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The Only Way to Fly

Airports are going green — partly on principle and partly because it makes good business sense.

By William F. Hewitt

Green is the hottest color at the nation's airports. Consider the following:



Chicago's O'Hare International Airport is using a sustainable design manual to build a new terminal and runway. San Francisco International is taking an across-the-board approach to sustainability, as are airports to the north in Portland and Seattle. New York's Kennedy Airport has found a way to reduce pollution from deicing by 90 percent. Virgin Atlantic has been testing the feasibility of towing airplanes to and from the runways, a project that could reduce fuel use and greenhouse gas emissions.

Industry groups are developing comprehensive surveys of best sustainability practices. They are also creating sustainability guidelines that include economic viability as a core component.

In short, the greening of airports is on the agenda of airport management and industry associations, the airlines and their consultants, and local and federal agencies. There is also a committed corps of professionals driving much of this activity.

Surveying sustainability

"An airport is a city, with utilities, transportation, businesses, even parks and recreation in some cases, and residences and training facilities," says Carol Lurie, AICP, senior environmental planner for aviation services with Vanasse Hangen Brustlin, based in Watertown, Massachusetts. Lurie works on Logan International Airport's Environmental Status and Planning Report, produced every five years since 1999. She also works on the environmental data report that is issued in the interim years for the Boston airport.

According to Stewart Dalzell, deputy director of environmental planning and permitting for Massport — the operating authority for Logan — the environmental reports are used as a measure of progress on the goals outlined in the airport's Environmental Management Policy and its Sustainability Plan. Those documents were adopted in 2000 and 2004, respectively.

In another commission from Logan, VHB was asked to review sustainability initiatives at other airports. Lurie reported on this study at an industry conference in July. The study compares sustainable best practices at 10 major airports around the world, eight of them in the U.S. It looks at a range of environmental performance categories: sustainability, noise, air quality, waste management, energy use, and so on.

Among other things, Lurie concludes that the future will bring changes in airport planning and operations and a focus on the facilities' carbon footprint and greenhouse gas emissions.

At a larger scale, the Transportation Review Board's Airport Cooperative Research Program, which gets \$10 million annually from Congress, has 70 projects in the works and 25 more in the pipeline. One of ACRP's projects is a study of airport sustainability practices at nearly 30 airports around the world — being conducted by Ove Arup & Partners, based in London. After review by a panel of aviation industry experts, the report will be available to the public early next year.

Gail Staba, AICP, is a senior program officer with TRB and the facilitator for this project. "Airports are interested in all aspects of this: green building, waste management, water management, energy, etc.," she says.

Also focusing on green practices is the American Association of Airline Executives, which has more than 5,000 individual members nationwide. According to Tom Zoeller, the organization's vice president for regulatory affairs, "airports are looking to be leaders now on sustainability." Because of climate change, he adds, there has been a "political climate change" as well.

What's driving the trend?



Economics is a major impetus for greening airports, says Sue Schalk, AICP, the president of Aerofinity, a consulting firm in Indianapolis. Schalk is also a past president of the Airport Consultants Council. (See her June 2002 article, "In Plane View.")

"For airports, the economic side is more important than the environmental or the social," Schalk says. "It's a volatile time for the aviation industry. If you can show cost-effectiveness, that's an important sales tool in outreach to the airport's board."

Carol Lurie agrees. "To sell sustainability internally, you have to show that it's cheaper in the long run," she says. Likewise, Eric Dillinger, a principal and vice president at Carter & Burgess in Fort Worth, says "If it's not cost-effective, it's not sustainable."

There's a lot at stake here because airports are economic powerhouses. O'Hare generates 450,000 jobs and \$38 billion in economic activity each year. The airport's upcoming modernization is expected to attract another 195,000 jobs. Similarly, New York's John F. Kennedy International Airport employs 35,000 people and contributes about \$30 billion in economic activity annually to the New York–New Jersey metropolitan region.

Even a medium-sized airport like Boston's Logan International packs a big punch. Logan ranks 20th in the nation in passenger volume. It employs about 12,000 workers and contributes about \$7 billion a year to the New England region.

But other factors besides cost are also driving the move to green airports. If their pollution levels get too high, for instance, airports could have a hard time persuading federal officials to approve their expansion plans.

