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DBO TAKES OFF FOR GROWTH

What does the BBA-Landmark merger mean for the industry?

PAGE 36

After years of losing passenger and aviation traffic due to space constraints, Dubuque is opening a new \$40 million terminal and building a true gateway to the city.

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Dubuque Regional Airport is set to open its new \$40 million terminal in June in an effort to improve passenger experience, add capacity and entice more airline service to the city.

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SouthComm
Business Media

PO Box 803 • 1233 Janesville Ave
Fort Atkinson WI 53538
920-563-6388 • 800-547-7377

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GROUP PUBLISHER: Brett Ryden

Brett@AviationPros.com
920-568-8338

EDITOR-IN-CHIEF: Joe Petrie

Joe.Petrie@AviationPros.com
920-563-8370

SENIOR EDITOR: Benét Wilson

BWilson@AviationPros.com
443-838-7033

COLUMNIST: Ralph Hood

ralph@ralphhood.com

SALES

National Accounts Manager: Michelle Kohn

800-547-7377 x3344
Michelle@AviationPros.com

Classified Advertising: Michelle Scherer

920-568-8314
mscherer@AviationPros.com

International Sales Representative: Stephanie Painter

+44 1634 829386 • Fax +44 1634 281504
Stephanie@painter-low.com

PRODUCTION

Art Director: Rhonda Cousin
Media Production Rep.: Carmen Seeber
cseeber@southcomm.com

CIRCULATION

Audience Development Manager: Debbie Dumke

SOUTHCOMM BUSINESS MEDIA

CEO: Chris Ferrell
CFO: Ed Tearman
COO: Blair Johnson
VP, Production Operations: Curt Pordes
VP, Technology: Eric Kammerzell
Executive Vice President: Gloria Cosby
VP Marketing: Gerry Whitty
Director of Digital Business Development: Lester Craft

List Rentals: Elizabeth Jackson

email: ejackson@meritdirect.com
phone: 847-492-1350 ext. 18 • fax: 847-492-0085

Subscription Customer Service

877-382-9187; 847-559-7598
Circ.AirportBusiness@omeda.com
PO Box 3257 • Northbrook IL 60065-3257

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Wright's Media 877-652-5295, ext. 118
bpettilo@wrightsmedia.com

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INSIDETHEFENCE

Joe Petrie
Editor-in-Chief



What We've Got Here is a Failure to Communicate

As politicians and regulators debate the proper layers of security for our airports, it's important everyone gets back to basics.

At the end of March, I was on my way to Florida to take a short vacation when I got a front row seat in watching airport security breakdown.

Flying out of Milwaukee, I got to use my recently acquired TSA Pre-Check for the first time. Strolling past the hoard waiting in the regular line, I walk up to the TSA stand and put my iPhone against the scanner only to have the agent give me a sneer and tell me I didn't belong there. Despite my protest that he was wrong, I was ushered over to the regular line befuddled as to what happened.

Later on the flight, about when we passed by Indianapolis, my girlfriend reached into her purse, suddenly got a puzzled look on her face and asked "wait, am I supposed to have this?"

She pulled out what was roughly a quart of perfume (my estimate at least), then a massive bottle of lotion. Instantaneously, I parroted off the recording engrained in my mind from frequent traveling, "the TSA would like to remind you, 3-1-1..."

In the wake of the recent terrorist attacks in Brussels, security is once again becoming the forefront of conversation in airports as regulators, safety inspectors and politicians all look at ways to secure facilities. No doubt the topic is important, but it causes plenty of consternation in the industry.

One example is our cover story in this month's issue on the Dubuque Regional Airport. After 9/11, the airport found itself with a massive bottleneck thanks to new security checkpoints and all of its parking eliminated for some time when the 300 foot rule went into effect. Even now when they're opening a new terminal, TSA required them to build a vestibule into the agency's office. When asked why, all the airport leaders did was shrug their shoulders and joke "its top secret." What they did know however, was the sizeable cost per square foot it cost to add said vestibule.

Sure, taking pot shots at the TSA is easy, but really it's not the way we get to a better solution as an industry. The agency serves a valuable service and like all agencies across the industry it has to improve, especially in communication. A lack of communication led to a staggering mess of a line when I first signed up for pre-check at Mitchell. Then a lack of communication on the airline side led to my pre-check not working when added to my Southwest account. Then a lack of communication by TSA led to one woman accidentally bringing way too much liquid luggage through security.

The debate whether there are too many levels of security or too few is a difficult one and highly politically charged. However, improving cross agency communications seems like it would be a great place to start.



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► Engaging Passengers with Digital Technologies in the Modern Airport

Airport terminals of the mid to late 20th century – aging infrastructure reminiscent of a more utilitarian era before connectivity and major security initiatives – are now being replaced in abundance with modern, intuitive architecture, higher ceilings, expansions, and

passenger-centric environments. Most passengers just want to get to their destinations quickly as possible. But now, airports are becoming destinations in and of themselves.

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Making the Case for a New Kansas City International Airport

While most of the power players in the city agree that something needs to be done about the airport, there are differing views on how to do it. The last two airport master plans recommended building a new, single terminal.

Kansas City International Airport is in the middle of a battle to build a new, badly needed state-of-the-art terminal. The current three-terminal facility was designed in the 1960s and opened in 1972 during a time before baggage screening was required and increased security was the norm. Bloomberg Business named the airport among the 10 least-favorite facilities as determined by frequent travelers.

In December, the Aviation Department reported that 10.4 million passengers traveled through the airport in 2015, up 3 percent year over year. The airport also received new flights

from Frontier Airlines and Allegiant Air, along with increased frequencies and new destinations from existing carriers.

In 2011, Aviation Director Mark VanLoh sparked a discussion on the airport's future after noting that the current three-terminal configuration was becoming inefficient and outdated. This was during a time when airlines were merging and airports across the country were building more efficient and technologically advanced terminals.

While most of the power players in the city agree that something needs to be done about the airport, there are differing views on how to do it.

The last two airport master plans recommended building a new, single terminal. The city council approved an 18-month study to validate and guide the

design of a new single terminal and recommended that it be built. The Mayor's Airport Terminal Advisory Group also determined that a new single terminal was the best option. Both groups felt the existing terminals are not configured in a way that offers the best passenger experience for residents and visitors.

But some members of the community and a few government officials are opposed to building a new terminal, instead preferring to renovate the facility, which is forecast to cost more than new design/build. Airport officials have said that renovation is not an option, and tenant airlines, including Southwest, agree. The Greater Kansas City Chamber of Commerce is also a supporter of the single terminal, noting it was the best option for passenger safety and convenience.

The Aviation Department has emphasized that no taxpayer dollars would be used to build the new terminal. It will be funded via Passenger Facility Charges, concessions revenues, Airport Improvement Program grants and revenue bonds. And when the time comes, the department will be able to pay for the terminal after Moody's Investors Service revised to positive the outlook on the airport's bonds in June 2015.

But the ratings agency also warned that the airport's 'financial flexibility' is constrained due to low average concession revenues, which the Aviation Department believes is due to the decentralized terminal layout and limited room for traveler concessions inside security.

A solution could be coming soon, as the city's Aviation Department is working with its airlines on a plan, with results expected to be unveiled in May. Here's hoping that sensible heads will prevail and allow the city to build a next generation terminal that will offer a better passenger experience for visitors and residents.



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Modernized Port Columbus terminal enhances passenger experience, expands capacity

Completion of a three-year, \$80 million terminal renovation and modernization program positions Port Columbus International Airport for future passenger growth and reinforces the airport's \$3.7 billion annual economic impact to the Columbus Region.

The multi-faceted terminal modernization program incorporated a major facelift for the ticket lobby, baggage claim and Concourses A, B and C as well as extensive mechanical, technological and security upgrades. Funding sources for this progressive airport initiative, which is anticipated to be the last significant renovation

to the terminal originally opened in 1958, include passenger facility charges and capital reserves. No local tax dollars were used for the renovation.

"We're especially proud that 15 percent of the work was awarded to small and economically disadvantaged businesses," said Elaine Roberts, A.A.E., President and CEO of the Columbus Regional Airport Authority. "We recognize the importance of providing opportunity to businesses of all sizes. While under no federal requirement, this program provided a tremendous opportunity to partner with a wide variety of highly-skilled companies."



Columbus Regional Airport Authority



GOAA Approves Spending Plan

The Greater Orlando Aviation Authority (GOAA) Board unanimously approved the spending plan that will initiate construction of a new South Terminal Complex at Orlando International Airport. At the March 16, board meeting, a revised Capital Improvement Plan (CIP) for FY 2016-2023 that includes the \$1.8 billion South Terminal Complex (STC) Phase 1-Terminal C was sanctioned by the seven-member board.

"The CIP reflects the growth of our global appeal as an international travel gateway for business and leisure," said Frank Kruppenbacher, chairman of the Greater Orlando Aviation Authority. "To enhance our capacity to accommodate projected passenger increases, it is essential we move forward with South Terminal construction sooner rather than later."

AECOM...

assisted Hartsfield-Jackson Atlanta International Airport (ATL) with the development and implementation of an energy management system (EnMS), which was recognized as the first U.S. airport to achieve ISO 50001:2011 certification.

AÉROPORTS DE MONTRÉAL...

announced Pierre-Elliott-Trudeau Montréal international will see no fewer than 110 destinations accessible by direct flight, including four new destinations: Reykjavik, Glasgow, Denver and Hamilton. In addition, the total supply of seats will increase by 13 percent from 2015, while the number of frequencies will be increased by 8 percent. Montréal-Trudeau will also welcome two new international carriers, namely Icelandair and WOW air, which will serve Reykjavik.

AIRPORT BUTLER...

released a new online reservation system.

AIR ELITE NETWORK...

welcomed its 52nd Diamond Service FBO to the network, Skylink Services, located at Larnaka International Airport (LCLK) in Larnaka, Cyprus.

Over 1,200 Students Explore Aviation Careers at Van Nuys Airport

On April 1 Congressman Tony Cardenas, Councilwoman Nury Martinez, Los Angeles Unified School District Board Member Scott Schmerelson, and Board of Airport Commissioner Jeffery Daar, welcomed over 1,200



local high school students and 45 aviation industry experts to Van Nuys Airport for the 11th annual, "The Sky's the Limit: Aviation Career Day."

