Venue Recycling in the U.S.A.

A Report on the Potential Recovery of Beverage Containers at Venues and Events

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1. OVERVIEW

A) Project Background

In 1995, the Coca-Cola Company introduced a 20-ounce contoured PET bottle into the marketplace.[1] The new container was so successful that it changed the market dynamics for beverage sales and packaging. Driven by both consumer preference and logistics, fountain serve cups – the mainstay of carbonated beverage service at stadiums, arenas and events all over the country – began to be replaced by these new single-serve containers.

In 1996, the National Association for PET Container Resources (NAPCOR) began working with various stakeholders to collect the bottles sold at these events for recycling. The two initial efforts were at Wrigley Field in Chicago and Fulton County Stadium in Georgia. While these efforts succeeded to various degrees, the stadiums just didn't have the critical mass of bottles necessary for the economic sustainability of the programs.

This situation changed dramatically with the introduction of the PET beer bottle in 1999 and its subsequent adoption by stadium and event vendors throughout the country by 2000. With these bottles came the clamor to get them recycled – from season ticket holders and other fans, environmentalists, and recycling officials. The subsequent introduction and rapid growth of single-serve water bottles only fueled this impetus to recycle.

As a result, NAPCOR embarked on a nationwide effort to determine the best ways to recycle these bottles and put sustainable recycling programs in place. This effort culminated in the implementation of a wide range of programs at over forty locations including professional baseball and football stadiums, NASCAR tracks, civic centers, hockey arenas, festivals, concerts, golf tournaments, road races, and festivals, most of which are still in place today. Unfortunately, by 2003 the resources necessary to continue these organizing and training initiatives were no longer available through NAPCOR.

At about the same time, the Association of Post Consumer Plastic Recyclers (APR), whose members include all of the PET reclaimers in the United States, began to look at ways to get more PET bottles collected to alleviate their chronic undersupply.[2] With the understanding that they could have little impact on publicly initiated programs, APR was intrigued by the NAPCOR work that demonstrated that substantial volumes of bottles could be recovered from venues and events. Accordingly, the APR provided the impetus to both NAPCOR and the U.S. EPA to complete this report. A special acknowledgement must be made to APR's Vice-Chairman, Steve Navedo, without whose tenacity this project would not have come to fruition.

[1] PET is "polyethylene terephthalate." Bottles made from PET feature the "#1" resin identification code.
[2] APR PET reclaimer member companies purchase post consumer bottles and produce a clean flake suitable for remanufacture.

B) Project Introduction

As the popularity of single-serve PET bottles for soft drinks, water, and other beverages continued to increase during the mid- to late-1990s, concerns began to arise that these containers were not being captured for recycling in municipal curbside and drop-off programs, the mainstay of residential recycling recovery. Those in the recycling industry suspected that the simultaneous flattening of the residential recycling rate curve was due in some part to the increased portability of these containers, and that purchase and consumption was on-the-go instead of at home in close proximity to the curbside recycling bins. Conversations with venue managers revealed that single-serve beverage bottles were replacing sales of fountain beverages and, in many instances, were also driving incremental beverage sales due to their ease of vending. The fans at sports events liked the bottles because they didn't spill and could be carried in a jacket pocket when hands were otherwise occupied with food trays. The central problem remained that recycling infrastructure was essentially non-existent in the places where the bottles were most popular – sports venues, multi-purpose venues, and special events.

When this project contract was awarded, most facility managers viewed the implementation of on-site recycling programs as cost-prohibitive and logistically problematic. Since then, public concerns about global warming and climate change, along with business and industry's interest in sustainability issues, have re-focused attention on recycling efforts, particularly in highly visible contexts such as large stadiums and events. While this increased focus has certainly made the subject matter of this report more timely, it has also generated new program activity and a degree of flux, making it more challenging to obtain an accurate picture of the current status of venue recycling. These changes are not only reflected in the increase in actual programs, but in the evolution of expectations for "best practices" as more options for waste stream recovery become available. While this report focuses on beverage container recycling, some venue and event recycling programs are now encompassing food waste, cooking oil, mixed metals and paper. Conversely, however, many sites still have no recovery efforts at all, not even for cardboard, which should be taken into account when reviewing and using this document.

C) Target Audience

Much of the information that follows targets public recycling officials. While there have been cases where the management of a particular venue instigated a recycling program, it has been NAPCOR's experience that most programs are initiated by local recycling coordinators, trade associations, environmental groups, and other stakeholders. With states such as Washington and California now mandating venue recycling plans or programs, local officials are more likely to be called on to provide the expertise and level of programmatic detail outlined in this report.

With this in mind, we preface this report by acknowledging the importance of "keeping it simple," but counter that those involved in recycling initiatives understand that the key to establishing a sustainable program lies in the details. For this reason, we've chosen as comprehensive and specific an approach as possible.

2. OBJECTIVES & KEY TASKS OVERVIEW

The objectives of this project and the tasks necessary to fulfill them fall into three main categories:

a) Identify and characterize venues and events, and capture basic data.
b) Estimate the total volume of containers potentially available for recycling at these venues and events.
c) Identify successful models for recycling based on venue category, as well as categories for which there are no successful (or only moderately successful) models currently in use or in trial.

In short, we began by defining and categorizing the various venues and events where beverage containers are sold in the United States for the purpose of calculating how many beverage containers are consumed at these locations and how best to recycle them.

A) Identify & Characterize Venues and Events / Data Capture

In order to begin capturing and analyzing data, the Project Team first had to define and categorize the venue and event universe. We defined it fairly broadly and included a wide array of publicly attended venues and events in the scope of the Project, only imposing limitations for the purposes of defining the body of work. We've developed seven separate event and venue categories based on shared characteristics and criteria that we felt were most relevant to the successful recycling models that are further detailed in *Section 5* of this Report. The specifics of the event and venue types captured and how they are categorized in this Report are further detailed in *Section 3*.

This phase of the project also included basic data capture, which yielded an estimate of the total number and type of major venues and events in the United States. In addition, this portion of the project:

- Provided key data, a tool used to estimate the total amount of beverage containers available for recycling (see Section 2b below);

- Helped us to refine the venue and event categories thus better developing models, as discussed below.

Specifically, the project researcher(s) systematically gathered venue data pertinent to beverage container recycling. The data is comprised of: (1) identification and categorization of facility location, (2) types and frequency of events, and (3) capacity and attendance statistics. This information was obtained via the internet and telephone interviews with agencies or organizations related to specific venue types. Additional information was obtained through relevant trade associations, public market reports, almanacs and beverage suppliers. All information gathered was entered into a database constructed specifically for this project.

Over the course of this project, the Project Team recognized that not all venue and event attendance and annual schedule information is available, and thus we acknowledge that we do not have complete data for each venue in each category. Likewise, we do not profess to have captured all of the many free-standing outdoor events that occur year-round in fields, parks and on city streets, some supported by strong marketing infrastructure and outreach and others relying on local custom and word-of-mouth. Nonetheless, we have gathered a great deal of data and are confident that we have captured enough of the venue and event universe to accurately – if not conservatively – estimate the total volume of materials generated as described below.

B) Estimate the Volume of Containers Available for Recycling

During this phase, the Project Team estimated the total amount of containers available for recycling using data provided by beverage companies, venue volume calculation models (by Category), and the approximation of the U.S. venue universe. To achieve this goal, the Team relied partially on Stakeholder representatives who assisted with provision of baseline data to define the scope of the issue. Equally important were sales numbers for all beverages sold in all types of containers from beverage suppliers or venue managers. Where applicable, information about beverages that are brought into venues by visitors from outside (for example, at NASCAR races) was also sought and used to figure total beverage container generation in addition to inside-venue sales.

Once the preliminary analysis of this data was complete, further calculations determined total tonnages of these beverage containers and their potential impact on waste management and disposal costs for venues and local jurisdictions. These calculations also allowed the Project Team to assess the environmental impacts of discarding and not recycling these containers, from landfill space to energy consumption (Section 4c below). All types of beverage containers used at the venues were included.

C) Identify Venue Categories that have Model, Sustainable Recycling Programs in Place – and Those That Don't.

While the Project Team members laid the groundwork for characterizing the venue universe and the potential material volumes generated, Team members also identified facilities or events with functioning recycling programs. A follow-up analysis of their performance determined whether their programs might serve as successful recycling models. Venues with recycling programs in place were identified through NAPCOR's database of previous venue recycling efforts, the recycling trade press, the internet, interviews with local and state agency representatives, the U.S. EPA's experience, and other reports provided by the Stakeholders.

The Project Team also attempted to define criteria for program "success" in this context. Preliminary indicators of success were identified as the following:

- Significant crowd size at the event or facility (venue capacity of at least 2,500; attendance of 5,000 or more at a free-standing event);
- Significant per-capita beverage consumption in PET bottles per person and/or aluminum cans that could be documented;
- Documented or estimated costs and/or savings, per event, for recycling in the context of waste collection and disposal;
- Support from all stakeholders along with a willingness to try new techniques;
- Documentation of material recovery with evidence of a majority of containers recovered for recycling;
- Scrap value generated that supports program operations, at least partially;
- Programs that have been operational for at least three seasons/events/years, depending on the type of venue or event.

Evaluating these recycling programs involved reviewing what was known about the event or facility, conducting interviews to gather data, and analyzing the information to determine if recycling programs identified were actually cost-effective and sustainable.

In the process of collecting and evaluating this information, we found that some of the criteria initially used to define "success" required re-evaluation. For example, with some outstanding exceptions, such as the Seattle Mariners, few facilities or events knew the costs of their recycling program. They did know that the costs of the program were not high enough to cause concern. The Project Team remains concerned about the long-term sustainability of programs that do not track their cost data, as well as the ability of either program managers or local government recycling coordinators to use these programs as models to "spread the word" and encourage additional programs. However, as the analysis progressed, the list of criteria defining success was reduced to the following three factors:

- Support from all stakeholders, along with a willingness to try new techniques;
- Documentation of material recovery with evidence of a majority of containers recovered for recycling; and
- Basic knowledge of the range of costs and or savings, per event, for recycling in the context of overall waste collection and disposal costs, and acceptance of these costs.

This information, as gathered from program managers at events and venues with successful recycling programs in pace, is used extensively to develop the models described in *Section 5*; relevant case studies illustrate each model and the criteria for success.

3. IDENTIFY & CHARACTERIZE VENUES AND EVENTS

The categorization of venues and events varies somewhat depending on context. New state laws in California and Washington define venues in the context of compliance with new recycling requirements. These are summarized below since they may serve as models for future state legislation. In addition, as these laws are implemented over time, state governments will likely chronicle successful models within the contexts of their respective laws.

Also requiring recycling at events, although not written to directly address event or venue recycling, are North Carolina's recently enacted House Bill 267 and three older, more general mandatory recycling or waste diversion laws in Connecticut, Wisconsin and Minnesota.

For purposes of this report, however, we categorized venues/events based on characteristics most likely to be relevant to our experience with successful recycling models; we developed our database and data capture fields to reflect this.

A) Venue/Event Categories as Defined by Current State Recycling Laws[3]

Although Wisconsin, Minnesota and Connecticut have recycling laws that are interpreted to encompass venues and events, only California and Washington currently have legislation that specifically targets recycling at venues and events. California's AB2176, was signed into law in 2004. Washington's law, HB2056, became effective on July 22, 2007. North Carolina's legislation, ratified as House Bill 267, requires holders of certain Alcoholic Beverage Control (ABC) permits to separate, store and recycle all recyclable beverage containers. The law does not apply to temporary alcoholic beverage permit holders, such as music festivals, but does apply to permanent venues such as sports stadiums. The bill became effective Jan. 1, 2008.

The approaches to defining relevant venues and events differ from state to state and are summarized below:

1. Definitions Under State Law

California's AB2176 applies to both "large events" and "large venues." Large events are defined as events that:

a) Serve an average of more than 2,000 individuals per day of operation – including attendees, participants, staff and volunteers; and

[3] Information on California's venue recycling legislation can be found at: http://www.ciwmb.ca.gov/Venues/Mandates/Default.htm. The complete text of Washington state's law can be found at: http://www.leg.wa.gov/pub/billinfo/2007-08/Pdf/Bills/House%20Passed%20Legislature/2056-S.PL.pdf and North Carolina's House bill 267 at http://www.ncga.state.nc.us/Sessions/2007/Bills/House/HTML/H267v4.html

b) Charge an admission fee or are run by a local agency.

AB2176 specifically includes public, non-profit and privately owned parks, parking lots, golf courses, municipal street systems when used for events such as marathons, and other open spaces when these spaces are hosting events as described. These include events such as flea markets and sports. If there is no admission fee, the event is not included in this category, unless it is operated by a local agency. A Boy Scout Jamboree, for example, would not qualify since there is no local jurisdictional responsibility and no admission is charged.

Examples of large venues include airports, amphitheaters, amusement parks, arenas, aquariums, conference or civic centers, museums, halls, horse tracks, performing arts centers, racetracks, stadiums, theaters, zoos, and other public attraction facilities.

Washington's HB2056 covers two different categories of events/venues:

a) Official Gathering: an event where authorization to hold the event is approved, recognized or issued by a government, public body, or authority, including but not limited to fairs, musical concerts, athletic games, festivals, tournaments, or any other formal or ceremonial event, during which beverages are sold by a vendor or vendors in single-use aluminum, glass or plastic bottles or cans.

b) Sports Facility: an outdoor, recreational sports facility, including but not limited to athletic fields and ballparks where beverages are sold by a vendor or vendors in single-use aluminum, glass or plastic bottles or cans.

Recycling is required at these types of events and locations only if they are located in communities that have established curbside collection programs and where a recycling service is available to businesses. It is unclear as to whether a cost-based subscription recycling service qualifies as being "available," or if only local government provided business recycling services can be considered. While Washington's definition of "sports facility" currently includes only outdoor facilities, as implementation begins it may be argued that an "official gathering" may also apply to a sporting event at an indoor stadium, for example, since the definition of official gathering does include "athletic games."

While the definitions read differently, with the exception of the threshold size in the California bill, it appears that some of the same types of events would be covered by both laws. For example, a state fair would most likely be covered by both laws, except in Washington, the fair location would have to be in an area covered by both curbside and business recycling services. The size limit may prevent small ballparks, such as Little League parks, from being affected in California. An airport, stadium, or zoo, however, would be a "Large Venue" in California, but would not be included in Washington.

North Carolina's law applies to venues as an adjunct to its main targets: bars and restaurants. Since it does apply to all holders of ABC permits for sales of on-premises malt beverage, on-premises unfortified wine, on-premises fortified wine and mixed beverages, it

affects any facility, including stadiums and convention centers, as well airports and zoos if they hold permits.

In **Wisconsin**, venues and events are included in the general state requirement (Wisconsin Act 335, 1990) to recycle certain materials – glass, aluminum, plastic (#1 and #2), newspapers, corrugated, and office paper – and the accompanying landfill ban on these materials. **Minnesota**'s comprehensive waste reduction and recycling legislation, originally passed in 1989, is based on recommendations made by the Governor's Select Committee on Recycling (SCORE). It sets out recycling goals to be achieved from a list of recyclable materials and is also paired with landfill bans on these materials. Likewise, **Connecticut**'s 1991 Mandatory Recovery Regulation also requires recycling of certain materials.

None of these state laws were developed to specifically address venues and events and thus don't define them separately from the general scope of the laws. However, because they can be large material generators, event planners and facilities have been identified by state environmental agencies as worthy of dedicated education efforts.[4]

2. Responsible Entity

In California, the organizers or operators of large events and venues are the responsible entities. Local or regional solid waste agencies are required to report on the activities and progress of the top 10 percent of the large venues and events combined, within their jurisdiction, measured by waste generation.

In Washington, vendors of the beverages in single-use bottles and cans are required to provide recycling programs at all official gatherings and sports facilities. The facility managers or event coordinators may work with the vendors in setting up programs, but the requirement is not on them.

In North Carolina, the ABC permit holder is responsible for establishing the recycling program. Recyclable beverage containers are defined to include aluminum cans, plastic bottles and glass bottles. Steel food cans are not required to be recycled, but any steel cans containing "boutique" beverages would be covered by the law.

In Minnesota, counties are responsible for planning and managing waste disposal and recycling. They are also required to promote recycling and provide public education about recycling opportunities.

In Wisconsin, the municipalities are responsible for organizing and operating recycling programs. Since 1990, there have been mergers in 35 counties to form "Responsible Units" (RUs) under the law. Over 1,000 additional RUs are comprised of cities, villages, towns or combinations.

[4] Educational brochures for event recycling in Wisconsin and Connecticut can be found at: http://www.ct.gov/dep/lib/dep/reduce_reuse_recycle/brochures/special_event_recycling_brochure.pdf and http://www.dnr.state.wi.us/org/aw/wm/publications/recycle/PUBL-CE-281-2001.pdf

In Connecticut, both solid waste facilities and local municipalities bear responsibilities under the law. The owner/operator of solid waste facilities must submit an operations and management plan to the state Commissioner. A municipality must be part of an approved recycling plan development process and/or implement a plan approved by the Commissioner.

3. Required Actions to Develop Recycling Program

In California, the large venue and event organizers/operators must:

- Develop a waste reduction plan, goal and timeline;
- Implement the planned program;
- Report their progress annually to their local government agency; and
- Update the solid waste plan every two years.

The local government agencies are required to:

- Identify large venues and events;
- Provide waste diversion information with the permits they issue; and
- Report the progress of the top 10 percent waste generating venues/events combined to the California Integrated Waste Management Board (CIWMB) as part of their AB939 reports.

In Washington State, the vendors must provide a recycling program, defined as "provision of receptacles or reverse vending machines, and provisions to transport and recycle the collected materials." There are no requirements for local government agencies in the Washington law.

The only requirements for local government agencies in North Carolina apply to the provision of the law that specifies that the beverage containers required to be recycled under HB 267 are also banned from disposal in landfills. Presumably, publicly owned landfills would need to establish a mechanism to detect and prevent such disposal, but the law does not specify how they are to do this.

4. Monitoring and Reporting

In California, venues and events are required to report their results to the local government agency annually, within 30 days of the information being requested. The local agencies are then required to report to the CIWMB about compliance with the plan and the materials diverted from the top 10 percent of venues/events in terms of waste generation. However, since the venues and events are not required to report to the CIWMB directly, there is concern that some may not report.

To encourage compliance with the law and with the reporting requirements, the CIWMB is charged with assisting local governments by providing to them a model ordinance that they can adopt that includes provisions to impose direct local incentives and penalties on the

venues and events. The law gives local governments the authority to adopt these ordinances and thus locally regulate the venues and events.

The laws in Washington and in North Carolina contain no reporting requirement provisions.

In Minnesota, the Minnesota Pollution Control Agency (MPCA) provides Minnesota counties with financial and technical assistance and is responsible for approving county solid waste management plans.

In Wisconsin, the Wisconsin Department of Natural Resources (DNR) approves and monitors effective recycling programs, provides financial and technical assistance. The DNR shares responsibility for enforcement with local governments, and communities are responsible for having ordinances and for enforcing compliance. Event or facility owners are responsible for staffing and operating the recycling programs. While DNR emphasizes voluntary compliance through education and technical assistance, the department has the authority to issue citations to those who violate the law.

In Connecticut, municipal or regional recycling authorities or intermediate processing centers must keep records of the amount of solid waste recycling and submit information to the Commission each year.

B) Venue and Event Categories As Defined for this Project

The categorization of venues and events for this Venue Recycling Project is based on early NAPCOR work with a wide range of venue and event types and sizes. The categories, and resulting types and sizes of events/venues considered, seek to account for both fixed venue locations that host events, and events that are hosted in non-venue locations, which might best be defined as locations with no fixed boundaries. Such events include downtown music festivals and marathons, both of which can be seen as special, discrete events, but which take place on city rights-of-way that are temporarily closed to their normal use.

Some overlap exists within the organization of places into categories, but the overlap does not jeopardize completeness. For example, the Georgia World Congress Center in Atlanta is a venue that serves as the location for many discrete events, such as professional Supercross (motorcycle) races. The overall goal of the definitions and categories of events and venues was to establish a framework inclusive of a large number and variety of events and venues that are significant contributors to the beverage container waste stream, but not necessarily well-served by existing recycling models. At the same time, setting some limits on the inclusion of venues and events was necessary in order to keep the work of characterization and modeling manageable.

It is important to note that the NAPCOR categories exclude events at which beverages are sold primarily through retail and are only adjunct to the main function of that particular location or event. For example, airports and museums, both specifically included in the California definition, are excluded from NAPCOR's definitions. These are certainly large

areas of public congregation and regular waste generation, however these facilities (1) operate continuously; (2) function independently of beverage sales; and (3) perhaps most importantly, recycling models for these types of locations already exist. Adequate recycling services for fixed retail or similar locations can be purchased from waste haulers and other recycling service providers and in some areas are provided by local governments. By the same token we have excluded movie theaters and casinos.

On the other hand, some NAPCOR category exclusions are based on the fact that the event boundaries are too broad and waste sheds too extensive to develop and apply a workable model. Examples of these types of events include boat races and water skiing competitions where the primary location may be a marina, or the event may include several marinas and much of the audience may be on the water in their own boats. The waste shed is too spread out and the individual events too disparate to rely on one particular model for recycling. We have also excluded City, State and Federal Parks and Recreational Areas. While they may be sources of beverage containers for recycling, the Project Team felt that identifying responsible parties could be problematic, and dealing with regulations, specifically in the Federal arena, could be time-consuming with little result. It is felt that some of the events that are included in the definitions may take place in such facilities, and thus may be addressed indirectly.

NAPCOR's categories do include venues such as convention centers and civic auditoriums. It can be argued that these types of facilities also have access to working models for recycling, either on the open market or provided by government. However, it is also the case that many events staged in these types of facilities are stand-alone occurrences that are run almost completely independent of the management of the facility itself. Professional event organizers are often unaffiliated with the facility and sign contracts for use, i.e., specialized freight and exhibit companies gain access for event set-up and tear down; and the beverage vendor and catering company may or may not be closely affiliated with the facility itself. Food and beverage services procured for one event may be completely different than for the next, with the small retail food and beverage outlets within the facility contributing a minimal amount of recyclable waste compared to event-related activities. The Project Team believes that the existing recycling models may be inadequate for the challenges provided by these changeable venues and circumstances and, in some cases, may address the event rather than the facility.

NAPCOR has also excluded college and university venues and events, mostly because college and university recycling coordinators enjoy an active information-sharing network that provides instruction and peer-group experience to help establish recycling at athletic venues and the large variety scope of special events that occur at institutions of higher learning. Through CURC, the NRC's College and University Recycling Council, these recycling coordinators can take advantage of the following types of assistance:

- Every year the topic of venue and event recycling is addressed at the National Recycling Congress. In past years it has been included in the Agenda for the College/University Recycling Workshop held on the Sunday prior to the Congress. At the 2007 Congress, CURC participated in an educational session addressing Comprehensive Recycling Strategies for Special Events.

