public entities involved
 - Tons of waste per event
 - Description of any current recycling
 - Quantity/tonnage of materials currently recycled
- ___ Identify beverage suppliers and case sales data for beverages (soft drinks, water, beer) packaged in PET bottles (page 6)
- ___ Estimate quantity of single-serve bottles available for recycling (page 6)
- ___ Identify and locate potential markets for single-serve bottles (page 10)
- ___ Determine collection method (page 12)
 - Bins
 - Picks
 - Bags
 - Determine commingled vs. separated
- ___ Decide the best storage option for your venue (page 16)
- ___ Understand the requirements of your recycling service provider (page 17)
- ___ Develop plan for training staff and labor (page 18)
- ___ Develop plan for promotion and education for recycling (page 19)
- ___ Develop system for data-gathering, monitoring and evaluation (page 20)
- ___ Identify formula for costs and benefits calculation (page 21)

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