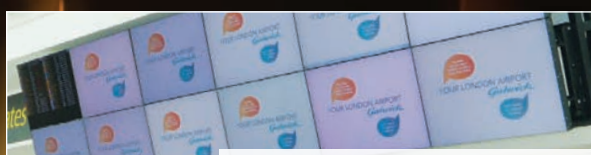
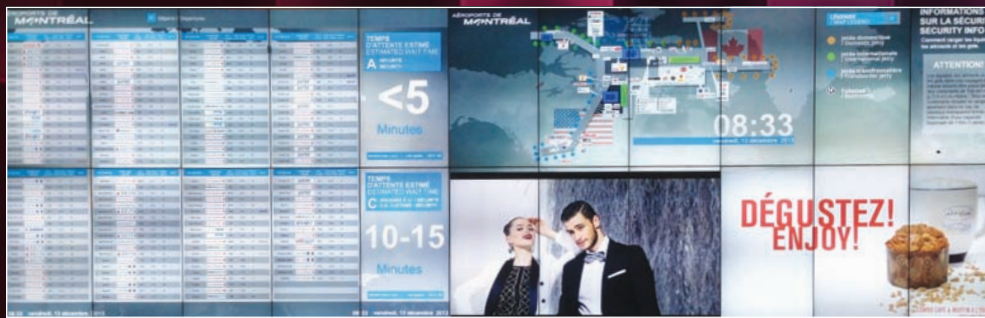


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INSIDETHEFENCE

Joe Petrie
Editor-in-Chief



The Time and Place

The election is over and it's time for the federal government to move forward on issues that impact the industry.

With President Donald Trump officially in power, the new administration is finally getting settled in and new leadership in Congress is taking on its new initiatives.

Before Trump or the new Congress took over, it was already besmirched in partisan fighting and vows of radical change on social and economic issues that will have ramifications across wide swaths of people and regions.

But for those of us in the transportation world, we got lucky. New U.S. Department of Transportation Secretary Elaine Chao was met with praise and accolades during her confirmation hearing and neither party vowed to stick claim to a particular issue impacting the nation's infrastructure.

This doesn't mean an easy ride in moving America in 2017 — far from it. But it does mean there are some opportunities to tackle some big issues this year and if parties involved can find a way to steer clear of the political mess other industries are about to mire through, we might be able to find some bipartisan solutions that help the aviation sector on some important issues:

- The Trump infrastructure plan
- ATC Privatization
- A PFC increase
- NextGen
- International flight restrictions

We're poised for a lot of change in aviation policy this year, which could transform the transportation industry for a generation.

That being said, you'll notice *Airport Business* is working to keep up with all these changes. In this issue, you'll see our new feature from Kevin Burke, president and CEO of Airports Council International-North America, who gives his take on what's happening in Washington, D.C. He will be giving us updates throughout the year to keep you informed on what you need to know about the industry from the Capitol.

Also, Roddy Boggus, from Suffolk Construction and chair of the Airport Consultants Council Board of Directors is kicking off his new regular feature with us, "Totally Boggus." It's all the wit that's fit to print from Roddy as he tackles some of the big picture issues facing the industry.

And most notably, for the first time in the magazine's existence, Ralph Hood will not be featured in the magazine. But not to fear, I'm not letting Ralph stray too far away. You can still catch his insights on current events in the industry twice each month in our daily newsletters. While it's sad to see Ground Clutter missing from the issue, I'm happy that Ralph is going to keep writing his insight for us on AviationPros.com.

From all of us at *Airport Business*, we thank you for all you do Ralph!



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► Three Top Trends in Digital Signage at Airports in 2017

Technology continues to evolve in airports to find more ways to improve the passenger experience. Learn about the top trends in digital signage for airports coming this year and what it will mean for your facilities. www.AviationPros.com/12293157

► Travelers Have an Appetite for Healthier Fare

With the trend towards healthy eating continuing to rise, airports are faced with challenges in giving travelers the foods they want. What will you need for your facility to meet this demand and increase your revenues? www.AviationPros.com/12293575

Technology in New Airport Terminal Projects

Use technology to create a smoother operational process in your airport.

New technology is emerging in people's personal and professional lives, so it only makes sense that airports are using it in areas including running more efficiently and making a better passenger experience. Two airports discuss how they are using technology to take their operations to the next level.

Phoenix Sky Harbor International Airport is currently overseeing the Terminal 3 Modernization Program. Originally opened in 1979, at the time it set new standards in air terminals, with airline ticket counters and baggage claim on the ground level, and shops,

restaurants and access to the gates on the second. But now the city of Phoenix is embarking on a \$590 million project that will include new passenger amenities, custom-design spaces and an enhanced traveling experience with a focus on convenience and efficiency.

Art Fairbanks is the airport's project administrator and Steve Rao is the design team director. "One major improvement coming to Terminal 3 is the use of common-use technology kiosks. The benefit is that it offers flexibility for the airport and the airlines," said Fairbanks. "We will have them installed at ticket counters and at gates."

Technology at security checkpoints and baggage are big trends in the industry and Sky Harbor is joining by building a consolidated line.

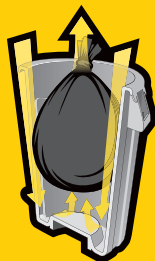
"We don't control what the Transportation Security Administration does, but we can partner with them," said Fairbanks.

"We're building in the ability to allow TSA to incorporate the latest and greatest technology to make things better for passengers," said Rao. "We will have real-time sensors to scan for line wait times using SITA's QueueAnalyzer."

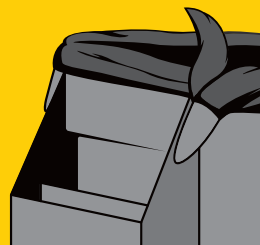


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QueueAnalyzer, part of SITA's Day of Operations Business Intelligence services, was launched about a year ago, said Matthys Serfontein, vice president airports. Facilities using the technology include Orlando International Airport and Phoenix Sky Harbor International Airport.

"Other major U.S. airports are currently running pilots with a view to full implementation. Over the coming months, there are also plans to roll it out in some of the world's largest airports in Europe and Asia," said Serfontein.

With QueueAnalyzer, passengers can view security wait times before they travel as well as when they arrive at the airport, said Serfontein. "Real-time checkpoint wait times can be available on the airport's website, as well as on flight information displays in the terminals and ground transportation," he explained. "By combining historical and real-time data with powerful algorithms, QueueAnalyzer delivers highly accurate wait-time predictions."

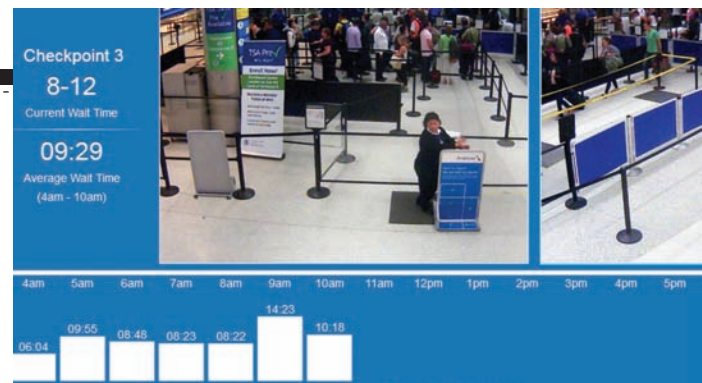
The direct and almost immediate impact has been shorter wait times at Orlando, said Serfontein, which now has 53 percent fewer passengers spending more than 15 minutes in line. "As well as providing passengers with the information they need, SITA QueueAnalyzer provides airport management with dashboards to assess current wait times and view live video of lines," he said. "It also provides dashboards for quick analysis of real-time information against historical data, allowing for better allocation of resources to avoid bottlenecks."

SITA QueueAnalyzer provides the airport with a real-time view of the TSA checkpoints, said Serfontein. "This enables rapid response to unexpected conditions, helping ensure the airport authorities and the TSA can work together to minimize disruption," he said. "It also provides predictions which supports planning to avoid delays when possible."

The critical thing with checkpoints now are wait times, said Fairbanks. "Whether they're at home or at the airport, passengers want to know how much time they will need to get through the checkpoint," he said. "We'll have times posted on our website and via digital displays in the area to help with those messages."

Another big trend is wayfinding, which is especially important in new facilities. Sky Harbor's Terminal 3 was a lot of heavy pre-cast concrete, with dark tinted glass, said Rao.

With QueueAnalyzer, passengers can view security wait times before they travel as well as when they arrive at the airport. SITA



TECHNOLOGY PLAYS A KEY ROLE IN TRAVELER EXPERIENCE

JOÉ LLOYD

is the director of global marketing for NanoLumens, a digital LED signage and display company based in Atlanta. The company's products are used in airports including Hartsfield-Jackson International, Vancouver International, Detroit Metro, Miami International and Honolulu International.

Passengers have smart computers in their pockets and have expectations on the experiences they want to have in places like malls and airports, said Lloyd. "For example, if you went shopping on Amazon on Cyber Monday, you could see how it knew what you like to see and offer suggestions and keep track of what you need. Travelers are increasingly having those same expectations," she said. "I recently landed in Miami from Mexico. There was signage that helped get you to where you want to go. If you're traveling out of LaGuardia, you have no idea where you're going."

Digital signage provides a whole new experience, said Lloyd. "Statistics show that happy travelers spend more money, because they are spending more time in airports," she said.

From an advertising standpoint, digital displays are a great opportunity to highlight what's in an airport, said Lloyd. "Atlanta's airport is opening new stores and restaurants at a rapid pace. What better way to show them off than through digital advertising," she asked. "With digital signage, you can highlight more than one restaurant on a sign. You can also make changes or fix typos easily."

Security is also a big issue in airports, and digital signs can help with that, said Almir DeCarvalho, NanoLumens' vice president of strategic accounts. "So using digital signs for displays and notifications in airports is a tremendous value," he said.

Airports trying to improve the passenger experience is a big trend, said DeCarvalho. "Travelers now go to the airport with the understanding that they will be waiting for at least one to two hours before their flight. Airports can use their common areas and incorporate technology that is not only aesthetically pleasing, but also provides needed information," he said. "We fill that niche. We can build curved custom displays that can be turned into creative art pieces that give customers the information they need, but also allow the airport to sell advertising."

There's a big focus among airports are what each are doing to stay competitive, said DeCarvalho. "They're asking if they had to choose between having a layover in Atlanta or Minneapolis-St. Paul, which one is more customer friendly? We're not just saying that airports need digital signage. They need signage that is aesthetically pleasing and helps improve the customer experience."

The industry is competitive and continues to change, so NanoLumens keeps up by listening to its customers, said DeCarvalho.



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"We're pulling that away so you can see the ticket counters and baggage carousels, along with seeing where you need to go," he said. "We opened up both floors and they will now have great views of the city. Things are much easier to find."

The baggage system is also getting a major upgrade, said Rao. "We're installing a state-of-the-art Pteris system," he said. "It will be a flexible system that allows airlines to use more carousels if they have multiple flights coming in."

Further north, Salt Lake City International Airport is building an entirely new facility under its \$2.9 billion terminal redevelopment program. Director of technology Ed Cherry noted that everything being done at airports across the country is more technology oriented.

"Things like the building and construction is important, but everything that touches the passengers and the airlines is technology-based," said Cherry. "We have to look at what goes into the airport of the future and that's different than what we did 20 to 30 years ago," he said. "We've planned ahead, so we have put in enough infrastructure to have any kind of technology and communications systems that we may need, because we can't guess what may happen in the next 10 years. But we'll be ready for it."

While the Salt Lake City project won't be building the actual security checkpoint, it is helping supplement that function by managing all the doors and portals, said Cherry. "But we will provide all video surveillance in the airport, and that will include using it to monitor security lines."

The airport is also installing a queue management system so passengers will know how



Wayfinding is a very important part of Salt Lake City's plans to improve its terminal.
Salt Lake City International Airport

long lines are, said Cherry. "It will also be an aid for TSA to help them plan on when to open more lines and better facilitate getting travelers throughout checkpoints," he said. "It will also be available to passengers on our website and on display screens in the airport."

Wayfinding will be an important part of Salt Lake City's project, said Cherry. "The facility we're building is much larger than what we currently have, so this has become more important, especially for those who have to walk," he said. "We have invested significant time and effort looking at pathways for passengers in all parts of the airport, from garages to gates."

With that, passengers will need static and dynamic signs to aid them, said Cherry. "And we've been looking at it from a user's standpoint, asking 'what would I like to see in an airport I'm not familiar with,'" he said.

The airport is also building a bifurcated ticketing operation, said Cherry. "We will still have a standard ticketing hall, but we'll also have an annex attached to the new parking garage that will allow travelers to check in as they come from the rental car or parking facilities," he said.

Salt Lake City, like Denver International Airport, has travelers who carry oversized items like skis and golf bags, said Cherry. "We've installed technology to allow people to check their oversize bags at the annex," he said. "It can be a big inconvenience to have to schlep these oversized items all the way to the ticket hall."

Another project that will be in the new terminal is common-use technology at ticketing counters and gates, said Cherry. "It will allow any airline to use a ticket position or a gate. When you're planning ahead years in advance, you don't know who will want to fly in and out of here. We recently added Air Canada and last

year we got Alaska Airlines," he said. "We're not a huge airport like Los Angeles, but we are a major hub for Delta."

Under this project, the airport wants to make it as easy and painless as possible for airlines who want to start service here, said Cherry. "We will facilitate that in the new terminal. It also will help existing airlines that may want to expand on a seasonal or permanent basis or handle unforeseen circumstances," he said. "We're right-sizing our facility to meet the needs of the airlines we serve."

Both airports have visions of what they want to see once their projects are completed. "In Phoenix, our goal is to improve the passenger experience. By doing that, they can move more efficiently through the building and ensure that the building is IATA Fast Travel-ready for our partners," said Fairbanks. The Fast Travel program provides self-service options in six areas of a passengers' airport journey: self bag tag printing; document check; flight rebooking; self-boarding and baggage recovery.