- CURC supports a recycling list serve, Recycl-L, that provides an information sharing resource open only to collegiate recycling coordinators.

Given the existence of these resources, the fact that campus events and venues may frequently piggy-back onto the regular campus recycling service, and the fact that hundreds of colleges and universities exist in the U.S. and all have unique programs and challenges, NAPCOR elected to omit these venues and events from its consideration for this project. It should be acknowledged, however, that several of the models created by this project may be adaptable to the university environment.

C) Project Venue and Event Categories

Table 1 below details the Categories one (1) through seven (7) as defined for this project.

Table 1 – Venues and Events by Category

Category Number	Venue or Event Category Description	Types of Facilities and Events Included in Each Category
1	**Outdoor Sports Stadiums**: large fixed-seat stadiums, arenas, and auto, horse, dog, bike racetracks.	Football, Soccer, Baseball, Track & Field, Tennis, Lacrosse, Auto and Horse Racing.
2	**Indoor Sports Arenas**: fixed seating stadiums; primarily sporting event oriented.	Basketball, Ice Hockey, Jai Alai and Tennis.
3	**Outdoor Sporting Events**: no fixed seating, seasonal with little fixed infrastructure.	Road Races, Marathons, Grand Prix, Beach Volleyball, Golf Tournaments, Ski Races, Bike Races, X-Games, Soap Box Derbies, Surfing.
4	**Specific Purpose Venues**: non-event based; open year-round or seasonally.	Zoos, Aquariums, Amusement, Theme and Water Parks, Fee-based Natural Attractions, Halls of Fame.
5	**Indoor Mixed Use Event and Conference Centers**: often includes both fixed seating and non-fixed conference, event, concert, and exhibit facilities, primarily non-sporting.	Conference and Trade Show Facilities, Civic Centers, Mixed-Use Urban Complexes (theater/stadium/conference space).
6	**Dedicated Use Venues**: geared mainly toward a specific function; primarily outdoor; fixed and non-fixed seating.	State Fairgrounds, Permanent Rodeo Grounds, Equestrian Centers, Amphitheaters.
7	**Outdoor Events**: no fixed facility or infrastructure; often occur annually.	Music, Art and Food Festivals, Parades, Hot Air Balloon Festivals, Motorcycle Rallies, Special Interest Gatherings (attendance of at least 5,000).

4. BEVERAGE CONTAINERS AVAILABLE FOR RECYLING

For the purposes of this report we have attempted to identify and quantify the containers used to vend and/or consume beverages within the various venue and event categories. Many factors made this a daunting task. In some cases, two containers are used for one sale. This is standard practice where glass bottles are used and the contents poured into cups at point of purchase, but can be true for aluminum cans and PET bottles as well. In addition to beverages sold on site, some venues and events allow patrons to bring in beverages purchased elsewhere. Also, while most venues have a primary vendor responsible for the sale of beverages where centralized sales data can be obtained, many have some smaller ancillary vendors in addition to the primary, and some have multiple individual vendors that often consider sales information to be proprietary.

Consumption data was gathered and compiled from a wide range of sources including venue and event operators, vendors, beverage companies, waste audits, recycling contractors, Anheuser Busch Recycling, and NAPCOR. This data conveyed regional and local differences in both the types of beverages consumed and how they were packaged. Weather also provided a variable for outdoor events. Very hot conditions, for example, led to additional bottled water sales while other beverages remained about the same. Nevertheless, we saw no practical way of reporting the data other than by averaging and even then some categories proved to be statistically challenging. Therefore, this information should be considered a guideline as to what might be consumed at a venue or event and be available for recycling. Finally, a significant amount of non-beverage containers is generated at these locations; containers used for food, spices, condiments, soaps, and other cleaning products. They are typically made from tin plated steel, PET and HDPE plastic. While these containers often pose some additional obstacles in terms of product residue, we recommend that programs utilizing a single stream marketing opportunity should explore capturing these materials as well.

A) Containers / Materials Commonly Found and Available for Recycling

PET Bottles

PET beverage bottles are found at virtually all locations and are used in various degrees to contain water, beer, carbonated soft drinks (CSD), tea, isotonic drinks, juice and juice drinks, and even milk. The point of purchase can be a patron's seat, refreshment stands, push-carts, bars, restaurants, VIP lounges, bottle troughs, hospitality tents, vending machines, or outside the venue (and brought in). Dominant beverage categories vary widely. Football stadiums in southern states can sell more bottled water than beer, whereas northern stadiums overwhelmingly sell more beer. CSD tend to be the dominant beverages at amusement parks. While not sold directly, PET liquor and, increasingly, wine bottles are generated at bars, restaurants, lounges, luxury boxes and hospitality areas.

Aluminum Cans

Aluminum cans are used for beer and to a lesser extent CSD at many locations, but often not in great quantities. In some cases, for example, stadium concessionaires may not sell anything in aluminum, while employee vending machines may. In most cases, beverages are poured from the can into a cup providing for easy and complete recovery of the container. In other instances, a cup is offered with the can, or the can is sold alone. Aside from vending machines, most cans originate from direct seat sales and, to a much smaller extent, luxury boxes. Some events like NASCAR races, outdoor concerts, and fairs allow patrons to bring in product in aluminum cans.

Glass Bottles

Surprisingly, the use of glass containers at venues and events has increased over the past years. Although using glass bottles in these locations was at one time not considered prudent for logistical and safety reasons, many venues are now offering beverages in glass, albeit under very controlled circumstances. With the exception of luxury boxes and hospitality tents, all beverages packaged in glass are poured into cups prior to being vended. Again this allows for efficient and complete recovery of the bottles at points of generation such as refreshment stands, bars, restaurants and VIP lounges. Glass liquor and wine bottles are also generated in the luxury boxes, bars, restaurants and VIP lounges. We did not find any venues or events that allowed patrons to bring glass containers inside.

Cups

Bottled beverages have become increasingly popular at venues, particularly in the case of still water. However, the majority of other beverages, whether originating from kegs, tanks, glass bottles, or aluminum cans, are sold are in paper or plastic cups. Paper cups used for either hot or cold beverages generally have a coating that renders them problematic in the recycling process. Plastic cups are made from a wide range of polymers including:

Abbreviation	Polymer	Resin ID #
PET	Polyethylene Terephthalate	1
HDPE	High Density Polyethylene	2
PVC	Polyvinyl Chloride	3
PP	Polypropylene	5
OPP	Oriented Polypropylene	5
EPS	Expanded Polystyrene (Foam)	6
HIPS	High Impact Polystyrene	6
OPS	Oriented Polystyrene	6
GPS	General Purpose Polystyrene	6
PLA	Polylactic Acid	7

Most of these polymers are incompatible with each other and not easily sorted, manually or otherwise. In fact, cups made from PET, PVC, OPP, OPS and PLA are virtually identical to each other and it's necessary to check the resin identification code on the bottom of each to determine their individual compositions. Often, many different types of cups are used within a

single venue, e.g. EPS for hot drinks, PET for beer, GPS for cocktails, HDPE for souvenirs, etc.

Markets for all of these materials are in various stages of development. Whether as a separate stream or mixed in with the bottles, if all the cups used at a venue are made from one material, the chances of effectively recycling the material are greatly improved. However, in many venues this may be difficult due to the variety of cups deemed suitable for the different types of beverage sold, further compounded by multiple vendors. Where this is the case, the recycling of cups is probably not practical, either as a separate stream or commingled with other recyclables.

B) Materials Volume and Usage by Category

Table 2 below provides a summary of materials used at each venue category. Where no data is shown, we did not find appreciable usage of the material in the relevant venue or event category.

Table 2: Total Beverage Container Use Analysis

			Bottles, cups, and cans shown in number of single-serve units.							
Venue or Event Category*	**Total # Venues or Events**	**Total Category Attendance** (in MM's)	**Average PET Bottle Use**	**Total PET Bottle Use** (in MM's)	**Average Cup Use**	**Total Cup Use** (in MM's)	**Average Aluminum Can Use**	**Total Aluminum Can Use** (in MM's)	**Average Glass Use**	**Total Glass Use** (in MM's)
1	723	263	1.72	452.36	1.0	263	0.422	110.99	0.04	10.520
2	61	141	0.9	126.9	1.0	141	0.08	11.28	0.2	28.200
3	385	35	1.3	44.45	1.05	36.75	0.48	16.80	0.004	0.140
4	605	305	0.84	256.2	0.96	292.8	0.03	9.15		0.000
5	380	89	0.7	62.3	0.92	81.88	0.26	23.14	0.055	4.895
6	211	122	1.1	134.2	1.0	122	0.28	34.16		0.000
7	1000	85	0.55	46.75	0.6	51	0.82	69.70		0.000
TOTAL	**3365**	**1040**		**1123.16**		**988.43**		**275.22**		**43.755**

* See Table 1 on page 16 for full Category descriptions.

C) Disposal Costs / Potential Environmental Impacts

As will be discussed in the sections that follow, economically sustainable recycling programs are based not on the value of the collected recyclable materials, but on the "avoided cost" of reduced waste collection and disposal. However, many venue operators also consider the value of good public relations engendered by recycling programs, and their importance to a growing number of patrons and season ticket holders. In that regard, it is useful to be able to discuss the positive environmental impacts that result from a particular effort.

Simply stated, recycling beverage containers (and other materials) saves energy, reduces greenhouse gas emissions, and diverts material from landfills. The EPA WARM Calculator can be used to calculate these benefits for an event, team, or all of the events held within a particular facility or location.[5] The table below reflects the positive environmental impacts that would occur if all of the PET, Aluminum and Glass beverage containers identified in this report were recycled. We chose not to attempt an estimate on cups since we were not able to estimate the volumes of the various materials.

Table 3: Recycled Versus Landfill – Emissions, Energy & Landfill Volume Saved

	PET 31,200 tons	**Aluminum 6,900 tons**	**Glass 10,938 tons**
MTCE – Metric Tons of Carbon Equivalent Saved	13,509	25,799	951
MTCO2E – Metric Tons of Carbon Dioxide Equivalent Saved	49,577	94,592	3,467
Energy Saved (Btus)	1,665 billion	1,428 billion	29 billion
Landfill Volume Not Required	273,818 cubic yds	33,311 cubic yds	10,938 cubic yds

[5] Calculations made using the U.S. Environmental Protection Agency's Waste Reduction Model (WARM) on-line calculator, Version 9 (August 2008), http://epa.gov/climatechange/wycd/waste/calculators/Warm_Form.html
Emission and energy factors used are also available on this page.

5. BEVERAGE CONTAINER RECYLING: MODELS FOR SUCCESS

A. Introduction

This section of the report outlines the fundamental guiding principles and critical elements necessary for successful beverage container recycling programs at venues and events. It also details program models in each defined venue and event category.

How is recycling at venues and events fundamentally different from curbside or drop-off recycling programs?

Venue and event recycling programs often require a different mix of skills than those needed to manage curbside and drop-off recycling programs. Local recycling coordinators who take on venue and event recycling initiatives should understand that they will encounter challenges involving management of diverse stakeholders and program participants as they organize programs. Negotiation and coordination issues will be ongoing and the time frame is often short. It is important for a recycling coordinator to be prepared for the challenges that will be faced in planning and facilitating this type of program.

Tactics that may be unfamiliar to local government recycling coordinators may be appropriate for venue and event recycling programs. For example, recycling at venues and events may rely heavily on non-participatory methods such as pre- and post-event picks or sweeps. Waste stream composition studies at most events and venues will show a very different stream from that of residential dwellings or even most commercial establishments. Venue and event waste will contain little food waste compared to household trash, and the food waste encountered will most likely be cooked and will be packaged differently from household food. In many venues, waste will be highly segregated between activity areas, and the single-serve beverage container waste will be mostly commingled only with "light-fraction" trash such as empty snack bags. These compositional differences make it easier to use non-participatory methods and "sort as you go" methods at events and venues, compared to the established system and logistics of household recycling collection that strongly discourage any sorting of mixed household garbage in order to recover the recyclables.

In some cases, the facilities and events will be initiating and organizing recycling programs on their own without any involvement from local recycling coordinators. They must also understand the reasoning behind the tactics chosen to make these programs successful. Partnerships with local government recycling coordinators can yield benefits as they will have access to resources that the venue or event will need.

This portion of the report presents guiding principles for venue/event recycling programs and discusses recycling program elements that are common to most types of venue and event recycling programs. It goes on to provide detailed guidance on how to plan and implement effective and sustainable recycling programs at specific types of venues and events. The authors recognize that there may be a number of different variations on venue and event recycling programs that are currently working in particular facilities or jurisdictions that we have not included. Venue and event recycling is a growing area of interest for both public and

private facility managers and recycling program managers. Several coinciding trends are responsible for this interest, including:

- Recognition of significant potential beverage container recovery and the market value of the containers;
- Significant landfill diversion possible with an effective program; and
- Renewed public interest in the environment and greenhouse gas reduction.

The authors of this report are interested in every variation on the overall theme, and if it is not included here, it's likely that the authors are simply not aware of the program. We recognize the many challenges that recycling program planners and managers encounter and applaud their efforts. (In fact, we'd like to hear from them about successful programs.)

B) Six Guiding Principles for Venue/Event Recycling Programs

Six vital guiding principles for venue and event recycling are identified here. These principles provide a framework for planning and decision making, and greatly help to support the specific program logistics that are chosen. Each principle is explained briefly below. The concepts inherent in these principles will be discussed in more detail in the models discussion that follows.

1. Key stakeholders must be identified and included early in the decision making process.

All key stakeholders must be included in program development and decision making. Stakeholders who participate in the program planning must be decision makers for their particular companies or areas of responsibility, given that there is often a short time frame available for planning. Ideally the primary decision maker needs to be involved to the extent that employees, contractors and other personnel understand that the commitment has been made to seriously implement a recycling program. It is important that every member of the team understand that the program has been given priority from the very top management levels. Once commitment and accountability are established, the relationships among all the stakeholders will be very important and should be well understood, along with the functional responsibilities of individuals for specific tasks. Negotiation and coordination of roles and responsibilities must be done early in the planning stages among all stakeholders under the leadership of one individual designated as the lead organizer.

2. Recycling programs must reflect a full understanding of the collection & disposal costs of recyclables as trash.

Program planners should strive to make programs cost-effective so they will survive and become sustainable. This means that the cost of recycling the beverage containers should not exceed the alternative cost of collecting and disposing of them as waste. Even though individual venues and events may accept some increased costs as a result of legislation, or because they accept some sort of trade-off (getting good publicity, not losing a reliable cleaning contractor), a cost-effective program will survive changes in management, finances,

and environmental priorities much better than a costly program, or a program that is perceived to be costly. When event and venue managers are responsible for both the collection and disposal of the trash generated, then recycling – if done properly – can be very cost effective. Issues arise when "special arrangements" are made with sponsors in return for trash hauling, when municipal officials provide the hauling and disposal service at no cost because of other desired benefits to the municipality that the event or venue brings, or when trash hauling contracts are fixed-cost. Gathering the data to establish cost-effectiveness is one of the most challenging aspects of venue and event recycling. This data should include clean-up costs, trash collection, transport and storage at the facility, hauling, and trash disposal costs (tipping fees).

3. Planners must have access to complete sales data from the event or facility to accurately predict volumes and weights of recyclables.

Ideally, venue management and its food service contractors should provide complete beverage container sales data to allow accurate projection of volumes and weights of recyclables. These numbers should include total sales (usually expressed as cases of 24 containers) broken down by beverage types and container types, along with sales locations. Unit weights, available from the container trade associations, can be used to calculate potentially recoverable tonnages and where they will be generated. It may be difficult to obtain complete sales figures due to concerns about confidentiality. Venue managers and beverage companies may not understand why the sales figures are needed to plan the recycling program and will need to be educated.

The venue/event's policy on allowing outside beverages must also be articulated so that these containers can be accounted for as well. These additional containers may be significant in planning for recovery; in fact, some venues with generous outside beverage container policies have reported greater than 100 percent recovery numbers based on beverage sales, illustrating how an accurate accounting for these containers is important. The numbers can be estimated based on conversations with venue management and other stakeholders.

4. Program planners must have the ability to track and record recovery numbers accurately.

A comparison of sales numbers, converted to weights, and the weights of the recovered materials will enable program planners to calculate waste diversion and recycling rates and evaluate the performance of the program elements. Tracking these numbers over time will allow the programs to be fine-tuned in a continuous improvement process. Accurate numbers and rates will also provide management with data that they can use in publicity materials, as well as a sense that the program is worth the effort and commitment. To gather accurate recovery data requires access to a reliable local market that is willing and able to manage the loads of recyclables from the venue or event separately from other sources – at a minimum, to weigh the incoming loads and account for them correctly.

5. Programs should maximize material recovery with the least disruption to the status quo, and do this by being integrated into the existing solid waste management system.

This will require cooperation from, and coordination with, all the parties involved in on-site operations, including food service, beverage sales, site clean-up, and waste collection. In some events and venues, representatives from these activity areas may have never interacted before, and the need to build relationships among them must be recognized. While volunteers and outside workers can be involved in the material recovery system, program planners must avoid the perception that recycling is to be done as an overlay or add-on to regular clean-up and waste handling. It is important to get buy-in to the program from the regular on-site workers so that they assume their share of the responsibility. A permanent recycling program may change their job responsibilities to a degree, and these changes must be approved by event or venue management and accepted by these individuals and, if contracted, by their own companies.

Venue managers and recycling program operators should also understand the importance of an evaluation of disposal needs after a program is initiated. A high-performing recycling program can divert a significant percentage of solid waste from disposal, with the resultant need for smaller waste containers, less frequent pick-up, elimination of compactor units, or other changes that can reduce both hauling and disposal (tipping fee) costs. Few generators are prepared or trained to change their solid waste arrangements to realize this potential cost avoidance and few solid waste haulers will voluntarily help their customers take advantage of less need for disposal services.

At a minimum, venue managers should make sure they are billed separately for tipping fees from container rental and pulling, so that cost avoidance is automatic. Additionally, contracts should itemize costs so that adjustments can be made. While fixed-fee contracts that bill the same amount regardless of number of containers or waste may be common, they should be avoided and new contracts should strive for maximum transparency and flexibility.

6. There must be access to a reliable local market.

The market is the entity that normally receives, sorts and densifies the recovered material. A detailed local investigation must be conducted to find a local materials recovery facility (MRF), scrap dealer, or plastics processor (reclaimer) who is willing to work as a market and partner in the type of non-traditional (i.e. not a curbside or drop-off program) recovery scenario offered by an event/venue recycling program. Factors to be determined in choosing a market entity include:

- Location,
- Ease of access,
- Capacity to manage additional material,
- Willingness and ability to collect and provide recovery data;
- Familiarity with beverage container recycling, and
- Willingness to consider long-term participation.

The costs and benefits of using a particular market must be balanced. Program planners must look at these costs and decide what makes sense. A market that pays the program some revenue for the material is obviously most desirable. If such a market is not available, the least-cost market should generally be used, but all options should be evaluated.

C. The Value of Precycling

Once key decision makers are comfortable with the program concept, and all of the logistical and economic information has been accumulated and evaluated, recommendations can be made regarding measures that should be implemented *prior* to program start-up in order to make recycling more effective and limit incidental waste materials. This is commonly known as "Precycling" and can be pivotal in ultimately determining what levels of recovery are possible.

Since venues and events, for the most part, are defined and controlled situations, their waste (recyclable) streams can be improved in ways that could not be achieved with residential recycling. The venue or event can use its authority with vendors to implement requirements that may include:

- Limiting the choice of cups to be used on premise to allow only compatible materials. The Minnesota Stair Fair, for example, does not allow any vendors to use cups not provided by the Fair management. In this case, the cups are all Expanded Polystyrene (EPS) and are collected using separate bins and marketed accordingly. Other venues have gone to HDPE and PET together or exclusively. Still others have restricted cup use entirely and have beverages vended exclusively in bottles.
- Ensuring that paperware has recycling friendly moisture and grease resistant coatings.
- Allowing only compostable food service packaging and utensils.
- Mandating that any plastic promotional or commemorative beverage packaging is compatible with the existing PET bottle stream. (HDPE, PP, LDPE are okay; PVC, PS, PETG are not.)

While getting buy-in on these types of macro changes is difficult, it often spells the difference between limited or no marketability for materials and achieving extraordinary recovery levels. Ultimately the potential returns are worth all of the extra effort involved.

D) Common Program Elements

The program elements or tactics discussed in this section apply to most venue and event recycling programs. The structure of each program element will be slightly different depending on the event or venue category, and on the prevailing "culture" at the type of event. The program elements build upon the guiding principles, adding details and incorporating project logistics so that the principles are always followed.

1. Involvement of Stakeholders

The particular roles of the important stakeholders identified in the previous section are presented here in more detail. These include potential and desired roles; for specific venues and events they may differ. In general, all stakeholders should be contacted individually prior to any attempt to design a recycling program or set up a meeting or working group. Attitudes, roles desired, and level of influence should be ascertained.

The challenges regarding stakeholders will include identifying all of them, overcoming negative attitudes toward recycling, dealing with the perception of great costs and time commitments to be involved, and needing to chase down and keep some people involved and sticking to their commitments. Generally, involved stakeholders and their roles will include the following:

Beverage suppliers – are asked to provide sales numbers on a confidential basis; assist with purchase of bins; issue public statements of support; assist with promotion and education (P&E).
Venue management – appoints program manager; takes leadership role; ensures compliance and participation among staff and contractors; issues public statements of support.
Venue recycling program manager – not yet a common role, but may become more widespread as more venues recognize that dedicated managers can be important for program sustainability; can act as liaison with local government recycling coordinator.
Food service or catering personnel – manages recycling bins in their areas; enforces compliance among employees; able to solve problems as they arise.
Cleaning contractor or personnel – organizes post-event clean-ups incorporating "picks" of recyclables separately from trash, with an understanding of the goals of maximum recovery at minimum cost; services recycling bins; ensures no mixing of recyclables with trash; reports costs.
Local market (may be waste hauler) – supplies storage/transport containers; hauls material to recycling center; ensures that material does get recycled; monitors for compliance; reports tonnages and costs to program manager.
Waste hauler (if not recycling market) – supports goals of program; reports tonnages and costs of solid waste hauls; willing to change service level as solid waste generated is reduced; makes public statements in support of the program.
Local government recycling coordinator – works with venue program manager to form planning task force or committee; assists with P&E and local media outreach; identifies sources of collection bins and local market service provider; trains personnel involved in recycling logistics; receives, analyzes and interprets data.

