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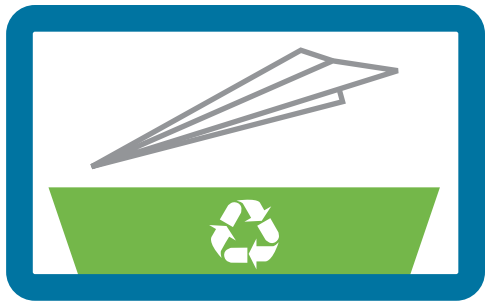
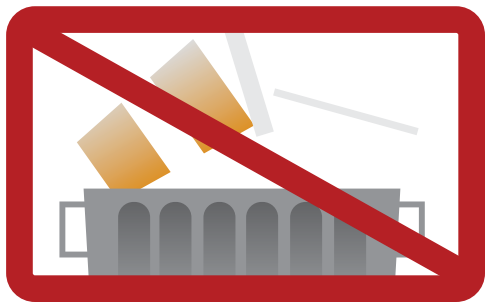
RESOURCE RECYCLING

Recycling Takes Flight



Recent efforts to improve the environmental impact of air travel have yielded new recycling programs specially designed for airlines and airports, making it possible for collection and recycling to take off.

by Henry Leineweber



As air travel becomes increasingly synonymous with cuts to service and delayed departures, the costs of the supposed comfort and convenience of flying continues to mount. But in recent years, the changes in the way we fly have begun to take a growing toll on the environment.

The hub and spoke system has produced such airports as Chicago's O'Hare International, where the number of delayed flights on a given day averages 35 percent, forcing travelers to consume extra products. According to the Natural Resources Defense Council, the average air traveler generates approximately 1.28 pounds of waste during their time in an airport terminal, roughly one-third of what the average American produces in a day at home. Servicing millions of people every day, the nation's air travel infrastructure produces a staggering amount of materials, including paper, plastic, aluminum and organic waste, which, until recently, has presented an overlooked opportunity for recycling.

But, many airports nationwide, and some airlines, are trying to buck this trend of more waste by introducing new recycling programs. Faced with a unique operating environment, those developing airport recycling programs have had to invent new ways of making collection and recycling work.

Getting off the ground

Facility size, round-the-clock operating hours, waste disposal agreements, airline and retail space restrictions, and most recently increased security measures, all contribute to the difficulty of implementing a successful airport recycling program. As a result, many successful programs have begun with an initiative from airport management. Startup capital and the authority for a recycling board to begin a waste assessment of the airport are an essential first step.

It is important to note that no two recycling committees are alike, given the uniqueness of each airport; however, most are composed of representatives from the airport's existing solid waste program (or programs), terminal and administrative staff, retailers, airlines and security personnel. Other individuals, such as graduate or doctoral students and municipal, county or state recycling coordinators, have also been known to lend their expertise to program development. Consulting the latter is a necessity for airports operating in municipalities, counties or states with existing recycling legislation.

The U.S. Environmental Protection Agency (EPA) identifies the first order of business for any airport recycling committee as

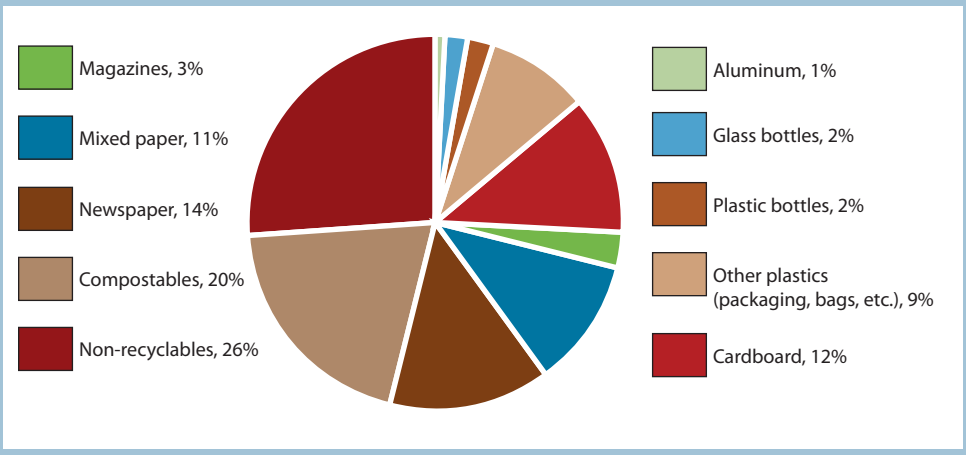
being a waste assessment of the airport facilities. This can be accomplished a number of ways, such as reviewing waste hauling and disposal records, a waste facility walkthrough, or a "waste sort," in which strategically-selected refuse bins from the airport are surveyed for their contents at different hours of the day.