"In order for the U.S. to continue being a global leader, we must connect our communities

to resources and opportunities in key industries such as the aviation and aerospace field. By encouraging our young generations to seek a career in such fields, we are, in turn, building a framework of innovative professionals that will drive our country forward to a better future," said Congressman Tony Cardenas.

Students in attendance were provided a behind the scenes airport tour, took part in interactive exhibits and viewed aircraft displays including an EA-18 Growler, Condor Squadron's AT-6, Los Angeles Fire Department Air Rescue Unit, and Van Nuys Airport major tenants including Clay Lacy, Signature Flight Support, Western Jet and the North Valley Occupational Center.

AIR FRANCE-KLM...

partnered with Tata Communications to create a superfast network to power the airline's mission-critical systems for new aircraft and provide the foundations for a more seamless travel experience to millions of passengers in the Middle East, Africa and Asia Pacific.

ALASKA AIRLINES INC...

announced the company plans to form a wholly owned subsidiary called McGee Air Services, which will operate as a vendor to Alaska Airlines and will compete for Alaska contracts in select cities. As the company develops the infrastructure and processes, McGee Air Services will evaluate opportunities to serve other airlines.

ALLEGiant AIR...

announced new seasonal non-stop flights to Tulsa, Okla., from New Orleans will operate twice weekly starting May 26.

AMERICAN AERO FTW...

announced Riggs Brown, general manager at Meacham International Airport in Fort Worth was named a 2016 "40 Under 40" award recipient by the Fort Worth Business Press.

ASTRA AVIATION...

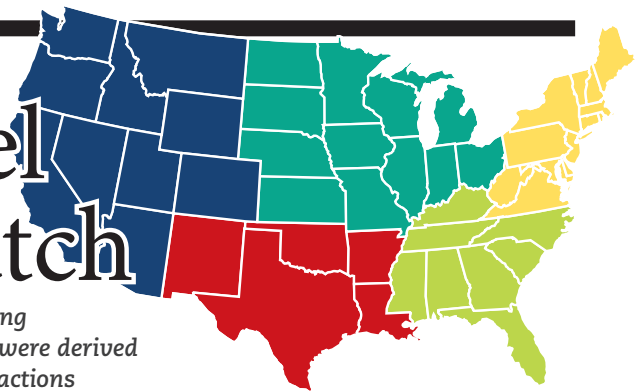
expanded its presence in Africa with the addition of a new location at Harare International Airport in Zimbabwe.

THE BIRMINGHAM AIRPORT AUTHORITY ...

promoted Leslie Williams-Murray to director of administration services.

Fuel Watch

The following fuel prices were derived from transactions completed with the AVCARD credit card during February. Not all operations sell both jet-A and Avgas. The figures for jet fuel prices will be more representative than those for Avgas, due to the higher number of transactions recorded. Prices reflect all taxes and discounts. Data is supplied from AVCARD in consolidated format; individual transactions are not disclosed.



West Coast

Jet-A: \$4.06
Avgas: \$5.31

South Central

Jet-A: \$2.33
Avgas: \$4.63

Southeast

Jet-A: \$3.60
Avgas: \$4.97

North Central

Jet-A: \$3.96
Avgas: \$5.13

Northeast

Jet-A: \$3.80
Avgas: \$5.26

She leads and directs human resources, DBE program, risk management and information technology.

CLARK COUNTY DEPARTMENT OF AVIATION...

launched "Voices of Vegas," which features a custom playlist broadcast over the public address system so those at the airport and the McCarran Rent-A-Car Center now hear hits by music stars with Las Vegas ties.

DALLAS FORT WORTH INTERNATIONAL AIRPORT (DFW)...

was recognized by the U.S. Environmental Protection Agency (EPA) for Excellence in Greenhouse Gas Management—Goal Setting, for its plans to achieve its GHG reduction goals through a variety of measures, including increasing its proportion of renewable electricity from 30 percent to 40 percent; introducing alternative fuel fleet vehicles; and integrating best available energy efficient technology into its facilities.

DASH DESIGN...

announced the appointment of Peter Burgoyne as a new creative director for the firm.

DENVER INTERNATIONAL AIRPORT (DEN)...

set a record for the busiest February in the airport's history, with 4,069,006 passengers, which is an increase of 10.2 percent over the 3,693,876 passengers in February 2015 and the sixth-consecutive month of record-setting passenger traffic at the airport.

EASTERN AVIATION FUELS...

welcomed the Florence Regional Airport (FLO) in Florence, S.C., to the Shell FBO network as Precision Air entered into an agreement to manage the FBO operation.

GREENWOOD AIRPORT...

eliminated 100 percent of landing fees for all aircraft and allow companies to enter into a contract fuel program to try and attract more corporate jet traffic.



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GRUPO AEROPORTUARIO DEL CENTRO NORTE, S.A.B. DE C.V...

reported that terminal passenger traffic at its 13 airports increased 11.4 percent in February, as compared to February 2015.

HNTB CORP...

was selected by Dallas Fort Worth International Airport (DFW) to perform program management/construction management services for the next five years.

JET AVIATION ST. LOUIS...

earned certification from the Mexican civil air authority as a repair station Approved Maintenance Organization (AMO) for aircraft registered in Mexico.

JETBLUE...

awarded \$150,000 in grants to help encourage aviation programs that support science, technology, engineering and mathematics (STEM) initiatives.

MERIDIAN...

announced the addition of a Gulfstream GIV-SP (N999AA) to its growing charter fleet of private business jets.

MILLION AIR DALLAS...

announced Bob Schmidt was named president of the company.

PHOENIX-MESA GATEWAY AIRPORT AUTHORITY...

Selected AirIT's integrated suite of airport IT solutions to facilitate continued growth.

SSP...

has been awarded a seven-year contract valued at approximately £90 million to operate eight food and beverage outlets, as well as a state-of-the-art conference centre at Düsseldorf Airport. The outlets will open between 2017 and 2019.

Dallas Love Field Showcases Texas Music

Dallas Love Field is teaming with North Texas businesses and the Texas Music Project to bring rising stars and established Texas artists alike to a new performance stage in the lobby of the airport's main terminal. The stage, which debuted April 4, is positioned inside the secure area, near the food court.

Performances by Texas musicians will be scheduled from 11 a.m. through 2 p.m. on weekdays. Dallas singer-songwriter Jon Christopher Davis was the first artist to grace the stage in the Texas Music Singer-Songwriter Series.

GoVision was contracted to install a 9' x 16' LED wall comprised of GV 3.9mm LED panels to serve as the stage's backdrop.

Michael Clay, principal and owner of Michael Clay Productions, who developed the concept of the Love Field Stage, said his primary goal is to help provide performance opportunities for rising stars and established Texas artists alike.

"Texas is known worldwide for its musical contributions and the state boasts more Hall of Famers and Grammy winners than any other place on Earth," said Clay. "With millions of people passing by this stage in the years to come, we have created a new platform for live performances by talented artists, fully equipped with state-of-the-art sound, lights and video."



Performances by Texas musicians will be scheduled from 11 a.m. through 2 p.m. on weekdays. GoVision L.P



The south tower incorporates a high-performance curtain wall designed to maximize the use of daylight, a geothermal heating and cooling system, LED lighting wherever possible, and a green roof on the base building (not visible in this view).

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New Runway and South Tower Complete a Major Milestone of O'Hare Modernization Program

Runway 10R-28L adds another parallel east-west runway; new south air traffic control tower is designed to achieve LEED Gold.

The Chicago Department of Aviation's (CDA) ongoing O'Hare Modernization Program (OMP), which is anticipated to be completed in 2021, has already achieved many major milestones, including the recent opening of the \$516 million, 7,500-foot-long Runway 10R-28L and the new \$41 million, 218-foot-tall south air traffic control tower. Initiated in June 2001, the more than \$8 billion OMP is transforming O'Hare's airfield from an intersecting runway system to a more efficient parallel runway system — increasing the airport's capacity, reducing delays and meeting the anticipated demand well into the future.



Runway 10R-28L adds another parallel east-west runway for the south airfield in alignment with the predominant wind direction in Chicago.

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Runway 10R-28L adds another parallel east-west runway for the south airfield in alignment with the predominant wind direction in Chicago. O'Hare's fourth new east-west

runway in the last 10 years, it has significantly increased the arrival/departure rate under visual flight rules (VFR) conditions. The runway enables planes to operate safely at high

capacities in all weather conditions. The new south tower is the second new tower at O'Hare to be designed to achieve LEED certification. The commissioning of Runway 10R-28L and

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O'HARE MODERNIZATION PROGRAM (OMP):

Selected Milestones 2001-15

- ▶ **June 29, 2001:** Mayor Richard M. Daley announced the O'Hare Modernization Program (OMP) with the goal of reconfiguring O'Hare's airfield into a modern, parallel runway layout, thereby increasing the airport's long-term efficiency, capacity and safety.
- ▶ **2003:** The OMP sustainable design manual (SDM) was released, making Chicago the first in the nation to develop sustainability guidance for airports. The SDM was applied to every OMP design and construction project, resulting in the evolution of a unique process and many industry firsts, including the development of an airport green rating and award system.
- ▶ **2005:** The FAA issued a record of decision in favor of the OMP followed by a letter of intent funding \$337 million for OMP phase 1.
- ▶ **2006:** The FAA approved the OMP phase 1 noise program passenger facility charge application and implemented mandatory flight caps at O'Hare.
- ▶ **2008:** New OMP Runway 9L-27R, the extension of Runway 10L and the north airport traffic control tower were commissioned ahead of schedule and \$40 million under budget. The FAA allowed mandatory flight caps at O'Hare to expire at the end of October.
- ▶ **2009:** The FAA approved the OMP completion phase design passenger facility charge application and the remaining OMP noise program passenger facility charge application.
- ▶ **2010:** The FAA issued a letter of intent funding \$410 million for the OMP completion phase.
- ▶ **2011:** The city of Chicago, American Airlines, United Airlines and the FAA announced a \$1.17 billion funding agreement for construction of OMP phase 2A.
- ▶ **2013:** The OMP commissioned Runway 10C-28C, marking the completion of OMP Phase 1 and the halfway point of the OMP.
- ▶ **Oct. 15, 2015:** The OMP commissioned Runway 10R-28L and the south air traffic control tower, marking the completion of all runway/taxiway construction in the south airfield for the OMP.