2. Discussion of Market Options

Market arrangements are changing as the recycling industry matures. Supply shortages are chronic for several grades of recyclables, and representatives of all beverage container material groups express a strong need for more material to be recovered and recycled. High market prices have lasted for several years now, and material processors and markets are

paying attention. The flow of market information and pricing information is greater than even a few years ago, and mis-information is less widespread.

Issues that will arise when establishing a market arrangement include:

- Storage and transport containers;
- Commingled vs. separated;
- Bagged or de-bagged;
- Processing fees;
- Revenue;
- Contamination; and
- Accurate weights and records.

In most localities, program planners will be able to find a market that will provide storage containers such as large roll-offs or front-end loading boxes. Usually a rental fee will be charged for the containers, along with a separate fee each time one is picked up at the site. However, these fees are frequently negotiable and may be tied in with processing fees and material revenue. Local government recycling programs that provide drop-off centers and/or commercial recycling programs may own the necessary containers and trucks, and may be able to offer them at no charge. Depending on how important revenue is to the venue recycling program, and how many market options are available, it may be possible to negotiate an arrangement for the market to take ownership of the aluminum and plastic containers in return for containers at no charge.

Management of the full containers by the hauler must be understood. Weekend events may be an issue – storage containers may be available to use over the weekend, but pick-up will most likely occur on Monday morning. It is important to secure material if all personnel leave the site on Saturday or Sunday, and the Monday morning dispatcher must remember that the material is to be recycled, and not hauled to the landfill. The chosen market must be included in stakeholder discussions so that these logistical arrangements don't become problems.

Fees for containers and processing fees will be dependent on the market's requirement for material separation. If sorting of commingled cans and bottles is needed, that cost may be passed on to the program in the form of a container rental fee and/or a material processing fee. However, most MRFs have sorting systems that are capable of dealing with a much wider range of materials than just commingled bottles and cans (the typical curbside mix). Given the value of both aluminum cans and PET bottles, sorting costs should be negligible compared to the market revenue for the materials. Venue/event recycling program managers have a good negotiating position in the value of the material.

With market prices at record highs and material shortages prevalent in the industry, program managers should initiate negotiations with potential markets to share a portion of the material revenue as well as eliminating processing fees. Aluminum cans were selling for about $1.00 per pound ($2000 per ton) in the spring of 2008, and PET bottles about 18 cents per pound ($360 per ton). A share of this revenue can help cover any costs incurred for the program. If the recycling program can show some revenue, it will help the program planners

in educating venue management and other stakeholders that these materials do indeed have value and contribute to the program's long-term sustainability.

De-bagging of material may be a larger issue with the market than commingled containers. If de-bagging is not an option, a market must be found that has the capacity to accept bagged material and efficiently de-bag it for sorting and processing. Processors that routinely accept bagged material are not uncommon although most MRFs are accustomed to, or under contract to, accept only loose curbside and drop-off material. Most scrap dealers and paper dealers similarly are not accustomed to handling bagged material. The markets can again be reminded that the mix of materials in the bags has market value – aluminum cans and PET bottles. The value of the material may overcome any additional costs incurred for de-bagging, and possibly the MRF will be able to pass this value on as revenue. The MRF or market managers will need to be educated about this in order to overcome negative assumptions.

The presence of contamination in bags of bottles and cans must be addressed honestly with the markets. If contamination is expected, the market must be warned, as the extra sorting and potential health and safety issues can impact discussions about processing fees and revenues. An effective education and promotional campaign, along with trained collection staff, is vital in keeping contamination to a minimum. In some venues and events, recycling bins will see very little contamination. In places like campgrounds at concerts or car races, contamination may be a serious issue. If a recovery program at a venue or event encompasses a variety of activity zones, it is a good idea to use different colored bags for collection in each area if contamination from one area could be an issue. It may be desirable to use separate storage/transport containers for the material from these zones. Such separation will enable program organizers to learn more about the expected degree of contamination from different areas.

An optimized program would be able to de-bag, sort and densify material on-site, thereby having a full range of markets demanding the material. As of yet, few programs have reached this stage, although there is a growing awareness based on test programs that an on-site processing system would yield numerous benefits, including reduced storage container rental costs, reduced costs for pulls or hauls to markets, elimination of any processing costs and the best paying markets.

The ability of the market entity to gather and report recovery data is an important criterion, since accurate tracking of recovery numbers allows an evaluation of the program and helps fine-tune program elements. Maximizing material recovery should be a goal of every venue and event recycling program. The need for frequent close evaluation of performance may eventually fade if the program becomes routine, but periodic audits are recommended.

Building a long-term relationship with a market and sharing the learning curve will pay off in the long run as the market becomes more comfortable with the logistics, costs and marketability of the material, costs should drop and revenue may become a possibility. After a program has been established and is proven successful, the program managers should include recycling operational logistics in bidding documents for solid waste services, venue cleaning services, and even vending and catering services, to institutionalize each entity's role in the

recycling program, along with incentives or enforcement mechanisms to ensure compliance with these performance specifications.

When venue managers realize that what they have been discarding for many years is not trash, but instead valuable commodities, they may become more supportive of the recycling program. Examples of sports venues that have covered all beverage container recycling costs and also gained some revenue include the Safeco Field (Seattle Mariners) and the Coors Field (Colorado Rockies).

Table 4 presents a summary of possible market arrangements and some of the benefits and challenges program managers may face in working with each type of market. This is not an exhaustive list – each locality is slightly different and other arrangements are possible.

Table 4 - Market Arrangements

Possible Market Arrangement	Benefits	Challenges
Waste hauler or recycler to their own MRF	Negotiate with only one entity for hauling, processing, record-keeping and tonnage reporting. Many cities use contracted collection and processing for curbside and drop off programs.	It must be determined that the containers destined for the MRF are actually hauled there, and that weights are obtained prior to discharging the load
Waste hauler or recycler to other local MRF	Weights may be easier to obtain, since the trucks will most likely be weighed to facilitate payment, or at least transfer of ownership of the material from one company to another.	Processor must be included in discussions about the types of material that will be hauled to their facility, how much is expected, and how it will be commingled. Less common arrangement due to competitive issues.
Local government collection and hauling to MRF	Will usually provide services at no cost or a very low cost, in keeping with their own recycling mission. May be more flexible with pick-up times; may be very helpful for events that take place on public land or at public facilities.	Some local governments have limited data collection and tracking ability, or interest, since they are focused on waste diversion and do not necessarily track recycling services carefully. Without contracts in place, recyclables may change hands with no processing fee paid and no revenue received, therefore not requiring careful tracking.
Table continued on next page		

Possible Market Arrangement	Benefits	Challenges
Single-stream MRF	Have a greater degree of technology for processing and is able to handle commingled cans, bottles, cardboard, paper, and possibly bagged material. Trend is toward more single-stream MRFs in the U.S.	In general, sorting costs are greater for single-stream material. Studies have shown that processing fees charged by single-stream MRFs are usually higher than for dual-stream MRFs for curbside generated material. (May not have any experience with accepting a mixed load of beverage containers only or handling bags.)
Dual-Steam MRF	More common still than single-stream MRFs, but losing ground.	Will not be able to accept paper materials mixed in with bottles and cans. May not have any experience with accepting a mixed load of beverage containers only or handling bags.
Intermediate Processing Centers (IPCs) Single-material dealers such as paper packers and scrap metal yards that also have the capacity to handle other materials. In deposit states, IPCs known as third party handlers are the entities that handle beverage containers with a deposit value.	If the containers collected have a deposit value, it is possible to negotiate part or all of the refund of the deposit value with the IPC, depending on the requirements of the particular state deposit law. In non-deposit states, using a scrap metal yard may be beneficial, as they will probably have the highest value markets for the recovered aluminum cans. These entities recognize the market value of the materials and may pay accordingly.	They may need some assistance in processing and locating the best markets for the PET bottles.
Beverage Container Material Processors or Reclaimers local to venue or event	If a PET reclaimer and/or aluminum can processor is located nearby, the MRF or dealer can be by-passed and costs may be avoided. These entities recognize the market value of the materials and may pay accordingly.	Revenue may depend on source separation of materials, as they have no sorting capability. These entities may not have storage and transport containers available.

As successful programs become permanent, recycling requirements and specifications should be written into bid documents and contracts for solid waste and recycling services, including marketing. Incentives or other enforcement clauses can ensure compliance with these specifications and institutionalize the program, reducing the need for continuous on-site monitoring by program managers.

3. Recycling Bins

Recycling bins are the bread and butter of recycling programs. They can be placed in a variety of locations, can be used for educational messages, and reinforce a venue/event's commitment to recycling. At events and venues, bins may be placed in concourses, walkways, lobbies, private suites, food service areas, exhibit halls, merchandising areas, etc. They should always be located next to trash cans, if possible, to maximize the opportunity and convenience of recycling and to reduce contamination by trash.

Recycling bins are available from numerous vendors in a large variety of sizes, shapes, capacities, construction materials and prices. Bins may be permanent or temporary, nesting or collapsible, metal or plastic. Some bins are designed with panels that can be used as "mini-billboards" and advertising space on the bins can be sold for revenue to contribute to the bin and service costs.

Bins will be placed and serviced by venue or event clean-up contractors or personnel, or by food service or catering personnel in areas where they have control. Bins must be lined with translucent bags, and be equipped with instructional signage. When full, the bags are transported to recycling storage area while the bins stay in place.

Considering that bins are such a recycling icon, there are a surprising number of challenges to be taken into account when using them, including avoiding contamination by trash, ensuring that bags of recyclables are taken to the proper area and not disposed of, integrity of bags to prevent leakage during use and transport, and perceived or actual lack of space in suites and food service areas for recycling bins. Different situations will require different bins, but in general bins should have restricted openings, proper signage, and be present next to all trash cans as practicable. In certain situations, bins will need to be secured against theft or unexpected weather conditions. This may be accomplished by using a nylon cable tie or similar fixture that does not interfere with servicing. A summary of the benefits and challenges of using bins for venue and event recovery is presented in Table 5 below.

Table 5 – Benefits and Challenges of Recycling Bins

Tactic	Benefits	Challenges
Recycling Bins	• Bins serve as icons of a program and visible reminders to recycle. They can display public education and promotional messages. • Most people who already recycle are familiar with bins and will be pleased to see them – for these people, bins communicate that the facility is committed to recycling. • In stadiums and fixed seating venues that rely mostly on picks for recycling, they provide an option for habitual recyclers who will use them and not leave recyclables at their seats. • They are a good option for hospitality areas and suites where trash cans are normally used for trash and a bin takes advantage of already learned behavior.	• Finding the proper bin for the venue or event – is it easy to set up and break down, is the capacity sufficient considering the frequency with which it will be serviced, is it durable enough, does it meet any aesthetic standards, etc. (see NAPCOR's web site for information on a variety of bin choices: http://www.napcor.com/plastic/bottles/bins.html) • The logistics of handling bins – keeping track of them, placing them, collecting and cleaning them after the event, and storing them – can be time consuming. • Bins frequently become contaminated with trash due to misuse by non-recycling public. If bins are seen being dumped into trash, it can have a negative result. • Servicing bins during events must be done regularly so they don't overflow. Time must be budgeted for this. • The possible increased marginal cost of clear or translucent liner bags over black trash bags must be considered (although the absolute number of bags should be about the same).

4. Recycling Incentives and Special Programs

Incentives to motivate event attendees to recycle and to promote recycling are popular and effective. Incentives will vary depending on the type of event, resources available and management interest. They will add an extra degree of complexity to planning and organizing the recovery program. Examples of several different incentives are discussed below.

Pass-the-Bag – Used mostly at stadium sporting events, pass-the-bag programs involve passing a recycling bag along a seating row during a break in the action, such as the seventh-inning stretch. Fans deposit their recyclables in the bag and pass it along. At the end of the row the full bag is collected by an usher, a volunteer or a special character. In Seattle, at Mariners baseball games, a costumed character named "Captain Planet" is featured during this activity.

Pass-the-bag programs have a number of advantages. They allow conscientious fans to actively participate in recycling without leaving their seats to seek out a recycling bin, they reduce the burden of post-event clean up and recycling, and they are educational tools, calling attention to recycling activities and motivating participation through peer pressure.

However, program managers should understand that the logistics of managing the full bags must be carefully planned to minimize disruption to fans or the event. Passing out empty bags is easy and can be fun – collecting full, possibly dripping bags and then moving them out of the stands without inconveniencing fans is more of a challenge.

If a pass-the-bag program is used, it should be promoted by an announcement on the audio-visual system and/or participation by a mascot or character identified with the team or community in order to achieve maximum visibility and participation.

Merchandise or promotional incentives – Events and venues have successfully used a variety of special merchandise or promotional incentives to motivate recycling at events. These items can be inexpensive and are frequently provided by team or event sponsors. Usually attendees are encouraged to bring a specified amount of collected containers – for example a bag full – to a centralized depot or redemption center to be awarded their prize. Bringing them to the depot provides planners with an opportunity to personally promote recycling and provide education. A further advantage is that significant amounts of material can be aggregated at these depots to make final collection easier.

Moondance Jam, a music festival in upper Minnesota, has used bandannas with the name of the event, a list of performers, and recycling information as give-aways to fans using recycling stations. At one NASCAR race, shop towels and posters featuring a popular driver were successful at motivating fans in campgrounds to deliver bags of recyclables to central locations. At the depots, these fans could then enter a lottery for a grand prize – a ride around the race track with a favorite driver. Younger fans especially appreciated these prizes.

Reverse Vending Machines – Reverse vending machines, or RVMs, are often familiar to residents of beverage container deposit states. Many redemption locations use them to accept deposit containers from the public and issue coupons for the deposit value. They can be placed in venues in deposit states for attendees to redeem their deposit on-site. These machines can also be modified for use at venues and events in non-deposit states to provide coupons for merchandise or products as an incentive for attendees to recycle. They are particularly suitable for situations where there are long waiting lines, which may be serviced by banks of beverage vending machines. During the wait, or at the end of the line, the attendee can deposit empty containers in the RVM. Reverse Vending Machines have two important advantages over recycling bins - they densify the containers, storing many more than a standard bin and drastically reducing the need for service, and they accept only containers, eliminating contamination.

On the down side, RVMs are also expensive and some events report that they get lost in crowds. They also may require frequent maintenance. Outside of deposit states, most people have never seen or used one, and developing this habit takes time. If they are to be used,

placing them next to recycling bins can show the public that they are meant to be used for recycling. Fans have the option of using the machine or the bin. Alternatively, they can be placed next to beverage vending machines. Program managers interested in using reverse vending machines should be aware of the following needs:

- Electrical supply lines
- Commitment from upper management
- Maintenance and repair protocols

Table 6 summarizes the benefits and challenges associated with different types of incentives or special programs.

Table 6 - Benefits and Challenges of Incentives and Special Programs

Tactic	Benefits	Challenges
Incentives and Special Programs	• Can provide an extra program element to gain more tonnage and participation. • Pass-the-Bag programs call attention to and promote recycling program. • Fans and attendees, especially youth, appreciate commemorative items. • Sponsors will usually provide merchandise featuring their product and tying it to recycling for little or no cost (to venue). • RVMs compact containers and hold large volumes relative to their size.	• Arranging the logistics of pass-the-bag programs during the event without disruption. • The cost of RVMs maintenance needs and "learning curve" for using them. • Using RVMs requires greater commitment since they are more permanent installations. • Providing merchandise as incentive requires personnel to staff a recycling center and determine eligibility to receive prize. • Large events may require very large quantities of merchandise incentives, which may be an issue for sponsors/providers.

5. Promotion & Education (P&E) and Training

The Value of P&E

Providing recycling opportunities paired with educational messages can be an excellent way of normalizing recycling participation and behavior at events and venues when currently recycling behavior is generally only the norm at home. Regular at-home recyclers should be pleased to participate in an additional opportunity, and non-recyclers or occasional recyclers may be motivated by celebrity or product brand endorsements. However, program planners should understand that just as recycling without education and promotion is incomplete, so is education/promotion without recycling.

Most venue and event recycling programs include promotion and education. If a recycling program is implemented at a venue or event, organizers will want to advertise it in order to increase participation, decrease contamination, and promote the venue or event operator as environmentally concerned. Even facilities that do not provide participatory recycling opportunities can use promotion and education to inform the public that they are recycling in other ways. P&E also has a more long-term and less measurable effect – to gradually make recycling the norm at venues and events so that it becomes the norm in peoples' lives in general.

The design of P&E materials and messages should include three elements:

Promotion of the program to encourage participation and ensure that supportive venue management is recognized;
Instruction to participants in the program – attendees who recycle, staff who service bins, crews who perform picks – as to how to correctly perform their role; and
Education about recycling, so that people feel that their actions have accomplished something, which may include environmental, community-focused, and/or economic messages.

Messages

Research into Social Marketing has shown that reasons people do not recycle include:

- People are not aware of the activity or its benefits;
- They are aware, but perceive barriers to participating; or
- They may not see barriers, but they don't see any benefit, either direct or indirect, to them from the activity.

Venue and event recycling program planners should keep this in mind, along with the character of the audience, when designing public education materials. It is often assumed by recycling professionals that knowledge directly and immediately influences behavior – as soon as people understand that recycling can save energy, they will participate. However, this knowledge is not a motivating factor if people perceive recycling as inconvenient, messy, or costly; nor will it motivate individuals who, for whatever reason, don't value energy

conservation. Even a message repeated over and over will not cause behavior change if it does not in some way relate to values individuals already have.

Promotional and educational messages should be appropriate for the expected audience, and particular channels should carry the appropriate messages. To the extent possible, marketing should be integrated with or include campaign images, slogans, messages, etc, from state and local recycling programs.

Instructional messages must be very simple and straightforward. Recycling program planners should step out of their recycling roles and imagine themselves as members of the public when instructional messages are designed. For example, a sign that says, simply, "Place Empty Bottles and Cans Here" is going to be more effective that one that says "Recycle Plastic and Aluminum Here for the Earth". Technical terms are often not effective in direct communication with the public. Environmental messages are important, but the appropriate channels should be used to communicate them.

Some think pictures of containers are also critical to proper understanding and participation, including minimization of contamination. Additionally, instructions might use the word "only" to discourage contamination and note the presence of unacceptable materials that attendees might interpret as recyclable, such as plastic cups. In some situations, bilingual educational materials will be appropriate.

Appropriate promotional and educational messages should be discussed and agreed upon by the stakeholders. Certain stakeholders may have resources to provide – for example, if a popular public figure or celebrity is featured at an event, recycling messages with references to this individual may catch the attention of the attendees, and the cost of such promotion may be covered by the interested parties. If an athlete or popular musician can be recruited as a recycling spokesperson, their endorsement can have far reaching effects in helping to make recycling acceptable or even "cool" among certain audiences.

Channels

Once the appropriate messages have been agreed upon, the tools, or channels, by which the messages will be delivered should be decided upon and a budget developed. Channels can include:

- Signs on bins, or on poles next to bins
- Posters in suites and food service areas
- Event programs
- Information on electronic scoreboards and other audio/visual on-site devices
- Public address system announcements
- Press releases and other outreach to local news media
- Information/articles in venue newsletter and print items
- Point of sale messaging: t-shirts, pins, stickers, etc.

Support for education and promotion should be a cooperative effort among various stakeholders, including venue management, beverage suppliers, the local government recycling program, the hauler and/or market, and the container industry. Costs should be shared.

Training

Training of groups and individuals that will actually be performing the physical and logistical tasks of handling recyclable materials is a special aspect of education. Training should be provided to:

- Food service personnel
- Clean-up personnel or contractors
- Volunteers
- Ushers, if special incentives are used
- Vendors that will be recycling directly from their locations

Separate training programs may have to be designed for each of the groups due to the difficulty of assembling all of them in one place at one time. Some training may take place on the job; however, program planners should try to schedule a brief period of time with no distractions where the only focus is on the recycling program and the expected tasks for a particular group. This will allow time for questions and suggestions from the workers that may improve the program. Program planners should inquire in advance as to whether a multi-lingual program is needed. It will be a judgment call based on the type of venue, types of workers, and complexity of the tasks as to whether written materials will be developed and distributed.

The best training, like the best public education, ties in to people's values. While the most important thing is to instruct the individuals as to how to accomplish their specific jobs, they will most likely learn better and retain and act upon the information if it is portrayed as a partnership and an activity with which their help is needed. The involvement and interest of these workers must be obtained. Training should provide a context for the work – the "why" as well as the "how".

The challenges for public education and promotion at venues and events are summarized in Table 7.

Table 7 - Benefits and Challenges of Promotion and Education

Tactic	Benefits	Challenges
Promotion and Education	• Reducing bin contamination through proper instruction. • Informing habitual home recyclers that recycling is occurring at the event or venue. • Helping to establish recycling as a societal norm outside of the home as well as at home. • Increasing participation by promoting incentives to recycle for immediate personal gain. • Communicating the venue or event management's commitment to environmentally positive actions.	• Identifying appropriate messages for the audience or for multiple audiences. • Changing behaviors doesn't happen quickly and requires consistent messages. • Finding the funds for adequate implementation and exposure through media channels with event-based priorities and aggressive revenue goals. • Recruiting sponsors for incentives. • Convincing management of the need for employee training and the time it requires. • Measuring and evaluating the impact of P&E initiatives.

6. Data Gathering and Analysis

In order to evaluate the recycling program and its cost-effectiveness, data must be gathered and analyzed. This analysis will provide benchmarks on which to judge further efforts and reveal program areas that need improvement. It will, hopefully, reveal successes that all stakeholders can claim a part of.

At a minimum, data to be gathered must include:

- Numbers of beverage containers sold, by type, converted to potentially recoverable tonnage;
- Estimated number of beverage containers brought in to the location by attendees, if allowed;
- Amount of material diverted from disposal (tonnage);

- Amount of material actually processed and marketed to be recycled, if possible[6];
- Tonnage of solid waste previously disposed (prior to recycling);
- Cost of solid waste disposal;
- Costs of the recycling program.

A number of program success indicators will be calculated from this data, including containers consumed per attendee, by type; beverage container diversion rate; beverage container recycling rate; disposal reduction over time; costs per ton of the program to divert beverage containers; and a comparison of these to disposal costs to reveal avoided disposal costs credited to the recycling program.

Beverage container sales data should be obtained from venue management, who can provide figures for all beverage types, container types and brand owners. Case sales data can be multiplied to obtain individual unit quantities. Container weights are available from material trade associations. These can be used to calculate potentially recoverable tonnages. The beverages that will be encountered will include water, sports drinks and soft drinks in PET bottles; beer in PET bottles, aluminum cans, and glass bottles (in controlled food service and hospitality areas only); and possibly wine and alcoholic spirits in glass or PET bottles, depending on the venue. Usually, container sales of beverage are in addition to fountain sales.