In seeking ways to cut pollution, airports are focusing on such tasks as deicing. Right now, they use a deicing method that depends on the application of glycol, a highly polluting chemical derived mostly from petroleum. Containing the glycol after use is a costly job, as is trucking the waste away for disposal.

An alternative is infrared energy, which reduces the need for glycol by 90 percent. Ian Sharkey, director of deicing services for a firm called Radiant Aviation Services, based in Niagara Falls, New York, notes that infrared technology was used for deicing for the first time at Kennedy Airport last winter. The Port Authority of New York and New Jersey, which operates the metro area's three international airports, estimated that infrared technology eliminated 82,000 gallons of glycol discharge.

Another factor behind the greening trend is public sentiment. Cheryl Koshuta, the chief environmental officer for Oregon's Port of Portland, says her organization's efforts were made easier by the fact that "people who live in Portland generally have a greener ethic."

Sam Mehta, environmental services manager for San Francisco International, frames the issue this way: "With the environmental culture in San Francisco, we are preaching to the choir." His airport's top managers also are very supportive of the sustainable program, as is Mayor Gavin Newsom, Mehta says.

Another mayor, Chicago's Richard Daley, has been instrumental in keeping the O'Hare Modernization Project green, according to its executive director, Rosemarie Andolino, first deputy commissioner of the Chicago planning department.

Chicago: From the ground up

The \$6.6 billion O'Hare modernization project was announced in 2001. The project includes the construction of a new runway, relocation and extension of existing runways, and a new terminal.

Looking for environmental innovation — in design, construction, and operation — project managers assembled a task force of experienced people representing both government agencies and consultants. The team worked to flesh out guidelines that would govern the work. They used principles borrowed from the U.S. Green Building Council's LEED program and those already in place in Chicago.

The resulting document, the *Sustainable Design Manual*, was published in 2003. It applies to four different project categories: civil-landside, civil-airside, occupied buildings, and unoccupied buildings. The manual includes guidelines for sustainable site management, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, facility operations, salvage of materials, and construction practices.

Andolino notes that 90 percent of the project's construction and demolition debris is being recycled or salvaged. That's

about 30,000 tons of steel, brick, concrete, and other materials. In addition, ultra-low sulfur diesel fuel is powering the construction equipment, and, although 154 acres of wetlands will be lost during construction, they are being offset by 450 acres to be created at various sites around Illinois.

A certification point system established as part of the design manual awards from one to five "green airplanes" for elements of the modernization project that meet certain design targets. The North Air Traffic Control Tower has earned four green airplanes.

Modernization will have other tangible benefits, says Andolino. She notes that when the first phase is completed in 2011, the average delay time for pushing off from the gate will be 16 minutes — down from the current 22 minutes. That delay will be only six minutes when all the work is done in 2016 or earlier. In dollars, that translates into \$370 million in annual savings for the airlines, including fuel costs, and another \$380 million for passengers. The airport's carbon footprint will shrink as well.

SFO: Reducing the thirst for fuel

San Francisco International Airport has a full program that includes green buildings, air quality enhancement, noise abatement, water conservation, solid waste reduction and recycling, and energy efficiency. The program includes some innovative strategies that help airlines reduce fuel use as well.

At most of its gates (soon at all of them), SFO gives airlines the option of getting two power feeds directly from the airport itself: preconditioned air and ground power. This option allows the airlines to avoid using their own auxiliary power (the small engine at the back of the plane), thus saving fuel and money.

"Airlines are very conscious of costs," Mehta says, noting that if all the airlines used this option at all 100 SFO gates, fuel savings could reach nine million gallons a year.

SFO is also the site of a test being conducted by Virgin Atlantic, whose founder, Richard Branson, has made sustainability a goal. The airline is pioneering a program to have planes towed into and out of the terminals. At a trial in March, jointly administered by the Federal Aviation Administration, SFO, Virgin Atlantic, and Boeing, a plane was towed from its gate to a spot closer to the runway, saving 595 pounds of jet fuel in the process.

Mehta calculates that if just 30 percent of departing flights used this protocol, 16,000 tons of carbon dioxide emissions would be avoided each year at his airport alone. Of course, fuel saved by towing could be consumed by delays if the process isn't smooth. Virgin Atlantic is working with its partners to extend its pilot program to other airports in the U.S. and in Britain.

