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Chris Gwilliam

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chris.gwilliam@airportdimensions.com
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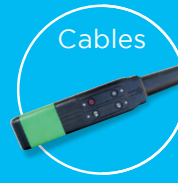
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Publisher
Paul H. Bowers
 paulbowers@airportimprovement.com
 262.510.7832

Editorial Consultant
Rebecca Douglas
 rebeccadouglas@airportimprovement.com
 815.621.4525

Social Media Director
Kristin Shaw
 kristinshaw@airportimprovement.com

Creative & Production Director
Becker 505, LLC - Chad Becker
 chad@becker505.com

Circulation Director
Lisa Monday
 lisamunday@airportimprovement.com

Webmaster
Matt Tews
 matttews@airportimprovement.com

Contributing Writers
Scott Berman, Jennifer Bradley, Nicole Nelson, Robert Nordstrom, Jodi Richards, Mike Schwanz, Kristin Vanderhey Shaw, Thomas Smith, Victoria Soukup, Ronnie Wendt

Advertising
Paul H. Bowers
 paulbowers@airportimprovement.com
 262.510.7832

Adrienne Gibson
 adriennegibson@airportimprovement.com
 262.844.4368

Vicki Jensen
 vickijensen@airportimprovement.com
 414-331-9768

Editorial Advisory Board
David Byers, Ph.D.
 Quadrex Aviation, LLC

Paul Cudmore
 Eagle Integrated Solutions

William Fife
 Peer Review Consultant

Glenn S. Januska
 Casper/Natrona County Int'l Airport

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Making Dollars & Sense of Green Projects

Change driven by politics rarely has a public mandate. Consensus is difficult to achieve; no one seems completely happy with the outcome; and it rarely accomplishes the intended results.

Conversely, change driven by greater rewards, cost savings or better user returns/customer service is easy to implement and accept.

Which brings me to the subject of being green, sustainable or earth-friendly.

In our risk-averse airport industry, green projects were once viewed as politically motivated ideas championed by hippy, left-leaning activists. Now they're being recognized as smart.

I'm happy to observe that we've turned the corner. Check out the natural landscaping at Phoenix Sky Harbor profiled on Page 62 and Portland International's Green Plate Program on Page 52 for two great examples of win-win environmental projects.

Sustainability can provide better service, healthier alternatives and reduce costs. Sure, it's not always easy; and there are costs

associated with making things right environmentally. Coverage in our July/August edition about the PFAS problem related to firefighting foam is a sober reminder of that. But with a dedicated effort and advancing technology, we have the will and capabilities to make things greener and better.

Our to-do list is fairly extensive. Carol Lurie, this issue's Industry Insider on Page 66, gives us a few ideas about where to start.

If you're looking for additional inspiration about how airports are bringing great ideas to fruition, check out the Airports Going Green conference Nov. 3 to 6 in Chicago, www.aaae.org/green. We'll be there with this issue.

Cheers,




PAUL BOWERS, PUBLISHER



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Oil Boom Leads to New Airport in Williston Basin

BY JODI RICHARDS



WILLISTON BASIN
INTERNATIONAL AIRPORT

FACTS&FIGURES

Project: New Airport

Location: Williston Basin Int'l Airport (ND)

Owner: City of Williston, ND

Total Est. Cost: \$275 million

Land & Airfield: \$165 million

Terminal & Support Facilities: \$70 million

Roads, Parking Lots & Utility Extensions: \$30 million

Planning & Environmental: KLJ

Terminal Surveying: KLJ

Designer of Record for Runway 14-32, Parallel Taxiway, Commercial Apron: KLJ

Designer of Record for General Aviation Area, Roads & Parking Lots: Burns & McDonnell; KLJ

Designer of Record for NAVAIDs: Burns & McDonnell; KLJ

Designer of Record for Airfield: Burns & McDonnell

Architect for Terminal & Snow Equipment/ARFF Building: Alliance

Engineering: KLJ

Owner's Representative: Cardon Global

Construction Manager at Risk (Terminal & Snow Equipment/ARFF Building): JE Dunn

Construction Project Manager: Ulteig; AE2S

Operational Readiness Services: Chrysalis Global Aviation

Exit Lane Breach Control: Dormakaba

Boarding Bridges: JBT AeroTech

Beam Seating & Recliners: Vitra

Lounge Seating: Decca; Martin Bartrud

Recharge Seats: Andraeu World

Ground Handling Services: DGS

Of Note: Rapid economic expansion related to oil production prompted city to replace small existing airfield with larger new greenfield airport



Booming. Surging. Growing. Like oil production in the Bakken formation, that's what is happening to communities in the northwest corner of North Dakota. In fact, a brand new \$275 million airport, Williston Basin International (XWA), opened in October to keep up with the unprecedented economic expansion.

The new airfield and terminal are located in Williston, a rapidly growing community 60 miles from the Canadian border and 18 miles from the Montana border. The city sits atop the vast Bakken oil formation, which exceeded the 1 million barrels per day production level in 2014, making North Dakota the nation's second largest oil-producing state in the U.S. The booming production drew new workers and businesses to the region—surging population in Williston from about 14,000 in 2010 to an estimated 27,000 in 2018.

The city's new airport, XWA, replaces its previous airport, Sloulin Field International (ISN), and is roughly twice its size. As the local economy and population grew, so did enplanements at ISN. Soon, the growth presented substantial challenges for the

airport, which was designed for small aircraft and much less passenger traffic. The 10,000-square-foot commercial terminal added in 2005 was designed to handle about 10,000 annual enplanements, which “was perfect for those times,” notes Airport Director Anthony Dudas.

Then, a resurgence of oil production in 2014 quickly rendered ISN decidedly undersized. “Who would have forecasted that type of growth for our community?” Dudas muses.

As the city and its planning team, led by KLJ engineering and planning services, considered whether to renovate or replace ISN, new commercial jet service added in 2012 definitely tipped the scales. Prior to that, ISN was served exclusively by turboprops through Great Lakes Airlines. With the upgrade to commercial jets from Delta Air Lines and United Airlines, ISN grew from less than 10,000 enplanements in 2009 to more than 120,000 in 2014—a 960% increase (yes, you read that right).



ANTHONY DUDAS





“The terminal was just not designed to handle what we’re seeing today, let alone the traffic that came when we commenced that jet service,” Dudas says. For example, the secure area in the terminal was designed for 41 people, which means it could not accommodate a single 50-passenger regional jet.

As a temporary measure to expand capacity, the airport added a doublewide trailer that accommodated up to 130 passengers at a time. “But it didn’t have all of those amenities that you would expect at a modern airport facility,” Dudas notes. Moreover, ISN did not have a baggage claim or passenger boarding bridges, which were sorely missed during cold North Dakota winters.

The ISN terminal was so undersized that TSA could not squeeze in an automated baggage screening device, so all checked baggage was hand-screened. Airport administration offices were moved to a separate facility to make room for rental car and airline operations.

Airside, the Category B paved surfaces and related infrastructure were designed to accommodate aircraft less than 25,000 pounds. ISN’s runway length (6,650 feet) and slope (1.3%) do not meet FAA design standards for larger corporate jets or the type of aircraft commercial carriers typically use to service communities the size of Williston. An elevation change of 90 feet from one end of the runway to the other created “challenging operational characteristics” for airlines and general aviation operators, Dudas notes. “We saw substantial weight restrictions because of that slope and the obstructions off the end of the runway,” he adds.

Too often, up to 25 passengers would be bumped off of a 50-passenger regional jet because of weight restrictions associated with the runway slope.

With only 803 acres, ISN did not have developable space for expansion. “The city grew up around the airport,” relates Dudas. “We didn’t really have any room for expansion without significant impact to our residential neighbors and the businesses that surround our facility.” And even if the airport purchased surrounding land, it would still have lacked room for future expansion.

Reviewing Options

Following a substantial environmental assessment and a site selection study that included seven different options, the field was narrowed down to three alternatives. One was to reconstruct ISN—a plan that would have required the city to replace virtually every piece of infrastructure. “Essentially, we were building a new airport no matter what—either on Sloulin Field or on a greenfield site,” recalls Dudas.

While ISN could have been renovated, doing so would have been impractical, he explains. Constructing a new airport on a greenfield site allowed traffic to continue operating at ISN during construction

of the new airport. Shutting down ISN for a reconstruction that could have taken up to two years would have had a hugely negative economic impact to the community. Additionally, there were fewer environmental impacts to building new, and the expected future sale of ISN will help cover the city's cost to construct XWA. "Financially, building a new airport made the best sense for our community," summarizes Dudas.

In 2015, an economic impact study conducted by the North Dakota Aeronautics Commission showed that ISN provided \$209 million of economic impact to the region.

Using geographic information system modeling with about 160 characteristics for compatibility with airport development, the project team evaluated land in Williams and McKenzie counties. The territory reviewed was from the Montana state line on the west to 20 miles east of Williston and from Alexander north to 15 miles north of Williston.

Alternatives were ranked based on factors including terrain, wildlife attractants, airspace obstructions, environmental impact and compatible land use (such as proximity to critical infrastructure and access to emergency services). Ready access for passengers was also an important factor. In addition to the city of Williston, XWA serves northwest North Dakota, northeast Montana and Canada. "We want to make sure that all the people can get to our facility easily," Dudas remarks.

Naturally, construction cost was a key consideration. "While most people think North Dakota is very flat, western North Dakota is not. It's pretty challenging to find a two-mile straight line that isn't either impacted by energy development or terrain," he explains.

Ultimately, the city purchased 1,620 acres about five miles northwest of ISN to build XWA. The state constructed a new bypass around Williston, which provides easy access to the new airport.

Today's Terminal

After the site was selected, planners positioned the airfield and terminal to make best use of the acreage and to preserve Native American heritage sites.

"Being a greenfield site was really a great opportunity," says Scott Sorenson, lead terminal designer with Allliance. "The careful planning and siting of the building allows for future growth that can happen in a managed way and still maintain the design intent of the building."



SCOTT SORENSON

The 103,000-square-foot terminal has four gates with three passenger boarding bridges, and is designed to accommodate about 300 passengers per hour at peak use. The terminal opened with one TSA passenger checkpoint, but has the capacity and infrastructure to add two more. "We feel it's going to be a great entrance to our community," states Dudas.

Allliance designed the terminal in three sections: a front zone with public spaces; a center zone that includes most of the

infrastructure and permanent fixtures; and a rear zone with passenger gates. This layout allows flexibility for growth off the rear and/or front zones with minimal impact to the infrastructure-rich center area, explains Sorenson.

In fact, the design team conducted three-dimensional studies to analyze the feasibility and logistics of future expansion. The terminal layout can accommodate up to 12 gates without any change to the infrastructure in the center zone.

Passenger amenities include a full-service restaurant, baggage claim, nursing mothers' room, children's play area, baggage screening area, passenger checkpoint, more comfortable landside and airside lounge seating, and ramp space for general aviation and commercial aircraft.

An airside restaurant, Refinery Kitchen + Bar, plus a grab-and-go option will add to the passenger experience, notes April Meyer, senior terminal designer-interiors with Allliance.



APRIL MEYER

The design and layout of the terminal provide expansive views of the prairie, with a drilling rig visible in the distance. "You see Williston's past, present and future right there," Sorenson relates.

Stratified limestone from the Missouri River basin is reflected in the exterior façade, running the length of the building and into the interior. Architects also incorporated cues to the region's industrial and mining sectors. The careful, clean and modern exposure of structural beams was part of that influence, explains Sorenson.

Interior elements pay tribute to the nearby Badlands, striated limestone along Missouri River bluffs and prairie grasses on rolling plains. The terrazzo flooring is reflective of the prairie, sky and horizon, notes Meyer. Darker colors and curves in the first 40 feet of the terminal lead to lighter, flowing colors. "It's almost as if it's pulled in from the exterior to the interior," she relates.

Airside, a grade-sheltered tug drive allows ground support personnel to access the baggage makeup areas and provides overnight shelter from the elements for equipment.

For high environmental performance, the terminal is well insulated and includes high-efficiency HVAC equipment and LED lighting to maximize energy savings. Exterior shading helps minimize glare from the low-setting western sun.

Expandable Airfield

Runway 14-32 at XWA is 7,500 feet long and 150 feet wide, and is designed to D-IV specifications, for aircraft with single wheel weight up to 120,000 pounds, dual wheel up to 195,000 pounds and dual tandem wheel up to 339,000 pounds. It is sufficient for the currently anticipated traffic, but the city acquired enough property to expand the runway up to 8,500 feet if necessary. The airfield also includes a full parallel taxiway and stub-outs for a future 4,500-foot-long, 75-foot-wide crosswind runway.

XWA has nearly twice the amount of apron space as ISN. A new fixed base operator, Overland Aviation, shares a 51,000-square-foot facility with Customs & Border Protection.



PHOTO: OVERLAND AERIAL PHOTOGRAPHY

The new airport's runway is 7,500 feet long, with room to expand it to 8,500 feet.

A 29,000-square-foot building houses snow removal equipment and aircraft rescue and firefighting services. It was designed with similar colors and materials as the terminal, notes Sorenson.

Future Growth

While forecasting is always a challenge, Dudas says that city officials are comfortable that they now have an airport that will accommodate today's traffic with room to grow. "We didn't want to be full on day one," he relates. "We anticipate the terminal building lasting a century, so it needs to be able to accommodate future growth as well."

He says the current four-gate facility will accommodate three airlines comfortably, and four "relatively comfortably." With service from Delta and United in place, Williston officials are working to attract a third carrier oriented toward leisure travel.

Like the airport, all city-owned facilities are designed with growth in mind. "That's one thing we learned from Sloulin Field," Dudas reflects. "We didn't want to put ourselves in a position where it wasn't easy to grow should economics determine that we need to grow."

Funding/Schedule Challenges

While there are numerous benefits to new construction on a greenfield site, the XWA project also encountered challenges—namely that the federal funding cycle doesn't gel with the abbreviated construction season in North Dakota.

When all is said and done, cost for the new airport is expected to total \$275 million; and city officials expect 50% federal participation. "We had a great partnership with the FAA and state to help fund this project," Dudas reports. "However, the funding timeline follows the federal fiscal year, so those dollars don't typically come through until mid- to late-summer; and we have a very short construction window because of winter weather."

To meet the tight construction timeline, the project had 30+ prime construction contracts active at the same time. "We worked through a very aggressive timeline on this airport relocation project," he points out.

While 1,600 acres sounds like a large worksite, careful coordination was still necessary to make sure each contractor

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Building on a greenfield site allowed flight operations to continue unimpeded at Sloulin Field until the new airport was ready.

PHOTO: OVERLAND AERIAL PHOTOGRAPHY

had necessary site access and did not impede another crew's work. The city established a program coordination team, headed by Ulteig and AE2S, which controlled and coordinated onsite engineers and contractors.

"I can't be here every day, and we needed to have 'boots on the ground,' to help organize, manage and coordinate all of the ongoing construction," Dudas says. "The project coordination team was an integral part of making sure that we were going to open this airport on time."

Working with a lean staff that lacked experience building an entirely new airport, officials say it was necessary to tap industry resources to ensure a smooth, efficient project and transition.