The tons recovered should be obtained from the hauler who collects the recyclables, or the processor who takes them in. At some point, the truck should have to pass over a scale for a weight. This gross incoming weight has its drawbacks: liquids remaining in bottles and cans, or spilling from the beverage containers but remaining in the transport container will add to the total weight, and the weight of the plastic bags and any trash contamination will also be included. Visual spot-checks of bags of containers can determine the degree of liquid and contamination, and a percentage correction to the gross weight can be chosen based on the spot check. A second method is to obtain marketed (baled) weight of the material generated, but it is more difficult to ensure accuracy as in most material recovery facilities the incoming material from the venue will be mixed with material from other sources, and the marketed weight will consist of an educated guess.

If the loads are mixed PET, aluminum and glass, the sales data will be very helpful in determining an estimated containers-per-ton number that can be used to calculate the recovery rate based on the ratio of PET, aluminum and glass containers sold. A caution here is that if different recovery rates are envisioned for the different materials – i.e. glass is only recycled in hospitality suites where capture rates are most likely less than with post-event picks – these must also be taken into account.

One of the most important project elements to establish from the very beginning is the market that will provide recovery data. Even before fine-tuning the collection arrangements, the market should be identified and visited to assess its actual data capabilities. The market

[6] This number can be compared to the tonnage diverted to check the accuracy of reporting and to estimate contamination and residue levels in the material collected.

representative should be assigned a place on the planning work group for the recycling program.

Solid waste disposal numbers can be obtained from venue management. The contract with their solid waste hauler should provide an invoice that specifies the tonnage for each container pull. These records should be monitored carefully over the duration of the recycling project to determine how much the solid waste is reduced by the recycling program. Some venues, however, may pay a set contract price for all solid waste services with no separate accounting for numbers of pulls or disposal tipping fees. In such situations, gathering disposal data will be more difficult. Substitution of a recycling container for a waste container is the desired end result of the recycling program, and careful tracking should determine when this can happen. Venue management can be educated about writing future solid waste management contracts to specify recycling services and data reporting and right-size their disposal needs.

7. Costs and Revenues of the Recycling Program

The capital costs of establishing a venue or event recycling program may be much less than envisioned prior to implementation. Ongoing and operational costs will be the majority of the program cost, and may include:

Labor:

- Servicing bins
- Providing pre- and post-event picks and clean ups
- Developing and disseminating P&E
- Training

Materials and supplies:

- Liner bags for bins
- Bags for picks and clean ups
- Education and promotional tools
- Health and safety equipment such as gloves

Services:

- Hauling to market
- Processing fees
- Leasing of specialized equipment if needed (such as crushers or shredders),
- Leasing or rental of storage trailers or roll-off containers

The costs of a venue or event recycling program should be shared among the stakeholders, according to the resources each has available. In this way, no one entity bears all the costs and the program can be called a true partnership. Early in the planning process, a budget and cost-tracking spreadsheet or form should be developed by a planning team member with experience in this area. An example of such a spreadsheet is included in the Appendix of this report. Suggested cost-sharing arrangements are summarized in Table 8 below.

Table 8 - Possible Cost-Sharing Arrangements Among Program Stakeholders

Cost Element	Responsible Party Options
Recycling Bins	• Beverage company (logo and advertising opportunities) • Local government (may have bins available to lend) • Recycling service provider (advertising/promotion opportunities)
Other Specialized Containers	• Venue Management (these will probably remain as property of the facility) • Recycling service provider (may already have containers to lend or lease)
Labor for picks and servicing bins	• Venue management (through direct personnel or clean-up contractor) • Local government (through volunteers for certain tasks) • Catering company (in suites and hospitality areas under their direct management during events)
Developing and disseminating P&E	• Local government, in partnership with beverage company, recycling service provider and venue management • Venue management (and possibly the other parties) if local government is not involved • Beverage company and/or recycling service provider, incorporating logo and advertising opportunities as appropriate
Training	• Local government • Venue management through direct personnel or clean-up contractor
Bags for bins and picks	• Beverage companies • Venue management
Educational and promotional tools	• Beverage companies • Beverage and container company trade associations • Local government
Hauling to market	• Venue management (if private hauler employed) • Local government (if they provide hauling services)
Processing fees	• Venue management • Local government (if they provide processing service)
Leasing of specialized equipment	• Recycling market (if equipment helps meet their specs) • Venue management • Beverage companies

Revenues from material sales should be negotiated as a way to offset a significant portion of program costs. If a venue or event recycling program is truly comprehensive and effective, literally tons of new material will be recovered and provided to the local market and ultimately the end market. Most private MRFs have revenue-sharing agreements with the communities for whom they process and market curbside and drop-off recyclables. The managers of these facilities should understand that the material being recovered and brought to them from venue/event programs has significant value. Despite costs that may be incurred in de-bagging and sorting, ultimately the local market will make money on the aluminum cans and plastic bottles recovered. A portion of that market revenue should be available to the venue recycling program organizers. A local market that is interested in a long-term relationship will be eager to provide assistance to the program, including accurate weights and material accounting, to maximize the value and sustainability of the program.

Cost savings from the avoided costs of disposing of beverage containers as solid wastes should also be accounted for. These savings should accrue to the venue management, at least at first, to further reinforce the idea that beverage container recycling can pay for itself. As avoided disposal costs are internalized over time, they may be spread out among the stakeholders, as desired, to cover some additional costs.

E) Common On-Site Recycling Opportunities

1. Pre-event Recycling

Fixed-location venues that feature events prior to the main event, whether they are official and sanctioned or informal, may be candidates for pre-event recycling as part of the overall program.

Pre-event recycling locations may include tailgate parties in parking lots, parades or processions, temporary corporate hospitality areas consisting of tents in which food and beverages are served to invited guests, and gates or entrances to the venue itself. Depending upon the proximity of the activity to the venue, these recycling efforts may be serviced by the **s**tadium clean-up contractor or personnel, volunteers with a local environmental organization or charity, local government recycling personnel, or all of the above.

A combination of recycling bins and "picks" can be used for pre-event recycling, depending on the size of the activity and available resources. It must be recognized that the recyclable material stream will be completely different for tailgating events than it will inside venues, with much less control over the materials brought to the site by fans and attendees. Glass bottles will most likely be much more prevalent, and thus bags of recyclables will be heavier. Contamination by food is also more of a possibility. Recycling bins therefore should be monitored by volunteers, if possible, and need good signage. Roving vehicles, such as trailers towed behind pick-up trucks (often referred to as cotton wagons or chuck wagons) may provide contamination-free collection as well as education and promotion for tailgating events. These vehicles, or alternatively golf carts or four-wheel drive utility vehicles can carry full bags from bins to a recycling storage container. Clean-up picks can be done using the

same number of employees usually used to pick trash off the ground, by giving them different colored bags. More detail on picks is provided in the section on Post-Event Picks, below.

Stadiums have had great success with recycling bins placed at entrance gates to the main venue or event. Virtually all venues and events prohibit entry with open beverage containers, and most fans will want to drink their beverage all the way up to the final moment. Program managers have found that there is almost no limit to the number of recycling bins that will fill up at gates, for example at professional football games. The tonnage recovery for such locations can be huge. Again, the recyclables may include a significant number of glass bottles, making emptying bins more difficult due to weight, and partially full containers. Programs that include glass bottles need to be fully aware of the handling and safety issues that may arise, including both the weight and the potential for breakage, and are most likely best served by using a single-stream or dual-stream MRF for a market.

Corporate hospitality tents are also potential targets for recycling beverage containers. These areas host functions for the purpose of public relations around the sponsoring organization's contribution to the event or venue. They feature food, beverages, and celebrity appearances. The food service is usually provided by the venue's contracted caterer. Recycling bins can be provided for these locations and material collected by the clean up crew.

Challenges to pre-event recycling efforts include the distraction of a "party atmosphere" contributing to contamination in bins, the weight of glass bottles, broken glass, possible vandalism of bins, and perceived or actual lack of space for recycling bins in corporate hospitality areas.

Table 9 below summarizes the typical benefits and challenges of pre-event recycling.

Table 9 - Benefits and Challenges of Pre-event Recycling

Tactic	Benefits	Challenges
Pre-event Recycling	• Recovers containers that would otherwise be trash and helps to maximize landfill diversion and material recovery. • Communicates immediately that recycling is important and available (if bins are used). • Can tie in recycling with other positive public relations messages. • Reduces litter on-site. • Mitigates safety issues arising from containers remaining on the ground.	• Discarded waste from tailgate parties and hospitality areas will contain a high percentage of food residue. • Glass bottles may be prevalent and the weight in bins can be problematic. • Some volunteer organizations that serve youth groups may be reluctant to provide volunteers for events where alcohol is consumed. • The logistics of managing a large number of bins filling rapidly at entrance gates may be difficult.

2. Vendor and Merchandiser Recycling

At most venues and events, food, beverages, and branded merchandise are sold by a variety of vendors. Venue and event managers should encourage, and require where it is practical, all vendors to recycle packaging materials and to some degree take responsibility for the products they sell. Many venues and events have established programs for vendors to recycle corrugated cardboard packaging (OCC). This is a relatively easy material for vendors to recover since it remains under the direct control of the generating vendor, is easily size-reduced, and generally not dirty. Encouraging vendors to help with recycling of beverage containers is not as straightforward, but can be done. For example, some vendors pour beverages from aluminum cans, glass bottles and PET bottles into plastic or paper cups as they are sold, then keep the cans and bottles in recycling bins or boxes behind their counters for recycling pickup after the event. The recycling benefit of such an approach is obvious – the bottles and cans remain in control of a relatively few vendors in concentrated areas. Waste reduction, however, is not a benefit of such a strategy, as the cups still litter stands, parking lots, etc and take up space in trash cans. There is some potential for volume reduction of the waste, as generally cups are smaller than bottles and cans, they can be 'nested', and a certain number of commemorative cups will be retained by attendees and taken off-site.

Vendors may also generate steel, HDPE and PET non-beverage containers used for condiments, soaps, etc. that can also be recovered, although product residue can be an issue.

Vendors can assist with recycling in a number of ways:

- Hosting recycling bins for the types of containers they sell in their sales areas, and placing banners and signs advertising their support;
- Requiring their employees to wear buttons or apparel that encourages customers to recycle their bottles; and
- Selling beverages only in recyclable containers.

The benefits and challenges of instituting vendor and merchandiser recycling are summarized in Table 10.

Table 10 - Benefits and Challenges of Vendor and Merchandiser Recycling

Tactic	Benefits	Challenges
Vendor and Merchandiser Recycling	• Can approach 100 percent recovery of beverage containers if beverages are poured into cups and containers kept at vendor stand. • OCC recovery is relatively easy and can motivate vendors to accept recycling. • Vendors can be involved in hosting recycling bins in their areas and motivating consumers to recycle by displaying buttons, apparel, signs, banners, etc. that encourage and promote recycling.	• Pouring beverages into cups introduces another waste material into the stream. • Waste collection and disposal costs are not greatly reduced if amount of trash is not reduced. • Does not recover containers from beverages brought in to the facility or event location. • Bins placed near food vendors risk contamination with food.

3. Event-Based Campground Recycling

Some events and venues will include camping areas where attendees stay for one or several nights. These are special situations found mostly at automobile and motorcycle racing venues (both NASCAR and road course tracks), rural music festivals, and some amusement parks. Some of these facilities will provide only primitive camping for tents, and some will provide full hook-ups for large motor homes. At some events it is possible to find both of these types of campgrounds along with fields where motor homes and RVs park but have no hook-ups. Campers can be a potential source of a significant volume of recyclable beverage containers, since they are usually allowed to bring in all supplies they will need for the duration of the

activity. However, they will also generate solid waste consisting of more food waste and household-type waste than typically found at similar venues.

Campground recycling can be accomplished in several ways. The simplest method is to place recycling bins around the campgrounds next to trash cans, possibly in "kiosk" or cluster arrangements along with flags or signs on poles to direct users to these bins. These bins would be serviced when the trash cans were serviced. Some facilities do not provide trash cans in campgrounds, however. Providing stand-alone recycling bins is risky, with a high probability of the bins being used as trash cans.

A second method that is more hands-on and potentially can provide more recycling education is to set up incentive-based recycling redemption areas and award small prizes or rewards to campers who bring bags of recyclable beverage containers to the sites. This method requires setting up these redemption points and staffing them at set time periods, as well as a sponsor to provide the give-aways. The incentives can be very inexpensive and still appreciated, for example posters of popular NASCAR drivers.

The most costly but possibly most effective method in the long term is to set up a "curbside" collection program in the campgrounds, where campers are individually given recycling bags when they check in along with information about which materials to include and where/when to place full bags outside for collection. This method requires more resources, including a truck or golf cart and personnel to carry out the collection task. Some campgrounds at events do provide daily curbside trash collection for RV campers – recycling as an adjunct to such trash collection could make campers feel right at home. One risk of bag-based campground curbside collection programs is that some campers will consider the recycling bags as nothing more than extra, free trash bags. A method for dealing with trash-filled recycling bags must be put in place – either they can be left behind, or collected anyway and then discarded. Leaving them behind is risky because of the limited ability of recycling staff to leave notes or "sorry" stickers such as those used for household curbside programs. Collecting them is risky because if they are not discarded at some point on-site and end up at the market facility, it will contaminate the recyclables and possibly lead to the conclusion that recycling is not feasible at campgrounds. Some middle ground that does not require excessive staff time must be agreed upon in advance by the affected stakeholders.

Regardless of the method or combination of methods chosen, campers will need some information and instructions about how to find and use the specific recycling opportunities provided. Ideally, as campers check in they could be issued recycling information and, if curbside is to be used, a supply of recycling bags. Reaching every camper can be complicated by the fact that at some venues, campers who have reserved and paid for their sites in advance do not check in, but proceed directly to their sites. In other situations, campers may line up hours in advance of facility gates opening up, and once the rush begins any activity that could tie up traffic is usually strongly discouraged. Recognizing these constraints, recycling planners should consider other ways to provide information, such as:

- Post on the venue's camper registration web page;
- Distribute with bags at the redemption centers;

- Recruit volunteers to walk up and down lines of campers waiting at gates; and
- Piggy-back on outreach efforts of other organizations such as on-site ministries.

Table 11 summarizes the benefits and challenges of establishing beverage container recycling programs in event campgrounds.

Table 11 - Benefits and Challenges of Campground Recycling

Tactic	Benefits	Challenges
Campground Recycling	• A significant number of recyclable beverage containers are brought into venues by campers. • Education can be provided to campers through incentive programs and through direct personal contact by "curbside" collectors. • Providing curbside collection of recyclables will mimic what many campers have at home, and possibly encourage participation.	• Bins are not feasible if campgrounds are not provided with trash cans. • Sponsors are needed for incentives. • Staff involvement increases with the provision of incentive redemption areas and curbside recycling. • Food and trash contamination can be a serious problem. • Stakeholders must be creative in developing ways to communicate with campers to instruct them about recycling and to provide recycling supplies, if appropriate.

4. Recycling On-Site at Clubs, Restaurants and Suites

Most fixed venues offer special areas where attendees may obtain full-service food and beverage. These may include clubs that require membership or a ticket upgrade; restaurants that may or may not restrict entry, and suites that are usually available only to permanent seat holders, including individuals and corporations. These areas are usually serviced by the on-site contract catering service, which may be a company such as Aramark or Sodexo, or may be operated by the venue itself.

Recycling for beverage containers may be offered in clubs, restaurants, and suites, but a careful examination of the specific facility and its service protocols must be made in order to place the appropriate recycling tools. Restaurants with table service, for example, will most likely recycle beverage containers behind the counters, and customers will not be involved. Suites usually provide food buffet-style, and may provide self-service beverage coolers or full beverage service.

Providing bins in suites and some clubs is appropriate if customers have access to self-service beverages. Depending on the size and configuration of the venue, there may be a large number of suites. The number of bins deployed for each suite will depend on both the amount of beverage served, space available, and the frequency of recycling pick-up. At some events, janitorial service for suites is not provided until the end, and while food service is going on the catering company personnel handles trash removal as well as food delivery. These workers must be trained in servicing recycling bins, and this must become a part of their normal job for events. The management of the catering companies must be included in stakeholders meetings so that their role in the overall recycling program is understood.

In many cases, suites and clubs have special needs that will dictate the types of bins that can be used. Usually, they must be aesthetically pleasing, although high standards in this case typically don't apply to trash cans, so it should not be a sticking point. It is also very important that the bins do not leak, and that full bags, when removed, do not leak, since floors may be carpet or hardwood. Bags removed from bins can be collected at the same time, and in the same manner, as the trash bags. Usually wheeled plastic containers, sometimes called "whales," are employed for this task. Table 12 outlines some of the issues involved in club, restaurant and suite recycling.

Table 12 - Benefits and Challenges of Club, Restaurant and Suite Recycling

Tactic	Benefits	Challenges
Club, Restaurant and Suite Recycling	• A significant number of recyclable beverage containers may be sold in these facilities, depending on the size of the venue. • Education can be provided to another subset of attendees.	• Catering personnel must be trained. • Bins of specific design should be used, suitable both practically and aesthetically. • Bins must be serviced carefully to avoid leaks and spills. • Food and trash contamination can be a problem.

5. Post-event Recycling

Introduction

Because they are effective, it is important to provide an introduction to post-event recycling programs and explain how they work, and why they are used. Post-event recycling involves a comprehensive effort to recover recyclable beverage containers from the mixed trash left behind in seating areas, parking lots, and other gathering places by venue and event attendees. These recycling initiatives are often poorly understood or opposed as supporting negative behavior by not discouraging the practice of fans leaving their trash at their seats or on the ground. However, both pilot and permanent programs have shown that these "picks" can be extremely successful in terms of capturing tonnage – for example, a test at a NASCAR race showed that 92 percent of the recyclables collected were recovered by the post-event pick and only 8 percent of the recovered material came from the recycling bins.

Post-event picks do not involve public participation in material separation and recovery. Objections may arise from those who feel that recycling is more important as a tool for educating the public about environmental issues than for actually recovering tonnage. Other individuals feel that allowing fans or attendees to leave trash at their seats during an event also encourages other littering behavior, such as throwing trash from car windows. Post-event picks would not be necessary, the argument goes, if enough trash cans and recycling bins were provided along with public education to teach and encourage consumers to use them. While the value of a properly educated and engaged public is undeniable, the process of getting there is a long-term effort. It will take time before recycling reaches the point of 100 percent participation and zero percent contamination. Changing the behavior of 70,000 fans at a football game, for example, is unlikely to happen over the course of a game or even a season. In the short term, while these behaviors are being assimilated by the event-going public, other tactics that recover significant recyclable materials will allow the economic infrastructure of recycling to grow.

Post-event picks should be used in conjunction with recycling bins, if venue or facility management will support this two-pronged strategy. Attendees who are recycling-aware and wish to use recycling bins will then have the opportunity to do so. However, it should be recognized that the purpose of a special event is to allow attendees to enjoy the activity. If their enjoyment includes proper management of their discards, that is excellent. If their enjoyment does not include proper management of their discards, but an effort is made to educate them as to how to accomplish this and opportunities are provided for them to practice such new behaviors, this is a worthy endeavor. However, even if no effort or opportunity is provided to allow attendees to recycle and to learn about it, it is still desirable to recover their discards for recycling rather than allow them to be discarded.

If a decision is made to pick beverage containers after the event, the planning group or stakeholders should discuss with venue management whether to inform attendees that containers left at their seats will be recovered and recycled. This can be done at low cost by placing posters at beverage sales locations and having personnel wear buttons or t-shirts with the message. Many fans who assume that if there are no bins, there is no recycling will be

pleased to hear that their containers will nevertheless be recycled. Some fans who are dedicated recyclers may object because they do not understand; a short article in the local newspaper or venue program or newsletter can provide the necessary background information. In venues that also provide bins, news that additional recycling also occurs will most likely be received positively by attendees.

For the purposes of this discussion it is assumed that the value of recycling in diverting tonnage from landfills and back into economic uses is equal to its value as a teaching tool for environmental values. It is a fact that a portion of the admission fee or ticket price every event or venue attendee or participant pays is used to clean up the area around their feet and remove the trash.[7] It is logical that separating and removing recyclable beverage containers is a positive add-on.

Concept and Methodology

Post-event recycling can be done in grandstands, parking lots, other merchandising areas, or any area in which people gather in large numbers and trash may be uncontained. Cleaning up without recycling is straightforward. Some time after an event, a crew of individuals is assigned to remove trash from every area under the control of the event or venue. The clean-up methods vary widely, depending on the type of venue or location. Mostly it involves no tools or machines except rudimentary tools such as litter sticks. Crews consist of individuals picking up each piece of trash. In parking lots or streets, crews with simple machines such as leaf-blowers may arrange the trash in piles for pick-up with shovels; or may use vacuum trucks, loaders or other mechanical means of picking up the trash.

Cleaning up with recycling can be equally straightforward and is based on the reality that most trash is manually picked up piece by piece. Thus picking and placing the recyclables in separate bags should add little if any additional cost. Proper planning of a post-event pick involves utilizing the existing method and crew with as little disruption and added costs as practicable to pick up the recyclable containers separately. Since each discrete item is already handled individually, sorting these items in real time and placing them in different bags or containers will not present complicated logistical challenges to crews or managers.

The primary initial objection of venue managers and clean-up contractors to post-event picks is the cost. Frequently clean-up contractors inform management that adding a post-event pick will double the cost of clean-up. This tends to occur because the companies are usually uninformed about how to organize a pick. In most cases, once they have seen one done they understand that it costs very little more than a regular clean up since it involves the same

[7] In evaluating the wisdom of post-event clean up and recycling, it is interesting to consider the logistical challenges that would occur if every fan actually did bring all of their trash and all of their recyclables up to the concourse and did not leave any at their seats. Most likely, the number of trash cans provided would have to be tripled, at least, and many recycling bins provided. Crowding on stairways and in concourses would also be an issue. Even if fans spread out their trash-carrying duties over the course of the event and during other trips to the concourse, it still would involve more disruption of seating, more traveling, more blocked views and more noise.

amount of trash, very close to the same number of plastic bags (recycling bags distinguished from trash bags by using a transparent blue, green or clear bag), and does not require more personnel as long as the crew is large enough to efficiently hand-pick the area in the first place.

Choosing the right bag for picking up recyclable beverage containers is crucial to the program's acceptance. Standard black trash bags absolutely must not be used. They are not strong enough, and will encourage trash contamination. Even if care is used and only recyclables are collected, when full and tied off there is no way to distinguish them from bags full of trash. Recycling collection bags must be large enough so that they don't fill too quickly, yet compact enough to fit between rows of seats in a stadium. They also must be strong enough to withstand the weight of the containers, some of which will contain residual liquids, and occasional dragging on the ground or snagging on a seat. For indoor recycling picks, extra-strong leak proof bags are sometimes required by venue management. Bags should be translucent, and of a different color than bags used for trash.

