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## Tampa Int'l Opens New Rental Car Center & Automated People Mover



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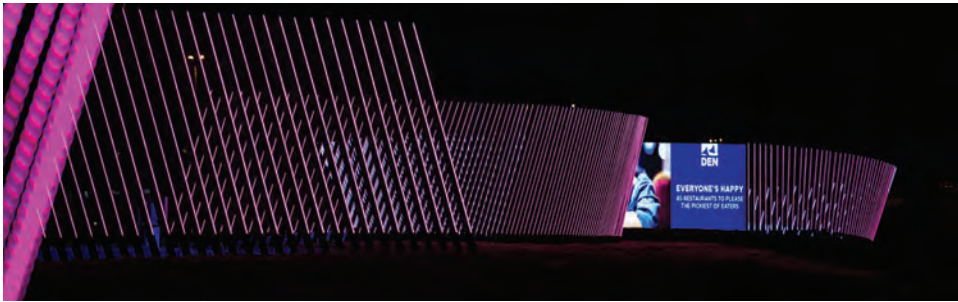
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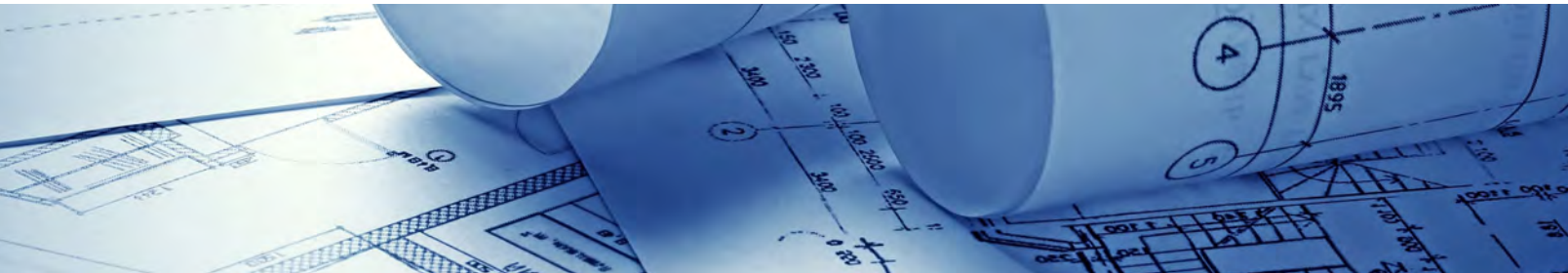
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## Not So Dynamic

Transportation network companies (TNCs) such as Uber and Lyft continue to shape airports. Some may not like how it's happening, but it's happening; and we have to embrace the evolution. There's a myriad of discussions and changes taking place as a result of TNCs, and our story on Page 64 sets the stage about how airports have been responding and planning for the future.

Just as we were finalizing the article, a newspaper piece about the pricing at ski resorts caught my attention. Many ski resorts are no longer posting walk-up prices on their websites. They've introduced flex, or demand, pricing to maximize their revenues depending on day of the week, snow conditions, lead time of purchase, etc. They're also bundling ski passes with lodging, food and equipment rentals.

The article about ski resorts reminded me of a presentation RezPort made at ACC's 2015 annual meeting in Newport Beach. A company executive said that the parking industry has the capabilities to provide dynamic pricing to airports, and that airports

could double their parking revenue in just a year or two. Further, accepting online reservations would allow airports to obtain passengers' e-mail addresses and create a database of customer information currently only held by airlines. Hmmm. Great idea!

So where are we with dynamic parking at airports? Sadly, it's still a work in progress. But there's a lot of innovation taking place. Dynamic parking could be one solution to the many challenges presented by TNCs and other market upheavals.

Cheers,

*Paul*



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# Tampa Int'l Kicks Off Master Plan Updates With New Rental Car Center & Automated People Mover

BY JODI RICHARDS



Valentine's Day was extra sweet for Tampa International Airport (TPA) this year. The growing Florida facility opened two substantial new pieces of infrastructure to the public: a \$323 million consolidated rental car center and a \$412 million automated people mover. Both projects were designed to reduce curbside congestion at the terminal, improve customer service and pave the way for future passenger growth.

The projects are key components in Phase 1 of a three-phase Master Plan created to help the airport accommodate the tremendous traffic increases it expects in coming years. Phase 1 alone will include \$971 million of improvements. (See sidebar on Page 14 for more details about the rest of the plan.)

While the industry as a whole is seeing a general rebound in passenger volume, TPA is experiencing rapid growth, especially in international traffic, notes Al Illustrato, vice president of facilities and administration. When officials began the process of updating TPA's master plan in 2012, the airport served about 16 million passengers. By 2017, that number jumped to a record high of



AL ILLUSTRATO

19.6 million; and officials expect to serve more than 20 million passengers this year.

Ultimately, a new North Terminal will be needed, explains Illustrato. In the meantime, however, the airport is working to maximize its current facilities by alleviating the "pinch points" that are driving it toward the need for another terminal. "It was the roadways and curbsides, rental cars and terminal building capacity that needed to be dealt with most urgently," Illustrato specifies.

Eventually, more airside gates will be needed. Phase 3 of TPA's expansion will add a 16-gate facility that will be used for international traffic.

One primary issue leading the airport to a Master Plan update was vehicle traffic associated with car rental companies operating on the first two levels of the long-term parking garage near the terminal. "The roadway traffic really started to grow on us fast," Illustrato recalls. The number of vehicles during peak travel times became more exaggerated, and, at the same time, rideshare services such as Uber and Lyft added even more volume as they grew in popularity.



## FACTS & FIGURES

**Project:** Master Plan Improvements

**Location:** Tampa (FL) Int'l Airport

**Strategy:** 3-phase program designed to enable current terminal complex to serve up to 34 million annual travelers

**Master Plan Consultant:** HNTB

**Cost for Phase 1 Projects:** \$971 million

**Phase 1 Projects Completed:** New rental car center; automated people mover

**Remaining Phase 1 Projects:** 50,000-sq.-ft. terminal expansion (transfer level); completing concessions revamp

**Project:** Consolidated Rental Car Center

**Facility Size:** 2.6 million sq. ft.

**Customer Service Building:** 100,650 sq. ft.

**Cost:** \$323 million

**Total Storage Capacity:** 8,685 vehicles

**Ready/Return Stalls:** 3,621

**Peak Processing:** 3,200 vehicles/hr

**Quick Turn-Around Facility:** 30 wash bays; 144 fueling pumps

**Architecture, Interior Design, Structural Engineering, Environmental Graphics, Wayfinding:** Gresham Smith & Partners/Demattei Wong Architecture

**Design/Builder:** Austin Commercial

**Opened to Public:** Feb. 2018

**Project:** Automated People Mover

**Cost:** \$412 million

**Current Configuration:** 5 dual-car trains, with 1 train in reserve for backup

**Length of Guideway:** 1.4 miles

**Trip Time:** 5 min between terminal & rental car center

**Maximum Speed:** 48 mph

**Maximum Passengers:** 56/car

**Peak Capacity:** 2,500 passengers/hr

**Stations:** Main Terminal; Economy Garage; Rental Car Center; System Maintenance & Storage Facility

**People Mover System Consultant:** Lea + Elliott

**System Design/Construction/Operation/Maintenance:** Mitsubishi Heavy Industries America

**Operations & Maintenance:** Joint Venture of Mitsubishi & Sumitomo Corp.-Crystal Mover Services

**Architecture, Interior Design, Structural Engineering, Environmental Graphics, Wayfinding:** Gresham Smith & Partners

**Design/Builder:** Austin Commercial

**Opened to Public:** Feb. 2018



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To relieve the growing congestion, the 2012 Master Plan Update called for the airport to build a consolidated rental car facility south of the terminal and add an automated people mover system to connect the new rental car facility, economy parking garage and terminal.

Illustrato notes that the airport prides itself in being a “customer-friendly model of efficiency,” and that philosophy guided the design of both projects.

### New Rental Car Center

Previously, TPA had eight rental car brands operating across the street from the terminal and another eight located off airport property. The new 2.6-million-square-foot center doubles the number of rental car brands on site to 16, all located in one facility south of the terminal.

“There should not be a wait for a car because of capacity,” says Illustrato, noting that Tampa is the ninth-largest rental car market in the United States. “So we had to create a total experience that was friendly.”

Preparing for future increases in passenger traffic was another catalyst. “We could not constrain our growth,” he explains. “We needed to have a rental car facility that could handle that growth going into the future.”

Locating the new rental car center in the southern portion of the airport provided rental car companies with more operating space, which in turn helped decrease customer wait times. It also routed a considerable amount of traffic away from the main terminal. “Because there is less congestion on the curbs at the airport, pretty much all the passengers now get



GRANT CLIFFORD

a better experience,” notes Grant Clifford, senior vice president with Gresham, Smith and Partners, which led the project design.

The new facility houses 16 rental car brands, with total vehicle storage capacity for more than 8,600 vehicles. It is designed to process 3,200 vehicles per hour at peak operation, notes Clifford.

“We believe we checked the box of creating a facility that has capacity,” Illustrato quips.

It was important for the new operation to be efficient for customers and car rental agencies alike, he adds.

To provide maximum functionality for operators, the multi-level facility includes a quick turn-around area on each level, with

a total of 30 wash bays and 144 fueling dispensers. This allows car rental companies to clean, fuel and return vehicles to service in about 15 minutes, reports Illustrato. The facility also includes service centers for basic maintenance and minor repairs.

For customers, the airport focused on making the huge facility comfortable and easy to navigate. Wayfinding and vertical transportation were consequently key factors, and a total of 21 elevators and 22 escalators were installed. In determining the size and quantity of elevators and escalators, designers considered passenger volumes, peak hours and the percentage of passengers with bags. “It goes back to understanding your customer, the type of airport and the level of service that you want to provide,” notes Clifford.

The facility also includes self-service kiosks that allow passengers to print their boarding passes and check bags before heading to the terminal.

Designers specified glass liberally—on canopies, to clad interior elevator cores, etc.—because it is durable and easy to clean. Overall, the facility includes 132,000 square feet of glass.

Elegant, yet timeless and durable, finishes coordinate and connect the new rental car center with TPA’s existing facilities, says Jessica Smith, a project professional with Gresham, Smith and Partners. “It’s such a grand space,” she comments. “The airport has a fantastic art committee that took time to bring in some wonderful pieces to create a sense of community that is going to be experienced by millions of passengers.”

The facility is designed to be flexible enough to handle 10 years of growth, and the various project elements were deliberately positioned to allow for future expansion if needed—factors that were considered throughout all Phase 1 projects, says Clifford.



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*Designers focused on vertical transportation and wayfinding elements to make the new rental car center easy to navigate.*

The airport will reclaim the space that rental car companies previously occupied in the long-term parking garage and will use it to create 2,400 more parking spots close to the terminal for customers—something that was sorely needed, notes Illustrato.

### Automated People Mover

SkyConnect, TPA's new automated people mover, was designed to provide travelers with a convenient and efficient way to move about the airport's 3,300-acre campus. The 1.4-mile train system connects the new rental car facility, terminal and economy parking garage. In doing so, it eliminates the need for shuttles to and from the economy garage and removes approximately 2.7 million vehicles per year from TPA's inner roadways. It also reduces emissions.



SANJEEV SHAH

The automated people mover is an operating asset and the goal was to ensure that system would deliver reliable and safe transportation service, explains Sanjeev Shah, chief strategy officer for Lea + Elliott.

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*The new automated people mover connects the terminal, new rental car center and economy parking.*



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The procurement approach and strategy focused on leveling the playing field to foster a competitive procurement environment. Shah notes that automated people mover technologies are proprietary and, as such, Lea + Elliott recommended and developed performance-based design criteria package/procurement documents so that each prospective supplier had the opportunity to propose its best technical solution while demonstrating that it could meet performance-based requirements. Total lifecycle value of the system was equally important, adds Shah. “There’s always a risk that if you just focus on the capital delivery, then the operation and maintenance might be too expensive, thus a design-bid-build-operate-maintain approach to optimize the total cost of ownership,” he notes.

Mitsubishi Heavy Industries America won the contract—a design-build-operate-maintain agreement for five years, with two potential five-year options. Operations and maintenance will be provided through a joint venture between Mitsubishi and Sumitomo Corp.-Crystal Mover Services.

The airport worked with Mitsubishi designers to create a system that completes the trip between the terminal and rental car center in just five minutes. The ride to/from the economy garage takes four minutes, and train departures are spaced less than three minutes apart. “Again from that customer-friendly perspective, we had to

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make sure that we had something people would enjoy and would not require a great wait,” Illustrato remarks.

When transporting riders to the new rental car center, SkyConnect takes them directly to the customer service lobby. When the train doors open, it’s a direct path to 16 rental brands. Customers who do not need to go to the reservation counters head north or south to take an escalator or elevator directly down to the waiting cars.

The new automated people mover system includes a total of 12 cars—six two-car trains. Currently, the system operates five dual-car trains, so there is a spare two-car train at the ready to rotate into service to facilitate preventive maintenance or maintain service despite operational issues.

Creating a smooth and efficient ride was a priority, Illustrato emphasizes. Each car can accommodate 56 passengers, with a peak passenger capacity of 2,500 passengers per hour. Maximum speed is 48 miles per hour.

As passenger traffic increases, TPA has the ability to add two more cars to the trains, and the stations are designed to accommodate that growth, says Altan Cekin, project manager at Gresham, Smith and Partners.



ALTAN CEKIN

Similarly, the SkyConnect station at the terminal was built to allow for expansion to the north if and when TPA builds a second terminal. The substations that support the guideway system are also sized and located for potential expansion. Shafts for six more elevators have already been constructed.

**Laying the Groundwork**

Site prep for the consolidated rental car center project was extensive, primarily because the land was occupied by the quick turn-around/service facility for the rental companies previously located in the parking garage. “We had to plan very carefully to move that operation out to the perimeter of the rental car site, but not be overly disruptive because they had to maintain operations while we were doing it,” explains Illustrato.

After crews relocated the existing service centers and completed other enabling projects, the parcel for the rental car center was essentially a greenfield site—a major benefit considering the aggressive construction schedule that lay ahead, notes Clifford.

Because TPA used the design-build delivery method, the project team was able to begin site work, including utility relocations and construction foundations, while the structures, interior features and design details for the buildings were



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# Updating the Master Plan

Tampa International Airport (TPA) recently unveiled close to \$1 billion of infrastructure improvements, and it's just getting started. Still ahead are two more Phase 1 projects, plus two additional phases of Master Plan construction.

The ultimate goal is to enable the airport to accommodate up to 34 million annual travelers. The key to TPA's strategy is building new infrastructure as demand dictates, with phases based on growing passenger volume, explains Al Illustrato, vice president of facilities and administration.



TOM ROSSBACH

The airport and HNTB began working on the Master Plan update in 2011 and secured approval from the Hillsborough County Aviation Authority in 2013. Tom Rossbach, HNTB's aviation architecture market sector director, describes the planning project as a holistic analysis of all airport facilities that ultimately developed into a comprehensive three-phase capital improvement program.

The process began as a study designed to maximize the capacity and longevity of the Main Terminal facilities, while maintaining the level of service for which the airport is known, explains Rossbach.

Phase 1, which is largely complete, focused on decongesting the airport's roadways and curbside operations. A new consolidated rental car center and 1.4-mile automated people mover are already in operation, and a concessions update and terminal expansion are currently underway.

Phase 2 is a \$543 million program to expand TPA's terminal curbsides while also developing a 17-acre commercial property around the new rental car center. The Commercial Real Estate Plan can accommodate two office buildings and associated parking structures, two hotels, a convenience store with gas station, some retail and a remote commercial curbside to provide additional short-term curbside capacity while terminal curbside improvements are ongoing, and in the future, as a contingency for irregular operations.

The remote curbsides also provide connections to regional transit networks, notes Grant Clifford, senior vice president with Gresham, Smith and Partners, which is leading the project design for the commercial property site infrastructure, atrium and bridge components. Construction is scheduled to begin on those elements this September.

In February, the airport authority was winnowing down the list of potential developers for the office building. Airport officials expect to select a developer this fall, begin construction next spring and open the new building in late 2020.

The curbside expansion project at the Main Terminal will create a new customer service program called Express Curbside and add four outer lanes on two levels to the terminal road for arrivals and departures. Designed by HNTB, the new layout will allow departing travelers who are not checking bags and already have a boarding pass to head directly to the transfer level of the terminal. "They'll be able to get dropped off at that curb and go up a vertical circulation element directly to the transfer level, bypassing the ticket lobby altogether," Rossbach explains.

On the flip side, arriving passengers who do not need to stop at baggage claim can also catch a ride at the Express Curbside. "Not only do we create more capacity on our curb, but we give the opportunity for customers to select the kind of service they want," Illustrato notes.

The program was partially inspired by the growing national trend of passengers traveling without checked baggage to avoid additional airline fees. "Folks try to find creative ways not to have to check luggage," observes Illustrato.

"If we can get half of those people on another curb, we can really disperse future congestion at the airport," Rossbach adds.

In order to expand curbside capacity, the airport will need to relocate a central utility plant and demolish an administrative service building. Airport personnel currently housed in the administrative building will be relocated to the new office building development being built during Phase 2. Transit to the terminal will be provided by the automated people mover built during Phase 1.

Phase 3—construction of a new 16-gate airside concourse—will begin sometime in the late 2020s, estimates Illustrato. Current plans for the new airside facility include swing gates that can accommodate domestic or international flights. The project will also add a Customs and Border Protection facility and Federal Inspection Services station for processing international passengers.

Together, the three phases are designed to extend the life of TPA's existing terminal complex, explains Rossbach. "We demonstrated that there's substantial room to add additional gates within the current terminal complex for years to come without having the investment it would take to build an entire new North Terminal complex," he remarks.

Rossbach commends TPA administration for staying ahead of its challenging growth curve. "Some airports get behind the eight ball and are always trying to catch up to demand that's overtaking them," he observes. "TPA is very proactive when it comes to anticipating growth and planning for the future—a strategy that benefits airlines and travelers." ✈️

still being developed. “The design-build methodology [enabled us] to utilize our designer and builder together with our rental car stakeholders every step of the way, so that we could plan it and do it properly from the start,” Illustrato comments.

Stakeholders included existing and potential on-airport rental operators. Nearly five years of monthly meetings allowed the companies to have a voice regarding the design and construction of the new facility.

### Threading the Needle

Design and construction of the automated people mover were complicated processes for all involved, notes Illustrato. The 1.4-mile guideway system “snakes its way” from the fourth level of the terminal (about 100 feet off of the ground) and over roadways and shuttle guideways before dipping down to grade level and under a taxiway bridge. After climbing back up to surface level, the train heads to its first stop, the economy parking garage, and finally proceeds to the rental car center.

“Every path along the way of that alignment had enormous challenges, because we had to build the guideway above active roadways that couldn’t be closed,” relates Illustrato. “Shoehorning this people mover into our campus took extraordinary effort in planning and executing with airline partners, police and operations to coordinate overnight shutdowns.”

Because the airport roadway is a loop—with one way in and one way out—the parkway could only be shut down for a few overnight hours to construct the guideway. “We didn’t have the luxury to only build this project during the non-busy months of the airport,” he comments. “We had to do some pretty active traffic management in order to keep the place moving.”

Crews had to deconstruct and rebuild the Taxiway J bridge that spans over TPA’s inbound and outbound parkway to accommodate the new people mover system. “It was very dicey to deconstruct the bridge and reroute our roadways around it at a time when our traffic numbers are growing,” advises Illustrato.

Clifford agrees that constructing the guideway was a formidable challenge. “We basically thread the needle with that piece of infrastructure,” he reflects.



The train trip between the terminal and new rental car center takes five minutes.

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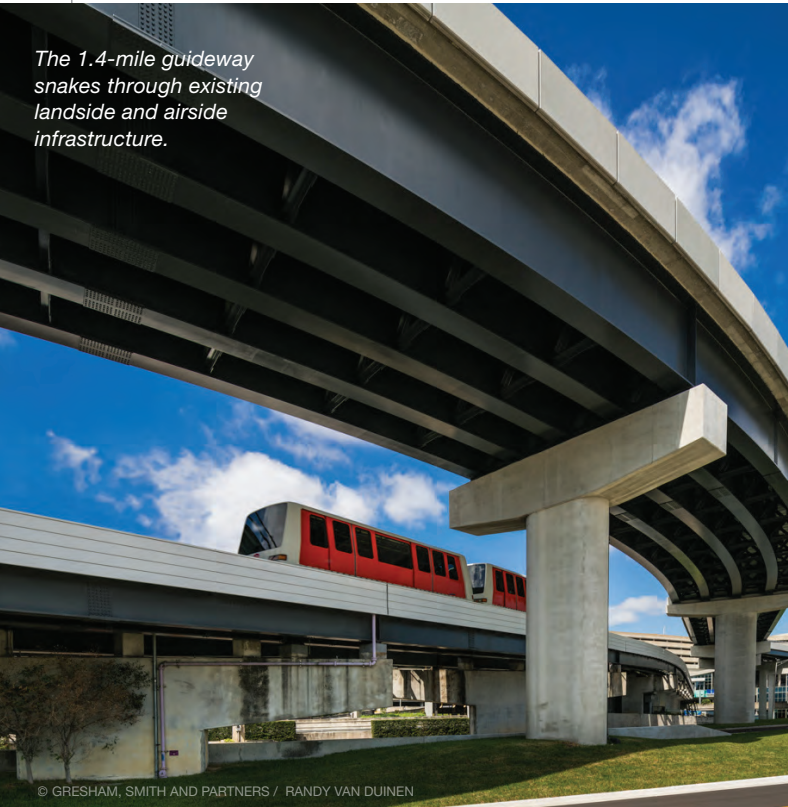
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The 1.4-mile guideway snakes through existing landside and airside infrastructure.



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Because portions of the guideway needed to be built around existing facilities, there were limited opportunities to locate support columns in some areas. As a result, the system includes some girder spans of 260 feet. The 10-foot deep, horizontally curved steel-plate girders were all installed while the airport remained operational.

“Under taxiways, avoiding protected airspace—you name it,” says Clifford. “It was quite a challenge.”