The firm of Cardon Global was initially engaged to help



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DON CARDON

the city repurpose Sloulin Field after it is decommissioned, but its role was expanded to owner's representative three years ago. "There are so many people involved in the new airport that the city really wanted to be able to carve out and have this be a singular focus outside of their own capacity," explains Don Cardon, the company's chief executive officer. "A lot of our job was trying to make sure that they were being a good fiduciary of the cost implications, but also trying to get construction done quickly."

Because ISN operated through the opening of XWA, having an owner's representative allowed city staff to focus on the existing airport and their roles managing a booming city, without the added volume of details associated with developing a new airport.

In a similar vein, JE Dunn was first hired as construction manager at risk for the snow removal equipment/aircraft rescue and firefighting building in 2016, and was later awarded the contract to be construction manager at risk for the terminal building as well.

The company also provided overall site management for environmental safety and security. With multiple contractors working at a 1,600-acre project site, the city wanted a single point of contact for each company's safety officer.

Marc Mellmer, vice president, JE Dunn, acknowledges that the aggressive schedule was challenging, but also notes that applying best practices from other airports and its own experience helped keep the project on task. "There was no roadmap or specific answers to many questions because it had been so long since this had been done," Mellmer says of constructing an entirely new airport. "Every step of the way was blazing new trails."



MARC MELLMER



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The Transition

Dudas notes that Chrysalis Global Aviation, an airport operational readiness (ORAT) consultant, was a critical resource for meeting the opening day schedule. The city hired Chrysalis to ease the transition from ISN to XWA for the city, airport tenants and surrounding community.

"The transition from one airport to another requires a substantial amount of coordination and planning, and that's what the transition consultant has helped us accomplish and continues to do so," he explains.

Chrysalis not only brought expertise about airport openings, it also had specific experience in North Dakota, as it helped debut the new terminal at Minot International Airport (MOT) in 2016. "But this was not just a new terminal—it's a new airport. And you don't see those every day," says Suzanne Phelps, Chrysalis managing partner.

On Oct. 9, the last commercial flight departed ISN around 5:30 p.m. Typically, there are two later departures, but those were cancelled to allow additional time for the move



The new terminal capitalizes on views of nearby prairies.

to XWA. Cancelling the 11 p.m. inbound flights on the 9th automatically cancelled the 6 a.m. flight on the 10th and maximized the window the transition team had to complete the move.

While a substantial amount of transition happened overnight on the 9th, much work was completed in the months, weeks and days leading up to opening day. “We wanted just the things needed to handle those last evening flights and very first flights the next morning to be all we touched on the big move night,” explains Phelps.

One advantage to XWA being an entirely new airport is that most furnishings had to be new, relates Ann Thorvik, aviation practice lead at Chrysalis. “Many assets were too old or too sparse to be able to populate this beautiful new, large space,” she explains. “We didn’t have to move a lot of the usual furniture, trash cans and other items that often get moved during terminal upgrades.”

Relocating the snow removal equipment, however, was particularly tricky. With a grand opening in early October, one might assume the equipment could be moved prior to the 10th. However, that was not a gamble the

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Small Details Matter

After construction, it's up to airport staff and tenants to operate and maintain a new terminal. Thus, it's critical for the end-user perspective to be considered throughout the building process. Ferreting out and incorporating that information is the mission of Chrysalis Global Aviation.

"We can bring in the experience of what we've seen elsewhere," explains Scott Vriesman, an airport operational readiness (ORAT) consultant with the firm.



SCOTT VRIESMAN

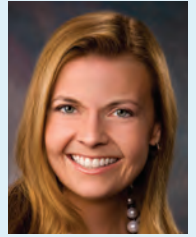
One example at Williston Basin International (XWA) is the design of the quick turn-around area for the rental car facility. Because of the region's geography, nearly all of the rental vehicles are pickup trucks and sport utility vehicles. And customers often return them full of clay-like mud that does not easily flow down the drain when crews wash the vehicles for the next customer. As a result, standard drains must be cleared out with a shovel almost every week.

Per Chrysalis' suggestion, project designers included a 1-foot-wide concrete trench, with the drain bottom at the door instead of at the back of the building. This allows easy access for a vacuum truck to clear the drain of mud and other debris.

"That seems like a small thing, but if you're the one with the shovel, that's a great big deal," says Ann Thorvik, aviation practice lead at Chrysalis.



ANN THORVIK



SUZANNE PHELPS

"This is why ORAT is critical during the Design phase of an effort," adds Chrysalis Managing Partner Suzanne Phelps. "While many folks tend to think of ORAT as an eleventh-hour activity, careful attention to environment-specific operational needs early in the process yields dividends in the form of change-order avoidance."

XWA will have three rental car operators, but the quick turn area has space for four. The original facility design would have hindered the ability for crews to open all four doors of a vehicle when cleaning it inside the building. "They would have had to close a door to go around, which would have been a lifelong hassle to vacuum the vehicles," Vriesman relates.

To remedy this, Chrysalis recommended that designers place the personnel entry door at the back of the building and center the garage door on the bay. This provided ample space for all doors of vehicles to be open during cleaning, making the process much easier for employees.

"That's just a small example of the types of things that are uncovered in an operational readiness program," notes Phelps. "With the operational readiness approach, the idea is to ask the right questions and bring experience from other places so that we uncover these things and mitigate your risk by ensuring nothing gets missed."

"This is why we're boots on the ground and not sitting remotely in an office making hypothetical checklists," adds Thorvik. ✈️

airport was willing to make. (Last year, the area received its first snowfall on Oct. 3.)

Extra Challenges

Williston's remote location, six hours from Fargo, ND, complicated the process of procuring supplies and resources for the transition, notes Thorvik. Lead times and mobilization costs were top of the list for Chrysalis and its associated contractors.

A lack of skilled tradespeople was another issue, notes Scott Vriesman, ORAT consultant with Chrysalis and project manager for the XWA transition. "The oil and gas trades consume most of the labor up here," he explains.

Reaching out to other firms and sharing crewmembers among subcontractors helped address the labor shortage and kept the project on the tight schedule, Mellmer notes.

But despite careful planning and coordination, the team encountered a few unavoidable challenges. For instance, flooding in Missouri prevented boxcars on rail lines from picking up dry cement in Canada for XWA's airfield pavement.

"You'd think you could plan for anything," quips Vriesman.

This material hiccup, in turn, impacted other aspects of construction. "There were a lot of phone calls to change deliveries

of everything else," Thorvik recalls. "For instance, you can't place a boarding bridge until you've got a ramp to put it on."

Ultimately, it took action from North Dakota lawmakers and the governor to resolve the issue. Instead of the dry cement coming into Williston on rail and being trucked to the site, it came into Minot, 90 minutes away, and the governor reduced restrictions on truck travel between Minot and Williston.

Keeping the community informed was another challenging endeavor. The project team used social media, newspapers, radio, a newsletter and presentations to local clubs to remind the public about the switchover schedule. "We knew that we couldn't reach everyone, but we made every effort to do so," says Dudas. "We also had appropriate signage in place at Sloulin Field on Oct. 10th."

The city and Chrysalis worked together to keep the community engaged and informed throughout the construction process, and through opening. "Our airport operational readiness process isn't just about training people and moving furniture. It's about every aspect of continuity for operations," Thorvik says.

Many aspects of the new terminal simply did not exist at ISN, such as baggage claim, jet bridges and automated baggage screening. Employees needed training about new processes and operating and maintaining associated equipment.

Some elements were new to passengers, as well. To familiarize travelers with the new processes and procedures, community members were invited to tour the new terminal at XWA before it opened. Project personnel then asked if the processes, signage and other key elements made sense. This allowed the airport to address issues and iron out kinks prior to opening day, explains Vriesman.

Taxi operators, hotel vans and oil field shuttles were also given the opportunity to familiarize themselves with the new airport before it opened.

Sloulin Field's Future

When ISN is completely decommissioned, Williston will have 803 acres of readily developable property in the middle of the city at its disposal. "That's a pretty exciting endeavor for our community," Dudas relates.

Just as regional growth prompted construction of a larger airport, it is also creating the need for more schools,



PHOTO: GREG GOUDY, G&S AIRPORT CONVEYOR

The new airport's baggage claim area will be a welcome addition for passengers.

medical facilities, retail and housing. As a result, there are many development options already teed up for the land that previously housed ISN.

"We have a substantial shortage of all of those things and more," says Dudas. "This presents an opportunity to help enhance the quality of life for our region."

Interest in redeveloping ISN has apparently been substantial. Management from Cardon Global notes that the former airport site will serve as a mixed-use community asset and regional destination that will help accommodate growing interest in North Dakota. ✈️

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Austin-Bergstrom
International Airport

FACTS & FIGURES

Project: New Long-Term Parking Garage

Location: Austin-Bergstrom Int'l Airport (TX)

Size: 6 floors, each approx. 810 ft. wide & 375 ft. deep

Garage Capacity: About 1,000 spaces/floor; 5,800 total (when top floor opens)

Total Airport Parking: 18,386 spaces, including 1,474 in employee lot

Facility Design: PGAL Architects

Specs for Space Detection System: Walker Parking Consultants

Cameras & Track: Park Assist

Installation: Associated Time Instruments

Parking Management: SP+

Timeline: Design started in May 2016; construction began in June 2017; first 2 levels opened in Dec. 2018; most of remaining parking opened in April 2019

Key Benefits: More parking capacity; space detection system eases parking process for customers; moving airport administration from terminal to new garage frees up space for passenger amenities; solar panels being installed on roof will provide renewable energy

Space Detection System Lights the Way to More Parking Capacity at Austin-Bergstrom Int'l

BY KRISTIN V. SHAW



Austin, TX, is booming with tech companies galore, a vibrant arts scene and a calendar full of large festivals that attract hundreds of thousands of people to the growing area. Amid the hustle and bustle, executives at Austin-Bergstrom International Airport (AUS) are looking down the road five, 10 and even 20 years to predict passenger needs.

Seeing the clear need for more parking capacity to keep pace with passenger growth, AUS opted to replace one of its flat surface parking lots with a six-story garage, increasing capacity in that area from 1,050 spaces to 5,800. The airport's total

parking capacity is nearing 18,400 spots (including about 1,475 for employees). The new Blue Garage, which is adjacent to the airport's consolidated rental car facility, is part of a \$250 million project to execute improvements throughout the airport.

The new facility includes long-term parking with a space detection system, a five-story administration facility and upgraded entryways and exits for vehicles. The moving target for the airport is to get ahead of anticipated growth by freeing up valuable real estate and streamlining the parking process for greater passenger satisfaction.

“I think this garage will address the overall capacity between our lots and off-airport parking,” says Jerry Dinse, administrator of parking services for AUS. “With this project, the demand for airport parking is covered for at least the next five to 10 years.”

Moving the airport administration facilities into the new multi-level garage freed up space for more lounges, concessions and passenger amenities in the terminal.

The airport engaged PGAL Architects to design the facility and Austin Commercial to build it. In turn, Austin hired Park Assist to provide sensors and accompanying track for the space detection system; and Park Assist subcontracted Associated Time Instruments to link the sensors to the servers. New digital signage was added for the entire length of Presidential Boulevard to improve traffic flow and help drivers passing through the airport perimeter see the availability of onsite parking.

“It becomes frustrating to chase down parking spaces as a garage approaches max capacity,” says Park Assist Chief Executive Officer Gary Neff. “With this technology installed, visitors will know exactly where to find a place to park, and the airport can manage the capacity more tightly.”



JERRY DINSE



GARY NEFF

Space Detection

The new garage at AUS includes a smart-sensor system that streams images to a video management system while also transmitting data for integrated license plate recognition and occupancy tracking. When a parking spot is occupied, one of the system’s 3,000 cameras will detect that a vehicle is in that space. If all other spaces in the four-vehicle block are also taken, the LED light overhead will turn from green to red (or blue to red for accessible parking spaces).

As long as a vehicle is parked nose in/tail out as directed, the cameras will capture its license plate number for the database. As a result, if a customer forgets where he parked, the software can scan the system for his plate number and indicate which floor he parked on, and what is parked near it for reference. Two kiosks stand ready to assist forgetful drivers.

“There is an algorithm that recognizes the space, and the software has a learning process,” says Ed Lammer, vice president of Operations for Associated Time. “For instance, in the morning the camera learns the difference between dark and light and adjusts accordingly.”

A dedicated onsite server collects the data and sends it to the cloud.

Avoiding Disruption

Before construction of the garage began in June 2017, the team developed a transition plan to route passengers around surface lot that was being transformed, and funnel them into alternate parking locations.

“There’s no way to keep customers from feeling the impact when they’re in the middle of a construction site, but the idea is to minimize it as much as possible,” says Dinse. “We gave notice to our passengers with flaggers, signage and traffic plans to minimize the inconvenience.”

Installation of the space detection system was less disruptive than facility construction, notes AUS Project Manager Robert Mercado. “The logistics of closing a large parking lot and having the very large cast-in-place concrete structure constructed while maintaining all other parking operations and access to the Terminal Building from the remaining parking areas was a challenge,” he reflects. “Almost all of the thousands of cubic yards of concrete were poured during overnight hours to avoid disruption to airport traffic during the day.”



ROBERT MERCADO

Dinse notes that the project team met weekly, and the airport has an exceptionally good and open relationship with the contractors. “Given the challenge of doing a massive major construction project in the middle of a parking facility, I think it has been a successful project,” he remarks.





Using exterior speed ramps helped maximize capacity in the new garage.

Design & Construction

The Blue Garage is approximately 810 feet wide and 375 feet deep. Lammer puts the size in perspective this way: “Each floor can hold just over five football fields. In other words, it’s the equivalent of 25 football fields, not including the additional five football fields on the roof.”

That’s clearly a touchdown for increasing capacity.

“We chose to include exterior speed ramps instead of internal ramps, which helped us maximize the number of spaces per floor,” adds Dinse. “During the design phase, we were talking about capacity and demands and how we were going to move people. The idea for an external speed ramp made a lot of sense.”

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The airport's "go date" to have the first two floors ready for business before Thanksgiving 2018 created a scramble; but Dinse notes that collaboration between project participants ultimately made it possible. "It was key that the airport and contractors worked together," he says. "We all worked around-the-clock with multiple shifts to get it done. Austin Commercial really understood the business and made it possible for us to do our job."

Because the garage was new construction, Park Assist had to wait until the floors were striped to install tracks and cameras for the space detection system. But parking spaces did not need to be empty for crews to install or repair lights. Tracks and lights can be accessed from the center of the lane.

Neff notes that some other parking systems use sensors on the ceiling directly over vehicles.

"Ours is about three-quarters technology and one-quarter implementation," he says. "Ultrasonic technology is the opposite; it's more like three-quarters labor and one-quarter technology. In this case, the cameras are installed down the center aisle, which means no customer displacement."

Another Green Gem

On the roof of the Blue Garage, lean skeletons of canopies provide shade for vehicles. Soon, the canopies will be covered with solar panels. In partnership with Austin Energy, AUS will install 8,100 frameless solar modules with 80 inverters. When completed, the solar roof is expected to generate more than 3.2m kilowatt-hours (kWh) per year.

"For the sixth consecutive year, the airport is 100 percent powered by renewable energy, and we participate in the Austin Energy GreenChoice program," says Hackett. "Last year, we replaced more than 30 diesel-powered vehicles with electric alternatives."

The airport's sustainability achievements are described on the "Green Gems" page of its website. Here, passengers and business partners can see that all electric power for airport buildings is generated by wind turbines. By using reclaimed water, AUS saved more than 35 million gallons of drinking water in 2017.