The team at Salt Lake City airport has spent a lot of time discussing when it was planning for the new facility, said Cherry. "One thing we did was listen to what people like about the existing airport. For example, all of our rental cars are connected to our parking structure, which is connected to our main terminal," he said. "It's very convenient. They don't have to get on a bus to get to a car rental facility, and we kept that in the new design."

The airport has focused on what passengers wanted while meeting needs of its airlines as well, said Cherry. "Folks will be pleasantly surprised that nothing has really changed. It's just more modernized and offers a better experience."



Salt Lake City International Airport is building an entirely new facility under its \$2.9 billion terminal redevelopment program.

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Enhance Your Passenger Experience and Increase Revenues

Is your airport effectively capitalizing on the changes that are driving an increased demand for shared-use airport lounges?

Depart or transit from almost any international airport and you will be delighted to learn that there is a lounge option available regardless of the airline you are traveling on, the class of service you are flying, or your frequent flyer status. International airport directors and boards discovered the benefits of a 'shared-use' lounge option well over 25 years ago.

While the first airline lounge was opened in 1939 at what is now New York's LaGuardia airport, the U.S. airport lounge market has not kept up with the increasing demand for lounge alternatives. Since the opening of the first airline

lounge more than 75 years ago, many of the U.S. airports have depended on the airlines to provide a lounge experience for their travelers. The airlines developed loyalty lounge membership programs tied to frequent flyer loyalty programs.

These lounge membership programs allowed travelers flying in any class of service to enjoy the benefits of a private lounge experience. As the airline industry suffered from soaring costs and declining revenues, they began to open up their private lounges to a variety of customers outside of their loyalty membership audience. Day passes for the infrequent travelers and access via a variety of customer credit cards and other lounge membership programs increased. Now that airline industry profits have increased and airline frequent flyer program partnerships with key credit card and financial institutions have strengthened, airlines have begun to limit who is allowed access to their lounges. Airline lounges have become increasingly more exclusive leaving thousands of travelers without an option to gain access to an airport lounge experience.

The demand from travelers for lounge alternatives is growing. In a frequent flyer "Airport Experience" survey published in May by Priority Pass, travelers from seven countries confirmed that an airport lounge is viewed as a sanctuary from the stress of travel.

The survey respondents indicated the airport does not simply provide an opportune moment for last minute shopping; for business flyers it has become a sanctuary ahead of a long flight thanks to the convenience of the airport lounge. Nearly two-thirds (59 percent) of frequent business flyers consider access to a premium airport lounge to be an "important" or "very important" factor when selecting an airport, with 40 percent admitting to going straight to the lounge and avoiding the shops altogether.

The research found 51 percent of frequent business flyers actively enjoy the airport experience. This is a high percentage when you consider the fact a business flyer is traveling for work purposes and does not have the relaxation of a

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typical leisure trip to look forward to on arrival. The airport lounge has an important role to play here, offering a rare moment of tranquillity or the ability to stay connected in a peaceful and convenient environment."

WHAT IS DRIVING INCREASED AIRPORT LOUNGE DEMAND – WHY IS IT IMPORTANT TO YOUR AIRPORT?

Increased passenger demand for access to a shared-use lounge is being driven by three important factors.

- **Airline lounges have become increasingly more exclusive and costly.**

Airlines have increased lounge membership and day pass rates making it less appealing to many travelers.

Exclusive credit card partnerships are restricting access to passengers with competing credit cards.

Airlines are making lounge improvements with substantial capital investment to ensure they retain their most important travelers and convert their competitors' travelers. The airlines wish to differentiate their most important travelers airport experience with their lounge product.

- **New international airlines and increased international travelers**

The growth of new international carriers to the U.S. brings an airplane full of lounge savvy travelers who expect to find a lounge available to enhance their airport experience. The Federal Aviation Administration Aerospace 2016-2036 report predicts international passengers traveling to/from the U.S. will increase by 16 percent between 2016 and 2020. That growth is projected to continue to well over 100 percent by 2036.

Passengers traveling to/from the Pacific will increase by 19 percent; and from the Atlantic over 18 percent between now and 2020.

Not only are these passengers looking for an airport lounge experience, the airlines bringing these travelers demand a lounge experience for their most important customers.

- **Constrained airport terminal real estate limits options to provide lounge space to new international airlines.**

As demands for increased concessions grow it becomes increasingly difficult to dedicate adequate space to accommodate the lounge requirements of new international airlines. You limit your airport's competitive position with new international airlines if you do not have a lounge solution to offer.

HOW DOES A SHARED-USE LOUNGE SOLVE THESE CHALLENGES?

A shared-use lounge gives your airport a competitive edge with travelers and new international airlines. A true shared-use lounge provides an "inclusive" lounge experience for all travelers regardless of airline, class of service they are flying, credit card relationship, or frequent flyer status. An experienced and established airport lounge operator is adaptable and can tailor the lounge experience to meet the needs of your international airline premium customers, while welcoming your moderate to in-frequent travelers.

A shared-use lounge is an efficient use of limited real estate. It allows multiple airlines the ability to offer a lounge product to their most important customers. Allowing other travelers, such as Priority Pass members and Day Pass customer access enhances the value of your shared-use lounge and grows airport revenue because of increased guest volumes.

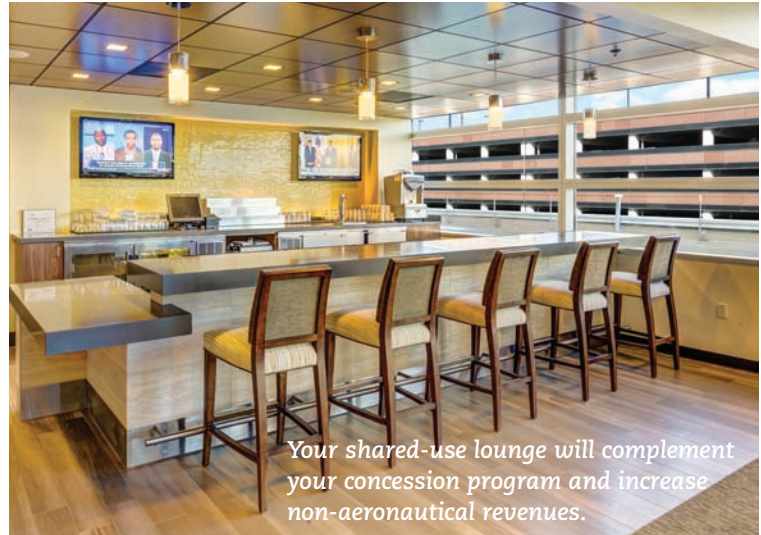
INCREASE NON-AERONAUTICAL REVENUES WITH A SHARED-USE LOUNGE

While it is important that your shared-use lounge is located as close to your most important flight departures as possible, the lounge does not need to take away from your concession development. Shared-use lounges can be developed on mezzanine levels and areas less desirable for key concession operators.

There are a variety of financial propositions that can be applied to your shared use lounge. You determine which of the financial structures fits your airport's concession strategy.

- **A lease for square footage**
- **A concession revenue share**
- **A minimum revenue guarantee**
- **A combination of lease plus revenue share**

Whatever option you choose, you are increasing your revenues and efficiently utilizing your limited terminal real estate.



Your shared-use lounge will complement your concession program and increase non-aeronautical revenues.

HOW DO YOU DRIVE INCREASED SHARED-USE LOUNGE REVENUE?

The secret to achieving your shared-use lounge revenue targets and increasing revenue is guest volumes. As you plan your shared-use lounge it is imperative you have accurate and reliable guest volume projections. This is critical in the lounge foot print size, seating capacity, and financial projections.

The most successful and financially sustainable U.S. shared-use lounges welcome a combination of contracted airline guests, Priority Pass membership guests and Day Pass guests. The Priority Pass membership audience is critical to your shared-use lounge success. This membership audience of sophisticated and savvy travelers comprises the most elite echelons of airport and airline customers. They are avid users of airport lounges and seek travel experiences are customer focused.

The addition of a shared-use lounge ensures your airport will be viewed favorably by U.S. and global travelers and safeguards your competitive position with new airlines.



ABOUT THE AUTHOR

Nancy Knipp

Nancy Knipp is the senior vice president of ALD and has a rich background in the airline and airport lounge industry, having held senior roles at American Airlines for over three decades, including president of the American Airlines Admirals Club.

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Campaigning on Infrastructure, Governing on Infrastructure:

A Look into the Early Days of the Trump Administration

Just a few weeks ago the world watched as Donald J. Trump took the oath of office to become the 45th president of the United States. No presidential candidate had ever advocated so passionately for infrastructure – particularly airport infrastructure – while on the campaign trail as Mr. Trump. But now that the campaign is over and President Trump has assumed office, what happens next for airports?

I am excited for the opportunity to join *Airport Business* magazine as a contributor bringing you the latest policy updates from Washington, DC. The mission of Airports Council International – North America (ACI-NA) is to advocate for policies and provide

services that strengthen the ability of airports to serve their passengers, customers, and communities. As the “Voice of Airports,” we are dedicated to fulfilling our mission of being a go-to resource that keeps our members, policymakers and the traveling public informed

on policies affecting the industry. Our nearly 400 airport members count on us to be their eyes and ears when it comes to legislative and regulatory issues.

While it is common for campaign promises to fade after the inaugural balls come to an end, good news remains for the airport industry when it comes to advancing key airport priorities on infrastructure. Throughout his campaign President Trump remained an advocate for infrastructure investments to strengthen America by continually speaking to the challenges that our national infrastructure – including airports – face. In his inaugural address, he continued his pledge to “build new roads and highways and bridges and airports and tunnels and railways all across our wonderful nation.” In fact, President Trump’s inaugural address includes the first ever mention of the word “infrastructure” in any presidential inaugural.

While we await the exact details of President Trump’s infrastructure plan, ACI-NA has rightly



praised President Trump's commitment to airport infrastructure. We have pledged to work alongside him to get the job done. After all, modernizing our nation's airport infrastructure has been a top priority to ACI-NA for several years. Our policy solutions – eliminating the outdated federal cap on the locally set Passenger Facility Charge, maintaining the Airport Improvement Program and protecting tax-free municipal bonds – are aligned with his call to address the significant infrastructure challenges facing our nation. And, we hope to see President Trump act on behalf of our nation's infrastructure early in his administration.

The case we are making in Washington could not be more important. Airports are a fundamental part of our nation's infrastructure.

America's airports generate more than \$1.1 trillion in annual activity and support over 9.6 million jobs.

America's airports generate more than \$1.1 trillion in annual activity and support over 9.6 million jobs.

But our airports are at risk of falling behind. According to ACI-NA's most recent airport infrastructure needs study, America's airports have almost \$100 billion in infrastructure projects that must be undertaken to help airports maintain their leadership in the global aviation system. The almost \$100 billion in airport infrastructure needs identifies the significant funding that is necessary to renovate tired terminals and runways, relieve congestion and delays, improve safety and security, and spur new airline competition that will lower fares for passengers.

ACI-NA remains fully dedicated to advocating on behalf of our members and the industry, but we cannot do it alone. Airports are in the best position to tell their unique stories, based on the economic benefits airports provide to their local communities. Airports must communicate their airport's story to their congressional representatives. Detail the challenges you face in running a modern and competitive airport by inviting them for an airport tour. Urge them to work with President Trump and

Congress to modernize airport funding options and strengthen America's airports. Your support will help us advance our collective mission to modernize airport infrastructure that is so important to your local communities.

With your support we will get Washington out of the way of local airport investment decisions to ensure airports become more financially self-sufficient and capable of meeting today's infrastructure needs and tomorrow's opportunities. President Trump has not been shy in stating that our airports are "are like a third world country." We remain committed to working with his administration and the 115th Congress to make airports great again!



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Make the Customer Experience Soar with **DIGITAL SIGNAGE**

Digital signage displays can enhance customer engagement while driving airport revenue – and having a strategy is critical.

Airports are consistently busy places, and some are starting to double as shopping malls or high-end food courts in an effort to improve what sometimes can be a frustrating experience for passengers: long lines at security, flight delays due to weather and lost baggage are all challenges passengers may experience when flying the friendly skies.

As airports morph from transit hubs into places to shop, dine and relax before a flight, they can pair these offerings with a digital signage platform to amplify customer engagement.

Chances are most air travelers already have come across some form of digital signage. Anyone who has used a screen to check flight departure times has viewed real-time information via airport digital signage. And digital signage deployment in airports is poised to take off: The compound annual growth rate of digital signage in transportation, including airports, is expected to increase 18.9 percent from 2014 to 2020.

But digital signage isn't just about arrival and departure information anymore. There are a number of other reasons for airports to invest in digital signage.

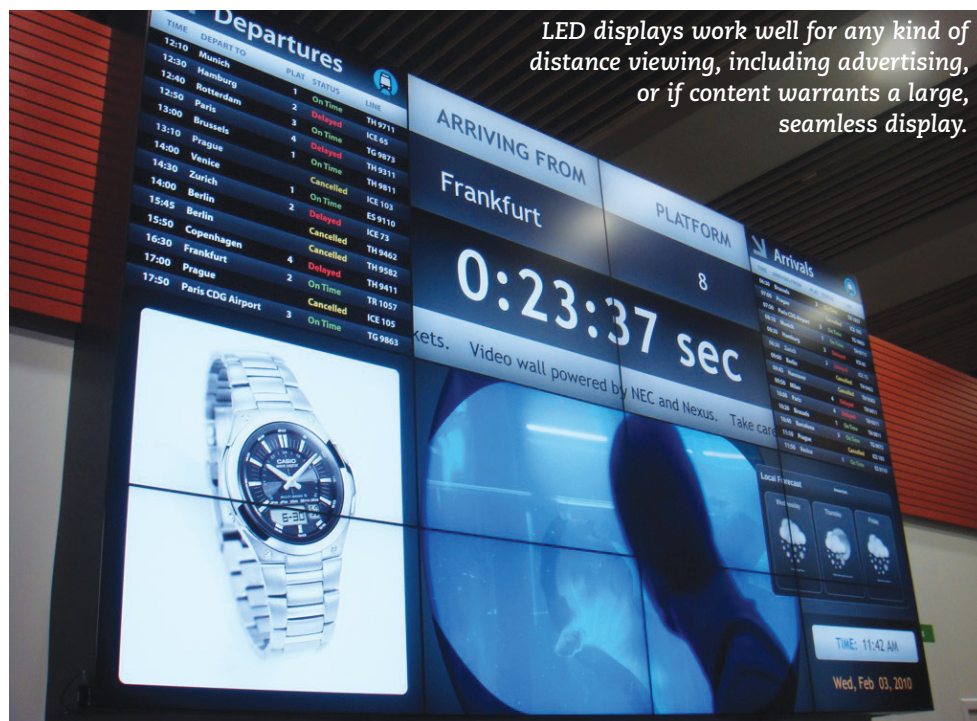
WHY USE DIGITAL SIGNAGE

In the past, static signage was used as wayfinding across all types of transportation. The changeable nature of modern transportation methods, however, means static wayfinding signage can be quite useless. Airports exist in a highly dynamic world; thus, it makes sense they are moving away from static signage and going digital.