Designing a transit system that could achieve enough speed without producing a roller coaster effect for riders was another challenge. “It’s quite a complex piece of engineering when you account for very detailed analysis to avoid protected air space, but then also to make sure that all the curves and turns and slopes provide for a very good ride quality,” he explains.

A few elements of construction, such as placing steel guideway beams over the roadway, required closing the parkway, and were consequently performed during limited overnight work windows. “We had precious hours to set a beam, get it stable, disconnect the rigging from it and be ready for operation,” Illustrato recalls.

During those critical phases, stakeholders from across the airport met nightly to make “go/no-go” decisions. In addition to the project team, the group included airline partners, airport operations personnel, representatives from TPA’s marketing and communication departments, police officers and security personnel. “The airport took a very proactive approach to getting word out about possible road detours or closures,” says Illustrato.

## Hallmarks of Success

In retrospect, Illustrato says that continuous involvement and communication with all stakeholders throughout design and construction were the “hallmarks of the success” of the project. The comprehensive effort involved weekly meetings to discuss phasing, operational issues and construction matters.

“Because of the way the Authority managed the project and their decisive approach, the project was delivered from start to finish in a short period of time—and successfully,” comments Shah.

Keeping customer service at the forefront was critical for the airport and its project partners. “Our MO was always to come up with plans that did not affect the customer,” Clifford says.

As customers enjoy the new rental car center and train system, TPA is pressing ahead with the last two primary projects in Phase 1 of its Master Plan updates. Crews are currently expanding the transfer level of the terminal by 50,000 square feet. The new space will include four landscaped terraces for customers between the automated people mover station and terminal. The other project underway is a revamp of 69 food/beverage and retail locations. As of mid-March, 60 of those locations had opened.

TPA is also currently in the procurement process for Phase 2, which will include more curbside improvements and a sizable commercial development. Construction for the third and final phase is slated to begin in about 10 years. 





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# Northeast Ohio Regional Maintains Commercial Certificate to Support Economic Growth

BY NICOLE NELSON



## FACTS&FIGURES

**Projects:** Runway Reconstruction/Extension & New Terminal

**Location:** Northeast Ohio Regional Airport

**Operator:** Ashtabula County Airport Authority

**Runway Improvements:** \$9 million (including \$304,000 to remove powerlines)

**Associated Closure:** April 1, 2017, to Aug. 22, 2017

**Terminal Building:** \$876,000

**Funding:** FAA grants, Ohio Dept. of Transportation grants, private donations

**Consulting Engineer:** Michael Baker Int'l

**Airfield Lights, Signs & NAVAIDs:** ADB Airfield Solutions

**Key Benefits:** Maintaining commercial certificate; supporting regional economic development; improving customer facilities



In 1965, a forward-thinking businessman and aircraft operator named Robert Morrison marshaled local politicians and civic leaders to create the Ashtabula County Airport Authority for the purpose of developing an airport that would serve as an economic driver for Ashtabula County and northeast Ohio.

“His vision was to have a jet-capable airport, which is pretty remarkable when you consider that business aviation was really in its infancy back then,” remarks Dwight Bowden, president of the current airport authority.



DWIGHT BOWDEN

If Morrison were alive today, he undoubtedly would be proud to see how his vision has been brought to fruition at Northeast Ohio Regional Airport (HZY). Authority officials recently christened a new terminal building and completed a \$9 million runway improvement project that allows the

airport to serve all but the heaviest business and private aircraft.

In fact, HZY is one of only two general aviation airports in the state that holds a full commercial operating certificate from the Ohio Department of Transportation, which upgraded the airport authority's 2016 conditional certificate once recent runway improvements had been completed

Morrison also would likely approve of HZY's organizational structure. The airport, which straddles two separate townships, is operated according to a proprietary business model under the leadership of a nine-member volunteer board of trustees. Three full-time employees manage its daily operations.

## Decision Time

Pursuing full compliance for Category II operations with a jet-capable runway wasn't always a foregone conclusion. As recently as 2014, the airport authority had considered downgrading the runway/airport to serve only propeller and small turbine-driven aircraft.

“About five years ago, we hit a fork in the road when we had to decide if we were going to allow the airport to fall into a state of disrepair, or if we were going to take corrective action and save the aviation asset for future generations,” Bowden explains.

The clock was ticking on that decision as the airport’s sole runway neared the end of its 50-year lifespan. After a traffic forecast indicated that HZY should continue serving jets, the Airport Authority chose to embark on a major runway improvement project to retain and improve upon its CII classification.



LAURA E. JONES

“It was that original vision of Mr. Morrison that kept us driving forward,” comments Laura E. Jones, vice president of the airport authority board of trustees. “The tipping point occurred when local communities spoke up about the need for infrastructure improvements to attract new businesses and to help establish business growth and expansion,” she recalls.

“The board honored the original intent of this airport’s founding documents,” explains Jones. “It was meant to be an economic development driver; and without it here, and without the ability to make those improvements to keep it viable and vital, our county was going to lack the ability to move forward economically”.

“When you talk strategic planning, master plans and the vision for the future, without the airport as a major piece of that puzzle, we basically would be shutting the economic doors to our community. Should the airport cease to exist, it is not coming back.”

## Planning & Execution

The airport’s ultimate salvation began when the Airport Authority took action to acquire property and navigation easements, relocate utility power lines, remove tree obstructions and satisfy other runway certificate requirements.

Funding was provided by FAA grants, Ohio Department of Transportation grants and private donations. Bowden credits the airport authority board of trustees and airport staff, along with professional service providers, for securing FAA grants and successfully executing a plan to preserve the airport for future generations.

The FAA provided nearly \$7.4 million to help reconstruct and extend Runway 9-27 and install a runway safety area to current design standards. The local funding match of \$418,000 was provided by private donors, rather than local taxpayers, notes Bowden.

The Airport Authority is the beneficiary of three donor advisor trusts created by private donors and administered by The Cleveland Foundation. One trust is primarily for non-routine maintenance; another is designated for capital improvements; and a third was created to prepay a hangar construction loan. “Those three trusts, plus substantial private donations, allowed us to fund our local match and move both projects forward,” explains Bowden.

The improvement initiatives began in 2017 under the direction of consulting engineer Michael Baker International. The most significant project was the full-length reconstruction of Runway 9-27, which entailed removing and replacing the entire pavement structure down to the base. Crews also added a 703-foot extension and installed a new high-intensity lighting system. Now, HZY has a 5,900-foot runway capable of serving nearly all private and business aircraft.

Paul Strack, Associate Vice President with Michael Baker International, notes that the firm has provided on-call service to HZY for about 14 years, and the last 10 or so have been dedicated to making Northeast Ohio Regional Airport 100% compliant with all federal standards and state licensing requirements. “This project is a great example of a general aviation airport persevering and executing a vision,” he comments.



PAUL STRACK

Bowden credits Michael Baker consultants for creating a roadmap to help the airport achieve full commercial certification. “We had FAA submission calls, which provided the format of a list of items that had to be addressed. We would complete items, add new ones, and move forward in the execution of the project,” he explains.

Airport Manager Barbara Ford notes that the improvement initiatives stretched beyond physical infrastructure. “It is not just the actual runway lights and pathways we are talking about,” she explains. “The ACAA [Ashtabula County Airport Authority] also changed the way it operates and improved its performance by viewing the airport as a business.”



BARBARA FORD

Leases, bylaws, rules and regulations were rewritten; a minimum standards document was created; and a records retention policy was put in place. “Basically, the thrust of the airport is to be a safe, clean, secure and compliant facility,” summarizes Ford. “In my mind, ‘compliant’ is the big one, because it is not only about tree obstructions and runway markings, it is how you do business.”

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*Recent runway improvements allow the airport to serve a wider array of corporate traffic.*

### Terminal Upgrade

In addition to constructing a fully compliant, jet-capable runway, HZY also constructed a new terminal building to provide a more attractive front door to the region. The former terminal facility was essentially an attachment to the main hangar. “The conference room was actually converted from a poorly insulated automobile garage, and it did not have ADA-compliant restrooms,” Bowden explains. “In summary, it was 50 years old. Like the runway, it was in desperate need of being replaced.”

The airport created a new terminal building by erecting a 2,400-square-foot steel structure the airport had

purchased years earlier. Construction was funded with an Appalachian Regional Commission grant, a grant from The Cleveland Foundation and private donations.

The new terminal includes a pilots’ lounge, office space, a conference room, a file room, etc. “It is not elaborate, but it is functional,” says Bowden.

Jones and other members of the board trustees felt it was important for the new terminal building to be true to the area. “A really modern building wouldn’t have fit,” she notes. Designers consequently opted to highlight regional elements, such as agriculture, wineries

and covered bridges. “Bringing the outdoors in as a piece of the entryway was important,” notes Jones.

### Increased Usage

The recent infrastructure investments have caused a substantial uptick in traffic, reports Ford. Since opening the new runway, touch and go passes have increased from 160 to 200 per month, and she has noticed a marked increase in airfield activity on the weekends. Whereas HZY is a non-towered airport, precise traffic numbers are not available.

The airport also supports frequent business flights by Delta Railroad Construction, Molded Fiberglass Companies and other local companies. In addition, the airport recently struck a deal with Ashtabula County Medical Center and the Cleveland Clinic to be an alternate landing zone for their helicopters flying out of Cleveland.

Looking ahead, officials are also working with Kent State University-Ashtabula Campus to establish a two-year maintenance degree program at the newly upgraded airport. The venture could be mutually beneficial for HZY and the University, and would support workforce development for the entire county, notes Bowden.

Current customers seem to be already sold on the airport’s recent improvements. “Some pilots stop in to the new terminal out of curiosity, and they absolutely love it,” reports Ford. “They will be coming back.” ✈️

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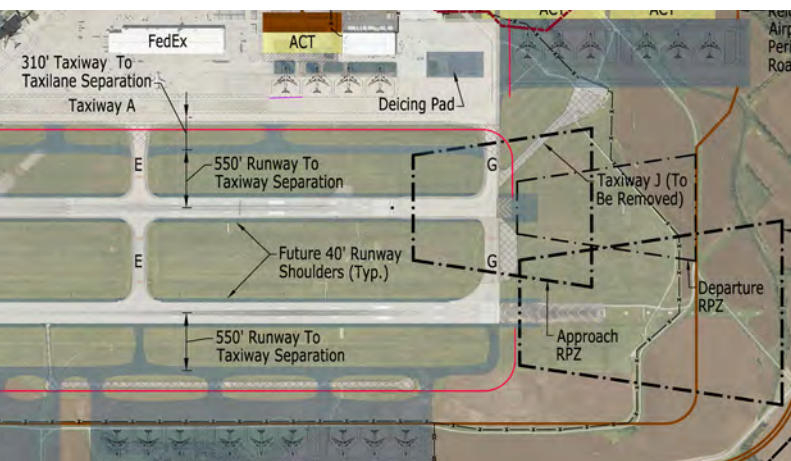




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Pittsburgh Int'l was an early pioneer in coping with the infrastructure implications of dehubbing.

## FACTS&FIGURES

**Project:** Rightsizing Terminals

**Common Impetus:** Airline consolidation & dehubbing



**Location:** Cincinnati/Northern Kentucky International Airport

**Catalyst:** Dramatic service decrease by Delta Air Lines beginning in 2005

**Facility Changes:** Consolidated all operations into 1 terminal in 2012; tore down 2 other terminals in 2016. Decreased from 69 multi-carrier & regional carrier gates to 50 mainline aircraft gates

**Other Adjustments:** Increased investment in cargo operations & commercial development

**Change in Customer Profile:** Traffic used to be 90% connection passengers; now locals account for up 94%

**Impact on Airfares:** Airport used to be 1 of top 3 most expensive U.S. airports; it now ranks 83rd



**Location:** Memphis (TN) Int'l Airport

**Catalyst:** 2013 dehubbing by Delta Air Lines

**Impact on Service:** Delta dropped from peak of 245 flights per day to about 20

**Facility Changes:** Project currently in progress to decrease gates from 83 to 23 & practically eliminate 2 concourses

**Impact on Airfares:** Avg. price has dropped an average of \$181



**Location:** Pittsburgh Int'l Airport

**Catalyst:** 2004 dehubbing by US Airways

**Impact on Service:** At peak, airport had non-stop flights to 110 markets; that number dipped to 37 in 2014. Today, it has non-stop service to 74 destinations

**Facility Changes:** Building new facility for landside terminal functions; number of gates will decrease from 75 to 51



# Airline Consolidation & Dehubbing Trigger Rightsizing Projects

BY PAUL NOLAN

There is a lot of buzz about the “customer experience” these days. Sometimes referred to as simply “CX,” it has become the focal point of business plans and marketing strategies across a wide swath of industries. Everyone from chief executives to frontline foot soldiers is charged with making customer interactions exceptional, memorable and worth repeating.

Airlines began touting their customer experience long before it became de rigueur; but for decades, most airports did not pay as much attention to emotional connections with travelers. Airports were more utilitarian—like highways—and few focused on goals such as “sense of place” and “customer delight.”

That was then. This is now.

Sweeping and dramatic changes in the industry have left airport executives hustling to modernize their facilities and market them

more effectively—not only to airlines, but also to the communities they serve.

Industry consultants and designers preach the importance of making an airport a destination in and of itself, rather than a generic conduit that travelers pass through on their way from Point A to Point B. One area of particular change is the explosion of concessions—retail, food/beverage and services—and their post-9/11 migration behind TSA checkpoints.

## The Fallout of Dehubbing

The transformation of many U.S. airports coincides with a decade and a half of historic change within the aviation industry. The number of airlines serving the United States has shrunk from 24 in 1980 to just nine today; the number of U.S. major carriers dropped from nine to four between 2005 and 2015 alone.

Consolidation has concentrated traffic at the largest airports. According to the Bureau of Transportation, passenger traffic at large hub airports has increased 15% since 2005, while volume at medium and small hubs dropped 4% and 2%, respectively. With consolidation came the concentration of hubs and the “dehubbing” of once-bustling regional airports.

Scott Brockman, president and chief executive officer of Memphis International Airport (MEM), has watched the changes unfurl and adapted accordingly. Brockman spent more than three decades in various management roles at airports in Florida, Iowa and Arizona before landing at MEM in 2003.



SCOTT BROCKMAN

This year, Brockman and other officials are kicking off a \$114 million modernization/rightsizing project that will take the airport from 83 gates to 23 and all but eliminate two concourses.

“Two things have rewritten aviation history more than anything in my 32 years,” Brockman reflects. “9/11 changed this business overnight in more ways than I can describe. The other one is consolidation.”

## A Return To Serving the Community

The impact of industry-wide airline consolidation has been dramatic at MEM. For decades, the Tennessee airport served as one of three primary hubs for Northwest Airlines (along with Detroit Metropolitan and Minneapolis-St. Paul International). When Delta and Northwest announced a merger in 2008, Brockman knew big changes were afoot. The airlines insisted that the merger would allow for expansion, not contraction, but the reduction of flights through MEM began in 2010. By June 2013, Delta had effectively announced that MEM was no longer a hub. Currently, Delta operates about 20 daily flights out of MEM, down from a peak of 245.

“When we were dehubbed, we obviously had to look at a different business model to manage and maintain the airport going forward,” says Brockman. “We started what I call the ‘reinvention of Memphis International Airport’ in the middle to the end of 2013, although preparations began much before that. We started planning when Delta and Northwest both filed for bankruptcy on the same day in the same courthouse in New York City [in 2005].”

At that point, MEM officials began contingency planning for a wide variety of scenarios, including what would occur if the airport were no longer a hub.

As early as 2007, Brockman and his colleagues met with counterparts at Pittsburgh International Airport (PIT), which had been dehubbed by US Airways in 2004. “We talked with them about what they found was effective and what was not effective in trying to reshuffle the deck chairs to get their business back in line,” he recalls. “We built in a contingency plan that was actually more draconian than we ended up having to use. We did a nice job putting us in a place to know how to act and react.”

The silver lining to Delta’s dehubbing is that Brockman and his team began focusing on serving the Memphis community. When

MEM was a hub, more than 80% of its customers were transfer passengers. The tradeoff for having 91 nonstop destinations was high ticket prices. MEM ranked in the top five for average airfare prices in the country for most, if not all, of its time as a hub, laments Brockman. As with other hub airports, local passengers paid a premium to offset the discount given to transfer passengers.

“It actually disincentivizes local travelers from using their own airport,” Brockman explains. “I had passengers who drove to Little Rock and flew *through* Memphis because they got a lower air fare than if they had taken a direct flight out of Memphis.”

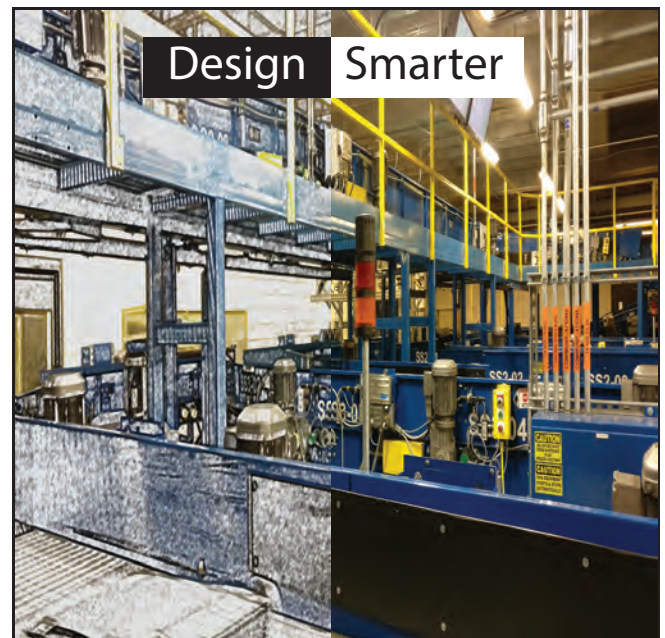
Airfares out of MEM have dropped an average of \$181 since 2012, and MEM has steadily gained more local passengers. In fact, it plans to hire a customer service manager this year to help employees provide a “positively MEMorable travel experience,” just as the airport’s marketing slogan indicates.

## Same Story, Different Market

While Brockman was leading the transformation at MEM, Candace McGraw was tackling similar challenges at Cincinnati/Northern Kentucky International Airport (CVG). McGraw started at CVG in 2009 as chief administrative officer and accepted the position as chief executive officer in 2011.



CANDACE MCGRAW



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CVG consolidated operations into one terminal and tore down two others after Delta dramatically decreased flight service.



Like MEM, CVG was also once a dominant Delta hub. More than 90% of its passenger traffic was via Delta, and most were connecting passengers. At its apex in 2006, CVG served 600 flights per day. It is now at 180.

“When I arrived in 2009, there had already been considerable downsizing,” recalls McGraw. “The No. 1 thing was to stop the bleeding. When I took over as CEO, we tried to build a strong case with Delta that they cut too deep into the bone, and we put some mechanisms in place to bring in new carriers.”

In 2011, the airport reclaimed Concourse A from Delta, moved it into Concourse B, and spent a full year renovating Concourse A before moving in other airlines. In 2012, CVG consolidated all operations into one terminal and tore down its other two in 2016. Delta was already operating out of Concourse B at the time. All other airlines operate out of Concourse A.

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After the reshuffling, United and America Airlines increased their service into the airport, and Frontier initiated service. Since then, the airport has recruited Allegiant, Southwest, WOW air, and OneJet, and expanded operations of Sunwing/Vacation Express. Every carrier experienced passenger growth in 2016 and 2017, McGraw reports.

Throughout the process, CVG's passenger profile was flipped on its head. While transfer passengers used to comprise 90% of the airport's traffic, locals now account for up to 94%. The airport grew local passenger volume by more than 21% in 2017, and in December set a new record in its 70-year history. In 2017, CVG achieved its fifth year of year-over-year local passenger growth. And McGraw expects that trend to continue.

The airport used to be one of the top three most expensive U.S. airports. It now ranks number 83, according to the Department of Transportation.

"We're keeping our costs low, we've gotten into the land development business to diversify our revenue streams, and cargo is growing tremendously," McGraw explains. The airport is breaking its own records for cargo volume, which helps lower the cost of operations for passenger carriers. In January 2017, Amazon announced it will build its first and largest air cargo hub

on 210 acres at CVG. The airport already serves as the North American hub for shipping giant DHL.

"Now that we've reached a point of stability, how we grow is the next step," says McGraw. In 2016, her team released a five-pronged strategic plan that combines continued passenger and cargo growth with a focus on building its brand and establishing more business partnerships. It could be easy to bask in the success of the past several years, but McGraw says that this is no time to put the airport on autopilot.

"We all have aging infrastructures," she comments. "This year, we are updating our master plan and will take a deep dive into exploring whether we have the proper facilities and compare costs of demolishing and building new versus rehabbing what we currently have. We also need to look at what airfield work is necessary, especially with the Amazon facility coming. The question becomes, 'How do you pay for all of this while trying to keep costs down?'"

The master plan update is scheduled to be complete this fall.

### Pittsburgh Demands Airport Revival

Building a new terminal wasn't on the radar of the Allegheny County Airport Authority a few years ago when it recruited Christina Cassotis



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to serve as chief executive officer of Pittsburgh International Airport (PIT). But a new terminal is currently in the works, and it's just one part of the resurgence that Cassotis is leading.

For better or worse, PIT was a pioneer in coping with the fallout of dehubbing. US Airways, which was central in the decision to build a \$1 billion terminal in 1992, closed its hub there in 2004. "When I got here in 2015, the airport was connected to 37 markets non-stop, which was down from a peak of a 110 during the US Airways hub days," explains Cassotis. "We had a whole community in Pittsburgh that was used to having a level of service that one could argue we didn't deserve because it couldn't support itself. The community was frustrated beyond belief with the airport's inability to match a turnaround that the city itself had worked hard to achieve after the steel industry collapsed in the 1980s."

Instead of cutting flights sharply after dehubbing, US Airways methodically trimmed its service at PIT. In retrospect, Cassotis says that it would have been better for the airport if the carrier had ripped off the Band-Aid quickly. Total air service bottomed out in 2014, a year before she arrived. Today, the airport has non-stop flights to 74 destinations. Last year, it served close to 9 million travelers—its highest passenger total since 2007.

