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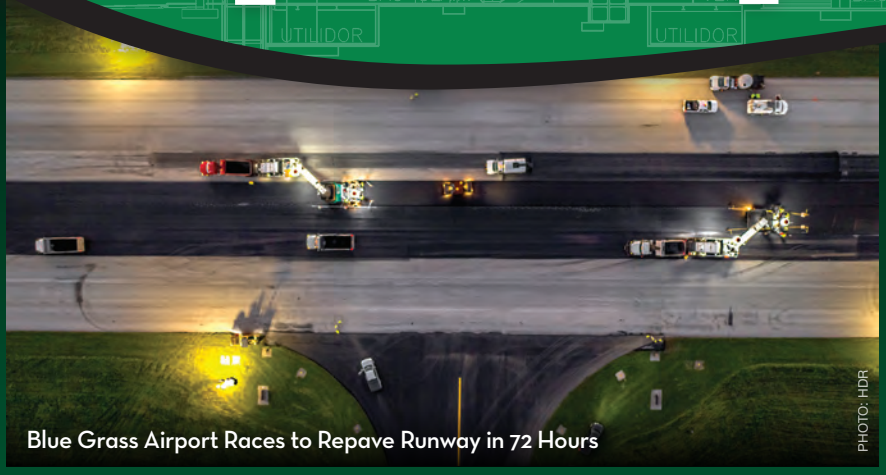

Blue Grass Airport Races to Repave Runway in 72 Hours

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Privacy Pods Gaining Popularity With Passengers and Airports

Memphis Int'l Modernizes and Expands While Consolidating Concourses

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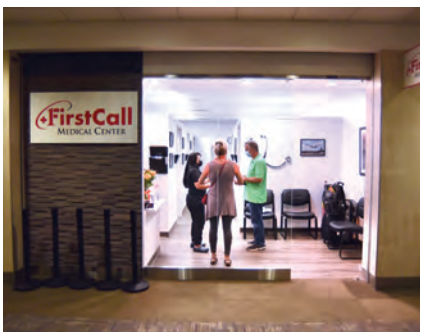

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Why I Love High Tide

The capacity to evolve that our industry demonstrates never ceases to amaze me. From shoehorning in extra security equipment after 9/11 to devising safe passenger processing strategies during the current pandemic, airports continually refine their facilities. And typically, they're happy to share what they've learned with colleagues at other airports. As a result, we consistently have an overabundance of projects to cover in this magazine. The sentiment about rising tides lifting all boats almost always applies.

That's why we were surprised when a large airport authority did not want us to publish an article about improvements made at one of its airports. To be clear, there was no question about the accuracy of the information or the article itself. Moreover, the project or topic wasn't at all controversial. In fact, the airport was making a rather mundane update to keep the facility running smoothly after years of changes and incredible growth.

Even so, the media department didn't want the airport to acknowledge that it was *ever* in need of updates and wasn't *always* on the cutting edge operationally.

Is this realistic? No. Are there airports out there without any to-do lists? Of course not! If there were, there would be a long line of consultants at the unemployment office; and your job as airport directors would be easy, if not dull.

PAUL BOWERS, PUBLISHER

When it comes to homes or airports, we're constantly improving our facilities. That's just the way it is.

So why am I telling you this? To encourage you to be candid with your peers—over the phone or email, at conferences, and on the pages of *Airport Improvement* magazine. Don't let the fear of appearing anything but 100% perfect stop you from sharing your experiences with other airports. They'll be very appreciative, and it's a safe bet you'll learn something valuable in return.

We all prosper and grow through interaction and communication. Let's raise *all* the boats.

Cheers,

Paul

Memphis Int'l Modernizes and Expands While Consolidating Concourses

BY JODI RICHARDS

There's a big shift happening this fall in the central United States, and it's related to the New Madrid Seismic Zone, the most active U.S. seismic area east of the Rocky Mountains. Memphis International Airport (MEM), located just 150 miles south/southeast of the zone, is consolidating all passenger operations from three aging concourses to one brand-new, seismically-compliant Concourse B. The $245 million investment also allows MEM to modernize and expand the more than 50-year-old building to set the stage for future growth.

Scott Brockman, chief executive officer of the Memphis-Shelby County Airport Authority, says officials began planning for the Concourse B Modernization Project in 2012. In addition to making seismic enhancements and consolidating airline and retail operations into a single concourse, the airport authority is adding higher ceilings, more natural light, wider circulation areas and larger gate areas. Other improvements include more seating, moving walkways, charging stations in gate areas, a children's play area, a stage for live performances in the rotunda area and additional lounge areas. "The building will be much more energy efficient and passenger friendly," Brockman adds.

SCOTT BROCKMAN

After seismic upgrades were completed on the roadways and airfield, the focus turned to Concourse B. "It was built in the '60s based upon an aircraft size that doesn't exist anymore in Memphis," notes Brockman. "So the holdrooms were too small, it was congested and it lacked what we thought were fundamental design standards and creature comforts."

The modernization project renovated the spine and east leg of the Y-shaped concourse, creating 23 new gates. "We believe that will take us a good number of years into the future," he comments. The project also removes the south ends of the A and C concourses to allow for unobstructed access for aircraft to the entire B Concourse. The west leg of Concourse B, which

houses international operations and includes a Federal Inspection Station and Customs and Border Protection facility, will remain untouched for now. It will be upgraded in a future phase of development that will add nine gates.

MEM funded the current modernization project with general airport revenue bonds, state and federal grants, passenger facility charges and airport authority capital funds. Initial plans for the redesign focused on seismic upgrades that were primarily underground and maintained a significant portion of the existing facility by adding onto it and creating better lines of sight throughout the concourse. Plans included shoring up the base of the facility with sheer walls and supports, increasing the square footage of the concourse and tying new space into the existing footprint. Brockman notes that this plan addressed structural issues to make the concourse code-compliant, but did not include any aesthetic enhancements.

"We were looking at a cost somewhere in the neighborhood of $50 million in seismic upgrades that would not be visible to anyone except the people who wrote the checks," he explains. "So we started down a path of redesigning—going in an entirely new direction."

Thornton Tomasetti, the project's structural engineering firm, designed aboveground seismic fixes integrated into

TAKE OFF WITH US
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FACTS&FIGURES

Project: Concourse Modernization

Location: Memphis (TN) Int'l Airport

Owner/Operator: Memphis-Shelby County Airport Authority

Cost: $245 million

Funding: Airport revenue bonds; state & federal grants; passenger facility charges; airport authority capital funds

Timeline: Initial planning began in 2012; construction started in 2018

Grand Opening: Fall 2021

Architect: UrbanArch; Alliance

Structural Engineer & Sustainability Consulting: Thornton Tomasetti

General Contractor: Flintco

Common-Use Technology: Amadeus

Seating: Arconas

Food & Beverage Concessionaire: Anton/Host

Retail Concessionaire: Paradies Lagardère

Boarding Bridge Design & Engineering: AERO Systems Engineering

Passenger Boarding Bridge Supplier: JBT

Pre-Conditioned Air/Ground Power Unit Supplier: ITW/GSE

Prime Contractor for Boarding Bridges: AERO BridgeWorks

Design & Engineering for Hydrant Fueling, Other Ramp Facilities/Equipment: AERO Systems Engineering

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Smart Glass: View

Lighting Consultant: CTG Lighting Design Studio

HVAC & Electrical Design: Dynamix Engineering Ltd.

Wayfinding/Signage Design: Entro Communications

IT, Security, Communications Design: Faith Group LLC

Plumbing & Fire Protection Design: Innovative Engineering Services LLC

Civil Engineering-Airfield: Kimley Horn

Civil Engineering-Utilities: Powers Hill Design

Upcoming Project: End of Concourse C will be removed in 2022

the architecture of the building and design enhancements that will be evident to visitors. This pivot added a couple years to the planning timeline, and construction kicked off in 2018.

"It has taken a lot of resilience, patience and intestinal fortitude to get where we are," Brockman reflects.

COVID-related supply chain issues and labor challenges have slightly delayed the opening of Concourse B. In early October, MEM officials were planning for a move-in date after students' fall break (traditionally when the airport experiences its peak traffic), but before Thanksgiving (another very busy travel time). "That's the broad parameter," Brockman advises. "It's something we'll have to figure out along the way."

Functional Design

The design team, comprised of UrbanArch and Alliiance, held several workshops with MEM officials to determine the direction the design of Concourse B would take. Three guiding principles emerged from those sessions: connect, transform and inspire. "That became something we could check our design success against," says April Meyer, an Alliiance principal. "Does it help connect people? Does it transform the experience? Is it inspiring? If it did all those things, we're fulfilling the goals and the vision."

APRIL MEYER

The "martini glass columns" from MEM's original 1963 terminal design influenced plans for Concourse B, but the current design team added its own contemporary interpretation. "They wanted to build off of that and create a new image, but have them be related," explains Brian Bullard of UrbanArch. Except for the foundation and new footings outside the building, all of the seismic upgrades for Concourse B are integrated into the structure and leveraged as design features. For example, X-bracing on exterior walls complement the martini glass columns of the terminal and provide seismic support.

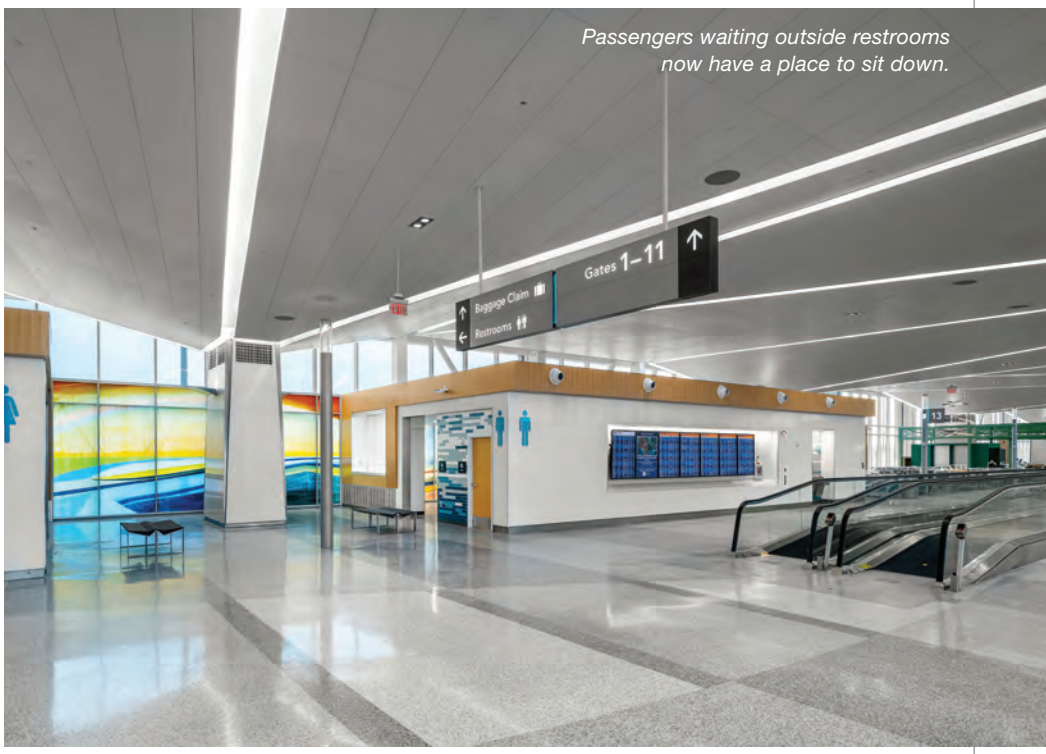
Meyer notes that the original Concourse B was typified by low ceilings, narrow corridors, lots of heavy brown brick and poor sight lines. In contrast, she describes the new facilities as light, airy, calm, sophisticated and functional. Following a theme of "Memphis Walk," it is a series of experiences and explorations expressed in the design, layout, colors and amenities, says Meyer.

Julie MacLeod, a senior associate with Alliiance, notes that the column-free layout allows flexibility and design longevity—necessary attributes as airline and passenger needs evolve.


JULIE MACLEOD

Another recurring theme from the workshop process was Memphis' hospitable and friendly culture. Designers expressed that sentiment by specifying soft seating throughout the concourse. Meyer notes that passengers will find plenty of places to relax or be productive throughout the bright open space thanks to a variety of seating options (beam, lounge, ADA-compliant, etc.) and counter-height workstations. Power outlets are located at accessible heights, and designers added lobby-style seating areas between restroom banks so passengers have a comfortable place to wait for travel companions.

Airport officials emphasized the need to provide the region with concourses that



Passengers waiting outside restrooms now have a place to sit down.

Designers made restrooms larger and easier to navigate for passengers with mobility issues.

facilitate travel and make the experience easy and convenient for all passengers. Brockman notes that the increase in leisure travel MEM has experienced in recent years underscored the importance of focusing on the overall passenger experience during recent renovations.

"Some leisure passengers don't travel frequently," he remarks. "While you want to provide amenities and beauty, it's really more about ease of operation—making it easy for passengers to find what they're looking for, navigate to the gates and be comfortable, and to see the amenities so they can take advantage of them without being stressed."

New amenities in Concourse B include a military lounge, a children's playroom, a service animal relief area and the St. Jude Children's Room, a quiet place for kids receiving treatment at the local St. Jude Children's Research Hospital. "We recognize that airports can be intimidating and noisy, which can be challenging for someone who's been through treatment," says Brockman. "We wanted to make sure that we are good partners with what is such a positive part of the Memphis community."

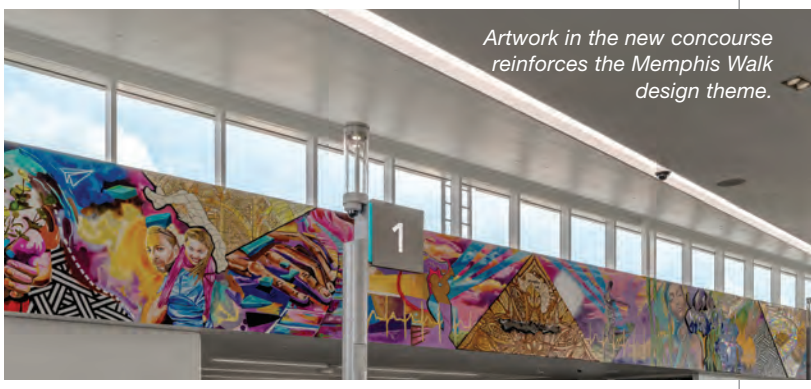
Restrooms are now larger and more conveniently laid out, especially for elderly passengers and/or those with mobility challenges. For instance, designers did away with entry doors and provided wider circulation areas. Instead of including a few fully accessible stalls per ADA requirements, they sized and configured *all* stalls to better accommodate guests

with reduced mobility. Specifically, all stalls are wider and deeper than code requires and include a full complement of grab bars. Integrated hands-free sinks, soap dispensers and dryers eliminate the need to cross general circulation areas with wet hands, a common layout that can produce slipping hazards.

Other amenities that support universal access include moving walkways to give passengers a lift through the long concourse, new signage for clear and consistent wayfinding assistance, a hearing loop that delivers announcements directly to hearing aids and Aira, a system that provides audio information and directions for passengers with visual impairments. "That is a tremendous amenity," emphasizes Brockman. "It will allow sight-impaired individuals to navigate the facility, for the most part on their own, independently, if they so choose."

Finishing Details

Artwork figures prominently into the aesthetic of Concourse B. Five new permanent pieces were selected by the airport's art committee to adorn the new facilities: a suspended sculpture for the east leg, a wall-bound piece at the security checkpoint and three glass creations in waiting areas. "All of our selected winners are led by local artists, which is a testament to the talent and creativity in our community," notes Brockman. "There is also strong representation from women and minority artists, which we feel is essential in celebrating the diversity of our great city."



Artwork in the new concourse reinforces the Memphis Walk design theme.

In early October, concessionaires were busy building out their spaces. The new lineup includes national brands such as Starbucks, PGA Tour Fan Shop and Tripadvisor. Local concepts include Distillery District, a retail package store that will sell Tennessee whiskeys and other regional spirits and wine.

All of the concessions among the gate areas will be open-air facilities that are directly accessible from holdrooms. Brockman explains that this approach creates unobstructed lines of sight

and encourages travelers to shop while waiting for flights. "One can free-flow in and out of those facilities in a much more customer-friendly manner," he observes.

An upgraded website and mobile app provide mapping functions and menus for dining options throughout the concourse.

"This project is really a breath of fresh air for our community," comments Bullard. "There's a lot of excitement about it."

Brockman is enthusiastic about the overall transformation: "The new concourse will give passengers an opportunity to take in more of the amenities, to enjoy the artwork and experience the rotunda with its live music space while waiting for their flight to board."

Tech Talk


BETROS WAKIM

While modernizing Concourse B, airport officials took the opportunity to upgrade its technology infrastructure for operations personnel, tenants and passengers. One of the key upgrades was moving to common-use gate systems from Amadeus. "They had the vision of what they wanted to accomplish," relates Betros Wakim, senior vice president of Airport IT for Amadeus. The new technology, partially operated in the Cloud, provides the airport with flexibility and scalability to optimize its resources without the worry of infrastructure, he adds.

"Because of gate management and a common-use gate system, we are able to meet capacity needs," Brockman says, noting that MEM is the largest small hub airport in the U.S.

It still has preferentially assigned gates for signatory airlines (Delta, American, Southwest and United); but all gates are controlled by the airport authority. "So if a signatory airline has a four-hour block where they are not operating any flights, we can utilize that gate under a common-use system," explains Brockman. "That gives us much greater flexibility than we had under the old gate management system."

Prior to the start of the pandemic, enplanements at MEM were around 2.3 million per year. With a robust common-use gate system in place, MEM officials expect to have the capacity to process 3.5 million passengers annually. When and if traffic grows beyond that, the airport plans to start redeveloping the west leg of Concourse B.

To help its airlines get comfortable working with the new technology before they move into Concourse B, MEM installed the new common-use gate management system on various gates in concourses A and C.

MEM also uses the Amadeus Airport Operational Database system to allocate and optimize resources, and PROPworks, the company's revenue management software. "This is a true digital transformation," says Wakim.

"The whole industry is changing as airports empower themselves and implement technology that allows them to better manage resources, attract airlines, serve customers, remain flexible and create an airport for the future with common-use technology," he adds.

Smart Views

Concourse B is shaped like the letter Y, with the stem of the Y facing north/south. As

such, it is affected by the rising sun in the morning and the setting sun at the end of the day. To address concerns about associated temperature changes and harsh lighting, MEM installed Smart Windows from View. They use artificial intelligence to automatically adjust the glass tint in response to outdoor conditions. This provides building occupants with continuous access to natural light and views without excessive heat and glare.

"Memphis is driving strategies to benefit people, the planet and profits," says Kristi Crase, View's aviation strategy director. "Our technology directly supports all three goals by creating more comfortable environments where passengers enjoy spending time and money, while also conserving energy."

Crase adds that the project at MEM hits close to home for the company because it has a manufacturing facility just outside of Memphis, and many employees live in the area. "View is excited to help transform Concourse B into a world-class facility that sets the standard for comfort and sustainability," she remarks.

Modern Challenges

While construction on an active airfield is never easy, MEM was able to use a roadway that enters the middle of Concourse B between the west and center runways to deliver workers and materials to the jobsite. "We've done very well in maintaining a secure and safe construction zone from the standpoint of logistics," Brockman reports.

NICOLE MCKEE

Given the advanced age of the 60-year-old structure, crews encountered a few surprises during construction. "It was a dingy brick structure with very little light, few windows and a low ceiling," recalls Nicole McKee, an estimator for general contractor Flintco. "It was almost a cave."

GREG WELLS

Preconstruction projects included asbestos abatement and updating all existing infrastructure. Greg Wells, Flintco's onsite senior superintendent, notes that replacing

Gate areas were expanded and outfitted with more charging stations.

The modernization project created 23 new gates.

the infrastructure was particularly difficult without accurate as-built drawings to depict where underground utilities were located.

To preserve as much of the existing structure as possible, the roof and top floor were demolished, leaving the apron level and a tunnel underneath that. While this strategy was beneficial from a sustainability standpoint, it did pose additional challenges.

Close coordination with airport stakeholders was critical to minimize the impact of construction on daily operations, notes Wells. For example, the project team distributed a detailed plan to make sure everyone on the airfield was aware of crane operations; and sometimes the plan was updated several times a day.

"Any renovation project will have challenges," says McKee. "We really have to keep open lines of communication with designers and owners."

At times, Flintco and various subcontractors needed as many as 250 workers on the project site. To accommodate such volume, the project team created a non-secure site within the larger secure airport operations area. Buses carried badged workers who were cleared at an off-site security checkpoint to the secure airfield, and eventually to the non-secure work site that was established.