Digital signage is easily updated and offers interactive experiences. Digital displays give the flexibility and fluidity an airport requires by making it easy to instantly swap out content by uploading it to a server – whereas a static sign can only be updated if an employee physically changes out the sign.

Digital signage can integrate real-time data. Its functionalities allow on-the-spot updates of news, weather, emergency alerts and delays, as well as location-based advertising.

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LED displays work well for any kind of distance viewing, including advertising, or if content warrants a large, seamless display.

Digital signage is almost omnipresent at airport counters, boarding areas and baggage claim – all informational settings – but the new ways in which it is being used are helping to enhance customer engagement.

Until passengers are past security digital signage is better used for information and wayfinding – people want to know where to drop their bags and then how to get through the security lines as quickly as possible. After security, digital signage can be geared toward entertainment – content viewed while waiting for a flight or in line at a store or for restaurant seating. Informational signage regarding flight updates, locations and gate changes still are important, but many people have time to linger in airports and want to be entertained externally, not just via their smartphones.

Ads make sense in airports, too. According to ScreenMedia Daily, “Key growth drivers for digital out-of-home advertising included customers spending more time with media outside their homes; increased engagement with digital out-of-home screen content linked to mobile devices; increased exposure to the medium on public transportation combined with longer commuting time; and the growth in both leisure travel and longer shopping hours.” All these factors play a role in why airports should use digital signage for advertising and engagement while passengers shop, dine and wait for flights.

Digital signage systems’ naturally dynamic capabilities can showcase meaningful advertising to the intended audience. Its features allow the ability to incorporate a brand’s colors and logo, showcase compelling visuals and interact with user technologies like mobile phones, which ultimately increases user engagement and can lead to an increase in sales.

FOUR WAYS TO MEASURE AND BOOST ENGAGEMENT

There are four key best practices for an airport looking to expand the customer experience:

1. Advertise items of interest. Especially after customers cross into the post-security realm of the airport, they’re looking for ways to be entertained while they wait to board their flights. Their options might include buying memorabilia from airport stores; trying restaurants with celebrity chefs’ names attached to them; cashing in on deals at airport stores or restaurants; or picking up special duty-free items.

A Rich Media Technologies study indicates digital signage is 63 percent more attention grabbing than static signs. Running ads for the purchases a captive audience can make inside the airport will increase customer spending.

2. Enable touch. Many airports already use touchscreen kiosks at check in, but they can also be deployed post-security. Kiosk touchscreens create an interactive experience for customers, allowing users to browse offerings in the area or search for a specific outlet, and obtain directions. Many utilize analytics to understand the users and their interests to help drive new, effective content and advertising.

3. Be able to measure engagement levels. A good way to do this is by using a call to action that asks customers to text a certain number to receive a digital coupon, or provide their mobile numbers or email address to receive updates or offers. This will measure how many people are engaging with the content on a display. Airports may even want to do an A-B test by testing out two different pieces of content advertising the same thing and see which one is engaging more with customers and use the more effective one to increase awareness.

Some displays are often coupled with a software element to measure engagement levels using facial recognition, which can determine dwell time and target advertising by determining age range and gender of the consumer.

4. Employ technology. Beacons, near-field communication (NFC) or RFID chips can be added to kiosks or digital displays to create new levels of interactivity and engagement. A user can tap a smartphone to a display or kiosk with NFC technology, or use a QR code to receive flight or product information.

Business Insider estimates there will be 4.5 million active beacons by the end of 2018. There are many apps for air travel and beacons can pick up that a traveler’s mobile phone has the app and target market them on digital displays, or beam ads or promotions directly to a smart device (the caveat here is that a traveler must opt in to receive these).

FIVE BEST PRACTICES AND CONSIDERATIONS

These five best practices will help guide an airport looking to invest in digital signage:

1. Budget: Budget is an important con-



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For up-close viewing, wayfinding and entertainment, LCDs work well.

sideration for any purchase and should be addressed early in the project, so an integrator can help an airport choose the best possible solution for its needs. Commercial-grade displays will always have a higher price point than a big-box store TV, but there are many reasons why that investment is worthwhile.

The image quality of a commercial display will be brighter, clearer and less reflective than traditional televisions. The panels are also built to withstand longer operating hours, so the 24/7 runtimes airports require can be achieved. Features such as a full metal chassis, integrated active cooling system and real-time temperature sensors protect the investment.

2. Control options: A majority of commercial display products can be networked so that all control of the content, scheduling and asset management can be done from a control room. A majority of display systems can send email alerts to a network administrator if there is risk of overheating or change to the system.

Another benefit of having network-based control is the ability to switch an input or push content on demand – meaning if there is an emergency, content can be changed in an instant to push emergency messaging.

3. Traffic patterns: By conducting a traffic pattern study, an airport can understand where people are walking and looking. This helps position displays in the right location

for both wayfinding and advertising purposes. Adding biometric capabilities can determine viewer aspects such as gender and age so messaging can be targeted based on the demographics.

4. Content: It is recommended content is rotated and changed out frequently. People tend to look past things they see constantly. If content is always fresh, it will draw the eye. Keep each image/slide on the display long enough for it to be read and digested, but not long enough that viewers become bored.

5. Environment: Whatever manufacturer or integrator an airport selects should be made aware of all environmental conditions in the space. Conditions like ambient light change throughout the year and can wash out certain types of displays, so any large glass ceilings or walls should be considered.

A display inside an atrium may require higher brightness capabilities to counteract the

ambient light. Automatic dimming, through an ambient light sensor, may be necessary.

TYPES OF DIGITAL DISPLAYS: LED VERSUS LCD

Both liquid crystal displays (LCD) and light-emitting diode (LED) displays have uses within different applications in an airport.

LCD technology allows higher-resolution capabilities at closer viewing distances; however, it is important to choose a robust display. For up-close viewing, wayfinding and entertainment, LCDs work well.

LCDs with high-haze panels have a matte finish on the front of the panel, which allows ambient light to be scattered more than reflected. If an LCD panel can't scatter the incident light, an image may be unreadable.

LCDs work best for displaying flight information, gate information, baggage information, advertising or wayfinding. They can be used

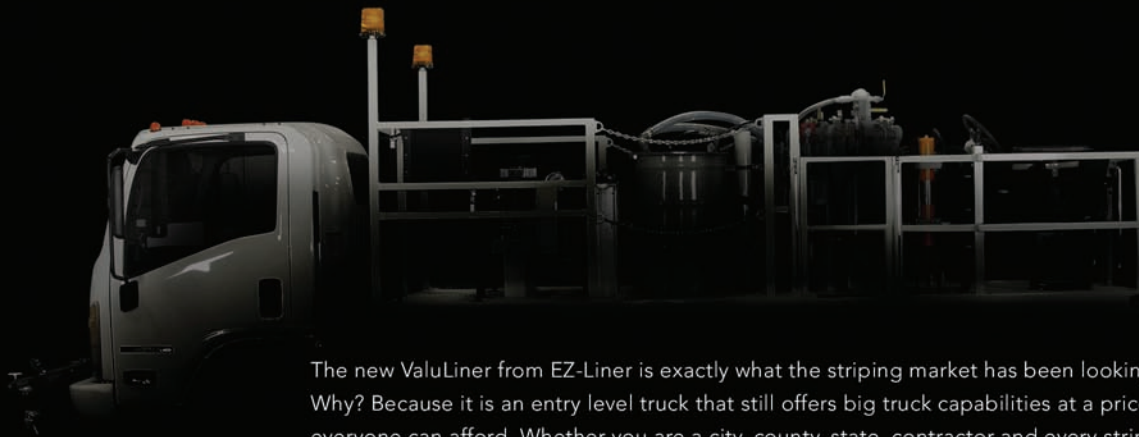
when travelers enter an airport and after security to display flight information or act as TVs.

LEDs are light-emitting diodes, meaning they emit colors and are not reflective the way an LCD is. Even though they do not reflect light the same way an LCD does, it's still important to consider the reflectivity of an LED panel's surface, and the two factors that affect it.

The first is resin placed over the LED itself. Most quality LED displays developed for indoor applications will use a small LED package that houses the red, blue and green LEDs in a single packet, which is covered with a resin to protect the LEDs. The face of these packetized LEDs can be white or varying shades of gray and the darker the face, the less light it will reflect.

The second factor is the reflective properties of the mask LEDs, which is typically made from black plastic with a matte surface. One good way to tell if the mask has adequate anti-reflective properties is to view the display from

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the side. If the display turns into a mirror, it may not have adequate antireflective properties.

LED displays can be produced with fine pixel pitches to give the displays high clarity up close. They can also be produced with a wider pixel pitch and very bright intensity, allowing viewing at great distances.

FIVE STEPS TO IMPLEMENTING DIGITAL SIGNAGE

When an airport is looking to implement digital signage there are five steps to developing a plan.

The first is to determine what the goals. These could be getting travelers from point to point, or they could be more involved: increase awareness of the facility's offerings.

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LCDs typically work best for displaying flight information, gate information, baggage information, advertising or wayfinding.

The next step is to understand the project's budget. Digital signage technologies and systems vary greatly.

The next step is determining what type of display technology will best achieve the goals while staying within the budget. For this task, it may be helpful to employ a digital signage consultant.

After that, it's important to determine how the airport expects to benefit from what it deploys – how to measure engagement based on the costs associated with the investment in digital signage.

Lastly, it's important to think about the future: what additional resources or add-ons can be integrated into a digital signage strategy.

Using digital signage to engage and interact with travelers creates a smoother traveling experience for customers while boosting revenue and is part of the next wave of air travel. The airport of the future is ready to take off.



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Plan for Growth

Knowing your key markets and developing a plan can help you enhance air service.

Without air service, there's no reason for airports to be in business. So facilities large and small have put aside resources to go after all-important flights and maintain existing service.

That task has gotten harder in the past 10 years as airlines have merged, gotten rid of smaller regional jets and turboprop aircraft and reduced capacity. Airline planners have raised the bar on how they choose air service, resulting in more airports chasing after a smaller piece of the pie. Representatives from large, medium and small airports share their successes and challenges with air service development.

Kristie Van Auken, who at the time this story was written was senior vice president and chief marketing and communications officer at Ohio's Akron-Canton Airport, located about 50 miles south of Cleveland-Hopkins International Airport. "The consolidation of the airline industry has really shaped the air service picture for airports in our region, and both airports have been affected by consolidation," she said. "We were also affected by the merger of Southwest and AirTran, and now the reduction of our service on Southwest."

But the airport has also had some really good wins, said Van Auken. "That's the nature of this industry, particularly if you're not at a megahub. You're not going to win every time," she said. "This year (2016) is going to be a painful year for us. But at the same time, in the last 12 months, we've been able to secure non-stop service to two New York City airports, which was really exciting for us. That was a key market that we wanted to replace after Southwest decided to leave that market." The airport now has service on United Airlines to Newark and LaGuardia Airport on American Airlines.

The key for Akron Canton Airport is to focus on the fundamentals, said Van Auken. "Those fundamentals are offering deep knowledge of our local market to help airlines become successful faster in Akron Canton than other markets," she noted. "We have to aggressively

pursue the airlines that are still standing. Our competition is the 420 commercial airports across the U.S."

Those airports all want to be the next best opportunity, said Van Auken. "For us to position ourselves to get that next best opportunity, we have to be smarter and be a little hungrier. And we have to go in with some unique propositions," she said. "We feel our low-cost structure, our deep partnership mentality and our marketing knowledge is a powerful story is that everyone really likes."

Mark Kiehl is the air service development manager for Norman Y. Mineta San José International Airport. "Travel patterns don't typically change a lot over a five-year period. But if there's one thing that is identifiable here, it's that there's probably an





even greater global reach for our Silicon Valley companies,” he said. “And I think that’s why you’re seeing us go from two to seven international airlines in the span of about a year. If those markets weren’t important and high-profile, then the carriers wouldn’t be responding.” In the past year, Mineta Airport has won new service from China’s Hainan Airlines, British Airways, Lufthansa, Air Canada, ANA and Mexico’s Volaris. Kiehl said that he’s been through several airline mergers. “If you look at the big three today, American, Delta and United, there’s probably at least 30 other carriers behind those brands because of all the mergers and acquisitions,” he noted. “It means that the pool has gotten smaller, which means that choices are fewer. That means that airports have to be much more targeted and more of a proactive partner with carriers and build your plan accordingly.”

San Jose is fortunate to have so many air service stories to tell right with the growth of international and domestic carriers, said Kiehl. “The traditional way to do air service is tactical, where you approach an airline and talk about a specific route that might have an opportunity for new or expanded service,” he pointed out. “But when I got here, I took more of a strategic approach with carriers, so we are really moving forward both domestically and internationally. We hold out our new international routes as

successful. But a domestic route is every bit as important to us, and is every much as successful for us too.”

San Jose is not the only airport in the region, with San Francisco International, Oakland International and even Sacramento International. “So as the crow flies, all those airports are not too far off. But when you are sitting in traffic for two hours from here in the South Bay trying to get to the North Bay area, that’s not so fun, especially in the morning when you have a flight to catch,” said Rosemary Barnes, San Jose Airport’s public information manager. “We are very much focused on the convenience that our airport offers. Customers are able to get to their gates within a reasonable amount of time.”