Cassotis' three-step strategy to help the airport recover involved assessing opportunities to bring in additional airlines, partnering with community leaders to help define what kind of airport the city needed, and reinvigorating PIT employees. "I could go out and recruit airlines, but I had to have 475 people buy into this vision and participate," she says of the crucial third component. "It was vital that everybody understand what we were doing and why. The job was always about bringing in more flights and it still is; but to do that, I need everyone helping."

The airport authority was in the planning stage for a major terminal modernization project when Cassotis arrived. Officials were focused on reconfiguring the existing terminal, but she stressed that building a new terminal had to be included in the options being considered.

"We quickly realized that combining the landside and airside terminals made sense, because we are no longer a large connecting hub," she explains. "We don't need the 75 gates we have. We don't have enough space landside, and we have too much airside."

After a 30-month master planning process, the authority approved a \$1.1 billion project that will relocate landside terminal functions and related ground operations to a new facility that will

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be built adjacent to the existing airside terminal. The number of gates will drop from 75 to 51. Eventually, the airport will demolish the existing landside terminal or renovate it for commercial use. The plan also includes the addition of a new 4,500-space parking garage.

The airport authority emphasizes that it will pay for the improvements at no cost to taxpayers and without increasing fees to the airlines. In fact, it estimates that PIT's cost per enplaned passenger will actually fall from a current average of \$12.76 to \$9.73 (in today's dollars) in 2023, when the construction work is scheduled to be finished.

The plan allows for additional industry changes that are sure to come, notes Cassotis. "It's the pace of change that we are planning for," she explains. "We don't want to build a big building with huge spaces that can't be

*Work is currently underway at MEM to decrease from 83 gates to 23.*



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Like her counterparts at CVG and MEM, Cassotis has focused on developing an airport that reflects the surrounding area and provides a sense of place. “Airports are becoming much more emblematic of their communities—the front door, the beginning and end of a local brand,” she remarks. “We need to make sure that this airport reflects a very tech-forward, diversified, energetic and vibrant community, which it doesn’t do today.”

Looking ahead, Brockman notes that continued airline consolidation will have differing impacts on different cities and airports. “Some will be positive and some will be tremendously negative,” he predicts.

“I have never been more optimistic about where Memphis International Airport is going and what we are poised to accomplish,” he adds. “We have worked hard to put ourselves in a position to not only sustain all of this, but to come out of it in a tremendously positive way for this community. I’m proud of the team and my board and everyone that is involved.”

McGraw and Cassotis express similar sentiments about their respective markets. And all three foresee more major shifts for the overall industry.

“I think there is tremendous volatility still coming,” says Brockman. “But that’s a different discussion.” ✈️

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# Challenge Junkies

It is often said that leadership is about managing change. It’s also about having the humility to lean on others. The airport executives profiled on pages 22-27 emphasize the importance of exchanging insights with peers while navigating the dramatic changes that have occurred in the industry over the past two decades.

“One thing you will find about airport directors is they are challenge junkies,” says Scott Brockman, president and chief executive officer of Memphis International Airport (MEM). “We are all part of one big family. We do a good job of communicating, sharing and plagiarizing with permission.”

Brockman says he regularly fields calls from other airport executives who want to know how he handled specific challenges, and he has placed similar calls on several occasions. Even before Delta officially closed its hub at MEM in 2013, Brockman had met with the director, chief financial officer and legal counsel at Pittsburgh International Airport (PIT), which had navigated the process almost 10 years earlier.

“We talked about bankruptcy issues they had not thought of and how they were modeling their operations to reduce costs so they could still offer reasonable charges,” he recalls. “They gave me a CD with all of their data on it, which I brought back to validate all of my projections.”

Candace McGraw, chief executive officer of Cincinnati/Northern Kentucky Airport (CVG), is also a big believer in industry collaboration. “There are a lot of good, smart people to bounce some ideas off of,” McGraw says. “We are all focused forward. There is no looking back at what we used to be. We are focused on moving forward and how to position ourselves to provide the best airports and be economic drivers for our community.”

True to their collaborative nature, McGraw and Brockman both head industry organizations that hold conferences and other events that encourage airport executives to meet and share ideas. Brockman is chair of the American Association of Airport Executives; McGraw is chair of Airports Council International-North America.

Brockman encourages airport directors who gather information and ideas at conferences to view them in context. One-size-fits-all solutions are extremely rare.

“There is a phrase we use: ‘If you’ve seen one airport, you’ve seen one airport.’ We all manage with the same kinds of things going on, but we manage them in different ways,” he says. “There are as many different models of rates and charges across the system as you can imagine. You really have to be careful when you start comparing airports and you start taking raw numbers without delving deep into what they mean, because they could be misleading.” ✈️



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## FACTS & FIGURES

**Project:** Subdividing Janitorial Contract

**Location:** Seattle-Tacoma Int'l Airport

**Total Contract Value:** \$16.4 million for 2018; \$17 million for 2019

**New Contractors:** C&W Services; PRIDE Industries; Wayne Enterprises

**Contract Duration:** 2 yrs, with up to 3 single-year renewals based on performance

**Performance Tracking Software:** iAuditor

**Rationale for New Strategy:** Competition among contractors is expected to improve performance

**Added Benefit:** Providing work & personal growth opportunities for disadvantaged workers

# Sea-Tac Int'l Leverages Competition to Boost Janitorial Efficiency

BY MIKE SCHWANZ

Airports often award a single contract for their janitorial services. Beginning this year, executives at Seattle-Tacoma International Airport (SEA) are taking a different tack. They divided up the work and awarded contracts to three different companies, hoping that competition among the firms will improve efficiency and tangible results.

"The new contract should improve quality and performance, reward the companies with the best performance, increase the opportunities for small and disadvantaged businesses, while offering more security to our workers," explains Stuart Mathews, director of aviation maintenance.



STUART MATHEWS

A cornerstone of the new approach is that each company is assigned a certain zone to clean. "We wanted competition among the contractors in the years going forward, with the hope this will raise the performance of each company," Mathews adds.

C&W Services won the bids to operate in SEA's South Satellite, Concourse A, Concourse B and public pre-security areas such as the ticketing hall and baggage claim area. It is partnering with Wayne Enterprises, a small, minority-owned business based in Denver.

PRIDE Industries, a nonprofit enterprise that specializes in creating jobs for veterans and workers with disabilities, will maintain the Central Terminal, Concourse C, Concourse D and the North Satellite. It is partnering with Evergreen Building Services, a small, woman-owned business from Mill Creek, WA.

Wayne Enterprises will operate independently to maintain nonpublic areas such as the bagwell, Airport Office Building, police/security area and remote facilities.

## Contract Details

Combined services from the three janitorial contractors are projected to cost \$16.4 million this year and \$17 million in 2019. In comparison, SEA's contract with its previous single vendor cost about \$14.5 million in 2017. The current companies are working under two-year contracts with up to three single-year renewals based on performance.

Costs for all custodial services are covered within the annual Aviation Maintenance Department budget, which—like all other airport department budgets—is reviewed and approved by the Port of Seattle Commission.

One important stipulation in the contract was an employee retention measure that required contractors to extend offers to existing employees for a minimum of 180 days, as well as a written labor peace guarantee with the union. "We worked closely with the union here (SEIU Local 6) to get this done," Mathews says. "We

wanted their buy-in so we crafted labor harmony language with which they were comfortable, and worked for our purposes as well. The union representatives had initial concerns that we would be cutting jobs, but once we convinced them that we would need more people, not fewer people, they were on board."

## Measuring Performance

Jinah Kim, SEA's senior manager of aviation maintenance, plans to closely monitor the work performed by the new contractors. "I have a weekly walk-through to inspect every area of the airport. Airport duty managers also check their sections every day," she says. "The contractors have incentives to reach high scores. We have a software program called iAuditor, which sets a template and measures cleanliness in several key locations, including the gate area, main corridor and walkway, restrooms and food court."



JINAH KIM

Each contractor works only within its particular zone, using its own employees and equipment. "They do their own thing, based on their own industry expertise and methods to be successful," Kim remarks. "It is to their advantage to do the best job possible in their zone, since there is a possibility they could earn more work if another company falters."

If a contractor fails to perform to standards, the airport has the option of terminating the contract and re-bidding the work.

## Increasing Service

Decentralizing janitorial services was not done to save money, says Mathews. In fact, the new contracts will cost the airport approximately \$2 million more per year. "Our main purpose was to get the right level of service," he explains. "To increase our service and improve cleanliness throughout the airport, we needed to boost customer satisfaction—both with our airline customers and the passengers. This was not a downsizing; it was a rightsizing."

Two areas in particular were targeted for improvement since January, when the new contractors took over: public restrooms in the terminals, and the holding areas by each gate. "Our weekly surveys of airline customers showed improved scores concerning cleanliness in these areas within a month," Kim reports. "We do encourage our customers to be as honest as possible when we poll them, and we definitely will pay close attention to their feedback as we proceed."

Nevertheless, there is still much work to be done, adds Mathews. "The previous contractor was in place for several years. There are aches and pains with any big change like this. Still, I am guardedly optimistic. It may take sometime into spring before we reach all of our goals."



One of the contractors the airport selected hires veterans, workers with disabilities and youths exiting the foster care system.

### Social Outreach

One of SEA's new contractors provides much more than clean carpets and shiny mirrors. PRIDE Industries, based in Roseville, CA, focuses on hiring veterans, workers with disabilities and youths exiting the foster care system. About 3,300 of the company's 5,600 employees have documented physical and mental disabilities, making it one of the largest nonprofit employers of people with disabilities in the country, notes Steve Twitchell, the company's senior vice president of sales and marketing.



STEVE TWITCHELL

"The state of Washington is big on sustainability and social responsibility, which aligns perfectly with our mission," says Twitchell. "And the Seattle region especially is a region of growth, near and dear to our hearts. We are experts in building and identifying opportunities for disadvantaged people, and look forward to working with the Seattle community."

The company works for government and private sector entities alike, and has several airports as clients, including Dallas/Fort Worth International, Sacramento International and numerous small regional airports. "At SEA, we will have 60 full-time employees, and will work with 30 to 35 of our subcontractor's employees," says Tim Vanover, director of business development for PRIDE Industries. "We work closely with one of our partners, Evergreen Building Services, to make sure that quality and safety needs are met. In addition, Evergreen helps us identify, through local agencies in the



TIM VANOVER

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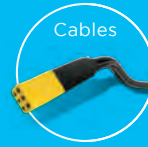
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Seattle area, people who would be suited for this type of work.”

The two companies partner to accomplish the work at SEA. Evergreen maintains Terminal D and the North Satellite. PRIDE maintains the Central Terminal Food Court, mezzanine and Terminal C, where Alaska Airlines has its hub. Each company maintains its own supervisory staff 24/7, and PRIDE uses a web-based technology to conduct quality audits via handheld devices.

### Worker Training

Each PRIDE employee undergoes detailed orientation and training before starting work at the airport. “As an organization, we are committed to sustainability and a healthy environment. We teach our employees how to reduce water usage and chemicals, providing them with the latest in green cleaning technology,” says Vanover. “We have a comprehensive matrix, developed over many years, that we use to prepare each employee.”

Many of PRIDE’s managers have degrees in care management, adds

### STIA CUSTODIAL ZONES

- ZONE 1** – C&W Services: Concourse A, Concourse B, and South Satellite
- ZONE 2** – Pride Industries: Concourse C, Concourse D, North Satellite, and Central Terminal
- ZONE 3** – C&W Services: AOB Mezzanine, Ticketing, Baggage Claim, Skybridges, Curbside, Garage Elevators and Elev Lobbies, Escalators, 3rd floor Transportation Booth and 3rd Floor Garage Restrooms
- ZONE 4** – Wayne Enterprises: Baggage Handling, Compactor Sites, Airport Office Bldg., Main Terminal Police and Security, MT Penthouse, Outlying Buildings and North GT Cruise Lot

Twitchell. “We have workers with multiple types of disabilities and have a subject matter expert for each type of disability,” he explains. “Over the years, we have learned how to match an employee to a job that is best suited to him or her.”


Providing jobs and opportunities for personal growth is key to the organization’s mission. “When you give a

job to someone who typically doesn’t get those opportunities, it changes their life,” says Twitchell. “Our employees greatly value and appreciate their jobs, and that passion and sense of self-worth through employment is infectious.

“Travelers do recognize and appreciate the enthusiasm and hard work of our employees,” he continues. “They appreciate that our employees take their jobs seriously.”

That said, PRIDE prepares its employees for the possibility of interacting with travelers who are having a rough day or are generally less supportive of the company’s mission. “By an overwhelming margin, people say they have positive interactions with our employees,” Vanover reports, noting that customer service is key to the company’s success.

Keeping a busy facility such as SEA clean requires constant vigilance, Twitchell emphasizes. The airport is open 24 hours a day and served 46.9 million passengers last year alone. To keep pace with the traffic, PRIDE cleans in cycles every 20 to 30 minutes from 5 a.m. to 1 a.m. Crews perform restoration work, such as floor care and restroom detailing, at night.

Although SEA’s new custodial policy only has been in effect for a few months, airport officials are optimistic that it will be effective long-term. “So far, most of the comments we have received from our airline customers and our travelers have been very positive,” reports Mathews. “And I expect that to continue.” 



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The deadly shooting incident attracted heavy media coverage.



# Fort Lauderdale Int'l Shares Lessons Learned From 2017 Active Shooter Tragedy

BY RONNIE GARRETT

## FACTS&FIGURES

**Project:** Refining Emergency Response

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

**Catalyst:** Mass shooting in Terminal 2 baggage claim area on Jan. 6, 2017

**Shooting Casualties:** 5 people killed, 6 hospitalized with injuries

**Total Injuries:** 50+ people hospitalized with chest pains, broken bones, etc. incurred while fleeing the scene & during subsequent stampede triggered by false reports of another shooting 90 minutes later

**Post-Incident Review:** Ross & Baruzzini

**Key Changes:** Relocating emergency operations center & streamlining identification procedures for personnel access; improving communications systems to address passengers & airport personnel; enhancing active shooter training for airport employees & holding practice drills

**New Communication System:** Integrated Public Alert & Warning System

**Public Address System for Ramp:** XYZ

**Personal Effects Management:** BMS CAT

Early last year, Fort Lauderdale-Hollywood International Airport (FLL) in Broward County, FL, experienced the deadliest airport shooting in U.S. history when a passenger killed five people and sent six others to the hospital with injuries. More than 50 others were hospitalized for chest pains, low blood sugar, broken bones, etc. incurred while fleeing the scene and during a subsequent stampede triggered by false reports of another shooting.



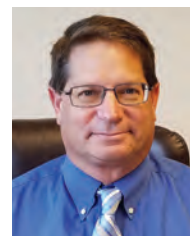
MARK GALE

millions of people who traverse through airports every day, there is no foolproof way

Airport Director Mark Gale and other FLL executives have been notably candid sharing their reflections about the horrific tragedy for the good of the overall industry. "When you think of the tens of

to prevent the actions of a single individual," Gale says solemnly. "However, there are lessons in this incident that can help every airport—from a small general aviation facility to a large mega-hub—be better prepared."

Mike Nonnemacher, chief operating officer at FLL, summarizes one overarching theme of airport's message this way: "You can mitigate a lot of things by having a good, solid plan, practicing that plan and being ready. You can mitigate the time it takes to respond, the impact of the response and the confusion that follows."



MIKE NONNEMACHER

In the aftermath of the mass shooting, FLL hired aviation consultant Ross & Baruzzini to help evaluate the incident and the airport's associated response. FLL executives have since addressed, or are in the process of



addressing, all topics identified in Ross & Baruzzini's assessment. Specific projects include relocating the emergency operations center and revising response procedures for key personnel; improving communications systems; and enhancing existing active shooter training for airport employees.

## Lessons Learned

To understand the extent of what has occurred at FLL in the last year or so, Gale encourages peers at other airports to take a closer look at what ensued on Jan. 6, 2017.

The shooter waited at a baggage carousel in Terminal 2 for several minutes before being paged to pick up his bag at a baggage service office. He took the bag, which contained a 9 mm semi-automatic pistol, into a nearby bathroom, where he loaded the weapon and then stuck it in the waistband of his pants. Minutes later, he pulled out his gun and began shooting.

It is at this point that Gale begins most of his conversations about planning for an active shooter incident. He notes that he has reviewed the short video clip of the event hundreds of times, and always comes to the same conclusion: "You cannot tell the individual has a gun in his waistband. You can't tell what he is

about to do. There is no behavior that would have caused people to become concerned, panicked or alarmed, until he pulls out his weapon and starts to fire."

Deputies stationed at the airport raced toward the shooter as he fired 14 rounds. Within 85 seconds, law enforcement had him in custody. But he had already done his damage, and people lay dead and wounded.

As soon as police officials arrived on the scene, they began trying to determine the identity of the shooter, where he came from and whether he was caught on camera with anyone else who could be a companion or an accomplice. "This is all taking place as [emergency response] officials are tending to fatalities and injuries," Gale advises. "As you can imagine, it was a chaotic and crazy scene. But I think the airport staff, law enforcers, fire/rescue personnel—everyone—did a good job on that particular piece."

It wasn't until 90 minutes later when things began to unravel a bit, he adds. That's when false reports of additional gunshots caused widespread panic among travelers, airline personnel and airport employees in all four terminals. Many took cover inside, but thousands

rushed out emergency exits onto the tarmac. News reports used words such as chaos, turmoil and pandemonium to describe the scene.

The crowd's reaction was not entirely predictable, notes Gale. "I know there are some who would argue that the incidents at LAX or JFK should have been a wakeup call, but I don't think that we could have envisioned a secondary incident with the magnitude of what we experienced. Nor could we have anticipated that it would cause such a panic and spontaneous evacuation from our building," he remarks.

"You've heard the saying, 'Hindsight is 20/20'? If we had to do it again, there are a number of things we would do differently."

Here are nine of his top recommendations for other airport operators:

### Recommendation #1: Ensure Access for Critical Airport Personnel

The day of the shooting, Nonnemacher served as incident commander at the airport's emergency operations center (EOC). The industry veteran, with more than three decades of aviation experience, oversaw recovery efforts, including logistic coordination with law enforcement.

Nonnemacher was notified within 1½ minutes of the shooting and was able to reach the EOC to begin operations within 11 minutes. But other key staff members were delayed reaching the EOC because police had erected barricades while they investigated reports of a second shooter.

"If you were on airport property but away from the terminal, you didn't get in—even if you had an airport ID," explains Gregory Meyer, public information officer for Broward County



GREGORY MEYER

Aviation Department, FLL and North Perry Airport. "Law enforcement was doing its job; but this meant critical airport personnel couldn't get in until they figured out how to get in. It took me 10 minutes to talk my way in, and I'm the airport PIO."

Public information officers from other organizations worked out of a mobile trailer to help the airport manage a deluge of media inquiries.



When FLL transitioned to addressing corrective measures, this is the first problem it tackled and solved.

“Airports absolutely *must* have a robust methodology of identifying critical responders,” advises Nonnemacher. “Even our own airport CEO was denied access to certain areas of the airport during a drill; and that was just a drill. We had to solve that problem.”

These days, the airport requires a small group of key employees to carry special identification badges that indicate their status regarding emergency response. FLL also trained local law enforcement how to recognize and respond to the new badges. Now during an emergency, select airport employees will be able to flash their badges at assigned checkpoints for quicker access to the airport EOC.

Access has also been tiered. For every EOC position, the airport now designates and trains primary, secondary and tertiary responders. Primary responders are granted access first; secondary and tertiary responders gain entry when they are summoned. The new structure reduces the number of people attempting to enter the EOC at one time and ensures coverage if an event spans multiple days.

“During the 2017 incident, we had a significant amount of burnout among the personnel who responded, because the response lasted several days,” notes Nonnemacher.

## Recommendation #2: Analyze Location of Emergency Center

Like many airports, FLL used to house its EOC inside the terminal proper. It was located in Terminal 3 to facilitate quick response to situations within all four terminals. However, during the active shooter incident, police put that area in lockdown when reports of shots elsewhere rolled in. As a result, no one could enter or leave the crucial response center.

FLL has since moved its EOC to another building away from the terminals.

“It’s now much easier to get to,” says Nonnemacher. “If we seal off the terminal building with a police barricade, we can still access the EOC because it is in a separate building.”



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Locating the facility elsewhere also ensures that EOC personnel can maintain access to communications systems; electrical power; and heating, ventilation and air-conditioning (HVAC) systems—essential elements when responding to an incident. During the 2017 incident, the EOC had enough power to run its operations equipment but lacked sufficient power to operate the HVAC system.

“The new EOC, which we christened during Hurricane Irma, performed beautifully because the HVAC system and all critical components worked under a generator. The generator powered everything that we needed, and we housed people for four days during that event,” Nonnemacher reports.

### Recommendation #3: Provide a Staging Area for Outside Responders

While extra assistance is needed and appreciated during an emergency, processes must be in place to handle the influx of responders, Gale advises. When an estimated 2,600 police officers descended on FLL after the shooting, a lack of familiarity with the airport’s layout and operational policies hampered their response efforts.

“When the call went out about there being a shooter at the airport, law enforcement had a self-deployment issue,” Nonnemacher explains. “They came in droves and set up checkpoints and blocked entrances to the airport. This included officers who were not in our district.”

In retrospect, FLL recommends following the National Incident Management System (NIMS), a program from the Federal Emergency Management Agency that provides procedures and protocols for all responders—federal, state, tribal and local. NIMS guidelines are designed to help organizations manage the complicated logistics of emergency response.

Per FLL’s new system, law enforcement responding to emergencies at the airport now report to a pre-set staging area. From there, officers are deployed to specific locations where they are most needed—to search buildings, secure perimeters, help the injured, etc.

The airport has also conducted outreach programs to help educate local police and other first responders about its facilities. Maps and blueprints of the terminals and associated infrastructure were distributed on thumb drives and will soon be distributed on heavy-duty tablets.

### Recommendation #4: Develop Backup Communication Systems

As police and fire officers answered calls for backup and converged on FLL, they encountered radio problems. “The crush of users sent the system into a ‘fail-soft’

mode, and all connections between responding agencies were lost,” said the Sheriff’s post-incident report. “Dispatchers were not able to quickly reconnect groups and told all units to stop transmitting until the radio bridges could be restored.”