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the south air traffic control tower marked the completion of all runway/taxiway construction in the south airfield for the OMP.

WSP | Parsons Brinckerhoff has served the city of Chicago for more than 10 years, managing the construction of four runway components and two air traffic control towers as part of the OMP. The firm is responsible for construction management, inspection, quality assurance, safety, project controls, document control and contract administration.

DESIGNED FOR SUSTAINABILITY

O'Hare operated with one control tower until November 2008, when a second tower, the north air traffic control tower, was commissioned. The opening of the new south tower in October gives O'Hare three Federal Aviation Administration (FAA) certified towers.

The newest towers were constructed with sustainability in mind from design through

The cab of the south tower has full, unobstructed views of Runway 10R-28L.

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construction. The north tower was the first certified LEED® Silver air traffic control tower in the U.S.; LEED Gold certification is being pursued for the south tower.

Innovations not previously seen in air traffic control towers were incorporated into both towers. They each have green roofs on the base buildings and include sustainable components, such as high-efficiency systems



and use of recyclable, local and low-emitting materials. Additionally, the south tower operates with a geothermal system of heating and cooling, LED lighting wherever possible and a high-performance curtain wall designed to maximize the use of daylight.



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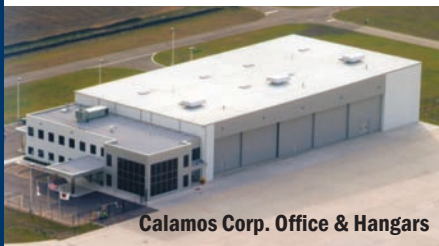
Moreover, nearly all of the construction material stayed on site instead of being hauled away and it was reused wherever possible. Recycling measures were extended to the runway projects as well, where concrete was crushed into aggregate and reused whenever possible in the runway and taxiway shoulders.

COLLABORATION IS KEY

Collaboration is critically important for the successful execution of the largest airport construction program in the U.S. Much of the firm's personnel has been involved from the start of the program, working in the same building as the OMP team. The co-location of the construction manager with the program manager, designers, airline representatives,

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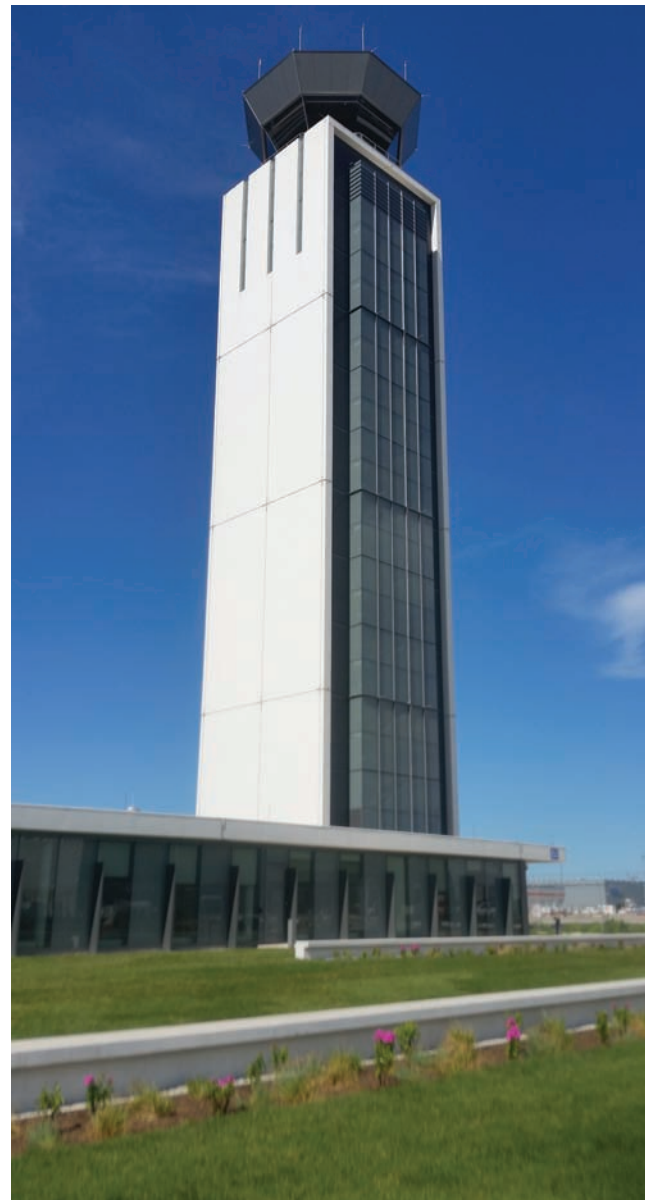


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The south tower incorporates a high-performance curtain wall designed to maximize the use of daylight, a geothermal heating and cooling system, LED lighting wherever possible, and a green roof on the base building (not visible in this view).

WSP | Parsons Brinckerhoff



AIRFIELD IMPROVEMENT



The south tower's cab glass is hoisted into position using a crane.

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and the CDA has enabled the prompt discussion and resolution of construction issues. In addition, the team's weekly meetings with airport stakeholders have been critical to the success of these projects, ensuring that any planned closures of taxiways and runways will have little or no impact on airport operations.

There were major work challenges involved in the construction of Runway 10R-28L, which is located on an active airfield. This involved moving 3.5 million cubic yards of soil despite an extraordinary rainfall in the spring of 2014. Two tunnels were constructed under the runway and taxiway through the winter of 2014-15 — a harsh winter even by Chicago standards — to maintain the schedule. The contractor was tasked with providing winter protection and

temporary heating to allow concrete to be poured throughout the season.

Although the majority of Runway 10R-28L is outside of most taxiways, the fiber optics transmission system (FOTS) loops had to be pulled throughout the airfield. The work was carried out at night to minimize the impact on airport operations. On previous runway projects, runway thresholds were displaced to enable construction in the safety areas. The associated reductions in runway lengths restricted the weight limits of some aircraft; however, the runways safely remained in operation during construction.

TRANSFORMING O'HARE

Several components remain to complete the OMP: construction of Runway 9C-27C, a crossfield taxiway system, a deicing pad/facility and the relocation of Taxiways A and B. With the completion of the OMP, O'Hare will have a total of eight runways — six east-west parallel runways and two crosswind runways.

To date, the Runway 10R-28L project has received the American Council of Engineering Companies of Illinois' 2014 Honor Award and the Hispanic American Construction Industry Association's 2015 Project of the Year Award.

As the nation's largest airport construction program, the OMP continues to serve as a model for how to execute such a massive program on schedule, under budget and in the most sustainable manner possible. Moreover, as a catalyst for economic growth and job creation, the CDA's OMP is making a significant contribution to keeping O'Hare and the city of Chicago competitive in the global marketplace.

ABOUT THE AUTHOR

Thomas C. Lyon, P.E.

Thomas C. Lyon, P.E., Construction Manager, is overseeing the work on the OMP in Chicago for WSP | Parsons Brinckerhoff.



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All of these items aren't just important things to have before heading to the airport — they're also all items that travelers expect to access via their mobile devices, such as smartphones and tablets.

When today's traveler steps into an airport, they're on their mobile devices from the parking lot to the gate. As more passengers use e-tickets, airline apps and everyday tools like email and social media to stay connected until they reach their destination, connectivity can make or break their experience within the airport.

The demand for easy-to-use technology shows no signs of slowing. A recent survey found that travelers are carrying more Wi-Fi enabled devices than ever before. About 97 percent of air travelers take along a smartphone, tablet or laptop when flying and one in five travels with all three. More than 90 percent of passengers expressed interest in using new mobile services while at the airport like flight and bag collection updates, airport

concession services and directions. If travelers aren't already dependent on their smartphone now, they will be in the near future. Moreover, today's travelers expect their connectivity at the airport to be as quick and easy to use as it is at their home or office.

With the current and projected growth in usage of mobile devices at the airport, IT teams are faced with a seemingly unwinnable tug-of-war between delivering the kind of easy, fast and seamless services travelers want and generating the important non-aeronautical revenue needed to continue offering complimentary service and to maintain the network. With connectivity considered an airport business imperative, how do today's airports manage it, monetize it, and move to quickly evolve with changing traveler needs?

Fortunately there is an answer to this very real challenge. Leading airports are embracing new managed services best practices and efficiencies to make networks more scalable, adaptable, and user- and bottom line-friendly.

ADOPT WORLD-CLASS EXPERIENCE STANDARDS

With the advent of the mobile-first consumer, the wireless industry coalesced to develop new standards that would make

Wi-Fi as easy and safe to use as cellular phones or home and office Wi-Fi networks. After nearly four years in development, a suite of powerful new wireless protocols called Passpoint made their debut at several airports across the U.S. in 2014.

Developed by a consortium of leading international wireless standards bodies, Passpoint delivers a connected experience to passengers.

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WIFI OPTIMIZATION

There are no logins and passwords to remember. No apps to download. With a Passpoint-enabled Wi-Fi network at the airport and a Passpoint profile installed on their device, a traveler is automatically connected to the fastest Wi-Fi available. Passpoint connects users securely as well, with an instant enterprise-grade WPA2-encrypted session.

The Passpoint experience may soon become a familiar one to consumers, with 25 major airports and other large-scale venues nationwide offering Passpoint-enabled networks today. In addition, major device manufacturers such as Apple, Google, Samsung and Microsoft are already supporting Passpoint, and carriers such as Time Warner Cable and Sprint are extending this quality of service to their customers. Sprint enabled millions of devices to automatically offload to Passpoint networks by Q4 2015, with plans to eventually offload millions more onto these networks to ensure an outstanding connected experience to customers, and balance their network capacity between their Wi-Fi and cellular networks.

In addition to offering the best available wireless experience to customers, Passpoint has the potential to offer a new revenue stream to airports. Wireless carriers and mobile service providers who choose to seamlessly move their customers to the airport's Passpoint-enabled network pay for the opportunity to do so, providing a new funding source to offset network operation costs. The customer only needs Passpoint credentials loaded on their device which, based on their provider, may also be done automatically without the customer needing to do a thing.

EMBRACE THE CLOUD

With user demand increasing, and connected behaviors evolving quickly, network scalability has become essential. Airports that embrace the cloud and the power of virtualized networks can ensure that they are prepared with a future-proofed wireless system.