Looking ahead, Brockman says that concourses A and C will generally not be used for passenger services, but the airport will maintain the facilities in a way that does not allow them to degrade while decisions are made about their ultimate fate. "They will be mothballed until after the master plan is complete," he states. One exception is a small portion of Concourse C that serves as an overflow security checkpoint.

When the updated master plan is ready (likely in the first quarter of 2022), the board will outline its priorities for further upgrades and possible expansion plans. Brockman expects key projects to include seismically upgrading the terminal core, and expanding and renovating the ticketing lobby, baggage handling system and security checkpoint. For now, though, MEM officials are comfortable with the extra capacity created by the Concourse B modernization project and the deployment of common-use technology.

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Privacy Pods Gaining Popularity With Passengers and Airports

BY NICOLE NELSON

FORT WAYNE INTERNATIONAL AIRPORT
A Whole New Altitude

GSP INTERNATIONAL AIRPORT
ROGER MILLIKEN FIELD

FACTS&FIGURES

Project: Privacy Pods

Sample Brands: YOURspace; Jabbrrbox Escape Pods

Sample Locations: 2 YOURspace units at Fort Wayne (IN) Int'l; 4 Escape Pods at Greenville-Spartanburg (SC) Int'l

Installations: April 2021 & July 2021, respectively

Key Benefits: Soundproof, technology-enabled space for customers to work, game or relax; potential new revenue stream for airports

Other Airports With Current or Pending Installations: Cincinnati/Northern Kentucky Int'l; Greenville-Spartanburg Int'l; LaGuardia Airport; John F. Kennedy Int'l; McCarran Int'l; Northwest Arkansas Nat'l; Oakland Int'l; O'Hare Int'l; Ontario Int'l; Pittsburgh Int'l; Seattle-Tacoma Int'l

Cellphones and laptops at the ready, a fair amount of business travelers regularly arrive early at Fort Wayne International Airport (FWA) to squeeze in a few calls or emails before departing. And it always distressed Scott Hinderman, executive director of the Indiana airport, to watch them bypass traditional seating areas and workspaces to huddle in remote corners for some peace and quiet.


SCOTT HINDERMAN

Time and again, Hinderman saw industrious business passengers with a finger jammed into one ear and a cellphone pressed hard against the other, struggling to tune out fellow travelers, boarding calls and the terminal's natural hustle and bustle.

The scenario, which plays out at airports throughout the world, has become less common at FWA since it introduced modular work pods from YOURspace, a local Fort Wayne company. The airport provides two units, each 54-by-54 inches, free of charge on a first-come, first-served basis. As expected, passengers are relishing the new soundproof enclaves.

"If you want to get on a call in a pod, you won't have announcements blaring in your ears," Hinderman remarks. "We have had lots of positive comments."

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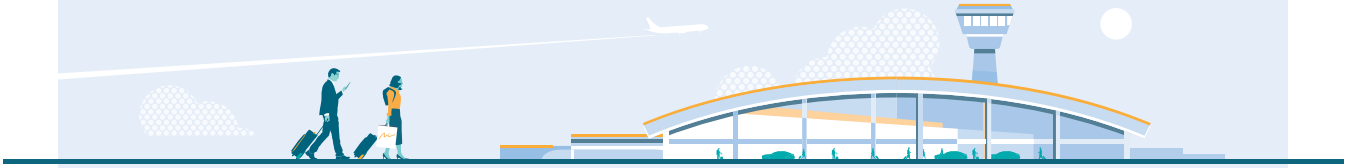

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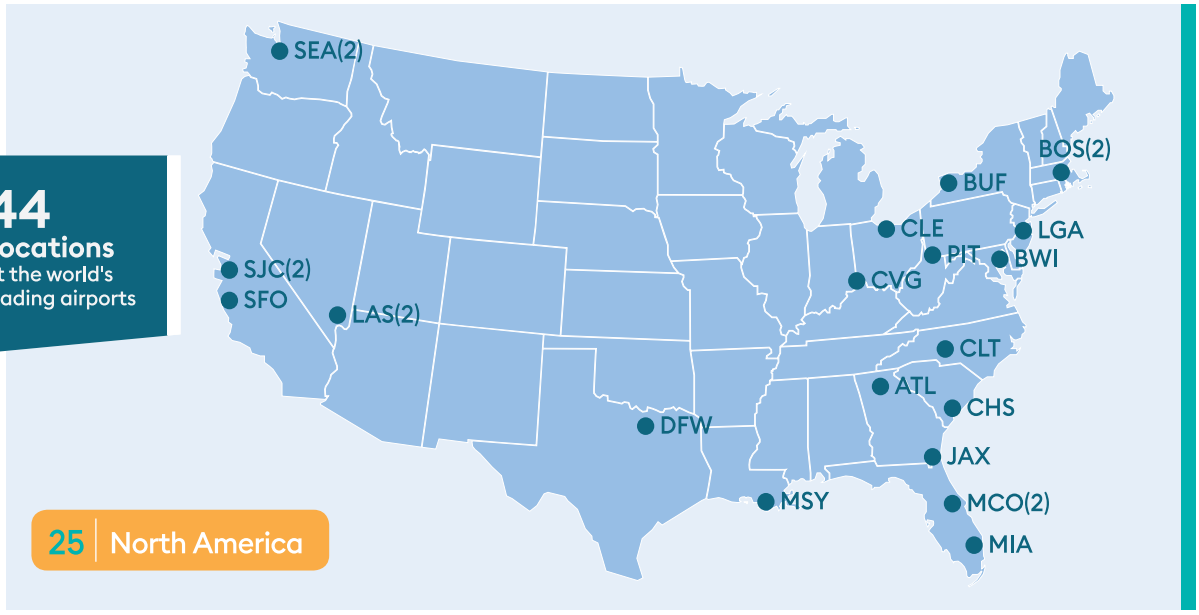

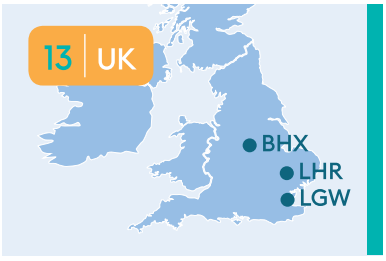

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Hinderman reports that the popular amenity has generated enthusiastic praise since FWA began an open-ended pilot program with YOURspace in April 2021.


DAVID FAUST

David Faust, chief executive officer of the company, notes that the pods were originally developed for in-home use by employees unable to work in offices due to COVID-19. Since then, however, the product's usage has evolved considerably.

"As we launched into the market, we found there were a lot more commercial applications than we anticipated, airports being one of those," Faust explains. "Airport terminals that are layover-centric don't have great environments for taking Zoom calls or conference calls, much less casual phone conversations.

"With people flying again and starting to get more into their normal routines with business and vacation travel, we can put these up to give people more privacy. If they are there for an hour or three, they have somewhere to go and be productive."

Regarding the general trend of increasing traffic, Hinderman reports that FWA is approaching its 2019 passenger levels. And like other airport executives, he is seeing leisure travel rebound more quickly than business travel. He consequently expects the modular workspaces to become even more popular as FWA's traffic normalizes and its terminal facilities continue to grow.

"I could see us needing two additional pods when our gates expand from eight to 10," Hinderman says, referring to plans for a capital expansion/renovation project slated to open in 2025. "And as we see more and more business travelers, I think these pods will be in much higher demand."

Hinderman notes that customers are still discovering the new amenity. "It's a very attractive and unique niche," he comments. "Some of the flying consumers flock to them and try to grab these private spots."

Monetizing the Concept

"Private spots" are gaining traction and providing a new revenue stream at Greenville-Spartanburg International Airport (GSP), where Escape Pods debuted as a co-branded venture of Jabbrrbox and Manchester Airports Group USA in July 2021.


JEREMY JENNINGS

Jabbrrbox Co-Founder and Joint-Chief Executive Jeremy Jennings describes the concession offering at GSP as a technology-enabled platform for passengers who want a private space on the go. Individual units have a physical hardware solution, the Jabbrrbox Pod, and a digital platform for productivity, privacy and wellness. Customers can reserve and book in advance through the Jabbrrbox mobile app or make reservations on-demand at the airport.

Jennings explains that Jabbrrbox formalized a partnership with MAG USA one year ago, creating an extension of MAG's Escape Lounge network, which develops premium common-use airport lounges that are not affiliated with specific airlines.

"We have jointly gone to market to bring our 'best of breed' Jabbrrbox units to airports with the Escape Pods co-branding to allow for a best-in-class customer experience," says Jennings.


SCOTT CARR

Scott Carr, vice president of Commercial Business and Communications at GSP, reports that the "plush and quiet" individual spaces have hit the mark with passengers at the South Carolina airport. Four Escape Pods—two in Concourse A and two in Concourse B—are attractive additions to the airport's award-winning concessions program, he adds. GSP collects a percentage of the revenue generated by each Escape Pod.

"These units fit like a glove into alcoves that had previously been used for automated retail," Carr says of the 46-by-46-by-90-inch pods. "Comparing high-end retail and private workspaces is like comparing apples and oranges. But based on the first six weeks of operations, we have been extremely happy with the revenue generation."

From his observations so far, the new pods have primarily been reserved by business travelers for Zoom meetings and conference calls via Microsoft Teams.

"I haven't seen anyone use one for gaming yet, but anything can happen," Carr remarks. He suspects that leisure passengers are more likely to rent pods for a quiet place to relax or meditate.

Fort Wayne Int'l does not charge passengers to use the new modular work pods.

Opportunities Abound

Carr sees many upsides to GSP's new concession option.

"For us, this was a unique opportunity based on the partnership Jabbrrbox had put together with MAG USA," he says. "We have a MAG Escape Lounge at GSP and thought the pods would be a natural extension of that passenger amenity. We already provide the lounge; private workspaces for the traveling public seemed like a good addition."

JEREMY DALKOFF

Beyond GSP and FWA, several other U.S. airports are in the midst of adding private pods/workspaces. Jeremy Dalkoff, vice president of business development for Escape Lounges with MAG USA, is heading the effort to expand the company's lounge and pod networks.

"We have 60 units planned in our ecosystem and have plans for a lot more," Dalkoff reports, noting that Escape Pods will soon be installed at McCarran International Airport, John F. Kennedy International Airport (Terminal 8), and Seattle-Tacoma International Airport.

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part of the jabbrrbox network

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Reagan Nat'l Opens Two New Security Checkpoints

BY RONNIE WENDT

In a poignant stroke of timing, Reagan National Airport (DCA) opened two new security checkpoint buildings shortly after Americans observed the 20th anniversary of the 9/11 terrorist attacks. The $269.8 million project was expressly designed to heighten security at the major airport just across the Potomac River from Washington, D.C., and to improve the screening experience for passengers and TSA officers.

The new checkpoints, each 50,000 square feet, expand TSA's screening operation from 20 to 23 total lanes, with the ability to expand to a total of 28 lanes. Screening operations were relocated and the new facilities engineered to create a "seamless, free-flowing environment" between Terminal B/C (Gates 10-45) and the new 14-gate concourse (Gates 46-59).

Another key objective was to help TSA officers process passengers with greater efficiency. The new screening areas are consequently deeper and more spacious than the previous checkpoints that were housed in the airport's National Hall and had remained in the same configuration since the Twin Towers fell.

"Terminal B/C opened in 1997 and was built for a different era of security lanes," explains Ryan Wolfgang, P.E., CCM, construction project manager for the Metropolitan Washington Airports Authority (MWAA).

RYAN WOLFGANG

Wolfgang worked in tandem with MWAA colleague Jon Burgess, who served as construction manager for most of the project. Wolfgang explains that before 9/11, airport security was designed to operate in the background; it wasn't noticeable, nor did it interfere with airport operations. When the federal government created TSA after 9/11, airports had to add more security checkpoints and equipment to their existing footprints.

At DCA, that meant putting checkpoints and queuing lines in the airport's iconic National Hall, which was designed by renowned Argentine-American architect César Pelli. "This architecturally dramatic space, with views toward planes and ramp activity, was never designed for that," comments Chad Menge, AIA, NCARB, DBIA, principal architect for MWAA.

Besides distracting from the iconic Pelli architecture, using an area never meant for security slowed the screening process and

REAGAN NATIONAL | PROJECT JOURNEY

FACTS&FIGURES

Project: New Passenger Checkpoint Facilities

Location: Reagan National Airport

Operator: Metropolitan Washington Airports Authority

Key Elements: 2 new TSA checkpoints, each 50,000 sq. ft., with combined total of 23 screening lanes with room for future expansion to 28 lanes; 15 airline check-in kiosks

Of Note: Checkpoint buildings added above arrivals roadway & partially underneath bridge where departing passengers are dropped off on ticketing level

Cost: $269.8 million

Funding: Bonds issued against future passenger facility charges

Timeline: Construction began late 2017; activation & opening expected in Nov. 2021

Project Name: Secure National Hall

Component of: $1 billion Project Journey capital improvement program

Design: AIR Alliance, a joint venture of AECOM & PGAL

Contractor: Turner Construction Co.

Foundation: Wagman Heavy Civil

Superstructure: Berlin Steel Construction Co.

Concrete: Corinthian Contractors Etc.

Roofing: Kalkreuth Roofing & Sheet Metal Inc.

Mechanical/Plumbing: Harris Co.

Electrical, Electronics & Security: M.C. Dean Inc.

Life Safety/Fire Protection: National Fire Protection

Plumbing, Fire Protection & Fire Alarm Engineering: Arora Engineers

Asphalt & Pavement Markings: Finley Asphalt & Sealing Inc.

Terrazzo: Boatman & Magnani Inc.

Elevators: Schindler Elevator Corp.

Baggage Handling System: Jervis B. Webb Co.

Exterior Glazing: Custom Glass Services Inc.

Dynamic Glass: SageGlass

Temporary Facilities & Maintenance of Traffic; Cast-in-Place Concrete: Christman Mid-Atlantic Constructors

Key Benefits: Increased screening capacity (from 20 to 28 lanes); purpose-built facilities with connections to National Hall & walkways from Metrorail station & parking garages; changes facilitate passenger flow between Terminal B/C (Gates 10-45) & new 14-gate concourse (Gates 46-59)

caused delays, Menge explains. The area lacked ample space for TSA equipment and officers, and there wasn't enough room for screening operations. At the back end of the checkpoint, there was no area for passengers to put their shoes back on, store their IDs and return other loose items to their carry-on bags.

CHAD MENGE

Increasing passenger counts only compounded delays. Passenger areas originally designed to serve 15 million annual travelers had to accommodate passenger counts topping 23 million, Menge reports. "We had a need for efficient TSA checkpoint screening areas to transform and improve the passenger experience," he explains.

MWAA funded the $269.8 million project with bonds issued against future passenger facility charges. The checkpoint improvements are a key component of Project Journey, a $1 billion multi-year capital improvement program designed to revolutionize the passenger experience at DCA. Project Journey also included the construction of an enclosed $391.5 million regional aircraft concourse to replace 14 outdoor gates serviced by buses from Gate 35X, plus roadway and parking improvements. The new concourse will offer passengers greater connectivity, more shopping and dining options, and a more pleasant post-security environment.

"The result is an enhanced experience not only for passengers but for TSA agents," Menge comments. "This is a tectonic shift in the flow of passengers, and it greatly enhances what passengers can do post-security. They now have the freedom to move throughout the terminal no matter what pier or gate they use."

The deeper and more spacious checkpoints offer ample room for TSA equipment, which includes 19 X-ray units, 12 advanced imaging technology body scanners, 12 walk-through metal detectors, four computed tomography machines for screening carry-on items, and security video cameras throughout the checkpoints. Project designers also added an area for passengers to recompose themselves after being screened.

"The new checkpoints have increased capacity, so they are more comfortable for travelers. There is plenty of light, so it's a brighter, more comfortable space," says Lisa Farbstein, TSA spokesperson for Strategic Communications and Public Affairs. "There are more lanes, which will increase throughput. They offer a much easier, better flow for the traveler and for TSA agents. It also gives passengers more access to restaurants and shops on the secure side."

To prepare for new TSA equipment in the future, project designers added more electrical outlets and utilities infrastructure than is currently needed. "We're always looking to the industry for state-of-the-art technology to improve our ability to detect threats," Farbstein remarks.

Respectful Design Strategy

The new security checkpoints were added above the existing Terminal B/C arrivals roadway, which connects them directly to National Hall and walkways from the Metrorail station and parking garages.

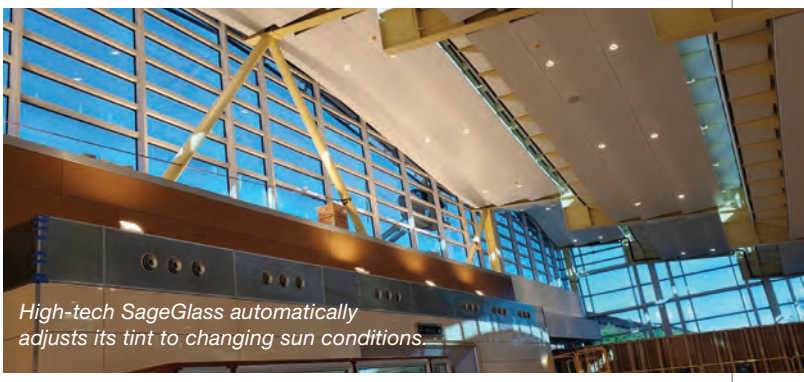
Menge notes that all of the design decisions were informed by the iconic and beloved architecture of the existing terminal, and the rolling hills that surround the airport. As such, the form of the new checkpoint buildings echo the curving roof structure Pelli created.

"We didn't want to do anything that detracted from the original architecture," Menge emphasizes. "But at the same time, we had to address the functional requirements. We wanted a space that was worthy and fit well with the original design."

A curvilinear roof structure and tall banks of windows met those requirements. "We didn't want to build a very tall structure next to the existing building," he remarks. "We also wanted a lot of light to make the space inviting for TSA screeners and passengers."

Pelli included a north-facing glass wall in the original terminal to provide stunning views across the Potomac River to Washington, D.C. Early in the planning process, the design team decided to include a large bank of windows to visually tie the new construction to Pelli's original design. "It's a pretty dramatic impact on the inside when you look at the windows," he says of the 32,860 square feet of glass.

When incorporating the glass curtain wall, the design team knew it was necessary to balance the desire for natural light with the ability to control the glare and heat that sunlight would add inside the building. Instead of using shades and extra air-conditioning, they opted for an intelligent glass system to mitigate the problems. Specifically, the new facilities include electrochromic glass that uses a small electrical current to transform from fully transparent to as tinted as required by changing sun conditions. The product was provided by SageGlass, a Saint-Gobain company.



High-tech SageGlass automatically adjusts its tint to changing sun conditions.

ANDREW KUCHEL

"We optimize the glass for the occupants," says Andrew Kuchel, aviation advisor for SageGlass. "We can strike the balance between energy savings, occupant comfort and camera/monitor use."

Menge notes that SageGlass met the airport's goals for plenty of natural light in a heat-efficient, sustainable building. "Using electrochromic glass helps us minimize the heat load," he explains. "We reduced the size of chillers and mechanical systems by using this glass in addition to reducing solar

Construction required extra coordination because it occurred above and below active roadways.

glare. We certainly didn't want TSA screeners facing the wall of windows to suffer from glare that might impede their ability to perform their important jobs."

CARL NEWHOUSE

SageGlass has installed its dynamic glass in numerous airports throughout the world. Using the technology reduces HVAC load and thus energy costs, says Carl Newhouse, a regional sales director for the company. "On average, the savings at peak load time will be around 8 to 10 percent," he specifies.

The high-tech glass also met DCA's construction requirements for vibration. "This is double-laminated glass to prevent it from shattering if something runs into it," Newhouse adds. "There is a roadway very close to the glass. We wouldn't want any projectiles or anything to go into the building; so they needed very strong, safe glass."

SageGlass manufactured insulating glass units in a variety of shapes and sizes, some as small as 12 inches, to fit with the building's curvilinear roofline. "This was complex," Kuchel acknowledges. "They wanted us to maintain the same design and effect as the original terminal. It involved a large number of different shapes."

Because a low-voltage cabling system operates the SageGlass, engineers had to plan locations for the controls upfront. "This process went smoothly because we planned so carefully during the design phase," says Newhouse. "We knew where the controls would be in advance, and everything worked well because of that."

Every glass wall needs structural support; and for that, the airport again stayed true to Pelli's design. Crews painted the steel support beams the same shade of yellow used in the original terminal.

PRIYAM SHAH

Coordinating Construction

Priyam Shah, P.E., construction project manager for MWAA, considers the security checkpoint project the most challenging of his 18-year career. "It required a lot of coordination just to get the building 'out of the ground' because we sandwiched it between two roadways," Shah reflects.

"It's not only above the roadway designated for arrivals on the baggage level, but also partially built underneath the bridge where passengers are dropped off on the ticketing level of Terminal B/C," Menge explains.