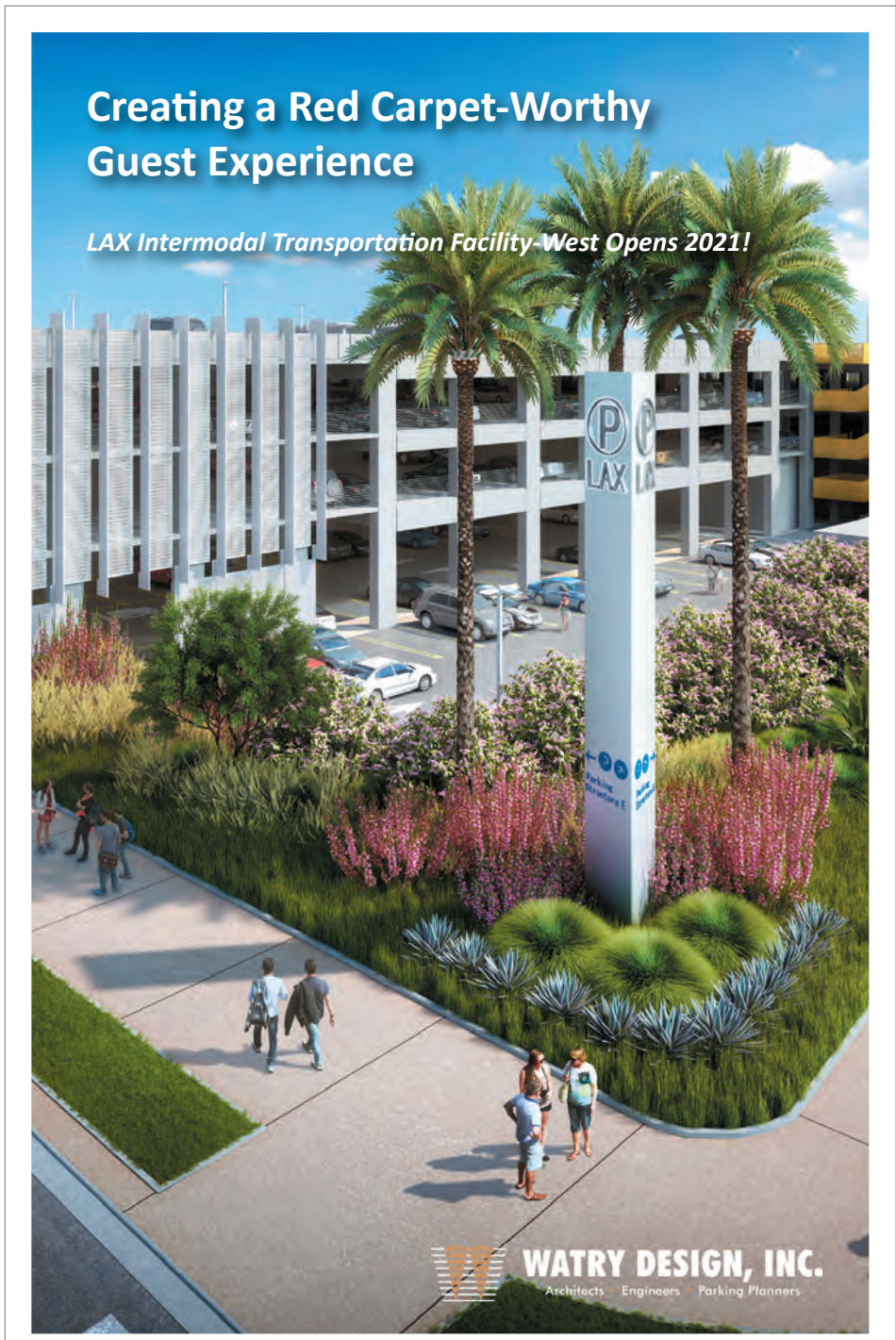
The airport's thermal energy storage program allows it to save chilled water during off-peak times for cooling the terminal spaces, and then use it during hotter afternoon hours—reducing electricity usage by 50%. In summer, temperatures in Austin regularly soar into the three-digit range. The drain on power for air conditioning is mitigated by these green efforts.

The forthcoming solar panels on the roof of the new parking garage are one more example of AUS' environmental pledge to incorporate sustainable principles, utilize climate resiliency best practices and integrate environmental stewardship into all aspects of its culture, planning, development and operations.

Data Tells the Story

Neff says that Park Assist is a parking company focused on the data to build historical information.

"For the consumer, it's about getting into the garage faster and with less stress. For the airport, it's optimizing the usage of the garage," Neff explains. "Many airports will close down their



Overhead signage points customers to open parking spots.



parking when it's 91% to 93% full. We can bring it up closer to 98%. We're not just detecting a vehicle; we record the license plate number, evaluate security risks and can change the price of parking depending on where they park."

While the parking management team uses the system's cameras to determine if spaces are occupied or available, there are other valuable byproducts of that data. Security monitoring is a big one.


"Installing 1,000 security cameras in a garage is expensive and challenging. But since we're already seeing everything, we share it with the surveillance system," says Neff. "We see those benefits as being logical. There are many other things that can be done."

Accumulated data will serve as a baseline for future predictive models. Mercado counsels other airports that might implement similar systems to consider where the airport service is headed in the future. "It's important to know that you're planning for a parking detection system that is up-to-date on technology and functionality to serve the airport customers," he says.

Dinse agrees that looking into the future is a challenging, but necessary, exercise. "We established a long time ago that when our traffic grew to a certain volume, that would be a trigger for certain expansions," he explains. "We did not anticipate the phenomenal growth that Austin has experienced, and we blew through those trigger points before we knew it."

"Get started well in advance and anticipate as much as you can," he advises. "How clear is your crystal ball?"

Neff and the Park Assist team are already crunching the data to develop a historical record and baseline. Information currently being collected is going to tell the story of how AUS customers will continue to drive the movement toward optimized parking, Neff predicts.

"Parking is something people love to hate," he concludes. "Our job is to help reduce stress getting in and out." 



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Philadelphia Int'l Upgrades its Asset Management System

BY JODI RICHARDS

 When Philadelphia International (PHL) wanted to upgrade its asset management system to a more robust tool, the project team talked with personnel at other airports about their experiences. As the Pennsylvania airport continues to deploy its upgrade, PHL Enterprise Asset Manager Milton Robinson is sharing his department's experience to help other airports reap similar benefits.



MILTON ROBINSON

In 2015, PHL was using an earlier version of IBM's Maximo asset management system. It was hosted on-site, antiquated, had limited functionality and was no longer supported, notes Robinson. Personnel could close out work orders and generate some reports, but the system was no longer effective and did not provide cost savings to the airport. "There were no updates for it, and we knew what we were doing was not really sufficient," Robinson explains. "We

needed a better tool for our maintenance department and decided to go ahead and invest in another system."

Ultimately, the airport selected Electronic Data Inc. to configure and implement an updated version of the Maximo system. "When we went out to look for a new system, we weren't set on using Maximo again," Robinson relates. However, the new, more robust cloud-based system provides the reliability, redundancy and updates the airport requires, and it's user friendly, he adds.

"Maximo provides a platform for [PHL] to manage their assets, asset lifecycle, work management, maintenance planning, inventory management and tie into their procurement processes and even support processes in airport operations as well—all from one platform," explains Scott Yates, chief operating officer at Electronic Data Inc.



SCOTT YATES



FACTS&FIGURES

Project: Asset Management System Upgrade

Location: Philadelphia Int'l Airport

Cost: Undisclosed

Timeline: Operations module launched in Oct. 2018; work management in June 2018; inventory management in Feb. 2018

Future Deployments: Safety management system; preventative maintenance; job plans; scheduling; payroll

System: Maximo, by IBM

Implemented By: Electronic Data Inc.

Maximo Host: Projotech

Mobile Software: DataSplice

Key Benefits: Increased reliability, redundancy & reporting functions; more user-friendly for staff



As airport assets become more sophisticated, the skill set necessary to maintain them increases, Yates relates. And, as the workforce ages, there is a significant amount of “tribal knowledge” that leaves the organization when older experienced workers retire. “There’s definitely a heavier dependence on trying to utilize information systems to bridge that gap and capture some of that knowledge during staff turnover,” he explains. Enterprise asset management systems also allow an organization to do more with less, adds Yates.

Previously, PHL’s asset and facilities management processes were heavily paper-based, which limited the ability to perform higher level reporting and analytics. “Maximo will provide PHL the foundation to standardize processes across the airport, as well as allow for comparison analytics and a basis for continuous improvement so they can continue to get more sophisticated with their asset management practices,” Yates predicts.

Customer Service Implications

A key component of PHL’s overall operating philosophy is enhancing the customer experience; and a big part of doing so is ensuring that the facility is running at an optimal level. Tracking assets and work orders helps the airport stay on top of maintenance and replacements.

“Passengers have enough stress,” says Robinson. “We try to make them as comfortable as possible.”

“Customer experience is a huge element of facilities and asset management at an airport,” agrees Yates. Beyond providing a positive customer experience, airports have an obligation to maintain efficient operations to minimize impact on the throughput of passengers and maximize revenue, he adds. “Enterprise asset management plays a key role in that.”

As of mid-September, PHL had fully deployed three modules of the updated Maximo system: inventory process, work order management and shift highlights, which includes incidents or emergencies. “Emergencies are all coded differently, so we use [Maximo] for capturing that information and reporting from the operations department,” Robinson explains.

Per its usual routine, Electronic Data Inc. began at PHL with a preconfigured version of Maximo. “This allows us to come through the door with a set of best practice processes in industry data standards,” says Yates. “It’s basically a starting point for any organization that’s going to embark on this journey.”

The standard deployment process begins with a workshop period when implementers evaluate current processes and procedures to learn how the program can be tweaked or adjusted to best fit an airport’s specific needs. Next is a development cycle, when the configured system is demonstrated to users as changes are made so they can provide feedback. “It’s a very hands-on process with the airport to make sure they are ultimately getting something that is going to meet their needs,” says Yates.

Robinson describes the workshop process as invaluable. To fully leverage it, PHL included frontline staff and supervisors who described what they do on a daily basis. Electronic Data Inc. then matched up those “user stories” with how Maximo could help PHL and tailored the system accordingly.

This collaboration also facilitates the organizational change management process, because users begin to assess the preparedness of their organization and end-user community, adds Yates.

One of the most intensive parts of the project is identifying, collecting, cleaning and loading data into the system. “A system is only as good as the data that you’re putting into it,” Yates advises. Loading data and asset information is an ongoing process, as is transferring departments onto the upgraded system.

New Capabilities

Tracking inventory through Maximo allows PHL to carefully monitor supplies-on-hand and their value, Robinson notes. Because all inventory has an associated cost, the airport operates its storeroom with debit/credit transactions. “Whatever department needs an item, we charge it to their cost center,” Robinson explains.

Because the airport integrated geographic information system (GIS) technology into its new Maximo system, users can pinpoint an exact location and write a work order for a specific issue. This capability is especially handy for airfield inspections, Robinson relates. “We have all of our airfield lighting, signage, taxiways and runways on GIS in Maximo.”

A similar system is used for terminal work orders. “An airport is an expansive facility, so having the ability for someone to drop a pin on a map where a problem is and have a craft group or technician responding to that problem know the exact location is incredibly powerful,” Yates says.

Thanks to software from DataSplice, PHL personnel are able to use mobile devices like iPads and smartphones with the Maximo system. Technicians can receive work orders on a mobile device

and track their work time and other project details. For inventory management, the software includes barcode scanning, which helps reduce human error.

PHL leverages the reporting features of Maximo to generate updates for the finance department and upper management. This allows executives to closely monitor work orders, to ensure they are being closed in an efficient manner, and to determine how many work orders are proactive versus reactive.

“We’re trying to swing the pendulum from being a reactive airport to a proactive airport,” says Robinson. “That way, we catch things before the passengers are affected. We don’t want to run systems to failure.”

Asset management reports also provide valuable information that helps justify costs to airport stakeholders, including the city council and airlines.

Implementation Challenges

At PHL, the Maximo upgrade has come with a steep learning curve for users. “Many employees were used to turning wrenches and getting the work completed,” explains Robinson. “Now, we’re putting a mobile device in their hand to record and capture their work.”

Detailed training before, during and after the deployment was critical. “You prep them and give them information; however, when it hits, it’s still a totally different thing,” he observes. “So we try to be there on-site to help get them going.”

Managing the transition is a challenge for many organizations, Yates acknowledges. “You’re taking a workforce that is used to doing things on paper, and switching it to technology.” Offering users hands-on assistance in the field helps tremendously, he says.

At the same time, Robinson notes that it’s important to let employees know that the new asset management system is not “Big Brother” looking over their shoulder. He stresses that it’s a platform to give upper management a better view of how departments operate and for individual employees and departments to receive credit for work performed. For example, if a backlog of repairs is occurring because of staffing issues or lack of parts, it’s important for that information to be relayed to supervisors who can address the problems.

Yates suggests focusing on the overall benefits to the organization, which ultimately translate back to the individuals. He urges airports to be open and communicative with end-users, sharing reports and metrics the system produces. “That

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shows that the data is not being reported at the individual or employee-specific level and shows the direct benefit to the organization,” he explains.

Finding time for system training was another challenge at PHL. The sheer number of system users (about 300), a complicated array of holidays/vacations, and unexpected work projects made coordinating a training schedule difficult, notes Robinson.

On the technology front, Yates encourages airports to make sure they have the proper infrastructure to support the Maximo system. For example, technicians working underground or far from the main terminal need reliable internet connectivity. “If users are frustrated when trying to use the device or get data synched up back to the system, adoption is going to be very hard,” he warns.

Lessons Learned

Robinson has three specific suggestions to airports implementing an asset management system: develop a change management strategy that includes a communication plan; establish a manageable scope of work; and be as thorough as possible when gathering information and requirements to tailor the system.

Right-sizing the scope of work is particularly important, he stresses. “You want something that’s manageable.” That’s why PHL is deploying its new system in carefully planned phases.

While it might sound tempting to implement a new system all at once, Robinson and his team knew that would not be the best approach for PHL. “This is a huge overhaul for a lot of different people, and it’s going to be a change in management for a lot of departments,” he explains. “Take it in phases. If you try to do it all at once, the risk of failure is very high.”

At PHL, the Maximo deployment is an ongoing process. In early October, staff was working to launch the Part 139 module, which will help track and report airfield inspections. “We have to make sure that it is ready for the FAA to approve and make sure that our operations officers are comfortable with it,” Robinson remarks. “All of the data that we’re collecting from inspections of the airfield has to mimic what we’re currently doing now or be better.”



The storeroom team receives training on how to use the new mobile software for inventory control.

As departments acclimate to the new system, more modules and capabilities will be rolled out. Moving forward, PHL plans to integrate its safety management system, preventative maintenance, job plans, scheduling and even payroll into Maximo. Robinson’s team is also in the process of upgrading its procurement system, which will then be integrated into the Maximo system. ✈️



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FACTS&FIGURES

Project: Budget-Oriented Terminal Update

Location: Erie Int'l Airport (PA)

Timeline: Feb. 2019-Aug. 2019

Approx. Cost: \$500,000

Funding: Capital Improvement Fund

Seating: Arconas

Flooring: Congoleum

Restaurant Renovation: Chardon Kitchens; Penn Glass; Watkins Construction

Furniture Installation: AJ Grack Business Interiors

Flooring Installation: Continental Flooring Co.