Today, leading network providers are designing networks utilizing the latest network function virtualization (NFV) and software-defined networks (SDN) technologies. These technologies aren't just cleverly named — they allow for virtual, centralized management of networks by airports or their managed services providers via software.

These technologies allow networks to scale up automatically to meet increased demand. The responsive technology of a virtualized network is instantly optimized to bring additional servers online when capacity needs to increase in real time.

Services managed virtually in the cloud allow for a more flexible and efficient network. These technologies can also allow airports to

bring new services more quickly to their consumers, as they allow for easier trial and service evolution through virtualized management.

ANALYTICS BUILT FOR ACTION

While operating an efficient, scalable and consumer-friendly network is among the top priorities of airport IT teams, bottom-line considerations are ever-present. Today's savvy air-



Boingo Wireless

port technologists not only want to help passengers feel at home, but they also want to understand and leverage connectivity data to better serve these passengers and drive ancillary revenue in the process.

Today's advanced, managed Wi-Fi networks can provide insight into overall system availability, bandwidth consumption, aggregated wireless usage per server, and even physical location of devices. Customized reporting structures delivered by a managed service provider on a regular basis or by immediate need can provide a more holistic picture of the network, which IT teams can use to evaluate the network's peak times and traffic trends. With this valuable information in hand, airports can formulate and implement appropriate actions to improve operations and optimize concessions, ultimately improving the passenger experience and overall service availability.

In this new age of the "Internet of Everything," airports have more opportunity than ever to understand the customer journey. Having the right tools to mine this data will be invaluable for new service propositions. Actionable data, such as the number of passengers connected, demographics and psychographics, usage behavior, browsing and streaming behavior, can help shape informed business decisions and new approaches to customer care.

TAILORED MONETIZATION, INCREASED FLEXIBILITY

Savvy airport and large-scale venue managers realize that their customers aren't biased toward a Wi-Fi or cellular connection. They are connectivity omnivores, who will connect to the best network available to get to the content that they crave.

With data demand projected to grow by 8 times by 2020, high-traffic airports are leveraging all of the latest technologies to ensure sufficient coverage and capacity for connected travelers, and for their airport operations. These technologies include Wi-Fi, Distributed Antenna System cellular networks (DAS), and small cells, to ensure comprehensive, flexible coverage across all device types and carriers.

Airport networks featuring comprehensive, unified architecture incorporating both licensed and unlicensed technologies also offer terrific flexibility in business models. These networks can support wholesale access, like carriers extending the network to their customers and paying for the opportunity. As with Wi-Fi networks, these networks can support fun, engaging advertising that helps subsidize complimentary network access. And as connected needs evolve, these networks can support tiered service experiences, providing travelers with a customized experience, and the speeds that best serve their needs on a given day. Airports can take advantage of all or some of these business models with a network that is upgraded for today's connected consumer.

MANAGING THE NETWORK OF THE FUTURE

To many airport staffers, the scenarios described may sound idyllic. With seamless connectivity, passengers are able to self-direct themselves around the airport and find the information

they need from a push notification on their phone. The challenge, however, is allocating the resources to make it possible. Creating a fast, reliable and future-forward network infrastructure often doesn't fit into budgets or requires too much ongoing attention and workload for IT teams.



UNSURPASSED AVIATION EXCELLENCE



TOP: SFO Air Traffic Control Tower, California | LEFT: Denver International Airport – DIA Hotel and Transit Center (photo courtesy of Denver International Airport) | RIGHT: Charlotte-Douglas International Airport Parking Garages, North Carolina

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WIFI OPTIMIZATION

Partnering with a managed service provider can help technology directors fill this gap by

With the right expertise and resources in place to support these critical objectives, staying at the forefront of the latest technology becomes standard operating procedure - leading to fewer headaches, happier customers and stronger long-term ROI on network investments.

outsourcing the tasks of monitoring, monetizing and evolving the airport's wireless network.

With the right expertise and resources in place to support these critical objectives, staying at the forefront of the latest technology becomes standard operating procedure - leading to fewer headaches, happier customers and stronger long-term ROI on network investments.

In terms of scale, speed and structure, the aggregation of data will reach new heights and require new technologies. And in terms of transforming raw data into data of value, airport operators should look to partner with service providers with the right skills and experience. Relationships with wireless carriers, thorough and quick technical integration and a reputation for high-performance and scalable networks are must-haves for busy airports. The best partner will not only understand the business and end-user needs, but will also bring a deep understanding of

industry trends and best practices on how to deploy and stay current with the most advanced technology.



ABOUT THE AUTHOR

Scott Phillips,
Boingo Wireless

Phillips is the Boingo's vice president of business development, with a focus on North American airports. Scott oversees the service strategy for Boingo's North American aviation customers, as well as all aspects of airport partner account management. Scott has more than 30 years of experience in serving some of the world's largest airports through development of innovative wireless solutions. Prior to joining Boingo, Scott founded and served as CEO of Advanced Wireless Group (AWG) and Electronic Media Systems, Inc. (EMS). Scott graduated from Rollins College in Winter Park, Florida.

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Sell Transportation Plus Recreation!

We have pushed the transportation value of general aviation far too often, the recreational value far too seldom. Truth is, we need both.

In recent months we've experienced an ever-increasing alarm about the dearth of new pilots in training. There have been more than a few solutions offered, and here is mine.

First, we must accept two facts:

1) Buying and flying a private airplane for transportation is expensive and most people can't afford it. 2) Buying and flying a private airplane for recreation is so much less expensive that many more people can afford it.

We have pushed the transportation value of general aviation (GA) far too often, the recreational value far too seldom. Truth is, we need both.

When non-flying people ask me about the cost of flying, I tell them it is expensive if you use an airplane for transportation, but not expensive if you use it for recreation. They are often surprised by my answer, but, by golly, they do ask a lot more questions than if I told them what a Bonanza costs!

I met a young working man recently who avidly sought info about buying an airplane and learning to fly. He had planned to buy a used Cessna 150/152, had checked the prices and was pleasantly surprised. (This young man maintains a fleet of school buses. He understands mechanics.)

Then a "real" pilot suggested he not "mess around" with a two-seat airplane, but buy a C-172. The young man and I talked for over an hour, during which he decided the smaller airplane would do everything he wanted right now. He could afford it and he was interested in recreational flying. He did ask me if he could fly it on trips occasionally, and I assured him that he could do so and enjoy it.

We have LSA aircraft now. No medical required and one can buy a qualifying Cub, Champ or Taylorcraft for peanuts, comparatively speaking. Maintenance, insurance, fuel and upkeep will be much less expensive; and with only one passenger, he is much less likely to get into trouble. Any one of the above airplanes can be purchased — used, of course — for far less than the avionics installed in a bona fide transportation aircraft.

Low-budget aircraft probably won't be based at large airports, but on little airports. That's true, but be honest — do you really want a Champ at your airport?

Somehow, somebody has to train a lot of new pilots. Recreational flying will help do that.



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By Joe Petrie



DBQ

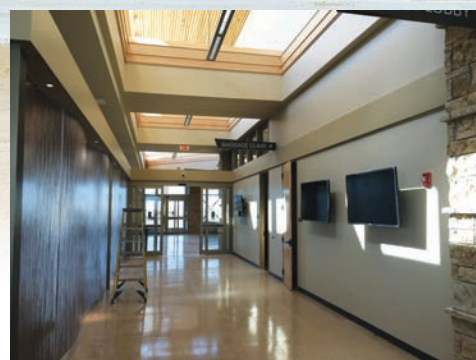
TAKES OFF FOR



Tiles on the floor of the new Dubuque terminal highlight the Mississippi River as part of the design. Joe Petrie/Airport Business



Natural lighting is a major part of the new Dubuque terminal as part of the city's larger push for sustainability. Joe Petrie/Airport Business



Samsung digital signage hangs in the new Dubuque terminal for flight information, entertainment and advertisements. Joe Petrie/Airport Business

Walking through the terminal at Dubuque Regional Airport (DBQ), you can see the evolution of flight in northeastern Iowa.

The linear facility offers a small waiting area with a security screening checkpoint jammed into a hallway between the gate and the luggage belt located next to the main entrance. Adjacent to the mixed arrival/departure area, three rental car counters crowd into the space while airline ticketing counters sit across the hallway. Walking away from the passenger area,

GROWTH

After years of losing passenger and aviation traffic due to space constraints, Dubuque is opening a new \$40 million terminal and building a true gateway to the city.



The new security area at DBQ is built to handle two lanes of traffic as opposed to just one lane in the old terminal.

Joe Petrie/Airport Business



The airline ticketing area of the new Dubuque terminal includes space for another airline if they're willing to serve the area. *Joe Petrie/Airport Business*



The new terminal significantly expanded its baggage claim to accommodate large amounts of passengers.

Joe Petrie/Airport Business

a darkened video game room with old arcade machines and empty business room stand idle from a bygone era.

And when you get to the restaurant located on the opposite side of the terminal of where passengers wait for flights, people eat as an Embraer 145 regional jet taxis onto the apron from Taxiway Alpha right outside the windows.

The plane looks as if it's about to collide with the glass before making a sharp turn to the gate, squeezing into its resting place.

"You can see how close Taxiway Alpha is right there," Dubuque Airport Manager Robert Grierson points out. "The whole building is really three different components. None of which took into consideration larger aircraft.

"Truthfully, it's designed for a DC-3. Now when you're talking about getting a 70-seat regional in there, jet it's tough."

Dubuque's airport terminal has slogged through 70 years of change, but now its time is finally coming to an end as DBQ opens its new terminal June 16, and ushers in a new future for passengers.

TIME WELL SPENT

Grierson says DBQ is a Part 139 airport, with about 97 percent of all operations being general aviation. American Airlines flights operated by Envoy Air provide the only commercial service to the airport, with three flights daily going between Dubuque and Chicago O'Hare International Airport (ORD). Sun Country flies charter 737 jets to the airport as well.

It also hosts a Part 141 flight school, run by the University of Dubuque as part of its aviation program.

DBQ is also the only airport in Iowa with a contracted tower, which is VFR-only. It's currently the second busiest airport in Iowa.

The airport is staffed with 17.8 FTEs and has an annual budget of \$4.8 million.