Because the buildings are located underneath an active roadway, they required an independent structural system that absorbs vibrations from the roadway. The design consequently included deep foundations and low headroom foundations that were drilled and augered in place beneath the departures roadway. This required 2,700 tons (4,200 pieces) of steel beams, 247 support piles and 5,500 cubic yards of concrete. Engineers mitigated vibration by supporting all utilities, lighting, etc. with spring isolators in the high-ceilinged, tiered rooms that house checkpoint queues.

"We had to put everything on suspension to absorb vibration because the roof is a roadway," Shah explains. "We had to mitigate the vibrations coming from the roadway into the building."

Because the building extends over all inner and outer traffic lanes—eight in total—the project team had to coordinate construction carefully to keep traffic flowing. "Everyone at the airport who contributes to running it had a part to play," says Shah.

The airport also re-evaluated flow for personal vehicles, shuttle buses and vehicles associated with transportation network companies (TNC) such as taxis, Uber and Lyft during construction phases. By inviting TNCs and shuttle bus companies into the design phase, the project team came up with what Menge describes as a simple but creative solution. "We diverted traffic between the two lanes and outer lanes on the arrivals level, and moved certain pickups and drop-offs from upstairs to downstairs and vice versa," he explains. "The concepts developed during the design phase were the framework for operations throughout construction."

Finally, the airport needed to tie the new construction into the existing B/C terminal, which also added an element of coordination. Stakeholders met regularly to study upcoming work and determine how best to execute it without affecting airport operations. Much of the construction activity occurred after hours, and all of it had to be coordinated in advance, Shah specifies.

"We had to keep the flow of passengers going and keep everyone safe, while maintaining the heating and cooling systems in an active terminal," he recalls. "It required a lot of collaboration and coordination."

Though 9/11 occurred two decades ago, the need for high security at the airport nestled in the U.S. capital remains. These days, DCA's new checkpoints are located in a space as iconic as the original building, but filled with modern security technology and the ingredients for a more pleasant passenger experience.

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Austin-Bergstrom Int'l Consolidates Maintenance Services in New 16-Acre Complex

BY VICTORIA SOUKUP

FACTS&FIGURES

Project: New Maintenance Complex

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

Cost: $63 million

Funding: Cash reserves; bonds

Footprint: 16 acres

Facilities: 16 buildings, including maintenance headquarters, warehouse, trades building, police facility & motor pool

Total Space: 131,000 sq. ft.

Construction: Summer 2019 to spring 2021

Project Leader - Construction: JE Dunn Construction

Lead Architect: Atkins

Environmental Certification: LEED Silver

Key Benefits: Enhanced operational efficiencies because multiple maintenance departments & functions are co-located in same complex; updated, more pleasant work environment for employees; demolition of previous structures will clear space for future expansion

Austin-Bergstrom International (AUS) had expanded its terminal and amenities to accommodate an unprecedented boom in passenger traffic over the past decade. Now, the central Texas airport has also improved its behind-the-scenes operations with a new consolidated maintenance complex.

The $63 million complex, completed in May 2021, spans 16 acres and contains more than a dozen separate structures. Key facilities include a maintenance office headquarters, parts warehouse, maintenance garages and a multi-discipline trades building. Locating these structures in the same area allows departments that support the same projects to connect with each other daily.

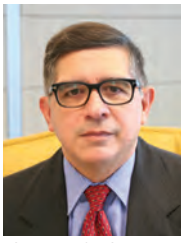
The new complex also includes related support facilities and a police headquarters building. AUS funded the expansive development by dipping into its cash reserves and issuing bonds. Construction took nearly two years.


SHANE HARBINSON

"Since the airport opened, our maintenance staff has been scattered around the airport property; and as the airport grew and we gained new tenants, our maintenance divisions have repeatedly been relocated," says Shane Harbinson, deputy chief of Planning and Development for AUS. "This permanent facility gives them a dedicated home."

It also enhances efficiency. For instance, locating the warehouse next to the trades building makes it faster and easier for maintenance workers to pick up the parts and materials they need.

PHOTO: BRIAN MIHEALSICK



ROBERT MERCADO

Robert Mercado, the airport's project manager for the new facility, explains that maintenance departments for daily operations were previously housed in structures built from 1942 to 1993 when the airfield was home to Bergstrom Air Force Base. Moreover, the distances between them presented additional challenges. Workers sometimes had to cross taxiways and travel to a building several miles away for equipment repairs, which wasn't ideal for safety or efficiency.

Originally, airport officials planned to improve conditions by renovating the dated facilities; but hazardous materials such as asbestos and lead paint would have required extensive, cost-prohibitive abatement. Instead, they decided to build a new complex on the east side of the airfield. This strategy not only enhanced efficiency by consolidating all maintenance departments into the same area, it also dovetailed with long-term redevelopment plans because the structures they previously occupied were in the path of planned expansion projects. "This movement helps clear space for the future development of AUS, which will provide more service to the traveling public who are our customers," Mercado explains.

Large, Diverse Facilities

The new complex includes 16 buildings with a combined total of 131,000 square feet of space. The five main structures are:

- a maintenance headquarters office building,
- a 25,000-square-foot warehouse,
- a new airport police headquarters,
- a motor pool, and
- a trades building for the airport's carpentry, plumbing, electrical, mechanical, welding and wildlife departments.

Other support facilities include an automated truck wash, a recycling station and garages—both enclosed and open-air.

The 38,500-square-foot maintenance headquarters is the only two-story building in the complex. It includes offices for division managers, meeting spaces, break rooms, training rooms, a fitness room and an overnight bunk area for personnel. "We often have a skeleton staff at night at the airport for emergencies," says Mercado. "Now, we have rooms where they can spend the night. That's a big help because it keeps our staff from having to sleep in their vehicles or under their desks."

The warehouse building houses critical parts that were previously stored in facilities scattered throughout the airport campus. It also has a dedicated receiving area and is located adjacent to the trades building, which is home base for the employees who regularly need to pick up parts.

Having a large warehouse building, which is expandable, was critically important for the project. "We have a lot of spare parts at the airport, and we need them available for equipment breakdowns," Mercado explains. "If there is an issue with the baggage handling system and the repair team needs a part, or a pump is needed for a mechanical system, we now have a warehouse that offers immediate replacement.

"That means we don't have downtime for our customers," he continues. "The warehouse has every kind of part that you can imagine that is used for an airport, and it even has general office supplies. Now, all our parts and supplies are all together in a way that makes sense."

The motor pool building is where crews perform maintenance on airport vehicles and equipment such as mowers and trucks. The new police building accommodates operations by the Austin Police Department and includes facilities for 42 officers and four K-9 handlers.

Location, Location, Location

For the airport, the biggest challenge of the project was site selection. Ultimately, project planners chose a tract of vacant property that had been used as a golf course during the airport's days as a U.S. Air Force base. "The site allows for runway response, and there is access to a service road directly to the terminal with no crossing of taxiways required," Harbinson explains.

Airport officials looked 40 to 50 years out when choosing the site. "We wanted to make sure that we weren't putting in a facility that would be in a future conflict beyond our current master plan," Harbinson says. "That was in the forefront when determining the best location for the facility."

JASON BEITER

The biggest challenge for JE Dunn Construction, the firm that led the building team, was extending utilities to the undeveloped construction site. "We had to bring in all the infrastructure: water, sanitary, gas and telecom," notes Jason Beiter, vice president for the prime contractor.

To enhance efficiency during planning, the project team leveraged virtual design construction (VDC) technology. "JE Dunn's VDC group took modules and laid them on a 3-D digital model to see if any clashes existed with mechanical or electrical structures," says Beiter. "Then, we jumped in and worked with Atkins [the lead


PHOTO: BRIAN MIHEALSICK

The new complex spans 16 acres and includes more than one dozen buildings.

architect] to figure out all these challenges ahead of time and find corrections before the actual construction began."

Project designers from Atkins included large retention ponds to address drainage concerns on the large, flat parcel of land. Because the maintenance complex is landside, they added a new airside operations area gate to control access to the service road and airfield.

Beiter notes that focusing on a project purpose statement helped keep construction moving forward, especially when the pandemic added new challenges. "At the beginning, we brought the architect, owner and end-users all together for a project purpose statement meeting," he explains. "The team collectively came together to form the project's statement: to build a collaborative facility for those who maintain the aviation experience."

Beiter points out that the statement doesn't address the actual construction of the facility. "We were more concerned about the experience and the end game, which was that employees had to service the vehicles and make sure the airport runs smoothly," he explains. "In the end, it's not about them; it's about all the people who come to travel at the Austin airport."

Worker Safety & Satisfaction

Due to the COVID-19 pandemic, JE Dunn contracted health screeners to evaluate crews daily before they were allowed onto the jobsite. Employees cleared to work were issued wristbands identifying their status. "That gave us the ability to trace if needed and resulted in our teams having minimal impacts from the COVID-19 virus," Beiter reports.

Keeping the worksite healthy and safe was also important for the end game. "If the employees are not working, they're not making money and supporting their families," Beiter explains. "That was a huge priority for JE Dunn, the city and the airport."

Outside, AUS added a parking lot and landscaped the area with drought-tolerant plants and trees to create a relaxing outdoor space.

Mercado reports that employees are thrilled with the new complex. "These are the people who do all the behind-the-scenes operations for the airport. The customer doesn't realize the continuous maintenance and repair that is needed to keep things running smooth," he remarks. "It's a nice facility, a safer facility, and it provides a great workspace for employees."

Beiter agrees that the new facilities increase workplace satisfaction. "Not only did we want to enhance the AUS experience for travelers, but we wanted to help support employee retention," he says. "The employees understand how the airport works and have a sense of pride when they come to work every day."

Harbinson emphasizes that having many different departments together in the new complex makes it much more efficient to maintain the large, complicated airport.

The dated structures that used to house various maintenance functions will be torn down in the next few years.

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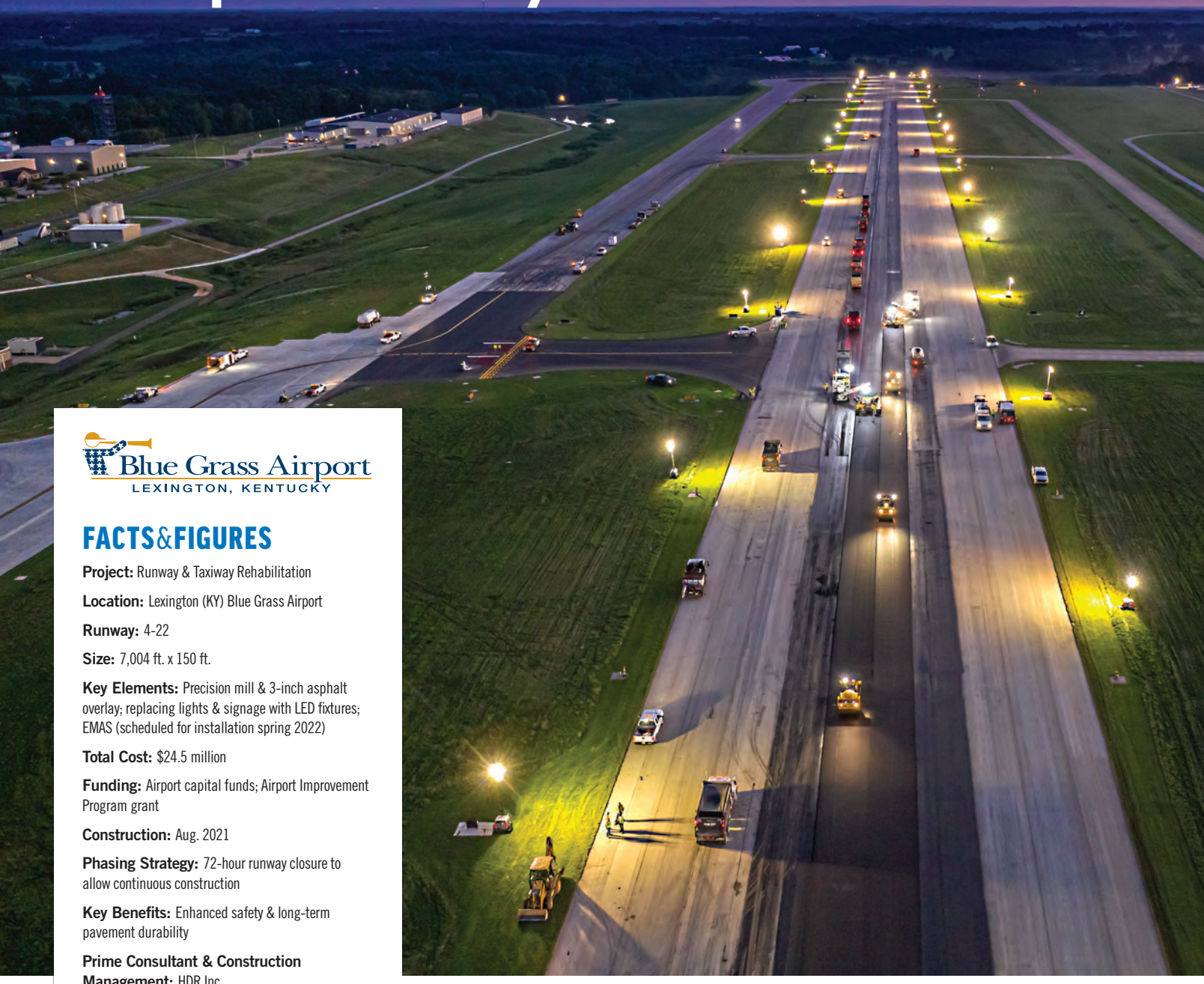
Blue Grass Airport Races to Repave Runway in 72 Hours

BY PAUL NOLAN



Blue Grass Airport
LEXINGTON, KENTUCKY

FACTS&FIGURES

Project: Runway & Taxiway Rehabilitation

Location: Lexington (KY) Blue Grass Airport

Runway: 4-22

Size: 7,004 ft. x 150 ft.

Key Elements: Precision mill & 3-inch asphalt overlay; replacing lights & signage with LED fixtures; EMAS (scheduled for installation spring 2022)

Total Cost: $24.5 million

Funding: Airport capital funds; Airport Improvement Program grant

Construction: Aug. 2021

Phasing Strategy: 72-hour runway closure to allow continuous construction

Key Benefits: Enhanced safety & long-term pavement durability

Prime Consultant & Construction Management: HDR Inc.

Electrical Consultant: AVCON Inc.

Pavement Consultant: RDM International Inc.

Quality Control Testing: S&ME Inc.

Lighting Supplier: ADB SAFEGATE

Planning Consultant: CMT Inc.

Markings Consultant: Sightline Inc.

Prime Contractor: ATS Construction

Asphalt Contractors: ATS Construction; The Allen Co.

Electrical Contractor: Appalachian Foothills Construction

EMAS Supplier: Runway Safe

There is a certain type of NASCAR fan who prefers to watch races from pit road because that's often where races are won or lost. They love to see the carefully choreographed flurry of action as crews fuel up a car and swap out four tires in less than 15 seconds.

These fans would have enjoyed the scene at Blue Grass Airport (LEX) this August, as workers resurfaced a 7,004-foot runway in just three days. When officials shut down air traffic at the Lexington, KY, airfield for 72 hours, something akin to a NASCAR pit crew sprang into action. Instead of jackmen, tire changers and fuelers, there were asphalt contractors, construction crews and trucking operators working furiously.

MARK DAY

This was the third time LEX has resurfaced its sole commercial runway in such a speedy manner. Mark Day, the airport's director of Development and Facilities, notes that a similar strategy was

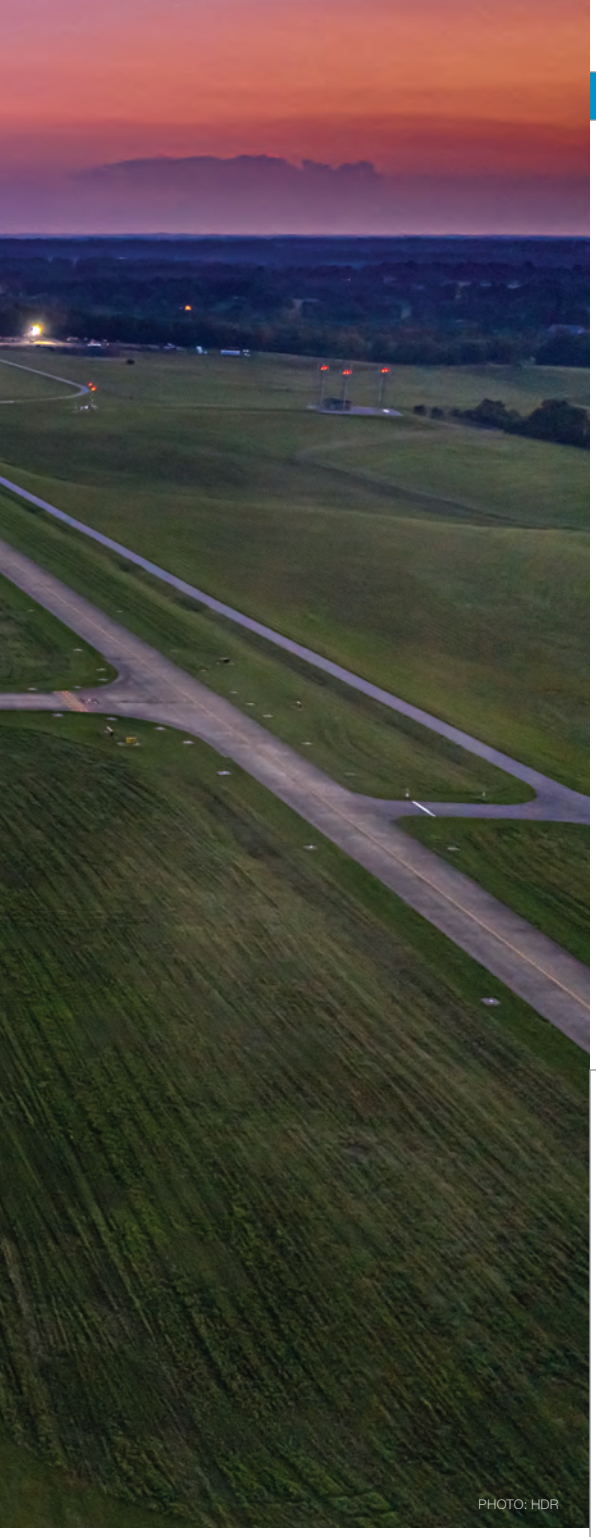


PHOTO: HDR

used in 1994 and again in 2006. Each time, team members have been impressed by the planning and coordination required to pull off the impressive feat.


DONNA SPEIDEL

"Watching all of the equipment and people… it was like a concerto of actors and musicians," says Donna Speidel, president of Sightline Inc., the runway markings consultant for the project. Speidel and her son, Mike, worked rotating 12-hour shifts to ensure the accuracy of temporary markings applied to the new runway.

The Decision to Shut Down

With non-stop and connecting service from four commercial airlines (Allegiant, American, Delta and United), LEX served more than 1.4 million passengers in 2019. The airport added a second runway in 2010; but at 4,000 feet long, it strictly serves general aviation aircraft. That's why management is always so intent on getting the commercial runway back into service after it is repaved.

Day knows from experience that planning plays a critical role in getting everyone on board for the extended weekend projects.

"We began engaging the airlines two years in advance to make sure we understood their schedules and the impact the runway work would have on them—everything from seasonal travel to schedules for business travel," he explains. "While airports and airlines never want to close, we were able to demonstrate to our partners that the extended benefits of paving in this way will reduce maintenance costs, which will save the airlines money down the road."

This time around, LEX considered pushing its runway project up when the pandemic drastically reduced flight traffic in 2020; but discretionary funds were not available at the time. The airport did, however, mill and upgrade its main taxiway for $4 million in fall 2020, which meant less to tackle during the closure in summer 2021.

Planning and preliminary design for its latest runway resurfacing effort began in 2016. During previous repaving projects, the airport was able to close for a shorter period (42 hours in 1994 and 48 hours in 2006) because crews were able

The project required two separate asphalt contractors to supply enough material in 72 hours.

PHOTO: HDR

to complete the milling in advance. However, FAA guidelines now restrict airlines from operating on milled surfaces. Also, Occupational Safety and Health Administration regulations limit the number of consecutive hours that truck drivers can work.

Crews were able to complete some prep work before the closure weekend—for instance, removing edge pavement and replacing edge lighting and some in-pavement lighting with new LED fixtures. In the months following the closure weekend, crews cut runway grooves, installed the remaining in-pavement LED runway lights and painted permanent markings. The final element of the project will be completed next spring, when the airport installs an engineered materials arrestor system (EMAS) bed.

Many airports avoid completely shutting down for similar work by repaving small sections of runway each night after flight service has ended and reopening for traffic the next morning. Day estimates it would have taken crews months to repave the commercial runway at LEX if management had opted to use a piecemeal approach.