This took about four minutes, but then the system began to “throttle,” which resulted in garbled transmissions.

Unfortunately, that was only part of the communication challenges. Another issue involved the passengers and employees who ran outside to the ramp area instead of sheltering in place inside the terminal. The airport was making announcements on its public address system and social media, but many passengers left their cellphones and some employees left their work radios in the terminal when they fled, and the public address system was only broadcasting messages inside the terminal. “You need to be cognizant of the fact that people will abandon their communication devices when they are running for their lives; so you need multiple modes of communication,” Nonnemacher counsels.

FLL now has more robust communication plans and systems in place, and is designing a new public address system for use on the ramp. It will also be using the Integrated Public Alert and Warning System (IPAWS), which is designed to provide public safety officials with an effective way to alert and warn the public about serious emergencies via a single interface. This modernized version of the nationwide alert and warning infrastructure can be integrated into local systems that use Common Alerting Protocol (CAP) with IPAWS infrastructure.

“In Florida, this system is maintained through the Florida Division of Emergency Management,” says Nonnemacher. “We simply call them up and ask that they broadcast a specific message on IPAWS, and it goes out to cellphones in a geofenced area, much like an Amber Alert.”

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For instance, if 100 people gathered on the southside of the airfield by the fence line, they could receive an alert with information about what's transpiring and what to do if just one person had a cellphone.

Understanding that people may not always have their cellphones, FLL purchased 50 bullhorns with a 1,200-foot radius capability. The new low-tech equipment will allow airport officials to make announcements in parking facilities, on the terminal roadway, in the terminal and on the airfield. FLL also maintains public address systems in its operations and security vehicles.

**Recommendation #5: Train Employees in Specific Response Techniques**

Before the Jan. 6, 2017, incident, FLL had trained its employees according to the *Run, Hide, Fight* active shooter protocol from the Department of Homeland Security (DHS). The program instructs people under siege to run toward a pre-determined escape route while leaving behind belongings such as cellphones, purses, etc. Once there, they should hide outside the view of the shooter(s), block the entry and/or lock the doors. Using physical aggression to incapacitate a shooter—“fight” in the program title—is recommended as a last resort and only in imminent danger.

Although the *Run, Hide, Fight* training FLL employees received is specifically designed to save lives, some say they didn't know what to do or how to help. “Many employees have gone through our security training, but valid points were raised in discussions afterward that led us to believe more training is needed,” Gale reflects.

As a result, FLL plans to build on the DHS curriculum by providing practical instructions for employees who may be hiding or in lockdown while law enforcement does its job. “One of our biggest takeaways was that while law enforcement is in charge, there needs to be recognition that thousands of people are in a variety of different locations and need support. They are going to need a bathroom, water and food, and more than anything else, they are going to need information about what's going on,” Gale says.

The main goal of FLL's additional training is to teach employees how to deal in an emergency. “It could be a shooter, an airplane crash, a fire or tornado,” he relates. “This will just give them the tools they need to deal with the situation at hand. And, we will have 15,000 people all receiving the same training, versus 15,000 people who have received 150 different versions of the same training.”

The supplemental material will cover important specifics, adds Nonnemacher. “This training will educate employees on how to

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communicate, how to report where they are, what their condition is, and what to say to people who are injured.

“It will also educate them on what to expect from first responders,” he continues. “During an active shooter situation, law enforcement is going to run into gunfire; they are not going to stop to help others.”

In February, a syllabus for additional training was approved by the Broward County Board of Commissioners, and the airport was developing a new training program with assistance from Safety and Security Instruction of Phoenix. Training is expected to begin in August; Nonnemacher estimates that it will take about six months to cycle all 15,000 FLL employees through the new program.

To help achieve its 100% training goal, FLL plans to offer materials in a cloud-based format, so employees can complete the curriculum in a variety of locations, even from home. Topics covered during the paid, mandatory training



*Many passengers left behind their cellphones when fleeing the terminal.*

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will include airport familiarization, what to expect during initial response efforts, how to interact with law enforcement and basic first aid.

A locally created active shooter video will replace the DHS video that is currently used, and a section on everyday customer service will also be added. Gale notes that the heart of the training will still be emergency response, but officials do not want to miss an opportunity to remind employees that everyone is an ambassador for the airport and their interaction with the traveling public is incredibly important.

### **Recommendation #6: Provide Basic Necessities**

After the shooting, travelers were stranded at FLL for up to 10 hours.

“Getting supplies to people was very difficult to do,” recalls Nonnemacher. “We did make arrangements, but law enforcement

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did not want any extra movement.” Eventually, airport personnel received permission to escort people to/from nearby restrooms and bring portable restrooms from construction sites to the ramp.

“Once we were off lockdown, we grabbed all the snacks and water we could from vendors to give to passengers,” says Nonnemacher.

Now, FLL keeps approximately 10,000 snacks and bottles of water on hand in a warehouse. Gale notes that it is important to get “simple necessities” such as food, water, blankets, pillows, diapers, baby formula, etc. to people as soon as possible. FLL rotates its stock to prevent spoilage and waste.

The airport also stockpiles basic medical supplies and bleeding kits. “This way, when we have an incident, we don’t have to wait for first responders; we have enough to get us started,” he explains. “We are trying to be as proactive as we can for what we hope never happens again.”

### Recommendation #7: Create a Plan to Return Personal Property

When people are forced to flee for lives, the belongings they leave behind create an eerie tableau. After the shooting at FLL, about 23,000 items were strewn haphazardly throughout the airport—everything from suitcases and cellphones to baby strollers, purses and passports.

Intent on returning personal effects to their rightful owners, the airport quickly called BMS CAT, a firm that specializes in recovery services for events including airline accidents. The shooting occurred just before 1 p.m., and the company had personnel onsite by 6 p.m.

“As soon as we were off lockdown, they began collecting bags and personal belongings,” says Nonnemacher. The firm worked throughout the night to recover and catalog all abandoned items, which were then stored overnight in a warehouse. The following morning, workers began the arduous task of tracking down owners. “Within one week, we had all but 1,000 items returned,” he remarks.

Nonnemacher learned about BMS CAT at a National Transportation Safety Board Family Assistance Training Forum—an event held several times a year that he highly recommends. “It is really valuable training, and really paid off,” he notes.

Gale urges other airports to identify a company in their area that specializes in this kind of work and establish a contract in advance. “If something goes wrong, you can just pick up the phone and ask them to come,” he says. BMS CAT began operating at FLL under a written emergency work authorization.

Helping customers replace their missing travel documents was another important follow-up effort. The airport worked with the governor’s office to arrange mobile units that issued temporary driver’s licenses and ID cards; and a congresswoman helped



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The shooting triggered an onslaught of media attention.

secure replacement passports. “We had a lot of international travelers who wouldn’t have been able to get out of the country without the appropriate documentation,” says Gale, again urging other airports to establish connections for assistance in advance.

**Recommendation #8: Plan Your Media Response**

Before the mass shooting, Meyer and other key personnel in FLL’s Public Information Office had managed two other major news events. In October 2015, 20 people were hospitalized when a Dynamic Airways plane caught fire on a taxiway; and about one year later, the landing gear on a FedEx DC-10 collapsed, causing another aircraft fire.

“In both cases, we had intense media response to what was happening at the airport, and we tried to manage the messaging as much as possible with



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timely accurate information,” explains Meyer. “For Jan. 6, you could take those two previous events, combine them, and then double that, and I don’t think you would have had the same media response. We had media vehicles triple-parked from Terminal 1 to Terminal 2.”

Meyer’s primary recommendation to other public information officers? Know your craft and be aware of what information the media will seek. “Give them information as quickly and as accurately as possible, and work with your executive team to get them talking to the media,” he advises. “It’s really about transparency and responsiveness and just trying to understand their needs.”

The airport held three press conferences the evening of the shooting, with participation from the sheriff, FLL’s chief executive, an FBI official and the governor. “They were all seasoned professionals, so they knew how to relay the message,” he recalls. “They coordinated behind the scenes about who would speak first and how the event would progress.”

Meyer also recommends calling for backup immediately. Within five minutes of the shooting incident, he reached out to a colleague and asked him to activate the region’s Mobile Joint Information Center, a 30-foot trailer loaded with communications tools, satellite TV, fax machines and computers. A team of 12 public information officers from other organizations worked from the mobile unit, helping the airport team communicate with the EOC and answering calls from the media.

It’s important to answer *all* calls from the media, notes Meyer. “I started with the local media who were on the property, then I handed my phone over to a fellow public information officer, gave him my password, and asked him to answer each one of my messages,” he relates. “I dealt with the locals first, because I had a personal relationship with them; and then continued with the national correspondents I knew.”

Finally, Meyer advises establishing a specific place for media to gather. The designated media area at FLL is between terminals 1 and 2, with signage directing reporters and camera crews to the right spot. Because FLL had pre-established a meeting area, members of the media weren’t roaming the rest of the airport, he explains.

“This is a place they go to every time they come, whether it’s a single reporter or a group,” Meyer explains. “It is where everybody

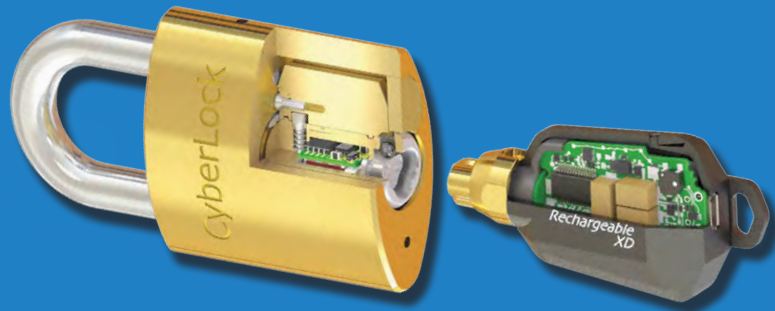
converged, because they knew we would host news conferences there. We also have a secondary location for large media responses. That’s something I encourage all airports to have, because you never know what kind of event you will have and what the media response will be.”

### Recommendation #9: Hold Active Shooter Drills

Nonnemacher firmly believes in the value of running emergency simulations. “We are not resting on our laurels because we had an active shooter event,” he remarks.



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In fact, FLL has a drill scheduled in late April to test some of its new processes and systems. The airport plans to simulate an active shooter incident from midnight to 4 a.m. away from public areas. The event is designed to address four main objectives identified in the report that Ross & Baruzzi produced after last year's shooting. Nonnemacher prefers not to share specific details about the four objectives, but indicates that the simulation will test elements such as new communication strategies and a unified command system. Drill participants will include law enforcement officers, fire/rescue personnel, airport first responders and representatives from airlines, concessionaires and other airport groups.

"Our intent is to drill it and document it, so we can use it as a tool for ourselves and others," says Gale. "The federal government requires airports to hold a mass casualty exercise for situations like a plane crash every three years. Like many airports, we do this more frequently. But I think it's time we layer in other types of security exercises. We've already done a number of active shooter tabletop exercises, but when you actually role play an event like this, it gives first responders a

sense of realism and a better idea of how to deal with these situations."

Despite the increased training and other improvements that have already been implemented at FLL, some scars from the 2017 mass shooting it experienced will likely be permanent. "Just because we are better prepared, doesn't mean that everything's going to be fine," Gale reflects. "If the same kind of event were to happen again tomorrow, next week, next month or next year, we could wind up with similar outcomes. But we believe through regular meetings with law enforcement and fire/rescue, and by drilling together, at least a piece of how we respond might be much different and much better.

"I'm not faulting anything anybody did on Jan. 6, because it was unthinkable; and everyone acted very heroically. But we still should plan and prepare." 

*Update: The accused shooter, Esteban Santiago, is scheduled for trial in June. As of mid-March, prosecutors had not announced whether they would seek the death penalty.*

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## Addressing the gap in employee screening

### Gaps in employee screening and perimeter security in aviation

Background checks, access control and limited entrances to secure areas have continued to be the main tools to address the insider threat in aviation security. Efforts to institute employee security screening in airports more widely have faced concerns about increased costs and reduced employee efficiency.

Employee screening needs to sit within an operating framework. Although parts of the solution already exist, current measures have been demonstrated to be incomplete. A layered security approach ensures the right measures are employed to achieve an effective deterrent, detection and identification capability. This requires people, processes and technology all working towards the same end-state, ensuring there are no gaps in the combination of measures employed.

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# LED 101: ARE LED FIXTURES UP TO THE JOB?

Airports are now faced with a choice between LED and incandescent fixtures. Do LED fixtures meet the photometric requirements specified in AC No: 150/5345-46E? Yes, because all fixtures are tested and certified as being fit for purpose.

Why change from Incandescent to LED Lighting?

There are benefits for airfields adopting LED technologies:

- Environmental

Compared with incandescent lamp technology LED have a much higher light output to power input ratio. There are therefore obvious energy savings, together with environmental benefits from lower CO2 emissions.

- Lower cost of ownership

High initial outlay is more than offset by lower running costs and higher reliability / longer life.

- Higher runway availability

Less time on the runway or in the workshop for maintenance

## DOES THIS MAKE SWITCHING TO LED'S A NO-BRAINER?

There are lots of other factors to consider. These are principally related to the fact that

LED fixture designs can be considered 'early life.' For example:

- Using LED fixtures on an existing 6.6A circuit is sub-optimal. The FAA is currently engaged in a project to investigate LED infrastructures to find a more suitable architecture for emerging LED circuit (Electrical Infrastructure Research Team).
- Transformers are sized according to the load they are expected to drive – transformers run at their best efficiency when they are properly matched/sized to the load they are driving. This shortcoming is apparent when retrofitting LED fixtures in existing circuits.
- CCR Compatibility issues. Due to the electronics that are present in the fixtures, this can have some unexpected effects upon the CCR's and the light output. Older CCR's may need to be replaced or modified to handle the varying loads and/or circuit noise that the LED fixtures can present. It is well worth doing some testing with your proposed fixtures and CCR's in advance of a full runway replacement.
- Although light manufacturers often claim that LED life is more than 50,000 to 100,000 hours this does not mean that the fixture as a whole has such a lifespan; there are many other electronic components in the fixture that can fail earlier than the diode itself.

- Maintenance. It is sometimes suggested that LED lighting will require no in-service maintenance. Based on this assertion the FAA requires that manufacturers give extended warranties of 4 years on condition that fixtures are returned unopened for replacement, implying that no maintenance will be required in that period. Consequently, electricians are not gaining the experience of maintaining these fixtures.
- Technology advances. LED technology is moving at a rapid rate, and fixtures that may be cutting edge today could be incompatible or even obsolete in as little as 5 years. Spare parts may also be an issue as LED technology continues to evolve.
- LED fixtures are not 'fit and forget'. They still have many of the issues surrounding halogen fixtures; water ingress, lens contamination or damage, and of course, they still need to be checked on a regular basis to ensure that they emit the specified light output (photometric testing) and remain secured in place. (Torque checked)
- Anecdotal evidence suggests that the quality of glass in some of these fixtures is lower – perhaps a cost saving measure – but it means the lenses are less hard and more easily damaged.
- Airfields are sometimes reporting water inside the fixtures – LED's fail if water gets inside a fixture.



- **Pilot Perception.** Pilots perceive a new LED installation to be brighter than the incandescent fixtures they replace. In LED fixtures the luminance of the light aperture is high and particularly at short ranges this results in the lights being uncomfortably bright. The issue should be addressed by a revision of recommended light outputs, particularly at night in good visibility conditions. However, field trials have proved that, as expected, LED and Incandescent fixtures of the same intensity always have the same visual range in all conditions. In this context it can be noted that;

- LED white lights maintain their color at lower intensities and can therefore be perceived as being brighter than the equivalent incandescent fixtures that change color towards orange. Human experience correlates this color change with intensity change.
- LED taxiway fixtures sometimes emit significantly greater intensities than they are rated for.
- Initially, new LED fixtures are clean, whereas the incandescent fixtures they replace have had little maintenance and have rarely been cleaned on a regular basis.

Overall pilots prefer LED lights.

- **Stability.** We have seen with long term laboratory testing of some fixtures and red LED fixtures in particular that they can lose as much as 40% of their initial brightness when stabilising over a period of 4-5 hours. This might explain why some fixtures far exceed the prescribed standard when initially energised. We have also seen fixtures attempt to “compensate” for this and adjust their brightness automatically after a period
- **Repair costs.** A failed LED engine or control board costs around \$200 each to replace. A Dichroic Halogen lamp for example in a halogen fixtures might only have a stated life of 1000 hours ... but could be replaced for less than \$20 – not forgetting the fact that for most of its lifetime the fixture is likely to be on lower intensity steps so real-world lamp life could be much longer. Halogen lamps also can keep running even when water is inside the fixture, whereas a LED driver PCB's would fail.

### WHAT HAVE WE LEARNED?

There are lots of factors involved in the changeover to LED – some are easily quantifiable and obvious, others less so. Early adopters have seen issues with their existing infrastructure highlighted but have not had much experience of actually maintaining the fixtures as they are typically sent back to the

manufacturers under warranty. Some have had to temporarily “roll back” to their old halogen setup while issues are resolved.

We have seen many examples of fixtures where a multiple LED emitter is only partially working; perhaps 3 of 4 LEDs are on – so they too can fail well before their 50-100,000 hours quoted lifetime.

That said we believe the emergence of LED technologies is a good thing. The Airfield Lighting Industry has some ways to go before the Principal Benefits outlined above are realized. Manufacturers are leading the way, but we believe that regulatory authorities also have a responsibility to provide leadership to ensure this goal is achieved as quickly as possible and with technologies that are non-proprietary.

### ABOUT THE AUTHORS.

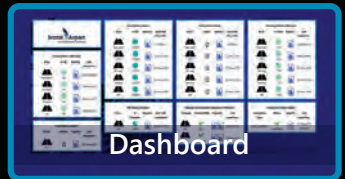
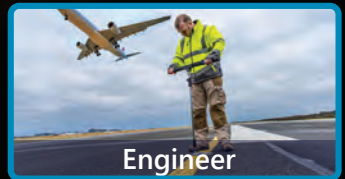
MALMS Navaid Inc. is a joint venture between Navaid Lighting Associates Inc. and Tailor Made Systems Ltd and has extensive experience of the measurement of airfield lighting photometric performance. TMS has been involved with in-service airfield lighting testing and maintenance since 1991 when the company was commissioned by the UK Civil Aviation Authority to study the in-service photometric performance of airfield lighting systems. This initial research project was successful and the MALMS Mobile Airfield Light Monitoring Systems have been developed using the knowledge and experience gained in this research program.

MALMS systems measure compliance with FAA and ICAO Standards. They also provide information to identify problems, develop maintenance strategies and produce work schedules and maintenance reports. The first MALMS system was operational in 1995 and MALMS Navaid therefore has unrivalled experience in the field of airfield lighting performance measurement and airfield fixtures in general. MALMS Navaid is not affiliated with any airfield lighting manufacturers but remains fiercely independent, whilst having close relationships with Stakeholders.

Recent developments in lighting technology (since the early 2000's) have focused on the creation of LED fixtures, with the major manufacturers all now having products in the marketplace. MALMS systems were used by the FAA to test in-field photometry of the first US LED fixtures installed Raleigh-Durham Airport in North Carolina and by the UKCAA to evaluate the first UK installation at Manchester Airport to test compliance.

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# Conversion to LED Airfield Lighting Proves Beneficial for Detroit Metro

BY JODI RICHARDS



## FACTS&FIGURES

**Project:** Converting to LED Airfield Lights

**Location:** Detroit Metropolitan Wayne County Airport

**Investment to Date:** \$1.2 million, plus \$1.2 million for the sign project

**Utility Savings:** \$270,000/yr (from taxiway lighting alone)

**Timeline:** Transition began with taxiways from 2006-2008; conversion of a main runway followed in 2013-2017; next runway project is scheduled to begin in 2019

**Maintenance Tracking Software:** AirSide Asset Management, from ADB SAFEGATE

**Runway 4L-22R Electrical Design:** Arora Engineers

**Environmental Accolade:** Envision silver award from the Institute for Sustainable Infrastructure

Since 2006, Detroit Metropolitan Wayne County Airport (DTW) has been incrementally transitioning its airfield lighting from incandescent to light emitting diode (LED) technology. Dave Garrett, the airport authority's electrical department manager, explains that the switch has several benefits, including energy savings, product longevity and—to a certain degree—reduced maintenance.



DAVE GARRETT

With about 5,500 LED lights on taxiways alone, DTW has made a significant investment in the newer technology, says Garrett, a master electrician and 25-year airport employee. "We view this as mission-critical work that has an impact on all airport users," he remarks.

After crews finished installing LED taxiway lights in 2008, the conversion continued in 2013, with the installation of 245 LED centerline lights and 180 touchdown zone lights on Runway 4L-22R. Lighting was a small portion of the \$137 million project to rebuild one of the airport's main arrivals runways.

The 4L-22R and associated taxiway project, completed in 2016, received an Envision silver award from the Institute for Sustainable Infrastructure. Garrett notes that the 10,000-foot runway is now 100% LED, but that was just one element that contributed to the environmental sustainability accolade.

DTW's next major runway project is reconstruction of 3L-21R and its associated taxiways. Work is expected to begin next spring and be complete by winter 2020. As with previous projects, Garrett will coordinate



*Data about torquing of in-pavement lights is transmitted via Wi-Fi for tracking and analysis.*

LEDs can last 10 years without needing to be replaced, while airports usually need to replace incandescent lamps two times per year, Weigel adds. This decreases costs for labor and equipment. Depending on the type of fixture, LED bulbs can be 50% to 75% more energy efficient than incandescent lights, he relates.

The longer lifespan of LEDs also means less need for maintenance vehicles on active areas of the airfield, Garrett



BILL WEIGEL

the electrical needs and lighting conversion with the capital project planning team.

His long-term goal is for DTW's entire airfield to be 100% LED.

**Benefits**

According to Garrett, LED taxiway lights save the airport about \$270,000 per year in energy and maintenance costs—and that's a conservative estimate, he notes. Runway LEDs boost the total savings even higher.

Longevity is a primary economic factor. An incandescent taxiway bulb has an average lamp life of 1,000 hours, while LEDs are rated at 56,000 hours at full intensity. In practical airfield applications, incandescent lamps may last 4,000 hours, while LEDs will provide at least 100,000 hours, says Bill Weigel, regional sales manager with ADB SAFEGATE, noting that his LED estimates are very conservative.