"You can add Waterloo and Sioux City together and we still beat them," Grierson said. "And they're 24-hour."

Todd Dalsing, airport operations and maintenance supervisor for DBQ, has seen the airport evolve since he came through the university's flight program in 1993 and started working

as a part-time line service worker pumping fuel. "At that time it was all Navajos," he said. "This whole airfield was Navajos and you could jump in from one to the other."

DBQ's old facility was first constructed in 1947, which was then expanded in 1969 when another piece was built to move operations over. In 1986 the facilities were merged together.

The linear design of traffic flow creates a major chokepoint in the facility, with the single lane Transportation Security Administration (TSA) security checkpoint, baggage claim, rent-

EVOLUTION OF DUBUQUE REGIONAL AIRPORT

- ▶ **1928** - Business and community leaders lease with Interstate Power Co. for the use of Nutwood Park, formerly the site of the old racetrack (presently Wickes Lumber/Minnesota Furniture).
- ▶ **1934** - February - Dubuque's first municipal airport, was relocated to City Island (formerly Ham's Island); this location was prone to heavy flooding and considered too hazardous for pilots and was abandoned in 1948
- ▶ **1944** - Dubuque's second municipal airport began operating at the current site.
- ▶ **1948** - Work on runway/taxiways completed and on Oct. 24, the airport and new terminal facility was dedicated by first Airport Manager Ole Olson.
- ▶ **1952** - Maintenance shop and garage built.
- ▶ **1967** - Lengthening of Runway 13/31 from 5,600 ft. to 6,500 ft.
- ▶ **1968** - New terminal building constructed (current facility) and dedicated Nov. 23, 1969.
- ▶ **1973** - Air Traffic Control Tower made operational.
- ▶ **1988** - Terminal building was remodeled.
- ▶ **1988** - Fall - Dubuque Municipal Airport - airport then began being governed by five-person airport commission elected to serve four-year terms.
- ▶ **1990's** - Record passenger traffic pushed the limits of terminal facility.

- ▶ **2000** - Terminal Area Study was conducted and was approved in 2003 by the Federal Aviation Administration (FAA) to evaluate size and location for new terminal.
- ▶ **2004** - Benefit Cost Analysis study conducted and approved by FAA.
- ▶ **2005** - Environmental assessment completed.
- ▶ **2006** - Master Plan and Airport Layout Plan was updated and approved by FAA.
- ▶ **2009** - Land acquisition completed for new terminal facility and Preliminary Design Phase began.
- ▶ **2011** - August - Site work began.
- ▶ **2012** - Oct. 12, ground breaking ceremony for new terminal building.
- ▶ **2016** - Opening of new terminal facility.

Sustainability Features

- ▶ **Stormwater Design features** to help reduce the amount of water flowing off site and the amount of contaminants filtered on site versus off site.
- ▶ **Light pollution reduction** by eliminating non required up-lighting.
- ▶ **Water efficient landscaping** requiring no additional irrigation.
- ▶ **Water use reduction** strategies including waterless urinals and tankless water heaters.
- ▶ **Emphasis** on the use of recycled materials throughout the design.
- ▶ **Construction waste management through-**

out construction maximizing the amount of recycled goods being reclaimed.

- ▶ **Emphasis on regional materials**, i.e., harvested, manufactured and shipped from within 500 miles.
- ▶ **Indoor environmental controls** increasing the quality of the indoor environment for occupants.

Funding Breakdown

- ▶ **\$39 million** project
- ▶ **33,000-square-foot** facility
- ▶ **Est. 85% federal funding** from Federal Aviation Administration (FAA)
- ▶ **Est. 15%** local latch

Major Terminal Project Components

- ▶ **Design** - All Phases
- ▶ **Site** Preparation
- ▶ **New Terminal Building**
- ▶ **Aircraft Parking Apron** & Taxiway System
- ▶ **Utility** Infrastructure
- ▶ **Furniture**, Fixtures & Equipment
- ▶ **Landside Paving** - parking lot, ring road, entrance road, perimeter road

Airport Statistics

- ▶ **Provides \$34.4 million** in annual economic impact to tri-state area
- ▶ **2nd busiest** airport in Iowa
- ▶ In 2015, DBQ had **36,820 enplanements** on American Airlines **up 7%** from 2014
- ▶ **3 straight years** of growth in enplanements

al car area and greeter areas all converging in one common area.

“It’s just a sea of humanity on occasion,” Grierson said. “It was just never designed to accommodate this kind of traffic.”

Furthering issues is post-security holding area, which holds about 50 people and includes two toilets and vending machines. The lone restaurant is outside of the checkpoint, so Grierson says the only options are either “wolfing down” food quickly before security or waiting to eat at O’Hare, which means paying twice the price for food.

When 50 people are waiting in the sterile area and a flight arrives along with a charter flight with another 150 passengers coming in, it creates even more of an issue.

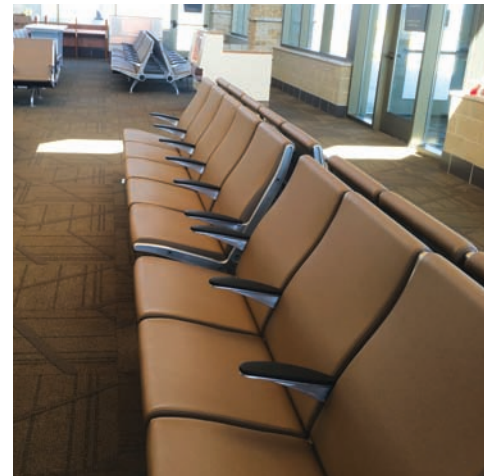
“If you get just a charter jet and you have 150 or 160 people on board, you literally have only 50 people in the sterile holding area and screened and then you have a line of 100 people that still

have to be checked in while those 50 people are then sitting on the plane,” Dalsing said.

Randy Vogel, project manager for the terminal project, of Crawford, Murphy & Tilly, says the process of looking at terminal replacement started pre-9/11, but it came to the forefront after the terrorist attack because new rules caused major issues for Dubuque. When authorities ruled no one could park within 300 feet of a terminal, almost all of the airport’s parking was eliminated. He said they did bomb blast analysis and made efforts to gain parking back, but there was a fear of not being able to obtain future waivers.

“It was in a building that was already too small to start with and now it was much too small,” Vogel said.

Grierson said flights at DBQ are at capacity. The 2015 growth rate was 7 percent; 6.8 percent in 2014 and 3.8 percent in 2013, so it’s exceeding the national average.



Each of the seats at the new Dubuque terminal features an outlet and USB plug for passengers to charge mobile devices while waiting for their flight.

Joe Petrie/Airport Business

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"We need more capacity," he says. "We're losing approximately 80 percent of ticketed passengers to other airports where they're paying more for their tickets. They're driving several hours to go to other airports to pay more for a ticket because they can't get out of Dubuque."

There's a challenge in getting airlines to invest in Dubuque, Grierson says, due to a misconception they have about the area. When airlines think of Iowa, they think of corn and soybeans, but Grierson said major corporations like John Deere, McGraw-Hill, IBM and Prudential all have place in the city, creating a different environment than the rest of the state.

Grierson says potential passengers are driving to Chicago, Cedar Rapids, Iowa, Moline, Ill., and Madison, Wis., to reach flights, even in hard winter weather because it's so hard to get a ticket out of DBQ.

"The new terminal building will have the capability to handle more aircraft and it'll be able to accommodate larger aircraft," he says. "Today, just having a 50-passenger jet maneuver on that apron is a bit of a challenge. When we have our 737 charters, they fit, but it's definitely not as well configured as it should be."

Grierson, an Elmhurst, Ill., native, started flying at 14 years old, before attending Eastern Illinois University, then joining the Army's flight training program, then went through graduate school at Northern Illinois University for public administration before getting recruited by the city of Chicago to run the budget for O'Hare, Chicago Midway International Airport (MDW) and Meigs Field. While it was at the kickoff of the O'Hare development program, the highly politicized nature of large airport operations wasn't an area he wanted to be.

"There I am, all of a sudden in charge of a \$350 million operations budget at O'Hare, earning less than an entry-level truck driver,"

he said. "It was a learning experience working in a passenger facility and I got to see what I never wanted to evolve into. I prefer the small airport environment."

Grierson then went to be airport commissioner for DuPage County, Ill., where he led it through a massive expansion program, then went to Fresno, Calif., then another smaller airport in Northern California before heading to Dubuque in 2006.

Grierson says coming back to the Midwest got him in touch with his roots and into a community that's a great place to raise kids.

"We have to balance ourselves in terms of who we work for," Grierson said. "You've got some airports and they say 'we don't care about general aviation, we love the airlines.' Well, we've got to love everybody."

"We don't care if you've got an experimental airplane or you're flying a 737 charter, we love you."

A NEW BEGINNING IN AIR SERVICE

Design was a major part of the facility to give passengers a comfortable experience in traveling through Dubuque. Designers and planners worked together to create a functional terminal with the design set with a "prairie feel," to fit with the area, including a mosaic of the Mississippi River down the main walkway with markings of landmarks so travelers can look down and see where they live.

The airport even had the jet bridge painted tan to fit the motif. Grierson says a lot of passengers will look at the outside of an airport when arriving and think it akin to a "Tennessee trailer court," and DBQ wanted to avoid that.

"We view the airport as the first thing you see when you come to the community as well as the last thing you see when you leave the community," he says. "It's really the first and



Crews finish up the access road to the new terminal. Joe Petrie/Airport Business

last impression, so we need to make sure it's a positive one because what people see there now, yeah, there's a lot to be desired."

Planners looked at building on the old terminal site, but determined there wasn't enough room and Grierson says he originally liked the idea of building on the west side of the airfield, but there were access issues. The University of Dubuque will take over the old terminal and turn it into classrooms and office space, which DBQ is trying to guide the college through once the move is made.

They decided the area at the south of the airfield would work best, however, it was located in a valley and it meant the airport had to negotiate the purchase of 103 acres of land, which took time as the seller initially wanted three times what DBQ was willing to pay.

"It was owned by a farmer and the county had zoned it residential, so we had to get this property," Grierson said. "It was a bad decision back in the 1960s to zone this as residential right between our runways."

The new terminal is about 33,000 square feet, compared to 11,000 for the existing terminal. It also utilizes space better, Grierson says because the linear design of the old terminal made it congested on one area. The changes will create a better flow.