Jim Tyrrell is the deputy director of business development for Philadelphia International Airport, a hub for American Airlines. “We went from a being a Star Alliance hub with US Airways to a oneworld hub under American,” he said. “So while we still have the same amount of international traffic, it connects differently.”

Because of industry consolidation, there are a lot less airlines to visit, said Tyrrell. “The interesting thing is not only the consolidation among the legacy carriers, but also the recent prosperity of the low-cost carriers,” he said. “Philadelphia has seen a fairly healthy growth in the last year and quite frankly, it’s been attributable to low-cost carriers.”

Despite its hub status with American Airlines, Philadelphia is still campaigning hard for new and expanded flights. “Most recently, we were successful in bringing Qatar Airways with daily service,” said Kiehl. “That was a big deal for us. Qatar is a oneworld carrier that has been looking to make inroads into the U.S. market. It’s our first Gulf region air carrier.”

The Qatar Airways service was important because of connectivity, said Tyrrell. “We have a huge Indian population. We couldn’t get there from here without somewhere to launch to Asia. Even though the Qatar flight doesn’t have great connectivity to the Indian market, it has geographic connectivity and a great level of service from Doha to India.”

Alaska Airlines added new routes that we’re happy about, said San Jose’s Kiehl. “They are very symbolic because they not only bring some additional competition to the market, but they show that carrier’s commitment to the Silicon Valley,” he said. “If you look at our portfolio, you see double-digit growth with Alaska, with American and with Delta. We’ll add to that [service] list, and every one of them is important.”

Domestic service is important, said Kiehl. “We try to make sure our team understands that too. That’s the backbone of most airports in this country, so we have to really be careful and pay attention to that,” he said.

San Jose’s Barnes is part of a team of 10

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that handles marketing and promoting at her facility. “We get the word out in the community about all our new service, announcements and launches. We also have a great team of consultants and great business associates in Silicon Valley that are so supportive of us,” she said. “Significant partners at the table include the Silicon Valley Chamber and the Silicon Valley Leadership Group, an agency that represents many of the high-tech CEOs here in Silicon Valley.”

They are at the table with the airport courting these airlines, announcing new service and launching these new flights, said Barnes. “They also go out on the delegations with us to help evangelize about Silicon Valley and our airport at those down-line destinations,” she said. “We also have the Silicon Valley Business Travel Association, a group of travel managers that represent a lot of companies here. But also at the table are airlines, hotels and tourism leaders. So we have a lot of support in the business



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community and certainly in our awesome team here."

Each airport has different goals. "The most important one for us was Orlando. We've had nonstop service to Orlando ever since I've been at the airport, and I've been here for almost 20 years," Van Auken said. "Since Southwest decided to exit that market, it was the number one priority. And thankfully, Allegiant is stepping in. They're going to provide nonstop service twice a week year round. So it's not daily, but it is low-fares and it's really well planned in time for vacation travelers."

The airport would love to get service a little further west, to Chicago, said Van Auken. "That is a key priority now for us as we move forward. But with that being said, we can't really move on to the next big objective until we are sure that what we have now will be successful," she said. "So we have to exercise some patience and some discipline."

Allegiant recently announced it's moving flights from Akron to Cleveland in February.

San Jose Airport is humbled by the growth that its having, said Kiehl. "So a lot of this year is focused on the launch of these new and expanded services," he said. "It takes a lot of team effort here to not only get these airlines launched, but we've got additional announcements coming up, which is almost a full-time activity all by itself."

But there's still a very high level of demand for service to the East Coast, said Kiehl. "If you look at the traditional markets, it's Boston, Austin, Seattle, New York and Washington, D.C., as clear targets. And Atlanta is important too, along with Raleigh and Charlotte, North Carolina," he said. "As the Silicon Valley expands, more and more companies need to have a presence here. If you came here and we took you for a drive, you would see companies represented that you think would be based here."

Philadelphia set three air service goals: Asia, Asia and Asia, said Tyrrell. "It's one of the fastest-growing market in terms of airline capacity. We are the largest metropolitan area in the United States without direct service to Asia," he said. "My business community is absolutely screaming that they want service to Asia." Beijing and Seoul would be nice, said Tyrrell. "One thing we fully understanding and recognize is an air carrier's commitment doing a route of the magnitude of Philly-Beijing or Philly-Seoul," he said. "So in order to fly a Philly-Seoul or Philly-Beijing, an air carrier would have to commit close to three aircraft to fly that route. And the aircraft flying that route are about \$500 million each, so we're talking about a commitment of an air carrier to over \$1 billion in terms of the investment to fly this route. We know that is a huge commitment and we want to make sure that it's sustainable."

In order to sustain that kind of investment of an air carrier, an airport has to have a "pretty damn good business case," said Tyrrell.

"So we make sure we do the due diligence that's necessary in terms of identifying why it makes sense for the carrier to commit the magnitude of those assets to Philadelphia," he explained. "We show them how many passengers that they can expect with each leg of the trip we're able to commit it.

We go through a lot in terms of carrying a presentation when we get the opportunity to do so."

It's not about trying to buy an air carrier for flights in Philadelphia for a specific period of time, said Tyrrell. "I've seen it done at other airports. But we have to make sure it's sustainable, because we're each making a huge investment, not just the airline."



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Hainan Airlines began service to McCarran International Airport in December, becoming the first direct flight from mainland China to Las Vegas.

McCarran International Airport

Prepare for Chinese Air Service

On Dec. 2, Hainan Airlines began mainland China service to McCarran International Airport (LAS), becoming the first carrier to offer direct flights from that country to Las Vegas with service three times per week from Beijing.

Chris Jones, chief marketing officer for LAS, said the airport is pursuing service from Chinese cities because leaders believe there's a ripe market for outbound travel from China.

Because LAS isn't a mainline hub airport, Jones said it's unlikely a mainline carrier like United Airlines, Delta Air Lines or American Airlines will ever put a direct China to Las Vegas flight in service. The airport is instead pursuing Chinese carriers.

There are also a restriction on the number of flights coming from Tier 1 cities — Beijing, Guangzhou and Shanghai — due to a bilateral agreement with the U.S. LAS is having the conversations now about the possible Tier 2 cities.

Though Tier 2 cities, Jones said they still have populations around 10 million people.

"I see cities like Chengdu, I see cities like Chongqing, I see some of the places that are down in the Pearl River Delta that might be within range of service, a lot of which that don't have any nonstop service to the U.S. right now," he said. "They have a market for it and they're clamoring for it as well because they want to get the connectivity to North America, but right now people in those areas have to go through typically Beijing or Guangzhou in order to get here."

THE MARKET FOR CHINESE AIR SERVICE

Vancouver International Airport (YVR) has been one of the leading airports in North America in attracting flights from mainland China in recent years, becoming the largest single destination airport from the country.

Carl Jones, director of air service development for YVR said the airport developed plans for the emerging markets to target the biggest growth potential. In January, the airport launched Flight Plan 2037, which updates its master plan to meet the needs.

"It's no great secret that the whole world and all airports are really focused on China and the growth," he said. "But having that foresight many years ago to not only focus on the growth out of Beijing, Shanghai and Guangzhou, we're really preparing for that next wave of growth from these secondary Chinese cities, so we have a Hong Kong marketing office that's very close and working with the airlines on the opportunities."

Steve, Martin, senior vice president for InterVISTAS Consulting Inc., said there are huge forces at work in the region as a whole and China in particular will continue to have

enormous growth. A lot of the airport clients the company works with are actively engaged in marketing themselves to China.

Chinese tourists spent \$229 billion in foreign countries in 2015 according to a study by GfK.

"They would love to have China service," he said. "In terms of regional and economic development, it's a tremendous economic engine."

Marcus Lam, vice president for InterVISTAS, said bilateral agreements between the U.S. and China are some of the strictest in the world, which creates challenges.

"Because of this regulation, airlines are kind of scratching their heads and saying 'look, I really want to start a flight into Beijing but for multitude of reasons, I cannot because of government regulation, because of infrastructure, because of timing slots that are available that I want to fly into,' Lam said. "Because of all these kinds of restrictions, a lot of the carriers operating in this space are looking to kind of be very creative in partnerships. If they can't do it alone, what if they can make a friend, a partner, whether it's codeshare, whether it's alliance, whether it's just interline or joint venture to actually serve that market."

Lam said there are a lot of joint ventures already in place in Asia and absent these joint ventures are most notably the Chinese carriers.

"We know that Air China is already in Star Alliance, we know that China Southern, China Eastern are already in Sky Team, there's no major Chinese presence in One World if you don't count Cathay Pacific and Hong Kong for mainland China," he said.

But is it because of regulation? Or is it an unwillingness to partake in a partnership by the Chinese?

"Anyone can take a guess but there's no one reason, but we do see movement in this space," Lam said. "For example, Air China just signed with Lufthansa Group on a joint venture for European traffic into China. We know that Air China is working very closely with Air Canada on a joint venture that is imminent. Not approved yet, but imminent."

Beijing has a new airport scheduled to open within the next two years, so what do airlines do until then? Lam said they certainly won't sit around waiting for new gates and new spaces to open up so they can bid on them so you will see very creative ways of serving the U.S. China market in this market.

"One of the notable standouts in this space in terms of airlines is the HNA Group, China's largest private airline. They are very creative. They also operate in this really constrained space and they say 'you know what? Fine, we'll start routes that aren't the most popular, aren't the biggest,'" he said. "Los Angeles to Changsha is an example. Twice weekly from Los Angeles, but it doesn't fall under the kind of restrictions that the bilaterals have placed on popular airports like Beijing or Shanghai.

"They're almost as you'd say, running the carriage ahead of the horse. They're placing their aircraft there and kind of developing the market in advance of the market being there because they see the growth rates that are so high."

There's huge potential for more flights and Chinese travelers heading to U.S. airports, but Lam said there are potential challenges on the horizon. President Donald Trump has spoken about strengthening trade restrictions between the countries, which could hinder flights to mainland China.

"Anecdotally, we know that people are now bypassing the U.S. whenever they can to go to the neighboring countries themselves. Universities are seeing an uptick in student applications into Canada and Mexico from China because the Chinese students may choose to avoid the U.S. in the next four years," he said. "It'll take some time for us to statistically back that up, but one hypothesis is because of this new administration's feelings towards China could really have an effect on the demand and the growth we've seen in the last few years."

If political issues to spiral between the U.S. and China, it could mean a shift to the Canadian market for Chinese airlines.



McCarran leaders prepared for the first direct flights to China by adding signage in Mandarin to accommodate Chinese travelers.

"I really see a drop in demand for connections via the U.S.," Lam said. "I think on top of the current restrictions right now for need a transit visa via the U.S., if the relations sour, then a Beijing to LA to Buenos Aires passenger could very well just travel Beijing to Toronto to Buenos Aires and skip the U.S. altogether.

"Those are the kinds of flows we see. They may not be truly valuable to the airline, but once you have multiple kinds of these on multiple itineraries, you really do see an effect."

Jones said Vancouver traditionally had an advantage in attracting Chinese air service because of its large Asian population. However, the real area of growth for the airport is building connecting traffic. They're working to build the facility as a trans-Pacific hub for these flights and identifying key markets it could serve.

"If we forecast out 20 years, the biggest growth rates will be China and Asia and Latin America," he said. "For us, it's working with the airlines to look at those opportunities and making sure our hub facility can sustain that."

While there's plenty of growth opportunities for U.S. flight from secondary Chinese airports, Lam said it's not as likely secondary airports will be a good fit for Chinese airlines. United started service from San Francisco International Airport (SFO) to Chengdu and Xian. While they're growing markets, they're very different than Beijing or Shanghai.

"I think it's a reality for large metropolitan centers, definitely very, very far away for the U.S. secondary cities to consider secondary cities in China," Lam said.

Lam said Chinese carriers will also start looking at connections more between the U.S. and China instead of just origin-destination traffic.

"I know that for example that China Southern is building up its Guangzhou hub to connect passengers from the U.S. onwards to Australia," he said.

He said U.S. carriers are likely not going to view the Chinese airports as connecting points from the U.S. However, the Chinese carriers will need to consider this more. They're being very competitive right now with flights ranging around \$500 with zero beyond cost, which signals a lot of capacity for the airlines.

"Airports in China now have to also consider their connection facilities," he said. "They now need to think about stuff like how to transit international to international passengers; do they need Chinese visas, this is why they came up with the 72-hour visa-free rule because the Chinese government has acknowledged that more and more passengers are using China as a transit point, which is a country that's not known to have a lot of transit passengers. Hong Kong is known to transit a lot of passengers. Taipei is known to transit a lot of passengers, but not

Beijing or Shanghai. But more and more of that's happening because there's so much capacity in the market."

What city could be the next Las Vegas? Martin said education is a big draw for Chinese travelers, so areas with a lot of higher education institutions will tend to attract more traffic. They're also fond of high end destination areas. "We're at the point where we can work with airport clients, we can sometimes get down to the zip code level of where the exact Chinese population is," Martin said. "Then it's about understanding the area, what kinds of airports they travel through and their travel patterns and what airports are they using if they have multiple to choose from."

"I think you really need an understanding of the Chinese population in your airport tachment."

The current market could also change if ultra-low cost carriers start ranging across the Pacific Ocean. Lam said there is word Lucky Air is interested in entering the U.S. market and the environment is ripe for lower cost carriers to serve the market.

PREPARING FOR CHINESE TRAFFIC

Jones said servicing the Chinese passengers was built into YVR's overall customer care program, which includes Chinese signage throughout the terminal, voice announcements and wayfinding to guide them through the facility.

Vancouver also has its Green Coat Program, which uses local residents as volunteers to promote customer service at the airport.

"It's really looking at ways for wayfinding and making sure guests can interact with our customer service team," Jones said.

Petr Otoupal, managing director of Simpleway, said airports need to make sure Chinese passengers can navigate through the terminals and to connecting flights or their destination. He compared it to a North American person traveling to China and then trying to navigate the airport without any English signage.