NAPCOR testing identified, through trial and error, suitable bags for picks that had the following characteristics[8]:

- Translucent green
- Measured 47 inches by 28-1/4 inches
- Made of linear low-density polyethylene (LLDPE)
- 1.5 mil thickness

If there is an additional cost for a post-event pick, it will most likely be the bags. These specialized bags will cost a few cents more than standard black trash bags. Reusing post-event pick bags is feasible if done with care. At the Metrodome in Minneapolis, material is de-bagged on site and bags are reused when possible.

Example of a pick

The contracted cleaning company, or the personnel assigned to the clean-up if there is no contractor, are instructed to break into two groups, with the first group picking up recyclables in the special recycling bags, and the other group following behind and picking up the remaining trash in standard trash bags. It may take a couple of trials to determine the right balance of workers in each group so that the recyclers stay ahead of the trash pickers. Some stadiums like Coors field have trash bags waiting for the recyclers when they finish that they then use to work back toward the trash pickers. In large stadiums, post-event recycling picks are done by a "sweep" method, where crews move horizontally across the stands servicing two rows at a time, until they have come full circle. If there are not enough employees to assign one to service two rows, (to some degree this depends on the design of the facility),

[8] Other colors, sizes and thicknesses may be appropriate for specific situations and locations; however, these bags were determined to work under demanding conditions and would be a good starting point for a new program.

then crews can clean and pick recyclables by seating section. Full bags of recyclable containers are transported to the recycling storage container usually by a train of carts.

In venues where a pick is used in combination with bins and pre-event recycling, it may be useful to use different colored bags for the picks and for the bins, if possible, so that tonnage recovery and contamination from picked material can be tracked separately from bin material.

There are two variations on the pick method that inexperienced venue operators or contractors may insist on trying. One is to allow the clean-up crew to make one pass of the facility picking up recyclables, and then an immediate second pass picking up trash. The second variation is to give each member of the clean up crew two bags, one for recyclables and one for trash, and expect them to pick up both at the same time. The first variant doesn't work because it involves two trips around the facility for each individual crew member. As soon as crew members realize this, they discontinue the recycling pick and go back to their normal routine as a matter of self preservation – one trip around a stadium or event area picking up trash is very hard work, and few would to do it twice. The second variant doesn't work because carrying and managing two bags at once is slow and clumsy. The workers soon realize that the new method is slowing their pace, and, wanting to finish as soon as possible, they abandon one bag. These less efficient methods are an area for concern, because worker fatigue may become an issue if the pick takes too long. If this occurs, inexperienced venue management will sometimes terminate a recycling effort if they perceive that the clean-up will not be completed in the time allotted.

One important exception to the rule is that in less structured settings, such as parking lots and spectator standing areas, the two-bag method can be used. Each worker can be given two bags and instructed to fill the black bag with trash and the translucent bags with recyclables. There is no disadvantage in doing it this way in these particular circumstances, since there are no seats restricting workers' movement, and their paths may be meandering rather than in straight lines. They can drop full bags any time and in any place for later collection.

Some facilities still use blowers or even water hoses to move the trash from the seats and rows into large piles at the bottom of the stands, although this practice is becoming less popular due to the fact that it often leaves as much of a mess as it cleans up due to sticky food residue getting spread around. The cost of water and power are rising as well. It can be more difficult to sort piles of trash for recyclables, and very unpleasant if the trash is wet. These methods should be discouraged. Parking lot clean-ups that use blowers to concentrate trash in piles for pick-up with small loaders, or may utilize vacuum equipment, can also leave piles that are more difficult to sort.

Challenges:

It is worth repeating here that one vital key to acceptance of the post-event pick by management is an understanding that if the cleaning crew is sufficiently staffed to perform an efficient clean-up, the labor costs for a pick should be no more than a normal trash pick-up (since there is the same amount of trash, and the same number of bags). Recognizing that in many cases clean-up crews may be lean due to circumstances beyond venue managers'

control, post-event picks may be done with fewer personnel by slightly modifying the logistics. Using a stadium as an example, instead of using a sweep of the entire seating bowl, the stands can be cleaned by section, with each crew member working one section, two rows at a time. There are most likely other variations that can get the job done. Each venue has a unique configuration that may require slightly different logistics. For example while the above discussion has been about large professional sports venues, road races and marathons require this type of trash pick-up as well

The challenges that may be encountered in planning and organizing a pick are summarized in Table 13.

Table 13 - Benefits and Challenges of Post-event Recycling

Tactic	Benefits	Challenges
Post-event Picks	• Suitable to recover recyclables from seating stands, where the norm of behavior is for spectators to leave trash at their seats, and from parking lots where litter is common and the number of trash cans is usually inadequate for the amount of trash. • Can have very high levels of recovery for minimal cost. • Hand-picking ensures very little contamination.	• Convincing management and cleaning contractor that cost of a pick will be minimal. • Not suitable for areas where patrons normally deposit trash in trash cans, such as suites and hospitality areas. • Can be difficult to get buy-in from stakeholders who strongly associate recycling with bins. • If not paired with a bin program, leaves no option for the person who wants to “do the right thing” and places all trash, including recyclables, in trash can. • Insufficient resources allocated to the original clean-up task in the first place can make incorporating picks difficult and more costly.

F. Venue/Event Beverage Container Recycling Program Models

1. Category 1: Outdoor Sports Stadiums, fixed seating

Example 1: Miller Park, Milwaukee, WI
Example 2: Safeco Field, Seattle, WA

Description

This category includes outdoor, fixed-seat sports stadiums and arenas. Examples of events held at these venues include football, baseball, soccer, NASCAR auto racing, track and field events, bicycle racing, dog and horse racing, and similar activities. These types of venues also frequently provide opportunities for events such as concerts, religious gatherings, and others in order to maximize utilization and revenue.

Boundaries and Activity Zones

These types of facilities may be characterized as having structured boundaries and activity zones. The boundaries may be flexible – for example, parking lots may be set up in grassy fields on an as-needed basis – but it is recognized that there are property boundaries. Activity zones can be characterized as follows:

- Parking lots
- Outdoor merchandising areas
- Outdoor hospitality function areas
- Entry points
- Sales and service concourses within the structure
- Private hospitality areas and clubs within the structure
- Spectator seating areas

Beverage container recycling can be successfully integrated into each of these zones, but will be approached somewhat differently in each one.

Overall Recycling Approach

Beverage container recycling may be phased-in or introduced all at once, depending on the support and resources available to program planners. A combination of participatory tactics and non-participatory tactics is appropriate for these facilities.

Participatory tactics will include:

- Recycling bins
- "Pass the Bag"
- Merchandise or other incentives

Non-participatory tactics will include:
- Pre-event pick
- Post-event pick
- Vendor recycling

The "culture" at these events influences the recycling methods to be used. While recycling bins are desirable in terms of emphasizing that recycling is taking place and providing a method for people who are already dedicated recyclers and will use bins, they should not be relied upon exclusively as the recovery tactic at these types of facilities. Too often, inexperienced program planners focus immediately on the placement of large numbers of recycling bins at venues, without due consideration of how to prevent contamination and what to do with contaminated recyclables. Although use of proper recycling bins is still the most cost-effective collection method, if a critical mass of beverage containers is present, bins must be collected full, and free of contamination, if the bin method is to be efficient.

Collection Infrastructure

Recycling Bins

Locations: Concourse, private suites, food service areas.

Serviced by: Stadium clean-up contractor or personnel, food service or catering personnel in areas where they have control.

Method: Recycling bins can be installed fairly quickly at venues. Bins are placed and serviced by janitorial or food service contractor, or facility employees. They must be lined with translucent bags (which may be clear, green, or blue and may or may not be the same as bags used for other collection tactics), and be equipped with instructional signage. A bin should, ideally, by placed next to each trash can. When full, bags are removed from bins and transported to the recycling storage area or a large container such as a roll-off. The contents of the bags may be emptied into the container, or the bags may be placed into it. Some venues report that wasps and flies become an issue if the material is de-bagged.

Challenges:
- Avoiding contamination by trash;
- Ensuring that bags of recyclables are taken to proper area and not disposed;
- Integrity of bags to prevent leakage during use and transport; and
- Perceived or actual lack of space in suites and food service areas for recycling bins.

Pass-the-Bag

Location: These initiatives take place in the grandstands of the stadium. They are usually implemented during breaks in the action, for example the seventh-inning stretch in baseball or halftime in football. For minor league sports, they can be a part of family-oriented activities that often take place during breaks.

Serviced by: Ushers usually staff these activities. Sometimes a team mascot is involved. Less frequently, volunteers can be used.

Method: The usher or volunteer with recycling bags starts at the bottom seats of the stadium grandstands and passes the empty bags to fans along rows with the encouragement to put recyclable beverage containers in the bags and pass them along. As bags are filled, they are carried by another volunteer up to a staging or storage area. An audio-visual prompt is used to encourage participation, usually on the big video screens surrounding the stands.

Challenges:

- Motivating fans to participate;
- Fans exiting and entering rows and climbing stairs during breaks acting as an impediment to bag movement and vice versa;
- Getting fans to understand that the bags are for bottles and cans only and not garbage; and
- Moving bags as they get full and heavy and may leak.

Benefits:

- Reduces cleaning costs and safety issues.

Pre-event Recycling

Locations: Tailgate parties in parking lots; temporary corporate hospitality areas, venue entrances.

Serviced by: Stadium clean-up contractor or personnel; or volunteers with local charity; or local government recycling personnel, along with catering personnel in corporate hospitality locations.

Method: A combination of bins and picks can be used, depending on the size of the facility and available resources. Bins should be monitored by volunteers, if possible, and need good signage. Frequently, pre-event recycling is the first recycling program to be established at these venues due to the fact that it can be done by volunteers, or sometimes by charity or social service groups, and does not impact existing venue solid waste practices. However, program planners should be cautioned that pre-event recycling is only one element of what is, ideally, a comprehensive venue-wide beverage container recovery effort.

Corporate hospitality areas and events will incorporate catered food and beverage service, and catering personnel may be trained to service the recycling bins. Beverage companies may be recruited to sponsor recycling activities at these corporate events; therefore, it is important that the initial data-gathering phase of planning include a determination of who sponsors these areas, which beverages are served and what types of beverage containers are used.

A small vehicle such as a golf cart or four-wheel drive utility vehicle will be needed to carry full bags to recycling storage containers. Clean-up picks can be done using the same

number of employees usually used to pick trash off the ground, by giving them different colored bags.

Multiple bins placed at venue entrances will provide containers for fans who wish to drink their last outside beverage up until the last minute. These containers will fill quickly once the rush to the gates begins just prior to the start of the event, and staffing should be allocated accordingly.

Challenges:

- Distraction of "party atmosphere" contributing to contamination in bins;
- Crowds and traffic impeding servicing of bins;
- Weight of glass bottles and issues with broken glass;
- Possible vandalism of bins;
- Perceived or actual lack of space for recycling bins in corporate hospitality areas; and
- Training catering staff to be responsible for monitoring recycling bins

Post-event Recycling

Locations: Grandstand seating, parking lots, other merchandising areas.

Serviced by: Stadium clean-up contractor or personnel, volunteers.

Method: Post-event picks involve picking up recyclable beverage containers from trash left after attendees depart. In large stadiums, post-event recycling picks are done by a "sweep" method, where crews move horizontally across the stands servicing two rows at a time, until they have come full circle. The contracted cleaning company, or the personnel assigned to the clean-up if there is no contractor, are instructed to break into two groups, with one group getting a 20-minute or so head start and picking up recyclables, and the other group following behind and picking up trash. A similar method of "roving crews" can be used to pick recyclables from parking lots. If the cleaning crews are sufficiently staffed to perform an efficient clean-up, this method costs little or no more than a normal trash pick-up, although the recycling bags may be slightly more expensive than standard trash bags.

Full bags of recyclable containers are transported to the recycling storage container. In venues where a pick is used in combination with bins and pre-event recycling, it is advisable to use different colored bags so that tonnage recovery and contamination from picked material can be tracked separately from bin material.

Using the presence and resources of an already paid-for cleaning crew that hand-picks every piece of trash from the seating areas to perform a recycling pick can yield very high recyclable recovery levels at very low – or no – added cost.

Challenges:

- Convincing the contractor and stadium management that a pick will not be significantly more costly than current clean-up procedures;
- Training of crews;

- Ensuring that sufficient employees are present to perform an efficient pick;
- Perception that picking up recyclables is not "real" recycling since attendees do not participate;
- Adapting recycling to clean-up procedures that move trash into piles.

Campground Recycling

Locations: Camping areas for overnight guest in RVs and tents, primarily at large motorsport events that last multiple days.

Serviced by: Facility clean-up contractor or personnel and waste hauler, along with volunteers with local charity or local government recycling personnel.

Method: A combination of bins, incentives, and curbside bag collection can be used, depending on the size of the campgrounds and availability of trash cans as well as other resources. Bins, if used, need good signage because staffing will be impractical due to the size of the campgrounds (Texas Motor Speedway, a NASCAR track, hosts 14,000 camping units on several hundred acres of campgrounds during a major race). Incentive programs, using small rewards tied in with popular drivers or performers, can encourage campground residents to deliver recyclables to redemption centers in the campgrounds. These centers must be staffed during certain hours, must be easy to find, and must have storage for a certain volume of recyclables. If enough centers are established, they are open and publicized during morning and evening hours when campers are likely to be in the campgrounds, and the prizes are good enough, redemption centers can eliminate the need for more expensive curbside recyclables collection.

Curbside camper collection involves picking up bagged recyclables daily at each individual campsite. It can be time-consuming and expensive, especially in spread-out campgrounds. At some venues, including both Texas Motor Speedway and Lowe's Motor Speedway in Charlotte, North Carolina, a few select campgrounds provide daily trash collection service. Integrating curbside recycling collection in these areas is easier because an existing service provider is already making the rounds for picking up trash and recycling is easy to add, and because curbside recycling may be familiar to a number of campers. Recycling planners should be aware that some campers will consider recycling bags as just more free trash bags. Stakeholders should agree on a policy for handling recycling bags full of trash so that they don't end up at the recycling market facility.

Staff for campground recycling programs will need vehicles to manage the recycling, either golf carts with adequate capacity, utility vehicles, or pick-up trucks. Clean-up contractors or waste haulers can be recruited to accomplish these tasks, but revenue will not cover their costs. Campground programs will generally be an addition to the overall solid waste management and recycling program budget.

Challenges:

- No trash cans in campgrounds to pair with recycling bins;

- Difficulties finding volunteers or paying for staff to supervise incentive/redemption centers;
- Cost and time necessary for curbside recycling in campgrounds; and
- Possible contamination.

Promotion/Education

The level of promotion and education (P&E) of recycling programs varies at sports venues. All stakeholders should be involved in determining the level and type of educational materials to be provided. In this area, the local government recycling coordinator should be prepared to be the strong advocate, as some other stakeholders may not realize the value of P&E.

Some sports stadiums prefer to do no education or promotion because they do not use bins or incentives but allow all recycling to occur "behind the scenes". Two examples are Bank of America stadium, home of the Carolina Panthers football team and Miller Park, home of the Milwaukee Brewers baseball team. Venue management may believe that if they advertised the recycling program, fans might demand recycling bins, or think that a behind-the-scenes recycling program is ineffective, or both. If there are no participatory recycling opportunities, designing educational messages can be challenging.

If education and promotion are a priority for the venue management, support for P&E should be a cooperative effort among various stakeholders, including venue management, beverage suppliers, the local government recycling program, the hauler and/or market, and the container industry. Costs should be shared.

Appropriate messages for the expected audiences should be agreed upon, and once they have been developed the tools, or channels, by which the messages will be delivered should be decided upon and a budget developed. Channels can include:

- Signs on bins, or on poles next to bins
- Posters in suites and food service areas
- Notices in event programs
- Information on electronic on-site devices
- Press releases and other outreach to local news media
- Information/articles in venue newsletter and print items
- Point of sale messaging: t-shirts, pins, stickers, etc.

Beverage companies frequently can contribute sponsorship to the recycling education program and may be able to provide a celebrity spokesperson as a recycling promoter. If these opportunities do arise, discussion among the beverage company, venue management and the recycling coordinator should occur in an effort to develop a promotional program that meets everyone's needs to the extent possible. The influence of a popular brand or recognized celebrity should be acknowledged.

To date, there has been little significant push-back from fans or local government recycling coordinators directed at venues where recycling occurs but no promotion is done (using picks

only). However, as awareness of new environmental issues such as global climate change grows, stadium managers may want to institute promotional programs to show the community that they are "doing their part".

Campground recycling requires a special dedicated education program if redemption centers with incentives and/or curbside recycling will be used. Campers must be informed of incentive programs and instructed as to where redemption centers will be located, what materials are accepted, and what it takes to win the prizes. For curbside recycling, the recycling bags as well as detailed instructions must be provided to each camper. Instructions can be printed on the bags themselves. Distribution is ideally done as campers check in, but where this is not feasible redemption centers or other locations can be established for campers to pick up their bags and receive instructions. Recycling promotion and information can also be provided to campers on the venue web sites where campers pre-register.

Budgeting and Tracking Costs

The ideal situation for budgeting and tracking costs would be to identify cost centers for each area or activity that contributes to the recycling efforts and budget them separately, then combine into an overall budget with revenues specific to each area or activity also identified. For example, promotion and education is expected to cost X dollars, which will be provided as in-kind services from the beverage company.

In actuality, many costs will be combined in programs such as these, and some will be impossible to identify and budget. In some cases, local governments may provide the recycling containers, hauling and processing and not bill for these services. Some facilities have solid waste services and hauling contracts that charge a fixed fee per event, or even per season. Avoided disposal costs are impossible to identify and track under such arrangements, and facility managers will continue to pay the fixed fee even if the amount of trash is significantly reduced. These situations can reveal opportunities for improvement that should be corrected when a recycling program is made permanent.

In part due to such issues in identifying costs, stadium management may cover any incremental clean-up costs for a post-event pick, and not identify what those costs are beyond acknowledging that they do exist but are not large enough to be problematic.

The Seattle Mariners (see case study below) developed a comprehensive spreadsheet for tracking the costs of their recycling program. It included costs for labor and consumables but most significantly also credited the recycling program with the *avoided disposal costs* that accrued from not disposing of collected recyclables with trash. A copy of this spreadsheet is included as an Appendix to this report.

NAPCOR, in its early work in venue and event recycling in the late 1990's and early 2000's, offered an arrangement to stadium and event managers that in return for allowing NAPCOR staff to coordinate demonstration projects of various recycling program elements at their facilities, NAPCOR would pay for any incremental labor costs associated with post-game picks. NAPCOR also supplied collection bags for the various collection elements, and

assisted the venue or event in finding suppliers or sponsors for recycling bins, incentives, and other program features. This offer overcame the main objection of many event managers who were concerned that they would encounter significant labor costs for post-event picks and other recycling program elements recommended by NAPCOR staff. NAPCOR actually paid out very little in funds to venues as a result of this agreement. Most venue managers, particularly in stadiums, found that to their surprise the incremental costs of post-game picks did not add significantly to the labor costs for the overall clean-up. They initially billed NAPCOR for minimal amounts, then absorbed these small incremental costs when they saw the positive results from the recycling programs. As one stadium manager put it, "I know there must be additional costs, but I can't find them."

Category Examples

Miller Park, Milwaukee, WI – Miller Park is the home of the Milwaukee Brewers baseball team. The venue, only six years old, features 41,900 seats along with 30 permanent concession stands and 70 luxury suites. Fans are allowed to bring only non-alcoholic beverages into the facility in small, soft-sided coolers. Only plastic bottles, no cans or glass, are allowed to be brought in. Recycling has been in place at Miller Park since it opened. The facility is privately owned and operated, but recycling is managed by the city of Milwaukee. Bins are provided, but the bulk of the recyclable material is recovered during post-game picks, which are organized by the facility's clean-up contractor. The bags of bottles are placed in a city-owned roll-off and taken to the Milwaukee MRF where the bottles are de-bagged and processed for market at no charge. The stadium provides no public education or promotion for the recycling program. The following PET tonnages have been recovered:

2004: 30.59 tons
2005: 43.23 tons
2006: 45.47 tons

Recovered tonnages for 2007 were not known prior to the publication of this report, but by September, they had already exceeded 2006 totals.

Safeco Field, Seattle, WA – Safeco Field is the home of the Seattle Mariners baseball team. Its seating capacity is 47,116. The stadium features 62 concession stands, 26 kiosks, one restaurant and one pub. No bottles, cans or outside beverages are allowed to be brought in to the stadium, with the exception of small "juice box" types of containers for children's beverages. The Mariners pioneered stadium recycling in the late 1990's, shortly after the facility was built in 1997. Using a combination of recycling bins, post-game picks, and pass-the-bag programs, the Mariners have consistently achieved high beverage container recovery levels. PET bottles are kept separate and are picked up by a local IPC that pays the Mariners per pound based on a price index. The Mariners operations management carefully tracks recycling tonnage and subsequent reduced solid waste costs. An analysis of the cost of recycling, the resulting avoided costs of disposal, and a rebate received for the value of the collected recyclables shows that the Mariners receive a significant positive economic benefit from recycling. A spreadsheet illustrating the Mariners' recycling tracking and results in 2002 is included in the Appendix of this report.

2. Category 2: Indoor Amateur/Professional Sports Venues, fixed seating

Example 1: Quicken Loans Arena, Cleveland, OH
Example 2: Hubert H. Humphrey Metrodome, Minneapolis, MN

Description

This category encompasses indoor, fixed-seat sports stadiums and arenas. These arenas may be used for both professional and amateur level sporting events, however the primary usage is professional basketball and hockey, with a handful of additional venues dedicated to tennis, jai alai, and track and field. To maximize utilization and revenue, these venues also provide opportunities for non-sporting events such as concerts, ice shows, rodeos, circuses, and merchandise fairs.

Boundaries and Activity Zones

These types of facilities may be characterized as having structured boundaries and activity zones. The boundaries are generally less flexible than for outdoor venues, because these indoor arenas are frequently located in cities or more urban areas. The main events occur indoors, so most trash is generated indoors. Generally space is also tighter and seats may be steeper in arenas devoted to basketball and hockey. Natatoriums may have limited seating of a more temporary nature.

Venues in these categories tend to be multi-use to a greater degree than outdoor facilities, because the weather is not a consideration. Seating and merchandising areas will be allocated according to the event type. Times of day during which activity takes place will vary depending on the event – afternoon for automobile shows and craft fairs, early evening for sporting events and later evening for music concerts. The audience will also vary – collectors and enthusiasts for merchandise shows and events such as auto shows, families for craft events, families and fans of all ages for sports events, and varying crowds for musical events depending on the performers.