"We recognize that within a couple of years there's going to be changes in the industry," he said. "We tried to keep on the leading edge of how you process passengers and security screening."

The new security entryway includes space



The gate to the new terminal was custom painted to match the rest of the new terminal.

Joe Petrie/Airport Business

for two lanes, while the outbound way includes automatic doors, Grierson says, which automatically close once someone crosses a certain point when trying to breach the area and their photo is taken and immediately sent to TSA.

Grierson says between light capture and sustainable features like Sloan waterless urinals in the men's bathroom, leaders are hopeful the facility will get a LEED Silver certification. Precautions were taken with the urinals and plumbing was installed behind them in case there's an issue, Grierson notes.

Planners also added a changing table to the men's room and brought women in to help design the women's restroom as well. The input led to bigger stalls so women had a place to put roller bags when using the facilities and shelves placed at the back of the stalls because of concerns they had with someone reaching over and stealing their purses when hung on hooks on the back of the stall doors.

The new terminal will bring the free Wi-Fi currently offered by DBQ in the old terminal, but one new addition will be electrical outlets and USB chargers. Each passenger waiting area seat in the new terminal is equipped with outlets and a USB plug for passengers to charge mobile devices.

In the airline ticketing office (ATO) area, outbound baggage handling has been brought indoors to keep items in a temperature-controlled environment.

"We're not building for what we don't have," Grierson says. "And the nice part of it is this could be expanded by my successor. The airline ticket office can be expanded by my successor. The hold room can be actually converted into a full-blown concourse if need be.

"The need isn't there today, but 10-20 years from now, I didn't want my successor to be put in the situation we were in trying to make that old building work."



Dubuque installed a water bottle filler inside the passenger holding area so passengers encounter less issues with bringing liquids in past the TSA checkpoint. Joe Petrie/Airport Business



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When Grierson came on board, DBO's master plan had already been adopted. While it's technically good for 20 years, the airport is already discussing an update with the Federal Aviation Administration (FAA).

"The single biggest project in the plan was the new terminal facility," he says. "Additionally, it called for expanded T-hangars and general aviation hangar facilities. Those have been pretty much done. The next big area is a runway extensions and I would love to do runway extensions. A 6,500-foot runway is maybe great at sea level, but on a high density altitude day we're pushing the limits on that. I'd like to see 500 to 1,000 feet extended to both."

BUILT TO GROW

One of the biggest enhancements is the addition of a dining area to the sterile side of the security checkpoint. The new terminal was built with a food service area expanding across both sides of the security checkpoint, so it can be run as a food service operation on both sides. Grierson says as of press time they're still negotiating with a food service provider to run the kitchen, but planners worked with a consultant to place all the proper equipment inside the

food area that a restaurant breakfast and lunch would desire.

"Currently, we got a decent view over there," Grierson says pointing out the window. "This is a view of both our runways, all our taxiways, all our general aviation, all of the University of Dubuque and even over here you can see our FBO."

"This'll be a place people can sit and wait for Aunt Nellie to arrive, have a drink, have lunch and watch airplanes. In fact, we're hoping people will come here and not just wait for family, but come here for lunch or come here for drinks and enjoy."

The city wanted to minimize its bonding for the project, so DBO leveraged every grant it could get to finance the project, but the biggest challenge came in addressing the speed of the project with local leaders. They didn't understand the process in getting FAA funding, Grierson says and there was hope it would be built faster because of the local demand for more air travel options.

"It was more educational in this process because there is the perception out there because we're in Dubuque and we're close to Dyersville, Iowa, where they have the Field of



A floor marker inside the outline of the Mississippi River allows travelers to see exact points along the floor as part of the design of the new terminal.


Joe Petrie/Airport Business

Dreams that people say 'If you build it, they will come,' but we say 'well, not necessarily,'" Dalsing says. "An airline doesn't care if you're operating out of a trailer. As long as there are butts in the seats they don't care how they get there or where they came from. They just want them."

Steven Accinelli, chair of the Dubuque Airport Commission, says it was clearly obvious a new terminal was needed when planners first looked at the issue more than a decade ago. Besides cramping airline passenger space, the old terminal hindered general aviation and the new space will open more room to increase business and therefore increase fuel sales for the airport's city-owned FBO.

"Cities don't build airports. Airports build cities," he says. "It's my belief that transportation infrastructure is a true jobs multiplier."

Grierson says people don't understand a lot about the current state of the airline industry and they need to understand the days of 20 different carriers fighting to provide service are long gone.

"We'll fill the plane. I guaranty you we'll fill the plane," he says. "It's just getting them to say 'yeah, we're going to send the plane there.'" 



The new cafe area outside of the passenger holding area is designed as a destination for people looking to eat, even if they're not flying out. *Joe Petrie/Airport Business*

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Meeting Challenges of **Aviation Fueling** **Training** with Multi- generational Groups

Targeted training efforts can improve line safety and bridge the generational gap in education.

Let's face it; training takes time, money and effort. But where do we find the time? Where will we get the money? And effort; can't people just learn how to do the job from hanging around the more senior personnel?

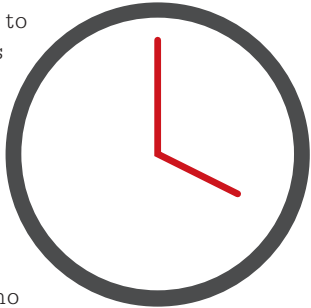
These are questions that apply to most any industry and role within that industry. The aviation industry, specifically aviation fueling, is no exception. So what is the solution?

TIME

It is true that everyone gets the same 24/7, but with reduced staff and ever increasing demands, there just doesn't seem to be time in the day to train anyone. Yet it is essential

that each of our staff members have the proper training to do the job we require them to perform. As managers we expect professionalism with our personnel; however, professionalism requires investment. The starting point being the investment of time to provide effective communication and training methods to produce the desired outcome. This changing landscape causes us to rethink our strategies concerning training.

The late 1980s and '90s are delivering a new generation of young people coming into the workforce today that are hungry for information. One thing researchers have learned is that these younger workers long for information. Just ask anyone a question nowadays and the first thing they do is reach for their smartphone to learn the answer. This generation is known as the Internet Generation, iGen or Net Generation; a generation whose individual members are called Gen-Yer's, digital natives, echo boomers or millennial's. They are extremely adept in online life, which includes online training. However, it has to be exciting, informative and memorable. No one



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MONEY

“Do more with less,” seems to be the phrase we often hear. With travel budgets being reduced, or cut, there just doesn’t seem to be any money for training. On the other hand, how much will the accident or incident cost? In aviation, particularly fueling, the cost of the accident, or incident, is always financial and that is certainly devastating. But even more devastating is when the cost is a limb, life or multiple lives. There is no amount of retribution that can replace those affected by an aircraft tragedy.

When an employee is asked to travel to attend training they are excited, enthusiastic and in many ways indebted to the company, however it is expensive and time consuming. Furthermore, the workload is increased for the remaining staff if the employer doesn’t have the redundancy in personnel. Often, training is delayed, or not addressed at all because there aren’t enough bodies to take anyone “off line” for any period of time.

EFFORT

Today’s business world can be a ruthless one. The aviation industry, in itself, is very unforgiving when it comes to lack of knowledge. Often times we do not take into consideration that the baby-boomer generation has had decades of hands-on experience in this industry. We sometimes expect the Gen-Yer’s to display the same (if not more) business sense, tenacity and expertise as their baby-boomer counterparts.

To help our younger workforce meet the growing demands and expectations set upon them, we must provide them with a type of training that will close that gap. The training should be fast, effective, seamless, streamlined, focused and independent of other factors that may delay them in reaching their goal within the specified time.

These changing demographics are presenting training challenges as employers try to bridge the communication gap that may exist in multi-generational workforces. Successful management of this new multi-generational workforce will require training that satisfies the needs and lifestyles of this diverse group.

Tribal knowledge can be rich and useful, however, many times it is myopic and will not deliver both the “how” and the “why” a task is to be performed. Gen-Yer’s want and need that information. Baby-boomers, holding management and supervisory positions in our organizations are delivering that training and tribal knowledge that must be passed on. This group values classroom-based, instructor-led training and, if given a choice over technology, will most likely choose to continue classroom-based training where they are most comfortable.

The Gen-Yer’s have never known life without the Internet, tablets and smartphones. They have instant information access and flexibility in their DNA. Immediate and continuous access to highly focused training, which can be quickly downloaded, becomes essential in retaining workers of this generation.

All employees deserve to be aware of the policies and procedures of an organization, but moreover they need to be clear on the reason those policies and procedures exist. To accomplish that effectively, there must be an effort to cover the required fuel handling training on all applicable subjects in a learning-centered environment; an environment that is hands-on, interactive and collaborative.

No longer is tribal knowledge enough, as it lacks standardization and does not set a clear expectation. It is important to remember that if you do not set that clear expectation for your team, each will take it upon themselves to do a task their own way.

Simulations and hands-on methods, with peer-to-peer collaboration will go a long way in bringing the multi-generational groups together. A one-size-fits-all approach to training will not get the job done, so consider a blended approach. Classroom training will most likely continue to exist, but could be supplemented with other technology to enhance acceptance and create a culture of acceptance and enthusiasm.

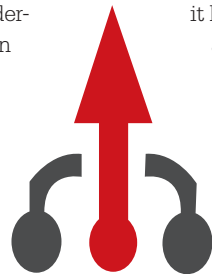
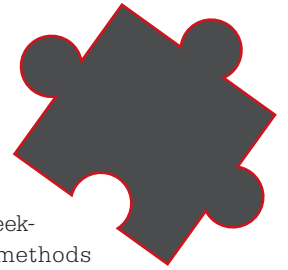
SOLUTION

Today’s aviation fueling professionals, specifically those faced with training multi-generational groups in fuel handling and quality control, are seeking blended training methods to effectively reach all employees from baby-boomers to Gen-Yer’s and those in between. One suggested course of action is to combine classroom training with electronic digital tools. One such tool is revolutionary in the marketplace, and known as, Fuel Analysis Safety Tool (FAST). For example, fuelers and line technicians will participate in a classroom curriculum that focuses on fuel handling and quality control; specifically on how to ensure clean dry fuel reaches the aircraft.