"If you at it from that perspective, you start thinking from the point 'what would I need in the passenger terminal to be able to navigate through the airport,'" he said. "Do we need wayfinding signs? Do we need static signs? Do we need it to be in multiple languages? Do we need voice announcements? What is the bare minimum I need and how can I start building off of that?"

Otoupal said the boarding process is an area it's essential to have multiple languages available for foreign travelers. As a baseline, you need to be able to cover all core operations, like final call, emergencies and irregularities.

"It looks like a lot, but it's really not that bad," he said. "Then you build on top of that."

There are various dialects of Mandarin and Cantonese as well as other languages present in the region. He said on one project they worked on involved using a form of Mandarin from mainland China, which was recognized as Mandarin, except in one area of the country.

"You're running into an issue of trying to find a neutral type of Mandarin or a neutral type of Cantonese with all the flavors of those various Asian languages to make it work for everybody," he said. "It's not just that someone may speak Korean or they speak Mandarin. There's actually a lot more issues than that."

Otoupal said a baseline requirement that clients will use is looking at the main languages of the regions where the Chinese flights are coming from. They also need to look at the airlines and the actual traffic they bring in.

"You are likely to cover the bulk of who is coming through your airport in this type of model," he said.

Otoupal said a technological solution may be the best option for smaller airports with connecting Chinese traffic because it can be difficult to find Mandarin speakers. He same there are concerns from airports about too many announcements and each language drowning the others out, so you have to limit the languages and train staff.

"When you look at it from a practical perspective, say you're looking for a lost passenger and you're looking for him in the language that we speak, you're more likely to use more messages to get him than if you do one message a language he speaks," he said. "Therefore, you're creating less noise, you'll make less calls and it makes for better customer service and an overall better experience for the passenger." Before LAS even secured service to mainland China, Jones said leaders knew they needed to address wayfinding issues. Leaders built a three-faceted program to address those needs.

Jones said LAS developed a welcoming ambassador program where the airport contracted with a company to provide Mandarin speaking ambassadors with specially designed

McCarran International Airport



Getting Chinese travelers to their final destinations is crucial when creating a positive airport experience and wayfinding.

uniforms that are deployed when passengers from the Beijing flights arrive in the terminal.

"As part of that, we had outreach to our concessionaires so they knew this was coming," Jones said. "Our duty-free store has started to stock up on items that they know are popular with Chinese travelers from their experiences in other markets that have Chinese service."

Jones said the airport's master concessionaire even had restaurants design menus printed in Chinese so the customers could read them and added items with traditional Chinese foods to make the travelers feel welcome.

The second piece of the planning was elementary wayfinding. Jones said staff walked the floor for an international flight coming in and thought out what the travelers will see when they get to each point.

The third element of LAS's plan was engaging Chinese travelers using the social media program WeChat.

"We wanted to have a presence on that website so that at the point where somebody is saying, 'you know what, I'm going to have some time off two months from now, I'm thinking of going to the United States, where do I want to go,' I want them to find our page on their WeChat site when they're in China and look at that and see that we've produced messaging in their language," he said. "Signage, directions, details on what kinds of stores or what kinds of shops restaurants, etc. and they can look at that and they can become comfortable and familiar with the airport even before they've made the decision to fly here."





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Chris Voith

The Human-Centered MRO

Inquiry-driven design approach improves safety and efficiency for Latin America's largest MRO.

Many people, including those in the aviation industry who should know better, have an overly simplistic view of MRO design. Even the National Institute of Building Sciences, in its Whole Building Design Guide, refers to aircraft hangars as “glorified garages” – necessary to keep the airplanes out of the elements while work is done, but not much more.

This perspective misses so much of the value created by a well-designed MRO.

The planning and architecture of an MRO must respond to a variety of human, technological, logistical and financial factors to deliver maximum efficiency, quality and speed. Done well, it can optimize operational, scheduling and budgetary performance, create optimal working conditions and contribute to fewer errors, quicker turn-around times, and higher ROI.

THE LARGEST MRO IN LATIN AMERICA

Leo A Daly had the opportunity to provide design and programming for Delta Air Lines and AeroMexico's new joint maintenance facility in Queretaro, Mexico. At 500,000 square feet, this is the largest MRO in Latin America, capable of servicing nine aircraft simultaneously.

Leo A Daly teamed up with Mexican contractor GMI to create cost-effective, and low-maintenance design for the joint facility. Using a

hub-and-spoke space-frame system, designed for clear spans, it was designed to keep construction costs low and future upkeep to a minimum.

The complex includes three hangars, new landside access service drives and loading docks, support shops and mechanical rooms, personal support spaces, a recreation building and an executive/administrative suite.

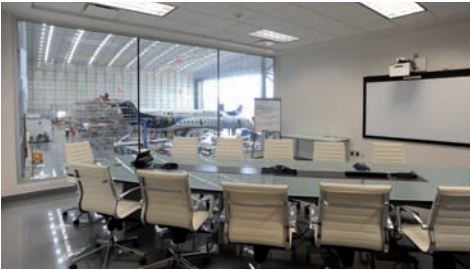
The design incorporates sustainable design strategies, including photo-voltaic panels that generate 75 percent of the facility's power, daylight harvesting, rainwater capture systems, aircraft-wash wastewater recycling and the use of locally manufactured materials.

PEOPLE AT THE CENTER

This MRO is a large-scale example of project success in human-centered design.

Rather than putting the airplane at the center of the design process the approach starts with the day-to-day work experiences of the facility's users and owners. Designing from the user's perspective helps reach unexpected conclusions, find improvements to processes, and develop workplaces that enhances the efficiency, quality and user engagement.

Chris Voith



An executive conference room overlooks the hangar floor, serving as an unforgettable sales tool.

HUMAN FACTORS

Airplane maintenance technicians work under unique and often challenging conditions. Late hours and high platforms, adverse temperature, unpredictable lighting, repetition of tasks and pressure of deadlines create stressors.

Human factors directly cause or contribute to 80 percent of maintenance errors. A more efficiently designed space reduces the number.

Chris Voith



Leo A Daly used a process of human-centered design to improve efficiency, safety and quality.

EVERYTHING IN ITS RIGHT PLACE

The first priority was to decide on an arrangement of spaces allowing employees to work efficiently. It was important the approach not start with preconceived ideas, but rather spring from the experiences and needs of the employees themselves.

Planners sat down with technicians and shop managers and asked them to diagram how

Chris Voith



Photovoltaic parking shades provide 75 percent of TechOps Mexico's peak power needs.

they work – how and when components come to them for repair, and where they go. We also asked about pain points: what isn't quite working. Finally, after prototyping a few ideas, we solicited their feedback on the designs.

The goal was to investigate existing work flows to determine the ideal arrangement of shops, storage and hangar space.

"You need these component shops in the right locations because labor is very expensive," says Hank Moody, general manager of corporate real

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estate with Delta. “You’re hiring highly skilled technical labor and you don’t want them running all over the place looking for supplies. You want the component to go off the airplane and right back on the airplane.”

Using a LEAN process, planners designed the MRO that positions three hangars around a central storage warehouse. Components arrive by truck into the center of the facility and go straight to the warehouse. Pieces are delivered just-in-time to the shops or hangars. Shops for painting, metal work, component repair and other functions are located directly behind each hangar.

This centralized design is “amazingly more efficient” than Delta’s previous facility in Guadalajara, says Kevin Lynch, general manager of corporate real estate for Delta. “In our former space, we had a standalone hangar, a standalone shop and standalone storage. There was a lot of movement across the airfield. Now it’s centralized and that is key to the entire operation.



Interior design for TechOps Mexico was done in collaboration with a local university, part of strengthening the MRO’s employee pipeline.

It made turn times a lot quicker because you’re not spending a lot of time moving parts to the aircraft line.”

Using an inclusive process many of these solutions came directly from employees. By the end of the first facilitation session, they had come away with a new way of doing things.

IMPROVING CONDITIONS FOR EMPLOYEES

Once the large parts were in the right place, we filled out the design with elements to further reduce stress on employees. The joint venture made substantial investments in the work environment, partially as a way of attracting and

retaining top-quality workers. Some of the key considerations there were mobility and health.

Mobile devices at the technicians’ workstations were designed to allow real-time communication with the issue window. This increased efficiency reduces stress on employees, freeing them up to put extra attention into ensuring proper documentation.

A recreation facility with basketball courts was added, as well as a break room, and café with optional outdoor seating. Employees pass through these areas every day, which increases use and reminds them they have a home here; that the company cares about their well-being.

According to the Harvard Business Review, exercise improves concentration, memory, learning, stamina and creativity, while lowering stress. Those are many of the same metrics the FAA points to in its AMT handbook as influencing human factors in aviation maintenance. The recreation facility with basketball courts for team improves staff culture and allows employees to develop the mental, emotional, and physical health to help them do their jobs more effectively.

THE EXECUTIVE EXPERIENCE

A human-centered approach should view the owner as a user and design the space around how he or she will use it.

Optimizing design for the TechOps MRO required a solid understanding of the economics of this specific joint venture. How it intended to manage its supply chain, how supply chain related to storage space for inventory, what effect the regional climate would have on the building, and the cost of water and power were all relevant to the planning and design of the MRO.

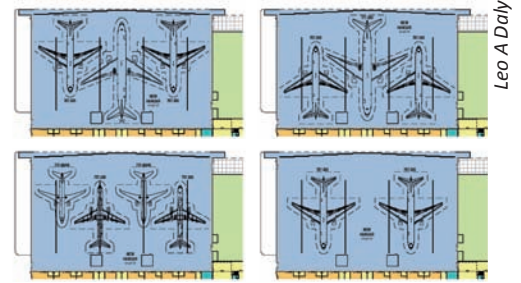
Planners identified efficiencies related to each of these considerations, which translated into design decisions to improve effectiveness.

RIGHT-SIZING

For this project, Delta moved to a just-in-time delivery method to reduce inventory.

“In the past, we would manufacture all the parts and pieces at the MRO. You’d have a cabin interiors shop, a brake and wheel shop, paint shop, etc. We would manufacture those parts and pieces on-site, requiring a lot more shop space in every MRO. Now, components are delivered just-in-time from our shops in Atlanta,” said Lynch.

This strategy allowed the design-build team to create efficient storage designs.



Leo A Daly

A flexible design allows TechOps Mexico to serve a wide variety of airplanes in various positions.

“With the just-in-time logistics strategy, we thought, why not cut three-fourths of the warehouse and use all the vertical space created by the other two hangars to orient the warehouse vertically,” said Miguel Uribe, who was CEO of the joint venture at the time of the design.

“We created so much space by going vertical, we were able to build a third hangar in between the two we had planned. That extra storage space became a heavy maintenance bay for a 737,” said Lynch.

The logistics strategy added 10 percent more space for airplane maintenance.

THE RIGHT STRUCTURAL SYSTEM FOR THE CLIMATE

The high-desert climate of Queretaro provided a number of challenges and opportunities.

Without heavy snow loads like Delta is used to in Minneapolis, the design-build team had the opportunity to explore lighter structural systems with the potential to lower costs.

The structure that underpins the three-hangar complex is a space-frame system – a modular structural solution most recognizable as the basis for Buckminster Fuller’s iconic geodesic domes. “It’s a geometrical design – a series of triangles that goes together just like an erector set,” said Lynch.

Initially the Delta team was wary of the space-frame design. “Delta typically builds heavy structures with big cantilever roofs,” Lynch said.

The space-frame system’s ability to span greater distances using a low amount of steel also translated into more flexibility over size.

“Spanning further allows us to accommodate more aircraft inside the hangar at one time, which also increases the variety of aircraft we can service,” Lynch said.

Chris Voith



The space frame structure system allows TechOps Mexico to span further using less steel than other systems.

HARNESSING THE DESERT

Due to QRO's location, water costs were extremely high and the power grid was not reliable.

"In Queretaro, it's very dry most of the year, but when it does rain, it comes down in overwhelming amounts," said Uribe.

This led to the design of a system of rain-water collection and gray-water reuse. Cisterns

collect rainwater, which are used for all non-potable need. It's designed to reuse water seven times before it needs to be treated.

We investigated photovoltaics and found it could qualify for government incentives.

Each parking space was outfitted with a PV sun shade. The solar field covers 75 percent of peak power needs.

ENGAGING LOCAL TALENT

The joint venture had to build an educational framework to ensure employees are produced

"The local university was producing about 100 to 150 qualified students every month, but we needed waves in excess of hundreds every quarter," Uribe said.

Planners sought a partnership with the

Aeronautics University of Queretaro to develop programs and recruit students.

"We used the TechOps brand to encourage recruitment at the university, filling their classrooms with our requirement of potential talent. The students not only had their tuition costs waived, but TechOps paid them an extra stipend so they could stay focused on their schooling. After graduation, they were rewarded with a job. With that, we closed the circle," Uribe said.

See more online at

www.AviationPros.com/12280948

ABOUT THE AUTHOR

Jerry Voith

Jerry Voith is global aviation practice leader for Leo A Daly, an internationally ranked architecture, engineering, planning and interiors firm. Voith has spent 35 years as an architect dedicated to creating innovative, award-winning aviation projects.

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Hotel Development Builds Revenue and Destination Status

Airports building attached hotels are enhancing the customer experience while building more revenues.

As airports continue to find ways to bring in non-aeronautical revenue and offer a better passenger experience, three facilities are using on-site hotels to do both.

Terry Teifer is the CFO for the Wayne County Airport Authority, which manages Detroit Metropolitan and Willow Run airports. As CFO, he oversees the Westin Detroit Metropolitan Airport,

located in the McNamara Terminal. Opened in 2002, the hotel features 404 rooms, 10 suites, 26,000 square feet of meeting space and a pool and fitness center.

Detroit's McNamara Terminal, home to Delta Air Lines, is by many accounts, one of the top airport hubs in North America, said Teifer. "If you look at what's offered by modern hubs like Detroit, an airport hotel adds to our brand," he said. "Our terminal is a single building with 122 gates that serves as the Asian gateway for Delta."