"While you can estimate lost activity for that 72 hours, I think the unknown losses of doing the project like other airports is challenging for comparison," he says. "It is difficult to assess what air service might have been lost if we couldn't open on time any given morning. Further, we wouldn't be able to accommodate late night flights at all."

Officials at LEX also feel that closing the runway for an extended weekend is a safer option for full-length repaving. "If you're closing your airfield every night and hoping that when you finish that five-hour construction window everything is buttoned up, marked

properly, and all the materials are in place when the lights come back on…you're taking a big risk every day," Day explains.

Coordination Is Key

The airport enlisted the services of two local asphalt contractors—ATS Construction and The Allen Company—because neither was able to supply enough asphalt individually to complete the project in just 72 hours.


TIM WARD

If, as Speidel suggests, the repaving effort was like a symphony, Tim Ward was the conductor. Ward is the design and construction project manager for HDR, which provided engineering and construction administration services for the project. Ward summarizes his role as "making sure I had all the ducks in a row for the weekend to be successful."

That included having backups for backups, and developing contingency plans for countless impediments, such as bad weather. Ward notes that some resurfacing work can be performed in rain, but heavy rainfall would have required LEX to extend or reschedule its project.

As it was, Mother Nature served up beautiful weather for the duration of the runway closure. Just two weeks later, blustery weather blew in as a remnant of Hurricane Ida.

"Some airport projects can be pushed to another weekend, but airlines build their flight schedules six months in advance," Ward explains. "If we programmed in a contingency weekend, the airlines would have likely aligned their schedules and not had any flights on that weekend whether or not it was necessary."

Shortages of materials and workers during the COVID pandemic have dogged a wide range of projects, and the runway rehab at LEX was no exception. "With supply chain issues, we had to work closely with electricians, asphalt producers and others to make sure everything was in line," Day advises. "Fortunately, every contingency we planned for was not needed."

Speidel was initially concerned that her company's preferred reflective paint might not be available for the temporary markings, but that proved not to be the case. In any event, she was prepared to move forward with a suitable substitute.

Cost Strategies

Airport officials peg the total cost of the project at $24.5 million. Funding was primarily provided by FAA Airport Improvement Program grants ($24 million) and LEX capital funds. Key expenses were:

- Planning – $1.1 million
- Design – $1.31 million
- Construction Management & Administration – $1.94 million
- Construction – $16.2 million
- EMAS – $4 million

Ward and Day note that the weekend closure strategy likely improved cost efficiency because contractors did not have to run the asphalt plant nightly for several months. Furthermore, they reason that concentrating the work schedule reduced costs for resident inspectors and certified testing personnel.

Crews resurfaced the 7,004-foot runway in just three days.

PHOTO: BLUE GRASS

Another important factor the project team considered was quality control. Since asphalt plants have to convert their operations for special FAA-approved mixes, it is more likely that repeated switching from daytime production for highway use to nighttime production for airport use could result in challenges, Day explains. If crews had installed a section of bad mix on the runway at LEX, it would have likely required additional closures.

Moreover, running multiple shifts over one long weekend allowed contractors to lay down hot asphalt continuously, thus reducing the number of "cold joints" between sections. This significantly reduces the amount of maintenance required over the lifetime of the runway, notes Ward.

Just as the pit crew of a winning NASCAR team understands its value and shares in the glory of a checkered flag, the companies involved in the project at LEX celebrated when the crucial commercial runway reopened.

"It was probably the best project that I've ever been involved in," Ward remarks. "I put in 16- to 18-hour days, but I enjoyed every minute of it. They were long, tiring days. But when I look back on them, it was a great opportunity."

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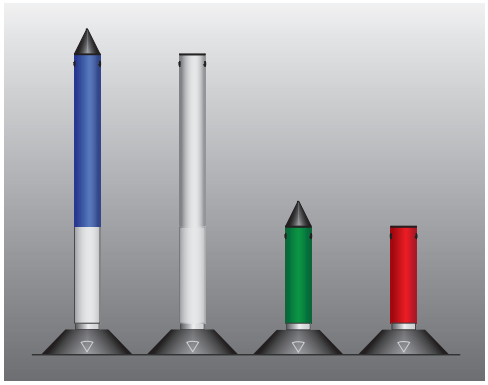

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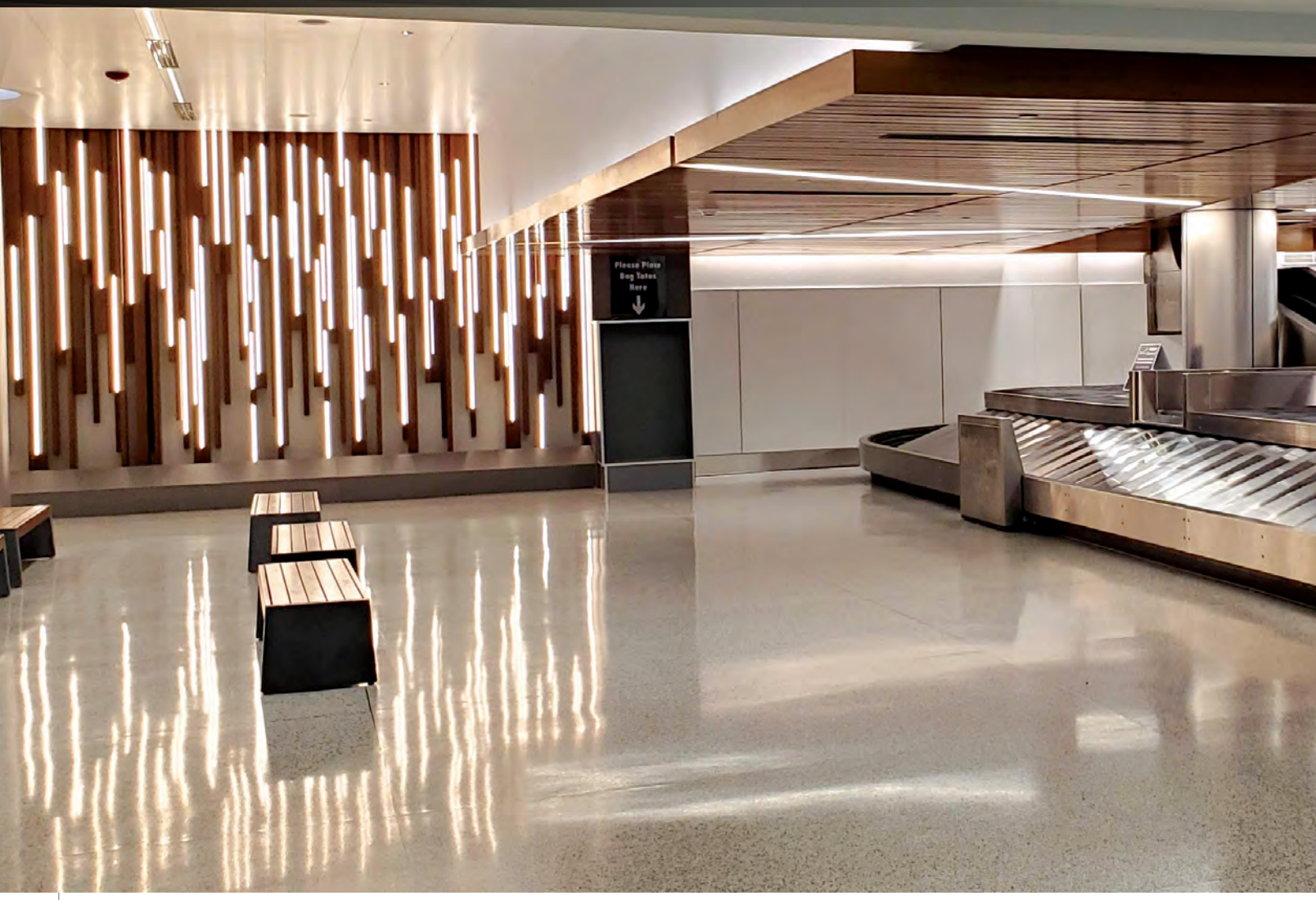
Terminal Upgrades Improve Flow at Buffalo Niagara Int'l

BY JENNIFER DAACK WOOLSON



It's too small.

That was the first impression William Vanecek, director of Aviation for Niagara Frontier Transportation Authority, had when he walked into Buffalo Niagara International Airport (BUF) on his first day of work in November 1998. The western New York airport was celebrating the one-year anniversary of renovating its two separate terminals into one larger facility. "When I walked in the front door, my initial reaction was: They built it too small," Vanecek recalls.

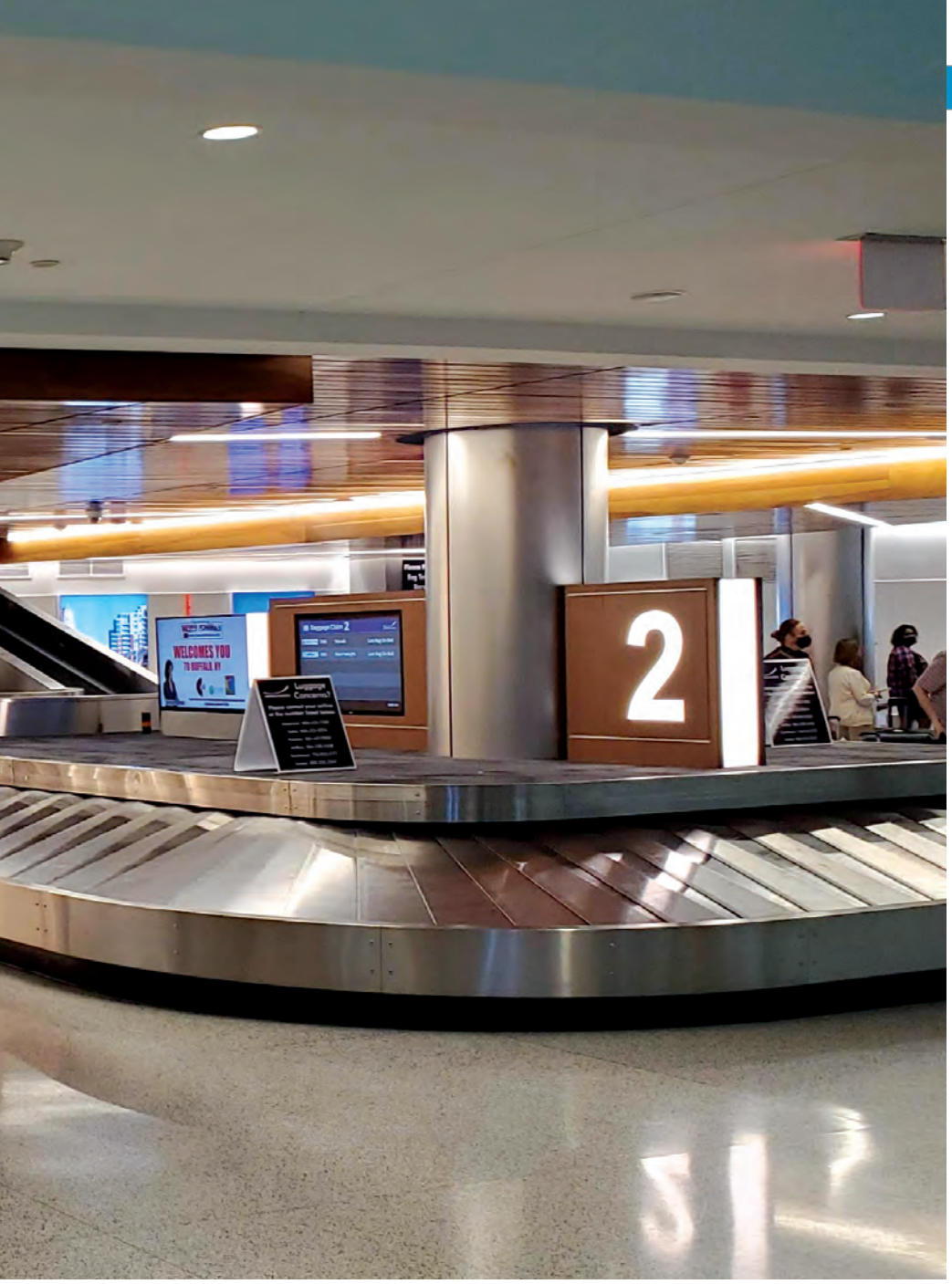
In the years that followed—especially after BUF added service from JetBlue in 1999—passenger volume grew to a peak of 5.2 million. The airport expanded from 15 gates to 25, but baggage claim capacity and auxiliary spaces for passenger flow did not keep up with the growth in passenger traffic.

That created the need for a two-year, $80 million improvement project that is slated for completion next spring. It is part of a $400+ million master plan that spans another nine years.

Fixing Passenger Flow

When viewed from above, the original terminal looked like an aircraft, with two linear concourses resembling wings, and a security checkpoint in between as the fuselage. Vanecek notes that the design looked pretty cool but didn't function very well. After 9/11 prompted new security measures, new flow patterns made it more difficult for passengers to clear TSA checkpoints and get to their flights. The airport expanded some security areas, but that didn't quite fix the problem. One specific issue was that the checkpoint entrance was directly adjacent to the concourse exit. This created a congested area, with no place for people to sit while waiting for arriving passengers and long lines of departing passengers waiting to enter the security checkpoint.

New exit concourses designed by Jacobs have changed the dynamic of how people move into and out of the terminal, and passengers no longer need to swim upstream against the flow of traffic. On the west side of the terminal, which houses American



Airlines and Frontier Airlines, a new 11,000-square-foot concourse routes passengers away from the central terminal and directly into the baggage claim area. A new west walkway was designed to better accommodate international arrivals, who previously had to go outside the building to get to baggage claim.

The east side, where Southwest Airlines, Delta Air Lines, United Airlines and JetBlue Airways reside, handles about 70% of BUF's traffic. In this area, designers created a much larger 41,000-square-foot exiting concourse with a more spacious meet-and-greet area.

The airport furnished the new area with modern furniture and desktops to create a better environment for arriving passengers. "They used to have a horrible first impression; but now when they deplane here, you just see smiles on their faces," Vanecek reports.

The airport's facelift represents a larger transformation that has occurred in Buffalo. What used to be a predominantly blue-collar steel town is now an updated community attracting more high-tech companies. The new terminal reflects the new culture, Vanecek explains.

When the original terminal was built, it had three flat-plate baggage carousels. The recent project installed four large slope-plate carousels, each double the size of the previous units.

BUFFALO NIAGARA INTERNATIONAL AIRPORT

FACTS&FIGURES

Project: Passenger Terminal Improvements

Location: Buffalo Niagara (NY) Intl' Airport

Airport Owner: Niagara Frontier Transportation Authority

Cost: $80 million

Funding: Passenger facility charges; airline contributions; loans

Size/Scope: 58,000 sq. ft. of new construction; 37,000 sq. ft. of remodeled space on 2 levels

Key Elements: Expansion of Baggage Claim Hall; circulation corridor from Customs & Border Protection Facility to main terminal building; additional exit paths from Concourse to Baggage Claim

Notice to Proceed: May 2016

Design: June 2016–Oct.2018

Construction: Jan. 2019–April 2022

Prime Consultant/Architect of Record: Jacobs

General Contractor: The Pike Company

Civil Airfield/Architectural Interiors/ Structural/Fire Alarm/ Lighting: Jacobs

Architect/Surveyor/Code Compliance: Foit Albert Associates

Landscape Architect: Watts Architecture & Engineering

Fire/Life Safety Engineering: Jacobs; Watts Architecture & Engineering; Foit Albert; Davis Fire Protection; Frey Electric

Civil/Plumbing: Watts Architecture & Engineering

Structural/Mechanical/Electrical: CHA Consulting Inc.

Telecommunication/Security: Moye IT Consulting LLC

Baggage Carousels: Siemens Slope Plate Carousels

Baggage Handling System: BNP Associates Inc.

Seating & Furniture: Steelcase, from Prentice Office Environments

Living Wall: Growing Green

Roofing: Ketone Ethylene Ester HP PVC

Photovoltaic Collectors (Solar Panels): High Efficiency LG NeON® 2 72cell Module

Glass: Trulite Glass Insulating Glass Units (Perma-Pane); Trulite Glass Tempered Glass (Perma-Temp)

Passenger Boarding Bridges: JBT

Lighting Designer: Jacobs

Lighting: Pierce, from The Lighting Practice

Signage: Jones Worley

Although the footprint of the baggage claim area didn't change, designers were able to create more space by removing some offices. Vanecek notes that these improvements have doubled the capacity for inbound traffic, which will help minimize overcrowding around the baggage claim belts. Recent changes also created room to expand the storage area for "lost" or delayed baggage, which in the past clogged the lower level.

Active Design Process

In addition to working right, the new areas also had to look right. That's another area where the Jacobs team figured prominently.

"In many ways, the terminal is the airport's brand for anybody who has been to Buffalo," says Rob Coan, the Jacobs' project manager for Aviation. "We had to be very, very respectful of that."


ROB COAN

One of the architects working on the project described the team's design process as "quiet intervention."

"I thought it was very eloquent," says Coan. "We just wanted to come in and make our changes and not 'stir up too much dust' with the existing building."

Personnel from Jacobs traveled around the country meeting with architectural teams working in aviation and other industries to develop a design that was not too bland and not too extreme.

Coan also sent personnel to BUF to interview user groups, take pictures and research existing material palettes to study the original terminal design. But the team also looked forward. "It's almost 25 years since that terminal was designed, so we didn't want to leave it back there," remarks Coan. "We wanted to continue to evolve it."

In addition to addressing aesthetics, Jacobs considered dynamics specific to the Buffalo area, such as winter storms that cause flight delays and what that means for the baggage claim hall.

Pre-COVID Contracts Prove Pivotal

Like other airports, BUF had days early in the pandemic when it served fewer than 10 departing passengers. "That was tough to take," Vanecek acknowledges. "We were a little concerned that we weren't going to be able to fund the project because the price of steel was going up everywhere."


LARRY FUENTES

Fortunately, the Niagara Frontier Transportation Authority had established strategic contracts with the primary construction contractor that allowed it to maintain the costs originally budgeted for the project. Before crews broke ground in September 2019, Larry Fuentes, executive vice president with The Pike Company, had already begun keeping an eagle eye on supply chain issues.

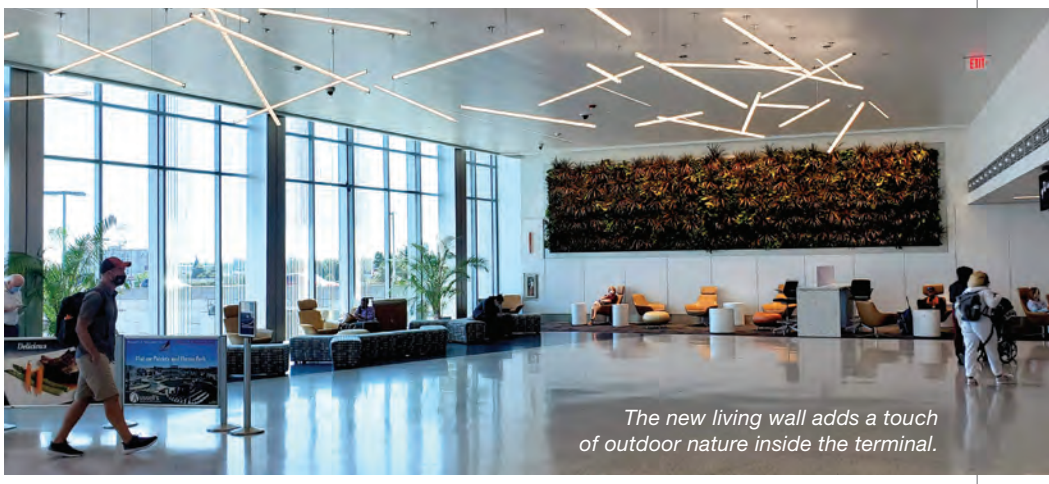
"We were constantly working with our subcontractors," Fuentes explains. "We asked

to see the purchase orders to make sure the material was ordered. Our verification process had to go a little above and beyond the normal."

Because it was essential for the airport to maintain operations throughout construction, the project's timeline was complicated. "We didn't have a lot of space to start with because the baggage claim hall was being expanded *because* we needed more space," Coan muses. "To make it happen, there was phasing, there was microphasing and then there was micro-microphasing. It was pretty detailed."

Bringing Outside Elements In

Before the recent renovations, passengers often described BUF as dreary. To remedy that, project designers added a lot of windows and sunlight. "Now passengers come in, they see this beautiful concourse that's all glass looking out over the taxiways, and then they come into this expansive waiting area," explains Vanecek.



The new living wall adds a touch of outdoor nature inside the terminal.

A massive living wall covered in plants makes the new waiting area significantly more impressive. Designers also outfitted the space with innovative light fixtures on bars that hang at different heights and angles. The Pierce lighting is particularly striking as visitors drive toward the terminal at night. Vanecek notes that the new area embodies the 2021 feel BUF was going for—as opposed to the 1970s look the terminal used to have.

