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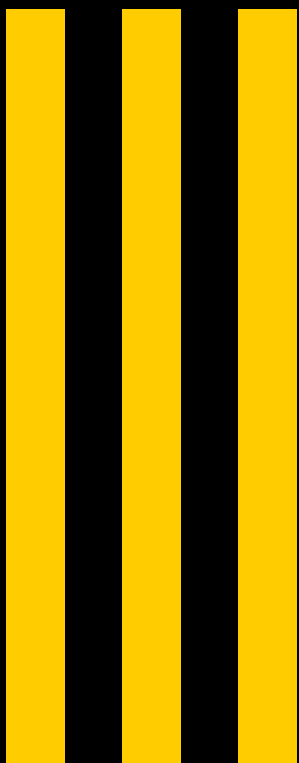
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8 Fernandina Beach Municipal Opts for Airplane-Shaped Terminal



14 Community Collaboration Drives Transformation at Gerald R. Ford Int'l



22 Birmingham-Shuttlesworth Int'l Begins Transition to Electric Ground Service Equipment



30 Denver Int'l Grants Greener Pavement Deicer an Audition



34 Wetlands & Wildlife Complicate Instrument Landing System Project at Worcester Regional



40 Public-Private Partnership is a Winning Formula for Curaçao Int'l



44 Hilton Head Airport Improves Sole Runway

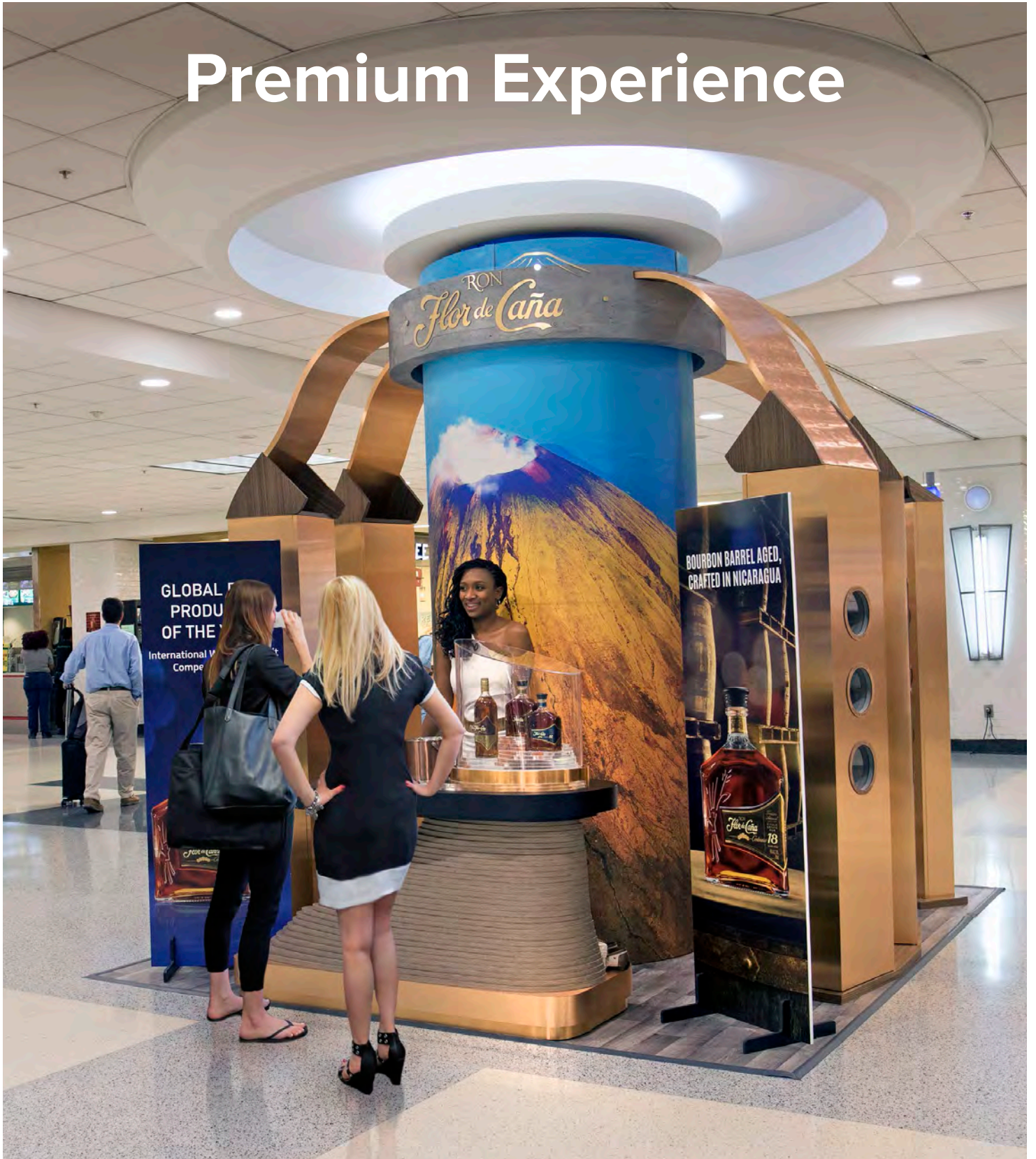


48 Miami Int'l Participates in Blockchain Trial



52 Los Angeles Int'l Adds Automated Screening Lanes at Tom Bradley International Terminal

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56 Nashville Int'l Transitions Shuttle Bus Fleet to Compressed Natural Gas



64 Runway Extension/Rehab at Cherry Capital Gives Airlines a Literal Lift



60 Airports Find Creative Ways to Purchase Luggage Carts



68 Greenbrier Valley Airport Assumes Management of Terminal Restaurant

columns

Publisher's Column
Sophia, Olivia, Jackson & Liam

6 **Industry Insider**
Dale Fowler, president of INDECT USA, makes the case for dynamic pricing in airport parking facilities.

70

advertiser index

ACC	63	CyberLock	57	Passero	11
ACI-NA	59	Daktronics	16	ProDIGIQ	49
ADB Safegate	67	Delta Airport Consultants	62	Quantum Secure	55
Aerosweep	7	Ennis-Flint	36	Republic Parking	61
AirEL	12-13	Gee	31	RS&H	43
Alliance	17	Hi-Lite	2	SEW	BC
AMAC	58	IES	46	SICK	19
Asphalt Systems	47	ITW GSE	21	Sightline	6
AVCON	11	JSM Associates	10	SMART Airports	54
BASF	32	K2	53	SWIFT	38
Becker505	18	Manchester Airport Group	71	Synect	51
Boyd Forecast Summit	50	M-B Companies	39	TWIST Aero	24
Burns Engineering	37	McCain Walls	41	TYMCO	25
BYD	29	Mead & Hunt	66	Tymetal	9
Clear Channel	4	NASi	33	Varco Pruden	42
CTS Cement	27	Neubert	10	Veoci	18
Cultec	45	NLB	26	VHB	37



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Sophia, Olivia, Jackson & Liam

These are the top four baby names of 2017. They're hot and trendy. But what's trending today will likely be forgotten by 2027.

Like names, certain buzzwords have a limited shelf life. Are you sick of hearing about "disruptions" yet? I am.

Another buzzword getting a lot of "traction" (yes, that one has also been used too much) is "innovation." It's almost everywhere. I find that there are two main types of innovation. There are artificially grown innovations that come out of lab-type settings, and there are homegrown innovations, often born out of necessity.

We *love* reporting on innovation at airports. Can't get enough of it. And in this issue, we cover innovations from both types of sources. It's easy to picture blockchain being created by computer scientists, cryptographers and mathematicians. Blockchain has yet to make its introduction at airports; but after reading about the experiences of MIA on Page 48, you'll understand the potential that it brings.

Then there are lower-tech innovations. These take many forms, and several are featured in this issue. How about significant

funding for terminal renovations coming from the private sector? Or a small regional airport getting into the restaurant business because no one else knows the market better? Or medium-sized airports providing passenger luggage carts through a lease-to-own deal that allows them to actually make money with this amenity? And then there's my favorite: A GA terminal building designed to resemble a vintage Corsair aircraft from WWII.

You never know where innovation will come from next. Perhaps reading about your peers in this issue will inspire you to innovate! After all, it will be years before Sophia and Liam will be old enough to launch the next big trend.

Cheers!

Paul



PAUL BOWERS, PUBLISHER

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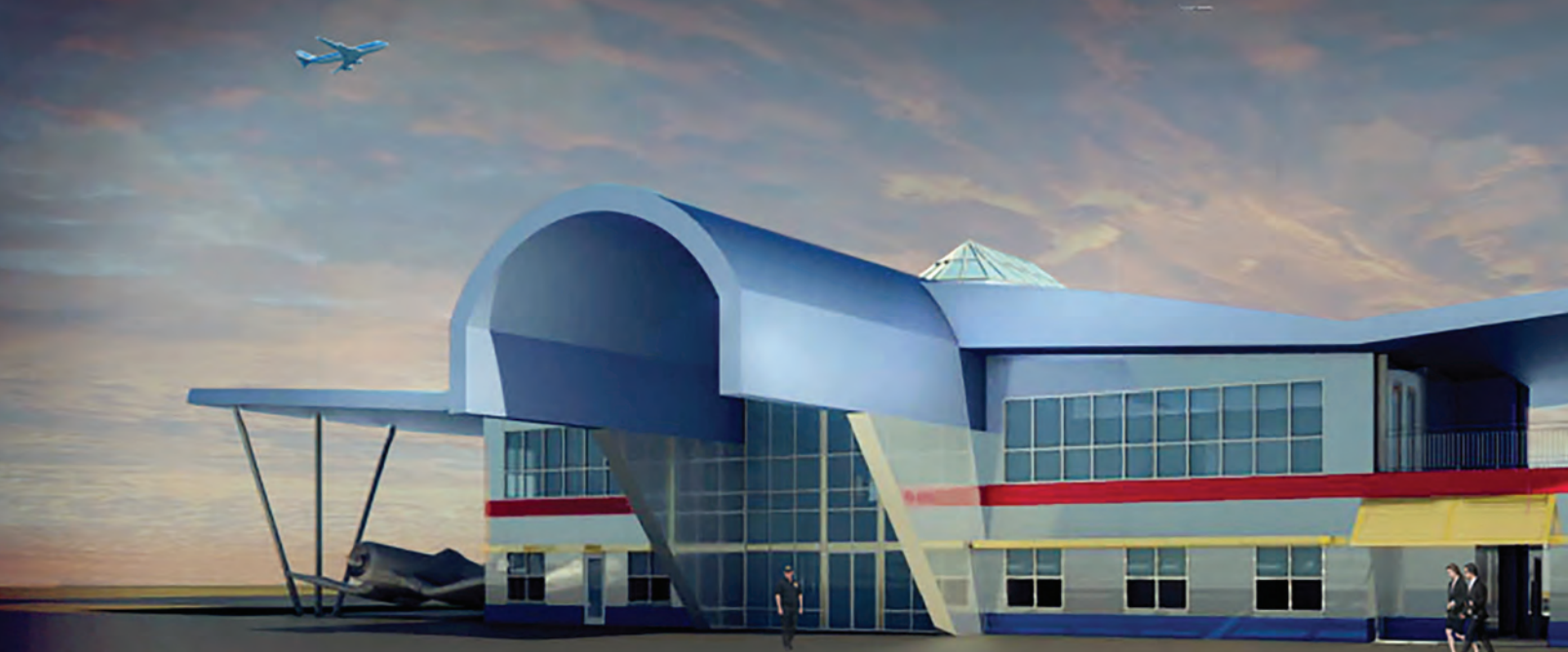
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Fernandina Beach Municipal Opts for Airplane-



FACTS&FIGURES

Project: New Terminal

Location: Fernandina Beach (FL) Municipal Airport

Size: 12,500 sq. ft.