Back when former Delta CEO Richard Anderson was in the same job at Northwest Airlines, he said he wanted a hotel at the airport, Teifer recalled. "He thought it would be a great fit."

In the airport environment, the hotel is busy during the week, while weekends are slow, said



Teifer. "You don't get business that comes in just for the weekend, so business travelers are key. But we have a significant park and fly program where you can stay at the hotel and get up to eight days of valet parking," he said. "We use that program to fill rooms on Friday and Saturday nights."

Because Detroit Metro has flights to 130 destinations, travelers can fly in and use the hotel's meeting space for events with no distractions, said Teifer. "We're able to get multinational corporations to bring in team together for meetings. They can fly into the hotel, hold their meetings, then fly home," he said.

Another unique feature at the airport is the hotel has its own Transportation Security Administration checkpoint, said Teifer. "The McNamara Terminal was designed before 9/11. But we have a solid concessions program that's an additional amenity for guests, so TSA allows us to get them past security so they can shop and eat," he said.

REFLECTING THE REGION

Phil Brown is the executive director of the Greater Orlando Airport Authority, which runs Orlando International Airport. The airport hotel, a Hyatt Regency located above security, opened in 1992. It features 445 rooms (including 23 suites), 42,000 square feet of meeting space, a fitness center and an outdoor pool.

The hotel was the brainchild of former executive director John Wyckoff, said Brown. "He thought a hotel would provide a significant amenity for travelers in and out of the airport that also reflected the theme of central Florida," he said. "There are some hotels that are connected to or near an airport, but I don't know of many that are incorporated in the airport as part of its terminal." Orlando is a great O&D destination, he added.

The airport has had the same operator, Hyatt, since the beginning, said Brown. "And we just negotiated a new 20-year deal with Hyatt."



"Our meeting spaces have been in demand because of our great location in the center of the country."

STACEY NICHOLS, DIRECTOR OF THE HOTEL AND TRANSIT CENTER FOR DENVER INTERNATIONAL AIRPORT

The Orlando Hyatt also markets itself to travelers flying out of the airport. "You can check into our hotel the day before, check your bags and make your early morning flight," he said. The airport also has a baggage retrieval and delivery service and its own airline check-in counters.

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The hotel falls under the airport's operations, said Brown. "We assume full responsibility for the management and refurbishment of the hotel," he said. "So we have to balance the hotel's needs with the airport's needs, because the funds all come from the same source."

Despite the recession that hurt a lot of hotels in the Central Florida region, the airport was able to survive, said Brown. "We've been able to cover our costs and pay for a refurbishment. In the early years, we had to subsidize the hotel, but those days are over," he said.

The airport hired a hotel advisor that helps watch the bottom line, said Brown. "We're good airport operators, but that doesn't mean we excel at hotel operations," he stated.

Stacey Nichols is the director of the hotel and transit center for Denver International Airport. The Westin Denver International Airport opened in November 2015. The hotel has 519 rooms, 35 suites, a pool and fitness center and a program that highlights environmental practices, including energy and water conservation and waste minimization.

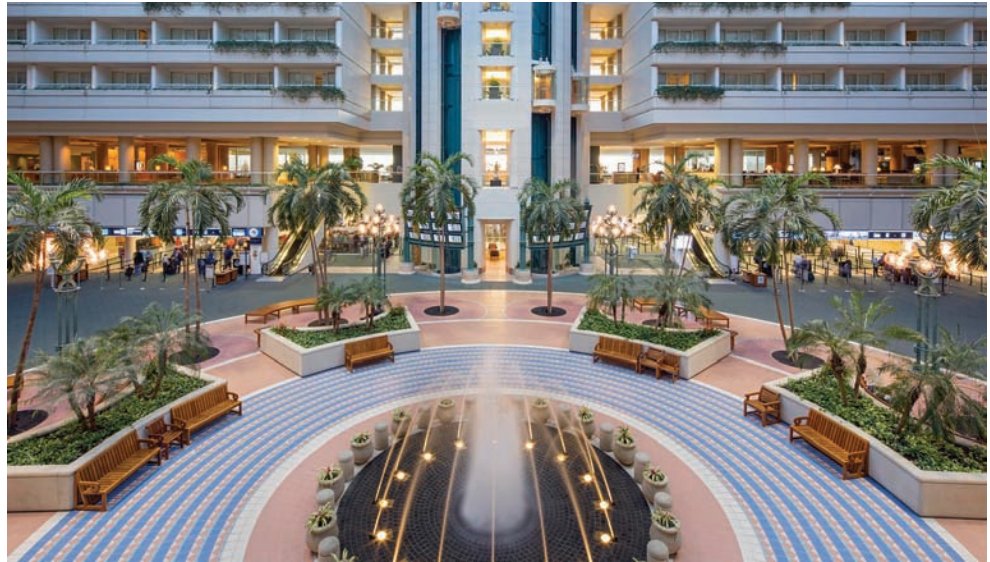
"We're excited to have this amenity here," said Nichols. "It was originally part of our master plan to have a world-class hotel at the airport, so I'm happy to see it come to fruition."

Teifer said his airport worked with Denver. "We helped them with lessons learned from our own hotel development."

So few airports have connected hotels, said Nichols. "And so few offer this level of amenities that it been game changer here for Denver airport," she said. "This facility is helping us meet the needs of today's more sophisticated traveler."

The unique challenge of running an airport hotel is operating in a fast-paced environment, said Nichols. "For example, I really appreciate the value of good weather forecasts from here and around the country, because we have unexpected passengers in need because of weather or airline issues. No day is the same," she said. "Our team has to work together to take care of travelers during challenging times."

Even though the Westin has only been open for about a year, it has become very popular for meetings, said Nichols. "Our location across from the terminal makes it easy for customers to plan fly-in, fly-out meetings," she said. "Our meeting spaces have been in demand because of our great location in the center of the country."



Greater Orlando Aviation Authority

It's been a success, and I'm happy to be part of their group and give them a great place to hold it."

BUILDING THE BOTTOM LINE

All three hotels are adding to the airports' bottom lines. The Detroit Westin brings in gross revenues of between \$30 million and \$35 million, said Teifer. "The hotel helps offset the airlines' costs here. Our Westin is number one in the southeast Michigan region for revenue per room," he said. "There are other hotels across the street, but we get twice as much per room than they do."

The airport planned refurbishment on the hotel late in 2016, said Teifer. "It's built very well. If you stay at a hotel across the street, you can hear the planes. Our hotel rooms are soundproofed, but you still get great views of the airport and air traffic."

The budget for the Hyatt Regency Orlando International Airport is \$42.2 million, and the operating budget is \$39 million, said Brown. "For the past few years, we have surpassed what we've budgeted, but it requires a lot of management and balancing of the business. We're in a very competitive environment," he said. "At the end of the day, we have a major amenity that brings in travelers and groups to the airport from different communities to meet and have conferences. We have to have an occupancy rate to make a positive contribution to the bottom line."

Nichols is pleased with the performance of the airport hotel in just a year. "We expect to be profitable, bringing in \$1-2 million in revenue by the end of [2016]," she said.

All three agree that having a hotel attached to their facilities is an important part of their function and brand. "If you look at the McNamara Terminal, it's clearly Delta's brand, and Westin is also a part of that brand," said Teifer. "It's all about amenities. Delta is focused on business flyers. They go after that and Westin also fits into that."

When people come Detroit Airport, they think it will be bad, said Teifer. "But they are really surprised when they get to our hotel, because there's a real wow factor," he said.

The Hyatt has become part of Orlando International's brand, said Brown. "If you look at any photos of the airport, you see our iconic lobby fountain in many of those pictures," he said.

When the airport hotel opened in 1992, it was only 11 years old, said Brown. "At that time, we were competing to attract business and leisure travelers. Miami International had a hotel in its terminal, but hotel we designed became iconic," he said. "It gave us the ability to attract more visitors and airlines. Airline executives came and stayed at our hotel. It became something that make Orlando International unique in the airport world."

Denver International Airport is in the center of the country, said Nichols.

"It's an important hub that goes to 180 destinations. Passengers are looking for a four-star, full-service experience and they are getting it at the Westin," she said. "The hotel also generates non-aeronautical revenue for airport, which is a win-win all the way."



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A New Round of Boggus Talk

First, I must apologize. I really didn't think it was that big of a deal to tear the tag off the mattress in a certain North Korean hotel room. But be sure that I have learned my lesson and have returned to the Institute of Boggus Talk (IBT) after an extended four-year hiatus just in-time to Help Make America Great Again or perhaps to modify an industry phrase to "Get Airports Great Again" or GAGA.

Yes, the IBT, at the urging of certain political extremists have relocated our headquarters back to the United States to avoid any potential "border thought-leader taxes" and well, it's just the right thing to do.

BOGGUS TERMS

- ▶ **IBT:** Institute of Boggus Talk
- ▶ **GAGA:** Get Airports Great Again
- ▶ **AIT:** Automated Information Transfer
- ▶ **CBIS:** Computer Based Information System
- ▶ **FAA:** Federal Aviation Administration
- ▶ **AIP/PFC:** Airport Improvement Program/Passenger Facility Charge
- ▶ **SAD:** Surprise and Delight
- ▶ **CDS:** Crack "delight" staff
- ▶ **TNC:** Transportation Network Company
- ▶ **TBS:** Totally Boggus Scenario

So, before we all start going GAGA, let's take stock of where we are.

- Passenger Security Checkpoints still slow? – Check
- Still only one pose allowed in the AIT? – Check
- No real high-speed certified CBIS? – Check
- People still crowding around the hold room jetbridge door when the first announcement is made no matter what the announcement really is about? – Check
- FAA Reauthorization and AIP/PFC Funding Issues? – Check
- No new terminal in a certain Midwestern state whose basement floods from time-to-time? – Check
- Travel etiquette a thing of the past in most air carrier cabins? – Check

It seems that the more things change, the more they stay the same. While this is not disappointing, it is a bit of a shame. We should note that the IBT is not above loading up our AMC Pacer and hitting the open road to help airports go GAGA, but we cannot help from noticing a certain phrase that keeps popping up around airports here in the US. That phrase



is "surprise and delight" (SAD). It seems to be the sacred verbal formula, or mantra being used to describe the penultimate desire of the aura to be given off by our airport facilities to the passengers, second only to that of separating the passengers from their money.

Now, stay with me here, because this could be tricky...if we want our airports to go GAGA and to do that they must have SAD elements, well this would be the perfect opportunity for the para-professionals at the IBT to weigh in on what a SAD terminal might look like.

YOU UP FOR THIS? I THOUGHT SO.

The IBT set up a double-blind study, laced with alternative facts, to determine what kind of surprises and delights one might find in our terminals. (It should be noted that finding surprises in a terminal was not very difficult for the IBT staff). When it comes to delight, well that's a different story.

What is delight after all? Some definitions say that delight is "great pleasure". Now I don't know about you, but airport and "great pleasure" seem to be as synonymous as, oh say, root canal and afternoon delight (look it up).

However, the IBT crack “delight” staff (CDS) set out to find delight as we go GAGA. Some examples are:

- Finding a parking space near the terminal without driving around 30 minutes (Surprise)
- Airline teams with TNC (Transportation Network Company) to pick you up and take you home (Delight)
- Takes 10 minutes or less to go through security (Surprise)

So, if you are looking to create a SAD terminal and concourse, the IBT stands ready to assist and provide our CDS to help you reach GAGA.

You can reserve a space and time to appear at the front of the security line (Delight)

- The restroom floor is not wet so you don't have to wonder about it. (Surprise)

Restrooms have valets to hold your laptop bag for you so you don't have to set it on the floor in that “stuff” (Delight and a jobs creator)

And then the IBT has come up with a few “delights” that are for entertainment only.

- The ability to wager, while in the plane, on whether the passenger can get their bag into the overhead bin without springing the door and thereby delaying the flight due to a mechanical (Delight if the carrier must take your bet).
- Allowing the airline gate agents to call boarding classes and group numbers to board that do not actually exist just to watch the throng at the gate react.
- Have the airline announce that for this flight it is all middle seat seating. There are no aisle

or window seats in this configuration. Would be worth my whole day to watch people try to logic that out.

So, if you are looking to create a SAD terminal and concourse, the IBT stands ready to assist and provide our CDS to help you reach GAGA. Rest assured that the IBT is ready, willing, and able to assist you in any Totally Boggus Scenario (TBS).



ABOUT THE AUTHOR

Roddy Boggus,

Executive Vice President of Aviation, Suffolk

Roddy is responsible for National Aviation Strategy, Pipeline Sourcing, and Tier Accounts. A 30 year aviation professional, he is an Architect with a Bachelors' of Design from Texas Tech University. Roddy is the 2017 Board Chair of the Airport Consultants Council (ACC) and sits on the Board of Directors for the International Partnering Institute (IPI) as well as the International Association of Airport Executives (IAAE).

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Teamwork to Change a Region

AAR's new MRO at Chicago Rockford International Airport became a reality with teamwork between all the stakeholders.

When the new AAR MRO facility at Chicago Rockford International Airport (RFD) opened in 2016, a new era began, which could impact the region's economy for years to come.

The MRO boasts about 200,000 square feet of space, the latest in fire protection and technology, and enough room to service wide body aircraft. While airport leaders understood the potential it

can have on the area, it took a coalition of entities to make sure it was completed on time and on budget in a way that would work for everyone.

A PATH FOR GROWTH

Jeff Polsean, economic development manager for the Greater Rockford Airport Authority said the airport has always tried to build its cargo operations. However, one of the issues leaders kept running into was concerns about aircraft landing at Rockford needing mechanical issue repaired.

Airport Director Mike Dunn went out to look for an MRO to handle aircraft repair and AAR was interested in established a facility at Rockford, but it needed a good supply of mechanics.

Rock Valley College, had an A&P program located at the airport, but was only graduating 15 to 20 A&P mechanics per year, Polsean said. After examining their options, the college committed to building a 40,000 square foot facility and start graduating 100 to 125 mechanics per year.