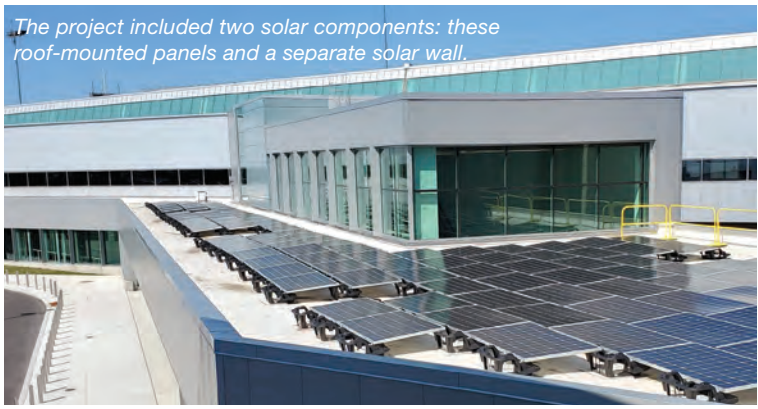
Another design feature of the east expansion is a solar wall. Coan explains that the south-facing wall is made of corrugated metal that allows air to blow through it. The air, which is heated by the sun, is then mixed into the facility's distribution system to help offset mechanical heating.

The west expansion also includes a solar feature, in the form of more traditional roof-mounted panels. The 50-kilowatt photovoltaic system produces power and ties directly into the facility.

Customer-facing improvements include new curb space at both ends of the terminal, a new bus waiting area on the lower level, a centrally located kids' play area and a tech center with workspaces and cellphone charging stations. Some concessions and the airport barbershop were relocated to the upper floor.

Planning Made All the Difference

Vanecek reports that nearly everything about the complex project has gone according to plan; and he emphasizes the important role that upfront planning played in making that possible. "You have to really take a long, hard look before you even start breaking ground to make sure that everybody is on the same page with respect to design," he advises. "There are always going to be some surprises during construction, but it's going to be very helpful if you know a path forward with certainty."



The project included two solar components: these roof-mounted panels and a separate solar wall.

Fuentes concurs: "I think whenever you're working in a facility that stays operational during construction, it's always a challenge. But through proper coordination, we were able to successfully work around the existing customers."

Because much of the construction occurred during 2020 and 2021, Jacobs and The Pike Company had to evolve their original plans to accommodate remote work and inspections.

"We're very accustomed to working remotely in different area codes and time zones," says Coan, noting that project designer and architects use FaceTime and Teams when they need to

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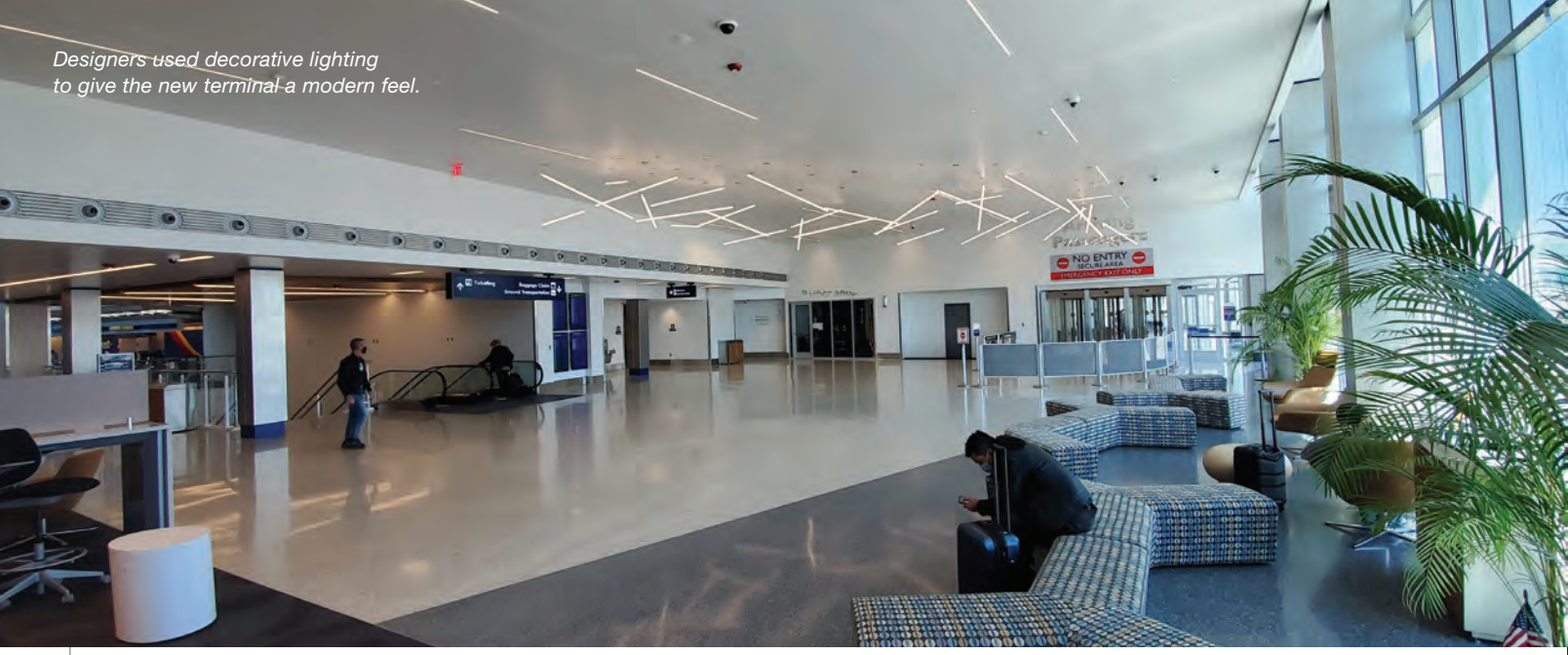
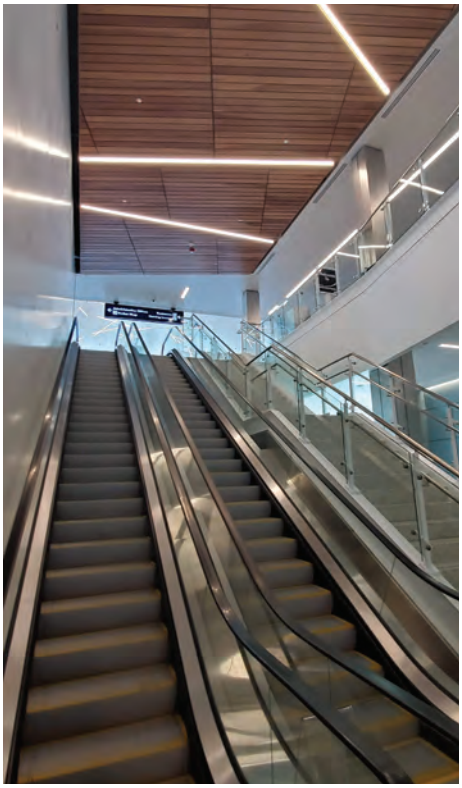


Designers used decorative lighting to give the new terminal a modern feel.

visually review something found during construction. He adds that when Jacobs personnel were able to be on-site in person, the Transportation Authority and prime contractor made the process seamless.

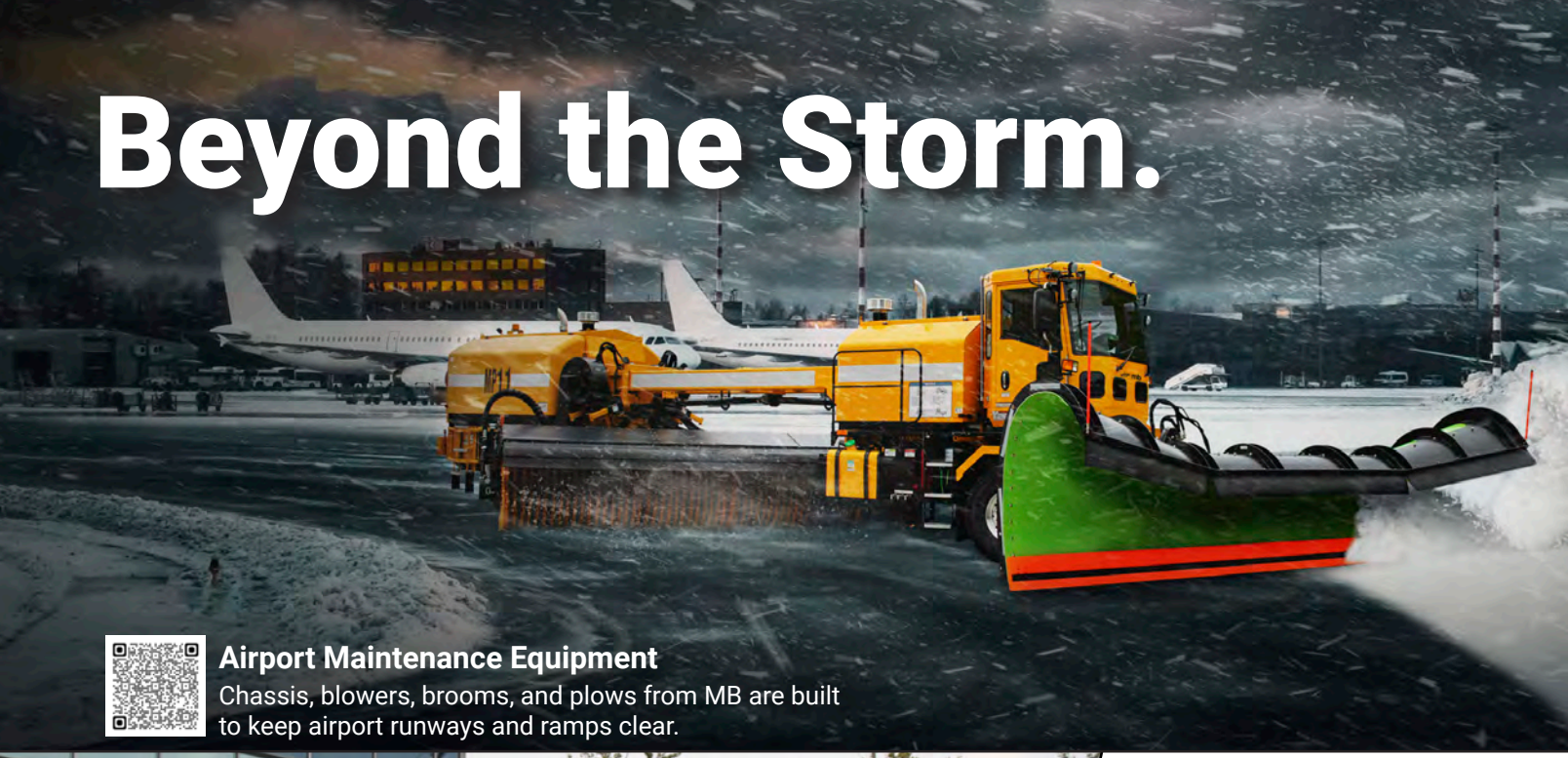
In retrospect, one of the things Coan appreciates most about the BUF project was the pride of ownership everyone exhibited. "Most, if not all, of the team members were personally invested in it," he explains. "They believed in what we were doing, and they wanted to succeed."

In fact, it wasn't unusual for personnel from the Transportation Authority, Pike and Jacobs to text each other at night or on weekends if they thought of something that could make the project better. "Although we had people on the design team spread across the country, there was a real hometown feeling," Coan remarks.



Vanecek notes that the positive team spirit extended to the airlines—particularly onsite personnel who continued to serve passengers during construction and renovation work. He acknowledges that the project was sometimes intrusive, especially when airline offices were relocated. "But the airlines supported us through this whole project, and they were great partners," he comments. "That meant a lot to us, and I think they're thrilled with how it turned out and how it functions."

Beyond the Storm.



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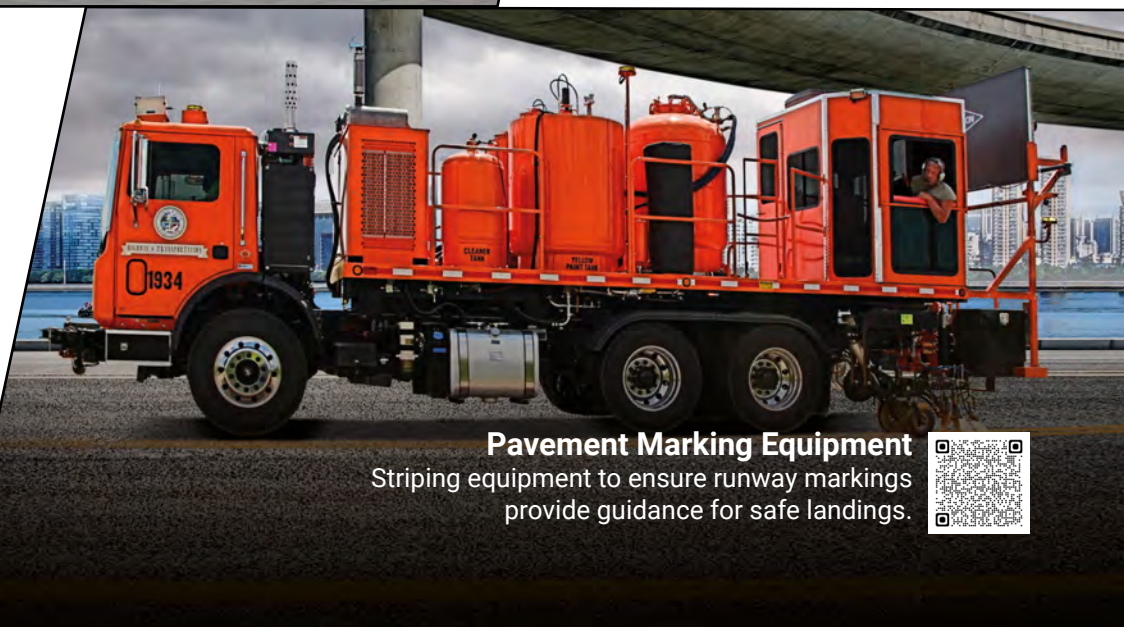

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FACTS&FIGURES

Current Project: Terminal Expansion/Renovations

Location: Tweed-New Haven (CT) Regional Airport

Owner: New Haven Regional Airport Authority

Operator/Manager: Avports

Master Plan Consultant: McFarland Johnson

Key Improvements: Addition of modular units for 300-seat holdroom & ticketing area; relocating baggage claim; updating security checkpoint

Cost: $5.2 million

Funding: $1.2 million from Avelo Airlines; $4 million loan from Avports that will be forgiven if company & airport authority reach new management agreement

Construction: Mid-Sept. 2021-Dec. 2021

Design: PGAL

Construction: Walsh Construction

Catalyst for Current & Future Improvements: New commercial passenger service to 5 Florida airports by Avelo Airlines; additional business destinations are anticipated next year

Next Phase: New Terminal & Runway Extension

Environmental Assessment: Currently underway

New East Terminal: 78,000 sq. ft., with 4-6 gates (to replace current West Terminal)

Design: PGAL

Construction: Timeline to be determined

Funding: Avports

Runway Extension: From 5,600 ft. to 6,635 ft.

Other Key Component: Runway safety areas

Construction: Timeline to be determined

Funding: FAA grants; Avports

Of Note: 2 neighboring communities stopped runway extension for more than a decade; in March 2020, U.S. Supreme Court upheld ruling of lower court to overturn state law that prevented runway project; Avports will invest $70 million in runway extension & new terminal if new operating agreement is reached with airport authority

Tweed-New Haven Regional Prepares for New Traffic With Funding From Avelo Airlines & Avports

BY THOMAS J. SMITH

Big changes are underway at Tweed-New Haven Regional Airport (HVN), and even bigger changes are in the works. Current projects include $5.2 million of improvements, most notably the addition of modular buildings to provide space for a 300-seat holdroom and a new ticketing area. The small Connecticut airport is also relocating its baggage claim area into what is now the administration building, and updating the security checkpoint, which will remain in its existing location.


SEAN SCANLON

The flurry of improvements is to accommodate new service from Avelo Airlines that is scheduled to begin in early November. “We have a two-gate terminal, and we are going to have five flights, sometimes three, a day,” explains HVN Executive Director Sean Scanlon. “We need more space.”

The new modular buildings and other changes will help HVN handle the increased traffic volume and more pronounced surges inside the terminal. “American Airlines flies with 75 seats, and Avelo will use Boeing 737s with about 140 seats,” Scanlon specifies. American, which flew Embraer 175s to Philadelphia International, ended that service on September 30. It was the only flight remaining between the two cities from pre-pandemic days.

Avelo, a new ultra-low-cost carrier, is providing direct service from HVN to five Florida cities: Fort Myers, Palm Beach, Tampa, Fort Lauderdale and Orlando. In an unusual move for the carrier, it is investing $1.2 million to upgrade HVN’s terminal facilities. Avports, the long-time private operator at HVN, is funding the remaining portion of current terminal improvements with a $4 million loan that will be forgiven if Avports and the airport authority reach a new management agreement. The company’s current agreement expires in 2024.

Larger and longer-term improvements being discussed include building a new terminal to replace the one being expanded and extending HVN’s runway. Airport plans to invest $70 million to make these projects a reality, but not until its new management contract is finalized. The city of New Haven, which owns the airport, took an important step closer to sealing the deal in late September, when it approved a new 43-year lease to the New Haven Regional Airport Authority. In mid-October, the authority and Avports were hoping to wrap up negotiations on a new operating agreement by November.

Avports has managed HVN for 22 years and is now a unit of West Street Infrastructure Partners III, an infrastructure investment fund managed by Goldman Sachs & Co. Last May, the pair announced plans for a long-term investment of $100 million via a public-private partnership to breathe new life into the little-used airport. At the same time, Avelo announced it was making HVN its East Coast hub and would be hiring 100 employees, including pilots, for its new base in Connecticut.

Current improvements to HVN’s existing West Terminal began on Sept. 20 under the supervision of Avports. Project officials expect the work to be completed in December. The Houston office of PGAL designed the project, and Walsh Construction is the general contractor.

Avports also selected PGAL to design a new East Terminal for the airport.

New Terminal, Longer Runway

Earlier this year, FAA approved the master plan McFarland Johnson developed for the airport. Key components include extending the 5,600-foot runway to 6,635 feet, abandonment of the little-used crosswind runway and constructing a new 78,000-square-foot terminal.

Scanlon notes that a longer runway will allow HVN to handle larger aircraft. Given the airport's location near marshes and the Long Island Sound shore, project designers will need to maximize the limited available land for the runway extension and accompanying safety zones.

Preliminary plans for the new terminal, dubbed the East Terminal, include four to six gates and concessions. While the holdroom capacity has not been determined yet, the new terminal will contain two TSA security lanes, just like the existing terminal.

The East Terminal will be built on the eastern end of the existing crosswind runway. Portions of the old runway will be converted into a taxiway and ramps linking to the extended runway.

Shifting the location of HVN's terminal will affect vehicle traffic in two communities because the airport straddles the official boundary that separates them. Currently, airport visitors drive through a residential area of New Haven to reach the West Terminal. When it closes and the new East Terminal opens, visitors will enter through a commercial area of East Haven. Scanlon notes that customers will simply use a different exit from Interstate 95 to access the airport.

To get the ball rolling on design work for the new terminal and runway extension, Avports is underwriting costs for the associated environmental assessment study. Airport officials expect the projects to require environmental mitigation measures and have included such work in the planning and construction timeline. Overall, they expect the environmental assessment to take one year, and building the terminal and runway to take two years.

Funding availability will determine the order of construction. The runway extension will be eligible for FAA funds, but the terminal project will not.

Scanlon says the airport does not have a plan for the West Terminal once the East Terminal opens, but it will consult neighbors about various options.

Contentious Backstory

For more than a decade, New Haven and East Haven joined forces to prevent the extension of HVN's runway. Primary concerns include aircraft noise and the presumed pollution of nearby waterways. A 2009 agreement that codified the municipalities' opposition was later incorporated into state law. After former New Haven Mayor Toni Harp failed at repealing the law, the airport authority went to court. Eventually, the case ascended all the way to the nation's highest legal venue. In March 2020, the U.S. Supreme Court upheld a previous ruling that overturned the state law.

"For the first time in 10 years, we were able to do what we wanted to do and were allowed to masterplan an expansion," Scanlon reports.

Critics of the runway project point to the $1.8 million that HVN receives from the city and state as proof that the airport is not economically viable. Scanlon, in turn, explains that HVN has been hamstrung and not able to build the infrastructure it needs to attract airlines that would pay the bills.

"I am constantly talking to either residents, politicians or different stakeholders to craft a community benefits package that will offset the impact of the expansion," he says. "It is a daily dialog and discussion."