The primary goal of conducting a waste assessment is to determine which areas of an airport have the highest waste volume, and what the composition of that waste is (Figure 1). Although composition varies greatly depending on waste bin location, airport, and time of day, approximately 75 percent of the waste stream generated by airports is consistently recyclable.

Findings revealed in a December 2006 NRDC report, entitled *Trash Landings: How Airlines and Airports Can Clean Up Their Recycling Programs*, point to terminal public areas, retail and restaurant locations and administrative offices as the locations that produce the highest volume of potentially recyclable materials on the airport grounds. Waste generated on inbound aircrafts, however, account for 47 percent of the total volume processed by airport sanitation services. Typically, this waste is composed of soiled paper products, uneaten food/compostables, and plastic or aluminum containers. The former category remains fairly consistent in per-capita volume among all air carriers, while the volume of the latter two are greatly increased on airlines that do not offer in-flight meal service, as this forces passengers to bring items on board.

Post-consumer materials generated by retail and restaurant businesses primarily consist of plastic bottles, containers and wrap, cardboard, mixed paper and food scraps. The same can be said for terminal public area waste, although higher concentrations of newspapers, magazines and restroom trash persist in these areas. A breakdown of the aggregate composition of all airport waste is illustrated in Table 1.

Figure 1 | Airport waste composition estimate



Source: Natural Resources Defense Council, 2006

Charting a course

Following the completion of a waste assessment, the development of an airport recycling program can progress in a number of different ways, determined in large part by the facility's existing waste disposal scheme. Many airports have adopted what is known as a decentralized waste hauling system, which is characterized by each airline or tenant contracting for their own waste collection needs. This method absolves airport management of the responsibility of having to coordinate the needs of each individual tenant and is particularly attractive to administrators looking to reduce staff costs.

A successful airport recycling program operates best under an alternative method of airport waste management. EPA guidelines on creating such a program specifically identify a centralized collection scheme as being ideal for coordinating an airport-wide recycling program. Under this plan, all airlines and tenants operate under a single waste collection contract negotiated by the airport authority. Program managers, however, are forced to spend more of their time coordinating different collection needs, as recycling programs necessitate a high level of coordination between all parties, in order to maximize the effectiveness of bin placement, education and efficient use of space.

Ensuring financial fairness for all parties has proven to be a challenge, but airports have developed many novel ways of making sure waste generators pay their share. Seattle-Tacoma International Airport, for instance, instituted a pay-as-you-throw system. Additionally, consolidating all waste collection services into a single contract allows the airport authority to leverage economies of scale, to negotiate substantially lower rates for all tenants and airlines.

Table 1 | Location of recyclable materials at airports

Materials	Public terminals	Ticketing	Security gates	Food service areas	Offices	Cargo/freight area	Maintenance areas	Airport grounds	Aircraft	Airfield ramps	Construction areas	Concessions/ retail areas
Cardboard				X	X	X	X		X			X
Mixed paper	X	X	X	X	X	X	X	X	X	X		X
Newspaper	X	X	X		X				X			
Glass	X	X	X	X	X	X	X		X			
Aluminum	X	X	X	X	X	X	X		X			
Plastic bottles	X	X	X	X	X	X	X		X			
Pallets						X						
Food waste & cooking oil	X			X	X							
Organics/ Green waste								X				
Electronics					X							
Tires							X					
Oil							X					
Scrap metal						X	X				X	
Concrete											X	
Lumber											X	
Batteries					X							
Toner cartridges					X							X
Non-bottle plastic							X	X				X

* Source: U.S. EPA, 2008

The EPA advises that since any waste hauling contract would likely need to be renegotiated to accommodate a potential recycling program, recycling committee members should use that opportunity to convince all tenants to participate in a centralized waste collection system. Much like a municipality or county, several options exist for collecting recyclables in any new contract.

Single-stream or post-treatment separation may be considered for simplicity's sake, and some airports have chosen this method of recycling, signing a favorable contract with a local material recovery facility. A potential disadvantage of this is that such programs can potentially decrease the visibility of the airport's recycling program, which can hamper education efforts.

Generally, airports that operate successful recycling programs have opted to participate in multi-stream recycling, as frequent air travelers are more than likely to be familiar with the mixed paper, plastic/aluminum and waste trio of bins. This setup simplifies collection by airport custodial staff, since different material streams are generated at different frequencies throughout the day. For instance, waste paper generation peaks in the morning when travelers pick up their daily newspaper, and beverage container generation peaks in the afternoon, following the lunch hour. Even though it seems as if a commingled or post-treatment collection method might be more efficient, pre-sorting materials greatly reduces the amount of labor required at sorting and processing facilities and, subsequently, the price charged to program operators.