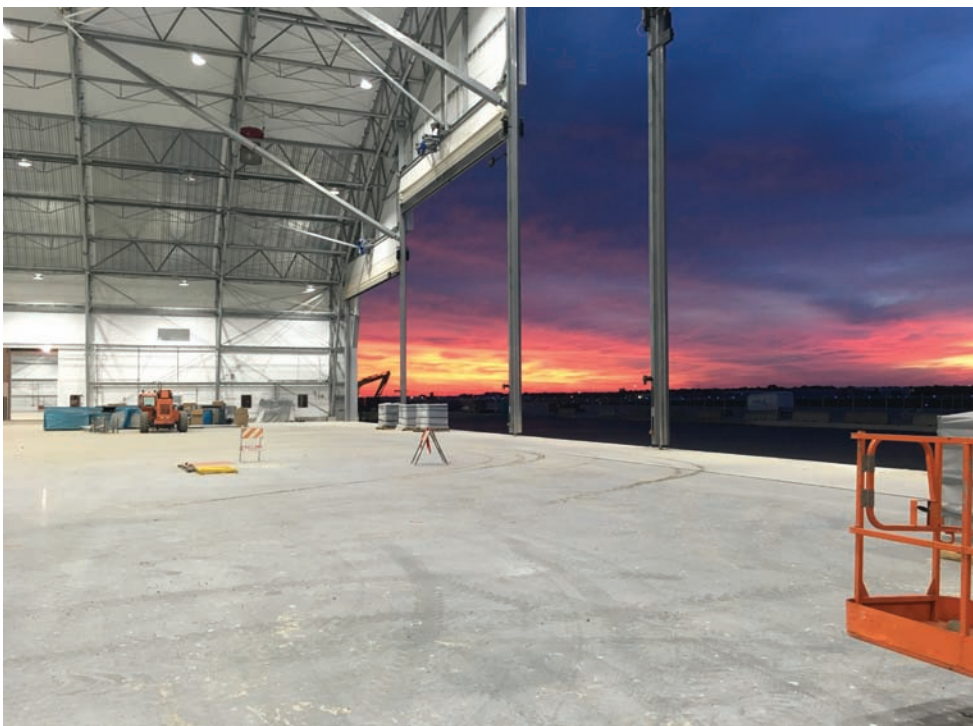
"Once that was in place, AAR was committed to the airport and starting an MRO operation, but what they needed was a hangar system in order to be able to do that process," he said.

Polsean said Dunn was then able to work with local, state and federal entities to come up with the \$41 million needed to build the MRO facility. Construction began in July 2015 and the entire project was completed a little more than a year after it started.

Cheryle Jackson, president of AAR Africa, who was vice president of government affairs for the company when the project took hold, said the MRO in Rockford is very important because of its technology and position to service the latest aircraft and wide body aircraft.

"Rockford is important to the MRO industry nationally and it's important to AAR," she said. "And we know that it's important to Rockford. It's an important job creator, not just any jobs, but good paying, skilled jobs that don't necessarily require a college education."

Chicago Rockford International Airport (RFD)





Chicago Rockford International Airport (RFD)

KEEPING IT ON TRACK

Polsean said the project faced challenges in creating the infrastructure for the facility, the supply chain and creating funding.

"Director Dunn led the charge as was able to bring all the parties to the table and come to an agreement as they went through the process and those challenges were all met," he said.

Getting local federal and state entities to keep the financing in place is one challenge to the project; they also needed to keep all of the suppliers and consultants working together as well.

Sean Hickey, sales consultant for Rubb Building Systems, said Rockford airport officials first approached the company a few years ago at a tradeshow when they expressed interest in building some hangars. By 2014, the company was contacted by the airport again and brought in to show some of its options for the MRO hangar compared to other types of building technologies.

Because the company creates a different style of building that some designers and airport leaders are accustomed to, Hickey said they kept educating project stakeholders about the usage of the Rubb building across the U.S. and how they work.

In the northern Illinois region, there's plenty of concerns about harsh weather, Hickey said, so Rubb had to temper concerns with leaders in the project and prove it would be able to handle the conditions the MRO facility would be subject to.

"We had to prove that our technology has worked elsewhere because we're kind of seen as an alternative or kind of a new type of technology, so naturally people are always a little bit hesitant about something new," he said. "We kind of had to prove from the ground-level up that we've done this before, the technology works, the fabrics are designed to be architectural fabrics and put on buildings and...these are durable, engineered fabrics that are made to be made to be put on buildings and weathered long-term."

Hickey said Rubb also engaged stakeholders in the engineering details behind the building. Rockford hired an architecture and engineering firm for the project, so the company made sure to work with them on the specs to build it properly and create a strong cost estimate.

They also addressed any concerns project leaders had with the structure using quantifiable data, such as meeting fire code standards and foundation analysis.

Rubb also has to work the structure through energy code, which Hickey said is trickier because it varies quite a bit from state-to-state due to different climates and building codes. Getting the insulated roof approved meant showing studies Rubb performed on heat loss and air seal and air loss.

Hickey said Rubb was kept in the loop on the political challenges hitting the project externally and communication by the stakeholders was key in helping the company help do its part to move the MRO facility forward.

Jackson said the entire project came about because Dunn is "very determined and passionate," and pitched AAR numerous times on getting AAR to establish an MRO at RFD. While the company is asked all the time about creating a

new MRO, the difference with Rockford was the passion and vision Dunn showed coupled with the support of the city and the federal support.

Jackson said AAR laid out its infrastructure needs with a new facility to leaders so they had a clear idea of costs. The company also voiced its needs for a deep labor pool.

"You can have a great facility, but if you don't have a labor force that can perform the work, this is a labor intensive industry and if you don't have the labor force to perform the work, then your potential to grow is constrained," she said.

Polsean said the airport worked to make sure the entities of the project were all committed to the final goal of completion.

"This is the first facility that AAR has in their system that was actually built for them," Polsean said. "Their other facilities that they've gone in, they're leased, they're purchased older facilities that were either military hangars or hangars from airline companies that had sold them."

Polsean said the design team worked with AAR to make sure the facility was built for their needs and operations to help it compete in the MRO world.

The short timeframe of building such a facility was a challenge, Polsean said and having a longer construction window would've been helpful, but they were able to do it.

"With that being said, we came out with a facility that is there's nothing like it in the country or in the world," Polsean said.

From the budgeting aspect, Polsean said it's important to work with the entities to make sure that everyone understands where the project is at.

"We were very fortunate to have partners that understood the impact to the community as well as the region and to the aerospace cluster," he said. "We had those who stepped up to the plate in order to complete the funding process that we needed."

Getting local federal and state entities to keep the financing in place is one challenge to the project; they also needed to keep all of the suppliers and consultants working together as well.

Become Smart Consumers and Smart Suppliers

The Digital Signage Federation offers myriad opportunities for all aviation industry leaders to enhance their knowledge and facilities.

As technology becomes an increasingly important part of the airport landscape, it can become overwhelming for airport consultants and facility managers to determine what they need to improve the overall customer experience.

The Digital Signage Federation (DSF) works to educate many industries about new technology hitting the markets. *Airport Business* recently spoke with Richard Ventura, vice president of business development and solutions at NEC Display Solutions of America, who is also the 2017 chairman of the DSF about what opportunities are available to the aviation industry in the organization.

AIRPORT BUSINESS: WHAT KINDS OF BENEFITS ARE THERE FOR THOSE IN THE TRANSPORTATION SECTOR ON DSF MEMBERSHIP?

RICHARD VENTURA: The focus of the DSF is on three core areas — education, certification and outreach. From an education perspective, what the DSF does is we host everything ranging from Google hangouts to putting together white papers for members. It's an association ran by and supported by members, so we're putting together documentation and information to educate and supply information to our

members. One of the key things about the DSF that's really important is we have certification programs. We really focus on aiding a certification program and continually expanding it so we can help end users, operators, consultants, designers. We're also looking at verticals and creating verticalized programs as well. The last thing is helping the members grow. That's really from a lot of the networking and connecting them with other people within the industry, be it designers getting connected to airports or airports getting connected to CMS companies or display companies. Really, it's helping close that entire loop so to speak.

IS IT MORE BENEFICIAL FOR DESIGNERS OR END USERS TO BE PART OF THIS GROUP?

RV: Actually, it's beneficial for both. I've been involved in the DSF now for five or six years. When I look at the history of the DSF, we had a very heavy focus on end users and the digital signage companies. There was this big area



that I really felt these last couple of years we started to pull in and that's the designers, the consultants and the integrators. What we all felt is that if we can educate and support the end users, we can make them very smart buyers. If we can educate, train and support the integrators and consultants and designers, we make them smart designers and integrators. So, what we end up having then is instead of one side is smarter than the other, we've created an extremely smart ecosystem that can help each other. The more we teach and the more

time we spend with the designers and the integrators and the consultants, the more they're going to be able to share information with their end users and really deliver the right solution. I can have an awesome solution, I can have an awesome airport, but if it's not deployed right, it fails miserably for everybody.

SOME PEOPLE MIGHT THINK DIGITAL SIGNAGE OR DSF IS SOMETHING BEST LEFT TO LARGE HUB AIRPORTS. IS THERE ANYTHING FOR MEDIUM AND SMALLER AIRPORTS TO GAIN FROM MEMBERSHIP?

RV: It doesn't matter the size of your airport. You still have to communicate to your customers. Whether you're an airport that has got two gates or you're an airport that has hundreds of gates, you still have to communicate information to the end users and the travelers. You start out with the simplest; you have the FIDS and

GIDS. That's simple. That's actually digital signage. Most people don't think of it, but that's digital signage. What you can then incorporate is your corporate communications for messaging, advertising, directory board, wayfinding; I could go down the list. It doesn't matter how big or small you are. The most basic fundamentals for an airport is you're disseminating information to the travelers. Digital signage is important for all levels. The other thing where digital signage is becoming so important in airports is emergency management. If all of



your emergency management is focused around audible, you're going to miss a very large portion of your travelers because you might have people who don't speak English or you might have people who have hearing issues. Having



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a digital solution is another way for them to disseminate that information and make sure everybody within the environment is aware of bad weather, or if there's an emergency, you can go down the list of everything that could possibly happen in an airport.

AIRPORTS ARE VERY INTERESTED IN ENHANCING THE OVERALL TRAVELER EXPERIENCE. ARE THESE THE KINDS OF TOPICS THEY WILL GAIN INSIGHT ON WITH A DSF MEMBERSHIP?

RV: One of the things we're focused on is creation of longer vertical market focus hangouts. We've done the hangouts on everything from education to transportation, IoT, Smart Cities. There are both vertical focuses and application-focused hangouts. In fact, every chairman has what's called their legacy...and mine is very heavily focused on two areas that are very distinct from each other and they both help the airport industry. One side is what we call the Ad Council. That's focused on the digital out of home side. The other side is focused on the integrators. From those we're going to be launching an entire Google Hangout series that's going to be talking about starting digital out of home, how to monetize a digital out of home network, where to go to start your digital out of home network and how do you expand it.



ABOUT THE DIGITAL SIGNAGE FEDERATION

DSF'S Mission is to support and promote the common business interests of the world-wide digital signage, interactive technologies and the digital out-of-home network industries. The DSF is a not-for-profit independent voice of the digital signage industry reflecting the diversity of its membership. It promotes professional recognition through certifications, continuing education, conferences, publications, and presentations offered by the DSF and affiliate groups. It provides government lobbying to leverage the collective strength of members and represent their interests at the higher levels of government and the community. The DSF provides leadership and networking opportunities focused on building a strong foundation for the advancement of the digital signage industry. For more information, visit www.digitalsignagefederation.org.

Richard Ventura is Vice President of Business Development and Solutions for NEC Display Solutions of America, managing the focus on developing new business and strategies for key vertical markets. He is responsible for the growth and market penetration of NEC's award winning portfolio of products, as well as responsible for development of new go-to-market strategies and products for the solutions market. Richard has spent 16 years within the NEC sales and marketing organizations focusing on display solutions, display technologies and projectors. During that time he has helped numerous client relationships flourish and spearheaded campaigns which have elevated NEC's brand and products throughout the marketplace. Richard has been honored to receive over one dozen internal awards from NEC for his exceptional efforts and tireless work ethic. Richard is a long standing member of many organizations within the industry as well as currently sits on the Board of Directors for the Digital Signage Federation serving as the Chairman of the Executive Committee and supports the International Committee, Membership Committee as well as the Ad Council. During his tenure with NEC he has delivered many presentations at industry conferences as well as authored articles for key publications and industry trade periodicals.



*Richard Ventura,
vice president
of business
development and
solutions at NEC
Display Solutions
of America
NEC*

That's going to be focused on all levels, whether you're a small guy and then we're going to have higher end programs for bigger organizations and then we'll be more vertically focused for transportation, hospitality and retail. And with the integrators, we're going to do the exact same thing. How do the integrators get involved in digital signage? How do traditional, non-traditional companies get involved? How does a consultant that consults to an airport, how do they get more involved in digital signage? We're going to be launching a lot of things around that with the hangouts.

WHEN IT COMES TO AIRPORTS OR CONSULTANTS, WHO ARE THE PEOPLE THAT SHOULD CONSIDER JOINING THE DSF?

RV: It's designers, it's the marketing people, it's the business development people, it's the CIO's, the information technology guys. It really crosses all levels. If we're dealing with an end user, in a lot of cases it's their marketing people, it's their corporate communications people. It's the people on the front lines who deal with the technology that their business uses for digital signage.





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A Premium Concept

Plaza Premium Lounge is focused on the U.S. market after years of changing the passenger experience across the globe.

What began as an idea in 1998 to offer lounge access to passengers who flew in economy class has turned into Hong Kong-based Plaza Premium Group, the world's largest independent airport lounge network.

The idea to create the first Plaza Premium Lounge was a simple one, said founder and CEO Song Hoi-see.

"I used to work for a bank, and I had the privilege of traveling first or business class, which included lounge access and services," he recalled.

But after leaving the bank to start his own business, Song began having to fly economy class, since he was paying for flights out of his own pocket. In economy class, you obviously you don't have access to lounges, he noted.