To help keep peace with HVN's neighbors, Avports has committed to funding a $5 million community benefits package. Although details about the package have not been released, Scanlon sees some signs that sentiment toward the airport may be changing. For instance, the mayors of New Haven and East Haven attended the press event last May when Avports announced its plans to invest $70 million in airport improvements.

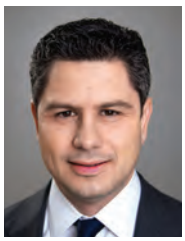
In addition to his daytime job as the airport director, Scanlon is also a state representative in Hartford representing the two shore towns directly east of East Haven.

The Big Proposal

When McFarland Johnson delivered HVN's master plan in March, the airport authority did not have a ready source of funding to pay for the local share of project expenses. "We don't have a revenue stream," explains Scanlon. "We don't have anywhere near the amount of PFC funds needed that we could tap."

As a result, Avports presented the unsolicited offer to fund HVN's capital improvements to the tune of $70 million.

"We have been part of this community for so long that we wanted to continue to be part of the community for the long term," says Jorge Roberts, chief executive officer of Avports. "We wanted to see the airport be a success, and they needed to have access to capital to do so."


JORGE ROBERTS

Roberts describes the pending management agreement as an expanded relationship. "We are working to solve a challenge that the airport faces—an infrastructure challenge," he explains. "We are providing the necessary capital and taking the risk."

With the agreement and attendant investment from Avports, the city and state would no longer subsidize HVN.

Under the current management agreement, the airport authority pays Avports a management fee and covers the salaries of employees the company posts at HVN.

In the pending agreement, "who pays who has not been finalized or revealed," notes Scanlon. Other details that have not been decided include which party has the final go/no-go decision on the terminal expansion and other key issues.

That said, a company spokesman notes that Avports will have the final decision on proceeding with its investments.

Avports will self-finance the capital projects and not go to the bond market, he adds.

Scanlon explains that the airport authority is leasing portions of HVN to Avports for development, but the authority is retaining ownership to remain eligible for FAA funding.

The proposed agreement is for 43 years. Roberts notes that the first three years cover the period of the company's investment for the environmental assessment and subsequent construction; and the final 40 years enable Avports to recover its investment.

Overall, Avports has been managing airport operations for 94 years. Its longest existing relationship, 50 years, is with the Port Authority of New York and New Jersey to run Teterboro Airport. The company has operated West Chester County Airport in New York for 43 years. Currently, it manages 10 airports.

Roberts describes the proposed investment in HVN as "our most involved in recent history" and points out that the company is stepping forward to transfer risk from the airport to Avports. "With that comes additional responsibility as well," he says.

The agreement—a public-private partnership—could serve as a model for future investments in other regional airports, he adds.

While airports elsewhere in the world have involved the private sector for more than 30 years, public-private partnerships are not as common at U.S. airports. Roberts theorizes that U.S. airports have not explored such partnerships because most have enjoyed ready access to capital. However, more airports are now "challenged" to get the resources needed to grow and may begin considering them.

Avports and others may step in more often to provide the capital airports need to grow and attract the air service that is vital to their respective communities.

"If we can make this work and get it off the ground, I have no doubt it will serve as a model for others," says Scanlon. "I think we will have more PPPs for those airports that don't have the funding capacity."

Roberts, who joined Avports in 2019, was previously with Carlyle Airport Group and was involved in the redevelopment of Terminal One at John F. Kennedy International Airport.

He says the runway at HVN needs to be extended so the airport can be economically viable and remain a valuable resource for the community. "Part of our business plan recognizes that the airport has the potential to be viable and potentially profitable," Roberts explains. "If the issues that have hindered the airport are resolved, as a private investor we should be able to recover the capital. If it were not viable, we would be very hard-pressed to make a case for an investment."

Air Service Development

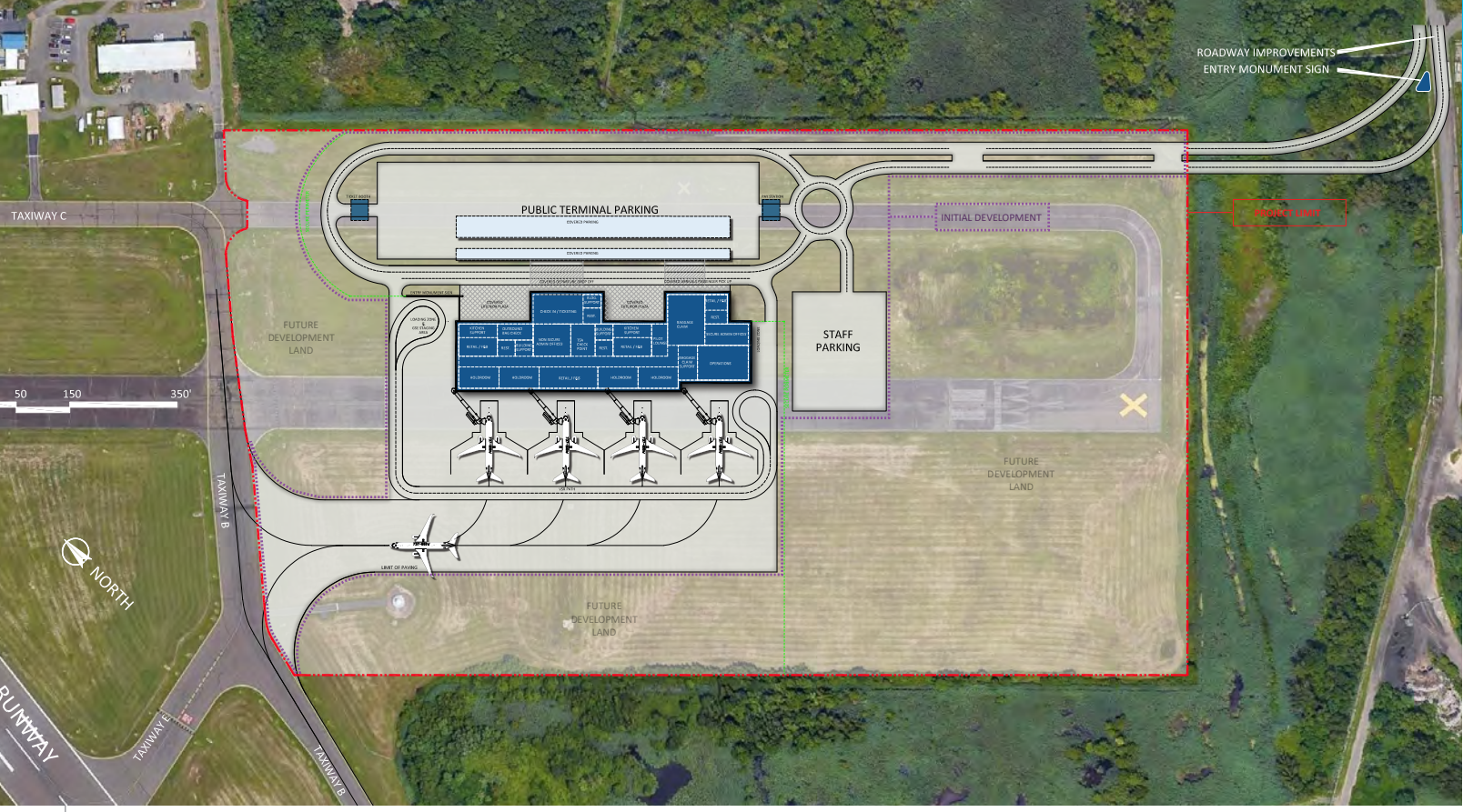
HVN started recruiting Avelo in August 2020. The airport negotiated rates and charges for the carrier, but did not "pay them to come here," Scanlon specifies.

Avelo has been assembling a point-to-point network of un-served and underserved communities where travel convenience is a big factor.

Currently, the airport authority pays for an air service development consultant through Avports. ASM is the airport's consultant.

Going forward, Scanlon says air service development will be a "combination of roles for each that still have not been publicly defined."

The catchment area for HVN includes 2 million potential passengers. Geographically, it spans from Strafford, just east of Bridgeport, to Middleton, which is south of Hartford.



Potential projects at HVN include a new terminal and runway extension.

Scanlon explains that most passengers from the New Haven area travel to New York airports rather than going up to Bradley International Airport, located just south of the Connecticut/ Massachusetts state line.

Consumer preference studies have indicated that the top destinations for HVN's catchment area include three Florida cities, the Midwest and the West. Previously, travelers had to fly through Philadelphia to reach any of these destinations.

Conversations with businesses in the New Haven area—particularly those in education, healthcare and biotech—indicate that a lack of air service hampers their recruiting efforts, adds Roberts.

While Avelo is initially serving tourist stops in Florida, Scanlon expects the carrier to add business-oriented destinations such as Chicago and Washington, D.C. in the second quarter of 2022.

With the departure of regional jet service by American Airlines, Roberts does not anticipate any legacy carrier to return to HVN until the new terminal is completed. "During this interim, we intend to work with Avelo to try to serve as much as possible the needs of the business community," he says.

Avelo was founded by Andrew Levy, a former executive with United Continental Holdings and Allegiant Air. Levy acquired Xtra, a charter operator, in August 2018, and subsequently converted it into a low-cost scheduled carrier flying B737s. Renamed Avelo Airlines, the carrier began flights out of Hollywood-Burbank Airport this April to West Coast destinations. Company officials note that Avelo is the first new mainline carrier in 15 years.

Given the recent history of start-up airlines, Scanlon is not concerned that Avelo may fail before improvements are completed at HVN.

"I trust Levy and his skills," says Scanlon. "He has a good track record at Allegiant. I believe in him, and I believe it will work."

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GO GREEN ON GROUND

Sanford Seacoast Regional Provides Airfield Land for Large Solar Farm

BY SCOTT BERMAN

FACTS&FIGURES

Project: Solar Farm

Location: Sanford Seacoast Regional Airport

Airport Owner: City of Sanford, ME

Capacity of Solar Farm: 50 MWac (enough to power more than 20,000 homes)

Timeline: Development started in 2015; construction 2019-2020; online in Nov. 2020

Cost: $120 million, financed by NextEra Energy

Farm Owners: NextEra Energy Partners; investor group headed by KKR & Co.

Financial Details: City receives $183,000/year for leasing land the solar farm occupies; owners sell energy farm generates to regional utility company; city collects $500,000/year in business property tax revenue, which it pours into local economic development initiatives via a tax increment financing district; city receives $173,000/year for ground maintenance services

Environmental Implications: Solar farm offsets 500,000 tons of carbon dioxide emissions annually; conservation easements included in areas that provide habitats for specific wildlife

Solar Contractor: Wanzek

Substation Contractor: Cianbro

Survey & Other Support Services: Stantec

Environmental Consultant: TRC

Environmental Permitting & Compliance Support: Flycatcher LLC

Maintenance: Airport employees manage vegetation & remove snow

A concerted, collaborative effort has turned empty land at Sanford Seacoast Regional Airport (SFM) in rural Maine into a privately financed 50-megawatt solar farm. The $120 million array, which went live in November 2020, is one of the largest airport-based solar energy farms in the United States, as measured by annual megawatt, alternating current (MWac) production.

Project officials note that the 50 MWac the new farm can produce is enough to power more than 20,000 homes, and SFM is located in a city of about 21,000 residents. By comparison, Tallahassee International Airport has two solar installations that generate a combined total of 62 MWac, and the solar farms at Indianapolis International generate 17.5 MWac. But the airport solar scene is dynamic: A 120 MWac farm is tentatively slated to open at Edmonton International in Canada late next year.

To be sure, developing and executing a solar project was an ambitious undertaking

PHOTO: GALE ASSOCIATES

for SFM, a municipally owned general aviation reliever airport with about 50,000 annual operations. The recently completed farm consists of 177,034 photovoltaic panels—some of which are single axis-rotating to preclude glint and glare from impeding the vision of pilots. The arrays sit in four different areas on 156 acres of airport land and 113 acres of adjacent land. In total, SFM has 1,119 acres at its disposal, and 419 acres are authorized for non-aeronautical use, such as the solar farm. That leaves more than 260 acres available for future expansion of the solar farm or other non-aeronautical development.

Construction of the new solar farm began in 2019. PHOTO: SFM

The current solar farm supplies power directly into the regional utility's grid, and was financed by developer NextEra Energy, based in Florida. NextEra bought the project from initial developer Ranger Solar in 2017, and managed the project through completion. In November 2020, NextEra sold the completed farm to its subsidiary, NextEra Energy Partners, and an investor group headed by KKR & Co. Inc. The farm at SFM was part of a package that included six other solar sites throughout the United States.

ALLISON NAVIA

Airport Manager Allison Navia explains that the airfield solar farm is a public-private partnership between the city, airport, private developers, regional and local utility companies, and the Sanford Regional Economic Growth Council, which is a local business non-profit entity that helps drive business and investment initiatives in the city of Sanford and Springvale, a village within the city.

JAMES NIMON

When the various entities came together in 2015, the city and airport had an expansive vision to make SFM financially self-sufficient. "Our motivation was to get the airport off the city's general fund, to create jobs and generate tax revenue," explains James Nimon, executive director of the Sanford Regional Economic Growth Council.

Mission Accomplished

The project created 94 construction jobs and 10 permanent positions; and the airport is, in fact, now financially self-sufficient. The city, which owns SFM, makes money from the massive undertaking in three ways: $500,000 of annual business property taxes paid by the solar farm's ownership group; $183,000 per year in lease payments for the airfield and other land the solar farm occupies; and $173,000 per year to maintain the solar farm grounds (snow removal and vegetation management services are provided by two to three airport maintenance workers).

The farm includes more than 177,000 panels. Some rotate to prevent glare for pilots.

PHOTO: GALE ASSOCIATES

Additionally, the city gained approval from the state to create a tax increment financing district, which funnels tax revenue from the farm directly into economic development projects at the airport. Current infrastructure improvements being supported include the debt service of an Airport Administration, Operations and Maintenance Facility, new hangars, water and sewer system upgrades and the addition of a broadband network. Other improvements already in place include a perimeter fence and a new airport road, as stipulated in the land lease agreement.

Overall, Navia describes the solar farm as a monumental project. "There was always something cropping up—real estate issues, regulatory complexities, state environmental concerns and technical hurdles," she explains. Moreover, issues were often interrelated, with response to one challenge creating or revealing additional challenges.

Take real estate, for example. The solar farm had to reach 50 MWac of generating capacity to achieve the necessary economy of scale and justify investment. Navia explains that the initial understanding, even after satisfying some federal environmental permitting requirements, was that airfield acreage could provide enough land. However, the state Department of Inland Fish and Wildlife and the state Department of Environmental Protection required conservation easements for areas of the airfield that provide habitats for various species—especially black racer snakes, Blanding's turtles and grasshopper sparrows. Researchers needed access to study those and other wildlife present on the airfield.

With the required setbacks around those areas figured into the project design, there was not enough airport land to accommodate the needed amount of solar panels. So the city and developer secured additional acres adjacent to the airfield to make up the shortfall. Some is Sanford Sewerage District land; others are privately owned parcels that NextEra now leases.

Another cascading challenge involved the regional utility, Central Maine Power. During the development phase of the project, it identified the need for a substation to handle the new influx of power the solar farm would produce. The solution: NextEra bought a non-airport parcel of land beside utility power lines and constructed an $8 million substation, which it then transferred to Central Maine Power.

The solar farm owners pay the airport $173,000 per year for ground maintenance services.

PHOTO: JOSEPH RIDLEY

Connecting the solar farm and substation required crews to install cable underneath SFM's runways, taxiways and roadways via horizontal direct drilling methods—substantial projects that alone took several months and spanned multiple seasons.

Maintenance Matters

The owners of the new solar farm pay the city $173,000 per year to maintain the grounds. Employees at the city-owned airport are responsible for managing vegetation and clearing snow. During project planning, SFM Maintenance Supervisor Joe Ridley and his team jumped into action collecting measurements of the array forms and clearances to determine what kind of equipment they would need.

Based on their research and recommendations, the city purchased a Bobcat skid-steer track loader, a John Deere tractor and two mowers to meet the airfield's changing maintenance needs. Ridley and his colleagues customized one mower by removing its factory-

supplied cover and fashioning a new one that allows the machine to maneuver under the solar panels and around the poles that support them. With revenue earned from fulfilling the solar farm maintenance contract, the new equipment is projected to pay for itself within one year of use.

Looking Back & Ahead

Figuratively speaking, the solar panels that rotate to mitigate glare were not the project's only moving parts. Coordinating those parts into a revenue-generating asset was a big win for the small airport. Nimon, from the Sanford Regional Economic Growth Council, says that the substantial accomplishment shows what is possible when the right partners assemble. "This is a new day for Sanford and our region in terms of generating renewable power," he remarks. "It's that combination of economics and renewables that is a big flag waving to attract additional investment in the community."

The airport's success may also pave the way for other solar projects in the region, adds Nimon.

That said, adding the solar farm was no walk in the park. As airport manager, Navia emphasizes that teamwork was, and continues to be, essential to the success of the sizable project. In particular, she says that it was crucial to include the SFM Maintenance Department early on.

"It's very important to start the planning process early," Navia adds, noting that delving into the solar project during a master plan update proved ideal for SFM. "That way, you get all of the players on board at the same time. That's a huge plus."

Nimon counsels other airports contemplating a renewable energy project to stay open to partnerships. "Avoid thinking like an island," he advises. "Start and sustain conversations with developers in the field who understand your organization's goals."

In a related vein, Navia notes that it's vital to ensure that operational efficiency remains the airport's utmost priority. She knows from experience that this is not easy during an enormous airfield project, but nevertheless believes in the importance of striving to "strike a balance."

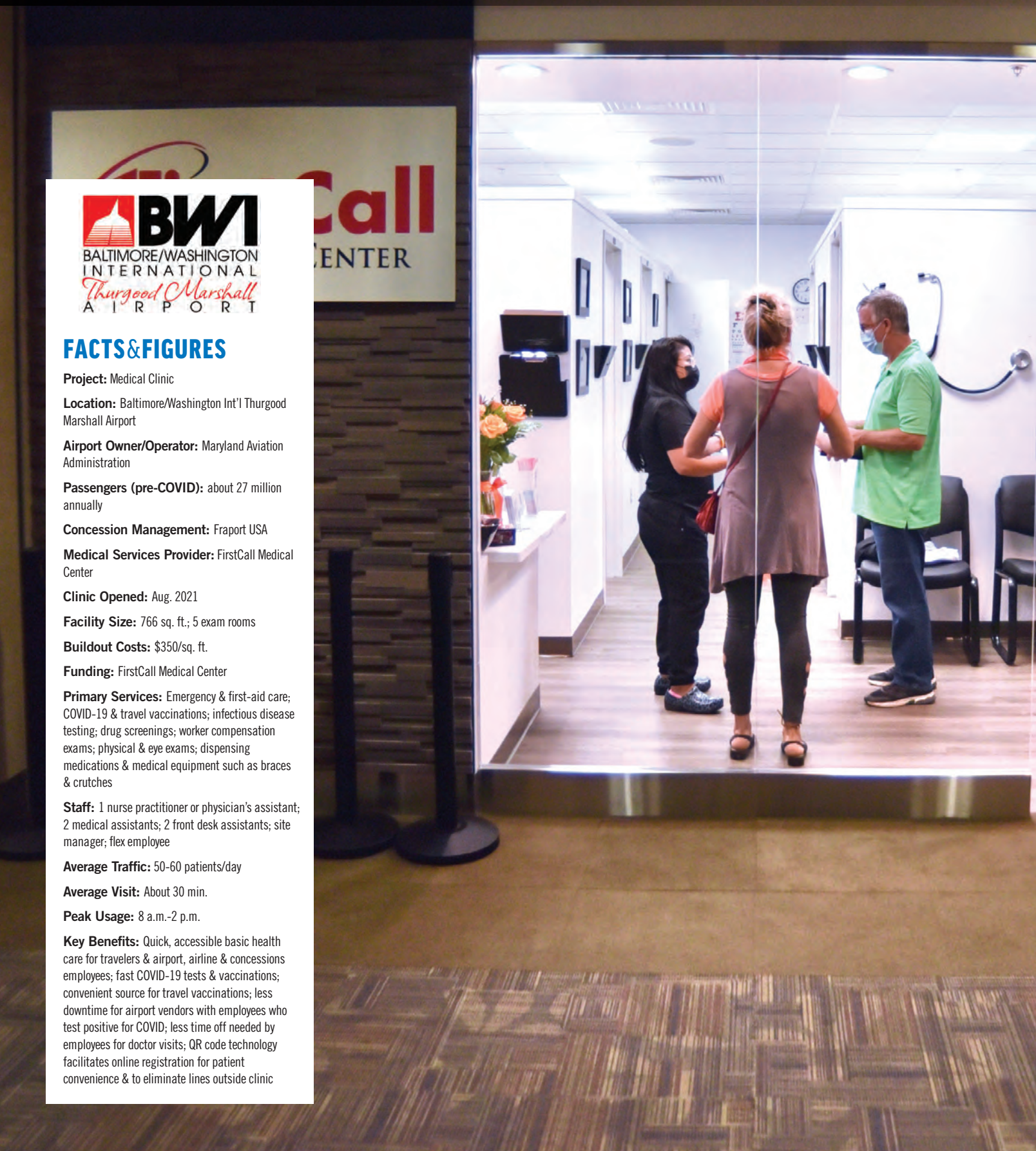
Nimon and Ridley highlight the need to secure support for solar projects from local leaders, and both compliment Navia's work in that area from start to finish. "You need someone who is unflappable in terms of the things that are going to be thrown at you," says Nimon.