Electrical: Newco Electric

Plumbing/HVAC: Scobell Co.

Doors: Plyer Entry Systems


Sally Port: Glen Davis Sales

Security: Eltech Security Systems

Of Note: Airport saved money by performing some demo work itself & working directly with the flooring manufacturer.

Erie Int'l Updates Terminal on a Tight Budget

BY ROBERT NORDSTROM

 How does a small airport with an aging terminal meet the needs of today's travelers without breaking the proverbial bank? That was the bottom-line conundrum at Erie International Airport (ERI) in Pennsylvania.

"We had a 1957 terminal building in need of an update. Or, to put it more bluntly, we had a pig in desperate need of some lipstick," explains Airport Director Derek Martin. "Small communities generally can't afford a completely new terminal building. Our short-term goal was to refresh



DEREK MARTIN

the building to provide our customers with 21st century amenities and a more pleasurable travel experience—and do it as efficiently and inexpensively as possible."

Post-9/11 Configuration

In total, construction lasted six months and cost \$500,000. The airport completed the project in August—a timely finish given its recent rise in air traffic. In May, American Eagle added a nonstop flight to Chicago O'Hare, and two nonstops to Charlotte Douglas International. These are in addition to Delta Connection's three daily flights to Detroit Metro and United Express' two daily flights to O'Hare. ERI officials are also working with United to add nonstop service to Dulles International.



AFTER

Previously, the terminal's pre-9/11 layout was a constraint. But with recent updates complete, the airport is now poised for growth.

"In most airports post-9/11, travelers find it more difficult to obtain food and beverage pre-security," Martin observes. "We had the opposite problem: Our restaurant was accessible from the landside only. Prior to the terminal update, travelers were reluctant to go through security because they had no access to food and beverages on the airside other than from vending machines. We needed to get travelers through security checkpoints where they could relax and wait for their flights. In the past, we'd have travelers waiting in the pre-security area for three different flights, which created backups when everyone tried to get through security at the last minute."

To prevent such bottlenecks and provide service on both sides of the TSA checkpoint, ERI moved the access point to its existing restaurant from landside to airside, and secured TSA approval to install a sally port. Passengers who have cleared the checkpoint use the restaurant's new airside entrance. Landside customers place orders on an iPad and pay via credit card following touchscreen prompts. Orders are received through a sally port system: Concessions workers on the secure side place food orders on a tray and rotate back to the customer.



BEFORE

The new sally port is an important feature that helps the airport serve meeters/greeters and passengers who want to sit, relax or work landside before their flights, Martin emphasizes.

"Obtaining TSA's permission for the sally port and changing the restaurant from landside to airside access proved to be one of our biggest challenges," he informs. "We had to add additional doors with security mechanisms and install a rolling door divider to seal off the secure area.

"Our sally port is unique," he adds. "I believe there are only three or four like this in airports around the country."

Seats & Feet

Aesthetically, the 1957 interior was in sore need of a facelift. While the seating was still functional, ERI officials wanted to refresh it. In total, crews installed 242 new Arconas seats throughout the terminal, from the check-in area to baggage claim.

"The airport moved away from the rigid, linear row-by-row beam seating prevalent in the old configuration to achieve a warmer, softer feel," says Arconas Account Manager Scott Jelliman. Cluster seating with thicker, softer cushions than most airports choose helped achieve the transformation, he explains.



SCOTT JELLIMAN

Six cluster seating groups with six seats each and curved seating that wraps around structural columns were installed in pre-security areas. InPower™ Bars and Stools provide functional stations where customers can work and charge their mobile devices.

All told, 154 seats were installed post-security and 88 pre-security; plug-in power options were increased dramatically throughout the building.

"We tried to take into account all types of travelers: families, groups, individuals and business," Jelliman elaborates. "While the terminal still has tandem seating, the cluster pieces and Imperial Blue vinyl seat coverings warm the terminal and offer a more collaborative, lounge-like feel while still providing excellent movement and flow through the terminal space."



The airport also removed its original 1957 carpet and vinyl composite tile, and replaced it with 30,000 square feet of new vinyl tile.

“Replacing the flooring throughout the building was

a big challenge,” Martin reports. “We had to stage construction activity around air carrier activity, working late at night or early in the morning. Some areas needed to be leveled and cured before the new flooring could be laid.”

Congoleum® Structure was selected to withstand the snowy, rainy, hot and cold Pennsylvania weather extremes, notes Congoleum National Sales Manager Jay Jacobs. “It is designed for high-traffic, commercial installations and is ideally suited for an airport environment.”



JAY JACOBS

The beige and brown colors provide more visual interest than a single-color scheme and hide dirt between cleanings, he adds.

Managing Costs

The airport saved money by dealing directly with the flooring manufacturer and dispatching ERI personnel to perform some work traditionally completed by contractors.

“As the flooring manufacturer, I can obviously control the costs of the material,” says Jacobs. “However, we were able to provide added value by allowing the airport to consider installation bids

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equally because the materials cost remained static. The airport was then able to evaluate installation contractors based on their expertise, timing and ability to work within the parameters established by the airport. I served as a point of contact to help articulate expectations. The project needed to be a three-legged stool between the airport, the manufacturer and the flooring contractor. Everyone had to be on the same page.”

Using this approach, the airport spent about \$178,000 for 30,000 square feet of new flooring—a phenomenal buy, Martin emphasizes.

Airport staff rolled up their sleeves when it came time to demolish interior walls and an old glass and brick wall in the restaurant area.

“We were able to cut costs by doing the work we could do inhouse,” Martin explains. “The project was subcontracted and piecemealed, which precluded us from having to go through an all-inclusive bidding process. It was a fluid process and we had to remain flexible with our design.”

More Improvements Planned

While the updated terminal serves ERI’s current needs, airport management has an eye on future growth and the new projects it will require.

Currently, the terminal has one baggage claim, which is problematic given the airport’s desire to grow air service in 2020. “We’ll be looking to knock out a wall and expand the terminal by 4,000 square feet to accommodate an additional baggage belt,” says Martin. “We’d also like to realign the TSA baggage screening so that it takes up a smaller footprint and gives air carriers a seamless single location to pick up bags behind the screening area wall.”

Outside the terminal, ERI plans to relocate and consolidate car rentals to free up space in front of the building.

Preparing for these projects, Martin reflects on the outcome of recent terminal enhancements: “Our customers’ travel experience has been enhanced with top-of-the-line amenities that might be offered at major airports around the country. And we did it on a budget.” 





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Fort Lauderdale-Hollywood Int'l Delivers Emergency Response Training to Entire Workforce

BY RONNIE WENDT



FACTS & FIGURES

Project: Emergency Response Training

Location: Fort Lauderdale-Hollywood Int'l Airport (FL)

Scope: Online training for 17,000+ employees of airport & tenants

Cost: \$322,834 (including almost \$142,000 for translation costs)

Timeline: March 2018 to mid-Aug. 2018

System Developer: SSI

Sample Topics: Personal action plans; what to expect from first responders; basic first aid skills; maintaining customer service during a crisis

Avg. Time to Complete Training: 2½ hours

Catalyst: 2017 active shooter incident near baggage claim area

Of Note: 1st large hub airport in U.S. to conduct mandatory emergency training for all employees; workers paid for training time

Recognition: 2019 Nat'l Association of Counties Achievement Award in the Personnel Management, Employment & Training category

One year after a man went on a shooting rampage near the baggage claim area at Fort Lauderdale-Hollywood International Airport (FLL), the Broward County Commission passed an ordinance requiring all aviation employees to receive emergency response training.

Before the 2018 resolution, airport workers received security training, but many tenant employees did not. Those not receiving training included airline counter employees, ground handlers, concessions staff and employees working in the parking garage and at the curb.

The Commission's decision to require emergency response training for all followed an independent after-action report that revealed most airport employees were unsure what to do during the Jan. 6, 2017, mass shooting.

Commission leaders took another bold step when they required FLL and its stakeholders to pay all workers while they completed the training, notes Mike Nonnemacher, chief operating officer for the Broward County Aviation Department.

Today, FLL has trained more than 17,000 workers how to respond to active shootings, weather-related emergencies and other catastrophes through its Airport Employee Emergency Training (AEET) program.

The result is a workforce that knows the steps to take when disaster strikes—an accomplishment that netted FLL recognition from the National Association of Counties. The airport's training program received a 2019 Achievement Award in the Personnel Management, Employment and Training category.



fire on a commercial airliner, a cargo plane crash, and I'm on my 10th hurricane after 32 years here.

"You need to be prepared," he stresses, noting that response training is an important part of being prepared.

Tight Timeline

Time was of the essence after the Commission resolution passed in February 2018. Both the airport and Commission wanted all workers trained by year's end.

However, FLL was starting from scratch. It is the first large hub airport in the U.S. required to provide response training for all employees. In short, FLL was not reinventing the wheel, it was building it.

The project team quickly settled on video-based online training. "It is an effective and consistent way to train employees," says Nonnemacher.

Needing a vendor that could deliver a program within months, FLL reached out to SSI, the security consultant already providing online training for badge renewals.

"They were under contract with us, and had a product that worked at the airport already," Nonnemacher explains. "They agreed to do it, and we got to work right away."

The FLL team included leaders from airport administration, law enforcement, fire rescue/medical teams and TSA representatives. The team met internally to determine topics to cover, then reached out to SSI. From that point, SSI had five months before FLL's goal for an early August launch, which was established to help meet the end-of-year completion deadline. The course production team included curriculum writers, videographers, graphic artists and security specialists.

The airport is also receiving direct feedback that points to success. One employee who recently discovered a suspicious package at the airport told management that he knew exactly what to do and how to report the item.

"You'd be surprised by what your employees don't know," says Nonnemacher. "When I say that, I'm not talking about the employees



MIKE NONNEMACHER

who work directly for the airport. I'm talking about the ticket agents, ground handlers, skycaps, wheelchair attendants, etc. But you will have emergency events. We've had a major



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Multiple departments and entities provided input about the curriculum.

“Normally, customized training takes four to six months for one training module. We did six in the same amount of time, and that was only in English. Broward County required the training modules to be translated into Spanish and Haitian



LORENA DE RODRIGUEZ

Creole. So, in fact, we deployed 18 modules inside of seven months,” notes Lorena de Rodriguez, president and chief executive officer of SSi.

Gregory Meyer, public information officer at the Broward County Aviation Department, describes the feat as a Herculean effort.



GREGORY MEYER

Developing the Curriculum

After determining the topics they wanted to cover, airport personnel met weekly to develop a training script. Content was reviewed many times before the team landed on a final draft, notes Nonnemacher.

“We then went to SSi in Phoenix and went over it word-by-word and case-by-case for four days,” he recalls. “We had to get the script right, because we would translate it into Spanish and Creole to meet our demographics; and translation is very expensive.” (See Facts & Figures on Page 32 for specifics.)

While SSi routinely translates its training courses into Spanish for clients, working with Haitian Creole was new for the company. “The airport was extremely helpful,” notes de Rodriguez. “A couple of their security managers have experience translating and interpreting in past positions, some with the military.”

At the same time, SSi sent a video team to capture secondary B-roll footage for the final production. “We even did an active shooter drill in the middle of the night, and SSi captured video of that,” Nonnemacher says.

“Normally, we wait until the script is 100% approved before we shoot any footage, but we began production simultaneously to save time,” explains de Rodriguez.

The airport and SSi gathered feedback about key aspects of the curriculum from employee managers and supervisors, and then edited changes to the course before launching the program airport-wide.

Initially, SSi set up the cloud-based training as a standalone website to train employees quickly. Required personnel from FLL were able to self-register and complete the training from any location and have their completion records maintained in the learning management database. Later, the database was integrated and the emergency training was simply another part of the airport’s badging process.

The airport launched its new training on Aug. 15, 2018. Training was required for all employees who regularly work at FLL or have Security Identification Display Area (SIDA) badges and/or Public Area Business Purposes (PABP) credentials. Most employees completed the online training at home on their own computers, but FLL also set up a temporary computer lab equipped with 12 laptops for employees who did not have a computer at home. The project team also set up a familiarization lab in Terminal 4 for two days. The lab was

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especially effective preparing tenant employees for the upcoming training.

By the close of 2018, every employee had taken the 2½- to 3-hour set of online courses.

Although the new training was inspired by an active shooter incident, FLL expanded the curriculum to also address hurricanes, aircraft incidents and other emergencies. “We had other tragedies in the past,” explains Nonnemacher. “We wanted employees to know what to do once an emergency happens. That included: How to communicate, who to communicate with, how to protect yourself, how to protect others, and whether you should protect others or protect yourself first.”

Emergency training should be unique to each airport, stresses de Rodriguez. “Fort Lauderdale had situations that they wanted to highlight, such as the incident in their terminal building and a plane crash,” she explains. “Another airport might be tornado prone and need their employees to know what to do in that situation or perhaps in case of a fire evacuation. Every airport will want this training to look a little different.”

FLL’s training program includes six modules that cover:

- Why emergency training is important
- Airport familiarization/orientation and review of emergency plans
- Active threat response: Assess, Run, Hide, Fight
- How to interact with first responders and communicate effectively during an emergency
- Basic first aid/what to do until help arrives
- Maintaining customer service during a crisis. This module

also discussed the TSA Blue Campaign for human trafficking awareness.

The importance of situational awareness is emphasized throughout FLL’s training. Workers learn that situational awareness does not occur after an event occurs. It is something they do at the beginning of every shift and throughout the workday.

“We are asking employees to take responsibility for looking around their work area,” says de Rodriguez. “If I’m working at the gates, what are my escape routes? If I’m working in baggage claim, what are my escape routes? If I’m working at the FBO across the airfield, do I have locations to hide to make things safe for myself and the passengers around me?”

“We ask them to take responsibility for thinking about what they would do if something happened,” she adds. “Evacuation routes will differ depending on where you are.”

Training employees how to communicate with first responders is also key. The curriculum teaches employees not to run after first responders or to make any sudden movements.

“After the 2017 shooting, employees reported that they didn’t know what to expect from first responders, or how long after an event they may still be in the aftermath,” de Rodriguez notes.

FLL’s training teaches workers how long emergency response can take, how to communicate with first responders, and what to expect during the initial response. For example, employees learn that first responders’ primary objective is to neutralize the threat.



Employees practice the Assess, Run, Hide, Fight Method.



Airport Employee Emergency Training



Are you providing lifesaving and practical knowledge on response capabilities in the event of an emergency?

Is airport continuity of operations during a natural disaster, catastrophe, or emergency events communicated to all stakeholders as essential?

How can your airport provide badge-holder need-to-know actions for potential emergency situations?

Content focuses on:

- Importance of Airport Emergency Awareness
- Situational Awareness / Airport Emergency Plan
- Active Threats and What to Do (Run, Hide, Fight)
- Communicating to Responders When Help Arrives
 - What to Do Until Support Arrives
- Your Airport Cares that Safety and Security is a Way of Life

RIGHT AMOUNT OF TRAINING Based on Role in Response	RIGHT TIME FOR TRAINING Quarterly Bi-Annual Annual	RIGHT TYPE OF TRAINING Online Self-paced Trackable Available 24/7
--------------------------------------------------------------	------------------------------------------------------------------	------------------------------------------------------------------------------------

(All emergency procedures referenced align with National Incident Management Systems, Federal Emergency Management Administration and established airport best practices to protect public safety.)