And 20 years ago, laptop computers needed to be recharged every two hours because the

battery only lasted for two hours, said Song. "When I traveled for the bank, I could charge my computer in the lounge. But when I started flying economy, I would have to 'steal' electricity from the public areas in the airport," he said. "And back then, I faxed a lot of documents and if you didn't have lounge access, you didn't have a place to fax your documents."

Song said it was frustrating because airlines were only taking care of those who traveled first and business class. "If you look at who buys seats on a plane, only about 10 or 15 percent make up first or business class. The remaining 85 percent make up the economy class. And many of the 85 percent require the services available in a lounge," he said. "So if I could come up with a concept where a business center and lounge were combined, I could take care of the 85 percent of people who don't have access to an airline lounge. And I thought that business proposition would work."

Song opened the first Plaza Premium Lounge in Hong Kong in 1998. "Today, we have 146 lounges worldwide. We are in 35 international airports and are serving 11 million people per year," he said. That was followed by Kuala Lumpur International Airport in Malaysia, he added.

"I chose Hong Kong because I was working and living there. And Hong Kong had just opened a new airport in 1998. I presented this concept to Hong Kong International Airport, but it took some time to convince them to do it because we were the first one in the world to do it," said Song.

The second lounge was opened at Kuala Lumpur International Airport because Song is Malaysian.

"And it had also opened a new airport, so I also presented the lounge idea to the airport authority and they accepted my concept," he recalled of the opening.



Plaza Premium Lounges

At the time Plaza Premium began, airports felt that lounges only belonged to airlines to provide services to their premium customers, said Song. "They never had the idea that lounges could be provided to everyone, regardless of the airline or class of service," he said. "So initially, I went around to see whatever airport would accept me and I'd go ahead and do business with them."

But after 18 years of growth and success, Song said he is much more careful in selecting which airports get his lounges. "When I want to open a new lounge, I have to be in major airline hubs. After that, I'll look at secondary cities served by that hub," he said.

The first North American Plaza Premium Lounge was opened at Vancouver International Airport in 2004. "I opened there because the airport authority saw my concept and invited me to set up a lounge. Vancouver airport is very proactive and one of the best airports in North America," he said.

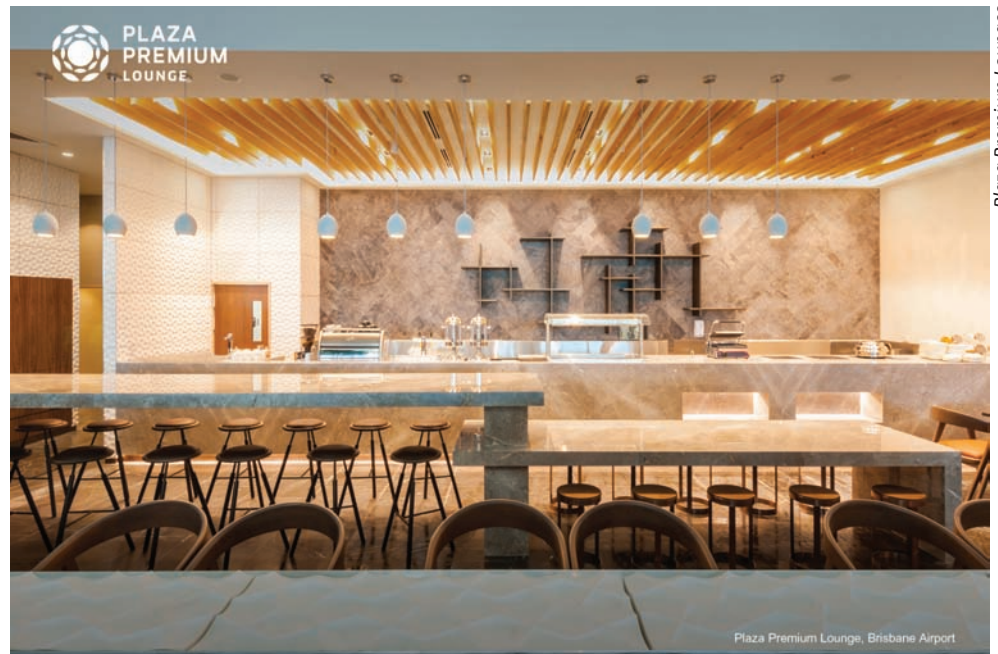
And from there, Plaza Premium expanded to Toronto, Winnipeg and Edmonton, said Song. "And I'm now beginning to look in the United States. The cluster of lounges in Canada are big enough to help me take care of the United States," he said.

In 2005, Plaza Premium started managing its first airline lounge, Thai Airways' Royal Orchid Lounge at Hong Kong International Airport. "Getting into the airline lounge business was not an easy thing. The airlines wouldn't look at me during the first five years of my business," he said. "But after seeing how we expanded and the quality of our product, the airlines began to talk to us."

Airlines running lounges is not their forte, said Song. "They are transportation companies. That's why they want lounge services to be taken care of by people who know how to run it," he said.

After 18 years of experience and all the Skytrax awards Plaza Premium has won, it shows the quality that can be delivered, said Song. "Not only do we deliver services on time, we also deliver consistency and quality, which are very important."

When asked about his favorite lounges, Song chose a few. "If it's one of the airline lounges we manage, I can tell you very confidently that Cathay Pacific's lounge at Hong Kong International Airport is one of the best in the world. And it's



Plaza Premium Lounges

right that Skytrax awarded it the best first class airline lounge in the world," he said.

Looking at independent lounges, Song offered three. "Obviously, I like London Heathrow and Hong Kong. And now I have a new one that opened on December 9 in Rio de Janeiro. It is outstanding."

Plaza Premium Group got into the airport hotel business in 2014, opening up the Aerotel at Kempegowda International Airport in India. The group's strength in airports is looking at efficiency gaps and pain points of travelers, said Song. "So after so many years in airports running lounges, we realized that a lot of passengers, especially transit passengers, require a place to take a nap before the second leg of the travelling," he said. "Or people arrived in the country early in the morning and their hotel was not ready to check in, so they needed a place to rest."

The purpose of the Aerotel is not to sell 24 hours, said Song. "We are selling six-hour blocks. Our first category of clients arrive at 6:00 in the morning and their hotel is not ready for them to check in until 2:00 in the afternoon. What are you going to do from 6:00 to 2:00," he asked. "We provide a hotel where you can go to sleep and refresh yourself. Then later, you can go on to do your work and we can send your baggage to the hotel that you're going to stay in that night."

The second category of clients are those leaving in the evening after 10 p.m., said Song.

"But the hotel tells you to check out at two in the afternoon. So what you can do is check out and come to the transit hotel, where you can take a nap or work for few hours before you fly out," he said.

The third category of clients are those who travel very early in the morning, said Song. "Can you imagine if your house is two hours away from the airport? If you travel at six in the morning, you have to wake up at maybe one or two in the morning to travel to the airport," he said. "At our hotel, you can check in around 11:00 p.m., sleep for five or six hours, wake up in the morning, take a shower and go to your flight."

Plaza Premium Group currently has six Aerotels, said Song. "In our current plan, we are going to build more in China, including Chengdu, Shanghai, Beijing and Zhengzhou," he said. "These are the places where major airports are and this concept works very well for them."

Song noted his company will be celebrating its 20-year anniversary in 2018. "In 2015, we created a year-end review that included a three-year plan to 2018. In that plan, we set a target to have 200 outlets by the end of 2018," he said. "And we plan to put up US\$100 million in investment to reach that number."

"In 2017, we have plans to open at least 20 new lounges, so by 2018, we are very confident that we will reach 200 outlets in our Plaza Premium Group."





Best Practices in FBO Management: CARGO OPERATIONS

Creating a business model for ad hoc cargo operators means planning for the unexpected.

FBOs are the jack-of-all-trades at airports. While the majority provide essential services such as aircraft refueling and itinerant parking, full service models are still alive and well, and many serve a clientele that most of us don't give a second thought to—unless our overnight package is late—air cargo operators. Many FBOs provide aircraft refueling services to scheduled air cargo operators, that much isn't unusual. However, FBOs desirous of truly ground handling unscheduled, ad hoc air cargo have much to consider before jumping in with both feet. While ground handling fees may seem lucrative and the attendant large fuel uplift enticing, the rule of “be careful what you wish for” applies.

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Whether shipping pallets of frozen fish, to delivering oversized or unusual parts to keep a busy production line going, to equine air transport, ad hoc air cargo operations are a different animal altogether. This group probably represents the smallest market segment when one considers the combined numbers of flights by scheduled air carriers such as UPS and FedEx, plus the myriad freight forwarding companies that collectively operate the hundreds of small aircraft that ply the night sky. Yet, ad hoc air cargo operations can present the most operational challenges for an FBO. Why?

First, let's begin with a compliment to the flight crews themselves. The term "freight dog" is still a badge of honor and by in large the pilot group flying ad hoc freighters are some of the nicest crews in the industry. Sent to airports they've never been to before, with zero onsite support of their company and in the middle of the night no less, they tend to be exceptionally kind-hearted and understanding of FBO personnel. To be sure, a great many once worked at an FBO. Simply put, they know your FBO has never moved the propeller shaft of a nuclear submarine at two in the morning during a snowstorm using a rented forklift- because they haven't either. The nature of ad hoc air cargo operations is just that- a curious series of first times with occasional moments that seem vaguely familiar to both flight crew and FBO alike.

In terms of challenges, investment in or resourcing proper equipment top an FBO's list to handling ad hoc air cargo. For scheduled air cargo operations, a contracted ground handler or the cargo company itself will often invest in a standard complement of equipment. Typically, that list includes a set of crew stairs, a pushback tug, proper tow bars, K-loaders or palletized cargo loaders, a belt loader and a forklift. For an FBO, that list comprises a six-figure investment. Because of the unscheduled nature of ad hoc air cargo, an FBO may only see a handful of operations a year. Or, a local contract involves a brief period of pseudo-scheduled air cargo, but it lasts perhaps a month. In either case, there is simply no Return on Investment (ROI) that creates justification for such a specialized - and speculative- equipment purchase by an FBO. Left with a business imperative to always serve the customer, but lacking the proper equipment to do so, FBOs tend to get creative.

At larger airports, FBOs are wise to execute short term equipment leases and bailment agreements with 121 carriers or other ground handlers that own or operate large fleets of Ground Support Equipment (GSE). Specialized off-airport leasing companies that allow short term equipment lease may also be of consideration. Another method employed by FBOs is simply subcontracting out the ground handling portion of an equipment offload to a qualified provider, in order to focus on the more straightforward FBO service, such as fueling and pushback only. The most common solution to the equipment conundrum though are reciprocal use agreements where an FBO and other ground service providers have the ability to use each other's GSE on an as-needed basis. In reality, these reciprocal use agreements lack any formality, and usually take the form of "borrowing" GSE and then topping off the fuel tank of that borrowed equipment as a thank you. Occasionally, a pizza is involved in such transactions. Humor aside, and while a tried-and-true practice, these informal arrangements can present significant risk if not mitigated and costly liability if not formalized. A form of risk mitigation would involve the FBO conducting and documenting annual training on vendor equipment. And, liability can at least be limited through even rudimentary written agreements. Finally on the subject of equipment, a few key pieces of equipment with wider use to the FBO may be worth consideration for a capital expenditure budget, such as a forklift and air stairs.

Proper equipment aside, there is the human element to consider- FBO personnel. A few rhetorical questions should be asked by the FBO manager before accepting the arrival. How many people are needed for the operation? And using the previous example of an off-load requiring a forklift, are they forklift qualified? If they are qualified, are they comfortable with such an unusual operation? Of note is that these answers to these questions may change if the proposed operation is in the middle of the day versus the middle of the night.

The nature of ad hoc air cargo operations is just that- a curious series of first times with occasional moments that seem vaguely familiar to both flight crew and FBO alike.

There's still another human factor in play- one outside the FBO. There are as many charter brokers as there are actual ad hoc air cargo operators and occasionally, something might be lost in translation by brokers. It is not unusual that a charter broker will assure the FBO that the aircraft is arriving with "only a few pallets of fish" and merely requires a belt loader. Hours

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later- and always after the broker is fast asleep- the aircraft arrives with “new diesel motors for a fishing trawler,” and needs a forklift- a big one. An FBO should consider they truly don't know what's onboard the aircraft until the cargo door opens and need to be prepared for surprises.

Finally, and once endemic to the ad hoc air cargo operator community, there remains the ugly specter of payment issues. In the not-too-distant past, the term “fly by night operator” was a double entendre. Bankruptcies were rampant and FBOs would find the vintage airliner-turned-freighter would be parking with them a very long time and its crew was nowhere to be found. In other cases, the aircraft would disappear one night, without word or warning. While the industry has improved since then, the margins for freight operators has not and remain frighteningly thin. FBOs are wise to secure payment, including a back-up form of payment for

At least for this FBO veteran, after a well-choreographed cargo offload, there is nothing quite as satisfying as watching a sooty 727 as it climbs into the low cloud, escaping the reach of the approaching storm. At two in the morning, of course.

ground handling. When possible, fueling should be performed using a contract fuel inventory- after a fuel release has been provided.

The rewards can be many for the well-prepared FBO serving ad hoc air cargo carriers. And on reflection, not all of those rewards are financial. At least for this FBO veteran, after a well-choreographed cargo offload, there is nothing quite as satisfying as watching a sooty 727 as it climbs into the low cloud, escaping the reach of the approaching storm. At two in the morning, of course.



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Douglas 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.

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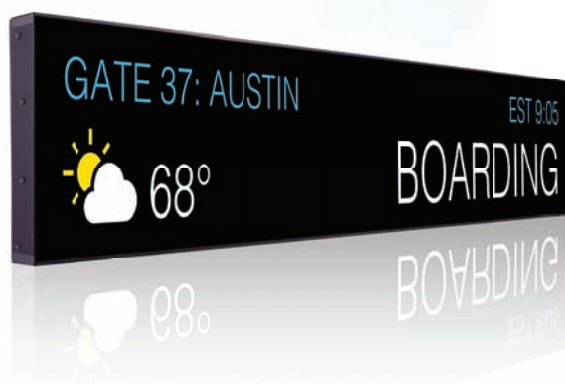
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