Cost: \$4.5 million

Funding: \$1.34 million supplied by airport; \$1.64 million in FL Dept. of Transportation grants; \$356,355 FAA grant; \$352,590 FL Dept. of Economic Opportunity grant; \$336,000 in interest-free loans from new FBO that will be repaid by airport via rent credits

Airport Owner: City of Fernandina Beach, FL

Fixed-Base Operator: Bent Wing Flight Services

Traffic Volume: 47,000 aircraft ops in 2017


Design/Engineering/Architectural Support/ Construction Admin: Passero Associates

Contractor: F&G Construction General Contractors

Electrical Sub-Contractor: Parker Electric

Project Status: Due to be completed in June

Noteworthy Details: Building resembles Corsair aircraft that flew out of airport in World War II; built to withstand Category 4 hurricane winds; 2nd story observation deck open to public

 Fernandina Beach Airport (FHB) didn't simply build a new terminal to handle general aviation operations for Amelia Island, just off Florida's northeast coast. The project team took a page from the community's history book and designed the building to resemble the iconic 4FU Corsair aircraft that flew from the airport during World War II.

The new \$4.5 million terminal, which is scheduled to open in June, is expected to attract more air traffic to the small city-owned airport and to serve as a destination for the entire community—young and old, aviators and non-aviators.

"This new terminal facility is a unique structure that stands out within the airport industry," says Airport Manager Nathan Coyle. "The building is intended to recognize the history of aviation in Fernandina Beach while also providing first-class service to the aviation community and the general public alike. The facility will provide a home for airport staff and the airport's new FBO, Bent Wing Flight Services; and our hope is that the building will be a hub of activity at the airport."

The two-story, 12,500-square-foot structure replaces an aging, non-descript trailer that previously housed the airport management offices and an old metal hangar that housed FBO facilities.

Passero Associates, the firm that designed the eye-catching building, doubts that there is another terminal like it anywhere else in the world. "It's obviously very unique," says Passero Vice President Andrew Holesko. "Constructing this new building is the most significant project at the airport since the facility opened 70 years ago. We believe it will literally change the airport, the operation and its long-term success in the community."



ANDREW HOLESKO

Design Celebrates Aviation History

The small city-appointed committee that oversaw early planning for the project insisted that the new terminal include more than just office space for the airport and FBO. Members also wanted the new building to present a professional appearance for the airport, portray the area's aviation history and provide space for airport meetings, community gatherings, private events and educational opportunities for local youths.

With expectations running high, the handful of initial concept drawings originally presented by Passero proved too traditional. "We wanted an exceptional building that was truly unique,"



NATHAN COYLE

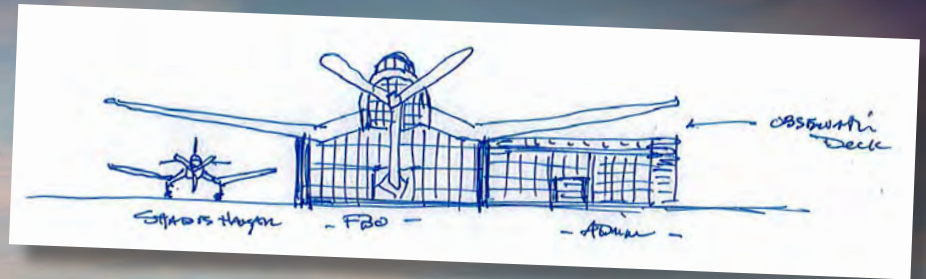


BRIAN ECHARD

Shaped Terminal Concept

BY VICTORIA SOUKUP

ARTWORK: PASSERO



explains committee member and FBO owner Brian Echard. “A lot of municipal airports have the traditional square box facility, but we wanted a building that would set us apart from the rest.”



CHRIS NARDONE

After listening to the committee’s feedback and meeting with Echard to review design options, Passero Architect Christopher Nardone began sketching a building

that resembled a Corsair. “That’s where the ultimate concept started—right after the committee meeting, on a blank piece of paper,” Holesko relates. A month later, the firm returned with a more refined drawing, and the committee unanimously embraced the concept.

The design resonated with committee members because FHB opened during World War II as a training facility for U.S. Navy pilots flying propeller-driven 4FU Corsairs. “The genesis of the terminal was to design a facility that would celebrate aviation and recognize the sacrifices made by the military men and women who served in World War II,” explains Nardone. “And there was nothing more significant than the Corsair to be the image of the terminal and celebrate the rich history of the aircraft.”

Landside visitors enter the building through the tail section, which also serves as a porte-cochere; airside entry occurs through the nose area. Inside the building, a half-scale Corsair replica hangs from the ceiling of the two-story lobby under a skylight shaped like a cockpit. The structure’s inverted gull wings, constructed from steel, shelter an observation deck on the airport side of the building and a shade hangar for aircraft that park on the FBO side.

Nardone describes the inside of the building as “very open, resembling

a large fuselage.” One side of the building houses FBO facilities on both floors. Features include a reception area, shower room for pilots, kitchen/caf  area, a large conference room and executive offices. The first floor of the other side of the building houses more FBO space—a pilot lounge, flight planning area, small conference room and public restrooms—plus the airport administration offices, a breakroom and additional public restrooms. A breezeway connects the two sides, and restrooms on the airport side are accessible from




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The new terminal will combine airport and FBO facilities into one building.



the breezeway. On the second floor is a large administration conference room with a catering breakroom and the covered observation deck that is open to the public.

Passero's design separates the airport operations areas, public areas and FBO facilities, so that when the FBO is closed, the rest of the building, including restrooms, can remain open, accessible and operational.

Airport facilities span about 4,800 square feet, including the covered observation deck and breezeway. The

FBO occupies approximately 5,500 square feet, plus another 2,200 square feet for the shade hangar.

Built to Withstand Hurricane Winds

In order to meet requirements for funding from the Florida Department of Transportation, the terminal was designed to withstand 140 mph winds, which is the threshold for a Category 4 hurricane. For example, the exterior was constructed with concrete block walls and finished with stucco.

"It is not a place to operate during a hurricane or other natural disaster; it is intended to serve as a place to serve the community *after* a disaster," Nardone explains. "Fernandina Beach is a barrier island. If there was a major storm and bridges were knocked out, the only means of support would be to utilize the airfield to bring in supplies and people. We designed the building to ensure that after a storm, the building would be functional and able to serve the community."

Naturally, constructing the terminal to withstand a Category 4 hurricane increased its price tag. "The largest criticism of the project has been related to the \$400 per-square-foot cost of the building," notes Holesko. "It's an expensive building, but consistent with construction industry costs for the strength of the building that is provided."

Project funding came from several sources. The airport provided \$1.342 million, and grants from the Florida

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Department of Transportation covered another \$1.64 million. A \$356,355 FAA grant and \$352,590 Florida Department of Economic Opportunity grant defrayed other costs. In addition, Bent Wing Flight Services provided a \$286,500 no-interest loan to acquire and install the nose and tail of the building, plus a \$50,500 interest-free loan to support early design/engineering costs for the project. Both loans were part of the company's winning response to the airport's request for FBO proposals. The airport will repay the loans by issuing rent credits. "It was an upfront funding source that allowed us to complete the nose and tail of the facility," Coyle explains.

Bent Wing also purchased the Corsair replica and upgraded fixtures to the tune of an additional \$120,000.

New Terminal, New FBO

Bent Wing began operating on April 1, replacing the former FBO that had been at the airport for 25 years. As owner of the new FBO, Echard hopes to attract more flight activity.

"I want more volume," he says. "I think more volume creates more opportunity for the airport and the community. And in order to do that, I have to offer competitive fuel prices and first-class aviation services."

Last year, the non-towered airport logged 47,000 operations on its three runways. Echard thinks that number can only go up.

"The uniqueness of the building will drive a lot of activity here," he predicts. "From the air, the terminal really does look like a giant World War II aircraft sitting on the ramp. We're going to have a lot of World War II memorabilia inside the terminal, and we expect to have a fly-in for the grand opening later this year. Fernandina Beach will become a prominent gathering place for everyone interested in aviation."

Coyle couldn't agree more. "We envision this facility to be the hub of the airport. Not only will we have the FBO and airport staff in one location to provide better services to our users, but we also expect that other agencies such as Civil Air Patrol, the Experimental Aircraft Association and the Friends of Fernandina Aviation will benefit from the new meeting and gathering spaces."

Holesko predicts the new terminal will generate interest in the airport like never before. "The location of the terminal building offers an unobstructed central view of the entire airfield," he notes. "There is a desire to get young people up on the observation deck to experience aviation and learn about flight. And even better, any member of the public can access the deck and spend time there. Or, it can be an entertainment venue for luncheons, business meetings or weddings. The city expects that all of those things will happen at some point." ✈️

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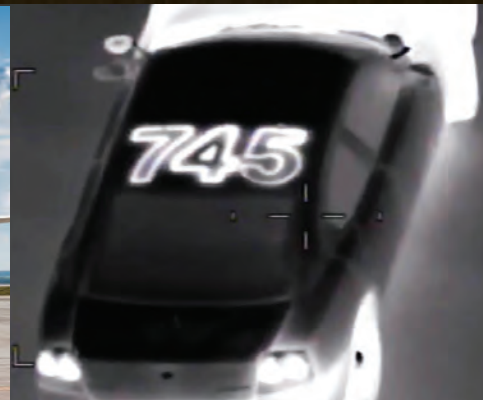
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PROSPECT HILL



Community Collaboration Drives Transformation at Gerald R. Ford Int'l

BY JODI RICHARDS



Jim Gill, president and chief executive officer at Gerald R. Ford International Airport (GRR), is the first to admit that he uses the word “collaboration” a lot when talking about the Grand Rapids, MI, airport—especially its \$45 million Gateway Transformation Project. But with \$17 million of the total cost coming from private donations, it is difficult to find a better descriptor.

Community involvement helped bring Phase 1 of the project to a close in September 2017, and the support continues as the airport prepares to kick off Phase 2 construction later this year. “This community is unlike any other,” Gill states categorically.