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"This means that you might be bleeding, but first responders will walk past you to find the threats," she explains. "Once they do that, they will prioritize needs based on the gravity of the situation. The training helps employees recognize that first responders have an important job to do. As an employee, your job is to listen to their directions and follow them to the best of your ability."

With permission, SSI incorporated a video from the Federal Emergency Management Agency (FEMA) into its training course. The 30-minute presentation, *Until Help Arrives*, teaches employees how to work with first responders and what to do while waiting for them.

For Nonnemacher, knowledge is power. "Employees now know that emergency response will take a long time," he reflects. "A situation may only take seconds to unfold, but it will take hours to recover from. If employees recognize this, they can stay calm and help other passengers understand the process."

Online Precautions

Employees self-registered for the emergency response training program and received personalized credentials to access the SSI Learning Management System. The web portal assigns specific training courses for each employee, based on his or her role in the

organization and language preference. Everyone, however, is on the training list.

Employees work through the training modules in sequential order and must pass a short quiz at the end of each section before moving on to the next.

"The average training time is 2½ hours," reports Nonnemacher. "It is a forced path. If you go through a module, there are knowledge checks along the way. If you miss something on the knowledge check, the system automatically takes you back to the section covering that topic. Then, you go through the knowledge check again."

According to de Rodriguez, more than 95% of FLL employees passed the training on their first try because of the intermediate knowledge checks designed into the courses. Employees could take each of the six courses separately, allowing them to accumulate toward total completion.

Because employees are compensated for their training time, the courses are programmed to "time out" if someone stops using it for more than five minutes. "They cannot start the program then go idle for seven hours and get paid for seven hours," Nonnemacher says. "When they print their certificate at the very end, it is time-stamped with when they started and ended, and the actual time they spent working on it."

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Training for All

Employees at FLL must complete emergency training annually or every other year, depending on their position. The SSI system tracks when it's time for an employee to retake the training. Automatic notifications are sent the employee's signatory, reminding them when the badge and training are due for renewal.

All employees must complete the training—even those who don't need a SIDA badge, such as curbside workers or parking attendants. "We amended our security program to require those employees who have a public area business badge to take this training," says Nonnemacher. "Airport CEO Mark Gale said if we are going to train employees at the airport, we will train all of them. It will be everyone, not just select groups of people who come in contact the public."



MARK GALE



Learning what to expect from first responders is an important part of the training.

With FLL firmly committed to training all employees, de Rodriguez has already heard from other airport operators who may soon follow suit. "Airports need to have this training, but they are struggling to make it happen," she observes. "Many airports deliver emergency response

training to their internal staff. But when something happens, it's often the airline employees, the ground handlers, the retail shop employees and food service employees who are on the front lines. They need to understand their role and what they can do to help." ✈️

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Columbus Int'l Installs System to Tighten Accountability & Efficiency of Ground Transportation Providers

BY KEN WYSOCKY



FACTS&FIGURES

Project: New Ground Transportation Management System

Location: John Glenn Columbus Int'l Airport (OH)

Approx. Cost: \$1 million

Funding: General airport revenue

Installation Timeline: Sept.-March 2019

2018 Airport Passenger Volume: 8.1 million

Commercial Transportation Operators: 250+

System Vendor: GateKeeper Systems Inc.

Technologies Employed: Geofences, transponders, radio frequency identification (RFID)

RFID Technology Vendor: Transcore

Electrical Contractor: Knight Electric Inc.

Fiber Optics Contractor: Gudenkauf Corp.

System Features: Onsite kiosk that allows taxi drivers to replenish their accounts for airport trip fees; digital signs that meter taxis from the holding lot one-by-one

Key Benefits: Revenue tracking/verification for pick-up & drop-off fees; more efficient paperless processes; automated billing for commercial transportation companies; more orderly & effective taxi dispatching from holding lot



A new \$1 million ground transportation management system is dramatically reducing paperwork and helping John Glenn Columbus International Airport (CMH) more accurately account for fees paid by ride-share services and commercial operators that pick up and drop off passengers at the terminal.

At the same time, the Ohio airport is enjoying more efficient and orderly taxi dispatching from the holding lot, which minimizes wait times for airport guests, reports Tracey Pomeroy, senior manager for parking and ground transportation at CMH.



TRACEY POMEROY

The project cost about \$1 million and was paid for with general airport revenue. The new system, from GateKeeper Systems Inc., took about six months to install and went online in March.

Pomeroy explains that two primary factors drove the need for change: a sharp increase in ride-sharing services, such as Uber and Lyft, during the last several years; and cumbersome

paperwork that bogged down everything from searching for report information to processing operating permits for taxis and other commercial operators.

Ride-sharing services posed an accountability problem because the vehicles are owned by individual contractors who aren't responsible for paying the \$4 pick-up and drop-off fees. As such, they didn't mesh with CMH's existing tracking system for taxis. Instead, the airport relied on ride-sharing companies to self-report the number of trips their drivers made into and out of the airport on a monthly basis, and the airport was unable to verify the numbers.

"We couldn't determine if the reports we received from transportation network (ride-sharing) providers were accurate," Pomeroy says.

"Nationwide, Uber and Lyft and others have taken significant amounts of passenger traffic from more traditional sources at airports," adds Lynn Richardson, chief executive officer



LYNN RICHARDSON



dispatch system to the taxi-driver payment kiosk, where drivers pay their pick-up and drop-off fees.”

It used to take one employee anywhere from five days to two or three months to issue a single permit to a commercial transportation provider. Delays were caused by various circumstances, such as operators not including key information on forms, not signing all the necessary documents or submitting unnotarized documents, explains Pomeroy.

“We have about 250 commercial operators—limousine services, courtesy vehicles, buses and so forth—and the operators don’t always read directions carefully,” she says. But electronic forms make the process much faster and more efficient.



WENDIE BIDWELL

“Increases in volume at airports, especially at Columbus, have presented a need for better ways to manage ground transportation,” says Wendie Bidwell, a project manager at GateKeeper. “Most airports have very manual processes on the back end that require a lot of people to keep track of what’s going on. And there also are

of GateKeeper. “As a result, airport curbsides don’t work as intended...at Columbus, there was a management system already in place to track taxi fees, but not for ride-sharing services.”

Ending the Paper Chase

Using a paper-based system slowed down administrative processes and made finding documents and getting them signed a time-consuming chore. “We needed to get rid of paper,” Pomeroy observes. “We wanted a digital database that could store pertinent information for commercial operators instead of using paper files—for things like their insurance forms, vehicle information and other documentation.

“We spent a lot of time shuffling papers around,” she continues. “Now, we can access everything right on a computer screen. GateKeeper hosts everything from all of our records to our taxi

safety concerns: Airports need to know who’s on the property.”

A customer portal allows transportation companies to see their accounts with the airport and automates formerly time-consuming processes. For example, if a limousine company gets a new phone number, now it can submit an electronic change request.

“Then, all the airport has to do is approve it electronically, rather than take a phone call, write the new number down on a piece of paper and hand key it in later,” Richardson explains. “There’s also a financial module that automates the process of billing and collecting fees, either by credit card or by electronic payments.”

New Monitoring Capabilities

To track ride-share drivers, CMH established geofences—virtual geographic boundaries defined by GPS or radio frequency identification (RFID) technology.

The system ties into GPS technology on ride-share drivers’ cellphones to detect and log whenever their vehicles pass a geofence boundary. While the GateKeeper system doesn’t track the fees that ride-sharing companies owe each month, it gives CMH a record of how many times such vehicles enter and leave the airport.

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“Hopefully, the numbers reported by the ride-share companies match what we see in the GateKeeper system in terms of arrivals and departures,” Pomeroy says. “If here’s a difference in the numbers, we can talk to ride-share providers and see if the geofences need to be adjusted.”

Overall, the system provides greater accountability and maximizes ride-sharing revenue, she says.

Taxis and other commercial transportation vehicles are tracked with RFID, similar to the system used by states to collect fees on tollways. The airport transponders are about the size of a credit card, and are applied to vehicle windshields like a sticker.

Antennas strategically located around the airport detect vehicles as they pass and record data such as the transponder number, time, the company that owns the vehicle and so on. Transcore supplied the antennas and transponders.

“Airports use that information to know who’s on the airport grounds and when,” says Richardson. “They also can check if vehicles comply with airport regulations (proper permits and car insurance, for instance) and, when necessary, track if there’s a charge owed for a trip to the airport.”

The system includes a kiosk in the taxi holding lot that allows drivers to “top up” the electronic accounts they use to pay pick-up and drop-off fees, which are withdrawn on a real-time basis.

“One issue airports face is they have all kinds of people that owe them money,” Bidwell explains. “They might have to spend time chasing down Bob Smith Taxicabs, for instance, which owes a \$50 fee at the end of the month. One way to avoid that is enabling drivers to pay on an automated basis by keeping a small balance in an account that can be replenished, either online or at a kiosk, whenever it gets low.”

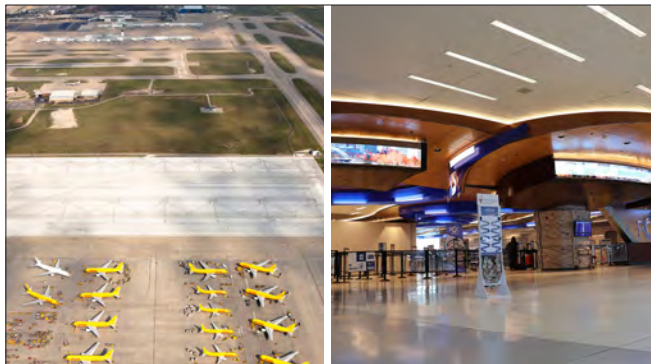
Better Taxi Dispatching

The GateKeeper system also improves taxi dispatching, notes Pomeroy. Previously, CMH used a buzzer system, with taxi drivers lining up in the holding lot until the taxi starter at the terminal pressed a button to “buzz” them.

“Then, a whole row of taxis would leave the lot and proceed to the terminal,” she says. “Chaos would ensue.”

Now, a large digital sign displays taxicab numbers to indicate when drivers may proceed to the terminal, one by one. The system uses RFID technology to determine the correct order to summon taxis, on a first-in, first-out basis.

“Taxi dispatching is much more orderly now,” Pomeroy reports. “And it’s more beneficial to airport guests because taxis are available at the terminal all the time. Before, if the starter was helping a customer, he might not access the buzzer as quickly to get more taxis to the terminal.”



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Another benefit: Taxi starters now have more time to “walk the line” of taxi drivers and enforce certain guidelines—for instance, making sure drivers are dressed appropriately, not sleeping and not working on their cars as they wait. “Believe it or not, we’ve had taxi drivers with their hoods raised in line,” Pomeroy relates. “So the system is beneficial to both us and our customers, who get better taxi service.”

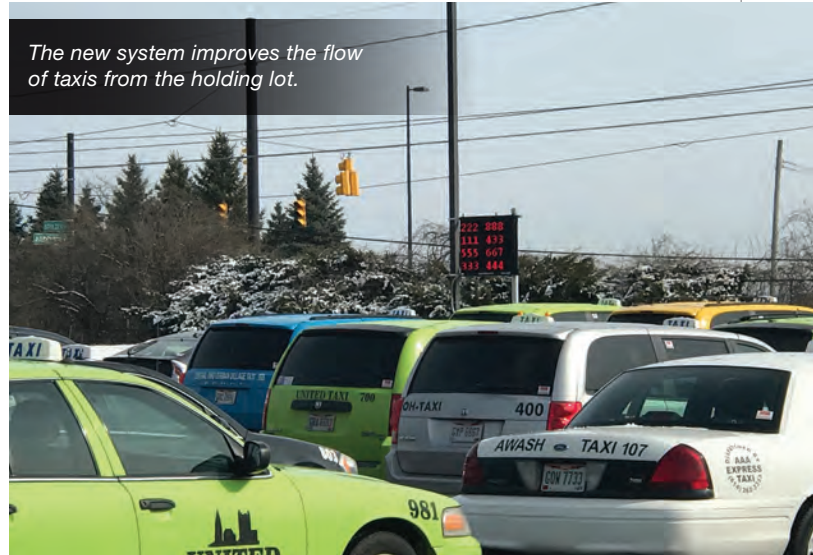
Maximizing Revenue

While it’s still too early to tell exactly how the GateKeeper system is impacting airport revenues, Pomeroy says there’s no doubt that ground transportation operations are running faster and smoother than before.

“Plus, we know we’re getting the revenue that we’re due,” she points out. “We just implemented drop-off fees earlier this year, and we probably wouldn’t have done that before because our old system wasn’t set up for it.”

“The system allows airports to be more accurate and collect all the fees they’re entitled to,” adds Richardson. “It also allows them to charge fees for things they couldn’t charge for before without an automated system.”

The new system improves the flow of taxis from the holding lot.



In addition, paperless processes enable ground transportation departments to focus more attention on customer service. “At Columbus, Tracey [Pomeroy] and her team are really utilizing technology to maximize efficiencies at their airport,” Bidwell says. ✈️

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Punta Gorda Airport Takes Holistic Approach to Development

BY SCOTT BERMAN

FACTS & FIGURES

Project: Balancing Growth & Airfield Safety with Wildlife Safety & Environmental Impact

Location: Punta Gorda Airport (FL)

Passenger Volume: 1.58 million in 2018; 1.65 million projected for 2019

2018 Aircraft Operations: 84,113

Runways: 3

Approx. Airport Footprint: 1,800 acres

In-House Wildlife Safety Staff: 6 Airside Operations employees

Wildlife Removals/Relocations: 28 in 2017; 56 in 2018

Reported Wildlife Strikes: 57 in 2017; 71 in 2018.

Wildlife Management Consultant: Michael Baker Int'l

For more information about mitigation credits, visit www.epa.gov/cwa-404/mitigation-banks-under-cwa-section-404

For resources about mitigating wildlife hazards, visit www.faa.gov/airports/airport_safety/wildlife/management/



Commercial growth, safe aircraft operations and environmental sensitivity go hand-in-hand at Punta Gorda Airport (PGD) on Florida's Gulf Coast. Toward that end, the airport's 2018 master plan update dovetails with its wildlife hazard management program.

"The Charlotte County Airport Authority prides itself in using a holistic approach that incorporates as many initiatives as possible in development projects," explains PGD Chief Executive Officer James Parish. "This means that our airport development projects contribute to several airport goals."



JAMES PARISH

A big part of the equation is environmental stewardship and managing wildlife hazards to enhance airfield safety.

Located beside Charlotte Harbor (which Parish points out is an important local estuary), PGD's wildlife issues range from alligators to Canadian geese. The airport had 57 reported wildlife strikes in 2017 and 71 in 2018. Most of the strikes involved small birds,

such as Eastern meadowlark, barn swallow, cattle egret, European starling, vulture, egrets and herons. As of late September, the airport's most recent strike had occurred in March 2019, when a mourning dove was ingested into the engine of an A-320.

Worldwide, wildlife strikes have resulted in hundreds of deaths and caused billions of dollars in aircraft damage during the past century. The FAA Wildlife Strike Database indicates that the problem is intensifying in the United States: from 1,800 reported strikes at U.S. civil airports in 1990 to 16,000 in 2018. Agency personnel attribute the dramatic jump to increased passenger traffic, the introduction of much quieter aircraft engines and a large increase in wildlife population.

