

ATL Proves It's Never Too Late to Go Green

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Sams Lake Bird Sanctuary was built by ATL as part of its fifth runway project.



Hartsfield-Jackson Atlanta

A lot has changed since the terminal at Hartsfield-Jackson Atlanta International Airport (ATL) was built in late 1970s. Sustainable design wasn't yet a hot topic among architects, and green building standards were decades from being established. Gas conservation was an issue, but it generally stemmed more from embargo-induced shortages than preservation of a natural resource.

As ATL's terminal approaches its 30th birthday next year, environmental initiatives for its next 30 years of operation are top priorities.

"We're doing what we can to reduce the airport's impact on the environment," explains Tom Nissalke, Ph.D., director of environmental and technical services for the City of Atlanta's Department of Aviation. "Once we got started, it (environmentalism) made its way into more and more projects. We've changed the way we approach things from the very start.

Now, it's a natural part of almost everything we do."

Initiatives at ATL range from seemingly small changes like switching paper products in restrooms to a \$21 million upgrade of the terminal's central utility plant. Even minor tweaks, however, yield major results at the world's busiest airport. With nearly 6 million square feet of terminal serving more than 90 million passengers and roughly 56,000 workers annually, the results of ATL's "eco-efforts" add up quickly.

Facts & Figures

Project: Leadership in Energy and Environmental Design Certification for Existing Buildings

Location: Hartsfield-Jackson Atlanta Int'l Airport

Terminal Operator: Atlanta Airline Terminal Corporation

Project Start: Spring 2007

Certification Anticipated: Spring 2009

Major Costs: Conversion of central utility plant from steam to electric - \$21 million; other HVAC upgrades - \$6.5 million; reflective roofing - \$6.75 million; water-saving restroom commodes and flush valves

Major Benefits: Decreased water and energy consumption; increased trash recycling; decreased emissions; decreased costs

The long list of green projects is a diverse mix of infrastructure upgrades, shifts in purchasing policy and changes to standard operating procedures. Some are being paid for by the city of Atlanta, which owns the airport; others are on the tab of the Atlanta Airline Terminal Corporation (AATC), which operates and maintains the terminal complex on a contract basis for the airline consortium. All are designed to bring the best of today's environmental technologies and practices to a terminal built in an era when most cars could be filled with gas for \$10.

Taking the LEED

The U.S. Green Building Council's standards for existing buildings provide the framework for many of the changes at ATL. Certification under the Leadership in Energy and Environmental Design existing building (LEED EB) program is expected next spring, after a full two years of efforts.

"It's quite extensive," explains Kim Vagher, executive director of AATC. "We need to meet specific standards for recycling, water and energy conservation, external maintenance and efficient use of materials and resources. And there's paperwork for all of it."

Water conservation was already a high priority when the airport registered to participate in the LEED EB program. A major drought throughout the Southeast in 2007 provided impetus; city-mandated water reductions and appearing on the Atlanta Journal-Constitution's list of top 10 water users added urgency.

"We reached the mayor's 10% reduction goal and branched out from there," recalls Vagher.

ATL's \$62 million restroom renovations combine aesthetic upgrades such as countertops, flooring and wall coverings with new water-saving fixtures. Thousands of new commodes and updated urinal valves are expected to save

more than 44 million gallons of water annually - one flush at a time.

Reusing water from the cooling tower of the airport's HVAC system is expected to save another 8 million gallons per year. Previously, water used during the blow-down process (which occurs seven to eight times daily) was flushed away because it contained metals that would damage the unit's turbines. Now, reverse osmosis removes the metals and other potentially harmful elements and the water is recycled.

Overall return on investment for ATL's water conservation measures is estimated at 3 1/2 years. "They're very cost-effective projects - especially when you consider the aggregate amount of water saved and the rate we pay for it," notes AATC deputy executive director Rod Ozust.