West Michigan has experienced tremendous growth over the years, and so has GRR. The Grand Rapids airport has logged record passenger numbers for five straight years. It finished 2017 with 2.81 million passengers, a 5.95% increase from 2016. And Gill says it is “definitely on pace for big numbers this year.” As of March 2018, year-to-date passenger traffic was up 15.3%.

The airport is not only a vital business driver for the community, it is also a reflection of the community. “We’re the front door,” Gill says. “The community wants us to do well and be representative of all the great things that are happening.”



JAMES GILL

FACTS & FIGURES

Project: Terminal Expansion/Enhancements

Location: Gerald R. Ford Int'l Airport – Grand Rapids, MI

Total Projected Cost: \$45 million

Design Architect: Alliance

Associate Architect/Engineer: TowerPinkster

Concourse B General Contractor: The Christman Co.

Food & Beverage Management: HMSHost

Retail Management: Hudson Group

Security/Technology Consultant: Faith Group

Noteworthy Detail: Airport has received \$17.1 million of private donations

Title \$8 Million Donor: Amway

\$1 Million+ Donors: Meijer; SpartanNash; Spectrum Health; Steelcase; Wolverine Worldwide

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Designers added open spaces and natural light to help the terminal feel brighter and friendlier.

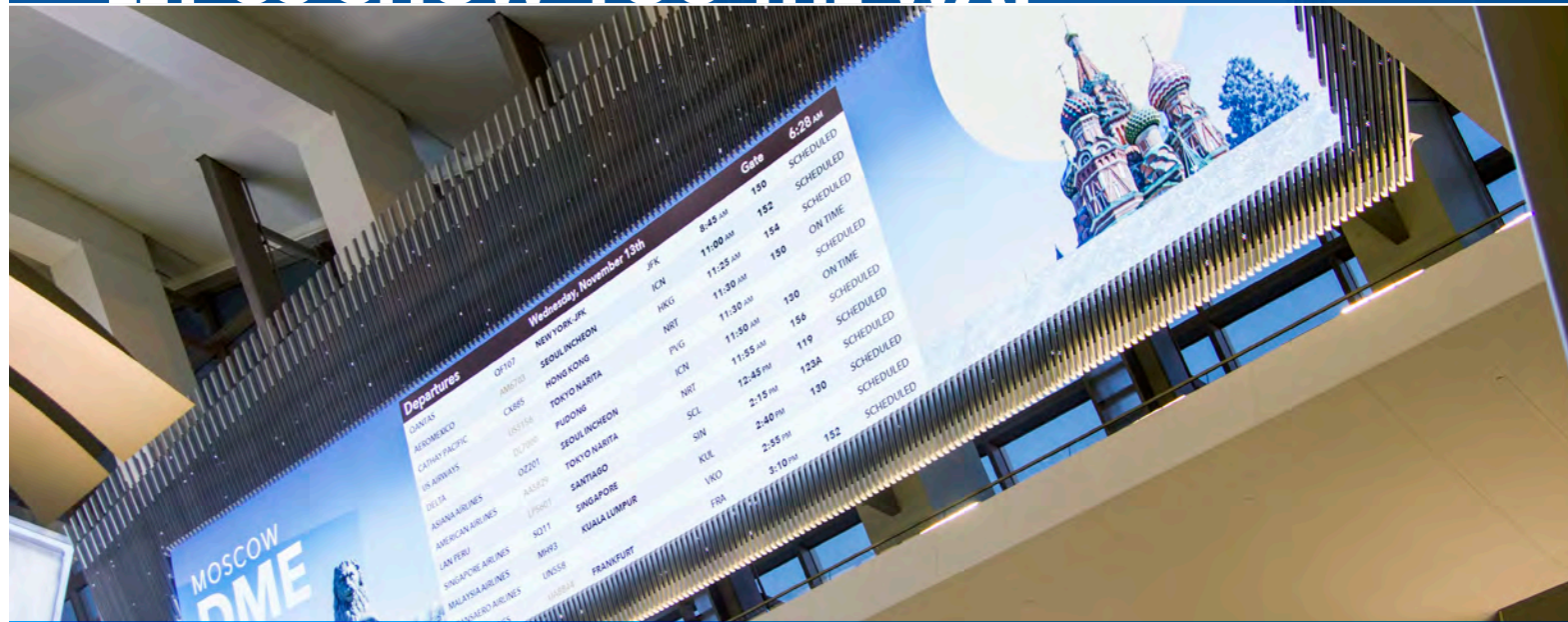
Photo: © JOHN MAGNOSKI PHOTOGRAPHY

At more than 50 years old, the facility was in need of modernization, he adds. “It was time to add some of those features that folks were starting to expect.”

To that end, the airport began construction of its Gateway Transformation Project Phase 1 in December 2015. Over a 21-month period, GRR added 59,000 square feet to the terminal to accommodate a new consolidated passenger screening checkpoint and improve the overall airport experience for travelers. Renovated restrooms, new concessions, four new business lounges, a post-checkpoint children’s playroom, mother’s nursing room and upgraded seating all combine to make the airport more comfortable for passengers.

“We try to give people in West Michigan not only the airport they want, but the airport they deserve,” Gill remarks. “We talk about our tagline all the time: ‘Getting there is better here,’ and we have to live to that mantra.”

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Consolidated Passenger Screening

Prior to the renovation, GRR’s terminal was often described as institutional. “It could have been an airport or a hospital,” explains Tara Hernandez, GRR marketing and communications director. The redeveloped space, however, looks and feels much different. More natural light and an open design make the entire facility brighter and friendlier, she notes.

“As a design team, we’re always looking for inspiration and a baseline for what we’re trying to accomplish,” relates Eric Peterson, principal with Alliance. “The airport’s attention to quality of space and its connection to the community helped us understand where we should go with the design.”

The design and finish materials in the new space celebrate West Michigan with subtle visual references to water, wind and the coast—from the terrazzo flooring to murals of regional scenes on the walls. Materials were also selected to blend with existing facilities. “They wanted it to have character, be expressive of the region and be a



TARA HERNANDEZ



ERIC PETERSON

state-of-the-art facility—something that matches the aspirations and sophistication of the community itself,” Peterson explains.

“The idea was to represent the region the best way we can,” says Gill.

In addition to the openness and natural light, the redesigned space also provides future flexibility, notes Peterson. Recognizing that aviation, and particularly security, are dynamic environments, the design team worked to “remove as many encumbrances as possible so the facility has the greatest amount of flexibility.”

The focal point of Phase 1 was consolidating GRR’s two passenger screening checkpoints into one. Consolidation takes advantage of economies of scale and allows TSA to respond more effectively with staffing, Gill explains. “One location makes the process very efficient.”

Like the airport, TSA and its staff have to adjust to GRR’s tremendous growth. “TSA is a service partner with us,” states Gill. “They continue to support the opportunity to not only expand staff, but also equipment and facilities to make the process continue to be smooth.”

Previously, separate checkpoints in concourses A and B each had two screening lanes, plus the option to open a pre-check lane as demand warranted. The new consolidated checkpoint

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includes six screening lanes, a dedicated pre-check lane and the ability to add a seventh lane, pending equipment and staff.

The transition from two checkpoints to one was carefully coordinated to minimize disruption to passenger flow, says Brian Scherrer, project manager at Faith Group. While some of the TSA-provided equipment was installed before the move, the major shift was phased over the course of a weekend. "A lot of pre-planning in anticipation of the move helped it go very well," reports Sal Mazzola, a senior security systems designer with the firm.

Transforming Concessions

A single, centralized screening checkpoint provides a more efficient security screening experience than the two separate checkpoints GRR previously had. It also allows passengers access to post-security amenities on both concourses.

Previously, food and beverage locations were concentrated before the TSA checkpoints. The additional square footage added during



BRIAN SCHERRER



SAL MAZZOLA



BRYAN LODEN



New post-checkpoint concessions include regionally oriented retail.

Phase 1 allowed for more post-security options. HMSHost focused on providing a blend of local and national offerings, just as travelers expect in today's airports, says Bryan Loden, vice president of business development for the concessionaire. Prospect Hill Brewhouse, a new partnership with HMSHost, provides that local reflection. "They don't want to look like 'Any Airport, USA,'" Loden explains. Experiencing a unique "hometown flavor" is something passengers appreciate at GRR, Gill adds.

Hudson Group opened several Michigan-themed retail locations behind the security checkpoint, including a Touch of Grand Rapids, which features regional foods, gifts, souvenirs, apparel

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and fashion accessories. The airport retailer also operates two Grand Rapids Magazine Travel Stores and two Destination Michigan locations that feature travel essentials and convenience products.

Gill notes that the new consolidated checkpoint makes it easier for travelers to spend their money. Rather than waiting in lengthy security lines, they are getting through in a more efficient manner with time to enjoy GRR's concessions.

Loden reports that HMSHost sales are up about 45% year-to-date. He attributes the growth to the airport's increasing traffic numbers and the variety and quality of food and beverage options now available to travelers. "We knew that the opportunity was there for an enhanced guest experience once the airport did this Transformation project; but we're still very pleasantly surprised on how everything is going," he says. As part of Phase 1, HMSHost gained nearly 4,000 square feet for its food and beverage program.

Technology Enhancements

GRR also took the opportunity to make technology improvements. Specific projects include an access control upgrade, new video surveillance system, updating the flight information display system, dynamic signage improvements, a new 22-by-8-foot video wall at the front of the security checkpoint, a new communications room and installation of a queue management system for the passenger screening checkpoint.

The queue management system is a camera-based system that provides real-time analytics by measuring when passengers enter and exit the queue. The data it collects helps the airport and TSA managing staffing levels and informs travelers of the estimated processing times. "People can check that and plan ahead and have a more relaxed experience," Scherrer notes.

The new communications room provides a secure, centralized data center for the airport and its tenants, with ample space for future enhancements. "The communications room that we built was very forward-looking to provide connectivity and growth," says Mazzola.

Security cameras that can be adjusted remotely provide expanded and flexible surveillance coverage of the facility.

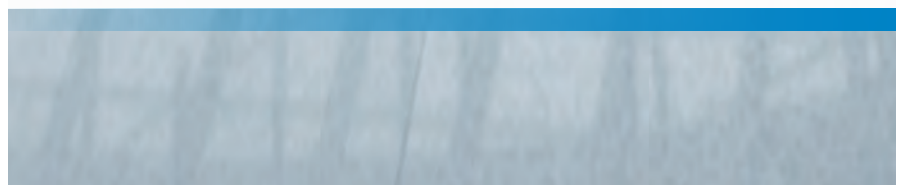


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Transformative Funding

Like any airport, GRR was faced with how to finance its capital improvements. The West Michigan region has always been philosophically supportive of the airport, and that positive relationship helped spur the idea of soliciting local financial support for the renovation program, explains Gill. “We’re very fortunate that the community is so supportive of the airport,” he reflects.