Managing wildlife on or near airfields is a challenge that typically requires a wide range of tactics. One of PGD's key strategies is modifying habitats on airport property to discourage wildlife from proliferating on its grounds. By doing so, the airport protects wildlife as well as aircraft and passengers, explains Kaley Miller, marketing and communications manager at PGD.



PHOTO: MARIIBEN ANDERSEN MICHAEL BAKER INTERNATIONAL

Specific efforts include:

- improving drainage to remove standing water from the airfield,
- encouraging wildlife to move elsewhere with noisemakers,
- relocating wildlife that pose danger to flight operations,
- using a perimeter fence to deter wildlife from entering the airfield,
- harvesting timber from a wooded parcel near the airfield in a sustainable manner,
- managing on-airport vegetation proactively, and
- inspecting airfield and perimeter fencing on a daily basis.

Six airside operations staff members are trained for and tasked with wildlife response. They work in tandem with Michael Baker International, a consultant the airport hires to provide additional insight and services. Training for in-house employees includes courses about trapping alligators and handling firearms, presented by the Fish and Wildlife Commission of Florida's Division of Hunting and Game Management.

Personnel relocate a variety of animals to safer habitats on airport property or nearby wildlife areas. Affected creatures included alligators, gopher tortoises, Canadian geese and various other birds. A licensed, permitted trapper relocates the alligators to central Florida; a permit from the U.S. Fish and Wildlife Service allows airport personnel to remove geese and nests of other migratory birds. The number of animal relocations at PGD recently doubled—from 28 in 2017 to 56 in 2018.

The airport uses lethal strategies as a last resort—to ensure safe aircraft operations and only when all other methods have been

exhausted, stresses Mariben Andersen, the FAA-certified wildlife biologist who heads the Michael Baker team at PGD. Wildlife takes are performed according to the conditions of the airport's Migratory Bird Depredation permit from the U.S. Fish and Wildlife Service, she adds. In 2018, there were 31 such takes.



MARIIBEN ANDERSEN

On the preventive front, Andersen reviews PGD's wildlife hazard management plan every year and provides initial and refresher wildlife safety/management training for airport staff. She also performs site assessments and recommends ways to reduce strike risks.

Andersen describes PGD's approach as "genius" in part because wildlife initiatives are incorporated throughout the airport's development program—from early discussions about individual projects to master plan updates and FAA FONSI (Finding of No Significant Impact). Doing so streamlines project design, permitting and construction, she notes.

Balancing Growth & Safety

The airport's commitment to wildlife and environmental stewardship continues to develop as PGD grows and renovates its facilities. Parish explains that the airport authority's most recent master plan update, approved by the FAA in 2019, includes several projects that simultaneously address the airport's economic development, growth and safety, including wildlife hazard management.

The projects, currently in various stages, include:

- constructing a new general aviation terminal and replacement hangar,
- expanding the airport administration building,
- expanding the long-term parking lot,
- improving and realigning roads,
- acquiring some property that abuts the airfield, and
- rehabilitating Runway 4-22, which is 7,192 feet long

A \$13.8 million airfield project slated to begin in November highlights how PGD combines expansion with wildlife management and environmental mitigation. In order to add 593 feet to Runway 15-33, the airport is executing a \$1.8 million project to fill 14 acres of wetlands on airport property—this initiative is financed by FAA grants and passenger facility charge funds. (The airport also plans to fill another 36 acres in 2022.) After construction is complete, Runway 15-33 will be 6,281 feet long.

"The presence of wildlife in the airfield increases the likelihood of a strike," explains Parish. "To protect wildlife and enhance safety, removing wetlands that would serve as a water source and home to various wildlife is the best approach." To offset the loss of those wetlands, PGD is simultaneously helping create new wetlands 25 miles to the south of the airport, at Little Pine Island, and 15 miles to the north at Boran Ranch.

The runway rehab and wetland mitigation is being funded by a \$6.4 million FAA grant, plus funds from the Florida Department of Transportation and passenger facility charges for the extension. Parish notes that the Runway 15-33 project exemplifies PGD's holistic approach: "The project improves the pavement condition

of the runway, which means less rubber wear on the aircraft; removes wetlands, thereby enhancing safety because they attract wildlife; and improves the stormwater management system by removing associated ditches that feed the wetlands. It also saves money since there is one mobilization for a multi-faceted project.

“Filling in the wetlands closest to the runways is really the best option for avoiding hazardous interactions between birds and planes,” he adds. “We’ll fill the wetlands in stages starting with less than 15 acres later this year. This will give time for the birds to fly away and the wildlife to relocate.”

Parish reports that the initiative has not been a point of contention locally. “I think our community understands we’re good stewards of the land and natural resources, and that we are committed to the safety of our pilots and passengers,” he explains. “Over the last several years, we’ve worked to educate our neighbors that the airport is not an ideal habitat for wildlife.”

Creating New Wetlands

The offsite wetlands project PGD primarily supports is located on Little Pine Island, a state-owned site off the west coast of Florida used to mitigate the loss of wetlands from construction projects in several counties.



The airport’s wildlife challenges range from alligators to Canadian geese.

Operating under the auspices of the state, Mariner Properties Development Inc. manages a long-term plan to remove invasive plant species and restore natural tidal flows at the 4,670-acre island, which was significantly impacted by development over the last few decades. The ultimate goal is to help bring the coastal and marine habitat back to a natural, healthy state. Onsite personnel report significant progress, with many birds, native plants and fish returning to the island since restoration efforts began in the 1990s.

The airport and other entities participate by buying wetland mitigation credits from Mariner, which then applies the funds to the habitat restoration effort at Little Pine Island. Miller reports that PGD will complete a \$1,354,500 payment to the mitigation bank in November. That amount will earn the airport 15.05 credits, for

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IAW FAA AC No: 150/5200-30D - Airport Field Condition Assessments and Winter Operations Safety & ASTM E 2101-15 -Standard Test Method for Measuring the Frictional Properties of Winter Contaminated Pavement Surfaces Using an Averaging-Type Spot Measuring Decelerometer



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restoration efforts applied to this project and the airport's next phase of wetland mitigation projects. Credits are units of trade, with costs that vary according to the number of credits purchased and type of habitat loss and mitigation projects involved.

Because the airport's wetlands span two different watersheds, PGD must also purchase two acres of credits for \$288,000 from a separate developer, Ecosystems Investment Partners, which operates the Boran Ranch Mitigation Bank in the Peace River Basin.

Entities such as PGD that execute projects impacting wetland habitats are called "producers." Developers that restore habitats elsewhere are called "bankers," and are approved to take funds to support wetland mitigation bank sites such as Little Pine Island, Boran Ranch and many others across the United States.

Advice for Others

Parish offers a tip for fellow airport operators working to balance growth with safety, wildlife hazards and environmental sustainability: "Proper planning and documentation on the front end is the key."

He also stresses the value of hiring credentialed consultants and maintaining consistent communications with regulatory agencies and the local community.

As head of PGD's wildlife consulting team, Andersen stresses the importance of preemptive action. "An ounce of prevention is better and less expensive than a pound of cure," she muses. "It is better to be proactive than reactive; so be aggressive with your wildlife hazard measures. Yes, you can and should fill or remove wetlands that are at the end of or next to your runway and taxiway."

Challenges Without Borders

Wildlife management issues often extend beyond a given airfield. "Only so much can be done within the airport," explains Andersen. "The issue of liability with wildlife attractants outside the airport property limits will most likely be the next controversial issue for safety. This issue will hopefully promote cooperation and partnerships with other entities and extend wildlife hazard management well beyond airport boundaries."

At PGD, officials plan to stick with their strategy of wildlife-sensitive growth. "We will continue to use a holistic approach with our development projects," says Parish. "We also evaluate new methods and new technology to enhance our wildlife management program. We have a lot of projects slated for the next several years, from additional parking lots for commercial passengers and rehabilitations of our runways to the development of the north side of the airport for more seamless general aviation activities." 



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FACTS&FIGURES

Project: Expanding/Modernizing Terminal

Location: Seattle-Tacoma Int'l Airport

Site: North Satellite

Sole Tenant: Alaska Airlines

Phase 1 (Expansion): Opened July 2019

Scope: 255,000 additional sq. ft. of space; 8 new gates; concessions space tripled to 46,000 sq. ft.

Phase 2 (Renovation of Original Space): Scheduled to open in mid-2021

Funding: \$658.3 million from Port of Seattle (airline fees; Airport Development Fund; passenger facility charge revenues); \$41 million from Alaska Airlines

Architect: AECOM

Design: Fentress Architects

General Contractor: Hensel Phelps

Structural Engineer: Magnusson Klemencic Associates

Mechanical Engineer: Mazzetti

Electrical Engineer: Stantec

Passenger Boarding Bridges: JBT Aerotech

Automated Docking: Safedock, by ADB SAFEGATE

Seating: Vitra



Sea-Tac Int'l & Alaska Airlines Partner to Expand & Modernize North Satellite

BY JENNIFER BRADLEY

When Seattle-Tacoma International Airport (SEA) built its terminal and two satellites in the late 1960s and early '70s, officials hailed the new facility as the "Jet Port of the Future." But that was decades ago.

In 2013, SEA launched the North Satellite Modernization program to update its outdated, nearly 50-year-old concourse and address seismic issues that emerged after an earthquake in 2001.

"Instead of just doing a normal shell and core project and allowing a tenant to perform tenant improvement, we decided to put our arms around Alaska Airlines (the sole tenant since 2012). They've also put their arms around us, and we decided to go down the road of renovating the North Satellite together," explains Ken Warren, capital program leader for the Port of Seattle, which owns and operates SEA.



KEN WARREN

As a result, the building was expanded from 160,000 square feet to 428,000 and now includes a second story and eight additional gates, for a new total of 20. Alaska Airlines built a 15,800-square-foot flagship lounge, with local concessions and stunning views of the nearby Olympic Mountains.

The Port of Seattle has invested \$658.3 million in the North Satellite; Alaska Airlines contributed \$41 million for the lounge and employee areas. The guiding principle for both is making the curb-to-seat experience for customers of the highest quality.

Officials expect to finish Phase 2 of the project—a comprehensive renovation of the original 1973 concourse—in mid-2021.

Design Intentions

The top objective for the project was performing seismic upgrades to address earthquake concerns. The second was improving technology; the third, cultivating a Northwest experience; fourth, modernization; and finally, sustainability.

The entire scope of the project was developed through the lens of these five objectives. But when SEA experienced double-digit passenger growth in 2015 (13,000 people per day), expansion was added to the list of major goals.

Design challenges arose working with a 200-foot-wide existing structure—double the size of the current terminal design practice, notes Warren. He credits the designers' solution of creating a river effect with clerestory glass and introducing light into the center of the satellite, increasing the passenger experience.

"Basically, we're building a new building on top of the old building, and then demolishing the old building from underneath the new roof," explains Rad Milosavljevic, construction manager at the Port of Seattle.

The new design highlights SEA's Northwestern location, with a river concept winding through the center, clerestory window, high ceilings and natural light penetrating all corners of the facility. The open and airy design is much different from the previous 1970s closed-wall concept.

"There's a very high wood ceiling that allows us to create the clerestory in the center of the building to bring natural light in," explains David Laielli, project architect at prime consultant AECOM. "The light comes through to highlight the river motif even in the details of the floor pattern."

Interior design elements give a nod to the area's natural features, such as mountains, rivers and Puget Sound. An 80-foot-wide, 35-foot-tall glass window wall in the Central Marketplace provides travelers with views of the mountains and bustling airfield.

"You get to see airplanes taxi around the airfield, and we hope this harkens back to an era where people came to an airport for an experience," Warren comments. "Flying used to be a big thing, and air transport seems to have lost some of that luster. We're hoping to bring the air travel shine back to the North Satellite."

Enhanced Passenger Experience

"Design intentionality" also extended into the realm of customer service.

The pet relief area is in a separate room with faux grass that can be easily cleaned and sanitized. Drains for the area feed straight to the sewer system, and designers included a 20 air-change-per-hour exhaust system to keep the air as fresh as possible. Odors from the pet area and nearby restrooms are exhausted out the building.

SEA prides itself in providing top-of-the-line restrooms. Facilities in the new North Satellite include slimming mirrors, low water consumption urinals and toilets, and shelves for carry-ons. Non-porous porcelain tile that resembles granite was selected for a luxurious look that will be easy to maintain.



RAD MILOSAVLJEVIC



DAVID LAIELLI

The mothers' suite is a private area with seating, sinks, restrooms and changing tables to help ease travel stress for new moms and their families.



A private suite for nursing mothers was a phenomenal addition, notes Dan Tauber, AECOM's project manager. "It's a really quiet space," he explains. "We thought through things like stroller storage, and provided a place for mothers to sit back, relax and take a breath."



DAN TAUBER

Customers with visual impairments can use Apple's iBeacon technology that is incorporated into light fixtures to interface with a phone app for wayfinding. Discrete devices are installed, and by using the phone app, visually impaired passengers can navigate by asking for directions. "They just have to ask where the Starbucks is, and the app could respond: 'Thirty-five feet ahead of you, turn to your left and go 10 feet,'" Tauber explains. "It's an amazing thing for a population that has difficulty navigating an airport."

In the Central Marketplace, designers added a built-in stage for live music and flanked the concessions area with a plethora of traditional and digital artwork to make customers' experience in the North Satellite one to remember.

"We don't want people to come through and be nervous," Tauber adds. "We want them to enjoy their experience, and the entire project team really thought through this process to provide a better product at the end of the day for those traveling through Sea-Tac."

Tech Upgrades

Design documents were created in Revit, which implements building information modeling (BIM) throughout the trades—design, construction, mechanical, electrical, etc. "Before anything is built, we have a consolidated BIM model all the utilities refer to," says Laielli. "In many instances, that model gets sent off to the shop and workers use it for their own fabrication models."

Revit technology also allowed the team to create animations and "fly-throughs" of the project, which help stakeholders visualize the final space.

"We live and breathe this stuff every day, but when airline project staff review a set of drawings, they may not see the same



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information we do,” explains Laielli. “When you can take that BIM model and show them what the facility actually is going to look like, it’s very exciting.”

Sharing realistic animations also increases communication and helps the team refine the design before construction begins, he adds.

After construction is complete, BIM technology provides benefits for asset management and maintenance, notes Frederick Robinson, capital project manager for the Port of Seattle.



FREDERICK ROBINSON

For example, data files allow staff to see when a particular air filter was installed, the specific model number, when it needs to be replaced and even where to buy it.

“The more you’re able to understand your facility, the better you’re able to operate it,” says Robinson. “This is a way to truly aim for a higher level of passenger service.”

Two full-time modelers are working at the airport during the project to manage the BIM model and help prevent conflicts in the field.

“Airlines are looking for innovation, and we, as designers and builders, have an opportunity to transform this project,” Robinson remarks.

For instance, new JBT Aerotech passenger loading bridges use technology to help passengers board and deplane quickly. Another new implementation, Safedock, automatically directs aircraft into their parking positions and helps find available gates.

“It identifies a pilot’s flight, airplane, routes and is now in proprietary use for Alaska Airlines here at Sea-Tac,” Robinson notes.