Accompanying the classroom training, the employee uses a new electronic fuel analysis safety tool for fuel handling and quality control, in lieu of a “paper workbook” or “class manual.” Once the employee is actually conducting the task in real time, the electronic tool serves as a checklist, reporting tool, continual training tool and effectively acts as the required documentation for the completed task.

This combined method satisfies the needs of those employees who prefer traditional classroom training and those who are most comfortable with technology and instant information access. There are even additional bonuses for management such as the ability to view photo imaging of abnormalities in fueling systems, or samples, memorializing fuel test results and email alerts to abnormalities that require attention.

Instantaneous gratification is the society we now live in. To ensure our younger workforce meets the growing demands and expectations set upon them, companies can benefit from providing training that is delivered to bridge that gap between experience and expectation. Delivering what is needed in the method it will be best received is the path to success.



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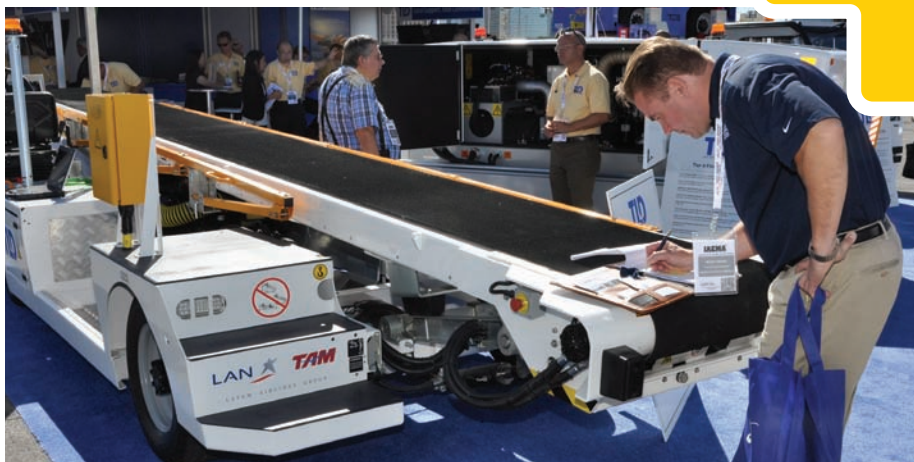
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A Transformative Acquisition

What does the BBA-Landmark merger mean for the industry?

With the integration of former Landmark Aviation locations in full swing, what does BBA Aviation’s acquisition of that FBO network represent to the industry? For those personally affected by the transaction, such as employees, customers or vendors, the changes may feel very **personal indeed.**

The back-office employee made redundant likely holds a different view of their now-former employer than the customer who may benefit from an expanded customer loyalty program, or from the supplier whose business doubled overnight, simply by being on the fortunate side of the transaction. For airports, the acquisition by BBA Aviation of the 68 Landmark locations – and their associated leaseholds- may be the start of a new relationship with a heretofore unknown entity. Collectively though, while BBA Aviation PLC’s Simon Pryce quite accurately referred to the transaction as “transformational” for his group, it actually isn’t for the FBO industry at large. The Signature signage being hoisted atop FBO terminals and hangars today is simply the outward manifestation of changes to the industry set in motion by airports as much as 70 years ago. These changes were predicted; no Monday morning quarterbacking required.

Briefly, in 1946, the return of airports from military hands after World War II was coincident with both a baby boom and a surge in general aviation aircraft manufacturing — numbers that respectively had never seen before — nor have since. Airports were “sold” by the government to cities and municipalities for the princely sum of \$1 and civilian airport administrators in turn executed ground leases with upstart aviation businesses. Little did they know at the time that those lease terms; often 30 to 35 years, would coincide with a second generational wave of FBO ownership and interest in general aviation. In the years between 1976 and 1981, those boomers — now adults — were at the helm for the second largest growth year of general aviation in 1978. New leases were executed, again 30 to 35 years and with that set of leases, airports themselves unwittingly laid the ground work for a future wave of mergers and acquisitions activity, the largest in FBO history. The cumulative effects of two lease terms after World War II meant that a disproportionate number of ground leases expired in the years 2006 to 2016 — precisely the same years the boomers were retiring.

Returning to the Landmark transaction, owner Carlyle Group wasn't exactly secret about its plans to build and flip the FBO chain. After all it had done it before in 2007, with the same chain. This time around however, most insiders could read the tea leaves. Bought back by Carlyle in 2012, Landmark's expansion was rapid, particularly so toward the end, so to speak. In a six-month period in 2014 alone, Landmark added RSS Jet Centres, Ross Aviation and others, swelling by some 20 locations. With various acquisitions of its own, the aircraft management arm of Landmark also grew, quickly becoming second only to Executive Jet Management in total aircraft managed. Then, months prior to formerly announcing the FBO chain for sale, Carlyle Group filed an S-1 with Securities and Exchange Commission on Landmark Aviation, signaling to some its intentions to exit — a mere three years after buying the chain back.

Landmark was built for sale, and built to complement other chains' networks. It was not built to last. To be sure a few of the FBOs acquired by Landmark in 2014 were only fleetingly rebranded — some having received cursory vinyl banners for signage by the time the BBA acquisition of Landmark was announced.

So what did BBA Aviation buy exactly? Curiously, a recent M&A announcement within the airline sector is analogous, for it provides context for the BBA acquisition of Landmark and the subsequent rebranding of those locations to Signature Flight Support. In April, Alaska Airlines announced its intent to acquire relative upstart Virgin America in a transaction valued at \$2.6 billion. As a backgrounder on Virgin America, the airline operates 60 aircraft and earned some \$201.5 million last year — meaning Alaska paid a nearly 13 multiple on earnings to purchase Virgin America. But as airline analyst Dan Reed notes, the devil is in the details. Virgin America only owns seven of those 60 airplanes — it leases the others. And those airplanes are Airbus A320s — in no way common with Alaska's Boeing 737 fleet. Incredibly, Virgin America doesn't even own its brand — in a brilliant strategy by the British billionaire, it leases the brand from Sir Richard Branson. Reed concludes that to Alaska Airlines, Virgin America is worth more dead than alive — and its route structure — not its assets — make for a viable transaction. The coming costs to Alaska to either integrate fleets and/or retrain crewmembers on a new type are difficult

to say, but they are not included in the \$2.6 billion transaction price. Nor does the price contemplate the cost of re-branding, which most decidedly will be Alaska Airlines.

For BBA Aviation, the Alaska Airlines-Virgin America transaction is oddly representative, with the notable exception that Alaska is purchasing Virgin with cash on hand and a portion of BBA's transaction involves a debt instrument. BBA Aviation paid \$2.065 billion, an approximate 14 multiple of earnings for Landmark Aviation. And with very, very rare exceptions, most FBOs sit on leased land, so like Virgin America, assets are thin in that transaction price. Even Landmark's managed aircraft are lease-backs, not owned. For BBA, it was Landmark's network — not its assets — that made for a viable transaction.

During a BBA Aviation PLC earnings conference call with investors this March, BBA Aviation PLC group Chief Executive Simon Pryce made this point clear, noting post acquisition "(W)e have FBOs on airports from which nearly 50 percent of all business and general aviation flights in America start or finish. And actually those airports pump over 70 percent...of all B&GA gallons pumped in North America...and of our 195 locations we own 149 of them. And of the 149 that we own 57 of them are sole-source locations."

It is the latter of these points that may incense some customers — 57 sole source locations. Yet, those customers may not fully appreciate why they are sole source in the first place, or the aforementioned historical reasons they changed hands. Many were always sole source, they just weren't owned by a chain. Some were family-run FBOs for two generations; say 1946 to 2016, only to find the upcoming leasehold renewal required a development investment beyond their financial means. To give context of the cost of leasehold investment requirements for FBOs, while not a sole source location, the former Landmark facility at Boeing Field (KBFI) is sitting on a relatively new lease; one that yes, was executed in the aforementioned 10-year span and yes, was sold by the second generation of owners. The minimum required reinvestment called for in that lease is \$6.9 million, of which BBA will bear the entirety of the cost, post transaction. Imagine buying a leased car, continuing to pay the monthly lease to the manufacturer and then installing a new engine, transmission and interior, plus painting it, prior to lease turn in. That, in a nutshell, is FBO "ownership."

"(W)e have FBOs on airports from which nearly 50 percent of all business and general aviation flights in America start or finish. And actually those airports pump over 70 percent...of all B&GA gallons pumped in North America...and of our 195 locations we own 149 of them. And of the 149 that we own 57 of them are sole-source locations."

**SIMON PRYCE, BBA AVIATION PLC
GROUP CHIEF EXECUTIVE,
POST ACQUISITION**

While surely transformative for BBA Aviation, the acquisition of Landmark Aviation doesn't signal a broader transformation within the FBO industry at large. Nor for that matter, should one assume BBA Aviation was the only suitor of Landmark, for there were other parties pursuing the acquisition. Moreover, the M&A activity in FBOs of the past 10 years was largely preordained by airports themselves.

Airports began the lease cycle in 1946. The subsequent creation of minimum standards and leasehold investment formulas; both of which are reasonable doctrines, indirectly create barriers to new FBO entrants and create financial hurdles for incumbent FBO leaseholders at renewal time, respectively. For the FBO industry to transform, a disrupting force is required at the airport level. Otherwise, FBOs are merely actors following the airport's script.



ABOUT THE AUTHOR

Doug Wilson

President & Founder of FBO Partners LLC

Wilson is the president and founder of FBO Partners LLC, an aviation consulting firm that provides asset management of hangar facilities for FBOs, and offers specialized consulting in due diligence, contract life-cycle management and other FBO disciplines. Wilson can be reached at douglas.wilson@fbopartners.com.

Spotlight on Airport Civil Engineering

When it comes to airport infrastructure improvements, much of the publicity focuses on terminal modernization and upgrades, better ticketing and lobby areas, expanded concourses, more comfortable gate areas, improved security check points, new retail and restaurant offerings, expanded shopping and dining options, convenient baggage claim areas and easier access to improve the overall airport travel experience.

Beyond the massive terminal and facility developments are many critical airport infrastructure projects that are less notable - such as runways, roadways, utility buildings, fueling facilities, and lighting and signage - yet these are integral for airports to meet all federal and local standards for safe and efficient operations.