The airport developed an outreach campaign in partnership with the Regional Air Alliance, an economic development group of West Michigan business leaders that focuses on supporting the airport. The mission of the campaign was to make sure that other business leaders understood exactly what they were investing in at GRR. “By far, it was an overwhelming success,” Gill reports.

Garnering financial contributions for the project was not a hard sell, he adds. “It really says something to me when you have business and community leaders that are willing to put their brand with and next to the airport brand. It shows the confidence they have in the airport.”

In total, GRR received \$17.1 million in private funds for the \$45 million Gateway Transformation Project. Amway’s \$8 million donation made it the title sponsor.

Donations came in the form of cash, equipment and in-kind services. For instance, Steelcase donated money, furniture and helped build out the new business centers. “It’s a great way for them to show off their product,” Gill relates.

SpartanNash, a grocery retailer and food distributor headquartered in West Michigan, sponsored the construction of the Military Welcome Center. Located pre-security, it provides refreshments, charging stations, flight information monitors and lounging space for active military members, veterans and their families. Spectrum Health Helen DeVos Children’s Hospital redesigned and added a new children’s play area, family restrooms and nursing rooms.

In partnership with the Gerald R. Ford Presidential Foundation, the airport added an exhibit of photos, an aircraft carrier model and rotating pieces from the Gerald R. Ford Museum, dedicated to the airport’s namesake.

Gill suspects that GRR’s transformation project would have moved forward without private contributions, but the burden of the associated debt service would have largely fallen on the backs of the airlines. “It wasn’t a matter of saying ‘forget about that consolidated checkpoint if you don’t come up with some money,’” he relates. Rather, it was an opportunity to engage the community and continue to make the airlines that serve the airport successful.

“The community and the business leaders really ‘get it,’” explains Gill. “They understand the dynamics of the airport, they want to continue to see it grow, and they’re willing to do what they can to help.”

“If we were running the airport into the ground and it was a dive, no one would want their name associated with it—and I wouldn’t blame them,” he continues. “So it creates for us another level of responsibility to make sure we carry that forward and



The airport’s new business centers are appointed with furniture donated from Steelcase.

always respect our namesake, but also the community that has literally and figuratively invested so much in the airport.”

Gill knows that the level of local support GRR receives is rare. “This sort of community collaboration with the airport is unheard of,” he acknowledges. “Sure, there’s partnerships that take place in other places, but we have the entire business community involved with our mission—without getting in the way and trying to tell us how to operate.”

Continuing the Transformation

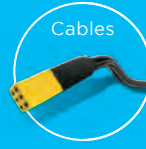
Phase 2 of the Gateway Transformation is currently in the planning stages and will update “front-of-house” areas such as ticketing and baggage claim. GRR is one of the few U.S. airports with CTX baggage screening machines still in the lobby. “The first order of business is to get those machines behind the wall,” Gill says.

As with Phase 1, Phase 2 will focus on modernizing aesthetics and improving passenger convenience, while ensuring flexibility for the future. “If we grow, we want to make sure that we have the technology and assets in place to be able to respond to that from a passenger processing or airline standpoint,” explains Gill. Improvements to airline ticketing, baggage screening and baggage claim, as well as additional restrooms and more pre-security concessions are in the works to help meet those goals. Construction is expected to begin later this year and be complete by the end of 2019.

Additionally, officials are in the process of updating GRR’s master plan, which includes airside capacity enhancements to address growing traffic. “Our growth has been phenomenal, but we have to make sure that we’re always ready for that next level of growth,” Gill notes. ✈️



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Birmingham-Shuttlesworth Int'l Begins Transition to Electric Ground Service Equipment

BY PAUL NOLAN



FACTS & FIGURES

Project: Transitioning to Electric Ground Service Equipment

Location: Birmingham-Shuttlesworth (AL) Int'l Airport

Status: 27 electric charging stations installed in 2016

Airline Partners: Southwest Airlines and Delta Air Lines

Cost: About \$1 million

Funding: 90% FAA Voluntary Airport Low Emissions (VALE) grant; 10% airport funds

Primary Benefit: Reduced greenhouse gas emissions



A project to install 27 electric charging stations at Birmingham-Shuttlesworth International Airport (BHM) is among the recent examples of the ongoing shift to zero-emissions fleets of airside vehicles such as baggage tugs, belt loaders and pushback tractors. The Alabama airport installed 13 dual-port chargers and one single-port charger to support electric ground service equipment purchased by Southwest Airlines and Delta Air Lines. The charging stations and supporting infrastructure, installed in 2016, are located on concourses A and C.

Each dual-port charging station cost \$38,500; the single-port stations cost \$13,000 per unit. Additional costs, such as cable management systems and racks to mount the stations in, brought the total project cost to about \$1 million. Fully 90% of the cost was covered by an FAA Voluntary Airport Low Emissions (VALE) grant; BHM paid for the remaining 10%.



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Southwest anticipates having an all-electric ground support fleet at the airport by the end of next year.

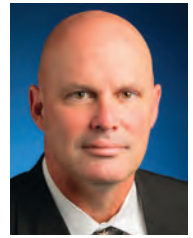
Established in 2004, the VALE grant program supports sustainable projects within EPA designated “non-attainment” counties that help reduce emissions at U.S. airports. The staff at RoVolus has assisted BHM with several VALE applications, and reports that the federal program has awarded U.S. airports \$20

million to \$45 million per year for more than a decade.

According to the FAA, airports are reducing ozone emissions by 478 tons per year through VALE-funded projects. That is the equivalent of taking 26,000 cars and trucks off the road annually.

Carrier Support Was Crucial

Southwest Airlines has access to six dual-port chargers and a single-port charger at BHM, and Delta has access to six dual-port chargers. The airport was able to receive the VALE grant because both airlines committed to replacing diesel-powered baggage tugs and belt loaders. Southwest still uses some fossil fuel-powered equipment at the airport, but plans to transition the rest of its fleet at BHM by the end of 2019, reports Adam Walters, the carrier’s senior environmental specialist.



MIKE THOMPSON

Delta Air Lines plans to transfer refurbished electric ground service equipment from its operations at Hartsfield-Jackson Atlanta International Airport (ATL) to BHM, and use new electric equipment at ATL. Mike Thompson, director of facilities for the Birmingham Airport Authority, emphasizes that BHM needed to demonstrate commitment from airlines to use electric charging stations in order to receive VALE funding. “Without their buy-in, it doesn’t do us any good to put the chargers in,” Thompson explains. “The airlines are not just committing to us, but to the FAA that they will fully utilize the stations.”

“In my experience, it is vital for airports to have sustainability as one of the pillars to stand and support the community it serves,” adds Miguel Southwell, interim president and chief executive officer for the Birmingham Airport Authority. “This VALE-funded program is an excellent example of the success this structure can bring about. We have airline partners working in concert with the airport to improve the emission levels for our city-centered airport with the support of our federal agencies”

Normally, the FAA requires airlines to purchase new electric equipment for airports to receive VALE grants, but Thompson says the agency made an exception for this project because Delta was purchasing new equipment for ATL, and, relatively speaking, BHM is a smaller airport.

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United Airlines and American Airlines, which also serve BHM, did not participate in this phase of its project. But Thompson expects that the airport will work with both carriers to replace their diesel-powered ground service equipment in the future. Their lack of participation to date was more about the airport authority's need to limit the scope of the project for budget reasons than disinterest on the airlines' part, he explains. The airport authority's \$100,000 share of the \$1 million project simply maxed out its budget at that time, notes Thompson.

Application Assistance

The 2016 charging station project is the fourth VALE-funded project that BHM has completed, and a fifth project has already been approved. The airport will use its next VALE grant to construct a compressed natural gas station so it can replace its current diesel shuttle bus fleet and one maintenance truck with vehicles that run on compressed natural gas.



DARCY ZARUBIAK

Thompson credits Darcy Zarubiak, managing director at RoVolus, for helping the airport authority secure most of its VALE grants. The airport authority tackled the application process for its first VALE-funded

project (replacing gas-fired boilers in 2013) in-house and struggled to complete it. "Once we got Darcy involved on the next four projects, it just made everything so much easier and so much smoother. I don't know how many more projects we would have pursued if we continued to try to complete them in-house," Thompson reflects.

Zarubiak advises airport managers on the optimal set of grants to use for various projects. In some cases, VALE grants are coupled with other funding, such as grants from the Diesel Emission Reduction Act to cover more of an airport project. Using various grants is an attractive means for accomplishing projects of all sizes, but the application processes can be cumbersome and time-intensive, says Zarubiak. He regularly tracks more than a half-dozen environmental programs and steers the application process on behalf of client airports.

Zarubiak reports that U.S. airports currently have numerous VALE projects in the works. "They are motivated to do the right thing environmentally, but they face all sorts of time and money limitations," he observes. "Sometimes the VALE money alone doesn't make the project happen, or the VALE program

is difficult to work with, so airports have reached out to other environmental grant programs.

"By my last count, 63 projects around the country have received VALE funding," he reports, noting that he played a role in applying for about 70% of those projects.

With an influx of \$2.9 billion in grant money becoming available from the Volkswagen Clean Air Act civil settlement, Zarubiak advises airport managers to create a wish list of air quality projects that would be eligible to receive grant money. (See sidebar on Page 28 for more details about funds available through the Volkswagen settlement.)

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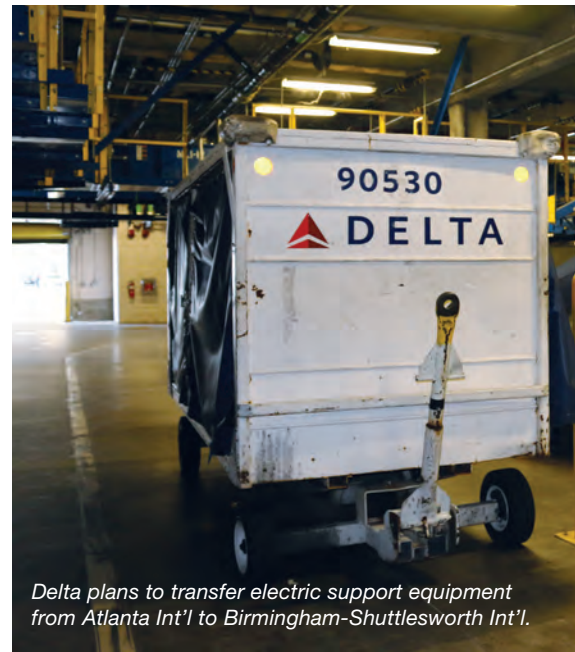
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Delta plans to transfer electric support equipment from Atlanta Int'l to Birmingham-Shuttlesworth Int'l.

Airlines Are Motivated To Go Electric

Even though airlines cannot receive VALE funding, they have plenty of incentive to coordinate with airports on projects like BHM's transition to electric ground support equipment. According to Zarubiak, carriers can save up to \$3,000 per vehicle annually by using electric vehicles, due to reduced fuel and maintenance costs.