Sustainability Strategies

At SEA, it’s standard procedure to build numerous environmental measures into the front end of facility upgrades. The North Satellite modernization includes escalators with high-tech motors that sense when people are not using them to enable a sleep mode, delivering nearly 40% energy savings. The updated baggage system has a scanner with 12 head positions, and is producing a 92% accuracy rate.

“It’s as smart as we can make it,” comments Milosavljevic.



Customized Alcove seating from Vitra was added in privacy nooks for the comfort of nursing mothers.

Designing for the human experience

Nashville International Airport Terminal & Landside Area Planning



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The airport added eight gates, for a new total of 20 in the North Satellite.

A rainwater capture system that supplies restrooms will save almost 750,000 gallons of supplied water a year. Currently it is in limited use, but Milosavljevic reports that industrial wastewater will eventually be used to flush all toilets and urinals in the North Satellite.

Given the project's numerous sustainability features, the airport is tracking toward LEED Silver for Leadership in Energy and Environmental Design. Recycling 95% of construction waste from the project is identified as a major part of the effort.


High-performing materials on the walls and floors, light emitting diode fixtures and air reconditioning are just a few of the other sustainable features. Milosavljevic notes that the goal is to be environmentally green, but also save real money. "We're benchmarking and making sure that we're meeting all the anticipated results," he emphasizes.

One key measure is the new facility's ability to withstand seismic activity. Because a 2001 earthquake slightly shifted the original terminal, the addition was upgraded to handle this kind of natural stress. Project designers also surrounded the original 1970-era building in a new steel moment frame. "We froze

that structure and gave it the effect of being updated, meeting today's seismic codes," explains Warren.

"I refer to it as a 'seismic hug' and once gave Rad [Milosavljevic] a big hug on TV when talking about the project," he laughs.

With the North Satellite expansion completed in Phase 1, the project team is fully immersed in Phase 2: comprehensive updates to the original structure. Officials expect to open the newly renovated portion in summer 2021. In the meantime, the airport has moved passengers into the new second-floor space while crews update the old facilities.

Maintaining normal operations and passenger flow has not been easy during the transition. Tauber notes that even routine tasks such as garbage pickup have been a challenge. "There was a short time we called it the Frankenbuilding," Warren jokes. "We had a 1970s facility tied to a modern 2019 facility. It was absolutely stunning to see how many people would purchase food in the old, dark, low facility and walk over just to enjoy it in our beautiful new building." 

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FACTS&FIGURES

Project: Green Plate Program

Location: Portland Int'l Airport (OR)

Program Site: Clocktower Plaza (main pre-security food court)

Strategy: Offer customers option of using reusable service ware & utensils vs. single-use plastic versions

Participating Vendors: 6

Busing/Dishwashing Service: Relay Resources

Est. Annual Operating Costs: \$98,400

Anticipated Savings for Garbage Disposal: \$2,000/yr.

Test Program: April-June 2017

Cost of Pilot: \$43,000

Funding: \$29,871 from the Oregon Dept. of Environmental Quality; \$12,860 from Port of Portland

Initial Cost of Dishes: \$6,000

Results of Pilot: 3 participating concessionaires reduced their to-go packaging by 73%, collected/composted 374 pounds of food waste & reused 10,000 dishes

Key Benefits: Reduces plastic waste; upgrades dining experience for customers; reduces airport's garbage disposal expenses; reduces concessionaires' cost for plastic to-go containers

Portland Int'l Reduces Food Court Waste With Reusable Dishes

BY MIKE SCHWANZ

Adding to its established history of environmental action, Portland International (PDX) in Oregon is stepping up to the plate—literally and figuratively—to reduce the amount of plastic single-use containers that end up in its trash.

The Green Plate Program, introduced just a few months ago, gives customers at its main pre-security food court the choice of having their food prepared “for here” or “to go.” Meals ordered “for here” are presented on melamine dishes, with drinking glasses and metal silverware that are washed and used again. Customers who want their orders “to go” receive them in disposable paper and plastic containers, with plastic silverware.

Six vendors currently participate in the program: Bangkok Xpress, Blue Star Donuts, Sumo Sushi, Flying Elephants Delicatessen, Maruti and Panda Express.

Importantly, the new waste reduction program does not create extra work for participating concessionaires. The

airport's janitorial partner, Relay Resources, delivers, buses and washes the dishes and silverware. After “for here” customers finish eating, they place their dishes into one of 11 collection trays on top of trash cans throughout the food court. Relay Resources delivers them to the kitchen and loads them into a high-powered commercial dishwasher that cleans the dishes in only three minutes. In the first few weeks of the program, the maintenance contractor ran an average of 45 loads of dishes per day.

“A load of dishes can be washed and sterilized in only three minutes,” says PDX Media Relations Manager Kama Simonds. The new Energy Star dishwasher the airport installed in August uses only 1 gallon of water per cycle, she adds.



KAMA SIMONDS

Testing the Concept

The Green Plate Program was created after a 2017 study showed that disposable to-go containers and utensils made up nearly one-third of waste from the food court area—even though more than 75% of customers consumed their orders within the food court. The Port of Portland, which owns and operates PDX, subsequently launched a pilot program with three concessionaires to reduce waste from single-use food packaging.

During the pilot, a majority of customers chose to “eat in” off reusable plates and utensils.

“We called this ‘Green Plate’ because in the pilot program, all three vendors had green plates. Now, each of the six participating restaurants has its own designated dish color,” explains Simonds. “Each concessionaire was given several options and chose the types of dishes that fit its business. Some wanted one big plate, some wanted a specific type of bowl, some wanted a plate with dividers.”

The results of the pilot program encouraged PDX to press ahead. “During the three-month pilot, participating vendors reduced their to-go packaging by 73%, collected and composted 374 pounds of food waste, and reused 10,000 dishes,” Simonds reports.

After the pilot ended, the airport solicited input from the three participating concessionaires and Relay Resources to develop the full program that launched in August 2019.

Although this program is still new, the results have been encouraging. “We are still gathering data, but so far we have decreased waste in the food court by at least 25% percent,” says Simonds.

One Vendor’s Perspective

Bangkok Xpress signed on for the Green Plate Program after participating in the pilot from April to June 2017. Cheryl Nhun, who has owned the airport concession for three years, estimates that about 50% of her customers opt for reusable plates and utensils.

“It has worked out very well for us,” says Nhun. “Our customers seem to like it...and I like that the airport gave us choices in the types of plates we use. We offer 18 items on our menu, which require different types of plates. We have a medium-sized standard plate, a plate with three compartments and some bowls for the curry dishes. I also like that all of our dishes are yellow, which is a cheerful color.”

Nhun also likes that the program saves her restaurant money. “We have been doing this for only a few months, but so far we are saving about \$1,000 a month on purchasing plastic products,” she reports. “That will really help our bottom line as time goes on.”

Costs

The pilot program that tested the Green Plate concept cost about \$43,000. A grant from the Oregon Department of Environmental Quality provided \$29,871 to purchase reusable dishes, additional janitorial help to wash the dishes, and consultant support to manage and collect data



A commercial dishwasher cleans and sanitizes reusable food court dishes in just three minutes.

for the program. The Port of Portland provided \$12,860 in matching funds for personnel costs associated with program management.

Estimated annual operating costs for the full program are \$98,400. “We expect this cost to go down with reduced janitorial labor, and with an estimated \$2,000 a year we expect to save in reduced disposal costs for garbage,” Simonds forecasts.

Holistic Effort

The airport has been working to reduce landfill waste for years with programs such as the PDX Food Donation Program and annual spring and fall cleanups, which allow tenants and airlines to drop unneeded business furniture, displays and electronics to be donated and recycled.

“We are trying to look more holistically at the amount of waste generated by the airport and work collaboratively with our partners and concessionaires to try to reduce and eliminate waste,” Simonds explains. “We do use a bit more water, but the overall conservation benefits of the Green Plate Program make it worthwhile. We look at this undertaking as a good customer service option for our travelers.

“In the future, we hope to extend this program to all food court areas in different terminals,” she adds. “But for now, we will keep this in the pre-security food court.” ✈️

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FACTS&FIGURES

Project: New Public Safety Communications System

Location: Vancouver Int'l Airport (BC)

System Overview: 700- & 800-megahertz equipment; distributed antenna system that supports communications for first responders & back-of-the-house communications

System Provider: Advanced RF Technologies Inc. (ADRF)

ADRF Components: Active head end unit & amplifier (with duplicate standbys of both); 4 optic expansion units; 32 remote units

Other System Components: Active donor antenna (with duplicate to connect to the standby head end equipment); 13.6 km of single-mode fiber optic cable; 9.2 km of RF Heliac cable; 128 distribution antennas

911 Service: E-Comm

Project Timeline: Deployed in 2015, with continuing efforts to add coverage & capacity as needed; system will be extended to new gates in Pier D next summer

Vancouver Int'l Coordinates Communication System With 9-1-1 Service

BY NICOLE NELSON



Vili Antic, technical analyst at Vancouver International (YVR), sleeps well at night knowing that a cutting-edge public safety and communications system is in place at the British Columbia airport. The system helps coordinate emergency response from ambulance service, firefighters and police officers, and it receives ongoing updates to add coverage and capacity.

For the past 22 years, Antic has been responsible for Layer 1 infrastructure for YVR's public safety and emergency operations systems. That means he oversees every last inch of the cabling and communication rooms that handle the safe transmission of 9-1-1 service calls and subsequent first responder coordination.



VILI ANTIC

On a more technical level, Antic manages the physical layer that modulates signals transmitted over radio links and copper or optical fiber. This includes the airport's distributed antenna system (DAS)—a component that he praises for its efficiency and reliability.

The multiphase deployment of the system included a series of nodes that propagates radio waves in the airport's DAS, which was designed by Advanced RF Technologies Inc. (ADRF). "What we did first was assess the reason why we needed to go in this direction," recalls Antic.

Back in 2009, YVR deployed a trunked radio system that served the airport well for a number of years, he explains. But the computer-controlled two-way radio was supplanted when E-Comm, the 9-1-1 service provider for British Columbia, opted to change its emergency radio system for the province's primary first responders: ambulance, fire firefighters, and police. As a result, their frequencies changed bands, and YVR was brought to a technical crossroad.

"The way we were doing things, with what we inherited back in the 2000s, was not sustainable over time," Antic explains. "We couldn't use it to grow, and we had to assess which direction to go."

Operation DAS

After searching for a new solution, the airport ultimately opted for a DAS to enhance coverage and capacity. And Antic reports that there were no regrets about installing the state-of-the-art equipment.

ADRF Chief Operating Officer Arnold Kim says that the 700- and 800-megahertz supporting equipment of the DAS supports every single criteria requirement of E-Comm while also easing the jobs of airport staff tasked with the responsibility of public safety.



ARNOLD KIM

"They needed support for the latest and greatest code-compliant public safety equipment to ensure mission-critical communication at YVR," Kim says. "We won that RFP [request for proposals] and were able to deliver a 700- and 800-megahertz solution that provides connectivity for both the fire marshals, police and municipal folks, as well as for internal communications for airport personnel."

Antic notes that existing infrastructure at the airport made installation of the DAS rather smooth, all things considered.

"We have the foundation to accommodate different systems with respect to how our IT architecture is set up when we venture out and look for solutions such as DAS," Antic says of the high-profile system. "The way ADRF equipment works brought in a good blend, a good balance."

Antic says the "plug-and-play" capabilities of the DAS have been key, with components manufactured and delivered, on average, within two weeks. This is especially important as the DAS continues to grow with the airport.

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This is the type of DAS system installed at Vancouver Int'l.

“It is kind of like adding more pieces to a Lego city or going to IKEA and adding more shelves to your BILLY bookcase collection,” says Antic. “ADRF has really fit what we were looking for when we did the RFP.”

Easy accessibility of DAS equipment will be crucial as YVR nears the end of its largest expansion project since 1996. With eight additional wide-body international gates scheduled to open in Pier D next summer, the first two quarters of 2019 will be filled with bits and pieces of additional DAS equipment being deployed in that part of the terminal.

“It is straightforward and easy-to-follow, and (ADRF) is always there to help. If you want to deal with something that is a little different or if you have a question, they’re always available,” Antic reports. “It helps us, as we don’t have to worry or think about the DAS too much. That way, we can continue to look at other aspects to make our passenger experience better and better.”

Low-Profile Improvement

In terms of the airport’s customer experience, Antic and Kim agree that the less the passengers know about the DAS, the better the system is performing.

“This system is for emergency responders as well as the back-of-the-house folks who work at the airport. So if our communication system enables high productivity, then the less you hear, the better,” says Kim. “If we are able to mitigate or obviate a crisis or malfunction and the passenger is unaware of it, that provides a comforting travel experience for the passengers.”

Clearly, the contractor values the role airport personnel played in the improvement process. “Thankfully, a lot of smart people from YVR who have been immersed in all the latest and greatest requirements that an airport security and communication system requires put all of their experience and intelligence into the pre-design,” Kim concludes. “And thankfully, the existing system didn’t require any additional changes or modifications subsequent to that.” ✈️

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 #AirportSymp

Reagan National Prepares New Concessions Program for New Concourse

BY THOMAS J. SMITH



FACTS&FIGURES

Project: New Concessions

Location: Reagan National Airport

Owner: Metropolitan Washington Airports Authority

Project Scope: 13,900 sq. ft.; 10 spaces in the new concourse building

Anticipated Timeline: Leases awarded in Dec.; tenant build-outs slated to begin in fall 2020

Concessions Program Manager: MarketPlace Development

Tenant Build-out: Each vendor will select its own team

Overarching Program: \$1 billion Project Journey, slated for completion in 2021

Project Journey Design: AIR Alliance (AECOM & PGAL joint venture)

Construction: Turner Construction

With structural steel still being erected for the \$1 billion terminal expansion/renovation at Reagan National Airport (DCA), a new concessions lineup is already in the works. Ten concessionaires are being selected this fall for the new facility that is scheduled to open in 2021.

The Metropolitan Washington Airports Authority hopes to award leases in December and announce new retail and food/beverage tenants in January or February. New tenants are expected to begin building out their spaces next fall.

The concessions programs at DCA and Washington Dulles International Airport are managed by MarketPlace Development, a

Boston-based real estate retail manager. In July, the company issued a call for proposals seeking tenants to fill 10 concessions slots, totaling 13,900 square feet, in the 225,000-square-foot concourse being built at DCA. Proposals were due on Sept. 13.

The new concourse, a key part of the airport's \$1 billion Project Journey initiative, is being built on the north end of the existing Terminal C and will replace Gate 35X. Currently, passengers departing from Gate 35X ride a shuttle bus to board aircraft parked on the apron. The new concourse will have 14 gates with an extensive seating area. Beyond new concessions, amenities may include a private room for nursing mothers and a pet relief area.



PHOTO: METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

While there will be a walkway connecting the new concourse to the existing terminal, DCA does not plan to add any retail—storefronts or kiosks—in this space.

Additional retail space will be created within the new passenger security checkpoints. Two structures, totaling 50,000 square feet each, are being built over the arrivals roadway on the front side of the airport. This \$263 million addition will allow TSA to move its three current security checkpoints from the concourses deep within the airport to the front of the facility. In early October, TSA was still determining how many checkpoint lanes to add to the current 20.

Deven Judd, director of customer and concession development for the Airports Authority, reports that there will be two pre-security concessions. During construction, an existing Starbucks on the Ticketing level will be closed, but the space will reopen once the project is completed.