Electricity use is also being scrutinized. Recent conservation measures include turning off half of the North Terminal's baggage handling system when passenger loads allow and shutting down the airport's moving sidewalks and escalators from midnight to 5 a.m.

A new HVAC system preset that triggers air conditioning at 58° F is expected to net considerable savings. In addition, voltage adjustments allow terminal lighting to consume 50% less energy without any discernable changes for occupants.

On the airfield, Siemens' DC Series LED lights are being tested for use on taxiways and runways. "They're super efficient," stresses Nissalke, "but with our high volume of lights, we need to make sure maintenance costs don't offset the energy savings. So far, it looks very promising."



White roofs and central utility plant upgrades will slash the airport's electric bill and conserve water.



Cool It

Air conditioning a terminal complex that spans nearly 6 million square feet was already a formidable challenge. The addition of a new 12-gate international terminal in 2012 further increased the need for a critical reevaluation of the system.

Replacing the terminal's 30-year-old steam-powered chillers with new, more efficient electric units will conserve both water and energy as well as eliminate boiler stack emissions. The new electric-powered system will eliminate the need for natural gas that currently fuels the steam chillers

and will save an estimated 10 million gallons of water per year - enough to float a WWII battleship.

The \$21 million conversion was supported with other HVAC upgrades worth nearly \$6.5 million.

"We considered simply upgrading the steam-based system, but when we looked at current electrical infrastructure and capacity, along with the airport's plans for the future, we determined now was the time to make the move to an electric-based plant," explains the Department of Aviation's principal mechanical engineer, Eric Hall.

Three new electric water chillers and associated upgrades to the utility plant in Concourse E will provide up to 23,000 tons of cooling power for the airport - enough to cool approximately 4,600 family homes.

As the boiler stacks come down, white roofing material is being added to Concourse D for \$2.25 million.

"By reflecting heat off the roofs, we decrease the load on our HVAC system in the summer," explains Vagher.



Nearly 450,000 square feet of the same 80-mil single membrane material was added to the roofs of Concourses A and B earlier this year for \$4.5 million. Energy reductions of 20% to 30% are cited for other buildings using white roofing.

Rethinking Requisitions

Due to the sheer size of its terminal, the type of everyday consumables used at ATL is an important component of its greening efforts.

"We've had major wins in this area," reports Ozust.

Transforming paper giant Georgia-Pacific from a supplier to a strategic partner has netted considerable gains. Switching from folded hand towels to rolled towels in restroom dispensers, for instance, reduced the overall volume of material used by 245,000 pounds per year - roughly the same amount of paper towels used in 260,000 homes annually. At the same time, the airport switched to towels with a higher amount of recycled content (at least 70%), which compounds the positive effects.

Similar gains were made inside restroom stalls, too. By switching to single-ply tissue delivered on compact coreless rolls, ATL will use 145,000 fewer pounds per year.

"It's not just about how much paper is used," explains Vagher. "The way it's manufactured and delivered matters, too. By using tissue with a minimum of 40% recycled content and ordering it on coreless rolls without all the usual extra wrapping, we're saving 587 tons of CO2 emissions annually. That's like removing 113 cars from the highway every year!"

Despite impressive gains on the paper front, AATC continues to look for even greener options. Currently, it's testing hand dryers. "We'll have to see how customers feel about the idea," notes Vagher. Early indications show an even split of preference for towels and dryers. Excessive noise has already eliminated some models from consideration.

Converting to foaming hand soap from the airport's previous thick pearlescent formula drastically reduced the amount of product used.

Cleaning up the Janitor Closets

The products used to clean and maintain the terminal facilities are also being reevaluated for their effect on indoor air quality and the wastewater stream. Green-Seal products certified as environmentally responsible choices are now the norm.

ICS Contract Service, one of ATL's main custodial contractors, is already certified as a Green-Seal service provider; Corporate Service Management, the other main provider, is currently working for its certification. As such, both have learned about selecting and using environmentally responsible equipment as well as cleaning products. Floor scrubbers, for instance, can't emit more than 70 decibels of sound and vacuums must include dust capture systems.