Strategically placed bins (at locations identified by an earlier waste assessment) could possibly accommodate material generated inside the terminal or administrative offices, but waste generated on the airplane itself cannot be collected in this way. Short turnaround times between flights, as well as variations in recycling services provided at each destination airport, are identified by the EPA as being barriers to expanded recycling options on airplanes. Some carriers, such as Delta Air Lines, offer an in-flight recycling service, which indicates these issues can be addressed. But, for practical purposes, studies indicate that airports beginning new recycling programs often postpone collecting and sorting airplane waste until terminal recycling is firmly established.

Avoiding turbulence

In terms of education and marketing, airports offer several unique advantages for recycling program success versus municipal or county initiatives. For starters, airports are largely self-contained, and, even though a large volume of people are constantly coming and going, a greater degree of administrative control is possible in airports. Due partly to address concerns

Busiest U.S. airports* (in terms of passengers per year)

Atlanta – Hartsfield-Jackson Atlanta International Airport	90,039,280
Chicago – Chicago O'Hare International Airport	69,353,654
Los Angeles – Los Angeles International Airport	59,542,151
Dallas – Dallas-Fort Worth International Airport	57,669,331
Denver – Denver International Airport	51,435,575

*Preliminary 2008 numbers
Source: Airport Council International, 2009.

regarding employee turnover (presently, airport security screeners have some of the worst job turnover of all federal workers), airport employees and administrative personnel frequently undergo routine education and training every several months to keep abreast of new policies and changing conditions. This is the case at Portland (Oregon) International Airport (PDX), where new staff training on the proper management of recyclable materials has proven to be a quick and effective way of educating airport staff on recycling at airports. Similar instructional techniques have worked effectively with airport retail, vendor and restaurant staff, too, thus ensuring that all employees being educated and kept in the loop.

Customer education efforts can be accomplished through the visible presence of recycling bins, giving the distinctly-shaped bin styles, and openings of multi-stream collection programs, an advantage over commingled options. Additionally, signage identifying the location of terminal recycling bins, as well as advertising the airport's recycling and sustainability initiatives, have been shown to increase participation in airport recycling programs and boost interest in other sustainable initiatives. A common method of ensuring that recycling bin signage is attractive and visible is to partner or solicit sponsorship from a business. This will also help supplement some of the program costs.

Other ideas airports have successfully implemented to improve the efficiency of their recycling programs include encouraging vendors, restaurants and retailers to adopt uniform packaging standards to ease sorting, and communicating with recycling committees at other airports to reduce confusion for travelers.

Finally, the most successful programs tend to be the ones that utilize effective logistics in their recycling program. The limited space available for airports provides an extra incentive for program managers to renegotiate their waste collection contracts into a centralized system, if one is not currently present. This allows for a single waste management location for the entire airport, rather than individual locations for each party.

Similarly, the principles of reverse logistics can be applied more easily to a centralized system. Many airports have found that the quickest and most efficient way of getting recyclables to their on-site management location is to send them back through existing supply lines. For waste coming from the terminal or administrative offices, this would mean returning them via the same system used to deliver goods from freight loading docks to vendors, retailers and offices. For airport grounds and tarmac crews, fuel, parts and vehicle supply chains can be used to send back recyclable waste materials.

Ideally, a waste and recycling center for the program would be located near the airport's existing freight loading and unloading area, but again, existing space restrictions sometimes render this impractical.

Notable U.S. airport figures

650,000	Projected tons of waste generated by U.S. airports in 2015
425,000	Tons of waste generated by U.S. airports in 2004
20,000	Number of households powered from the resulting energy if airports and airlines matched the current U.S. recycling rate
19,847	Total number of U.S. airports
58	Number of Boeing 747 jets that could be built from aluminum cans discarded annually by the airline industry

Source: Professional Convention Management Association, 2009

Soaring higher

Implementing an airport recycling program is challenging, but not prohibitively so. Routine waste assessments to measure recycling progress at participating airports have, over time, illustrated many of the benefits of airport recycling, such as controlled access to facility areas and improved coordination with retailers, vendors and offices. Other related environmental initiatives, such as waste reduction campaigns and renewable energy investments, have also shown to improve public interest in recycling at such airports as PDX, Sea-Tac or Salt Lake

City International Airport. Additionally, program coordinators have found that reaching beyond recycling can generate added favorable press coverage and increased funding. Recycling is no doubt an essential component for greening airport operations, but when partnered with a comprehensive sustainability campaign, the sky's the limit. ♻♻

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