DEVEN JUDD

With DCA's current layout, the principal hall that connects all three concourses is filled with concessionaires that are accessible to the general public. Known as National Hall, the area functions like a public mall.

By shifting the security lanes from the head of each pier into the new space, DCA will regain valuable space adjacent to National Hall. Plans for this area are pending, but options include larger restrooms, nursing mother rooms, pet service areas, entertainment features, more seating and new concessions space.

"A number of airport departments need to come together and define what the space may look like," says Judd.

Two retail locations—a Capital One bank branch and a Brooks Brothers clothing store—were closed to create the corridor linking National Hall to the new security checkpoints. No other existing retailers in National Hall will be relocated or closed by the construction work, notes Judd.

The National Hall concessionaire leases expire in 2021, 2022 and 2023.

Post-Checkpoint Shift

The last major construction project at DCA occurred in 1997—before the creation of TSA and associated new security requirements. Back then, the facility was designed to accommodate



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15 million passengers. Now, nearly 24 million passengers pass through security checkpoints that virtually hug the gates.

While the new concessions space in the new concourse will add welcome options for travelers, the relocation of TSA security checkpoints will change the entire tone of National Hall.

Currently, many concessions are pre-security. While this allows the general public to use them, it also causes passengers who are worried about getting through the TSA checkpoint to reduce the amount of time they spend shopping and dining in National Hall. "Sometimes National Hall can be busy, with some passengers waiting in security lines and others trying to shop," Judd relates. Once through the security checkpoints, passengers are now "stuck in their concourse" without access to shopping or food/beverage options in National Hall or in other concourses.

After National Hall is reconfigured to be post-security, Judd predicts that passengers will spend more time and money in shops and restaurants.

Passengers will no longer have to monitor their watches and worry about how soon they need to get into the security lines, explains Kathleen T. Verret, MarketPlace's vice president for the

Washington region. Once travelers clear their TSA checkpoint, they will be free to roam the airport. "I think it will be a really great experience for the customers as well as the tenants," says Verret. "The tenants are all excited—they expect more business. We think they will really be able to thrive in the new post-security environment."



KATHLEEN T. VERRET

New Tenants

The emphasis will be on food and beverages in the new concourse. DCA is seeking café, burger, pizza, sandwich and coffee operators. Six food vendors will be complemented by two news shops, an electronics store and a gifts or clothing retailer.

MarketPlace is working with DCA to prepare a merchandise plan based on customer feedback and current industry trends. Verret notes that electronics stores continue to be sought-after retail offerings, and chef-inspired restaurants are still trending on the food/beverage side.

The development team is reserving a 5,000-square-foot block of space in the new concourse for a restaurant to serve multiple

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needs: sit-down service, grab-and-go, and coffee/pastry service. “We can bring in a brand that can do all of that because we now have the space,” Verret explains.

Judd notes that the airport wants new concessions to highlight the Washington, D.C., area. That “sense of place aspect” could mean local concepts, local operators or restaurants serving local farm-to-table selections, he explains. That said, neither DCA nor MarketPlace have inserted a pre-conceived notion of exactly what “local” is into the bidding specifications. “We are open to looking at all types of proposals whether from the local area, the region or even national brands,” says Judd.

Currently, about 40% of the concessions contracts are with local companies.

In the request for proposals, MarketPlace encouraged all prospective tenants to put forth the “most competitive rental rates they are comfortable with.”

Baseline rent is outlined in the request for proposals. Tenants pay the airport a percentage of their sales as rent. MarketPlace earns its management fee based on total sales. After the

company’s current contract expires in December 2021, the airport will solicit competitive bids for its new concessions management contract.

Verret notes that special consideration will not be given to existing tenants that want to open additional locations in the new space. “We want to give the travelers a choice,” she explains. “We don’t want the airport to have just one coffee brand. We want variety. In looking for the ‘better burger’ concept (one of the programed restaurant spaces), we may get six to eight proposals for a burger concept. The decision will be based strictly on the best proposals for that space.”

In late September, MarketPlace was evaluating proposals and preparing to make recommendations to the Airports Authority. Both MarketPlace and the Airports Authority declined to divulge how many proposals were received by the September deadline. Typically, the company receives at least two proposals for each space, says Verret.

Most food/beverage providers will operate with a 10-year lease; retail stores will be offered seven-year leases. ✈️

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Phoenix Sky Harbor Saves Water & Money by Switching to Native Landscaping

BY VICTORIA SOUKUP

FACTS & FIGURES

Project: Native Landscaping

Location: Phoenix Sky Harbor Int'l

Strategy: Replacing turf with native flora that require less water & reflect local desert environment

Cost: \$5 million (self-funded)

Associated Water Savings: 5.375 million gallons/yr.

Associated Cost Savings: \$425,000/yr.

Timeline: 2 years; completed in June 2019

Plantings: 435 trees that require little water; 75 saguaro cacti; 275 large cacti (ocotillo, senita, totem pole, organ pipe, etc.); 2,900 accent plants & shrubs for groundcover

Design/Construction: J2 Engineering & Environmental Design LLC

Smart Controls for Water Management: Calsense

Noteworthy Features: Extensive use of cacti & native plants; rain gardens that collect & reuse rainwater for irrigation; rock-filled gabion baskets arranged to look like wingtip vortices when viewed from the air

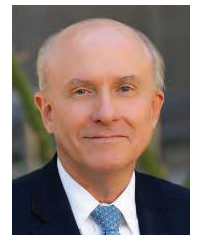


Over the last two years, Phoenix Sky Harbor International Airport (PHX) has transformed its lush green landscape into an eye-catching desert environment that requires less water and reflects the region's natural beauty.

The move from grass and deciduous shrubs to rocks and native flora is expected to reduce the Arizona airport's annual water usage by 5.375 million gallons and save about \$425,000 per year. The \$5 million project, which was completed in June, transformed 11 acres and updated 30 more.

"A project like turf replacement conveys the image and identity of Phoenix Sky Harbor and serves as a major step forward in our ongoing sustainability efforts," explains James E. Bennett, the airport's director of Aviation Services. "We have grown by leaps and bounds in recent

years and continue to add great customer amenities; but we are also committed to being true to what makes us unique while ensuring we are sensitive to our environment."



JAMES E. BENNETT

The method used, known as xeriscaping, incorporates native plants to conserve water and leverages other sustainable strategies. In fact, the entire project was inspired by the airport's 2015 Sustainability Management Plan, which includes a goal of reducing water consumption 10% throughout its grounds and facilities by 2020.

Jennifer Maples, superintendent of aviation facilities, notes that the project had been discussed for many years. "We



had beautiful grass; it was gorgeous,” she reflects. “But it came with a price tag. We realized having that type of landscaping was probably not the most responsible thing to do.”



JENNIFER MAPLES

After personnel quantified the benefits of switching to native landscaping, Maples issued a funding request in 2016. “We pitched the idea to airport leadership and demonstrated the quick payback through cost savings via water conservation and reduced maintenance requirements.”

Underground Surprises

J2 Engineering and Environmental Design, LLC, the Phoenix firm that designed the new landscape scheme and oversaw construction, which began by removing the existing turf, plantings and underground irrigation system that was previously needed to maintain them. Because the area involved

was located on the older side of the airport property, there were some surprises.

“We found water, sewer and communication lines that were buried but never marked or identified,” relates J2 Vice President Jeff Engelmann. “It was a fact-finding mission to determine whether the lines were still viable; and then we had to redesign some parts of the project to adapt to these discovered facilities.”

J2’s design includes extensive grading throughout the area to create a multi-level landscape. Height was added by earthen berms covered with indigenous rock; other areas were lowered to create rain gardens, which help capture rainwater to provide the surrounding vegetation with a natural source of irrigation. “The new earthwork reinforced the overall theme that we developed for the project: a Sonoran Desert landscape,” says Engelmann.

The airport worked collaboratively with the FAA regarding airfield safety—specifically, height restrictions for trees,



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and selecting plants that do not attract wildlife. In addition to choosing varieties from the FAA-approved list, the airport and J2 opted for plants that require little water and provide visual variety. “We took special care to populate areas with enough different species so there is a variety of colors of flowers and foliage, with different flowering cycles so there is always something in bloom,” explains Engemann.

In total, the airport added 435 new trees, 75 saguaro cacti, 275 large cacti (ocotillo, senita, totem pole, organ pipe, etc.) and about 2,900 accent plants and shrubs for groundcover. Fully 61 of the 75 saguaros were transplanted from other areas of the airport.

“The project has a very diverse plant legend,” says Seth Placko, a landscape architect with J2. “The airport didn’t want the whole palette to be just the same 10 plants; they wanted a lot of variety for better aesthetics.”



SETH PLACKO

Conserving Water

In addition to changing its landscape strategy, PHX also took the opportunity to begin transitioning to a high-tech point source drip irrigation system that is also used in many of the city’s parks and preserves.

“We put everything on the Calsense resource management system controller, which monitors the environment and only applies water when needed,” Engemann explains. “The controllers read humidity and temperature, then calculate evaporation and automatically adjust water times for plants based upon all that information. In addition, if there happens to be an irrigation leak, the system is smart enough to shut down specific areas of the system and send a signal to Sky Harbor staff notifying them that there is a problem and where that problem is located; and that saves water, too.”

Placko highlights the importance of the system’s leak detection feature. “Water is very precious to us,” he emphasizes. “If there is a break in the middle of the night, you lose water and you don’t get to use it again. This project has an overall desert-sensitive approach.”

Natural Design

From the ground, PHX’s new landscape resembles a typical Sonoran Desert. But views from the air bring an entirely different perspective. A string of gabion baskets snakes throughout the property for nearly 9,000 linear feet to mimic the swirling vortices created by wingtips of high-speed jets.

The airport opted for the baskets as a hardscape to visually break up the areas that would otherwise be dominated by decomposed granite. They range in height up to 16 inches tall, and are filled with fractured, angular rocks from a nearby quarry—another use of indigenous materials.

“We presented the idea of the vortices to the airport,” says Engemann. “We wanted to recreate that pattern on the ground. The gabion baskets allowed us to do that as well as shape the earth to reinforce the idea of air movement.”

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The rock-filled baskets are made of non-galvanized metal, which allows rust for a natural effect. "We wanted it to look weathered, so the metal blends with the colors in the rocks," explains Placko.

While the gabion baskets have a structured layout, the airport wanted placement of the plants to be intentionally unstructured. "A natural desert landscape will not manifest itself in grids or rows, so we wanted our landscape to be organic and reflective of the natural beauty found in the Sonoran Desert," explains Maples.

In addition to creating the new 11-acre desert landscape, PHX also updated 30 acres of existing xeriscaped areas. "We have a focus and commitment on water conservation," says Maples. "In the desert environment, we get 8 inches of rain a year on average. Conserving water through appropriate landscape was one way we could achieve sustainability at the airport."

On average, the airport uses 25 million gallons of water a month. The anticipated \$425,000 annual savings from recent



When viewed from above, rock-filled gabion baskets form swirling shapes that connote air movement off aircraft wingtips.

landscaping changes will not only come from less water usage but also from eliminated wages. Because the new design requires less maintenance, three employees (a groundskeeper, forestry technician and gardener) were not replaced after they vacated their positions for retirement and other opportunities.

In retrospect, J2's Engelmann says the project reached its goal: to have PHX reflect the community. "Sky Harbor now

blends in better with the Sonoran Desert," he says. "The water savings is certainly large, but I also think now we have an airport that really does a nice handshake with the environment in which it lives."

Airport officials are also pleased with the results. "We have paid respect to our roots and simultaneously strengthened our sustainability," says Bennett. "That is an investment in our future." ✈️

The Last Straw

I've been offered an array of creative alternatives to plastic straws at airports around the world: metal (watch out for your front teeth), glass (biting not advised), paper (soggy, just like the olden days) and even hollow pasta (seriously not recommended). Still, my personal favorite is no straw at all. But the sentiment in offering alternatives is right. Whatever we can do to reduce plastic straws and single-use containers is worth it—when we travel and at home.

Look around next time you are in a terminal. *Everything* is encased in plastic—from items at the gift shops and food court to single-use plastic water bottles (let's follow the lead of SFO and the Airport Authority of India to ban them!). Bravo to concessionaires that buy back read books bought at the airport, so the next traveler can immerse themselves in literature as they fly to another destination.

Passengers expect recycling bins and nursing stations; they crave healthy food options and yoga rooms. Airports with varied retail and relaxation options, public art/museum displays and children's play spaces have become attractive options for layovers versus airports that are less appealing or don't have many distractions. These features are not only good for the environment, they are also good for business.

On the other end of the spectrum, I am watching with admiration as airports around the world are committing to and becoming carbon neutral. The Airport Carbon Accreditation program promotes the concept by recognizing when an airport's net annual carbon dioxide emissions is zero (i.e. the airport absorbs the same amount of carbon dioxide as it produces). This is typically achieved through a combination of carbon reduction efforts by the airport



CAROL LURIE (AICP, LEED AP, ENVISION SP)

is the regional aviation director for VHB, a transportation planning and engineering consultancy. She is a past chair of the Airport Consultants Council, a founding member of the Sustainable Aviation Guidance Alliance, and has directed sustainability plans for airports coast-to-coast. She is also the principal investigator for ACRP studies focused on sustainability and a frequent presenter at conferences and seminars. When Lurie is not helping airports enhance their sustainability practices, she can be seen kayaking around New England and in exotic locales.

and its partners, and carbon offsetting by providing funds or resources to other projects that reduce CO₂ to make up for the emissions that airports are not able to eliminate. Kudos to the 283 airports in 71 countries that account for almost 44% of global air traffic that are working towards this goal. In the U.S., 43 airports have signed on to the Airport Carbon Accreditation program, and DFW has succeeded in achieving carbon neutrality.

These bold efforts bookend the myriad innovative ideas that airports and airlines are implementing to reduce their effects on surrounding communities and the environment, to be good neighbors and to promote economic development. Some of my favorites include:

- Collecting/donating excess packaged food from concessionaires and airline and contributing to the Food Heroes program (ATL, BOS, SEA and many others)
- Providing awareness training about human trafficking to airport and airline staff (Airline Ambassadors International)
- Executing/supporting zero waste flights that send no refuse to landfills (Qantas)
- Building sustainable food courts stocked with compostable materials, including utensils and plates (ATL)
- Installing vertical living walls with sprouting greenery that encourage customers to linger and relax (SFO, DTW, ORD, BHX)

- Partnering with tech developers and innovation labs to develop and test new ideas for simplifying the airport journey or creating spaces for interactive children's entertainment (SAN)

It *all* counts—from getting rid of plastic straws to promoting electric plugs-ins and supporting large-scale renewable energy projects. Airports need a variety of tactics to be more environmentally, economically and socially sustainable. Collectively, the industry must commit to making improvements; and tenants and vendors must also respond to travelers' needs. With a thirst for exploring the world, we have an opportunity to make a positive difference. ✈️

Footnote:

I'm just back from a bucket list trip to the Galapagos, which was a breathtaking balance of wondrous wildlife, precious environmental marvels and stunning beauty. I was struck by how the islanders are sustainable in all their practices as a matter of course. Not one single plastic straw. Recycling receptacles everywhere. Short duration showers. Reusable containers. The imperative for conservation and preservation is in the life blood of the residents. That is the way forward for us all.



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