In retrospect, Navia underscores the need for patience and perseverance. Both were crucial for the SFM team to navigate numerous twists and turns throughout the long initiative. "The project almost died on a monthly basis for about five years," she remarks.

Despite the many challenges the project presented, Navia reports that there are already rumblings about expanding the solar farm. Although there is no official timetable, she notes that a decision may be reached about another phase within five years.

New Health Clinic at Baltimore/Washington Int'l is a Shot in the Arm for Travelers and Employees

BY KEN WYSOCKY



BWI BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

FACTS&FIGURES

Project: Medical Clinic

Location: Baltimore/Washington Int'l Thurgood Marshall Airport

Airport Owner/Operator: Maryland Aviation Administration

Passengers (pre-COVID): about 27 million annually

Concession Management: Fraport USA

Medical Services Provider: FirstCall Medical Center

Clinic Opened: Aug. 2021

Facility Size: 766 sq. ft.; 5 exam rooms

Buildout Costs: $350/sq. ft.

Funding: FirstCall Medical Center

Primary Services: Emergency & first-aid care; COVID-19 & travel vaccinations; infectious disease testing; drug screenings; worker compensation exams; physical & eye exams; dispensing medications & medical equipment such as braces & crutches

Staff: 1 nurse practitioner or physician's assistant; 2 medical assistants; 2 front desk assistants; site manager; flex employee

Average Traffic: 50-60 patients/day

Average Visit: About 30 min.

Peak Usage: 8 a.m.-2 p.m.

Key Benefits: Quick, accessible basic health care for travelers & airport, airline & concessions employees; fast COVID-19 tests & vaccinations; convenient source for travel vaccinations; less downtime for airport vendors with employees who test positive for COVID; less time off needed by employees for doctor visits; QR code technology facilitates online registration for patient convenience & to eliminate lines outside clinic

Passengers and workers at Baltimore/Washington International Thurgood Marshall Airport (BWI) who need medical assistance no longer have to wonder if there's a doctor in the house.

In August, the airport opened a full-service urgent care clinic in its main terminal; and the new facility typically treats approximately 50 to 60 patients per day. The 766-square-foot clinic is centrally located in a pre-security area, near Concourse C.

JAIMINI ERSKINE

Jaimini Erskine, director of commercial management for the Maryland Aviation Administration, reports that the clinic had treated about 1,800 patients by late September, and most were coming for COVID-19 testing.

"We've thought about putting a medical facility in BWI Marshall for years," Erskine says, noting that the Maryland Aviation Administration owns and operates BWI and Martin State Airport through the Maryland Department of Transportation. "We think of our airport as a small city, so including medical services makes sense. We're always looking for new and innovative services that address passengers' and employees' needs."

GARY GILLIARD

The clinic at BWI is among just a handful of similar airport-based facilities nationwide, says Gary Gilliard, vice president of Fraport Maryland Inc., a division of Fraport USA, an airport concessions management and development firm owned by Fraport AG of Germany.

Fraport manages all concessions at BWI, including subleasing space to concessionaires, under a prime contract with Maryland Aviation Administration. In turn, Fraport pays the airport a percentage of the rent collected from concession operators.

The cost of building out the new clinic was about $350 a square foot. FirstCall Medical Center, the medical group that operates BWI's new clinic and several facilities throughout the region, paid for construction expenses.

Emerging Trend

Airports throughout the U.S. are quickly installing medical clinics—a development driven mainly by the pandemic.

"Most airports have departments for medical emergencies that can transfer patients to nearby medical facilities," Gilliard explains. "But the concept of walking into an onsite urgent care clinic is just starting to emerge at airports as an essential service that benefits the public."

At BWI, the clinic's core clientele includes airport, airline and vendor employees, who enjoy the convenience of being able to access health service onsite. It also benefits businesses that have employees who test positive for COVID, Gilliard observes.

"Before, if we had a restaurant employee test positive, that business had to shut down for up to three days while it waited for employee test results and officials to do contact tracing," he explains. "Now, we're talking just hours. So there's an economic gain if we can keep the airport functioning safely.

"It's not very convenient if there's no clinic."

Urgent & Routine Care

Seeds for the new clinic were planted about five years ago.


DR. RON ELFENBEIN

"I always thought an airport would be a great place for an urgent care clinic," says Dr. Ron Elfenbein, owner and medical director for FirstCall. "People thought it was either a stroke of genius or insanity.

"But you have a captive audience already walking through the airport with no access to health care. Plus airport employees get hurt or sick or need shots," he continues. "I thought it would be a win-win proposition."

Gilliard notes that planning for the clinic started long before the pandemic began. "But after COVID hit, there was an urgent need for testing and vaccinations," he recalls. "COVID moved the project front and center."

The clinic is open from 6 a.m. to 9 p.m. daily. It offers a wide range of services, including:

- emergency care and first aid,
- COVID-19 and other travel vaccinations,
- testing for infectious diseases,
- drug screenings,
- exams for workers' compensation cases,
- routine physical and eye exams,
- dispensing medication (intravenously or orally), and
- issuing medical equipment such as braces and crutches

"We can do just about anything most urgent care facilities can do, except for X-rays," Elfenbein notes. "But we can do those at our main facility, which is about 20 minutes down the road."

The clinic also offers occupational therapy for airport, airline and concession employees.

Technology Minimizes Lines

The clinic has five exam rooms and is staffed with one nurse practitioner or physician's assistant at all times. Other employees include two medical assistants, two front desk assistants, a site manager and a flex employee capable of handling medical assistant or front-desk duties.

To minimize wait times and maintain social distancing protocols, patients can use their cellphones to scan a QR code posted on about one dozen promotional signs located throughout the airport. The code also is available on digital advertisements

that appear on the cellphones of people using the airport's Wi-Fi network.

"It hits just about everybody who enters the airport," says Gilliard. "We use digital marketing on the airport's free Wi-Fi venue to connect with travelers throughout BWI."

The QR code links to an app that patients use to fill out registration paperwork. Once the paperwork is submitted, they receive an appointment time via text.

"We leveraged technology to accommodate a lot of people without things getting too crazy and hectic," Elfenbein explains. "This way, there's not a lot of people standing in line outside the clinic, waiting for an appointment."

The airport wanted to prevent lines from forming outside the clinic due to concerns regarding social distancing and

The clinic at BWI is operated by FirstCall, a medical group with several other facilities in the region.

fire regulations about blocking aisles. Having passengers wait in a lounge area provides them with a more pleasant and socially distanced experience, Gilliard adds.

Payment Details

The clinic accepts most health insurance plans and cash. To boost transparency, a posted menu lists the prices of some services, including a basic visit and various ala carte tests.

"It's a pet peeve of mine that people never know how much medical services are going to cost," Elfenbein remarks.

Most days, the clinic handles an average of 50 to 60 people, but it has tended to up to 161 patients in one day. "You never can tell how many people will show up," says Elfenbein.

Gilliard reports that the average patient stay is about 30 minutes and peak usage is between 8 a.m. to 2 p.m.

Within the next 18 months, the clinic will likely expand and offer more services, such as physical therapy and "gate calls," the in-airport equivalent of house calls.

Food for Thought

When asked about advice for other airports thinking about adding a medical clinic, Elfenbein advises them to temper their expectations about timelines and costs.

"Everything takes longer and costs more than you expect," he remarks. "But you have to persevere. It's a great service to offer to people because it provides yet another level of service for both airport employees and travelers who have no other option.

"You also can think of it as another fringe benefit for airport employees," he adds. "Every little thing you can do to entice people to work for you is a plus."

Gilliard says that it's important to fully vet the medical organization that will staff and operate a clinic. Your provider must have great credentials and the right operational experience to deliver services effectively, he emphasizes.

"There's a lot more to it than just having needles and giving vaccinations," he cautions. "We turned down companies that lacked the standards and delivery of services we were looking for."

Gilliard notes that it's also crucial to communicate effectively about a new clinic—to anticipate questions people might have and to provide answers that put their minds at ease. "There are a lot of concerns among the public (regarding healthcare), so we worked with FirstCall to create an informational brochure that's distributed at the airport's information desks and at the clinic," he explains. "It answers a lot of questions by putting facts in front of people," he says.

Airports and medical providers also must make patients feel welcome and create a non-threatening environment, compared to more intimidating large hospitals, adds Gilliard.

Erskine says her best advice for other airports is to start planning for a clinic.

"I would say it's important for both passengers and employees—a huge benefit all the way around," she summarizes. "If airports don't have one, they should do whatever they need to do to get one."

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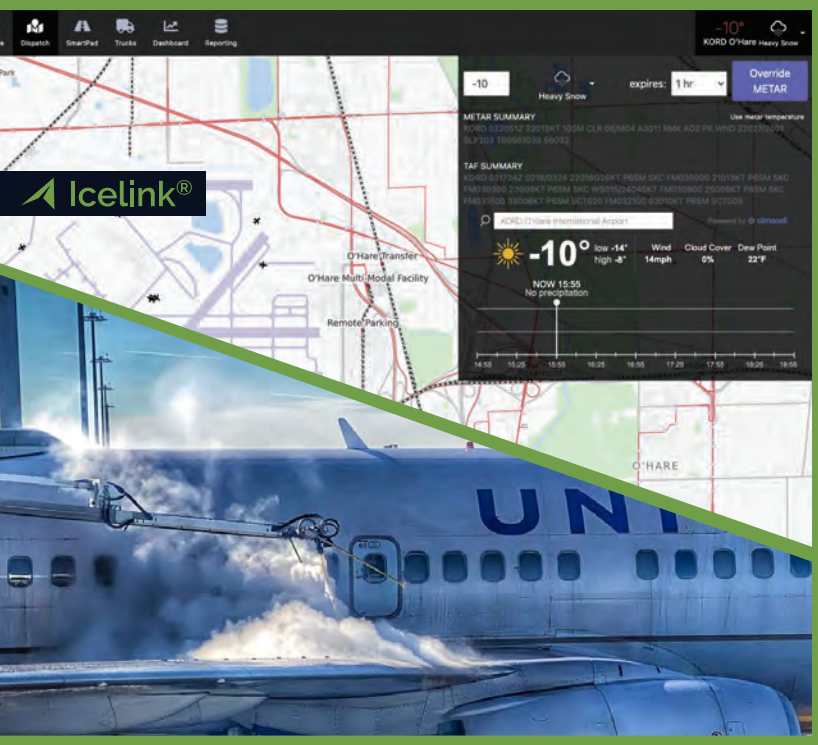

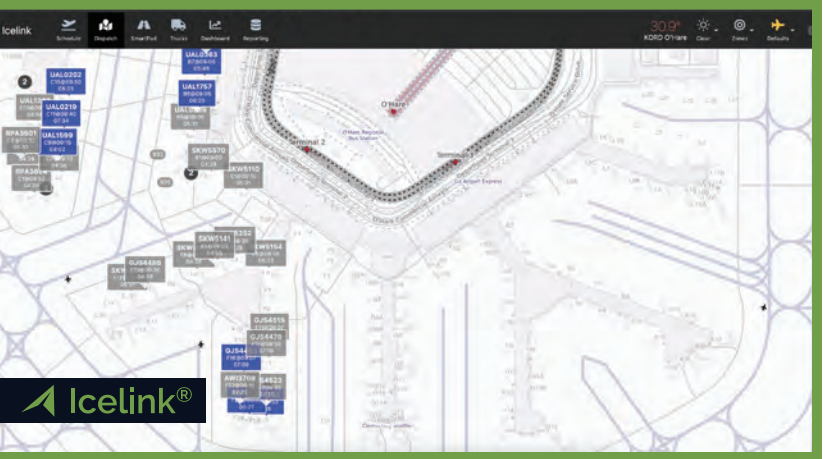

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LEE COUNTY PORT AUTHORITY
Southwest Florida International Airport

FACTS&FIGURES

Project: New Airport Traffic Control Tower & TRACON Facility

Location: Southwest Florida Int'l Airport

Owner/Operator: Lee County Port Authority

Cost: $81 million

Funding: $48.4 million from passenger facility charges; $32.7 million state grant

Of Note: No federal funds used

Tower Height: 214 ft.

Construction: July 2019-Oct. 2021

Equipment Installation: Jan. 2022

Estimated Live Date: Fall 2022

Project Manager: AECOM

Architect: Pond & Company

General Contractor: DeAngelis Diamond

Precast Concrete: Gate Precast Co.

Structural Steel: Trident Building Systems

Curtain Wall & Cab Glass: Key Glass

Precast Piles: Precast Piling Technologies

Metal Framing & Drywall: AA Stucco & Drywall

Electrical: NCN Electric

Heating/Venting/Air Conditioning: Page Mechanical Group

Plumbing: B&I Contractors

Fire Protection: Cox Fire Protection

Southwest Florida Int'l Self-Funds New Control Tower

BY THOMAS J. SMITH

As the last major step of a plan to control its own destiny, Southwest Florida International Airport (RSW) in Fort Myers will soon give FAA the keys to its new $81 million airport traffic control tower. As such, the Lee County Port Authority is the first airport owner/operator to build and equip an FAA control tower without any federal funds.

Construction of the tower is expected to be substantially complete by November, and the FAA is slated to begin installing equipment by January 2022. If all goes according to plan, RSW's new tower will start operating before the end of 2022 with freshly trained staff.

BENJAMIN R. SIEGEL

"From a building point of view, it is complete," remarks RSW Executive Director Benjamin R. Siegel. "It just doesn't have the equipment and technology installed yet."

The new 214-foot control tower complex is the third—and final—project to ready the airport for a new 9,100-foot parallel runway forecasted for construction in 2035. The port authority began a series of capital improvements nearly a decade ago to facilitate the future runway.

"The fire station was old and needed to be replaced," explains Siegel, noting that the airport's new $16 million airport rescue and fire fighting (ARFF) facility is strategically located to serve both runways.

After the ARFF station was completed in 2013, a taxiway connector system was constructed; thus leaving the new control tower as the final piece of the program to build. The existing 77-foot tower, built in 1983, was not in the right location to serve the future parallel runway due to line-of-sight issues. But RSW is not on FAA's list to receive a new tower in the near future. In fact, Siegel estimates that it would have been 10 to 15 years before the FAA would fund a tower replacement. A new tower would have been part of the parallel runway project.

"We decided we had the ability to fund this project with no impact on the airlines' rates and charges and to get it done," Siegel explains, noting that the key variable is when capacity use thresholds for the existing runway would trigger approvals for designing and building a parallel runway. It would also cost more to build a new tower in 10 to 15 years, he adds.

The airport funded its new tower with $48.4 million in passenger facility charge revenue and a $32.7 million Florida Department of Transportation grant. Siegel notes that RSW is paying for everything—the tower structure, the equipment that FAA will install inside it and the Terminal Radar Approach and Control (TRACON) facility at the base.

The FAA plans to staff the new tower at the same level as the current one. However, the new 15,000-square-foot TRACON building will be equipped for two future expansions.

With the tower, ARFF station and a new taxiway connector in place, "we have taken $100 million in capital improvement projects off the table earlier for less money than if we had waited. We are preserving our bonding capacity for terminal and runway projects that will drive the future of the airport," Siegel explains.

Design

The port authority retained AECOM in 2007 to serve as program manager for its trio of capital projects. AECOM, in turn, hired Atlanta-based Pond & Company to design the control tower. The port authority selected DeAngelis Diamond, of Naples, FL, as the construction manager/general contractor.

Pond had previously designed six FAA control towers, but this was the first project with AECOM. The design team worked with the FAA William J. Hughes Technical Center in Atlantic City to determine the height and location of the new tower. When operable, the new facility will control airspace within a 5-nautical-mile radius.

Contractors had to obtain a special permit to operate a tall boom crane near the airfield.

From the beginning, port authority officials made it clear they did not want a "plain Jane" control facility. "They wanted something more contemporary—not just a square box with a tower next to it," explains David R. Woods, Pond's principal architect for the project. Instead, officials asked for the design to include aesthetic elements, such as the curved roofline of the airport's 2005 terminal building, which was also echoed in the new ARFF station.

DAVID R. WOODS

Joe Glowacki, AECOM's project manager, notes that the design stage and construction process required the team to accommodate numerous stakeholders, sometimes with conflicting visions. For instance, the FAA is accustomed to building control towers that simply serve its practical needs. The airport was interested in making sure the new tower blended with the modern architectural theme of its campus. FAA does not typically include the host airport in design work, he adds.

JOE GLOWACKI

In the end, Pond included "architectural fins" to showcase the tall, slender shape of the tower. They start at the base and extend to the top. "It adds interest to the shaft and ties it together," explains Woods.

At the 185-foot mark, the tower transitions from precast concrete to a glass and steel structure. That's where Pond located the staff break room, enclosed in a 360-degree ring of glass windows. The control cab, which sits at the very top, is larger than the workspace prescribed in typical FAA tower design.

"The airport has a good relationship with the tower personnel, and wanted to give them a nice, roomy facility," Glowacki explains.

To reduce glare and heat from the sun, Pond designed a ring of exterior window shades for the top two floors. Designers also covered the gray concrete with a solar reflective coating in "Florida white" to improve the tower's appearance and reduce cooling costs.

Glowacki estimates that the extra architectural features and roomier footprint may have increased the cost of RSW's tower by 5% to 10%. But it would have been much more expensive to build if the airport had waited to qualify for FAA funds, he adds.

Per Florida Building Code, Pond designed the tower to remain operational during a Category 5 hurricane. But it also had to make sure that the structure would withstand "mini earthquakes" from daily blasting at a nearby rock quarry that cause vibrations to travel through a band of limestone to the airport.

Construction

The foundation of the tower is built on a base of 225 pilings, each 14 inches square and made of precast concrete.

The original design called for crews to drive the piles 80 feet into the ground, but they usually didn't have to drive them that deep to reach solid bedrock. As a result, workers had to cut 10 to 20 feet off each pile after installation.

Working only during daylight hours, it took crews about two months to drive the piles—longer than allotted in the original project schedule.

Before beginning, workers dug three ponds to manage the groundwater that would need to be removed from the construction site. Each day, they pumped 2.5 million gallons of groundwater out of the 30-foot deep excavation hole.


TYLER RICHESON

After the piles were in place, crews poured a 6-foot-deep, 60-foot-square concrete cap to create a foundation for the tower. Tyler Richeson, project manager with DeAngelis Diamond, notes that workers poured the 1,000 cubic yards of concrete over a Friday

The new tower is expected to begin operating next fall.

night and Saturday morning to assure a constant stream of concrete mixers.

Although the new tower is not located directly on the airfield, construction extended into RSW's airspace. That required contractors to obtain a permit for the 280-foot lattice boom crane they used to erect the facility. At the end of each workday, crews "knuckled down" the crane to minimize its intrusion into the airspace at night.

Sixteen precast concrete rings form the vast majority of the tower, with three floors of structural steel forming the top levels of the tower. Crews constructed each ring by setting together six curved precast concrete sections and installing rebar and pouring concrete to connect the precast ring sections together. After the exterior ring for one layer was in place, workers installed pre-cast walls to form the elevator shaft, lobbies and two stairwells before proceeding to the next ring.

Once assembled, the pieces provided pathways for 5 miles of conduit for electrical and data cables that will be installed later.

The precast concrete work began in March 2020 and was completed in September 2020. In all, crews assembled 450 separate pieces to form the tower.

Because tower projects are so rare, some subtrades of the construction team were not familiar with the intricacies of the concrete work. "It was not like high-rise residential condominium construction in that it required more time and expertise," Glowacki explains.

Engineers from AECOM, Pond and the FAA closely monitored and inspected the work along the way.

At the top of the concrete tower, a junction level serves as the base for the steel superstructure. The junction level also houses the master mechanicals, including the air handling system and communications equipment.

The top steel and glass layers were erected from September 2020 through January 2021.

This August, the project was tracking about three months behind schedule as it neared completion. Richeson attributes much of the delay to the extra work required to trim the piling and design changes. Glowacki notes that it is typical for projects designed years in advance to require design adjustments and most of the changes were to incorporate newer upgraded technology.

Looking Ahead

The parallel runway that the new tower will eventually support has become less urgent since the FAA's 2019 Terminal Area Forecast projects the current runway will reach 75% of its capacity in 2035, and that is the time FAA recommends to begin designing and construction a new runway.