Walters notes that Southwest fully funded the new equipment it purchased for operations at BHM at a cost of \$40,000 to \$50,000 per vehicle. When weighing the decision to replace gas-powered equipment, the airline assesses several factors. "You have to look at the entire economic picture, including the size of the fleet, the amount of runtime and usage of the vehicles, and the cost recovery from fuel savings," he explains. "The economics to convert at BHM helped us make the decision to convert."

Beyond saving the airline money, the new electric equipment is a hit with ground service personnel, because they like working with equipment that is quieter to operate. "We have always had a position at Southwest that if an airport is able to install electric charging infrastructure, and the climate supports our battery charging practices, we're going to do our best to convert that operation to electric," he explains.

Walters estimates that 20% of Southwest's nationwide ground service fleet is electric.



The airline tries to use electric vehicles at airports with warmer climates, because their batteries struggle to charge up and retain power during extended periods of extremely cold weather, he explains. As technology improves, though, Walters expects electric ground service equipment will eventually be able to work in most climates.

While airlines aren't eligible for VALE grants, they can receive other grants to help fund the conversion to electric ground service equipment and other environmental projects. But logistics associated with some of the awards can prove cumbersome. For example, DERA (Diesel Emissions Reduction Act) grants and funding related to the Volkswagen settlement can require airlines to pull the engines from diesel-powered equipment being replaced, drill a hole in each engine block and cut up the vehicles' frames as assurance the vehicles are being removed from service. Contracting this work and transporting the equipment to a scrapyard can negate the cost benefits of a grant.

"You have to document this process and send the information for each piece of equipment to the grant administrator so they can authorize the release of funds," says Walters. "When secondary markets exist, we may choose to resell that vehicle instead of going through the funding process because it takes a lot of time and resources. Still, GSE funding is a critical way to reduce emissions at the airports we serve." ✈️

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Volkswagen Settlement Funds Available for Airport Projects

 As part of the settlement for its highly publicized emissions scandal, the U.S. division of Volkswagen agreed to pay more than \$2.9 billion in fines to the U.S. Environmental Protection Agency (EPA). The EPA, in turn, created a trust to make that money available for projects that reduce harmful nitrogen oxide emissions.

Darcy Zarubiak, managing director at RoVolus, says this money is now becoming available, and encourages airport and airline executives to initiate environmental projects that qualify for the funds. (Assisting with grant applications is one of the numerous environmental planning services RoVolus provides to airports and other aviation-related clients.)

Many airport managers are not aware this money is available, Zarubiak notes. “We’ve got a couple of airlines that are paying attention, but it’s remarkable how people say, ‘It’s too much effort,’ or ‘I don’t have time to go for this.’ We’re not talking about a couple hundred thousand dollars; we’re talking tens, if not hundreds, of millions of dollars that are up for grabs across the country. That’s too much money to say it’s too difficult.”

Settlement Details

News broke in 2015 that for almost 10 years, Volkswagen had sold more than 500,000 diesel engine cars in the U.S. with devices that allowed the vehicles to meet EPA emissions standards during testing, but circumvent those standards and emit 40 times more harmful nitrogen oxide during regular use. The U.S. civil settlement calls for Volkswagen to pay \$25 billion in fines and restitution, with \$2.9 billion of that going to an Environmental Mitigation Trust.

Money from the trust goes to attorneys general in all 50 states, plus Puerto Rico, Washington, D.C., and Indian Tribal Nations. The \$2.9 billion was divided according to how many offending Volkswagen vehicles were sold in each state/entity during a six-year period. (The accompanying chart shows how much each state/entity received.)


There are 12 different categories of mitigation actions the funds can be used for, and three apply to projects that make sense for airports, says Zarubiak. One category is specifically for replacing gas- and diesel-powered airport ground service equipment with electric vehicles. Another category applicable to airports is designated for replacing gas-powered forklifts, and the third category is to replace diesel-powered shuttles, transit buses and school buses.

State governments may submit funding requests for eligible mitigation actions at any time, and they have 10 years to spend allocated funds. (After 10 years, unused trust funds will be redistributed as supplemental funding among beneficiaries that have used at least 80% of their allocated funds. Such beneficiaries will be given five additional years to use the supplemental funding.)

The FAA advises airport officials to identify the state agency that is directing the Volkswagen settlement money programs in their state and begin project planning. FAA personnel are working to facilitate these projects by helping obtain answers to questions, connecting key stakeholders and opening lines of communication between various aviation organizations in order to foster the use of Volkswagen settlement funds for aviation.

INITIAL SUBACCOUNTS	INITIAL ALLOCATIONS (\$)	INITIAL ALLOCATIONS (%)
Puerto Rico	\$ 7,500,000.00	0.28%
North Dakota	\$ 7,500,000.00	0.28%
Hawaii	\$ 7,500,000.00	0.28%
South Dakota	\$ 7,500,000.00	0.28%
Alaska	\$ 7,500,000.00	0.28%
Wyoming	\$ 7,500,000.00	0.28%
District of Columbia	\$ 7,500,000.00	0.28%
Delaware	\$ 9,051,682.97	0.34%
Mississippi	\$ 9,249,413.91	0.34%
West Virginia	\$ 11,506,842.13	0.43%
Nebraska	\$ 11,528,812.23	0.43%
Montana	\$ 11,600,215.07	0.43%
Rhode Island	\$ 13,495,136.57	0.50%
Arkansas	\$ 13,951,016.23	0.52%
Kansas	\$ 14,791,372.72	0.55%
Idaho	\$ 16,246,892.13	0.60%
New Mexico	\$ 16,900,502.73	0.63%
Vermont	\$ 17,801,277.01	0.66%
Louisiana	\$ 18,009,993.00	0.67%
Kentucky	\$ 19,048,080.43	0.71%
Oklahoma	\$ 19,086,528.11	0.71%
Iowa	\$ 20,179,540.80	0.75%
Maine	\$ 20,256,436.17	0.75%
Nevada	\$ 22,255,715.66	0.82%
Alabama	\$ 24,084,726.84	0.89%
New Hampshire	\$ 29,544,297.76	1.09%
South Carolina	\$ 31,636,950.19	1.17%
Utah	\$ 32,356,471.11	1.20%
Indiana	\$ 38,920,039.77	1.44%
Missouri	\$ 39,084,815.55	1.45%
Tennessee	\$ 42,407,793.83	1.57%
Minnesota	\$ 43,638,119.67	1.62%
Connecticut	\$ 51,635,237.63	1.91%
Arizona	\$ 53,013,861.68	1.96%
Georgia	\$ 58,105,433.35	2.15%
Michigan	\$ 60,329,906.41	2.23%
Colorado	\$ 61,307,576.05	2.27%
Wisconsin	\$ 63,554,019.22	2.35%
New Jersey	\$ 65,328,105.14	2.42%
Oregon	\$ 68,239,143.96	2.53%
Massachusetts	\$ 69,074,007.92	2.56%
Maryland	\$ 71,045,824.78	2.63%
Ohio	\$ 71,419,316.56	2.65%
North Carolina	\$ 87,177,373.87	3.23%
Virginia	\$ 87,589,313.32	3.24%
Illinois	\$ 97,701,053.83	3.62%
Washington	\$ 103,957,041.03	3.85%
Pennsylvania	\$ 110,740,310.73	4.10%
New York	\$ 117,402,744.86	4.35%
Florida	\$ 152,379,150.91	5.64%
Texas	\$ 191,941,816.23	7.11%
California	\$ 381,280,175.09	14.12%
Tribal Allocation Subaccount	\$ 49,652,857.71	1.84%
Trust Administration Cost Subaccount	\$ 27,000,000.00	1.00%
Tribal Administration Cost Subaccount	\$ 993,057.15	0.04%
	\$ 2,700,000,000.00	100.00%

Zarubiak says he understands that some airport managers are reluctant to divert resources and time to drafting and submitting requests for these funds. “It’s really hard to prioritize a program that no airport has ever seen,” he commiserates.

But he also emphasizes that the amount of money available is much greater than the funds from grant programs that aviation professionals are familiar with. Also, because many airlines stand to reap significant savings if they can use Volkswagen settlement money to convert to electric ground service equipment, many have offered to help airports draft their proposals. 

Settlement Resources

Visit VWclearinghouse.org to view a resource for potential beneficiaries created by the National Association of Clear Air Agencies) and the National Association of State Energy Officials.

The EPA has published a list of frequently asked questions about the Volkswagen Mitigation Trust Agreement. It is available at <https://bit.ly/2KqGPvM>.

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Denver Int'l Tests Greener Pavement Deicer

BY BRIAN SALGADO



FACTS&FIGURES

Project: Environmental Runway Deicer Trials

Location: Denver Int'l Airport

Avg. Amount of Deicer Purchased: 400,000 gallons/winter

Product Tested: 4,000 gallons of Alpine RF-14F by Nachurs Alpine Solutions Industrial (made with formic acid from BASF)

Timeline: Winter 2017-18

Trial Results: Potassium formate performed like potassium acetate, with 1/3rd less chemical oxygen demand

Price Comparison: Potassium formate costs about 10% more than potassium acetate

Other Potassium Formate User: Morristown (NJ) Municipal Airport



Building on its mountain of other sustainability programs, Denver International Airport (DEN) tested an environmentally sensitive runway deicer last winter, and initial results were promising.

Like most U.S. airports, DEN typically uses potassium acetate for deicing critical airfield pavement. But the airport's environmental group reached out to Field Maintenance Director Ron Charles about potassium formate, and he was



RON CHARLES

immediately intrigued. "It has been in use for years in Europe primarily over acetate, but I didn't know it was available to us," he comments.

After verifying that Alpine RF-14F, by Nachurs Alpine Solutions Industrial, is approved under AMS 1435 for use on airfield pavement, Charles agreed to give it a try. Throughout his five years at DEN, however, potassium acetate had always been the runway deicer of choice.

The competitive advantage of potassium formate is that it breaks down more readily after use. According to Nachurs Alpine, its deicer requires one-third less oxygen



to biodegrade in waterways than potassium acetate; so, its product has the lowest environmental impact of any commercially available runway deicer.

Despite its lower chemical oxygen demand, potassium formate is considered a sister product of potassium acetate, meaning the products deliver comparable deicing results.


Unfortunately, leaving behind a smaller carbon footprint isn't the only way potassium formate is "greener" than its acetate counterpart—formate also costs about 10% more.

BASF partnered with DEN to compare the performance of potassium formate and potassium acetate during the airport's snowy winter season, because it supplies the formic acid that is used to produce potassium formate for the alternative deicing product.

Charles expected the formate and acetate to deliver comparable results, and he was not disappointed when testing concluded in February 2018.

Running the Trials


Field maintenance crews emptied the acetate from one of DEN's 4,000-gallon



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chemical trucks and filled it with formate, so they would be ready to apply the alternative deicer during the next snow event. When the airport received 2 to 3 inches of accumulation, crews applied acetate to one of DEN's six runways and formate to an adjacent taxiway. Charles explains that it was important to choose pavements that were near one another (vs. two runways or two taxiways that were farther apart), because DEN's airfield is so large that various sections can experience surprisingly different weather conditions at the same time.