Activity zones can be characterized as follows:

- Parking lots, which may be multi-use and not specifically dedicated to the venue
- Temporary outdoor merchandising areas for some events
- Temporary outdoor hospitality function areas for some events
- Entry points
- Sales and service concourses within the structure
- Private hospitality areas within the structure
- Spectator seating areas
- Floor-level exhibit or display space for merchandise shows and trade events.

Overall Recycling Approach

The indoor nature of these facilities will have an impact on trash and recycling collection logistics, mostly because care must be taken to avoid spills. Being shielded from inclement

weather is a benefit for events, but for recycling it means there is no rain to wash down the venue and clean up spills.

A combination of participatory tactics and non-participatory tactics is appropriate for these facilities.

Participatory tactics will include:
- Recycling bins
- Merchandise or other incentives
- "Pass the Bag"

Non-participatory tactics will include:
- Pre-event pick
- Post-event pick
- Vendor recycling

Generally these venues will host fewer outdoor activities such as tailgating and hospitality/merchandise areas. Vendor recycling can be instituted inside the facility for beverage container vendors. Recycling bins are popular at such venues, and are easier to manage due to the smaller size of the venue. Smaller audiences can be easier to educate about using bins and using them correctly. Incentives such as merchandise can be used very successfully at these smaller facilities, again because smaller audiences are easier to reach with recycling and promotional messaging. Pass the Bag programs have limited applicability for these venues. For sporting events, they can be used; however, they must be managed more carefully due to the risk of spills and the tighter seating. For some venues such as natatoriums, Pass the Bag is not appropriate. It would also not work well for events where spectators mingle, such as craft fairs and merchandise shows that also take place at these venues.

Pre-event picks will also be limited in their usefulness for these venues, with limited opportunities for tailgating or outdoor activities adjacent to the venue.

As in the larger outdoor venues, the "culture" at these events influences the recycling methods to be used. While recycling bins are desirable in terms of emphasizing that recycling is taking place and providing a method for people who are already dedicated recyclers and will use bins, they should not be relied upon as the primary recovery tactic. These venues also employ clean-up crews for after the event.

Collection Infrastructure

Recycling Bins

Locations: Concourse, private suites, food service areas.

Serviced by: Stadium clean-up contractor or personnel, food service or catering personnel in areas where they have control.

Method: Recycling bins can be installed fairly quickly at venues. However, program planners are cautioned that recycling should not consist only of bins, due to the larger recovery potential of other methods. Bins are placed and serviced by janitorial or food service contractor, or facility employees. They must be lined with transparent bags, and be equipped with instructional signage. A bin should, ideally, by placed next to each trash can. When full, bags are removed from bins and transported to the recycling storage area or a large container such as a roll-off. Moving bags must be done carefully to preserve bag integrity and prevent liquid leakage. The contents of the bags may be emptied into the container, or the bags may be placed into it. Some venues will utilize indoor waste storage rooms, and some may use compactors with the feed chute in the building and the large container outside. Cleanliness and housekeeping can be critical in such facilities to avoid issues with insects and other pests, although generally these risks are greater for the trash component than the recycling component of the overall waste stream.

Challenges:

- Avoiding contamination by trash;
- Ensuring that bags of recyclables are taken to proper area and not disposed;
- Integrity of bags to prevent leakage during use and transport; and
- Perceived or actual lack of space in suites and food service areas for recycling bins.

Pass-the-Bag

Location: These initiatives take place in the grandstands of the stadium during sporting events. For minor league sports in these smaller venues, they can be a part of family-oriented activities that often take place during breaks. They are usually not suitable for other types of events that take place in these facilities, or for facilities that are structured differently such as natatoriums.

Serviced by: Ushers usually staff these activities. Sometimes a team mascot is involved. Less frequently, volunteers can be used.

Method: The usher or volunteer with recycling bags starts at the bottom seats of the stadium grandstands and passes the empty bags to fans along rows with the encouragement to put recyclable beverage containers in the bags and pass them along. As bags are filled, they are carried by another volunteer up to a staging or storage area. Audio-visual prompts may be used to encourage participation if the facility has video screens surrounding the stands. Activity on the playing floor can also serve to call attention to the program in these smaller venues, and may especially appeal to younger fans.

Challenges:

- Motivating fans to participate;
- Fans exiting and entering rows and climbing stairs during breaks can be an impediment to bag movement and vice versa;
- Getting fans to understand that the bags are for bottles and cans only and not garbage; and
- Moving bags as they get full and heavy and may leak.

Pre-event Recycling

Locations: Tailgate parties in parking lots; temporary corporate hospitality areas, venue entrances.

Serviced by: Stadium clean-up contractor or personnel; or volunteers with local charity; or local government recycling personnel, along with catering personnel in corporate hospitality locations.

Method: If pre-event recycling programs are appropriate for a particular event taking place at a smaller indoor venue, the same strategies and tactics used at larger outdoor stadiums will apply. A combination of bins and picks can be used, depending on the size of the facility and available resources.

A small vehicle such as a golf cart or four-wheel drive utility vehicle will be needed to carry full bags to recycling storage containers. Clean-up picks can be done using the same number of employees usually used to pick trash off the ground, by giving them different colored bags.

Multiple recycling bins placed at venue entrances will provide containers for fans who wish to drink their last outside beverage up until the last minute. These containers will fill quickly once the rush to the gates begins just prior to the start of the event, and staffing should be allocated accordingly.

Challenges:

- Distraction of "party atmosphere" contributing to contamination in bins;
- Crowds and traffic impeding servicing of bins;
- Weight of glass bottles and issues with broken glass;
- Possible vandalism of bins;
- Perceived or actual lack of space for recycling bins in corporate hospitality areas; and
- Training catering staff to be responsible for monitoring recycling bins.

Post-event Recycling

Locations: Grandstands, parking lots, other merchandising areas.

Serviced by: Stadium clean-up contractor or personnel, volunteers.

Method: Post-event picks can be an integral part of a comprehensive beverage container recycling program at these smaller indoor facilities. As in the larger venues, these picks involve gathering recyclable beverage containers from trash left after attendees depart. As in the larger venues, if the cleaning crews are sufficiently staffed to perform an efficient clean-up, this method costs little or no more than a normal trash pick-up (since there is the same amount of trash, and the same number of bags should be used). Recycling bags may cost slightly more than standard trash bags.

The most significant difference between a post-event pick in an indoor facility and one in an outdoor facility is residual liquids management. In some cases, during trash collection any bottles or cups with residual liquid are placed in the trash bag without emptying the liquid. The other trash in the bags absorbs some of this liquid and the bags contain the rest. Full trash bags are usually placed in watertight plastic rolling hoppers for transport to the trash receptacle. With this method there is still a risk of spills if the trash does not absorb the liquid and the trash bags are not robust enough to contain liquids. The trash bags also become heavy very quickly, increasing the risk that they will be dragged on the floor and possibly break open, releasing liquids.

In other venues during trash collection, liquid from cups and bottles is poured into buckets before the container is placed in the trash. While this practice virtually eliminates the risk of spills, it requires additional time and labor to empty liquids and manage the buckets when they get full. Although it may be counter-intuitive, this method of liquids management actually expedites the recycling process as workers generally place the empty containers at the end of the row for easier removal by the clean-up or recycling crew.

The recycling program planners for these facilities should take the time to be educated about which liquids handling method is used, and if possible, to witness a clean-up to judge whether the method of choice actually works. Recycling collection can handle the residual liquid either way, but collecting liquids in a bucket is preferable. Because there is no trash in the recycling pick bags, any liquids may be more likely to leak. Also, bags of empty containers are lighter and there is less risk of leakage.

Full bags of recyclable containers should be transported to the recycling storage container in watertight rolling bins if possible. In venues where a pick is used in combination with bins and pre-event recycling, it may be useful to use different colored bags so that tonnage recovery and contamination from picked material can be tracked separately from bin material.

Using the presence and resources of an already paid-for cleaning crew that hand-picks every piece of trash from the seating areas to perform a recycling pick can yield very high recyclable recovery levels at very low – or no – cost.

Challenges:

- Convincing venue management and their clean-up contractor that a pick will not be significantly more costly than current clean-up procedures;
- Training of crews;
- Ensuring that sufficient employees are present to perform an efficient pick;
- Perception that picking up recyclables is not “real” recycling since attendees do not participate; and
- Residuals liquid management.

Promotion/Education

Smaller venues, featuring mostly minor league or amateur sports, frequently do provide promotional and educational messages since most use both participatory as well as non-participatory recycling methods. The recycling messages will vary to some degree depending on the expected audiences. Given the variety of events held at these facilities, a diversity of opportunities exist for tying in recycling with enthusiasts, fans, and families.

Once the appropriate messages have been agreed upon, the tools or channels through which the messages will be delivered should be decided upon and a budget developed. Channels can include:

- Signs on bins, or on poles next to bins
- Posters in suites and food service areas
- Notices in event programs
- Information on electronic on-site devices
- Press releases and other outreach to local news media
- Information/articles in venue newsletter and print items
- Point of sale messaging: t-shirts, pins, stickers, etc.

Support for education and promotion should be a cooperative effort among various stakeholders, including venue management, beverage suppliers, the local government recycling program, the hauler and/or market, and the container industry. Costs should be shared.

As with large stadiums, the local beverage suppliers frequently can contribute sponsorship to recycling education program and can provide a celebrity spokesperson as a recycling promoter. If these opportunities do arise, discussion among the beverage company, venue management and the recycling coordinator should occur in an effort to develop a promotional program that meets everyone's needs to the extent possible. The influence of a popular brand or recognized celebrity should be acknowledged.

Budgeting and Tracking Costs

These smaller indoor venues face some of the same cost issues as the larger facilities described in Category 1. The perceived incremental labor cost for post-event picks may deter some venue managers from attempting them, but if one or two demonstration projects during typical events can be coordinated and the managers observe them and track the costs, they should see that the costs are actually minimal.

To cover the costs of recycling bins for these venues, beverage sponsors or suppliers should be approached. Usually they will cover these costs in return for the additional advertising gained. The soft drink industry, through its trade association the American Beverage Association (ABA) offers a bin of their own design that looks like a soft drink bottle and is available for purchase by soft drink companies or other entities.

Recycling bags may cost a little more than trash bags because of the additional features necessary, such as a specific thickness or strength, particular size, and a transparent color. However, since the use of recycling bags displaces the use of trash bags, the incremental costs are usually very small and can be accounted for with other consumable items.

Category Examples:

Quicken Loans Arena, Cleveland, OH – The home of the Cleveland Cavaliers hosts about 190 events per year. This is a location where the recycling program was initiated and implemented by the foodservice contractor, Aramark. Recovery of PET, glass and aluminum beverage containers from food preparation and vending areas, including clubs and restaurants, is done systematically in a commingled fashion. Bins are provided in the suites for beverage container recovery and larger, different bins are leased from the Arena's hauler and placed near vending areas on the concourses to collect PET beverage bottles that are sold without cups. Mixed paper is recovered from the offices and fryer grease is recovered and sold to a company that produces biodiesel. Other than the fryer grease, all recyclables are shipped commingled in a dumpster to a local single-stream MRF. Aramark staff has suggested to Arena management that a "pass the bag" collection at halftime, as well as post event picks, be implemented to complement these efforts. These will be considered prior to next season.

Hubert H. Humphrey Metrodome, Minneapolis, MN – The Metrodome is the home for the MLB Minnesota Twins and the NFL Minnesota Vikings, and hosts about 130 events per year. No cups are used except for HDPE souvenir cups that are collected along with the PET beverage bottles used for beer, water and soft drinks. Recycling bins are placed at the entrances as well as throughout the concourses. Different bins are used in the suites where aluminum cans are also collected. Cans and bottles that are generated at the vending and food preparation areas are collected commingled, along with the corrugated containers (OCC). PET bottles and HDPE cups are also recovered by a post event pick. In 2007 over 56 tons of commingled containers were shipped to a local MRF, in addition to 67 tons of OCC shipped separately.

3. Category 3: Outdoor Sporting Events, no fixed seating

Example 1: Cooper River Bridge Run, Charleston, SC
Example 2: Wachovia Golf Championship (at Quail Hollow Club), Charlotte, NC

Description

A diversity of event types fall into this category. They may include ski races, golf tournaments, Grand Prix and motorcycle racing, marathons, road races, beach volleyball, and surf competitions.

Boundaries and Activity Zones

Boundaries in such events are looser than for fixed venues such as stadiums and arenas. The main activity zone will be designated, but zones for spectators and the activities and services provided for them will vary considerably depending on the event and the particular venue.

For road course automobile and motorcycle racing, the main activity takes place on and around the course, which is usually long, up to three miles, and often integrated into hilly and forested terrain. Grandstands may be provided at the start/finish line area, but mostly spectators wander freely. The boundaries of the venue are fixed, but the area within the perimeter is very large. There will be areas of concentrated activity such as merchandise and foodservice tents. Beverage containers may be purchased mostly at these vendor areas, but will be consumed literally anywhere on the grounds. Spectators will be allowed to bring in food and beverages in any quantity they like, so recycling planners should be aware that any beverage sales numbers provided will be only a segment of actual container generation. Campgrounds may also be included on the property.

Golf tournaments operate on the same principal, and the activity zone will also be spread out over many acres, but consists of a grassy playing course instead of asphalt track. Generally the beverage, food and other merchandising areas will be more contained and controlled.

Road races such as marathons, half-marathons, 10K races and similar will be organized somewhat differently. They will usually occur on the closed streets of a city or town. Boundaries are non-existent, and spectators will wander in and out of range of the main activity. Vendor and merchandising zones will be concentrated around the starting and finishing lines, which may or may not be the same. In these events, as well as Special Olympics and extreme sports, participants and spectators will usually mingle and recycling services should be provided for use by both.

Overall Recycling Approach

Recycling bins are the most common approach for these types of events. Additional site clean-up activities may occur while the event is going on, and post-event clean-up recycling in parking lots and spectator areas immediately after the event. Recycling at entrances and exits will be less effective because beverages can be brought in to these venues. Often the impetus for recycling at such events and venues, especially those in cities and towns, is reduction of litter. Organizations that provide local litter clean-up and education should be included as stakeholders in planning recycling at these types of events.

In cities and towns with active curbside and commercial recycling programs, there is a greater opportunity for the local government recycling coordinator to be involved and bring resources to the event. For example, recycling bins could be loaned to the organizers for the event. Recycling coordinators often have their own supply of event recycling bins to lend out, or can work with their state or regional agency or state recycling organization that often have lending programs for bins. Additionally, it may be possible to offer material collection using the curbside or commercial recycling trucks on their regular routes, or to organize special pick-ups for these events.

Volunteers are often used extensively for road races for the following reasons:

- Events are short duration, and volunteers don't mind the limited commitment;
- Events are held on the streets of cities and towns, and often in city-owned parks and public spaces, so there is a concern that litter be picked up and removed and cities can usually help recruit volunteers for litter clean-up; and
- Participants' families and other running enthusiasts are usually involved in the local sponsoring club, which can recruit them as volunteers, giving them a job to do while on the site and providing rewards or validation for helping.

Volunteers may be used to collect full bags from recycling bins, to roam around the area picking recyclables from the ground, or to staff garbage/recycling "kiosks" and provide specific trash disposal and recycling instructions to attendees. The recycling tasks associated with these events, whether undertaken by volunteers or paid staff of some organization, will be one-time activities. Training specific to the situation will be required, because they will only have one time to get it right. The training must focus on ensuring that contaminated material (beyond what is allowed by the market) does not get into the recycling transport container. Drivers of the collection trucks must also be educated specifically as to the final destination for the recyclables.

Collection Infrastructure

Recycling Bins

Locations: All around the grounds or activity areas, including start/finish lines, and at vendor and merchandising sites.

Serviced by: Venue staff or clean-up contractor; waste hauler; local sponsoring organization; community litter organization or other volunteers; local government recycling program.

Method: Recycling bins should be placed next to every trash can. In some larger activity areas, the cost of such a large number of bins can be prohibitive, so as an alternative two trash cans and one recycling bin can be placed together in a "kiosk." These kiosks can be identified with signs or flags on tall poles that will allow attendees to locate them in crowds.

Recycling bins in these types of locations will usually be brought in and placed specifically for the event, then removed when the event is over. Therefore the bins must be owned and managed by some specific entity that is involved and will make sure that the bins arrive on time, are placed properly, are serviced regularly, and are removed at the end. Temporary easily-moved bins that disassemble and/or stack are most suitable for such events. Rarely will the event sponsoring organization own its own bins and manage them. Most of the time, either the local government entity will loan and manage recycling bins that it owns or has access to, or the private contracted recycler will assume these responsibilities.

Large containers to move the material to market must be temporarily placed at these locations. A place that is out of the way, yet convenient for gathering material, should be identified. Containers may be roll-offs, front-end loading dumpsters, trailers, or trucks – rented box vans or residential garbage trucks. The type of container will depend on the market that has ultimate responsibility for the material. Again, if garbage trucks or dumpsters are used, care must be taken to avoid accidental delivery of the recyclables to the disposal location (sometimes by the Monday morning driver mentioned in a previous section).

Challenges:

- Proper consumer education to ensure full use of recycling bins;
- Avoiding contamination by trash;
- Ensuring that bags of recyclables are taken to proper area and not disposed;
- Obtaining sufficient recycling bins to place next to every trash can; and
- Securing sufficient labor to empty them regularly.

Post-event Recycling

Locations: Seating areas if provided, parking lots, gathering areas and merchandising areas.

Serviced by: Hauler (public or private), clean-up contractor, volunteers, non-profit organization.

Method: Post-event picks can be conducted on the grounds or in any other spectator areas for these types of events. If litter and trash is normally hand-picked from the ground, post-event picks can be organized similarly to those at large stadiums – the clean up crew is divided up and half tackles recycling while half tackles trash. Alternatively, a two-bag system can be used, with each worker picking up both recyclables and trash. Since there is no fixed structure dictating the method and constricting worker movement, the two-bag system will work. Some events can obtain labor from local anti-litter organizations. In some cases, local

non-profit organizations are used as clean-up contractors in return for a donation to the charity. It is usually even easier to organize a pick using this donated labor, and the workers may personally relate to the recycling effort.

Challenges:

- Convincing event management and their clean-up contractor that a pick will not be significantly more costly than current clean-up procedures;
- Training of crews;
- Ensuring that sufficient personnel are present to perform an efficient pick; and
- Perception that picking up recyclables is not "real" recycling since attendees do not participate

Promotion/Education

Some events to provide comprehensive recycling P&E, but others prefer not to distract attendees from enjoying the activity by providing recycling education beyond instructions about how to use the recycling bins. Still, product vendors or suppliers can wear t-shirts or buttons that encourage people to use the available resources for recycling. The presence of recycling bins themselves with promotional signs affixed can serve an educational function.

Most events provide some literature or often a Website for participants and spectators that may be used for some brief recycling education. There is also usually a check-in where individual participants could be given a message about recycling.

Budgeting and Tracking Costs

Overall, the short duration of these events helps to keep costs of a recycling program to a minimum. In cities and towns, the recycling efforts frequently also take care of litter clean-up and thus so the costs may be absorbed into the municipal solid waste budget.

Costs for such events will include bins, staff to service bins, and hauling of materials to market. In many cases, the cities that host or sponsor the events will contribute bins on a loaned basis. Staff to set up, service, and break down bins are usually provided using volunteers associated with the sponsoring organization or the host city. These tasks can also be specified as part of the hauling contract for the recycling/solid waste service provider. Storage containers are needed for very short times at these events, so associated costs should be minimal.

Category Examples:

Cooper River Bridge Run, Charleston, South Carolina – The Cooper River Bridge Run is a world-class 10-K foot race. The annual event attracts approximately 40,000 runners, walkers, and spectators to the start line in Mt. Pleasant and the finish line in Charleston. Recycling at the Bridge Run began in 2002 under the leadership of Keep Charleston Beautiful, the local Keep America Beautiful affiliate and a partnership between the City and the County of Charleston.

Recycling efforts focus on the finish area, Marion Square in downtown Charleston, where a Finish Festival is held from 9 am to noon on race day. The Finish Festival features sponsors and vendors providing food, beverages, merchandise and services to runners and spectators. Water and sports drinks in plastic bottles are distributed. In mid-morning as most runners finish, the Square becomes very crowded. Approximately 30 recycling and trash stations are set up on the grounds, consisting of a 55-gallon drum as garbage receptacle, a portable folding recycling bin and bag for recycling, with banners on poles to direct people to the stations. The Bridge Run organization pays for the recycling pole signs, and the bins are loaned by Charleston County. No other recycling education or information is offered during the race; the position of Keep Charleston Beautiful staff is that the event is intense, participants and spectators are focused on the event, and it is of such short duration that general recycling education is not appropriate.

Community volunteers, recruited by Keep Charleston Beautiful, staff each trash/recycling station to instruct people as to what to recycle. Other volunteers roam the grounds, picking up litter and depositing it in the proper receptacles and collecting full bags of recyclables. Prior to 2007, AmeriCorps volunteers were used as race day volunteers, but are no longer available and other community organizations are recruited. Due to the work of the volunteers, the site is usually cleaned up and recyclables ready for delivery by 1:00 or 2:00 pm.

Recyclables are placed into a dump truck owned by the City of Charleston and delivered at no charge to the materials recovery facility owned and operated by Charleston County. KCB staff report that approximately 12-13,000 pounds of old corrugated containers (OCC) and beverage containers were recycled from the 2007 event.

Wachovia Golf Championship, Quail Hollow Club, Charlotte. NC – 2008 was the third year that the tournament provided recycling opportunities for both patrons and vendors. Recycling bins with distinct signage were strategically placed around the course to collect commingled aluminum and PET beverage containers. This was complemented each day by a post event pick. In some cases, waste receptacles were also “picked” by the cleaning contractor since they were so container rich. OCC and fryer grease were recovered from the vendor and food preparation areas and picked up by local markets. In 2008, over 28,000 pounds of commingled beverage containers were also picked up and processed locally.

4. Category 4: Non-sporting, Specific Purpose Venues

Example 1: North Carolina Zoo, Asheboro, NC
Example 2: Sea World Adventure Park, Orlando, FL

Description

These categories encompass aquariums and zoos; theme, amusement and water parks; fee-based natural attractions, and similar venues. These facilities are fixed venues with specific long-term activities. Additionally, some of these types of facilities also do special programming based on the season of the year, specific themed exhibits, and local demand.

Boundaries and Activity Zones

These venues are characterized by fixed boundaries and multiple entry points; their attendees are both spectators and participants. They operate predictable programs and activities on a regular schedule, usually six or seven days a week, which differentiates them from Category 1 and 2 venues that feature a wider variety of activity types at intermittent times.

