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Recycling at Penn State's Beaver Stadium

With a 13-year-old recycling program, The Pennsylvania State University's (Penn State) Beaver Stadium in the past diverted nearly 30 tons of recyclables per year from local landfills. A new initiative to promote recycling in the stadium's tailgating area has helped Penn State more than triple its old recycling record, collecting 112 tons in 2008. Proceeds from the sale of the recycled materials are donated to the local United Way—more than \$54,000 to date.

Facts at a Glance

- Beaver Stadium has a seating capacity of 107,282.
- The stadium and parking lots occupy 110 acres.
- 290 wheeled recycling carts are spread throughout the parking lots to collect recyclables, while 42 dumpsters are available to collect trash.
- 30 A-frames were added to dispense bags where dumpsters were not available.
- Volunteers hand out nearly 2,000 blue recycling bags per game. Another 2,800 recycling bags and an equal number of trash bags are available at the dumpsters.
- 90 percent of recyclables are captured in the blue bags.
- The tailgating “blue bag” initiative cost \$9,000 to implement but doubled the stadium's recycling capture.
- In 2008 the stadium collected 112 tons of recyclables.
- Sale of recyclables raised more than \$54,000 for the United Way.



This aerial photo shows the bowl area of Penn State's Beaver Stadium on game day, with fans filling the stands.

Program Overview

Located in University Park, Beaver Stadium is home to the Nittany Lions football team. The stadium and its surrounding parking lots occupy 110 acres. As the second largest university stadium in the country, it generally hosts 110,000 to 150,000 fans at its seven football games per year. Although the seating capacity is 107,282, big games can draw twice that number, filling the stadium and surrounding parking lots with tailgating Penn State football fans and guests who catch the game using portable radios and televisions.

Each game generates an estimated 50 tons of waste. Early afternoon games can yield less, but matchups with major rivals draw large crowds and can result in upwards of 100 tons of waste in a single day. With tipping fees for waste at \$70 per ton and recycling costing just \$5 unbagged, to \$15 bagged per ton, there is a clear financial incentive to reduce the volume of waste sent to the local landfill. By offering fans several convenient options for handling their recyclable materials, the stadium reduced the number of labor hours needed for cleanup, thereby reducing overtime pay. As a result, the stadium's recycling program has cut the cost of cleanup by an average of 40 percent per game.

Al Matyasovsky, supervisor of central support services at Penn State, describes the stadium's recycling program as both “evolutionary and revolutionary.” Over the years,



the program has expanded to include plastic bottles (#1–#7), aluminum cans, glass, cardboard, program booklets, and food waste. Plus, through an innovative partnership between the university, local government, and an alumnus-owned business, proceeds from the sale of the collected recyclable materials are donated to the United Way to support local Boy Scouts and Girl Scouts.

Nuts and Bolts

Matyasovsky’s office oversees the day-to-day operation of the stadium’s recycling program, but a number of other organizations helped design and implement it, including Penn State’s Office of Physical Plant and Department of Athletics, the Centre County Solid Waste Authority, Joe Krentzman & Son, Inc., and Centre County United Way.

Recycling at Beaver Stadium features two components: collections inside the stadium and collections in the parking lots and tailgating areas. Inside the stadium, the major recyclables are beverage containers, cardboard, and program booklets. The majority of the tonnage is derived from the tailgating areas, where fans are encouraged to separate plastic bottles, aluminum cans, and glass from their waste.

Tailgating Recycling. Fans can recycle in tailgating areas in various ways.

1. By placing 290 blue, 96-gallon, wheeled recycling bins throughout the stadium grounds, Penn State has made it more convenient for fans to recycle their beverage containers. With only 42 eight-yard dumpsters for trash, clusters of bins are constant reminders to recycle.
2. In 2007, stadium officials launched a new effort that involved the student club STATERs (Students Taking Action To Encourage Recycling) distributing translucent blue plastic bags to tailgating fans to collect their recyclables. About 15 student volunteers mingle with fans before games to personally hand out about 2,000 translucent blue recycling bags and encourage visitors to support the stadium’s recycling efforts.

Pennsylvania’s Municipal Waste Planning, Recycling, and Waste Reduction Act (Act 101) requires communities of 10,000 people or more to recycle at least three commodities. “We go beyond that,” says Al Matyasovsky, supervisor of central support services at Penn State. “We use Act 101 as a guidepost, but at Beaver Stadium we have 110,000 or more fans. We want to demonstrate appropriate waste management.”



These blue totes, labeled “Cans Only” and “Plastic Bottles #1–#7,” are positioned near the entrance to the stadium.



Student volunteers wear bright yellow-green T-shirts imprinted with recycling messages and remind fans that their participation in the recycling program not only helps protect the environment but also contributes money to the United Way.

3. Fans can also get the blue bags from specially designed dispensers (similar to those used to distribute plastic bags in a supermarket's produce section) affixed to brown dumpsters, the top two feet of which are painted green to let fans know they can pick up recycling bags there. Stadium staff members closely monitor the number of bags at the dumpsters and replenish them when the supply is low.

4. Thirty A-frames were added in 2008 to dispense clear bags in areas where there were no dumpsters.



Both recycling bags and trash bags are available at the dumpsters.