Costs for more eco-friendly supplies have "stayed in line," reports Ozust. "Using green products is simply the right thing to do," he adds. "In some cases, switching products is actually saving us money."

Outside the terminal, a switch from urea to sodium acetate for snow removal represents yet another environmental gain.

Sorting it Out

With an estimated 70 tons of trash being generated daily at ATL, recycling could emerge as one of airport's biggest green initiatives. Both the airport and AATC are intent on increasing the 3% that was previously recycled to 50% and better.

"Separating paper and aluminum is difficult to do on site," explains Vagher. "So we're finding a better way to get it done." The answer seems to be partnering with material handling company Waste Pro, which plans to build a large off-site material recycling facility to sort and process trash from the airport and other area businesses. Permitting issues have delayed construction of the facility, but interim efforts to sort airport materials off-site have already boosted ATL's recycling stat to 10%. By the end of May, it's expected to hit 25%.

"Ultimately, we're committed to recycling 70% of the trash produced at the airport," Vagher reports.



New paper products, commodes and hand soap are making ATL's bathrooms more environmentally friendly.

Airside Efforts

Many of ATL's environmental initiatives fall outside the LEED EB program and outside the terminal itself.

When 14 acres of low-quality wetlands were paved during construction of its fifth runway, federal regulations required ATL to restore an equal number of similar wetlands. Instead, ATL invested \$5 million to create high-quality wetlands - more than three times the required amount. After five years of work, a bustling 56 1/2-acre wildlife sanctuary with a reconstructed stream and three ponds replaced a dried up lakebed. Wooden observation decks, a walking trail and gravel parking lot were also added to encourage public use.

"It's thriving beyond anyone's expectations," reports Vagher.



Tom Nissalke, Ph.D., director of environmental and technical services for the City of Atlanta's Department of Aviation.

Reusing 675,000 tons of pavement from the 1999 demolition of two other runways further "greened" the project.

"We were really out front on that one," recalls Nissalke. The old pavement was cut into large pieces and loaded onto flatbed trailers with a "slab crab." After waiting in stacks on the south end of the airport for years, it was used as fill under the new runway.

During construction, ATL also enforced its usual requirement for contractors to use "clean" construction equipment that limits harmful emissions. The overland conveyor used to transport and place 17.6 cubic yards of soil for the fifth runway was recognized by a regional Environmental Protection Agency diesel collaborative for its innovative design and use.

Other green initiatives at ATL have nothing to do with products or equipment. Strategic airfield management saves significant amounts of aircraft fuel and dramatically decreases emissions.

"Our end-around taxiway on the north airfield dramatically decreases crossing and departure delays, which in turn decreases fuel burn," explains Nissalke. "It was the first of its kind at a high-volume airport and it has worked great. It's quite spectacular when you see the departing aircraft rolling out one after another without costly delays."

The airport achieves similar efficiencies by using two departure headings on Runway 26L. With 15 degrees separation between the headings, controllers can increase departure intervals and still maintain proper separation between aircraft. As departure rates increase, fuel burn and emissions decrease.

If permission is granted for multiple headings on two other runways, ATL estimates it could prevent the emission of 80 tons of carbon dioxide and 10 tons of nitrogen oxide annually - not including reductions already netted by current procedures on Runway 26L.

Later this year, an automated people mover connecting a new rental car center to the main terminal will retire an entire fleet of carbon-burning shuttles. Such large-scale efforts demonstrate that achieving green certification of the terminal is part of a larger, broader environmental agenda at ATL.

"If you take on projects one at a time, the idea of creating a more sustainable airport isn't as gigantic a task as most people think," explains Vagher.

"We still have to maintain budgets," he specifies. "But in many cases, taking the right approach from an environmental standpoint has saved costs and generated new value."