Annual operations peaked at 92,000 in 2007 and have been averaging between 78,000 and 83,000 per year ever since.

In July, RSW served 814,471 total passengers, a new record for that month. And, it is on pace to serve more annual passengers than its previous record year of 2019.

Overall, RSW is the nation's second-busiest single-runway airport, behind only San Diego International. But with fewer flight operations and improved technology, the capacity of its 12,000-foot runway has increased. "The need for the parallel runway has been pushed out into the future," Siegel remarks.

That, however, could change. In fact, the airport authority is actively working to make it change by marketing land on the north side of the airfield for additional cargo facilities or an airline maintenance base.

Siegel predicts that new activity on the site where the original terminal complex previously stood will boost RSW's total operations within the next several years. "This could move the needle by pushing the existing runway capacity to the 75% capacity threshold that will trigger an FAA-financed design of the parallel runway," he explains.

San Diego Int'l Builds New Airline Support Building

BY JODI RICHARDS

FACTS&FIGURES

Project: Airline Support Building

Location: San Diego Int'l Airport

Airport Owner/Operator: San Diego County Regional Airport Authority

Size: 93,600 sq. ft.

Key Functions: House provisions for passenger air service, airfield and terminal maintenance operations & belly cargo carried by passenger aircraft

Cost: $49 million

Funding: General airport revenue bonds; airport cash

Planning & Design: Began in June 2017

Construction: Jan. 2020-Dec. 2020

Design/Build Partner: Sundt Construction

Architect: HOK

Civil Engineer Firm & LEED Consultant: C&S Companies

Geotechnical Consultant: Group Delta

Traffic Engineering Controls: STC Traffic

Fueling/Maintenance: Blymyer Engineers

Landscaper: Rick Engineering

Structural Engineer: KPFF

Mechanical/Electrical/Plumbing Engineer: Randall Lamb

Code & Fire/Life Safety: Jensen Hughes

Tenant Relocation: Consolidated Building Systems

In July, San Diego International Airport (SAN) commemorated the opening of its brand new Airline Support Building. The $49 million project is part of a larger program to enhance overall behind-the-scenes facilities. The purpose-built facility was designed to provide a more efficient approach to cargo operations and consolidate support functions into a single centralized location.

KIMBERLY BECKER

"This building culminates the work of all teams at the airport authority and delivers on our promise to provide extraordinary customer service," says Kimberly Becker, president and chief executive officer of the San Diego County Regional Airport Authority. "The new [facility] provides our airline tenants with an efficient and sustainable building to carry out their cargo operations."

As the busiest single-runway airport in the United States, SAN is laser-focused on efficiency. In 2019, the busy airfield served 25.2 million passengers, breaking its previous records. Key facilities for cargo and passenger carriers include the new Airline Support Building, the Facilities Management Department, the Airport Fueling Operations building and an underground stormwater cistern. As the newest addition, the Airline Support Building houses ground service equipment maintenance, aircraft provisioning items, airfield and terminal maintenance functions and the belly cargo carried by passenger aircraft.

NICOLE HALL

Nicole Hall, senior communications specialist at SAN, explains that the buildings that previously housed these support services and maintenance functions were constructed more than 50 years ago, and had consequently become outdated and inefficient. Under the recently completed construction program, all such functions were relocated into more modern, energy-efficient facilities that are easily accessible from the airfield and public roadways.

The Airline Support Building is a 93,600-square-foot structure that combines offices, space for managing belly cargo, ground support equipment areas and maintenance facilities. Lease payments from carriers that use the new facilities create an important revenue stream for SAN. Tenants include Southwest Airlines, American Airlines, Alaska Airlines, Hawaiian Airlines, Sun Country Airlines, Delta Air Lines, Lufthansa and United Airlines/ PetSafe.

The new support building was created under a design-build contract with Sundt Construction. Planning and design began in June 2017, and construction occurred January 2020 to December 2020. Throughout the year, SAN consolidated operations from two outdated facilities and relocated them into a new facility on the southeast side of the airfield, along the main roadway near the airport entrance. Finding an optimal location on SAN's limited 661-acre footprint was not easy; but Hall notes that the tract selected supports the airport authority's efforts to modernize the airfield and contributes to its sustainability goals.

Designers strategically located office spaces on the second floor, tucked above the loading docks. This not only improved the building aesthetics from the public side, but also maintained higher ceilings in the cargo and maintenance warehouse areas. The facility was constructed using a pre-engineered steel structure covered by an exterior skin made of corrugated panels on the rear and sides of the building and insulated metal panels on the front façade. The project team selected this mix for cost efficiency and to provide large structural spans for future flexibility.

Preparatory site work included re-grading the construction area to elevate the building for added resiliency during expected rises in sea level and coastal flooding through the year 2100. In addition, project designers included stormwater infiltration areas and added a 3 million-gallon underground cistern that will capture stormwater runoff to prevent it from entering San Diego Bay. These measures also help reduce SAN's consumption of potable water.

Sustainable Services

The San Diego County Regional Airport Authority has a sustainability policy that focuses on three pillars of sustainability—economic, environmental and social. As such, green construction criteria are significant factors for tenant development and redevelopment projects. Under the airport authority's Design and Construction Guidelines, all new buildings or major renovation projects greater than 10,000 square feet are expected to obtain LEED Silver certification from the U.S. Green Building Council. Going above and beyond, four of the airline support buildings are designed to be LEEDv4 NC Gold Certified; the Facilities Management Department office was already certified as LEED Platinum; and the Facilities Management Department shop was certified as LEED Gold.

The project also conformed to the airport authority's Sustainability Management Program. It requires plans in the following seven areas: water stewardship, carbon neutrality, clean transportation, zero waste, strategic energy, climate resilience and biodiversity. Because none of the four buildings in the new support facility is connected to natural gas service, they are potentially eligible for LEED Zero Energy certification after 12 to 18 months of operation. Hall reports that the airport authority is currently exploring this credential.

A lack of natural gas usage aligns with the airport authority's commitment to reducing carbon emissions, as described in its Carbon Neutrality Plan. Instead of using natural gas, the four buildings are connected to and receive power from a closed-loop electricity distribution grid. Each building receives a portion of the on-site photovoltaic solar electricity generated elsewhere at the airport, coupled with 100% carbon-free electricity provided by the regional utility.

Inside, the modern buildings leverage natural lighting to reduce energy usage and create a healthy work environment. In fact, about 70% of the regularly occupied areas receive natural daylight and feature outdoor views. Designers added skylights over the cargo warehouse space to reduce its lighting requirements during the day. There was also a concerted effort to minimize heating/cooling requirements wherever possible. Designers capitalized on the region's temperate climate by using automated louvers to bring in outside air and maximize airflow. Other sustainability features of the Airline Support Building include:

- bicycle racks to encourage employees and visitors to use alternative commuting methods;
- reflective roofing to help reduce the heat island effect;
- restroom fixtures with efficient flush and flow rates that reduce indoor potable water use by 45%;
- drought-tolerant landscaping to reduce outdoor portable water use by 75%;
- use of products with low-VOC emissions to ensure good indoor air quality; and
- façades with reduced vertical glazing and increased solid areas to help keep birds safe.

One specific species of bird—the California Least Tern—figured prominently into plans for the new facilities. Because the building site was almost completely within the nesting area of the endangered bird, construction was "significantly restricted" between April 1 and September 15. Hall notes that the project team worked closely with SAN officials and the U.S. Department of Fish and Wildlife to develop a construction plan that protected the Least Tern throughout its nesting season. That included working overtime to complete the structure and apply the exterior building skin before the nesting season began. The team then worked inside the building and behind a sound wall erected onsite to continue construction activities. Hall reports that these measures provided an uninterrupted nesting period for the birds.

As with any construction project, there were many lessons learned. "With the Airline Support Building, key takeaways are to begin early with the environmental entitlements process to ensure timely local, state and federal approvals," Hall reflects. "And for our airport site, we had to ensure those approvals aligned with the limited construction period during the non-Least Tern nesting season."

The new facility consolidates multiple airline support functions into a single, centralized location.

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Cincinnati Int'l Assumes Operation of Local University Airport

BY KIMBERLY GIBBS

CVG
CINCINNATI/NORTHERN KENTUCKY
INTERNATIONAL AIRPORT

FACTS&FIGURES

Project: Airport Operating Agreement

Airports Involved: Cincinnati/Northern Kentucky Int'l (CVG); Miami University Airport (OXD, a general aviation facility in Oxford, OH

Terms: 5-year operating agreement that can be extended every 5 years for up to 30 years; CVG leases OXD for $84,000/year & assumes all associated revenue streams; Miami University retains ownership of airport facilities/land & pays CVG $120,000 in operating fees

Timeline: University approached CVG in 2019; operating agreement signed in Jan. 2021; FAA approval received in March 2021

Key Benefits: CVG can expand its general aviation footprint/presence; university gets out of airport management business and maintains full focus on educating students

Early this year, Cincinnati/Northern Kentucky International Airport (CVG) struck a noteworthy deal to manage and operate Miami University Airport (OXD), a quiet general aviation airfield located about an hour north of CVG in Oxford, OH.

Per the five-year agreement, CVG will lease OXD for $84,000 per year and take over revenue streams such as aircraft fueling, aircraft parking and hangar rental. Additionally, Miami University will pay CVG $120,000 per year to operate the airport. The general aviation airport is said to log about 20 flights per day, mostly from recreational fliers and private planes operated by families of university students. Its 4,011-foot asphalt runway and partial parallel taxiway also support law/drug enforcement flights, military practice approaches, and powerline inspections by Duke Energy.


MINDY KERSHNER

Mindy Kershner, senior manager of Communications and Community Affairs for CVG, describes the agreement as mutually beneficial. CVG gains the opportunity to expand its existing footprint in general aviation; and the university gets out of the airport management business and maintains its full focus on educating students.

"They found themselves at a decision point of whether to maintain the airport or pursue other developments," Kershner notes.

When Miami University first approached CVG to discuss the situation in summer 2019, it had sold its King Air and was not staffing OXD but was spending about $125,000 annually to maintain the airport. In essence, the university felt it was not in a good position to manage or grow operations at OXD, and CVG saw potential in the fledgling airfield. Executives at the larger commercial airport were not only intrigued by the chance to serve traditional weekend fliers, they also saw opportunities to explore more avant-garde markets such as drones and vertical-launch aircraft.

"When we look forward to the future of aviation, we thought about if we were positioned to capitalize on growth in the general aviation markets," says Scott Gibbons, vice president of Business Administration for CVG.


SCOTT GIBBONS

"There was a long period of due diligence that we went through to understand what we were getting into and what it would take to operate the airport," he adds.

After nearly two years of analysis and examination, CVG was ready to commit. The two organizations signed an operating agreement in January 2021, and FAA approved the arrangement in March 2021. The original five-year lease and operating contract can be extended every five years for a total of 30 years; the university retains ownership of OXD and associated 300 acres of land.

Candace McGraw, chief executive of CVG, expressed enthusiasm about the arrangement in a press release issued shortly after the deal was penned. "Over the last several years, the CVG team has been focused on growing and diversifying the airport business," said McGraw. "I could not be more pleased with this partnership with Miami University and the opportunity to manage the OXD Airport. CVG will bring our airport business know-how to handle the day-to-day affairs of OXD. Our staff will learn a great deal about general aviation airport management that will complement our core business of owning and operating CVG Airport."

Gregory Crawford, president of the university, was similarly optimistic: "By partnering with CVG, Miami is tapping into unparalleled expertise and knowledge to improve airport services and benefit the entire region."

Greater Possibilities

McGraw specifies that CVG's core business will continue to be owning and operating CVG, which served more than 9 million commercial passengers in 2019 and handled more than 1.5 million tons of cargo in 2020. While the commercial airport already serves general aviation customers via its fixed base operator, most are corporate aircraft. Traffic at OXD is predominantly from recreational pilots.

As CVG executives weighed the pros and cons of operating a stand-alone general aviation facility, they considered how it aligned with the airport's strategic plan. CVG's vision is to be the catalyst that transforms the region, and its mission is to redefine and elevate the role of an airport. One of the five key objectives

in its strategic plan is to leverage ventures, partnerships and collaborations to benefit CVG and the entire region. The agreement with Miami University is precisely what CVG envisioned when crafting that strategic objective. As the project team assessed each benefit of the partnership, it realized there were even greater possibilities for OXD.

"We plan to staff the airport with a full-time airport manager, and more staff resources from CVG will be committed to making our management of OXD successful," McGraw told the *Oxford Observer* back in February. "We don't expect to see a huge uptick in airport activity — it will remain a general aviation airport. However, CVG believes we can optimize the fundamentals of this airport's business."

After taking over management of OXD, the CVG team delved deep into all aspects of the general aviation airport's operations, business and facilities. Currently, personnel are determining what areas need the most attention as they move forward operating the airport.

"We saw this as an opportunity to get in and learn about general aviation and leverage the site for the future of aviation," Gibbons explains. The CVG leadership team is also able to develop its personnel in ways that might not have been possible prior to entering the operating agreement, he adds.

While still in the early stages of this partnership, CVG has already based one employee at OXD. Gibbons reports that he is gaining valuable operations and leadership experience. Looking ahead, Gibbons foresees additional opportunities to engage CVG and university staff in aviation-related business and innovation.

For instance, the facilities at OXD provide a more flexible space for CVG to work with startup companies interested in testing their products in an airport environment. Sometimes, such activity can prove too intrusive at larger commercial airports like CVG.

"There's a lot of thinking around how to get people, goods and cargo from urban to rural areas," notes Kershner. "Small general aviation airports, like OXD, are perfect for this and crucial to making advancements in these areas."

McGraw says that, over time, OXD may serve as a laboratory for aviation innovation—a place to explore the synergies around advancing drone technology, airspace management and increased air mobility. There has even been talk about projects with NASA.

Looking Ahead

Miami University and CVG both foresee the new airport operating agreement fostering additional partnerships and mutual benefits in the future.

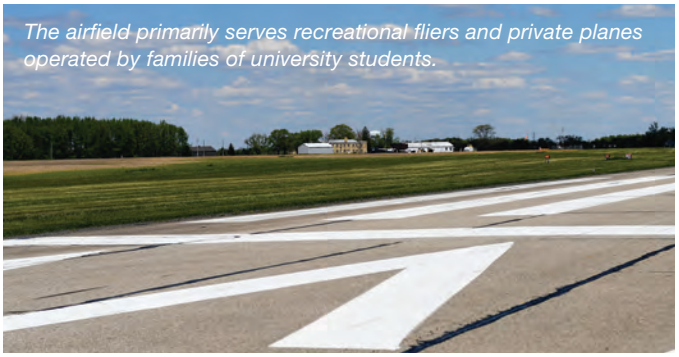
"This long-term commitment to OXD airport will create more avenues for collaboration between CVG professionals and Miami's faculty, and more opportunities for our students in terms of potential projects and internships," said Crawford in a press release.

Kershner notes that strong educational partnerships with Miami University and other colleges and universities in the area dovetail with CVG's ongoing research and development initiatives. Such collaborations can produce revenue for the airport and schools, she adds.

As airport personnel explore ways to increase traffic and revenue at OXD, federal funding is an important part of the equation. Currently, there are four general aviation aircraft based at the airport. But if the CVG team can increase that number to 10, OXD could qualify for FAA Airport Improvement Program non-primary entitlement funding of up to $150,000 per year. Naturally, this would be a major boost for the small facility.

As CVG continues to settle in managing OXD, the near-term goal is capitalizing on its strengths.

"The airport was underutilized," Gibbons comments. "Our first year is focused on stabilizing the airport, its expenses, the facilities and assessing the infrastructure, which means we're still developing what the revenue potential is and exploring that."



The airfield primarily serves recreational fliers and private planes operated by families of university students.

In exploring new revenue opportunities many airports look within their infrastructure or land use for growth potential, but CVG took an unconventional approach in their agreement with Miami University. They are using their core business, strategic goals and the future of aviation innovation as their path forward.

"We are a commercial airport operator, but we're using our knowledge not only for the operational expertise but for our business growth as well," Gibbons concludes.

Celebrating Oregon

Passengers traveling into and out of Rogue Valley International–Medford Airport (MFR) in southern Oregon will likely recognize the large new mural in the main terminal. It's a giant version of the colorful image that appears on license plates throughout the state.

Liza Burns created *Celebrate Oregon!* to help commemorate the 20th anniversary of the Oregon Cultural Trust. Her work depicts the local landscape, with a detailed overlay of graphic symbols that represent key aspects of the state's heritage, arts and culture. Look closely and you'll see significant landmarks, wildlife, historical references and many other gems.

"Ideally, every Oregonian can find something they recognize and love about Oregon," says the artist.

Burns worked with cultural content experts selected by the Governor's Office of Diversity, Equity and Inclusion to determine which symbols to include. A QR code posted near the mural connects viewers to an interactive key that provides more information about the 127 symbols that adorn the vibrant mountain, rivers, valleys and beaches.

JACKSON COUNTY
Airport Authority

Niki Price, board chair of the Cultural Trust, emphasizes how topical the artwork is: "The new design, built on a panorama of Oregon geography, reflects and respects the diversity of our culture at a time we need it most."

Airport Director Jerry Brienza notes that MFR chose to display the artwork pre-security near the baggage claim area so both passengers and greeters can enjoy it.

MFR debuted the new artwork in September. Additional versions also painted by Burns will subsequently be unveiled at Redmond Municipal, Portland International and Eugene Airport. All four airport murals were sponsored by GreenCars.com, an organization that promotes the use and purchase of electric and hybrid vehicles.

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Top 5 Things to Know About Airport Resiliency

As the 2021 Atlantic hurricane season ends, many airports are reflecting on the impact, devastation and response costs that major storms cause. And we *all* should be thinking about how to prepare for future storms—hurricanes or otherwise.

Here are the Top 5 things to consider about airport resiliency:

1. Resiliency can be defined as the ability to adapt and recover quickly from natural disasters and future conditions, such as tidal flooding, storm surge, sea level rise and other natural events. Focusing further on a single word, the natural "events" that require resilience are not limited to storms and floods. Airports also need to be resilient against wildfires, snow and ice, tornadoes, high winds and other significant threats—including infectious diseases such as the current COVID-19 pandemic.
2. Why should an airport invest and work to become more resilient? The answer is simple: to protect its assets; to enable it to continue operating effectively during and after disaster events; and to provide a safe environment to those who will operate or be sheltered within your facility. Quick statistic: Each dollar invested in resiliency protection can save $4 to $6 in disaster response and repair.
3. Most existing airport stormwater systems are not capable of handling a major storm event—even those that are properly designed. Consider planning an operational response beyond what is needed during a 100-year storm event. Expect your storm drainage system to fail partially or completely, and not to function as designed. Consider a scenario when no stormwater is capable of leaving the airport. Even worse, think about adjacent water entering the airport and causing additional flooding. What will you do? How will the airport operate?
4. To boost your airport's resilience, begin by reviewing vulnerable and low-elevation areas of the property that have previously experienced flooding and/or intrusions of water that caused damage. Consider assigning a conceptual flood-protection-line and target elevation above sea level to identify, separate and protect critical areas of the airport. Next, determine what areas can and must remain operational and occupied, with back-up power, water, food and appropriate shelter.

   It's often helpful to subdivide the airport into smaller operational zones:

   - commercial terminal and aircraft parking areas
   - FBO terminals and hangar areas
   - access roads and parking areas
   - fuel storage and fueling operations, and
   - the airfield

   The airfield is listed last because during and after a resiliency "event," the airfield is most likely not going to be operational. Often, only landside areas are available for limited operation and support.
5. Are grant funds available for resiliency projects? Can resilience planning be incorporated into a traditional airport master plan? Yes to both! We suggest taking a holistic approach to resiliency planning by making it a standard component of all future projects, versus making resilience the sole focus of any single project. Using that approach, resilience becomes a logical, grant-eligible portion of future improvements.

***Andrew Holesko**, CM, is the chief executive officer and national director of Aviation Services at Passero Associates. Throughout his 30+ years as a planning and design consultant, he has implemented numerous projects that have enhanced resiliency at many airports on the Gulf and Atlantic coasts.*

The FAA's advisory circular regarding airport master plans allows items of local interest and need to be included within the scope of a master plan. Resiliency considerations should become a part of related operational and facility planning. This includes strategic plans, sustainability plans, asset management plans, safety management system, operations/certification manual, and emergency response training. There are numerous technical references available from ACRP, and other agencies, that are very helpful.

Put simply, airports can never do "too much" to address and implement resiliency measures. It is wise to protect your infrastructure and prepare for events that may overwhelm your facilities and the surrounding area.

Although no airport can be fully prepared for *all* natural disasters and other catastrophic events, it is well worth the time to review the best practices already in place throughout the industry. There are great examples of airport shoreline stabilization and flood protection structures available, as well as innovative solutions for emergency power and water system needs.

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