Renewables and other efforts



Some airports are getting serious about renewable energy. Oregon's Portland International Airport gets 10 percent of its energy from renewable sources and is shooting for 100 percent eventually. The Port Authority of New York and New Jersey announced in May that it is looking at an array of renewable options, including geothermal, fuel cells, wind, and solar. The agency already has a 100-megawatt cogeneration facility at JFK.

Some airports' vehicles are already powered by alternative fuels. At Logan, 33 shuttle buses that use compressed natural gas have logged 10 million miles to date. Dallas/Fort Worth International has converted all of its light-to-medium duty vehicles and all of its buses and shuttles to alternative fuels. Portland and SFO are using

advanced biodiesel engines. Some airports are instituting incentive programs for cabs that use alternative fuels and hybrid engines.

Transit is also important to airport sustainability. SFO estimates that nearly half of its passengers use public transportation to get to and from the airport. AirTrain JFK booked four million paid customers in 2006, nearly one tenth of the total customer flow at the airport. AirTrain Newark attracted nearly 1.6 million paid riders out of the airport's total 35.5 million passengers. Riders boarding within the airport ride for free.

Airport buildings are beginning to go green as well. Delta Airlines and Massport received LEED certification a year ago for the 680,000-square-foot Terminal A, the first airport terminal to receive this rating. The facility's reflecting windows and

roof trap heat inside when it's cold and keep heat out when it's hot. The interior lights are set to dim automatically when natural light is available.

Another area of focus is food service. Portland International Airport has an ambitious food waste collection and composting program. "This is cutting edge for airports," says Cheryl Koshuta. The airport collects preconsumer waste (from the kitchens) and postconsumer waste (off the plates), and sends the scraps to a local facility for composting. Some of the compost comes back to the airport for landscaping. All the concessionaires are participating, as are the airport hotels and flight kitchens. To make this all work in the most efficient way, the airport has set up a comprehensive training regime for all food workers, Koshuta says.

The big picture

The trick to involving more airports, according to Wayne Harvey, director of facilities maintenance at San Diego International Airport, is to make "sustainability sustainable." This sentiment is echoed by many of Harvey's colleagues in the aviation industry.

What's involved is a life-cycle analysis — what Harvey calls the "total cost of ownership." In talks he gives with Ellen Crews of Carter & Burgess, he notes that 75 percent of the cost of ownership comes after a facility has been built. "A comprehensive asset management process considers all costs of acquisition, planning, design, construction, operations and maintenance, renewal, disposal, and replacement incurred over the life of a facility," Harvey says. "You have to design the sustainability answer around the organization's needs."

Another proponent of life-cycle analysis is Burr Stewart, manager of strategic planning for the Port of Seattle and chair of the Transportation Research Board's aviation sustainability subcommittee. He notes that "sustainability allows organizations to make comprehensive decisions" — so long as all the important points of view are taken into account.

Airports must communicate with local authorities, concessionaires and vendors, and the airlines, Stewart says. They also communicate with state and federal authorities and the International Civil Aviation Organization, and with industry groups.

One such group is the North American section of the Airports Council International. ACI's sustainability steering group is indexing sustainability initiatives that are under way at various airports, and it promotes best practices. According to the group's website, the core benefits of sustainability are economic viability, operational efficiency, natural resource conservation, and social responsibility — or EONS.

"Airports, the progressive ones, see sustainability as a way to do business," says Jessica Steinhilber, director of environmental affairs for the North American section of ACI. However, she points out that European airports are ahead of us, even with the many initiatives under way in the U.S.

That means more challenges lie ahead. As Carter & Burgess executive Eric Dillinger says, "The biggest challenge is to make sustainability more than just an architectural triumph, so looking back 20 or 30 years you can see you've had an impact."

Bill Hewitt is a writer and principal of Hewitt Communications. He runs a blog on climate change for the Foreign Policy Association.

Resources

Images: Top — A green roof under construction at O'Hare. Photo courtesy O'Hare Modernization Project. Middle — A plane at SFO being supplied with preconditioned air and power. Photo courtesy Sam Mehta/San Francisco International Airport. Bottom — Goats clearing vegetation at San Francisco International Airport. Photo courtesy Sam Mehta/San Francisco International Airport.

For more on the Airport Cooperative Research Program: www.trb.org/acrp

Airports Council International-North America: www.aci-na.org

American Association of Airline Executives: www.aaae.org

San Francisco International Airport's environmental sustainability program won an Environmental Achievement Award from the Airports Council International at its annual convention in Kansas City earlier this year.

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