Despite civil engineering's importance to providing engineering design and advanced technical services that are central to air operations, these contributions have largely remained below the radar. It's time to shine a spotlight on civil engineering's vital role as the foundation for global air transport today.

Airside and landside design and engineering services include:

- Runway, taxiway, and apron design
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- Utility design (storm drainage/sanitary sewer/water/gas/communications)
- Construction services
- Structural design (foundations and bridges)
- Navigational aid system planning and design
- Airfield lighting and signing and control system design
- Airside/landside fueling design
- Security system planning and design
- Surveying/geotechnical investigation

Every civil aviation project is unique and must be approached with a solid understanding of the requirements, technical skills and engineering creativity to be able to deliver the project successfully, on time and within budget. The following case examples demonstrate the depth and breadth of technical expertise and collaboration that is required to execute some of this country's most complex infrastructure programs.



HNTB

VAN NUYS AIRPORT RUNWAY 16R REHABILITATION

The \$20.5 million, seven-month Van Nuys Airport runway rehabilitation project for Los Angeles World Airports posed a major operational challenge – lack of a secondary runway to handle the majority of jet operations during construction at one of the world's busiest business airports. An optimal solution was developed that provided a unique design, varying pavement sections and creative phasing. According to James Long, PE, project engineer, "This was one of the most aggressively phased runway maintenance projects ever conducted at a general aviation airfield - it required airfield planning, engineering and construction management services along with significant stakeholder outreach."

A potential runway closure of up to 17

HNTB



weeks for complete reconstruction was reduced to just 10 days and 26 nights for rehabilitation work. Through careful planning, the runway was shortened for 65 days to a minimum length of 5,000 feet, accommodating the airport's entire aircraft fleet for departures and landings.

During project design, engineers worked directly with airport tenants on a solution to minimize the number of days the runway would be closed or shortened. Collaborating with key stakeholders early in the process enabled the team to develop a mutually beneficial solution and successfully execute the project, which became a model for other airports on how to design maintenance projects with minimal disruptions to airport operations.

PORT OF PORTLAND AIRPORT WAY REALIGNMENT

Portland International Airport has been named one of America's best airports in Travel +

Leisure magazine for three straight years. When an award-winning airport is faced with having to realign Airport Way, its main airport entrance, landside multi-disciplinary engineering design services are mandatory, along with an accelerated project schedule to minimize impact on access for tenants, services, and the public.

The work required complex, fast-paced, multi-faceted design services to meet a realignment construction schedule for the main airport entrance roadway that would make way for a second parking garage planned for the airport terminal area.

The approach roadway was relocated to accommodate the footprint of the second garage and to provide safe traffic movements with new decision points and channelization

associated with the second parking garage. HNTB identified the need for the realignment while working on the conceptual design of the second parking garage and it was determined that the roadway realignment project needed to conclude before completion of the second garage.

The project entailed the demolition of several existing aircraft hangars; relocating a fuel storage tank; reconfiguring vehicle parking and site access for a major fixed-base operator; constructing the new roadway alignment and storm water collection, conveyance and treatment facilities; and installing new roadway lighting, signage, and landscaping.

The detailed construction sequencing plan maximized construction efficiency while maintaining safe and efficient traffic routes. In addition to delivering the most cost effective solution, the roadway realignment that resulted in a safer permanent approach to the terminal

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was completed as intended with little disruption to the airport users.

SAN FRANCISCO INTERNATIONAL AIRPORT TAXILANE H & M REALIGNMENT

As part of San Francisco International Airport's Terminal 1 Redevelopment Program, two existing taxilanes to the south of boarding area B needed to be relocated to allow for future

expansion of the facility. Taxilanes H and M provide access to and from Boarding Areas A and B and this access had to be maintained during all phases of construction.

While the design of the taxilanes is being completed in house by airport staff, HNTB is providing project and construction management support services for this \$2.25 million program. As part of this effort, close coordination was required with airport stakeholders through their structured collaborative project delivery approach to ensure the project is designed to the needs and expectations of the end users. All interactions have been rigorously tracked to establish a clear basis of design and ensure the project moves out of programming and into detailed design in a timely manner. It was necessary to coordinate the efforts of sub consultants to provide design inputs in a timely manner to keep the project moving forward. This included coordination with geotechnical and environmental engineers, as well as schedulers and cost estimators. Now at 95 percent design stage and nearly a year into the assignment, Long said that the project remains on schedule and is on track for an exceptional project outcome.

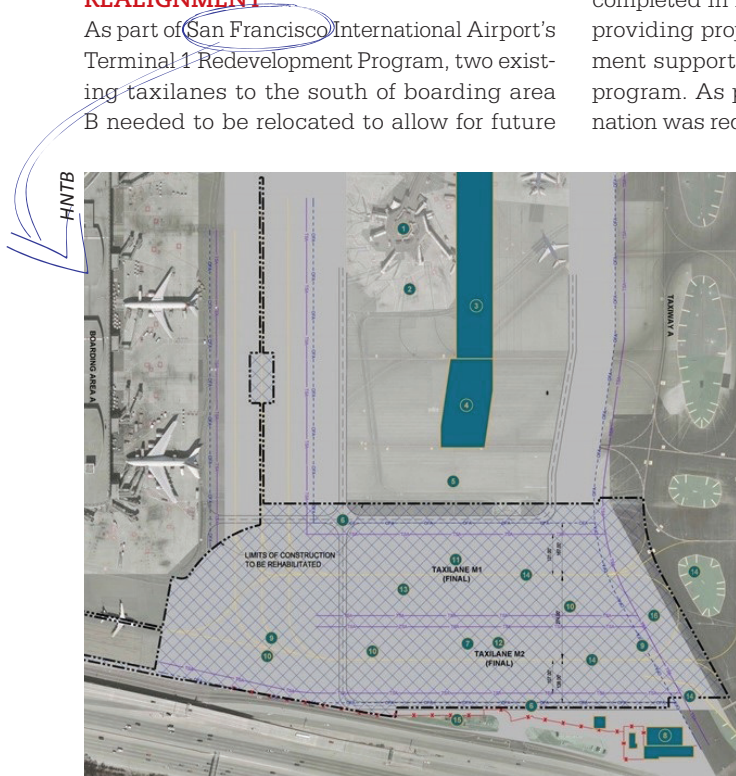
or landing. The mandated improvements provide an extra margin of safety for landing and departing aircraft. RSAs are typically 1,000 feet by 500 feet at each runway end and 250 feet from the runway centerline; they are not runway extensions.

Tony Fermelia, PE, project manager for the airside safety area improvement projects related to Runway 7L-25R explained that the objective is to comply with the congressional mandate to meet FAA design standards and to rehabilitate pavement that has reached the end of its service life.

The four primary design elements within the multi-phase project include extending the runway by 832 feet to the west and associated taxiway improvements, reconstructing Taxiway C and B at the east end of the runway and providing structural strengthening to the Sepulveda tunnel. Part of the key to the successful culmination of the program was stakeholder coordination and integrating ideas into the project. Expediting plan checks and reviews with third party agencies, including the FAA, DWP, Caltrans and LADBS, plus the development of a Safety Risk Management Panel, were all a part of the overall process. Detailed phasing plans were developed in coordination with airport operations and the ATCT that allowed for realistic, yet aggressive, construction sequencing plans that minimize risk for the airport. Runway 3-21 Repair at Naval Air Station Point Mugu, Calif.

The repair of runway 3-21 at Naval Air Station Point Mugu was a design-build project that consisted of repairs to over 1,250,000 square feet of existing asphalt at Runway 3-21. This was accomplished by milling the upper 2.5 inches of existing pavement and replacing it with a variable thickness hot mix asphalt overlay. Additional work included replacing 15 electrical vaults and Portland Cement Concrete pavement, cleaning and resealing 40,000 linear feet of pavement joints, reconstruction of asphalt shoulders, and more.

Design and construction had to be expedited in order to minimize the impact on stakeholders and the airfield. The project was scheduled during the Christmas holiday season from the middle to the end of December. Although challenging, the project was a huge success and won an award for excellence in project management by the Associated General



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At the completion of the construction, NAVFAC Construction Manager LTJG Alex Rovinsky said, "We fought against the weather, the clock, unforeseen conditions, and just about anything the gods of the underworld could throw at us, and we prevailed."

Clearly, there is so much more to an airport than meets the eye of the traveler. It takes specialized engineering skill and expertise to design, build and maintain an airport's

essential operating infrastructure – runways, taxiways, navigation aids, utility designs, airfield lighting, drainage, roadways, parking lots, etc. – and keep up with the technology to ensure safe and efficient operations. At every successful airport, there are unsung heroes – professional in house and consulting specialized transportation engineers - who work tirelessly on complex infrastructure projects to make safety a top priority at airports around the world.

ABOUT THE AUTHOR

Peter Aarons,
HNTB

Peter Aarons is West Division aviation director and associate vice president for HNTB. He has more than 25 years of experience in planning, development, design, program and project management, and construction for airports. Contact him at paarons@hntb.com.



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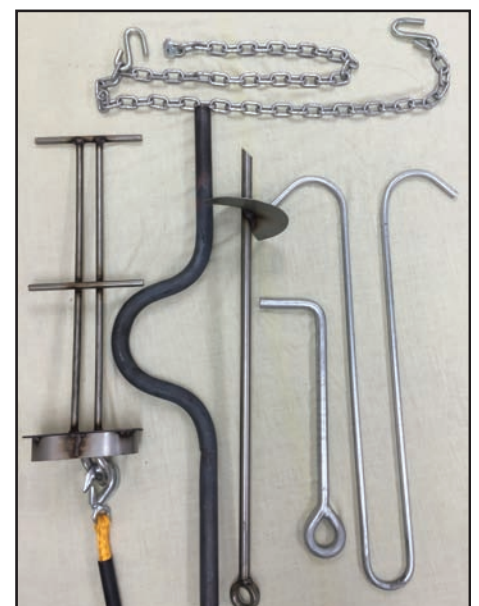
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FINAL ANALYSIS



AAAE HONORS ROBERTS

Elaine Roberts, president and chief executive officer of the Columbus Regional Airport Authority, received the American Association of Airport Executives' Distinguished Service Award on March 22. The award is presented to airport executives in honor of an exemplary career and contributions to the airport industry.

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1.3 billion

the number of travelers expected to pass through China by 2034

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