Before applying the deicing materials, crews followed their usual strategy of first clearing the runway and taxiway with plows and blast-brooms, and then spreading sand in an 80-foot-wide swath on the exposed pavement. They then applied an 80-foot-wide swath of each deicing product. Liquid deicer not only causes a chemical reaction, but also wets the sand, which helps hold it in place and improve traction, notes Charles.

"We basically applied the products side-by-side to see how the potassium acetate holdover time on the runway compared to the potassium formate holdover time on the taxiway connected to that runway," he explains.

Crews measured the results by monitoring takeoffs and landings, and using operations vehicles to perform friction tests

on the runway and taxiway surfaces. The tower also received reports from arriving flight crews categorizing the braking action as "good," "fair" or "poor." When conditions were reported as "fair," maintenance crews were scheduled to add more deicing chemicals to the surfaces. If conditions were deemed "poor," crews were deployed immediately to improve conditions.

Green Enough or Greener?

The potassium acetate DEN currently uses meets the airport's environmental goals. It is non-corrosive to machinery and airfield pavement. Maintenance crews do not have to perform cleanup procedures after applying it, and once it's diluted, it is environmentally stable. But potassium formate provides comparable results with less environmental impact; so DEN will consider using it in the future.

"Our environmental office would like to make us even more environmentally friendly," Charles comments. "Our goal is to continue to become as green as possible; so we took a shot at this to see if we can."

Due to the smaller footprint that potassium formate leaves on the environment, DEN will accept bids from its vendors for both potassium formate and acetate for use during the upcoming winter.



Runways love chemistry.

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“We would consider either replacing acetate or using one or the other for certain areas,” Charles says. “All of our storage tanks are filled with the same product, but are drawn down near the end of the winter season. We probably would not be looking at having to do a full-out exchange, however cleaning and moving the product out would be costly and extensive in the beginning.”

However, since DEN is run by a municipality, price is king. The vendor with the lowest bid will win the airport’s two- to five-year contract—no matter which type of approved deicer it sells. Given the high volume of deicer DEN purchases (about 400,000 gallons per year), it could actually help bring down the price of potassium formate in the United States if the busy airport makes the switch, muses Charles. Naturally, it all depends on which vendor wins the contract.

“To start off, we may want to have a mix just to ensure we have the same hold and everything is working the same,” Charles comments. “We potentially could use formate probably for the long term if that’s the lesser cost of the two. This is in the infant stage for us, so there are still a lot of unknowns.”

Ideal Location

BASF is conducting deicing trials at a handful of U.S. airports. Morristown Municipal, in New Jersey, tested potassium formate on

its runways in 2016 and has continued to use it since the trial.

However, DEN is the largest U.S. airport to put potassium formate to the test. “For us, Denver is a great test site because it is a large mainstream airport that has to always operate, has to be safe, and needs to accommodate aircraft coming in and taking off,” says BASF Market Development Manager Ben Glowacki. “It’s a true test case for this technology.”



BEN GLOWACKI

According to Glowacki, the trials at DEN and other locations proved exactly what BASF expected, giving the company more evidence about its product’s performance and environmental advantages.

“Our main message and reason for doing the runway trials is to show potassium formate performs just as well as potassium acetate,” Glowacki explains. “You save on wastewater treatment costs with no performance drawbacks. Potassium formate provides the opportunity to be better to the environment.” ✈️



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Wetlands & Wildlife Complicate Instrument Landing System Project at Worcester Regional

BY KRISTIN VANDERHEY SHAW





Worcester Regional Airport in Worcester, MA, is perched on a hill 1,000 feet above sea level, which is high elevation in that area. It's also one of the snowiest cities in the United States, regularly receiving over 100 inches of white fluff per winter. And although Boston is only about 40 miles away, Worcester experiences significantly different weather patterns. On average, Worcester reports 42 more days of fog per year than Boston. That's four times the fog occurrence rate.

The weather poses unique challenges for Worcester Regional Airport (ORH). Imagine that Boston Logan International Airport (BOS) is having an overcast day with low ceilings; Worcester Regional Airport, at the top of the hill, would be enveloped in those same low-lying clouds.

In 2010, the city of Worcester turned over ORH to the Massachusetts Port Authority (Massport), which further strengthened its connection to BOS. Although ORH's proximity theoretically makes it an ideal reliever for the larger international airport, weather frequently gets in the way.



ANDY DAVIS

"With the Category I [instrument landing] system we had, the runway visibility minimums were 1,800 feet," says ORH Director of Aviation Andy Davis. "As we tried to recruit new airlines, we saw resistance."

In 2012, the airport petitioned then-Secretary of Transportation Ray LaHood for a Category IIIb instrument landing system (ILS), to enable pilots to land with a visibility ceiling as low as 50 feet above the ground and a visual range ahead of them as short as 600 feet.

"The FAA did a cost-benefit analysis and didn't see a demand large enough to install CAT III," says Davis. "It was a chicken and egg situation—we could see a demand, but it wasn't at that level yet, and couldn't grow without a CAT III system."

Davis believed a CAT III system would help the airport grow because airlines demand reliability.

"Airline demand is increasing—just look at Logan's numbers," he says. "What this does is allow us to give customers in central Massachusetts an option that is much closer to them. It's the second largest city in New England, and we have the population density to support more air service and airlines."

Later in 2012, LaHood was invited to tour central Massachusetts, and ORH was included on the itinerary; Massachusetts Bay Transportation Authority was installing a rail system from Worcester to Boston for commuters and promoting commercial aviation. Davis asked him if the FAA could see that there was a benefit, and he posed the question on behalf of Massport, "If we could fund [a CAT IIIb ILS] could the FAA manage it?" The FAA said yes.

The Environmental Challenge

Massport, which owns and operates the airport, authorized funding to upgrade the ILS on ORH's main runway. In total, the project cost about \$32 million, which was paid for by federal grants and the capital from Massport.

The airport brought in its longtime consultants Jacobs Engineering Group and Vanasse Hangen Brustlin (VHB) to start working toward permitting and design. Permitting was a unique challenge because ORH is located on environmentally sensitive wetlands within the protected watershed area of the city of Worcester water supply. It was incumbent upon the team to protect the water quality and reservoir.

The wetlands location requires the airport to pay particular attention to its wildlife management program. It also meant that protecting the resource area and animal habitat was a priority as the consultants tackled challenges associated with the permitting, design and construction of the new CAT III approach.

"The soil at Worcester is the Massachusetts State soil, known as Paxton soil. This contains high percentage

of silt and fines, which made controlling erosion paramount in the protection of the reservoir," says Jacobs Division Vice President Dave Chamberlain. "Keeping the water clean is critical. Until vegetation is established in all disturbed areas, every rain event is a challenge."



DAVID CHAMBERLAIN

Crews monitored discharge during rain events of greater than a half-inch to ensure that turbid discharges didn't affect downstream wetland resources and the reservoir.

Plan A...and B...and C

According to Chamberlain, Jacobs brought together experts in all of the disciplines, routing everything through the FAA, Massport, and the agencies then communicating back. VHB was engaged for environmental impact and erosion monitoring, Green International Affiliates for drainage designs, and J.F. White as the local general contractor.

The original plan was to build a new parallel taxiway, which would have replaced five to 10 acres of wetlands. But that wouldn't be permitted, as it was an unacceptably large area of wetlands to be removed or altered.

FACTS&FIGURES

Project: Category IIIb Landing System

Location: Worcester (MA) Regional Airport

Cost: \$32 million

Timeline: Planning began in late 2012 & ended in 2016; construction was completed in Dec. 2017; system went live on March 19, 2018

Features: Jughandle taxiway; wildlife protection measures; design & construction strategies to preserve wetlands

General Contractor: J.F. White

Project Management: Jacobs Engineering

Environmental Consulting: Vanasse Hangen Brustlin



Crews completed the “jughandle” portion of the project in 2017.

PHOTO: BILL RICHARDSON, JACOBS ENGINEERING

Chamberlain and the Jacobs team didn’t want to transport a lot of fill through town because it would cause traffic, damage the local roads and disrupt neighboring residents.

“We had an innovative idea of creating the required fill by tunneling in the hill and using that as a parking area,” says Chamberlain. “We thought we could take the fill out of the tunnel.”

However, it wasn’t cost effective, and Jacobs went back to the drawing board. Plan B was a retaining wall to minimize the impact to the wetlands; not as much fill was required for this design.

The project team also had to address the unique challenge that the grasslands on the airfield support an endangered species called a grasshopper sparrow. The grasshopper sparrow’s nest is an open cup concealed on the ground under vegetation; the birds forage for insects, especially grasshoppers, and seeds in the grasses.

Ultimately, the construction had to minimize the impact to the grasses. In order to do that, the team had to reduce the construction zones and schedule around the breeding season. Construction was not halted, but crews had to approach the nesting areas very carefully.

Having a good relationship with state resource organizations, the state’s Natural Heritage & Endangered Species Program, and Department of Environmental Protection was a key factor. Because VHB had worked with the organizations before, the consultants knew what was needed to create a plan that would be approved and constructed. As a result, there were no significant delays and all permits were issued on time and on schedule.

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New Taxiway, New Design Approach

A standard CAT III ILS requires a full parallel taxiway. However, to save funds and reduce the footprint on the wetlands, the project team came up with a modification: a partial parallel called a jughandle.

The jughandle allows Air Traffic Control to safely hold aircraft awaiting departure out of the Runway Safety environment and allowing for the arrival of additional aircraft during low visibility.

“The jughandle is at the approach end, but aircraft can exit the runway if they have to or they can turn around,” says Davis. “The FAA has the understanding that in the long run, we may need a parallel runway if our demand begins to increase. We’re on a hill, so we would need barrier walls and retaining walls, and we would need to create a plan for that.”

Timing of the related runway closures was key. Luckily, JetBlue’s two daily flights at ORH are close to each other in the afternoon. That allowed the airport to schedule construction longer during the day, resulting in longer construction periods (up to 18 continuous hours).

“At the sacrifice of having to juggle the contractors, we were able to keep customer impact to a minimum,” says Davis.



The localizer component of the CAT III project.

Better Lighting

Along with the instrument landing system, the airport upgraded the existing Runway 11 Medium-Intensity Approach Lighting System with Flasher (MALSR) and ALSF-2 on primary Runway 11-29, which helps approaching planes align vertically with a glide slope indicator that provides information about elevation and angle of approach, and helps approaching planes center on the runway with a localizer.

The approach lighting system includes higher intensity lights and sequence flashers to provide visual guidance to pilots during low visibility conditions. The glide slope sends out a radio signal



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and helps approaching aircraft land. In essence, the glide slope aligns the plane vertically, and the localizer aligns it laterally to help center it on the runway.

For the approach lighting system, the plan doubled the number of light towers. The challenge, however, was that several of the existing light towers were in wetlands areas, which meant that some of the new towers also had to be put in wetlands as well.