Overall Recycling Approach

Recycling will be geared toward the attendee as participant at such venues as water parks, and the attendee as spectator at such venues as zoos and aquariums, but the distinction is not always clear cut.

These types of venues will utilize bin-based recycling programs. At these fixed venues, bins can be permanently placed, with venue management taking responsibility. Therefore the bins can be designed to complement the overall theme of the facility and be visually attractive. The size of the bins can be customized to match the expected usage and the servicing frequency. The bins can serve as icons for the recycling program in a similar way as curbside bins serve as icons for local government recycling programs. It is important, however, to design these attractive, themed bins to be different in appearance from trash cans, since in these types of venues typically the trash cans are also integrated into the visual motif. The identity and function of each type of container must be immediately apparent to attendees. Recycling bins and service should also be provided to behind-the-scenes employee areas, including offices and break rooms.

These types of venues feature a unique system of beverage sales that should be considered when designing the recycling system. In may cases, cold beverages are sold to attendees waiting in lines for attractions and rides, usually though strategically placed banks of vending machines. The empty bottles and cans are not allowed in the attraction at the end of the line, and a recovery system should be put in place that complements this unique feature.

Because these facilities are fixed they will have permanent maintenance yards, shipping/receiving areas, or logistics staging areas where trash is usually collected. Recycling storage containers can be placed in these locations. These storage containers will be out of

sight of the attendees, but will have the advantage of being monitored by regular employees who can be informed of the purpose of the containers and the recycling program and trained to perform the necessary tasks involved in managing the recycling program. If trash collection service is contracted to a private company, the contract can be written to include specific recycling services along with data collection and reporting. Contamination levels can be monitored on an ongoing basis by collection employees and the contractor.

Collection Infrastructure

Recycling Bins

Locations: All around the grounds or activity areas and at vendor and merchandising sites; in or at the end of waiting lines; in employee offices and break rooms.

Serviced by: Venue staff or clean-up contractor.

Method: Permanent **r**ecycling bins should be placed next to every trash can. Two trash cans and one recycling bin can be placed together in an attractive "kiosk". These kiosks can be identified with signs or flags on tall poles that will allow attendees to locate them in crowds.

Bins must be sturdy enough to withstand the local weather and constant use by the public. The designs should integrate with the overall "look" of the facility and graphics should be high-quality. Bins should also have restricted openings to discourage contamination.

Challenges:

- Choosing the correct bins to match the aesthetics of the facility and stand up to permanent outdoor use, but to be different from trash cans;
- Avoiding contamination by trash;
- Ensuring that bags of recyclables are taken to proper area and not disposed;
- Obtaining sufficient recycling bins to place next to every trash can; and
- Securing sufficient labor to empty them regularly.

Reverse Vending Machines

These types of venues and facilities also may benefit from integrating reverse vending machines into their collection scheme. The machines have several benefits in such environments, including:

- They can hold much greater volumes of beverage containers due to built-in compaction technology;
- They can be programmed to count each container recycled;
- They can be featured next to rows of beverage-dispensing vending machines, to reinforce the idea that beverage containers should be recycled;
- They can be strategically placed, for example in areas where participants line up for attractions and consume beverages, needing to discard the containers when they reach the end of the line;

- They can be designed to accept only beverage containers and reject other materials that may be contaminants;
- The can be programmed to distribute coupons or other incentives; and
- They can be fun for kids and families to use and be integrated into the venue theme.

Locations: The machines can be placed in snack bars and food service courts where containerized beverages are sold or brought in by attendees. They can also be placed outside, next to rows of beverage vending machines or in areas where people line up for popular attractions. The machines require electrical service.

Serviced by: Venue trash collection staff or contracted cleaning company

Method: The bags of shredded or crushed beverage containers are removed from the machines, the machine container count is recorded and the counter is re-set, then the material is moved to the central recycling storage location for hauling to market.

Challenges:

- Ongoing maintenance and repair of units;
- Keeping the machines clean and attractive;
- Motivating attendees to use them;
- Obtaining sponsors to provide rewards or incentives;
- Covering the cost; and
- Training staff who service machines to record beverage container counts and re-set counters.

Promotion/Education

Some facilities, such as zoos and aquariums, already perform educational activities as part of their ongoing mission. They have a unique opportunity to extend their educational emphasis to include recycling and the ways in which it can help the environment. Environmental tie-ins with habitat loss, for example, or water pollution, can motivate behavior by providing a tangible activity that the audience can perform right then and there that will have an impact. Bins can become a permanent educational tool for tying recycling in to the facility mission. Reverse vending machines, if used, provide an even larger surface for printed messages. Other educational tools may include facility brochures, posters, maps, audio tours and visitor guides.

Budgeting and Tracking Costs

These types of facilities are likely to incur initial capital costs for attractive, themed recycling bins or reverse vending machines and for educational and promotional materials. Since bins and associated permanent collection methods are the primary means of offering recycling, they must be high-quality, durable, and meet the aesthetic needs of the facility. The facility can amortize an incentive in bins over the long term.

Stakeholders should be approached about covering the one-time costs of bins (and RV machines if used). In particular, beverage suppliers should be approached, but the companies that provide the public relations functions for these facilities should not be overlooked. The positive publicity gained by promoting an environmental activity such as recycling by contributing in-kind services such as printing brochures or signs for recycling bins may appeal to these firms.

These types of facilities will also incur ongoing costs for servicing recycling bins, storing materials on-site, and arranging for hauling and marketing of recyclables. However, these costs should be minimal, since the facilities are already dedicating staff time and space to trash collection activities.

Category Examples:

North Carolina Zoo, Asheboro, NC – The NC Zoo attracts 700,000 visitors annually and has one of the most comprehensive recycling programs in the country. Internally it recovers office paper, OCC, motor oil, oil filters, batteries (all kinds), tires, antifreeze, pallets and other wood waste, plastic six pack rings, fryer grease, metal and plastic food containers. The fryer grease is turned into biodiesel that is used internally. Food waste from the kitchens and restaurants are composted with all of the animal manure and bedding as well as horticultural waste. The compost manufactured is also used on site. Beverages are sold only in PET bottles that are collected from the public using blue recycling bins placed next to brown waste receptacles. Special recycling bins are provided for on-site catered affairs. A strong "buy recycled" and public education program rounds out the zoo's waste recovery commitment.

Sea World Adventure Park, Orlando, FL – As in most of the venues in this category, recycling efforts take place in both "front of house" visitor or guest areas and "back of house" employee areas. Recycling bins for PET bottles and aluminum cans, consistent with the décor of the park, are dispersed throughout the visitor areas. Volumes have reportedly tripled and contamination greatly reduced since the number of bins were increased and placed directly next to the garbage receptacles. Other bins are placed in the hospitality area for aluminum bottles and cans. All are clearly marked and lined with blue bags that highlight the park's "Blue" Environmental Program Initiative. Different collection bins are used "back of house" in offices, employee break areas, and food preparation areas for collection of commingled plastic bottles, aluminum containers, glass and steel cans. Mixed paper is collected separately and shipped in gaylords. The OCC is collected, baled and shipped direct to market. Some aluminum bottles are kept and also sold separately like the mixed paper and OCC, but all other containers are commingled in a roll-off and shipped to a local MRF.

5. Category 5: Civic Centers and Multi-Use Arenas, indoor

Example 1: Oregon Convention Center, Portland, OR
Example 2: Verizon Wireless Arena, Manchester, NH

Description

These facilities include civic centers, convention halls, public auditoriums, concert halls, and urban complexes that combine multiple facilities. Older community civic centers and auditoriums generally host local interest sports and competitions, including boxing, wrestling, hockey, and similar events. They may also host local or regional trade shows and merchandise shows such as craft fairs, holiday bazaars and gun shows. Larger, multi-purpose convention centers may incorporate venues that can host these local events, but in major cities these facilities may host national and international conferences and trade shows. Many are large enough to host several major events at one time.

Some auditoriums and convention centers are publicly owned and operated and others are private. Some may be publicly owned but operated by a contracted hospitality company (examples are Sodexo and Aramark). Trash collection is usually contracted out to a private company, although in some cases, for example the Portland, Oregon Convention Center, the local government provides these services directly.

Boundaries and Activity Zones

These multiple-use centers are indoors. Some events will feature spectators, and some will host participants. Activities zones will include arenas for sporting events and stages for musical events, along with grandstand or stadium-style seating and concourse areas for merchandising. Convention centers will have large areas dedicated to classroom learning, lectures and meetings and large exhibit halls. Food service will include both kiosk or ready-to-eat meals and beverages and central kitchens with service in dining rooms. A regular contract caterer may provide food service options to events, and some events may use outside caterers exclusively. These types of facilities host multiple unrelated events on a quick turn around schedule. Several events may be occurring at the same time.

Overall Recycling Approach

The pace of scheduling and turn-around, diverse events and audiences, and variations in food and beverage service options complicate recycling for these facilities. Generally the recycling approach will include behind the scenes recycling for vendors, trade show set up and take down, meeting or learning event set up and take down, and food service. This will be the responsibility of facility management and will be done by their staff or a contractor. The approach should also incorporate recycling opportunities for attendees and spectators using bins. Some bins may be permanently placed; others will be temporary to cater to a specific event. Some temporary bins will be owned and provided by the facility and some may be brought in by the organizers of particular events.

Recycling services to the appropriate degree should be specified in the contracts with the venue operating company. The specific services would include placement and servicing of bins by company personnel, separation of beverage containers from trash, and delivery of bagged recyclable containers to the appropriate storage and transport containers. Similarly, recycling services should be specified in trash removal contracts and recycling participation required or strongly encouraged in contracts with facility users. More convention centers of various sizes, from the Barre Civic Center in Vermont to the Oregon Convention Center in Portland, are including such provisions.

Collection Infrastructure

Recycling Bins

Locations: Concourses and public areas (likely to be permanently installed bins); meeting rooms, exhibit halls and hospitality areas (likely to be temporary bins), vendor areas.

Serviced by: Venue staff, foodservice company staff, or clean-up contractor.

Method: Recycling bins should be placed next to every trash can. In public areas, permanent recycling bins may be placed in a kiosk arrangement along with trash cans. These kiosks can be identified with signs that will allow attendees to locate them in crowds and explain how they are to be used.

Permanent bins must be sturdy enough to withstand constant use. The designs should integrate with the overall "look" of the facility and graphics should be high-quality. Bins should also have restricted openings to discourage contamination.

Challenges:

- Avoiding contamination by trash;
- Ongoing training of clean-up staff to ensure that bags of recyclables are taken to proper area and not disposed;
- Securing bins that are aesthetically pleasing in certain facilities; and
- Obtaining sufficient recycling bins to place next to every trash can.

Post-event Recycling

Locations: Meeting rooms, exhibit halls and hospitality events.

Serviced by: Venue staff or clean-up contractor and/or catering personnel for particular functions.

Method: For recycling collection behind the scenes after events, personnel who provide the clean-up and trash collection for meeting rooms and exhibit halls should be provided with recycling bins or bags and trained to sort beverage containers from the remaining trash. Generally full meal service will provide beverages in glassware rather than bottles or cans, but snack service and breaks or hospitality functions will be a source of bottles and cans. Bins or

bags full of recyclable containers will accumulate in the loading dock or break-down area, where they can be set aside and transported to the recycling storage area.

Promotion/Education

Promotion and education opportunities at the large convention halls and multi-use exhibit facilities housed within this Category are limited, since they are on-site for a very short time and focused on their event. Therefore, recycling bins must be easy to see and heavily promoted. They should be attractive and always serviced regularly to avoid overflow or the appearance of neglect. Permanent recycling bins may be a wise long-term investment for these facilities, as they may be printed with educational messages communicate that recycling is the norm and is expected by attendees. These venues may be appropriate locations for recycling bin designs that feature advertising space that can be sold to cover a portion of the bin and service costs.

The mixed-use venues and civic centers that also form part of Category 5 provide an appropriate context for more active promotion. The Verizon Wireless Arena, Manchester, New Hampshire, home of the Manchester Monarchs hockey team, uses half-time announcements and contests on the ice to call attention to recycling. Much of their effort is geared toward families and children. The Verizon Wireless Arena also hosts music concerts, college hockey games, and other types of shows and events for which recycling bin placement, post-event picks and promotion/education are tailored to the expected audience and the logistics of the set-up.

Facility sales representatives can encourage organizations that utilize the facility to make their attendees aware of recycling opportunities and encourage them to use recycling bins. Suggestions can include placing information in the programs or meeting materials that will be distributed. An action statement, such as the simple instruction to “recycle this program” can help attendees remember to recycle. Additionally, any materials can inform the participants that their used beverage containers from breaks and hospitality functions are being recycled by event or facility staff.

An ongoing education function for venue management will be training of staff in the various recycling collection functions. This type of staff can have a high turnover rate, there are many different functions performed by different teams of staff persons, and reaching them all with ongoing training can be challenging. Additionally, during busy convention seasons functions may be scheduled back-to-back, and during quick change-overs recycling may be overlooked. With time, as recycling becomes institutionalized, these challenges should lessen.

Budgeting and Tracking Costs

Recycling costs for these facilities will vary depending on the scope and methods of recycling approach and infrastructure chosen by the particular facility. Costs will generally include bins, some of which may be permanent in concourses and public areas, and others that may be temporary – used in exhibit and meeting halls for events and stored for the time in between. Labor will be expended for collecting recyclables from bins, and possibly from

attendees in exhibit halls and from hospitality functions. Collection containers will be needed, as well as hauling to market. Education and promotional materials will be necessary in some instances.

Convention centers and similar facilities have the opportunity to pass on some of these costs to contracted vendors that provide an array of services for scheduled events. Any contracts with catering and foodservice vendors that are directly associated with the facility management should specify that recycling services will be provided, and provide as much detailed guidance as possible as to the scope of services, provision methods, and documentation and recording of these activities. Contracts with organizations that host functions in the facility should require users to incorporate recycling, by using infrastructure provided by the facility, at a minimum, and also providing their own bins and labor when appropriate. Any unusual or difficult to manage materials that they bring to the facility should clearly be their responsibility to manage at the end of the event. Some facilities specify in their contracts that only easily recyclable materials be brought in, and some go as far as to require the use of recycled paper and other materials for conference materials.

Finally, the waste hauling contract should also reflect an emphasis on recycling, and require recyclables to be separately collected, stored, and marketed, with tonnage figures reported to venue management on a regular basis.

Category Examples

Oregon Convention Center, Portland, Oregon – The Oregon Convention Center is a large, multi-purpose facility owned and operated by Portland Metro, the regional intergovernmental planning organization. Portland Metro's mission includes protection of open space and park; regional planning for land use and transportation; and management of garbage disposal and recycling for 1.3 million residents in three counties and 25 cities in the Portland region. The Convention Center is a LEED-certified building, and thus has requirements for environmental programs that include waste reduction and recycling. The facility is mandated to achieve 50 percent material recovery and recycling. The current rate is estimated at 45 percent, and includes food waste, OCC, and other materials in addition to beverage containers.

Currently, recycling bins are used for convention participants, exhibitors, and the public. Recycling bins are not yet placed next to every trash can, so recycling is currently less convenient than disposal, but the facility is working towards placing more bins and making recycling more convenient. Three separate recycling bins are used – one for cans, one for glass bottles and one for plastic bottles. The current materials collection system requires this, but Convention Center management realizes that a more optimal system would use commingled containers. Oregon Convention Center staff is responsible for setting up and breaking down exhibit areas and meeting rooms, and they manage the waste and recycling from events.

Verizon Wireless Arena, Manchester, New Hampshire – Verizon Wireless Arena, located in downtown Manchester, is the home of the Manchester Monarchs of the American Hockey League. The Arena seats 10,000 spectators for sporting events with some capacity variance for other events depending upon the appropriate set-up. The Arena hosts 120 to 130 events per year. Of these, 50 to 60 are sporting events that include, in addition to Monarchs hockey, Arena Football and college NCAA hockey. Other events are as diverse as the Ringling Brothers/Barnum & Bailey Circus of Dreams, Disney on Ice, the Trans-Siberian Orchestra and Bob Dylan. The Arena's major beverage sponsor is Pepsi-Cola, and several brands of beer are sold during certain events.

The Arena's beverage container recycling program uses both recycling bins and post-event picks. Both are managed by the cleaning contractor.

The Arena at first experimented with the use of a split, 35-yard compactor for recyclables, with one side holding OCC and the other, bagged bottles and cans. The two sides did not fill up evenly, however, and currently the local market provides a separate 20-yard roll-off container for the beverage containers and a compactor for the OCC.

Some promotion and education is done, especially during hockey season, and much of these efforts are geared toward youth. Recycling recovery numbers are tracked and reported by the local market. The following PET tonnages have been recovered:

2005: 13.29 tons
2006: 11.99 tons
2007: 8.07 tons through August (fall is the busiest season)

6. Category 6: Specific Purpose Venues, sporting or non-sporting, boundaries may be flexible (mainly outdoor)

Example 1: Alaska State Fairgrounds, Palmer, AK
Example 2: Minnesota State Fair, St. Paul, MN

Description

These venues form a diverse group, but share the characteristics of being primarily outdoors and having a fixed facility that is geared mainly toward a primary purpose or type of event. These venues may have flexible boundaries as in the case of some fairgrounds, but are generally fixed locations. Other than those shared characteristics, this category varies and includes both sporting and non-sporting facilities that host events that occur seasonally, all year 'round, or annually. Venues in this category include:

- State fairgrounds – non-sporting, regularly scheduled, usually at the same designated facility each year, which has boundaries and admission points
- Equestrian Centers – used for horse events other than racing
- Rodeo Grounds – permanent rodeo facilities (outdoor)
- Concert pavilions and amphitheaters – featuring boundaries, admission points, and large numbers of events.

Boundaries and Activity Zones

As listed above, the various types of events included in this category will have different boundaries and activity zones. This diversity makes it difficult for a model program to be defined, but an overall approach that incorporates the "culture" of these events and the entertainment they provide can be used as a guideline in incorporating recycling.

State fairgrounds in particular usually feature a significant amount of indoor space which, depending on the event, is used for display space or meeting space. Catered meals may be brought in and a wide variety of hospitality events may take place. For events that use the indoor space, recycling guidelines for Category 4 facilities, convention and civic centers, may be appropriate. Concert pavilions and amphitheaters may be organized more like small outdoor stadiums and recycling guidelines modified from Category 1 may be adapted.

In some cases, attendees of these types of events will be allowed to bring in their own beverages. There may be significant quantities of these beverages and glass bottles will most likely be included.

Overall Recycling Approach

Recycling will be geared mostly toward the attendee as participant at such venues. These types of venues will utilize bin-based recycling programs and incentives, along with post-event clean up activities where appropriate. Bins will most likely be temporary, and can be obtained and placed by the host city or county or by the managing organization. Vendor

recycling may also be incorporated. It should be recognized that these types of events will have a variety of beverages served, some in containers and some in cups. Attendees may also bring their own beverages to some of these types of events. Arranging for an adequate number of bins to be placed next to trash cans, of an appropriate design to withstand crowds and possibly infrequent servicing, will be a challenge at these venues.

Collection Infrastructure

Recycling Bins

Locations: Public areas, walking paths, vendor and merchandise areas, next to trash cans.

Serviced by: Event/venue staff or clean-up contractor, volunteers.

Method: Recycling bins should be placed next to every trash can, or may be placed in a kiosk arrangement along with a few trash cans. These kiosks can be identified with signs that will allow attendees to locate them in crowds and explain how they are to be used.

Few of these types of facilities will use permanent bins. The exception may be state fairgrounds. Permanent bins, if used, must be sturdy enough to withstand constant use and crowds. Bins should also have restricted openings to discourage contamination. If possible, they should be large enough so that they can be serviced infrequently, since reaching bins in crowds can be problematic at certain active times

The local government recycling coordinator can work with the sponsoring organization and the hauler to loan bins to the event. At a minimum, the local coordinator can work with the chosen recycling hauler or service provider to choose appropriate bins, and to advise on bin break-down and storage after the event. Again, in many cases it may be possible to recruit the beverage sponsor or another event sponsor to provide the bins in their name.

Challenges:

- Avoiding contamination by trash;
- Managing glass bottles;
- Ongoing training of clean-up staff to ensure that bags of recyclables are taken to proper area and not disposed; and
- Obtaining sufficient recycling bins to place next to every trash can.

Post-Event Picks

As with road races, some of these events can yield significant beverage container recovery from post-event cleanups of the grounds. Some organization, either the hauler, the host city or town, or a clean up contractor, picks up all the trash left at the site after the event.

Locations: Seating areas if provided, parking lots, gathering areas and merchandising areas

Serviced by: Hauler (public or private), clean-up contractor, volunteers, non-profit organization

Method: Post-event picks can be conducted on the grounds or in any other spectator areas for these types of events. If litter and trash is normally hand-picked from the ground, post-event picks can be organized similarly to those at large stadiums – the clean up crew is divided up and half tackles recycling while half tackles trash. Alternatively, each worker can fill two bags – one with trash and the other with recyclables. Some events can obtain labor from local anti-litter organizations. In some cases, local non-profit organizations are used as clean-up contractors in return for a donation to the charity. It is usually even easier to organize a pick using this donated labor, and the workers may personally relate to the recycling effort.

Challenges:

- Convincing event management and their clean-up contractor that a pick will not be significantly more costly than current clean-up procedures;
- Training of crews;
- Ensuring that sufficient personnel are present to perform an efficient pick; and
- Perception that picking up recyclables is not "real" recycling since attendees do not participate

Promotion/Education

In the case of state fairs, the state government is likely to be the major sponsor and organizer. Various state agencies, from environmental/natural resources to economic development may wish to tie recycling in with their particular mission and programs. These large events will bring in attendees from a wide geographic and demographic range, providing challenges but also opportunities for recycling education.

Recycling at these events can be promoted on event web sites and on materials provided to attendees as they enter the grounds or check-in, such as schedules and programs and maps, along with information about other necessary services such as sanitation. Attendees usually keep these materials with them and check them frequently.

Instructional signage on or around recycling bins must utilize simple messages that immediately inform users which materials are acceptable and also deter contamination. For example, asking for "bottles and cans" is preferable to asking for "plastic and aluminum".

Budgeting and Tracking Costs

These types of events may take place over a period of several hours or over several days. In some cases, the shorter duration of the event helps to keep costs of a recycling program to a minimum. However, in some cases the special, infrequent staging of the events can increase costs. Costs for such events will include bins, staff to service bins, temporary on-site storage containers and hauling of materials to market.