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adds. “We’re not replacing lights as much as we did when we had incandescent.”

Weigel says that consistently true color rendition is another significant benefit of LEDs. White incandescent bulbs, particularly when operated at lower intensity, can take on an amber glow that some pilots could misinterpret as nearing the end of a runway.

For some airports, long-term cost savings make LEDs the preferred choice despite their higher upfront price—the LED equivalent for a \$100 incandescent can cost \$200, says Garrett. Even with “acceptable casualties” that occur—especially during snow removal operations—the overall investment in LED more than pays for itself, he reports.

### Successful Formula

Planning and communication are crucial to airfield lighting conversion projects, Garrett emphasizes. Coordinating the upgrades with capital improvement programs has proved to be a successful formula for DTW. “We’re fortunate that they invite me to all of the planning meetings and we have significant input,” Garrett notes. “Communicating and scheduling the needs of the airport electrical systems with the decision makers is huge.”

In 2015, he approached senior management with a plan to update airfield signage with LED fixtures. That \$100,000 project demonstrated the positive impact of the technology and turned into

a \$1.2 million investment over the following three years. “We were pleased that we had the support to get that done,” Garrett reflects.

Throughout the program, in-house personnel updated 750 airfield signs and converted them from incandescent to LED. “We wanted to save energy; we wanted to reduce the amount of time we spent changing bulbs; and the structures themselves—the frames of the signs—were getting past their life expectancy,” he explains.

### LED Maintenance

Garrett reports that many maintenance requirements are the same for incandescent, quartz and LED lights. The overall time spent changing bulbs, however, has been cut considerably since the transition to LED began. This frees up the electrical team for other critical work, he notes.


Inspecting lights is still an important part of DTW’s airfield maintenance program, he emphasizes. Personnel routinely torque in-pavement lights, check lenses for pitting and look for casting damage after snow plows have cleared the pavement.

“You can’t install LED fixtures and forget about them,” Weigel agrees, noting the high value of a solid preventative maintenance plan.

Garrett describes the program DTW recently began as fairly aggressive. The airport authority invested \$120,000 in a new system to help Garrett and his team to track maintenance data—specifically, the torquing of in-pavement lights. FAA materials note that the impact of aircraft wheels can loosen mounting bolts, causing misalignment or fixture damage, primarily in touchdown zones.

Traditionally, DTW personnel tracked maintenance data such as bolt torque statistics for inset runway lights with a computer-based work order system. They are now transitioning to a Wi-Fi-connected torque wrench that sends data to an iPad. The iPad transmits the torque values to the database via cellular connection to automatically link with ADB SAFEGATE’s AirSide Asset Management software. Managers can download data and analyze it to better allocate personnel resources, notes Garrett. “When we look at the amount of inset fixtures that we have, the amount of hours that we’re going to spend to meet the FAA’s advisory circular, we feel we’re going to be able to trend that data and put our folks where they’re needed,” he explains.

The new software program will also help Garrett and his team monitor the performance of airfield lights, schedule and assign maintenance tasks, and track the maintenance history and lifecycle costs for all airfield assets. The software can incorporate photometric measurement reports, track bolt torquing for in-pavement fixtures and provide a complete view of maintenance history for each asset. The new solution, which uses GPS to precisely track asset location and automate the asset entry process, eliminates the need for expensive installation of RFID tags and scanners.

“Certainly LEDs have made maintenance more complex, but I’m fortunate that all of my employees are journeyman electricians with a high skill level,” Garrett remarks. “We spend a lot of time and effort on training.” 



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# Savannah/Hilton Head Int'l Prepares to Integrate Drones Into Airport & Airfield Operations

BY KEN WYSOCKY



## FACTS&FIGURES

**Project:** Drone Operations

**Location:** Savannah/Hilton Head (GA) Int'l Airport

**Missions:** Perimeter security, wildlife management, airfield pavement inspections

**Consultant:** Woolpert

**Contract Cost:** About \$90,000

**Funding:** General airport revenue

**Recommended Equipment:** Inspire 2 drone, from DJI, with high-resolution Zenmuse X7 camera

**Expected Implementation:** 2019

**Key Benefits:** Safer, faster perimeter security & airfield pavement inspections; wildlife detection/hazard mitigation



Patrolling the perimeter fence at Savannah/Hilton Head International Airport (SAV) is a difficult task, thanks to about 400 acres of swampland—and the alligators, snakes and other wildlife that live there. But it's an easy job for a camera-equipped drone. That's why the Georgia facility is striving to become one of the first commercial airports in the United States to integrate drone flights into some of its routine safety and security operations.

Since mid-2017, SAV officials have been working with Woolpert to develop protocols that will allow unmanned aircraft systems (UAS) to patrol the airport's 12+ miles of perimeter fencing, assist with wildlife management efforts and perform runway pavement inspections.

Potential perimeter inspection applications are particularly appealing, because approximately 10% of the airport's fencing crosses through hard-to-access swampland, explains Airfield Operations Manager Edwin Rahn. "There are many areas on the airport grounds that aren't accessible by foot, vehicle or watercraft—they're just too swampy,"

says Rahn. "We also see drones as a key player in wildlife mitigation. They can fly over those swampy areas and help us see what, if any, wildlife is present and what it's doing. Are beavers damming up water channels that can create flooding? Are birds nesting in areas where we don't want them nesting? Drones can help us more safely answer those questions."



EDWIN RAHN

Employees currently use utility terrain vehicles to monitor the perimeter fence and keep tabs on area wildlife, but the tasks can be very time-consuming—especially if a vehicle gets stuck in the mucky swamp. "It's a safety issue, too," Rahn points out. "Here in the South, we have snakes, alligators, fire ants and spiders. And if someone doing wildlife mitigation inspections is wearing hip waders and they fill up with water, the person can easily drown.

"But a drone can fly over an area and take a detailed look from the air," he adds.

"Instead of, for instance, taking several hours or even a full day to go in and locate a beaver dam, we can bring back drone footage and analyze it without traipsing around a swamp."

Facilitating inspection of the airport's two runways—9,351 feet and 7,002 feet—plus associated taxiways and ramp areas is another possible use that is being considered. Drones can be programmed to fly a precise grid pattern and take high-resolution footage for SAV engineers and managers, explains Rahn. "Then they can view it without ever having to go out there and beat the pavement," he says. "It's very interesting stuff."

## Rules & Regs

Thomas Mackie, aviation practice leader and a vice president at Woolpert, considers it part of the company's job to help SAV and other airports navigate the thicket of FAA rules that regulate drone use.

"We're taking a crawl, walk and run approach at Savannah," says Mackie. "Phase one is very heavy on addressing risks and determining applications of the technology—figuring out what are the key aspects that must be considered and addressed, as well as short-listing the drone options."

The first step includes drafting a Concept of UAS Operations—ConOps, for short. This document addresses a wide range of factors such as flight schedules, risk management considerations and communication protocols. "While all airports have distinct needs and directives, this guidebook illustrates how commercial airports can conceptually go about flying a drone in support of operational needs," says Mackie.

One significant consideration is coordinating with air traffic control to define acceptable drone operating areas, times and conditions. Developing protocols for emergency response should something go awry during a drone flight is another important precursor, he notes.

Airports also need to determine factors that could have a detrimental impact on drone operations at their specific fields. For example, are there

*The airport hopes to deploy drones for perimeter security and other routine inspections.*



areas where radio frequency interference could affect the control of drones? Are there line-of-sight limitations such as hangars or other buildings that could prevent air traffic controllers from seeing drones?

"Such blind spots (communication or line-of-sight) are a problem...you have to figure out how to mitigate those factors with your flight plans," Mackie advises.

At SAV, drone flights aren't expected to last very long, and they'll occur in small areas, which makes such issues more manageable, he adds.

Drone operators are required by the FAA to obtain a license, maintain continuous visual contact with their aircraft, and maintain radio communication with air traffic controllers when flying a drone in controlled air space.

## Test Flights Completed

Initial drone test flights occurred at SAV in January. Operations were conducted in four different areas of the airport and were pre-arranged with the FAA, Rahn notes.

The verdict: Drones can be used safely and efficiently for routine operational needs such as mitigating wildlife hazards and performing daytime perimeter checks. In fact, the value of using drones was underscored

when one of the test flights revealed that a fallen tree had broken through the perimeter fence on the swampy north end of the airport. The area is particularly difficult to access on foot or by watercraft, but the drone safely and efficiently collected GPS coordinates of the fallen tree and transmitted real-time imagery of the fence breach, Mackie explains.

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Before conducting the test flights, SAV officials used software to establish a geofence—a virtual boundary for the drone that is similar to invisible electric fences that keep pets inside residential yards.

“The test flights went very well,” Rahn reports. “The drone did exactly what we told it to do, even when we tried to make it cross the geofence.”

Of the many different kinds of drones on the market, Woolpert is recommending a multi-rotor model for the particular applications SAV has in mind. “They can perform vertical takeoffs and landings, so there’s no need for a large area to launch and land,” says Mackie. “That’s important because there always are things like trees, power lines and buildings to consider.”

### Getting Specific

Test flights indicated that the Inspire 2 drone, made by DJI, was best suited for SAV’s needs, Mackie reports. The unit weighs 7.58 pounds without extra equipment on board, and its gimbal—the pivot point where a camera can attach—rotates 360 degrees. The drone can accelerate from 0 to 50 mph in just five seconds, with a maximum speed of 58 mph. According to specifications on DJI’s website, the Inspire 2 can fly up to 27 minutes before its two batteries need recharging.

SAV and Woolpert officials also gravitate toward the Inspire 2 because it’s the only drone that can carry a high-resolution X7 color camera, made by Zenmuse. “The X7 brings the shock and awe factor,” Mackie quips. “It offers the highest resolution commercially available for drones. The resolution of the video it takes is so sharp that from 100 feet up, you can read the numbers on a bar code.”

The camera’s high-resolution capability increases the drone’s ability to operate safely, because it doesn’t have to get as close to objects or areas SAV personnel want to view. This could prove especially valuable for operations in controlled air space. “We can fly farther away from aircraft and still collect data that provides a great service to the airport,” Mackie explains.

The Inspire 2 also features “swappable payload” capability. This would allow SAV personnel to switch, for example, from a thermal camera that detects heat emitted by people or animals to a special multi-spectral camera that can detect objects invisible to human eyes, such as tiny growth on vegetation.

Mackie lauds the DJI drone’s control station software for providing versatile flight planning capabilities. An operator can fly it autonomously by programming a flight plan or fly it manually via a joystick and an iPad. “It really gives the operator a lot of flexibility

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in terms of flight planning and in overriding the controls if hazardous situations arise," he comments.


### More Planning & Decisions Ahead

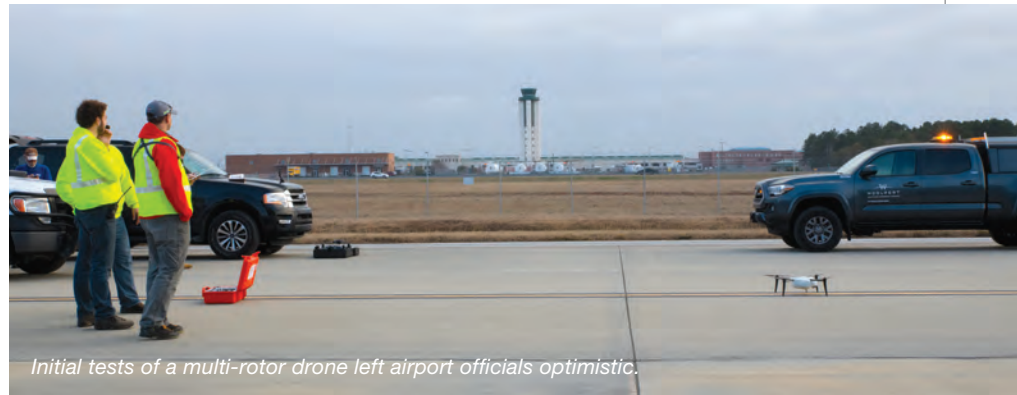
The next phase of SAV's drone implementation program will include flying drones in airport operating areas; obtaining FAA approval; validating that a drone can be used safely to support additional airport missions; helping SAV staffers obtain drone pilot licenses; and refining the systems, sensors, processes and data management techniques to reflect the airport's needs. Phase three, which Woolpert estimates is about one year away, will focus on acquiring a drone.

According to Mackie, one thing is certain: It's only a matter of time before drones become more integral to airport operations nationwide. "It's not even a growing trend. It's here and now in terms of excitement and enthusiasm," he says. "It is a very hot topic as airports see that they can use drones for the same applications they're already being used for outside of airports."

At SAV, Woolpert is working toward using drones to augment existing operations, rather than just for single missions such as a construction project or pavement study. The company has already performed aeronautical surveys and base mapping for the airport and has loaded that data into an asset management system called Cityworks, from Azteca Systems. Eventually, information gathered by drones will be integrated into the system.

As an example, SAV could use drones to collect data and imagery about airfield pavement conditions, and then create work orders and upload it all into Cityworks. "The additional capability with UAS will not eliminate the human in the loop for airfield operations," Mackie says. "But it will certainly provide an opportunity to minimize frequency and duration of time spent in safety-critical areas and create valuable geodata as part of the airport's system of records."

Rahn also sees vast potential for using drones. "Right now, our planning is in the incipient stages," he says. "But the sky's the limit to what drones can do. I believe that the more we use them, the more we'll see where else we can use them. But you have to crawl before you can walk." 



Initial tests of a multi-rotor drone left airport officials optimistic.



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# Quebec City Jean Lesage Int'l Prepares Terminal & Airfield for 2020 Traffic

BY VICTORIA SOUKUP

 Quebec City's Jean Lesage International Airport (YQB) recently doubled the size of its terminal, made widespread technology upgrades and increased baggage handling capacity using an innovative project delivery method that had airport employees—not outside contractors—managing and coordinating all of the projects.

The terminal update is just one facet of a larger program, dubbed YQB 2018, the airport is undertaking to ready its facilities to accommodate 2 million annual passengers by 2020. Airport officials say the unique project management “org” chart and daily reliance on building information modeling (BIM) allowed YQB’s private sector owner, Aeroport de Quebec, to maintain control and finish the \$277 million project on time and on budget.



GAETAN GAGNÉ

“Based on our vision of *Passenger First*, we have chosen to build world-class infrastructures in order to respond to the worldwide growth in air travel and meet the needs of travelers in the Quebec City area,” says YQB President and Chief Executive Officer Gaëtan Gagné, noting that passengers will be the principal beneficiaries of the ambitious project.

In addition to the recent terminal expansion and renovation, YQB 2018 also includes previous infrastructure improvements such as two runway resurfacing projects, the installation of new airfield electrical components and the construction of a multi-level parking facility.

The airport opted to use the BIM approach from the beginning of its multi-project program. The strategy proved effective in 2009, when YQB constructed a building to house its fire department and mechanical maintenance workshop; so airport officials took the approach further during the larger and more complicated YQB 2018 project.

“A multidisciplinary team of airport employees was in charge of managing the project; subcontracting companies reported to them,” explains YQB 2018 Project Director Marie-Noëlle Simard. “Most of the airport staff was already in office before YQB 2018. They were already familiar with the airport world and the vision beyond the project. The multidisciplinary team was formed with professionals of different fields of expertise, from engineers to IT, operations and communications specialists.”



MARIE-NOELLE SIMARD



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## FACTS & FIGURES

**Project:** Capacity-Enhancing Improvements

**Primary Components:** Terminal expansion, baggage system improvements, technology updates, runway renovations

**Location:** Quebec City Jean Lesage Int'l Airport

**Program Name:** YQB 2018

**Cost:** \$277 million

**Overriding Goal:** Upgrade facilities to accommodate 2 million annual passengers by 2020

**Timeline:** Updated terminal opened in Dec. 2017, after 2 yrs construction

**Worksite Management:** Pomerleau

**Architecture:** GLCRM

**Terminal Seating:** Artopex

**Civil Engineering:** WSP

**Mechanical & Electrical Systems:** SNC Lavalin

**Baggage Handling System:** SNC Lavalin

**Automated Baggage Drop-Off System:** Materna

**Building Structure:** Stantec

**Airport Technologies:** SITA

**Interior Design:** Steve Girard

**Boarding Bridges:** Adelte

**Baggage Handling System:** Daifuku

**Passenger Entry Technology:** BorderXpress Primary Inspection Kiosks, by YVR

**Runway Lighting:** OCEM; Anixter; Cooper Crouse-Hinds

**Of Note:** Airport used building information modeling to keep project on budget & on time; airport employees managed project & subcontractors

Once staff and subcontractors were in place, an “intelligent 3-D model” of the terminal was created for use by everyone involved in the process. Project teams then worked together to design, visualize, simulate and collaborate throughout the project lifecycle, explains Simard. The 3-D model was updated weekly, so participants could visualize developments as the new terminal progressed.

### Everyone Under One Roof

Simard emphasizes the benefits of co-locating about 100 key personnel from various firms and trades in a large project office the airport created in an unused aircraft hangar. “This unorthodox approach gives service providers the rare privilege of sharing a space and communicating face-to-face on a daily basis for the ultimate in fluid, efficient communication,” she remarks. “And BIM held us to continually review our work, our timeframe and budget.”

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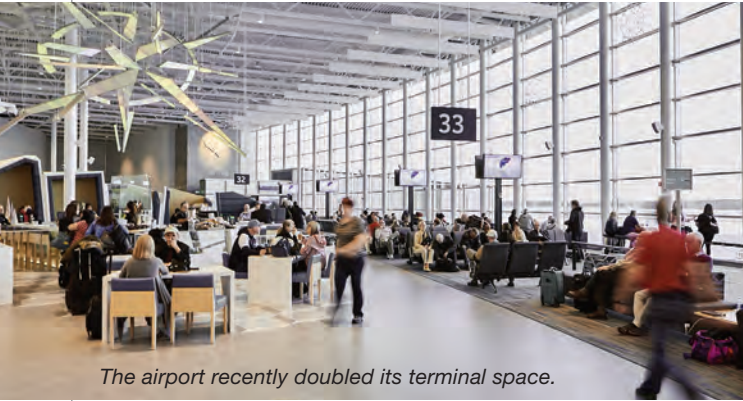
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The airport recently doubled its terminal space.

The team office has proved valuable on many occasions, including an instance when personnel discovered that a ventilation duct was interfering with a structural modification. “When a snag like this is caught at the design phase, the architect can simply pop over to the engineer’s desk to discuss the solutions,” Simard explains. “Then, they come up with a fix together, make the necessary adjustments and *voilà*, problem solved, with no unpleasant surprises during construction.”

Subcontractors working on the project are also enthusiastic about the office arrangement and delivery process the airport used. SNC-Lavalin, for instance, was responsible for the complete design, request for proposal support and construction



MARIE MANSEAU

surveillance of the mechanical, electrical and plumbing aspects of the terminal expansion and the baggage handling system (arrivals and departures systems). Marie Manseau, the company’s project director, says that the BIM approach facilitated multidisciplinary coordination, calculations, estimating and specifications. She also acknowledges that the process was not universally intuitive. It was a challenge to have all stakeholders “step into the BIM revolution,” she explains.

Simard agrees: “It is a new approach and almost everyone who worked with us never did it before. But we were very well prepared. We had the right people in the right places to implement the procedures correctly.”

**December Debut**

Construction on the terminal extension began in 2015, and the new facility opened to passengers in December 2017. During the course of the project, YQB:

- doubled the size of its terminal from 270,000 square feet to 540,000 square feet;
- added four gates, bringing the grand total to 12;
- expanded its airside food court and restaurant space to accommodate four restaurants (previously, there was only room for one);
- created a new duty-free store four times larger than its predecessor;
- installed new communications and signage systems; and
- added charging stations for smartphones and tablets; and
- installed an additional baggage carousel for international flights (previously, there was only one).

“It was a problem when we had two international flights coming in at the same

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time,” recalls Simard. “Now, we have better flow between the Customs area and the baggage carousels. We have more capacity, and we can now have four flights coming in at the same time and it is not a problem.”

Many of YQB’s check-in counters now offer passengers the option of using the airport’s new automated baggage drop-off system by Materna or receiving assistance from an agent. In addition, updated check-in kiosks were installed to provide a more efficient process for passengers and airline staff.

The airport also added 14 Border Xpress Primary Inspection Kiosks by YVR (Vancouver International Airport). The new machines, which debuted in December with the terminal addition, can be used by most incoming travelers entering Canada from U.S. or international destinations.

With the new terminal now open for business, Phase 2 of the project has begun—joining the original terminal and new addition with a middle connector area. “This is a big challenge,” notes Simard. “Passengers have to go through this construction to walk from the old terminal to the new addition.” Phase 2 is scheduled to be complete by the end of 2019.

Environmental responsibility was a major goal from the beginning of the project. “Before we even started construction, we asked our subcontractors to tell us everything we could do to ensure the highest level of sustainability,” says Simard

Key environmental measures include a new geothermal exchanger (with 54 loops that are 550 feet deep); energy-efficient LED lighting; heat recuperation; radiant floor heating; variable speed drives on all HVAC systems to regulate airflow based on a set of parameters, such as terminal occupation; low-temperature heating; and condensation boilers.

“The airport’s heat recovery system is the cornerstone of our energy savings strategy,” notes Manseau. “We are able to take heat that we remove from spaces that need cooling and send it elsewhere in the building where heat is required. When we have more heat recovered than we need, we store it in the geothermal exchanger, which operates like a bank. We can store heat in the summer to recover it the following winter.”