To minimize the footprint of the towers, steel sheeting was driven into the ground to protect the area. Using sheet piling minimized damage and limited impact to about 3,500 square feet of wetlands.

By using this technique along the slope with the retaining wall, the team was also able to meet its erosion goals.

More Routes Secured


The new system officially went live March 19, after 2,000 hours of FAA-required testing to certify it.

“The airport will be able to operate aircraft during low visibility,” says Chamberlain. “The new landing system should be able to relieve the traffic, too; and we hope airlines will bring in additional flights.”

Davis, who has been with the airport for almost a decade, is positive about the outlook.

“The initial response we’re getting from JetBlue adding a flight to JFK is a result of the new navigational aids. With our new routes on American Airlines, I’d like to say we will have heads turning in our direction.”

In May, new service with JetBlue Airways will begin to John F. Kennedy International Airport—marking the first significant connector route at ORH in over a decade. Davis says that in October, American Airlines will begin a daily morning flight to Philadelphia International, providing great connecting opportunities to the south and west.

“What I’m excited about is that Worcester is going through a renaissance,” says Davis. “We have 12 colleges and universities in the area, which means we are basically a college town. The city itself is going through a rebirth. For instance, 60 new restaurants have opened in the last 18 months. The demand to do business and grow in Worcester is there, and we’re right in step with the city and growing the airport to provide residents with more travel options.” 

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Feb. 9, 2017 (13.0") | Mar. 14, 2017 (14.4") | Jan. 4, 2018 (16.8") | Mar. 7, 2018 (16.4") | Mar. 13, 2018 (21.8")



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MB3 BROOM | EGE | MAR 2018



Public-Private Partnership is a Winning Formula

 Curaçao International Airport (CUR), on the Dutch Caribbean Island of Curaçao, is in the home stretch of a \$36.4 million expansion and renovation to increase its capacity from 1.6 million to 2.5 million passengers per year. The sweeping project will also update the terminal's look and improve operating efficiency for the growing number of tourists who visit the beach and scuba diving haven.

Curaçao Airport Partners, a consortium of international investors, broke ground on the project in June 2016 and expect it to be completed by this December. The private consortium provided \$26.4 million of the cost for the expansion and renovations; the other \$10 million was supplied by the Airport Trust Fund, which consists of contributions from Curaçao Airport Holding, the government-owned entity that holds title to the airport, and Curaçao Airport Partners.

The project exceeds its obligations as outlined in the 30-year Development, Operation and Management Agreement the private consortium signed with the government-owned holding company back in 2003. Per the agreement, the consortium opened a new terminal in 2006 to accommodate 1.6 million passengers a year. "Our contract read that when we reached 1.6 million, we would be obligated to design a terminal to accommodate up to 2.5 million, and when it reached 1.8 million, we would start construction," explains Bryan Elshot, manager of airport development for Curaçao Airport Partners.

Even though CUR had not reached the contractual passenger thresholds, operational strains and the desire to fuel the momentum of local development prompted the private consortium to invest in airport improvements ahead of schedule. In 2014, Curaçao Airport Partners hired Corgan Associates to design an expansion project with new construction and renovations to existing facilities.

Wilhelmus Ignacio, managing director of Curaçao Airport Holding, praises Curaçao Airport Partners for its cooperation with the government and willingness to begin the terminal expansion before it was required.

"Although we reached 1.7 million passengers, we never reached the contract number of 1.8 million," Ignacio points out. "But the logistics of the airport were not up to par considering today's standards, and everyone agreed that something had to be done. We are doing more than the contract requires, because everyone wants the airport to be one of the best in the Caribbean. (As the government representative), we could never have done this on our own, because of the tens of millions of dollars it takes to build a class-A terminal."



BRYAN ELSHOT



WILHELMUS IGNATIO



FACTS&FIGURES

Project: Terminal Expansion & Rehabilitation

Location: Curaçao Int'l Airport (Curaçao Island, Dutch Caribbean)

Owner & Regulator: Curaçao Airport Holding

Airport Management: Curaçao Airport Partners

Project Cost: \$36.4 million

Funding: Curaçao Airport Partners - \$26.4 million; Airport Trust Fund (Curaçao Airport Holding & Curaçao Airport Partners) - \$10 million

Lead Architect: Corgan Associates

Project Manager: ICM Consult

Architectural Project Manager: IMD Design

Project Advisor: Moedt Property Services

General Contractor: ALBO Caribbean

Telecommunication, Security & Airport Systems: Moya Consulting; SITA Systems; INDEL

Structural Engineer: Civil Engineering Caribbean

Mechanical, Electrical & Plumbing Engineer: Energy & Automation

Electrical: GEWI Technical Services

Heating, Venting & Air Conditioning: CHS Technical Contracting & Trading Co.

Baggage: Vanderlande Industries

Boarding Bridge: ThyssenKrupp Airport Systems

Seating: Vitra Int'l

Elevators/Escalators: OTIS/Caribbean Elevators

E-Gates: Vision-Box

Tiles: LOT 1038; Royal Mosa

Of Note: Public-private partnership is investing in airport development to foster & encourage island development; private operator initiated & executed terminal renovation/expansion before it was contractually required

for Curaçao Int'l BY ROBERT NORDSTROM

Preparing for the Future

Historically, Curaçao functioned more as a business hub than a tourist destination. Numerous oil refineries were especially prominent. But over the past decade or so, the island's tourism has grown considerably. As it did, the airport's shortcomings became more evident and problematic, reflects Ralph Blanchard, chief executive officer of Curaçao Airport Partners.



RALPH BLANCHARD

"For us, the airport expansion represents an opportunity," he explains. "We see Curaçao as a uniquely appealing and attractive destination to a global travel consumer base. We want to competitively position Curaçao to achieve the traffic success that we believe is within our reach. Our traffic concentration in the European market is already mature, and we are very actively looking to greatly expand consumer awareness of Curaçao in the U.S. market. But the airport's limitations had to be addressed. The functionality wasn't there, and space was tight."

Even though the existing terminal was fairly new, users and stakeholders alike knew it lacked the right efficiencies and amenities for travelers. Something had to be done, notes Blanchard. When the current improvement project is completed later this year, the terminal will be approximately 80% bigger, and in a much better position to accommodate the airport's 20 air carriers, which provide a mix of regional and international service.



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The project's main challenge, Elshot informs, was finding ways to minimize operational disruptions. Early in the project design phase, stakeholders were interviewed to determine not only what they needed, but also what they wanted—"the small things that make people happier and ultimately translate into a better experience for travelers," says Elshot.

"We kept our stakeholders aware of what we were going to build and how we were going to build it," he adds. "We let them know ahead of time the inconveniences they would experience. Everyone felt included."

While the existing terminal highlights the Dutch Colonial architecture and pastel color scheme that dominate the island, Curaçao Airport Partners wanted the new terminal to have a clean, modern aesthetic to project the future of Curaçao. Increasing capacity and operational efficiencies were other main objectives, notes Corgan Principal John Trupiano.

On the west side of the terminal a 22,000-square-foot addition doubles the holdroom capacity and includes a Code F gate with a new wide-body aircraft jet bridge. The expansion will also add new concessions and a bigger airport-run VIP lounge.

In the old terminal, a shared arrivals/departures corridor created operational difficulties with gate dependencies. Often, airport staff had to hold up departing travelers while arriving passengers moved through the corridor. To eliminate these issues and improve operational flexibility, the new terminal will include a sterile corridor on the mezzanine level for arriving passengers. Three new screening lanes at the security checkpoint will bring CUR's total to five.

With the old terminal's configuration, arriving passengers collected their baggage and proceeded through Customs, then stepped outside, where friends and family waited curbside. The new design relocates Customs, and arriving passengers will be greeted by friends and family in a bright and colorful indoor space with new concessions, new seating and reconfigured rental car counters. The new Arrivals Hall is already proving to be a photo-op landmark for passengers, and the airport plans to host seasonal events in the multipurpose space.

The Immigration Hall has been expanded and reconfigured, with more attention on E-gate processing to reduce wait times. A total of eight E-gates encourage travelers to manage their own clearance by authenticating their passport and verifying their identity through biometric screening.

Part of the Customs and Arrival Hall relocation included the addition of a wide-body baggage reclaim device. Arriving passengers now pass through a new duty-free shopping area between the baggage claim area and Customs Hall.

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A revamped concessions program adds new airside options, including walkthrough duty-free shopping immediately beyond the security checkpoint.

The new terminal also includes a mirador—a much-loved architectural feature of the original airport that was eliminated when the current terminal was built in 2006. The mirador was essentially an observation area that allowed the public to watch airplanes landing and departing, and even wave to loved ones as they boarded and disembarked. It connected the community to the airport, explains Trupiano.

The new mirador is located on the rooftop of the west expansion. A landside stairway and elevator provide public access to the covered observation area. “It was very important to our client that we incorporate a mirador in the new design, and they made a significant investment to make it happen,” says Trupiano. “The goal was to reengage the community with the airport, give something back to the public that had been missing for the past 10-plus years.”

The Future Looks Bright

With the project nearly complete, Curaçao Airport Holding and its private consortium partner Curaçao Airport Partners are both enthusiastic about the new terminal and what it will mean for the future of the island.

“What we are getting goes beyond our expectations,” reflects Ignacio, speaking on behalf of the government entity.

The private consortium, in turn, sees the terminal project as a tangible expression of its long-term commitment to the airport, government and overall development of Curaçao.

“Approximately 12% of the eastern side of the island is undeveloped,” explains Blanchard. “Going forward, Curaçao can rewrite its tourism product just by looking at that section of the island. We see the airport as a catalyst for growth and for helping the island to plan and execute a master strategy for tourism that will help the island reach its full potential. By the end of 2018, we will have put together a business and operational platform that we believe will accommodate the airport’s and island’s projected traffic demands and that will optimize the value of this national asset for the government as well as the shareholders of the private company responsible for its management and development. The Curaçao International Airport is an excellent example of the success that can be achieved when public and private entities cooperate to develop and manage critical national assets. We’re hoping that we’ll be looking to expand again once we reach 2.5 million passengers—within the next seven years or so if things go as we envision.” ✈️

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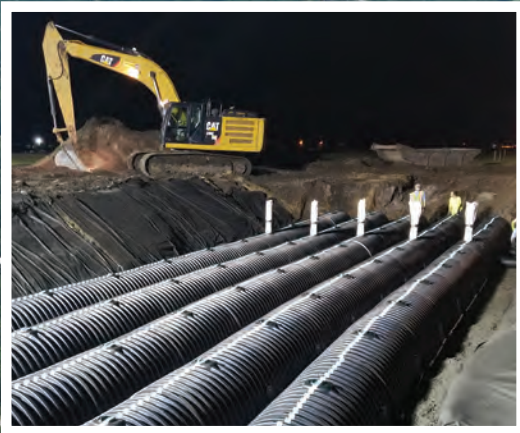
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Runway Improvements at Hilton Head Airport Enhance Safety, Service Options & Stormwater Management

BY KEN WYSOCKY



FACTS & FIGURES

Project: Runway Improvements

Location: Hilton Head Island (SC) Airport

2017 Enplanements/Deplanements:
27,332/30,553

Key Components: 700-foot runway extension; stormwater detention system; 2 engineered material arresting systems

Runway Extension: \$14.1 million

Stormwater System: \$5.4 million

Arresting Beds: \$8 million

Funding: 90% FAA; 5% state; 5% airport revenue

Engineering Consultant: Talbert, Bright & Ellington

Engineering: Ward Edwards Engineering

Prime Contractor: Quality Enterprises USA

Stormwater Chambers: CULTEC

Key Benefits: Improved safety; ability to accommodate larger aircraft/provide more travel options to passengers; enhanced stormwater management & wildlife mitigation

A \$14.1 million runway extension project at Hilton Head Island Airport (HHH) will enhance safety and allow the South Carolina airfield to accommodate larger aircraft. At the same time, the project also offers a practical blueprint for how to address local sentiment that runs counter to FAA recommendations.