State fairgrounds and some music pavilions are publicly owned and operated. In certain cases, the cities that own the venues or sponsor the events will contribute bins on a loaned basis. Staff to set up, service, and break down bins may also be provided using volunteers associated with the sponsoring organization or the host city. Solid waste arrangements may also be provided by the public entity, enabling recycling services to be piggy-backed on the trash collection. These tasks can also be specified as part of the hauling contract for a private recycling/solid waste service provider.

Category Examples:

Alaska State Fairgrounds in Palmer, Alaska is the site of the annual fair that attracts over 350,000 visitors. 2008 will mark the seventh year that Green Star, Inc., a local non-profit environmental group, has organized the recycling program for the event. Collection barrels are placed throughout the grounds to collect commingled aluminum cans and plastic bottles. The barrels are serviced by volunteers who use pull carts to bring the containers back to an on-site recycling center where they are sorted using a sort table. A wide range of other recyclable items are also collected from vendors. Accurate records have been kept since the program's inception and are summarized below.

Table 14 – Recycling by Material at Alaska State Fairgrounds

	YEAR *(material reported in pounds)*					
MATERIAL	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Corrugated Cardboard (OCC)	20,420	19,000	20,800	36,000	45,000	52,200
Aluminum Cans	1,308	1,105	1,375	1,400	1,300	1,140
Glass Bottles	6,000	5,800	5,800	6,050	6,050	none
PET/HDPE Bottles	1,350	1,460	1,500	2,000	2,700	2,913
Plastic Film	none	none	none	none	200	523
Mixed Office Paper	none	4,000	3,340	3,500	2,000	4,400
Steel Cans	none	none	none	minimal	minimal	475
TOTAL	**29,078**	**31,365**	**32,815**	**48,950**	**57,250**	**61,651**

Minnesota State Fair, St Paul, MN – The largest state fair in the country, with over 1.7 million attendees, appears to have the largest and most comprehensive recycling program as well. In 2007, the program recovered over 9.5 million pounds for composting and recycling. This included such items as oil filters, fluorescent bulbs, toner cartridges and paint. A complete breakdown is included in Appendix C. The total amount of waste discarded was less than 2.7 million pounds. To achieve these levels of diversion requires a comprehensive approach to providing – and in some cases mandating – recycling opportunities to vendors, kitchens and exhibitors. This is combined with aggressive education and opportunities for visitors to recycle beverage containers and compost food items like corn cobs. OCC collection containers are scattered throughout the site and a local recycling group is hired to educate the vendors and exhibitors as to the myriad of recycling and composting opportunities and how to properly take advantage of them. Only one type of cup is used for all beverages consumed throughout the fair since vendors are required to purchase cups from fair management. This allows for the separate collection of cups and the potential to successfully recycle them, although the fair is currently looking for a market for the EPS cups used. In addition to the cups, 45,000 pounds of commingled beverage containers were collected in 2007. While the program is institutionalized within the staffing and operations of the fair, the full implementation is assisted by the efforts of over 500 volunteers.

7. **Category 7: Special Events, no fixed facility, outdoor**

Example 1: Farm Aid, Randall's Island (New York), NY
Example 2: Bonnaroo Music Festival, Manchester, TN

Description

These events are the least structured of any category identified in terms of their variety of theme and structure. They are similar to Category 6 events, but have no fixed facility. For lack of a better term, these events may be called "happenings" and are truly "special" events. They are mostly non-sporting events and often occur annually in the same location. These events may be regularly scheduled or one-time only and take place in small towns and big cities throughout the U.S. They include:

- Large multi-talent musical concerts held in rural areas, e.g., the "Woodstock model;"
- Street festivals, parades and carnivals;
- Food, art, craft, holiday, and other special interest events;
- Hot air balloon rallies and air shows;
- Free-standing country and regional fairs (smaller fairs held in open space areas without the infrastructure of the "fairgrounds" included in Category 6).

Boundaries and Activity Zones

The various types of events included in this category will have few boundaries and many activity zones. While the event types differ, an overall model that incorporates the "culture" of these events and the entertainment they provide can be used as a guideline in incorporating recycling.

In some cases, attendees of these types of events will be allowed to bring in their own beverages. During street festivals in urban areas, the "official" beverages will most likely be sold in plastic bottles or cans, but people are free to purchase other beverages from stores and restaurants or to bring their own. There may be significant quantities of these beverages and glass bottles may be included.

Overall Recycling Approach

These types of venues will utilize bin-based recycling programs and incentives, along with campground recycling and post-event clean up activities where appropriate. Bins will most likely be temporary, and can be obtained and placed by the host city or county or by the managing organization. Vendor recycling may also be incorporated. It should be recognized that these types of events will have a variety of beverages served, some in containers and some in cups. Attendees may also bring their own beverages. Arranging for an adequate number of bins to be placed next to trash cans, of an appropriate design to withstand crowds and possibly infrequent servicing, will be a challenge at these venues.

Some of these types of locations will offer overnight camping, and a campground recycling program can be put in place as well.

Collection Infrastructure

Recycling Bins

Locations: Gathering or spectator areas, walking paths, vendor and merchandise areas, next to trash cans.

Serviced by: Venue staff or clean-up contractor, volunteers.

Method: If possible, recycling bins should be placed next to every trash can, but it is recognized that in large geographic areas this may be difficult. In gathering areas, permanent recycling bins may be placed in a kiosk arrangement along with trash cans. These kiosks can be identified with signs that will allow attendees to locate them in crowds and explain how they are to be used.

Bin must be sturdy enough to withstand constant use, weather, and crowds. It may not be advisable to use bins in the actual concert audience areas of music festivals due to the crush of crowds. Bins should also have restricted openings to discourage contamination. If possible, they should be large enough so that they can be serviced infrequently, since reaching bins in crowds can be problematic at certain active times. Signs must clearly indicate what materials are acceptable. It is vitally important to keep instructional messages short and easy to understand.

It may be possible for the local event manager to establish a partnership with the local government recycling coordinator to obtain bins on loan. At a minimum, the local recycling coordinator can work with the chosen recycling hauler or service provider to choose appropriate bins, and to advise on bin break-down and storage after the event. Again, in many cases it may be possible to recruit the beverage sponsor or another event sponsor to provide the bins in their name.

A recycling education and incentive area can be established in the areas where attendees purchase food and beverages. These areas would be staffed by the recycling service provider, or possibly by volunteers, for certain hours. They would offer a place for attendees to recycle, incentives and motivational tools, including peer pressure, and education about how the individual contribution to the recycling effort benefits the event and the environment.

Challenges:

- Placing bins in areas where they will be effective – i.e. invite convenient participation, be possible to service;
- Avoiding contamination by trash;
- Managing glass bottles;
- Ongoing training of clean-up staff to ensure that bags of recyclables are taken to proper area and not disposed; and
- Obtaining sufficient recycling bins to place next to every trash can.

Post-Event Picks

These types of events can yield significant beverage container recovery from post-event cleanups of the grounds. Some organization, either the hauler, the host city or town, or a clean up contractor, picks up all the trash left at the site after the event. Post-event picks can be conducted on the grounds or in any other spectator areas for these types of events. If litter and trash is normally hand-picked from the ground, post-event picks can be organized similarly to those at large stadiums – the clean up crew is divided up and half tackles recycling while half tackles trash. Alternatively, each worker can be given two bags, and fill one with trash and one with recyclables. Some events can obtain labor from local anti-litter organizations. In some cases, local non-profit organizations are used as clean-up contractors in return for a donation to the charity. It is usually even easier to organize a pick using this donated labor, and the workers may personally relate to the recycling effort.

Music festivals typically offer a certain number of attendees free passes in return for some volunteer work. There is precedent in recruiting such volunteers for trash collection and recycling. The participant usually pays the admission fee up-front, then during or after the events their volunteer duties are documented and their fee is refunded. These volunteers are an excellent pool of recruits for recycling jobs.

Challenges:

- Convincing event management and their clean-up contractor that a pick will not be significantly more costly than current clean-up procedures;
- Training of crews;
- Ensuring that sufficient personnel are present to perform an efficient pick; and
- Perception that picking up recyclables is not "real" recycling since attendees do not participate

Campground Recycling

Locations: Camping areas for overnight guest in RVs and tents, at rural music festivals primarily.

Serviced by: Facility clean-up contractor or personnel and waste hauler, along with volunteers with local charity or local government recycling personnel.

Method: A combination of bins, incentives, and curbside collection can be used, depending on the size of the campgrounds and availability of trash cans as well as other resources. Bins, if used, need good signage because staffing may be impractical due to the size of some campgrounds and length of events. Incentive programs, using small rewards tied in with the event or particular musicians, can encourage campground residents to deliver recyclables to redemption centers in the campgrounds. These centers must be staffed during certain hours, must be easy to find, and must have storage for a certain volume of recyclables. If enough centers are established, they are open during hours when campers are likely to be in the campgrounds, and the prizes are good enough, redemption centers can eliminate the need for more expensive curbside recyclables collection.

Curbside camper collection involves picking up bagged recyclables daily at each individual campsite. It can be time-consuming and expensive, especially in spread-out campgrounds. If trash collection is provided on a daily basis in campgrounds, integrating curbside recycling collection will be easier. Additionally, curbside recycling may be familiar to a number of campers. Recycling planners should be aware that some campers will consider recycling bags as just more free trash bags. Stakeholders should agree on a policy for handling recycling bags full of trash so that they don't end up at the recycling market facility.

Staff for campground recycling programs will need vehicles to manage the recycling, either golf carts with adequate capacity, Four-wheel drive utility vehicles or similar work vehicles, or pick-up trucks. Clean-up contractors or waste haulers can be recruited to accomplish these tasks, but revenue will not cover their costs. Campground programs will generally be an addition to the overall solid waste management and recycling program budget.

Challenges:

- No trash cans in campgrounds to pair with recycling bins;
- Staffing for incentive/redemption centers;
- Cost and time necessary for curbside recycling in campgrounds; and
- Possible contamination.

Promotion/Education

Recycling at these events can be promoted on event web sites and on materials provided to attendees as they enter the grounds or check-in, such as maps, schedules and programs, along with information about other necessary services such as sanitation. Attendees usually keep these materials with them and check them frequently.

On-site promotion can be done at redemption depots where incentive prizes are awarded. Usually these types of redemption centers are offered as part of campground recycling, but at large events these depots can also be sited in merchandising areas or other gathering places.

Instructional signage on or around recycling bins must utilize simple messages that immediately inform users which materials are acceptable and also deter contamination. For example, asking for "bottles and cans" is preferable to asking for "plastic and aluminum".

At some music festivals an environmental emphasis is already part of the "culture" and recycling should be more easily implemented and accepted. In such cases, more in-depth recycling education can be utilized.

Budgeting and Tracking Costs

These types of events may take place over a period of several hours or over several days. In some cases, the shorter duration of the event helps to keep costs of a recycling program to a minimum. However infrequent staging of the events can increase costs because a model will not be established.

Costs for such events will include bins, staff to service bins, temporary on-site storage containers and hauling of materials to market. In many cases, the cities that host or sponsor the events will contribute bins on a loaned basis. Staff to set up, service, and break down bins may be provided using volunteers associated with the sponsoring organization or the host city. These tasks can also be specified as part of the hauling contract for the recycling/solid waste service provider.

In the case of festivals, it is customary to recruit volunteers among the attendees for various jobs by providing free admission to the event. The volunteer pays the cost of admission up-front, works a set number of hours during or immediately after the event, and is reimbursed upon proof that all required hours were worked. Many festivals recruit their trash crews this way, and are now incorporating recycling as another duty of these volunteers. This is essentially a no-cost way to obtain recycling labor at events where the cost of admission is high enough to provide an incentive to work. Moondance Jam in Minnesota, Bonnaroo in Manchester, Tennessee, and the Lake Eden Arts Festival in Black Mountain, North Carolina all recruit recycling labor in this fashion.

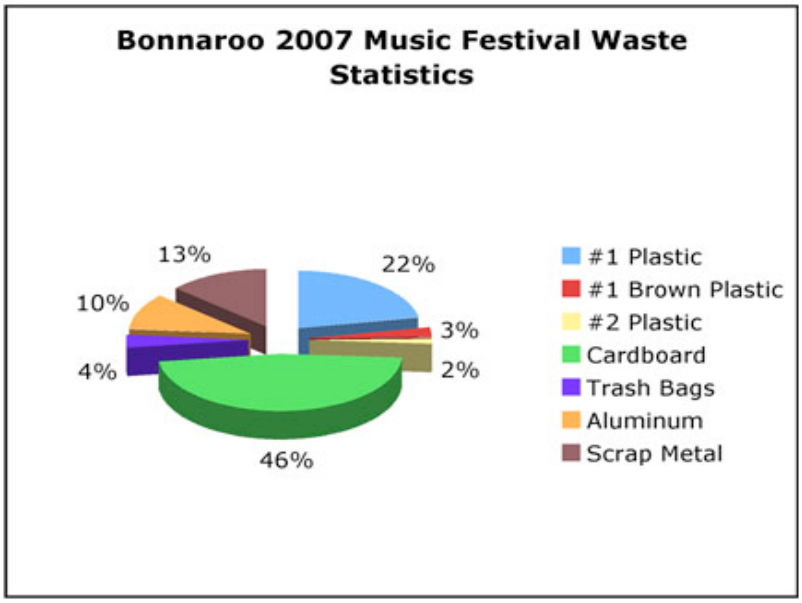
Category Examples:

Farm Aid, Randall's Island (New York), NY -- Farm Aid is an annual fundraising concert event that is held in different locations each year, the proceeds from which go to support small family farms. In 2007, the concert was held on Randall's Island in New York City and was the largest recycling initiative ever conducted by Farm Aid in its 20-year history. OROE, NYC's Council on the Environment Office of Recycling Outreach and Education, worked with Farm Aid staff to facilitate recycling and composting at the event which drew 25,000 attendees. OROE staff recruited nearly 300 volunteers for the event and set up 50 "ClearStream" recycling and composting stations throughout the grounds of the event. Volunteers were given on-site training by OROE staff and then assigned shifts at the recycling stations in teams of two. The recycling stations were active and staffed throughout the entire 12-hour, day-long event. Recyclables were moved by golf carts and deposited commingled in roll-offs that were shipped to a single stream MRF. A total of 7,400 pounds of paper, cardboard, plastic bottles, beverage cartons and cans were recovered for recycling. An additional 700 pounds of clean food waste and compostable cups and utensils, plates, and napkins were recovered and transported for composting to an organic farm upstate. This successful program will serve as the model for the 2008 event and other Farm Aid events moving forward.

The Bonnaroo Music Festival held in Manchester TN attracts about 100,000 people per year. Since 2002 it has hired Clean Vibes Inc., a company dedicated to responsible waste and recycling management of outdoor festival and events, to coordinate and implement a comprehensive recycling and composting program. Beverage containers, excluding glass, are collected commingled in well-marked 55-gallon drums. A sorting center is put in place on site where the containers are sorted and any contamination removed. It also serves as the center for cardboard and plastic film collected primarily from vendors. In 2008 the Clean Vibes Trading Post was introduced where bags of beverage containers could be "redeemed" for

green gifts such as eco-friendly beauty products and organic clothing. Food waste and other organics are gathered and sent to a composter.

Table 15 – Bonnaroo Waste



Total Recycled = 94,340lbs / 47.17 tons

Total food waste and biodegradable products composted = 20,600 lbs / 10.3 tons

We believe this example is particularly significant as it highlights the benefit of hiring a company that has expertise, not only in recycling and composting, but in implementing programs for a specific category of events and venues that carry challenges, logistics and even waste streams that may be unique to that category. We believe that companies such as these may evolve for other categories as well. For example, companies that have the capability to pick-up and process bags of mixed beverage containers including cups and residual liquids would fit a particular need in urban areas where space is a premium and there are a lot of stadiums and arenas. The reality is that the existing entities at venues and events that need to be involved for successful recycling programs to be implemented often view it as a giant bother and not good business practice. Businesses that can bring a new skill set that includes understanding the entire set of issues within a particular type of venue may go a long way to overcoming this internal resistance.

6. THE STATE OF THE ART: A General Evaluation of Venue and Event Recycling Program Health, By Category

In the course of this project, we've evaluated the current status and effectiveness of recycling efforts at venues and events, as summarized by Category in Table 14 below. These evaluations represent general findings across the respective categories, and while we recognize that there are always exceptions, we feel they reflect an accurate assessment of where things stand currently. Overall, it isn't a very positive picture and there remains dramatic room for improvement. Even in categories where sound, cost-effective programs are readily identifiable (1, 6 and 7), the vast majority of venues and events in those categories have no programs, or programs in name only. Claims of active programs were repeatedly found to be exaggerated, and or upon closer examination, non-existent in any real sense. (If a venue acknowledged that they put recycling collection bins out, but did not know what was collected or where collected materials went, we did not consider this a functioning program.)

Much work needs to be done, particularly in Categories 4 and 5. While we accept that the venues in Category 4 (single purpose venues such as Zoos or Theme Parks) have some logistical challenges, it appears to be more a lack of initiative and leadership versus infrastructure problems that prevent venues in this category from instituting programs. This is surprising given that many of these venues have very public environmental agendas, i.e. Zoos, Aquariums, Natural Attractions, etc. The large Convention Center segment of Category 5, however, is another matter. Overlapping and inconsistent areas of responsibility involving unions, facility staff, concessionaires, caterers and independent contractors – not to mention huge physical space, crowds, and the variety of event and exhibit configurations – combine to make instituting recycling at these locations extremely challenging. That being said, we did find a number of smaller Exposition Halls and Conference Centers that run successful programs, including many that write recycling obligations into their contracts with event sponsors. Also in Category 5, we found successful programs at Multi-purpose Civic Centers and Arenas, where Center staff – not independent contractors – are usually the responsible parties.

While some good programs can be found at National Hockey League and National Basketball Association arenas in Category 2, and at State Fairgrounds in Category 6, most of the other segments in these categories did not have much to discuss, although, the Red Rock Music Pavilion in Denver has an outstanding program with ninety percent diversion. In terms of what is arguably the single largest Category (#7 – Outdoor Events & Festivals), there are thousands of these held every year with even the smallest attracting crowds in excess of 5,000 for a one-day event, and the largest hosting over a million attendees over the course of three to twelve days. There are good models in this category. Many have a fund-raising component and thus attract the volunteers necessary to field a successful program. However, because these events are often held annually, it's inevitable that there will be staff turnover and depletion of institutional knowledge. There is a clear need for good information and tools so that recycling efforts can be institutionalized and run on an annual basis, perhaps more so with Events than with any other Category.

Table 16 – Status of Current Recycling Programs by Category

Venue/ Event Category	Evaluation	Comments
1 – Outdoor sport, fixed seats	Fair	Programs in some MLB and NFL stadiums.
2 – Indoor sport, fixed seats	Fair	Small number of facilities but large attendance; not many programs.
3 – Outdoor events, no fixed stadium or seats (e.g. road races, golf tournaments)	Poor	Some programs in road races and golf tournaments.
4 – Fixed-Purpose Venue (e.g. zoos, theme parks)	Fair	Good working models, but not a lot of ongoing programs.
5 – Convention and Civic Centers, Multi-Use Venues	Poor Fair	Large convention halls Smaller halls and civic centers
6 – Primary Purpose venue (e.g. Fairgrounds, Amphitheaters)	Good	Excellent models for state fairgrounds; high potential for large volume recovery.
7 – Outdoor Events/Festivals	Good	Lots of different program options; the category with the largest potential for recovery.

(See Table 1 on page 16 for full Category descriptions.)

7. MOVING FORWARD – Where Do We Go From Here?

The body of work contained in this report was originally conceived by representatives of APR and NAPCOR in 2005. It was during a period of time when interest in recycling had waned and collection of post consumer plastic was stagnant. These organizations understood that increasing residential collection programs was outside of their control, but thought that spurring collection efforts at venues and events was feasible, even with limited resources.

In point of fact, most recycling initiatives analyzed during the course of this project were initiated with limited internal and external support. This is not to say that there was not "buy in" from venue decision makers and leadership, but it is often the action of a committed individual or group that pushes against the inertia of the status quo and really gets things started. Typically, once begun, programs that are not dependent on extraordinary efforts will continue, while others may fail. Much time is spent reinventing the wheel because active and openly accessible information sharing is minimal, other than in an informal fashion. While more structured sharing of information does occur and is undoubtedly effective, it happens in a very limited or proprietary context, such as through corporate brand owner recycling programs, or through venue specific organizations like the College and University Recycling Council (CURC). Other efforts to support recycling, particularly event recycling, include:

- An excellent "How To" guide on recycling at special events in rural areas produced by the Northeast Recycling Council available on the NERC website.[9]
- A project jointly funded State of Georgia Department of Community Affairs, The Coca-Cola Co., and The Curbside Value Partnership to provide event-recycling trailers to GA counties that have recycling infrastructure.
- The Northeast Resource Recovery Association loans its members recycling bins and trailers for events and festivals.
- Cities and Counties around the country that have "bin banks" for loan of recycling bins.

However, the implementation of well-planned, comprehensive and sustainable programs would undoubtedly increase greatly if appropriate resources were available through a fully accessible, centralized clearinghouse. It is clear that neither APR nor NAPCOR are the appropriate organizations to house such an operation. While the volume of PET bottles available for collection at venue locations is sufficient to merit implementation of economically viable recycling programs, recycling officials, environmental groups, venue managers and the public are all now looking for a more comprehensive approach involving all waste streams. To that end, the proposed clearinghouse would need to have the capability to address all materials from collection through delivery to markets, taking into account the economic and logistical realities of a given situation. To undertake this effectively, staff would need to be practitioners, not advocates. To minimize administrative cost, the clearinghouse as proposed would be best housed in an active, capable recycling organization.

[9] A PDF copy of the NERC Best Management Practices Guidebook is available at http://www.nerc.org/documents/special_event_bmps_final.pdf

In addition to the dissemination of information, areas that need to be addressed to ensure efficient recycling programs include:

- Precycling or the identification and elimination of items that prevent or dramatically impact efficient recovery of materials
- Continued identification and development of appropriate collection bins
- Development of on-site densification technologies to reduce volumes, thereby aiding with on-site storage, handling and transport costs
- Identification and development of storage and transportation systems
- Maintenance of current and appropriate market options
- Continued development of educational tools

Finally, the authors make this recommendation with the full understanding and appreciation that it may be received as a call for "just another" recycling program. In some respects that's true, but this is an area that is largely untapped. With a minimal investment, expertise and resources can be provided, promoting the initiation of sound programs and enabling their implementation to proceed much more quickly. In short, much of the trial and error experienced in residential collection programs – which led some to question the viability of curbside programs – can be avoided by providing leadership in this area. If we are to make a serious effort in recovering materials at these locations and realizing the associated greenhouse gas reductions, then a serious commitment to the necessary resources is needed.

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