**Technological Review**

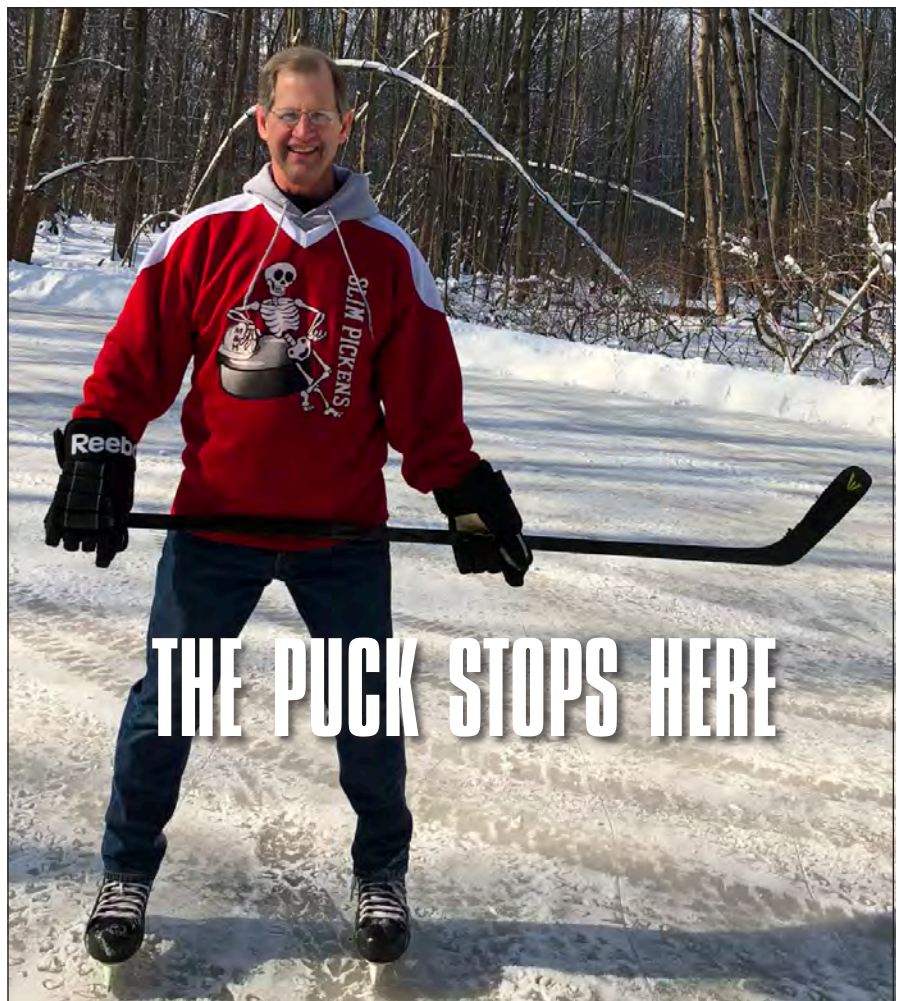
The airport worked with SITA to develop a new “concept of operations” and identify future technology requirements for new and existing facilities. The scope included a holistic review of 20 systems across airport operations, passenger processing, security, infrastructure

(LAN, WLAN and VOIP) and building management.

“Over a six-month period, we conducted a thorough gap analysis of the airport’s operating requirements, interviewing teams across the business to understand their operations and expectations,” explains Jeremy Springall, vice president of Business Integration and Solutions for SITA. “Based on this analysis, we were able to develop a new concept of operations and associated technology specifications, taking into account the airport’s growth objectives. The concept of



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operations is used to describe the user organization, mission and organizational objectives from an integrated systems point of view. It also details the systems, processes, resources, training and maintenance to support those operations.”

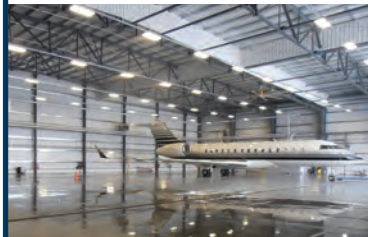
Springall notes that the technical specifications document was a key piece of information for the airport because it made clear recommendations on the technology needed to support YQB’s new approach to operations.

“We advised the airport management which systems would need replacing, kept or enhanced over a period of years,” he explains. “These recommendations took into consideration



Contractors performed a practice run to ensure that runway improvements could be completed in the time allotted.

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cost-savings, passenger growth, changing requirements from operations and passengers, and, of course, the investment in new technology over the next few years. The implementation of these changes and subsequent technology investments has significantly improved the efficiency of the airport.”

Another important element of YQB 2018 already in place is a new parking garage that nearly doubled the airport’s available capacity to about 2,000 spaces. Built in 2013, the 450,000-square-foot parking garage is located directly adjacent to the new terminal and includes an automated system that tells motorists how many spaces are available on each of the structure’s five levels.

### Airfield Improvements

The airport also updated its two runways during the course of YQB 2018. In 2016, contractors refurbished the center part of Runway 11-29 and the area where it intersects with the main runway, 06-24. Thirteen days were allotted for rehabbing the intersection area, but crews worked 24/7 and finished in 12 days, reports Sandra Gauvin, project manager for WSP.



SANDRA GAUVIN

“It went very well because we did a lot of planning with the airport, the contractors and the subcontractors,” says Gauvin. “We ensured that all materials were onsite, ready for use before we started. And, we did a preliminary run-through before we started. So when we got to work that first Monday, everything was ready to go.”

Crews also installed a new drainage system on Runway 06-24. "At Quebec Airport, we are in an area where water is coming from all sources. The groundwater is very high and the drains are used a lot," Gauvin explains. "Because we couldn't change the drains on the runway, we applied a new concept to relieve the drains. We created underground retention ponds to capture the groundwater before it arrives to the runway drains."


Finishing Runway 11-29 in 2016 was critical, because the airport needed a runway in excellent condition when it closed its main runway for improvements in summer 2017, she explains.

Work on 06-24 in 2017 was far more comprehensive. It took 80 days to resurface the entire runway, add more than 80 kilometers of updated electrical cables, install 88 new high-intensity LED runway lights and add new approach lighting. The upgraded lighting system runs on two parallel circuits, so pilots on approach will have visual cues even during a power failure.

### Ready for More Passengers

Simard is pleased with the successful completion of the terminal expansion. "The BIM approach allowed us to detect thousands of anomalies in the plan and to correct them in the virtual model," she remarks. "This means that hundreds of problems were avoided on the worksite, and those problems would have been way more expensive to deal with if they had materialized."

YQB's passenger traffic reached 1.67 million in 2017, an increase of 3.4% from the previous year; and the volume is predicted to continue growing. "Inspired by our vision of Passenger First, we have chosen to create world-caliber infrastructure to join the top 10 of the country's most-visited airports. YQB 2018 will accelerate the transformation of our organization and drive our growth, for the benefit of all our passengers."

Gagné notes that an average increase of 1,000 passengers per week shows that travelers from the greater Quebec City area are choosing YQB. "These results are no accident," he observes. "They reflect our hard work and major investments in our facilities to give our passengers a world-class airport." 

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# Protecting Your Bottom Line From the “Uber Effect”

BY THOMAS J. SMITH

## FACTS&FIGURES

**Projects:** Parking & Curbside Management

**Market Disruptors:** Transportation network companies; autonomous vehicles

**Consultant:** Walker Consultants

**Industry Trend:** Declining revenue from short-term & single-day parking in facilities closest to terminals

**Potential Offsets:** New or increased tolls for using airport roads; fees to maintain autonomous vehicles on airport property; increase of federally controlled cap for passenger facility charges

### PARKING INCENTIVE PROGRAMS

**Location:** Seattle-Tacoma Int'l Airport

**Program:** Unlimited parking in garage with direct access to terminal for \$350/month

**Location:** Jacksonville (FL) Int'l Airport

**Programs:** Unlimited surface lot parking for \$200/month; free parking & concession discounts for other frequent parkers

**Location:** Oakland (CA) Int'l Airport

**Programs:** Discounted corporate rates; free parking for passengers flying on select airlines to featured destinations



It has been about seven years since Uber and other transportation network companies (TNCs) first hit the streets in the United States. And just as airports begin to secure and analyze meaningful data about their effect on parking and other non-aeronautical revenue streams, another major force is preparing to merge into the market. In less than 18 months, the first autonomous vehicles are scheduled to be in commercial operation.

As TNCs penetrate deeper into more locations, and if driverless vehicles lower the cost to use TNCs as widely expected, there could be significant further erosion of traditional sources of revenue from rental cars, taxis and parking. Airports are working to protect their bottom lines by updating traditional strategies regarding parking infrastructure and curbside management.

According to a 2016 report from the Airport Cooperative Research Program, more than 90 U.S. airports permit TNCs to operate on their properties and 48 levy associated fees.

Oakland International Airport (OAK), located near the very birthplace of Uber, Lyft

and Wingz, is acutely aware of how app-based services have affected the airport industry. Kristi McKenney, assistant director of aviation for the Port of Oakland, characterizes this as a time of radical change.

“Anybody thinking about building a garage should be stepping back to have a broader conversation before putting a shovel in the ground,” advises McKenney. “Nobody should have the idea that you can build a building for 50 years and continue to use it the same way. We need to create spaces or buildings that can be one thing one year and something else in a future year.”

To help navigate ongoing market changes, personnel from the Bay Area airport regularly meet with start-up companies in nearby Silicon Valley and attend technology “show-and-tells” events that McKenney considers super-useful. “If we just sit back and wait four years for something to become popular, we will be behind the curve,” she explains. “The



KRISTI MCKENNEY



pace of change just keeps getting faster, and the pace will likely be hard for us to fathom.”

### Soaring TNC Use

According to research by Walker Consultants, TNCs may reduce airport parking revenues by up to 40%. Senior Vice President Mary Smith doubts that the impact will be worse because not all travelers will choose TNCs and rural passengers without access to TNCs will still drive to/from the airport. In addition, surge pricing discourages some passengers in metropolitan areas from using TNCs for airport transit during rush hour or other times of peak demand.



MARY SMITH

While many airports are still reporting static parking revenues, Walker is noting subtle changes among its client base. The impact varies by airport. At some, receipts in short-term or single-day parking at the terminal are down, while revenue from remote economy and long-term lots are holding steady. Smith attributes this to fewer “meet-and-greets”—more parents telling their college kids to “Uber” or “Lyft” home from the airport, for instance. At other airports, longer term and economy parking is more affected.

Business travelers also seem to be embracing TNCs. According to information compiled from expense reports that Certify processes for its Fortune 500 clients, TNC use soared from 8.1% in 2014 to 63% of ground transportation charges last year, while rental car bookings dropped from 55% to 29%. Taxi use also declined during the same period, in roughly the reverse proportion to TNC charges. While this data doesn’t only address ground

transportation to/from airports, it demonstrates the overall growth in the use of TNCs, notes Smith.

Although TNCs have not yet reached a saturation point in established markets, their rate of growth may have slowed, she reports. Public transit trips to/from the airports are also reportedly falling in Portland, San Francisco, Oakland and other cities.

Walker has found that most timelines predict that TNCs will begin using autonomous vehicles as soon as next year; and by 2025, they will have a “fairly significant number” going to/from airports. Around 2027, passengers will be using their own autonomous vehicles—and they won’t pay extra to park near the terminal, because they will summon the driverless vehicles from remote lots, explains Smith.

### Air Traffic ≠ Garage Traffic

In the past, parking revenue typically moved in tandem with passenger volume, particularly originating enplanements. But these days, some airports are seeing parking revenues level off while enplanements continue to climb.

Jacksonville International (JAX) in Florida is one facility experiencing the new trend. “Parking transactions are down—not hugely down, but they are down,” reports Airport Director Steve Grossman, noting that the drop in rental car usage is more pronounced. “We can no longer predict parking growth with passenger growth. The correlation is loosening.”



STEVE GROSSMAN

*continued on Page 68*

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## New Ways to Preserve Parking Revenue

Parking has long been a kingpin of non-aeronautical revenue. According to FAA data, U.S. commercial airports generated \$4 billion in parking and ground transportation revenues in 2016 alone.

That number may be dropping, though, as more passengers arrange pickups and drop-offs from Uber, Lyft and other transportation network services (TNCs). Airports throughout the country are consequently re-tooling parking programs to keep needed revenue flowing from their existing garages and lots.

With the advent and growth of TNCs at Seattle-Tacoma International (SEA), the airport plans to implement an online parking pre-booking system later this year that will allow it to dynamically price parking based on customer demand and available garage space.

In 2009, SEA responded to a downturn in parking associated with the Great Recession by launching a marketing program targeted at leisure travelers who traditionally park off-site or take other modes of transportation to the airport. These travelers typically park for longer periods of time than business travelers, so attracting more leisure travelers has helped increase the airport's



parking revenue, explains SEA spokesman Perry Cooper. The program now accounts for 20% of all annual parking transactions, he reports.

The airport also offers unlimited parking in its garage, on a floor with direct access to the terminal, for \$350 per month. Currently, about 800 passengers belong to the program. The airport hopes to increase participation by promoting the program within the terminal and through digital marketing.

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Jacksonville International Airport (JAX) offers travelers unlimited parking for \$200 per month. The Florida airport developed its Premier Parking program for frequent business travelers about five years ago and is currently operating at full capacity—150 customers—with 50 more on a waiting list. Capacity for the program is limited by the size of the surface lot dedicated to the program.

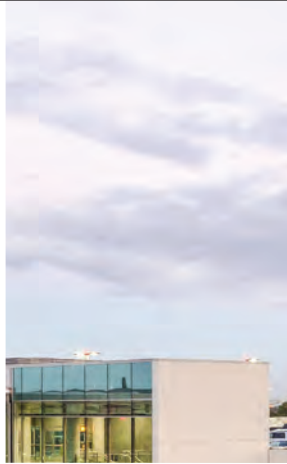
Another 1,000 travelers participate in JAX’s frequent parking program, which awards points for free parking or discounts on purchases within the terminal.

Oakland International Airport (OAK) uses online parking coupons to support its air service development efforts. Customers can receive several days of free parking if they fly on select airlines to specific featured destinations.

The airport also offers a corporate parking program, which provides discounted rates to about 2,800 drivers from roughly 1,500 participating companies, and a separate frequent parking program, with about 2,000 participants. The airport recently upgraded its parking systems, enabling additional customer offerings.



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continued from Page 65

State law in Florida requires JAX and other airports with user fees to charge taxi drivers and TNC drivers the same amount. (Some airports outside Florida voluntarily follow similar parity policies.) Grossman and other airport directors note that income from such user fees is a “wash,” while the associated loss of parking revenue can total millions of dollars for each airport. “That’s not chump change,” emphasizes Grossman.

At OAK, parking revenue continues to increase; but it is no longer growing in “lock step” with passenger enplanements, observes McKenney. Nevertheless, it is difficult to draw an accurate direct cause-and-effect relationship between higher TNC usage and slower parking growth due to changes in other factors, such as the airport’s increase in international carriers, longer haul services and connecting passengers, she notes.

Seattle-Tacoma International Airport (SEA) experienced record passenger growth last year—and while parking transactions remained flat from 2016 levels, parking revenues were up 7%. Airport personnel largely attribute the revenue gains to an aggressive marketing program that targets leisure travelers who tend to park longer than business travelers. Parking revenue has grown faster than passenger enplanements for four consecutive years, notes airport spokesman Perry Cooper.

SEA recently completed its second year permitting TNCs at the terminal. According to Cooper, early anecdotal evidence indicates that TNCs may be impacting private off-site lots rather than the airport’s parking options. There are more than 30 private parking lots surrounding SEA, he notes.



PERRY COOPER

### Drop-Offs & Pick Ups

While changes to parking garages and surface lots seem likely, they typically take years to develop and execute. In the meantime, some airport operators are taking action and updating their curbside management programs.

Curb space is, or will soon be, a premium commodity; and loading zones need to be convenient for both taxis and TNCs, cautions Smith. Most airports do not give priority to TNCs, even if they are now their biggest source of ground transportation user fees, she observes.

Pressed for space, some airports are leveraging existing square footage within their adjacent parking facilities. SEA, for example, uses the third floor of its garage for TNC and taxi loading.

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Flexibility is paramount, Smith emphasizes. She recommends using moveable bollards rather than permanent structures to designate TNC loading zones, because they will undoubtedly need to grow over time. "You want to avoid chaos with the passengers going all over the place," she remarks.

Airports with ground transportation facilities currently in the design stage are devoting "huge capacity" for TNCs, Smith reports. The new center currently under construction at Nashville International Airport, for instance, was specifically designed to accommodate growth in the TNC sector. The new facility is scheduled to open this summer.

At OAK, airport staff discovered that it would actually be inefficient to create a hold lot for TNC drivers, because unlike cab drivers, they don't generally park at the airport waiting to be dispatched from the arrivals area. "Of the 18,000 different TNC drivers at OAK, in one month only 10 handled more than two fares per day," explains McKenney. "We should not necessarily have a place for them to sit."

Instead, OAK allows "re-matching" and "pre-matching," so TNC drivers can pick up new passengers shortly after dropping off their previous fares.

SEA provides a hold lot for TNCs about one mile from the terminal, near a similar area for taxis. Cooper notes that SEA requires TNC vehicles to meet the same emission standards as taxis, and most TNC drivers serving the airport use hybrid or other environmentally friendly vehicles.

### Offsetting Lost Revenue

As rental car usage drops, so will the income airports collect in related user fees and facility charges. Smith, however, predicts that rental car companies will eventually become fleet managers for autonomous vehicles operated by TNCs. They have the resources and scale to provide cleaning, and both light and heavy maintenance, at large scale in cities. When this occurs, the associated excess space in rental car centers could ultimately be used to service and maintain the driverless vehicles. This is a significant risk to the current financing structure of consolidated rental car centers, and airports should explore collecting fees for vehicles maintained or housed on their property, she advises.

Smith also reports some futurists foresee U.S. carriers using autonomous vehicles to transport premium passengers home or to their hotels to match the door-to-door service

currently offered by upscale Middle Eastern airlines. Because such TNC service will cut into ground transportation fees, parking and terminal sales, airports should expect further challenges to their revenue streams, notes Smith.

From an accounting standpoint, OAK separates its ground transportation services and facilities from its terminal and airside operations, and consequently sets parking rates and TNC/taxi user fees to cover their own costs. Even though the airport does not offer covered parking, it is able to command rates close to covered facilities run by off-site competitors, notes McKenney.

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OAK personnel are watching changes within the TNC industry and considering whether to adjust TNC user fees accordingly. For example, both Uber and Lyft now offer “pool” fares to passengers who share rides. Fares are lower for individual passengers, but fuller cars earn the company more money. Currently, OAK levies one user fee per car, rather than charging individual fees for each person inside, but it is currently reviewing this strategy.

The management team at JAX is also assessing how to keep pace with changes in ground transportation. The recent paradigm shift that allows passengers to save money by using TNCs is requiring airports to contemplate associated paradigm shifts,

reasons Grossman. For example, JAX is exploring the idea of charging private vehicles a small fee for driving on airport roads to drop off or pick up passengers. “Our customers may not like that much, but the airport is forced into looking at it,” he explains.

In a similar vein, the airport could decide to collect revenue from vehicles that use an access road on its property as a short cut to avoid more heavily congested roads. Transponders used to collect toll road fees could be used to collect airport road fees, says Grossman.

## Other Revenue Sources

Developing airport land for commercial use is one possible alternative to additional user fees, notes Grossman. JAX has 6,000 acres of land zoned for industrial use, and so does its sister facility, Cecil Airport. “We have been developing aeronautical property very successfully for years,” he reports. “We are now starting to look at the demand for non-aeronautical uses, such as warehousing.”

In Florida, it is more profitable to construct facilities and lease space to tenants rather than leasing land to professional developers, he explains.

The recent loss of parking revenue is another reason that airports need a hike in the passenger facility charge, adds Grossman. He would also like to see more latitude allowed in the type of projects that can be funded with PFC revenue.

McKenney hopes that political and regulatory bodies will address new transportation technologies proactively, which would greatly aid airports in integrating new innovations. “Some are already thinking about autonomous vehicles,” she exclaims with relief.

Smith notes that major change will take time. “It will be 15 to 20 years of managing to get to the other side,” she cautions. “It [the transition to driverless] will not happen by 2025 ... A good chunk of cars sold by 2030 will not be autonomous; so there are a lot of years before they are retired from service, and therefore there should be a slow, regular transition.”

Time is also a primary factor affecting future infrastructure projects. A planning study completed for JAX three years ago advised building a garage for the sole use of rental cars within five to seven years. A separate study recommended constructing another public parking garage in four to five years. Given all the recent changes, Grossman estimates that there is a 50-50 chance that neither facility will be needed. ✈️

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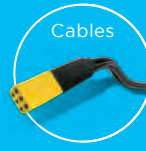
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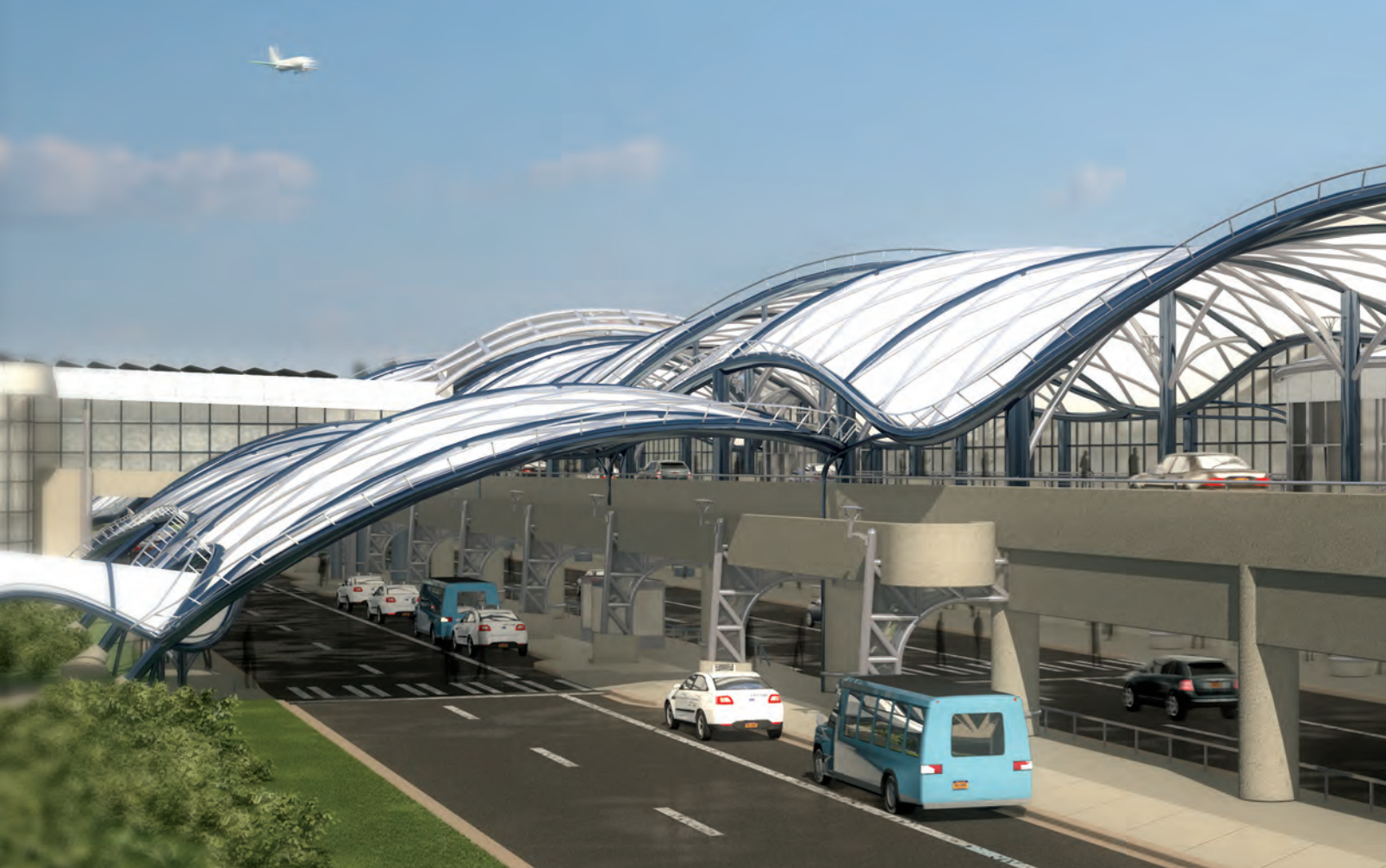
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# New York State Earmarks \$200 Million for Airport Development, Holds Project Competition to Disperse Funds

BY ROBERT NORDSTROM



New York Governor Andrew M. Cuomo has put the state's money where its airports are. Recognizing and emphasizing the importance of air transportation to general economic prosperity, the governor launched the \$200 million Upstate Airport Economic Development and Revitalization Competition in 2016.