Each fall stadium staff members place the recycling carts and dumpsters in their designated spots in the parking lots, where they will remain until the end of the football season in November. One staff member sets out the carts while two or three put the dumpsters in place. Stadium staff developed a map indicating where dumpsters would be placed, establishing consistency in location so fans know where to expect them from year to year.

On Sundays after games, the waste management staffers collect the filled blue bags from the parking lots and bring them to a university-owned recycling center and staging area, about half a mile from the stadium, to sort the materials. Bag collection might take a six-person crew with three trucks anywhere from four to six hours. The number of bags collected can range from 1,500 to 4,500 per game depending in part on the matchup, which drives fan attendance.



The stadium recently switched from black to clear plastic bags with black lettering so staff can ensure that only non-recyclable materials are thrown away.

Over the three or four days following a game, one staff member is responsible for collecting the recyclables from the blue carts, using a truck with a lift arm. Approximately 1 to 1.5 tons of recyclables per game are pulled from the blue carts. Recyclables in the carts are already sorted so they need not go to the university recycling center. A recycling marketer picks up the recyclables and sells them to processors. The proceeds are donated to the United Way.

For an implementation cost of about \$9,000, the "blue bag" initiative effectively doubled the stadium's recycling capture, Matyasovsky says, over simply scattering the wheeled recycling carts throughout the tailgating area.

Recycling Inside the Stadium. In 2008, Penn State began collecting beverage containers inside the stadium. It added 127 recycling bins in the concourse areas and plans to purchase more. The 96-gallon stainless steel bins have a 4- by 3-foot panel for print advertising, which will help cover the upfront purchase and ongoing maintenance costs for the recycling bins. These bins used inside Beaver Stadium will be shifted to other facilities, such as Medlar Field during baseball season, to further expand recycling opportunities on campus.



Workers load recycling bags filled with cans and bottles onto a truck for delivery to the Penn State recycling center where they will be sorted for delivery to the Centre County Solid Waste Authority.

Also collected inside the stadium are leftover program booklets and cardboard packaging from concessionaires. The university's waste management team collects these materials after the games at the stadium's north ramp and delivers them to the recycling facility for processing.

Education and Outreach

"Come to the Game, Honor the Name" is the stadium's recycling mantra. Fans are reminded through public service announcements on the video board and in person by the student volunteers that participating in the stadium's recycling program embodies a "multiplicity of Penn State values," Matyasovsky says. "At a Penn State game, you should enjoy yourself, but at the end of tailgating time, participating in the recycling program is the right thing to do to honor the school, keep our grounds clean, help keep costs down, protect the environment, and support the United Way."



Bins placed inside the stadium have panels for print advertising to cover the purchase and maintenance costs for the recycling bins.

Challenges and Solutions

Challenge: Not enough recyclables were being collected simply through use of recycling carts placed in the tailgating area. Even though scout troops encouraged fans to separate their trash from recyclables, with 110 acres to cover, the effort was not that effective, and trash still ended up on the ground.

Solution: Student volunteers now circulate through the parking lots handing out translucent blue bags so fans can easily separate their recyclables from trash. The bags themselves are recyclable once the materials inside have been removed and sorted. (The stadium is able to send the plastic bags along with other plastic film collected on campus to be recycled into wood/plastic composite lumber.) The blue bag effort nearly doubled the volume of materials captured in the tailgating area.

Challenge: The Centre County Solid Waste Authority requires that Penn State's recyclables have a contamination rate of 3 percent or less.

Solution: Penn State policy—university-wide—requires participation of faculty, staff, and students in its recycling program to ensure compliance with the county's mandated 3 percent or less contamination rate. At Beaver Stadium, the first line of defense is promoting source separation through use of blue bags and recycling carts. Once the recyclables are collected from the tailgating area, university waste management staff empties the bags and sorts the materials at the campus recycling center. The county does an additional level of sorting. Penn State has not faltered in meeting the 3 percent goal during the 13 years of the recycling program.



Jumbotron announcements like this one encourage recycling at the stadium.

In the Future

Penn State's goals are to increase student involvement in promoting the recycling program and to improve communication with fans to educate them about how many bags of recyclables have been collected and how much money they raised for the United Way. A long-term goal is to raise the stadium's recycling rate from 48.6 percent to 67 percent.

The stadium has purchased bins to compost food waste from food preparation areas inside the kitchen and will begin a pilot program during the next season. The university has a food composting program that will accept the food collected at the stadium.

The university continuously looks for ways to reduce waste on campus. Another successful initiative, and one of the few other events that take place in Beaver Stadium, is Trash to Treasure, a 1-day yard sale held every spring. The event invites students to drop off unwanted clothing, furniture, school supplies, and other items for resale. In its first six years, Trash to Treasure diverted nearly 422 tons of reusable materials from the landfill and raised \$258,000, which was donated to the United Way.

Tips for Stadiums

- Start with a pilot program to learn what works for the fans and the stadium.
- Be where the customers are and make recycling easy.
- Enlist students and other volunteers to hand out bags and promote the program.
- Advertise the program and report volumes collected on the video board, in advertisements in program booklets, and in announcements over the public address system.
- Thank the fans and stakeholders regularly.



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