The state allocated up to \$190 million for the competition and another \$10 million through the Governor's Aviation Capital Grant Program to support safety, infrastructure and economic development projects at airports across the Empire State. This \$200 million in new funding is in addition to \$90 million authorized for core airport improvement projects statewide as part of the governor's \$29 billion five-year State Transportation Plan.

Upstate general aviation and commercial service airports were invited to apply, and successful airports could receive up to \$40 million each. A total of 16 airports applied, and to date, four received awards totaling \$153.6 million. (See list on Page 73 for winning airports and their individual awards.) Remaining funds will be allocated in the near future.

Applicants were required to provide detailed project budgets as well as plans, drawings, reports and other supporting documents. Applications were evaluated on design innovation, passenger amenities and customer experience enhancements, cargo facility expansion, long-term job creation and generation of economic opportunities at and around the airport. Eligible projects included retail, hotel and conference center development; enhanced highway and transit access; improved security and screening methods; terminal expansion and rehabilitation; runway extension and rehabilitation; boarding, concourse and concession area enhancements; and aviation-related technology improvements.

When announcing the competition, Governor Cuomo highlighted the importance of investing in airport infrastructure and its role in the state's future economic prosperity. "Through this competition, we are transforming these upstate airports into 21st century transportation hubs to ensure they generate economic opportunity for local economies for generations to come."



Greater Rochester Int'l is one of four airports that received funds through the statewide competition.



## FACTS & FIGURES

**Project:** Airport Development Funding  
**Location:** New York State  
**Program:** Upstate Airport Economic Development & Revitalization Competition  
**Total Maximum Award:** \$200 million (up to \$40 million/winner)  
**Proposal Evaluator:** New York State Dept. of Transportation  
**Scheduling/Cost Monitoring Services:** WSP  
**Timeline:** Awards granted in 2016/2017; projects must be substantially complete by Oct. 31, 2018  
**Program Objective:** Facilitate community & regional economic development via financial support for airport improvements



### AWARD WINNERS

**Airport:** Elmira Corning Regional  
**Project:** Terminal Expansion & Renovation  
**Projected Total Cost:** \$58 million  
**Competition Award:** \$40 million  
**Additional Funding:** Current & future entitlement & discretionary Airport Improvement Program grants; local & state funds

**Airport:** Greater Rochester Int'l  
**Project:** Terminal Renovations  
**Projected Total Cost:** \$79 million  
**Competition Award:** \$39.8 million  
**Additional Funding:** Passenger facility charge revenue; Airport Improvement Program grant; local funds



**Airport:** Plattsburgh Int'l  
**Project:** Cargo, General Aviation & Industrial Complex Improvements  
**Projected Total Cost:** \$42 million  
**Competition Award:** \$38 million  
**Additional Funding:** Public/private



**Airport:** Syracuse Hancock Int'l  
**Project:** Terminal Renovations  
**Projected Total Cost:** \$62.4 million  
**Competition Award:** \$35.8 million  
**Additional Funding:** Airport authority; county; federal entitlements



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### And the Winners Are...

To date, the following airports have been selected to receive funding:

- Elmira Corning Regional (ELM)
- Greater Rochester International (ROC)
- Plattsburgh International (PBG)
- Syracuse Hancock International (SYR)

Awards were based on publicly available scoring criteria, and economic development was the “guiding light” in the selection process, says Paul Karas, acting commissioner for the New York State Department of Transportation. “Broadly speaking, tourism has a multibillion dollar impact throughout New York State—\$100 billion last year—and these airports are located near huge tourist attractions,” he explains. “We also need to provide top-notch transportation resources for people working at our universities, research institutes and support the state’s industrial and agricultural activities.”

To illustrate another aspect, Karas cites the recent decision of the New York Mets’ triple-A farm team to relocate from Las Vegas to Syracuse, NY. “One of the main reasons for the move was the attractiveness of the Syracuse Airport facilities,” he states.

With a substantial completion deadline of Oct. 31, 2018, for their projects, the four airports selected to receive awards had little time to celebrate their good fortune. “The whole process has

been a whirlwind,” remarks Christopher Kreig, airport director at PBG. “We found out we were a recipient in January 2017 and have been very busy ever since.”

Bill Hopper, director of aviation at ELM, concurs: “The timeframe we have to complete a project of this scope would, in more normal circumstances, be the amount of time we’d spend on design alone. We’re pretty much designing on the fly. We built about 30% contingency into our budget because we knew there would be unanticipated costs.”



CHRISTOPHER KREIG



BILL HOPPER

### Greater Rochester Int’l


ROC, the first winner announced, received \$39.8 million for its \$79 million project. “By transforming the Rochester Airport, we create a world-class hub to drive economic activity and growth throughout the region,” said Governor Cuomo in September 2016.

According to a 2010 Department of Transportation Aviation Report, ROC generates more than \$800 million in economic impact for the region each year and supports approximately 10,000 full- and part-time jobs.

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“The airport serves as the gateway to Rochester and the Finger Lakes Region,” notes Interim Aviation Director Andy Moore. “This revitalization project enhances the overall experience for the 2.4 million passengers traveling through the airport each year.”

The winning project will encompass:

- terminal renovations, including the addition of enhanced shopping and dining options;
- a smart energy management system to control heating/venting/air conditioning and lighting in all areas of the building;
- a new 85,000-square-foot terminal entrance canopy to provide shelter and allow for installation of additional security cameras;
- changes at the TSA checkpoint to minimize wait times;
- a 32-space Smart Phone Lot, complete with free Wi-Fi, charging stations for electric cars and a flight information display;
- color-coded signage and navigation cues between concourses A and B, and digital information visible to guide passengers heading to either concourse;
- new energy-efficient windows in the expanded food court area;
- Wi-Fi connectivity to a new passenger information system accessible on mobile devices for passenger wayfinding, flight status and gate information;



ANDY MOORE

- hundreds of new charging stations for passengers' electronic devices;
- interactive play areas for passengers of all ages, through a collaboration with The Strong National Museum of Play;
- new approach roadway signage, landscaping and improved LED roadway lighting; and
- state-of-the-art technology to make travel easier for deaf and hearing-impaired visitors.

The Greater Rochester area has one of the nation's highest per capita populations of residents who are deaf or hard of hearing, informs Moore. The National Technical Institute for the Deaf, the world's largest college for students who are deaf and hard of hearing, is located in Rochester.

The airport has taken a proactive approach to assist this population by installing hearing loops, an FM system that helps visitors receive messages from the public address system via T-coil devices in their ears. ROC is also working with the Rochester Institute of Technology to install screen devices at ticket counters and other key transaction points that translate American Sign Language into voice or printed content.

“Our original cost estimate when we applied for the award was \$54 million,” Moore reports. “But once we got into the design and

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engineering, and then decided to take this opportunity to expand the project, we came up with the more realistic number of \$79 million. We are very appreciative of Governor Cuomo's initiative and fortunate to have tremendous leadership from Monroe County Executive Cheryl Dinolfo, who values investing in our airport as an economic driver in our community."

### Elmira Corning Regional

ELM was also announced as an award-winner in September 2016. It received the maximum \$40 million toward a \$58 million project that includes:

- increasing terminal space by 25%;
- raising the concourse, adding one new jet bridge and refurbishing two existing bridges;
- adding space for a second baggage claim;
- adding 300 new parking spaces;
- constructing café and retail kiosks post-security and a 3,000-square-foot restaurant and bar pre-security;
- adding enclosed courtyards to showcase the local landscape and enhance passengers' travel experience; and
- installing programmable glass walls that display flight information and wayfinding information.

Previously, the airport had no airside food and beverage options, Hopper informs. Initial plans called for adding a 3,000-square-foot concession post-security, but airport authorities ultimately placed the new food and beverage option before the TSA checkpoint, because ELM's post-security area is only open for a few hours in the morning and afternoon.

"We settled on kiosks post-security, with the main vending areas pre-security, since a major vendor post-security would not be able to sell product when the area was closed," Hopper explains.

Airport officials are particularly pleased with plans for the three new courtyards. One is inaccessible to the public but visible from the baggage and security screening areas; another can be accessed from the landside restaurant; and the third is a post-security space passengers can enjoy while waiting for their aircraft to arrive.

"Travelers moving through TSA screening actually wind between two courtyards," explains Hopper. "We call it a walk through the woods."

He notes that the program's tight deadlines have made the design and construction process challenging, but all the stakeholders see the value of the projects.

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“We are getting a renovated terminal building for little local share cost, which translates into minimal costs for the airlines,” Hopper emphasizes. “We’re making it work. Come August of this year, we’ll have a brand new boarding area; and come next October, a whole new building.”

### Plattsburgh Int’l

PBG was just putting the finishing touches on a \$60 million terminal expansion when the upstate project competition was announced. Inspired by the chance to win funding for future improvements, they pushed through the natural post-project fatigue and began thinking about other items on their to-do list.

Although they had multiple ideas to enhance the passenger travel experience (civil site work, parking lot pavement repairs, further improvements inside the terminal), officials focused on cargo and general aviation projects for the airport’s application. They also keyed in on the business-to-business development described in the competition guidelines.

The strategy proved to be a winning approach, as PBG was awarded \$38 million toward its \$42 million project proposal. Specific components include:

- adding new retail and concession options, including a new dining facility;
- renovating two industrial buildings (90,000 square feet total) for light manufacturing activity;
- constructing a new 60,000-square-foot light industrial manufacturing facility;
- building a 10,000-square-foot distribution center for tenants in the airport’s industrial complex;
- adding a new general aviation Customs facility;
- demolishing several buildings that are beyond their useful lifespans;
- adding a connecting corridor for passengers arriving on international flights;
- constructing a Clinton County Transit Center;
- adding charging stations for electric vehicles;
- preparatory work for hotel development; and
- renovating the car rental building to speed vehicle turnaround.

“All told, we have over 200 acres of developable space,” Kreig informs. “Our chamber of commerce has done a great job fostering relationships with our cross-border friends. This project will help us attract Canadian businesses to the area. From

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building renovations to new construction, we are in a position to address the needs of companies looking for usable space.”

### Syracuse Hancock Int’l

SYR received \$35.8 million to update its aging infrastructure. The airport’s \$62.4 million project will include:

- redesigning the terminal building to create a more spacious and light-filled central hall;
- constructing a regional aviation museum, with assistance from the Onondaga Historical Association;
- adding a new exterior glass wall facade, with a green roof curb-front canopy;
- renovating two pedestrian bridges, so travelers with mobile app boarding passes can connect directly from the parking garage to the terminal’s second floor security checkpoint;
- adding weather-resistant architectural steel exterior panels, energy-efficient windows and a rainwater collection system; and
- installing new terrazzo flooring and energy-efficient lighting.

The various projects support the airport’s goal of creating a seamless passenger experience—which begins when travelers are dropped off at the curb or park in the garage, notes Airport Director Christina Callahan.



CHRISTINA CALLAHAN

Rather than encountering a solid wall, travelers will be greeted with a translucent glass wall with a sightline through the terminal to a matching glass curtain wall on the other side of the TSA checkpoint. Overhead, a translucent glass canopy filters natural light onto the terminal roadway and sidewalk.

Inside, travelers are welcomed into a bright, open space. The grand staircase and stone wall in the central lobby provide easy places for passengers to rendezvous with colleagues or loved ones. “From an architectural design perspective, we’ve deliberately constructed and highlighted features that can serve as reference points for travelers,” explains Callahan.

In reflecting on what the award means for the airport and community, Callahan says that the state funding has helped the airport authority create a world-class facility much sooner than would have been possible otherwise. Moreover, the award allows authority funds to be directed toward additional important projects and priorities.

As acting transportation commissioner, Karas acknowledges that small and medium-size airports often have to scramble for project funding. “When these airports get 5% to 10% state funding with perhaps a local match, that’s a good day,” he reflects. “New York state has stepped up to the plate to provide a large chunk of funding for major airport projects. That’s huge, and the reaction of the award winners has been great delight. By helping airports, we are helping the economy.” ✈️



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# Delta Opens New Cargo Control Center to Track Shipments

BY RONNIE GARRETT

## FACTS&FIGURES

**Project:** Cargo Control Center

**Owner:** Delta Air Lines

**Location:** Hartsfield-Jackson  
Atlanta Int'l Airport

**Purpose:** Support carrier's domestic  
& worldwide cargo operations; track air  
shipments, truck transport, mail & freight

**Open Date:** Oct. 2017

**Of Note:** Center is staffed by cross-divisional  
Delta team & personnel from joint-venture  
partner, Air France-KLM; other partners, such  
as Virgin Atlantic and Air Mexico, are expected  
to join



When cargo flights are delayed or diverted, it not only affects customers expecting freight, it also impacts airports handling the traffic. Sometimes it takes a domino effect of gate shifts to accommodate off-schedule or unexpected cargo flights.

Such disruptions are not unusual at Memphis International Airport (MEM), one of the top 10 airports in the world in terms of cargo tonnage. "An airport's role in moving cargo is essentially providing space and maintaining the runways to facilitate efficient cargo operations. Because of our high volume of cargo activity, MEM is able

to accommodate significant air traffic at any time," says Glen Thomas, the airport's director of strategic marketing and communications.

That said, Delta Air Lines is working to minimize disruptions. Last fall, the carrier opened a new Cargo Control Center at its headquarters in Atlanta (ATL) to keep airports and customers in the know. The new facility tracks air shipments, trucks, mail and freight—both domestically and internationally.

"Our Cargo Control Center knows exactly where freight is at all times, anywhere on the globe," says Gareth Joyce, president of Cargo



Operations and senior vice president of Airport Customer Service for Delta. "With that information, we are far more proactive in predicting potential service issues and providing freight solutions to our customers, and that really is a game-changer in the logistics industry."

## Cargo Proud

Julian Soell, managing director of Operations and Customer Experience for Delta, notes that the new center is part of the carrier's 'Cargo Proud' initiative. "We recognize that cargo is a critical part of our business, and it is important that we are proud of the business that we are in," he explains.

Part of that pride includes adding technology to manage the logistics of its cargo operations, while also striking a balance between technology and customer service. To accomplish this goal, Delta integrated employees from multiple aspects of its cargo operations together in its new facility. Centralizing cargo control functions in one location enables the airline to optimize operations in a way that could not be accomplished with various entities spread out in airports across the globe, Soell explains.

The center's cross-divisional cargo team includes representatives from:

- Capacity Management, which determines the specific capacity for each flight based on aircraft type, the weather it will encounter and other factors;
- Warehouse Management, with workers who can reach out to any warehouse across the globe as needed;
- Trucking, so personnel can see at a glance where delivery trucks are;
- Rebooking, which arranges new flights for shipments as needed;
- Unit Load Device (ULD) Management, the group that manages loading freight onto aircraft. (ULDs allow large quantities of cargo to be bundled into a single unit, saving ground crews time and effort and preventing flight delays. Each ULD has its own manifest, so that contents can be tracked.); and

- Service Recovery and Call Center Operations, with personnel who directly reach out to customers.

Collectively, the team can view the individual elements of the shipment lifecycle and identify issues before they take place in order to provide proactive communication and support if there is a delayed or cancelled flight, explains Soell.

"Having representation from all groups in one control center, even if they are using independent technology in their specific function, enables us to take care of things in hours instead of days," he remarks.

Delta's joint-venture partner, Air France-KLM, also posts staff at the control center; and other partners, such as Virgin Atlantic and Air Mexico, may eventually join as well. "There's a need to expand it, to have a broader reach," says Soell.

Having representation from joint venture partners on site helps Delta address problems more effectively as they arise. For example, if a shipment fails to make its regularly scheduled flight because the customer dropped it off late or encountered a weather delay, Delta can send the shipment on a later flight of a partner airline.

"In the past, we might have had to wait until the next day to fly that shipment," says Soell. "With our partners involved, we can use other airlines for service recovery, because they have access to their own network plus ours, which creates an even bigger network. It's just leveraging the entire joint-venture network as opposed to just Delta Air Lines' network."

When the center opened in October, it operated during business hours, Monday through Friday; but 24/7 operations began in January. With this change, the center now operates three shifts with about 40 total staff members.

"Our customers work 24/7, freight flies 24/7, so we need our central command center to operate 24/7," Soell remarks.

## How it Works

"The new Cargo Control Center is the culmination of our significant investment in technology systems and operation



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reliability, all with the aim of enhancing the customer experience and ensuring that they are at the center of everything we do,” says Joyce.

As Soell explains it, the facility leverages multiple types of software technology and analysis tools to turn the data it receives into actionable intelligence. Simply put, the center is designed to answer one crucial question: Where is my cargo?

“The software is very good at highlighting operational risk,” he notes. “Using this software, the center is very good at proactively

seeing what’s going to happen from a weather perspective and understanding what it means for our cargo in terms of where it is, where it needs to go and how we manage around that.”

For instance, if Atlanta is experiencing severe thunderstorms, the center makes sure shipments are routed around Atlanta. If a hurricane is predicted in San Juan, it moves freight out before the hurricane hits.

“The system allows us to turn data into information and to highlight things that might present a challenge,” explains Soell. “We have roughly 4,500 shipments around the world every day; it would be hard to have people watching every one of those. That’s why we have systems in place.”

The new command center leverages technology to identify which shipments are on track and which need special attention. “Our software tools filter what our team needs to focus on,” he remarks.

If the center’s systems indicate a delay, staff can proactively address the situation with shippers. “This ensures that customers never lose track of their shipments, and can make necessary adjustments on their end,” says Soell.

The system is designed to improve operational reliability and, in turn, the customer experience by identifying bottlenecks and

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rerouting shipments as needed. Locating the service recovery and call center on-site enables Delta to proactively reach out to customers to explain how delays are being addressed.

“The central command center is tracking and tracing shipments to ensure they are moving as scheduled,” he says. “If they are delayed, we can enable the customer to follow their shipment.”

The center uses GPS (global positioning system) technology to track shipments sent via DASH, Delta’s flight-specific express service for small packages. Such shipments are given the highest boarding priority and fastest transit time of any Delta Cargo service, and the carrier puts a GPS tracker on every DASH package to enable real-time tracking.

“This is a premium product with a premium service,” Soell comments. “We can load DASH shipments directly onto the aircraft, and the GPS is smart enough to know at what altitude it needs to turn off. We basically track the shipment when it goes on the aircraft, leaves the aircraft, is sent to the warehouse, etc. The GPS is tied directly into the central control center.”


Delta reports that customer response to the service has been strong. Antech Diagnostics, a nationwide network of veterinary laboratories, is among its enthusiastic users. “We started using DASH Critical because we needed a good way to track our packages from drop off to pick up,” says Todd Sand, transportation manager for the company’s North East Region. “We liked the idea of having an extra 15 minutes to tender our boxes and the guaranteed 45-minute offload time; but what really caught our eye was the GPS that is attached to every package. The GPS took a huge load off our shoulders, knowing that if something happened, we would know where the box was and could retrieve it in minutes.”

In the future, Delta plans to add RFID (radio-frequency identification) tags to some cargo shipments. RFID is already used to track baggage as it is loaded and unloaded from aircraft then moved to a baggage carousel.

### Tracking Success

Soell notes that the contents of Delta’s cargo shipments vary greatly, and some have no room for delays. He cites the following case as one of many success stories the new command center has produced: Recently, a critical supply of human organs was being shipped on a connecting flight. When the first flight was delayed, the team at the cargo center received the information immediately and rerouted the shipment.

“Without an effective management system like this, that first delay would have led to a missed connection on the second leg of the journey,” Soell explains. “But we were able to see that delay and proactively reroute the shipment to another location. In fact, we were able to get the organs where they needed to be 10 minutes ahead of schedule. We met our commitment, mitigating the situation caused by the delay so that our customer didn’t feel the impact of a delayed flight or missed connection.”

Improving the customer experience is what led Delta to centralize its cargo management operations in the first place, he concludes. 

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PHOTO: BILL PURCELL

# Experiential Concessions Faring Well at Portland Int'l

BY LAURA WAVRA

## FACTS&FIGURES

**Project:** Local & Experiential Concessions

**Location:** Portland Int'l Airport

**Concession:** Hollywood Theatre

**Description:** Non-profit theater that shows short films made by local Oregon filmmakers; no admission charge for passengers

**Size:** 815 sq. ft.

**Seats:** 17 (plus 2 spots for wheelchairs)

**Opened:** Feb. 2017

**Design:** Erskine Group

**Construction:** Iron Triangle

**Marquee:** Security Signs

**Speakers:** Triad

**Projector:** Barco

**Concession:** House Spirits Distillery

**Description:** Retail location & tasting room for craft spirits such as whiskey

**Size:** 950 sq. ft.


**Seating Capacity:** 13

**Opened:** Nov. 2016

**Design:** Osmose Design

**Construction:** R&H Construction

**Bar & Cabinetry:** Acme Design

 Portland International Airport (PDX), much like the city itself, takes pride in all things local and unique. The array of food, drinks and art throughout its five concourses communicates that pride in no uncertain terms.



KAMA SIMONDS

Kama Simonds, spokesperson for the Port of Portland, notes that PDX follows an unconventional approach to concessions, and local companies provide fully 70% of its lineup. Two of its latest additions—

House Spirits Distillery and Hollywood Theatre—offer passengers more than local products. They provide experiences.

## Local Brands & Pricing

In lieu of the prime concessionaire model, PDX operates a series of unique brands with individual leases, explains Simonds. Each tenant is tasked with managing and championing its own brand and products.

Shane Andreasen, senior manager of concessions development, reports that PDX has found success with this model.

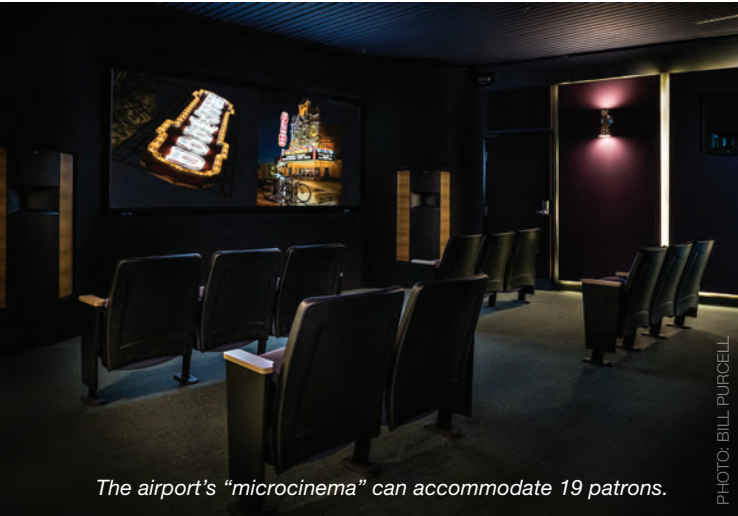
Customer surveys conducted several times a year indicate that roughly 80% of PDX passengers prefer local businesses to national chains. Not surprisingly, local concepts at PDX continually outperform their national counterparts, notes Andreasen.



SHANE ANDREASEN

Concessions at PDX must also adhere to “street pricing,” so prices at the airport do not exceed those at businesses in the surrounding area—namely downtown Portland. “We’ve held firm to the street pricing philosophy since the 1980s, and it’s been successful,” Andreasen says. “We want to make sure our passengers are happy while they’re here; and happy passengers tend to spend more money.”

He acknowledges that the policy can be a double-edge sword for concession vendors. The costs of operating in an airport are higher than elsewhere, but 19 million potential customers stream through the facility every year. “Businesses don’t have to rely on cycles of a downtown market,” Andreasen remarks.



The airport's "microcinema" can accommodate 19 patrons.

PHOTO: BILL PURCELL

### Catch a Show (or Two or Three)

Following its themes stressing local and unique, PDX provides a "microcinema" where passengers can watch an hour's worth of short films (each 10 minutes or less) made by local Oregon filmmakers. The nonprofit venture is the brainchild of Doug Whyte, executive director of Hollywood Theatre;



DOUG WHYTE

and PDX is the organization's second location. The 19-patron, 815-square-foot theater is located in Concourse C, where passengers can take in a variety of free short films while waiting for their flights.

The idea came to Whyte from an article in the *New York Times* about Theaters in a Hong Kong airport. He was already running a theater in northeast Portland, and loved the idea of opening another at the airport. Whyte reasoned that short films seemed like a natural fit, because most PDX passengers do not have long international layovers. The airport's public arts team agreed, and the project progressed.

The Port of Portland closed an underutilized business center to make room for the nonprofit initiative and teamed with Hollywood Theatre to secure funding for the roughly \$500,000 project through grants from the Oregon Community Foundation, Oregon Arts Commission, Oregon Cultural Trust and Travel Oregon. Triad, a speaker company based in Portland, donated an elaborate sound system, and Barco donated the film projector. The theatre project also received several small private donations and many hours of pro bono work.

From start to finish the project took three years—including negotiations with the Port of Portland, fundraising and design/construction. "It was complicated and expensive, but totally worth it," Whyte reflects.

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*This new concession is the outgrowth of a successful kiosk.*

The large, glimmering neon marquee, by Security Signs of Oregon, is one of the theater's most impressive elements, he reports. Because the sign was deemed an art installation, Hollywood Theatre received approval to exceed regular size restrictions for airport signs, and the 4-foot-tall marquee stretches for 30 feet.

Airport personnel and Whyte report that the theater has been well received by passengers since its February 2017 debut. It is always busy, and feedback on social media has been universally positive, notes Whyte. With 19 million annual visitors, the airport provides an immense platform for local filmmakers.

Whyte notes that the theater's relationship with the airport is very positive, and he describes PDX as inventive, supportive and enthusiastic about local business and the arts.

"It's a great partnership story, and a great amenity for travelers," agrees Simonds.

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### Tasting Room

Drafting off the current popularity of craft spirits, PDX recently opened House Spirits Distillery Tasting Room, where passengers can taste and learn about the company’s award-winning offerings. Décor in the 950-square-foot facility is sleek and modern—just like the aesthetic of the company’s flagship location in southeast Portland, which also houses a production facility.

The new airport concession—part retail, part tasting room—provides passengers with the full House Spirits product line and an assortment of merchandise. The Westward Whiskey Flight is reportedly the most popular selection at the tasting counter. Despite the time constraints inherent to any airport environment, the vibe is fun and relaxed, says Kelly Woodcock, partner and director of retail and hospitality for House Spirits.



KELLY WOODCOCK

The company is not new to PDX. In fall 2013, it installed a kiosk that proved so popular, company officials decided to invest in more space. House Spirits hired R&H Construction, a local firm with several years experience at PDX; Osmose Design, the team



Passengers can sample craft spirits such as whiskey, rum and aquavit.

responsible for House Spirits’ original facility; and Acme Design for the bar and cabinetry.

Construction began in July 2016, and the new concession opened for business a few months later, in November.

Woodcock notes that building at the airport was complex, but praises the concessions team for its assistance. “PDX does a really good job of partnering with you throughout development, design and construction,” she says. As is often the case, Woodcock cites planning and communication as key elements to the success of the project. ✈️



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# New Carpeting at Destin-Fort Walton Beach Airport Makes Environmental Statement & Conveys Local Essence

BY BRIAN SALGADO



## FACTS&FIGURES

**Project:** New Carpeting for Terminal

**Location:** Destin-Fort Walton Beach (FL) Regional Airport

**Area Covered:** 50,000 sq. ft.

**Approx. Cost:** \$321,000

**Funding:** Florida Dept. of Transportation 50/50 grant

**Installation:** Aug. 2017-Sept. 2017

**Carpet Tiles:** Net Effect, by Interface

**Environmental Advantage:** Carpeting is created with yarn made from discarded fishing nets

**Carpet & Vinyl Supplier:** Interface

**Carpet Installation:** The Flooring Authority

**Vinyl Tile Installation:** Contract Unlimited



The decision to replace the carpeting throughout northwest Florida's Destin-Fort Walton Beach Airport (VPS) was a practical one. After all, millions of passengers had trekked through the terminal since it opened in 2004, and the original carpeting was beginning to show its age. But instead of installing an ordinary pattern that no one would notice, VPS management decided to make a statement with custom-designed carpet tiles.



ROBERT CHAD ROGERS

"We're a destination location that's growing for a lot of reasons, our beaches specifically," explains Robert "Chad" Rogers, projects manager for VPS. "We're called the 'Emerald Coast,' so we wanted the carpeting to showcase that. We have the largest fishing fleet and more world-record catches in the books than anywhere else in the great state of Florida."

Using a 50/50 funding grant from the Florida Department of Transportation, VPS replaced 50,000 square feet of carpeting and purchased 5,000 square feet of overstock pieces for future replacements. Total cost for the project was about \$321,000.

Rogers had two goals for the new carpeting: capture the public's attention, like Portland International Airport did with its popular, kitschy design; and emulate the nouveau wave pattern of the carpeting at Hartsfield-Jackson Atlanta International Airport.

"We wanted to take a mundane, run-of-the-mill project and turn it into something special—that was a driving force," says Rogers.

The airport turned to Interface, a carpet designer and manufacturer based in Atlanta, for a product to highlight the best the Emerald Coast has to offer.

## Nothing But Net

Because VPS is located in an area known for some of the world's best fishing, airport





management wanted the new carpeting to be sourced from environmentally friendly materials. Net Effect, a line of carpeting tiles made from discarded fishing nets, proved to be a perfect fit.

An initiative called Net-Works coordinates the collection and sale of fishing nets that litter the beaches and waters of small villages in the Philippines. The program provides a source of income for the fishing villages and helps clean up the area, including an offshore double barrier reef. Interface's yarn supplier, Aquafil, repurposes waste nylon from the nets and other secondary sources to produce materials that are ultimately used to manufacture Net Effect carpeting.

To highlight the environmental stewardship of the finished project, Interface presented the airport with two certificates: a Cool Carpet™ certificate, which documents that the material purchase resulted in the retirement of 63 tons of verified greenhouse gas emissions through reduction credits; and a ReEntry® certificate, which recognizes the airport for recycling the 38,505 pounds of old carpeting that was removed from the terminal rather than sending it to a landfill.

## Design Process

Rogers worked directly with Interface account executive Katherine Thomas on the custom design for VPS's new carpeting. Because the airport had such a specific vision, the design process took four months instead of the typical two weeks.



KATHERINE THOMAS

The resulting product has a blue, green and sand color scheme that mimics the water, plant life and beaches throughout the region. Thomas describes the pattern as very organic, featuring different heights and textures to create a 3-D effect that looks like the waves in the Gulf of Mexico hitting the shore.

After airport management committed to the pattern, Interface's concept design team created custom hues for the sand and blue tones needed to honor the Emerald Coast. To create the desired effect, the pattern starts with "sand," which fades into colors representing the region's clear blue water.

For Rogers, it was especially important that the pattern of the new carpeting not be interrupted when a tile or two needed to be replaced due to damage or standard wear and tear. Interface's i2 line addresses that very concern. Using the principles of biomimicry, designers take inspiration from the appearance of a leaf-covered forest floor to vary the use of pattern and coloring within one style and color scheme. As a result, tiles blend together no matter when they're installed, explains Thomas. The tiles also create a more efficient installation process, with 90% less waste


than traditional broadloom carpet, easy reclamation and recycling, and the need for less replacement stock, she adds.

"What I was after was durability and quality product for the money, not necessarily i2 specifically," Rogers notes. "But with this, we'll have the carpet looking better longer and be able to maintain it easier because of the random pattern."

## Other Flooring

During installation, VPS decided it wanted to use durable vinyl tile instead of carpeting in areas that bear the brunt of rainstorms and other inclement weather. The pattern it selected portrays the wooden planks of a fishing dock. Removing carpet tiles that had already been installed in the baggage claim area added about \$5,000 to the overall project cost, but airport personnel are more confident about the long-term results.

Interface managed to create a seamless connection between the carpeting and vinyl tile without using transition strips, notes Rogers. In addition to improving the appearance, this eliminated a common tripping hazard and pieces that are often damaged by rolling luggage, he adds.

Considering how satisfied VPS is with the final result, Thomas encourages other potential clients to request custom designs and product combinations. 

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# New LED Welcome Sign at Denver Int'l is One

 When Denver International Airport (DEN) lays out the welcome mat, it goes all out. The largest and fifth-busiest airport in the United States now features a signature entry sign that stretches a quarter-mile long, with more than 900 LED-lighted poles that form a ribbon of moving light.

Three years in the making, DEN's \$11.5 million display is possibly the largest airport entry sign in the world. Designers invoked traditional Colorado images—rivers, mountains and rolling hills—when creating the iconic front entrance, says David Bruce, Facility Services manager for the airport.



DAVID BRUCE

The attention-grabbing display replaces the static backlit sign DEN installed before the Democratic National Convention in 2008, and is seen each day by arriving and departing passengers, riders aboard the city's new light rail line and people in an estimated 120,000 vehicles on the nearby tollway.

"We are a gateway and front door to not only Denver, but the Colorado region," says Heath Montgomery, the airport's senior public information officer. "We wanted to create something people are really going to remember."

## Local Associate

The airport partnered on the project with Panasonic, which made a considerable local splash a few years ago by choosing to build the headquarters for its main

U.S. innovation and sales hub (Panasonic Enterprise Solutions) in Denver. Plans for the company's 400-acre development, located just 10 minutes from DEN, include 400 employees and a full "smart city," complete with autonomous shuttles to the nearby light rail station. Local officials estimate the annual impact of the overall facility at \$82 million, and Denver Mayor Michael Hancock said it could be the region's biggest economic win in years.

Panasonic Enterprise Solutions was formed in 2014 as an umbrella organization for the company's divisions that develop and sell large-scale digital signage, solar power systems, and audio- and visual-technology products and services. DEN worked with Panasonic's CityNOW team to develop and install its new welcome sign, a micro-grid energy storage system and smart LED streetlights for the airport.

"We've always said from the beginning, we're not going to just be a vendor in this," explains John Greenwood, executive director of Digital City and Strategic Alliances for CityNOW. "The airport has always treated us like a partner. Three years later, we have something that everyone is proud to say was a joint, partnership-executed piece of art."



JOHN GREENWOOD

## A Display Like No Other

Concept planning for DEN's new sign began in fall 2015. A whiteboard session with airport executives, the city mayor and Panasonic officials developed an initial drawing that is



## FACTS&FIGURES

**Project:** LED Entry Sign

**Location:** Denver Int'l Airport

**Visual Effect:** Ribbon of moving light

**Size:** ¼-mile long; 3 LED signs, each 768 sq. ft.; 908 lighted poles, each 15 ft. tall

**Design & Installation:** Panasonic Enterprise Solutions

**Cost:** \$11.5 million

**Funding:** \$7 million from airport; \$4.5 million from Panasonic

**Maintenance & Operation Contract:** \$3 million over 12 yrs

**Timeline:** Idea developed in Sept. 2015; final design completed late 2016; installation completed Oct. 2017; sign went live early in Nov. 2017

# of a Kind

BY JENNIFER BRADLEY

PHOTO: DENVER INTERNATIONAL AIRPORT

strikingly similar to what is standing in the ground today, notes Greenwood.

The project team spent four months in concept mode, and then dove into the design phase. Approval for the final design came in late 2016, and construction began in late spring the following year, after final permits were secured and clear weather materialized.

DEN and Panasonic personnel spent weeks building a mockup of 30 poles to ensure that LED lights would provide the desired visual effect and help determine what kind of graphics to use. “We really learned a lot from that,” Bruce recalls. “For myself, I was able to confirm that we were going to be able to build what the vision was—and that was critically important to us.”

The mockup team fabricated 18-foot poles, painted them charcoal gray according to specifications for the final product and installed specially made LEDs from Hong Kong. After the sample system was complete, airport executives, Mayor Hancock, and representatives from Panasonic’s worldwide headquarters in Japan assessed the results.

“We fired it up, got it lit and then we started playing around with graphics,” recalls Bruce. “We walked around to look at it from different viewing angles, because

you don’t see it from a consistent angle when driving past—it’s always changing.”

The LEDs used to create the sign are good for 100,000 hours in a perfect environment, but Denver’s weather can be downright punishing. With wind gusts of 70 mph, 300 days of sunshine and multiple feet of snow stressing the sign’s components, Greenwood predicts that adjustments will need to be made after five to seven years.

The airport is responsible for maintaining the integrity of the electrical system that powers the sign and the grounds that surround it.

## Execution Was Everything

One of the biggest challenges was making sure that contractors could actually build the system that the project team envisioned. That was also why the mockup was so vital, Bruce notes. “We spent a lot of time sweating the details to make sure when we broke ground it would be what everyone signed up for.”

Greenwood still marvels at the final outcome. “From an engineering perspective, this has never, ever been done,” he muses. “It’s incredible that we’re sitting here now and it’s working.”

Producing the poles that stand alongside the primary LED displays was particularly

challenging, because they needed to curve at precise angles to create the display’s winding visual effect. Installers had to place each of the 908 poles perfectly, and every spot was surveyed to the finest detail, notes Bruce.

“They aren’t popsicle sticks,” Greenwood adds. “These things are huge.” Specifically, each of the poles has a 5-inch diameter and is 18 feet long, with 15 feet protruding above the ground.

H&H Metals, the local subcontractor that fabricated the poles, made significant contributions to the final system by calling weekly with ideas about how to make the poles better. “He would send us drawings, and I would pass them to our designer,” Bruce recalls. “They’ve been in the metal fabrication business for 30 years, knew what we needed to produce and understood the vision.”

All the contractors were fantastic to work with, and local vendors that already knew the airport environment were invaluable, he adds. “It was about more than just doing a job for a paycheck,” reflects Bruce. “It was an amazing experience for everyone.”

## Tactical Team Strategy

Greenwood says that using the pillar approach, which emphasizes the

PHOTO: DENVER INTERNATIONAL AIRPORT

*The new sign stretches a quarter-mile long.*



importance of early stakeholder alignment, is what made the unique project so successful. “If you don’t have that alignment in the beginning, it’s just an RFP [request for proposal] mentality,” he remarks.

Fostering unity was crucial from the original whiteboard session in September 2015 to the sign’s final debut in November 2017. Key stakeholders included representatives from DEN, the city, Panasonic and multiple real estate developers. “They needed to be humming the same tune, but also understand that it was not going to be ideal throughout the relationship,” Greenwood explains. He likens the project to a marriage: After the initial proposal was

accepted, the team walked down the aisle together and then produced something everyone was proud of.

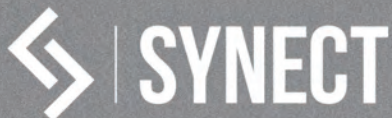
The airport will run advertisements to help pay for the sign’s installation and \$3 million, 12-year maintenance contract. It also uses the new display to alert visitors and local citizens about free arts and entertainment at DEN. The airport’s free ice-skating rink has been particularly popular since it opened in November 2016.

Overall, the private/public partnership between DEN, the city and Panasonic has proved effective on many fronts. “We have an innovative technology leader basically on premises in a place that calls for sharing big ideas like this,” says Montgomery. “I don’t know of any other airport that has that.”

Greenwood agrees, noting that Panasonic was seriously considering five other major cities for its smart city project. “It was this partnership that allowed, and convinced us, to move to Denver,” he remarks.

Bruce hopes that more airports and cities come to understand how such projects can inspire economic growth. “We’re happy and proud to talk about it with our peers,” he says. “The sign came out exactly as envisioned, and I’m still amazed every time I look at it. I love driving past it every day.” ✈️

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# What is the Right Number of FBOs?

 Most of us have heard the saying, “If you’ve seen one airport, you’ve seen one airport.” This is such a true statement. Although there are many similarities between airports, factors such as size, runway configuration, aircraft operations, employee population and the nature of traffic (commercial vs. general aviation) make each one unique. So, the right number of fixed base operators may be quite different for each and every airport.

I believe it is not up to an airport to decide what the right number is. That decision should come more from the FBO industry and the market forces that dictate the natural balance between supply and demand. Airports are required by the FAA to be open, without unjust economic discrimination; not to allow or grant aeronautical exclusive rights; and to operate as self-sufficiently as possible. To meet these obligations, an airport should seek many business opportunities to generate revenue. If an airport has vacant land for development, especially aeronautical-use property, it should seek all types of aviation businesses, including FBOs, to add to its revenue base. If an FBO wants to establish a presence on the field, it should have every right to do so, provided that land is available, the airport’s reasonable minimum standards are met and accommodations can be made without unjust discrimination.

Competition is always good for the consumer, but not necessarily for the businesses providing goods and services. Like the airlines, FBOs have also gone through a series of



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consolidations during recent years. The days of “mom & pop” operations seem to be fading, and the dwindling overall number of FBOs remaining reduces the likelihood of multiple FBOs at many airports. The availability of FBOs at surrounding airports may also impact the number of FBOs at a given airport, but a lack of FBOs doesn’t mean there is not competition located within a reasonable distance.


There are a few key logistics or market factors that can impact whether or not FBOs choose to compete. First, aircraft mix is integral to the number of needed FBOs. Corporate turbine aircraft have the potential to generate more revenue for an FBO than small single-engine piston aircraft. However, large flight training facilities that use piston aircraft may be equally important for revenue. Over the years, I’ve been told that the volume of fuel sold has a direct correlation to the number of FBOs on an airport. A reasonable size airport with a good mix of piston and turbine aircraft should sell a minimum of 1 million to 2 million gallons of fuel annually. Obviously, the economies of scale play an important part in profitability.

Second, the number of based aircraft vs. itinerant aircraft may also be a

deciding factor for the proper number of FBOs. More based aircraft usually corresponds to more T-hangars or box hangars. The availability of capital may make it difficult for a single FBO to keep up with hangar demand. With today’s construction costs, rent for an average new T-hangar can be in the \$600 range, which may limit tenancy.

Finally, airfield layout will impact an airport’s FBO population. Aircraft operators should not have to taxi long distances, cross runways or travel through commercial airline areas to reach an FBO. Conversely, an FBO should be able to reach aircraft customers in a relatively convenient and timely fashion.

As mentioned above, an airport’s role in setting minimum standards may determine how an FBO operates. Minimum standards should be set at a level that allows new entrants to compete with incumbents.

So, what is the right number of FBOs for a given airport? Ultimately, it comes down to whether all the FBOs on the airport can make a profit and provide high levels of service, while attaining high levels of customer satisfaction at a reasonable cost. 




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