The project, expected to end in late June, adds 700 feet to HHH's only runway (403 feet on one end and 297 on the other end), extending it to 5,000 feet. The additional length enabled American Airlines—the airport's only commercial carrier—to replace its Dash 8 turboprop service with regional jet service via 76-passenger Embraer 175s. That provides residents and tourists with more travel options, says Jon Rembold, airport director for HHH and nearby Beaufort County Airport.



JON REMBOLD

"In addition, we now can receive private aircraft from airports that are farther away than before, because the longer runway allows them to carry more fuel and people on board. It opens up their range," Rembold points out. The new length also makes HHH

more competitive with Savannah/Hilton Head International Airport, located about 45 miles southwest, and Charleston International Airport, located about 100 miles northeast, both which have runways more than 9,000 feet long, he adds.

Along with the runway extension, the airport installed a new \$5.4 million stormwater management system that stores, treats and transports rainwater downstream via a system of large underground plastic chambers. Stormwater management is critical because HHH sits amid an 81,000-acre environmentally sensitive watershed that includes the Calibogue Sound, three rivers and their tributaries, creeks, lakes and tidal flats. As such, the area is home to wildlife such as ospreys, bald eagles and dolphins.

The new system, which replaced a drainage canal adjacent to the airport's runway, also serves as a wildlife mitigation tool, because there is no longer standing water to attract animals such as foxes, coyotes, deer, alligators and birds, Rembold explains.

The airport further enhanced airfield safety by installing 200-foot-long engineered material arresting systems (EMAS) at each end of the runway. The FAA paid for 90% of the \$8 million safety project, the South

Carolina Aeronautics Commission paid another 5% and the rest was funded with airport revenue. The entire project took about 18 months to complete.

In general, real estate development and airport expansion are sensitive issues for many Hilton Head residents and government officials; and their cautious approach is reflected in the stringent master development plans of local agencies. As such, some residents strongly opposed the runway extension, even though the FAA recommended a longer runway to help the space-constrained island airport operate more efficiently. The FAA also recommended removing the drainage ditch, which posed a safety issue, due to a steep slope between it and the runway, Rembold notes.

“The FAA said we needed a 5,400-foot-long runway, based on our fleet mix,” he explains. “But a vocal minority of residents opposed that...They weren’t interested in taking that big of a bite. After a lot of discussion and public hearings, everyone got together and examined the options, and determined that 5,000 feet was more palatable politically.

“While the FAA would love for us to have a 5,400-foot runway, it acknowledges that [sometimes] it only advises and provides guidance,” he adds. “In the end, the FAA knows that airports must cede to local needs. And with the EMAS beds at either end, we still can accommodate the planes we wanted to accommodate.”

Rembold considers the new arresting beds a great solution, because they enable larger planes to land safely on a shorter-than-desired runway and allowed the upgraded runway to remain inside the airport’s existing footprint.

Working Under the Lights

Most of the improvement work was performed at night, due to FAA regulations that require airports to close runways when work is performed inside the runway safety area. Because HHH could not afford to shut down its runway during the project, construction crews primarily worked around American Airlines’ flight schedule, Rembold says.

Construction and installation activity typically began after the carrier’s last flight of the day, usually around 10:00 p.m., and continued until about 6:00 the following morning, when American flights resumed.

“The project did not impede regularly scheduled commercial air traffic,” reports Rembold. “While our private operators certainly had to make some adjustments, we worked diligently to allow as much flexibility in the construction schedule as possible while still remaining focused on the project timeline.”

Per FAA regulations, the landscape had to be restored to its original condition each night. For example, no open excavations were allowed, and all slopes had to conform to their normal conditions before air traffic resumed.

Protecting the Environment

The upgraded stormwater detention system addressed concerns about protecting the area’s fragile marine ecosystem from runoff and pollutants. That’s a major issue because heavy rainfalls are common and the airport stands only 19 feet above sea level, Rembold explains.

“Here on the coast, we have saltwater all around us,” he points out. “After a big rainstorm, there’s a lot of freshwater that eventually goes into the creeks and tidal flats. So we have very strict stormwater regulations.”

Moreover, much of the runoff from the airport originates from a light-industrial/commercial development near the south end of the runway. As such, large influxes of rain can carry pollutants such as volatile suspended solids, oil and grease, heavy metals and salts.

Previously, stormwater runoff travelled through the drainage ditch that paralleled the runway. “It ran about 4,500 feet through the airport and exited at the north end of the runway, where it emptied into an off-site stormwater detention area,” Rembold relates.

To eliminate the drainage ditch and its standing water, officials opted for large underground plastic chambers that store and convey stormwater runoff. The system holds stormwater long enough for it to slowly seep into the ground.

“We can’t stop the water from going into the ocean, but this system allows pollutants and solids to settle out and be treated,” Rembold explains. “It’s a big environmental win. We’re pretty proud of the system.”

Installing the underground detention system also allowed HHH to eliminate the steep slope near its runway. “It’s just a gentle swale now, so it’s no longer a safety hazard,” he reports.

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Underground Detention

The new system stores stormwater during low-flow conditions and conveys water downstream during high-flow periods. "The permeable nature of the system allows for continued interaction with the groundwater and temporary surface storage in the swale above the system," explains Paul Moore, project manager for Ward Edwards Engineering, the civil engineering firm that designed the system. "The option of underground detention was very valuable to the design of the site."

Holding chambers from CULTEC—half-circle sections of heavy-duty corrugated plastic—are primary components of the system. "The chambers essentially serve as an underground detention pond," says Jon Shell, the company's southeast sales manager. "That way, you can use the space on top for something else."



JON SHELL

Overall, the airport's two-section detention system includes 1,646 chambers that span 54,681 square feet and can store up to 152,420 gallons of stormwater runoff.

The northern section includes 1,000 chambers (each 4 feet long and 30½ inches high), configured into a five-row system that

stretches 1,403 feet. The chambers lie atop a 6-inch-deep layer of stone and are covered by another 6 inches of stone. The northern section alone can store up to 84,420 cubic feet of water in the chambers and between the voids around the stones.

The southern part of the system includes 646 chambers, each 48 inches tall and 8½ feet long. They stand atop a 9-inch base of stone and are covered by an additional 12 inches of stone. Total storage capacity exceeds 68,000 cubic feet of water.

Shell notes that installing chambers with two different heights is unusual. Engineers typically prefer to use relatively tall chambers to provide more storage capacity in a smaller area, he explains. That, in turn, also decreases project cost because less stone and labor are required.

At HHH, however, the elevation on the northern end of the runway is lower than the southern end, so engineers specified shorter chambers on the northern end to allow enough room for sufficient ground cover and to avoid penetrating the water table, which is very high in the area.

Comprehensive PR Campaign

The airport is a key gateway to the island's 2.7 million annual visitors. It's also critical to the regional economy, with an economic

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impact of \$166 million. So when Rembold encountered opposition to the runway project, he embarked on a three-year, one-man public relations campaign. How he went about it underscores the importance—and effectiveness—of establishing good community relations.

“Public opinion was our toughest challenge,” he reflects. Because there had been no major improvements at HHH for decades, residents were lulled into assuming that the airport would always remain a small, quiet facility, he explains. Moreover, some residents were opposed to the idea of increased tourism.

To help sway the naysayers, Rembold spoke to anyone or any group that was interested. About once a month, for three full years, he gave presentations that detailed how the airfield project would provide more travel options and improve convenience for residents. He also emphasized the economic-impact benefits.


“I wanted them to understand that new dollars that flow into our local economy from tourists are better than just recycled dollars from residents,” he explains. “Everywhere visitors go, they leave money behind.”

In retrospect, Rembold says that residents appreciated having an “airport person” to talk to. He felt it was important to get out

into the community and provide an open forum for questions, because people often feel that airports operate secretly from behind a fence.

“Not all of the questions were friendly,” he acknowledges. “But I thought it was best to be open and completely accessible to answering questions...There was no public vote per se on the issue, but public perception was important.”

In the end, collaboration and cooperation among many agencies, including the town of Hilton Head, Beaufort County and the FAA, were critical to the project’s success. “They were phenomenal to work with,” says Rembold. “So were our state partners and our consultant, Talbert, Bright & Ellington, and our prime contractor, Quality Enterprises.

“I’ve worked on a lot of projects during my career, and this is probably the best one I’ve been involved with because of the excellent relationships,” he adds. “In addition, there’s now a lot of excitement in the community about the project, and that’s very gratifying. What we’ve done here is accomplish the airport’s mission, which is to provide more diversified and safer travel options to residents and visitors who come to the island.” 

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Miami Int'l Participates in Blockchain Trial

BY JODI RICHARDS

PHOTO: HEERY S&G



Blockchain is *the* buzzword in information technology today, and airports such as Miami International (MIA) are paying attention.

“It’s our charter as IT executives to look at technology and see how we can insert it into our ecosystem to improve processes,” says Maurice Jenkins, information systems and technology director at MIA. “Some work, some don’t. You never can tell until you see how well you can actually apply it.”



MAURICE JENKINS

In an effort to explore possible applications of blockchain within the air transport industry, the technology research division of SITA recently performed a blockchain research project called FlightChain, in which MIA was a participant. Its white paper, *Research into the Usability and Practicalities of Blockchain Technology for the Air Transport Industry*, details the method, process and lessons learned from the trial.

While blockchain is not widely understood, it is quite simple, says Kevin O’Sullivan, lead engineer at SITA Lab.

He defines blockchain as a distributed ledger of events, digital signatures and hashing that is specifically designed to bring trust to data sets. All data is stored not just in one location, but among all members in a given blockchain network. New information is continuously updated and stored, but data cannot be altered—only added.

O’Sullivan compares the current rise of blockchain to the emergence of the Internet in the early 1990s. “There was a lot of excitement, but nobody really understood it,” he recalls. “It took a good decade for it to become established, and then it entirely revolutionized the B-to-C [business-to-consumer] engagement model.”

Like the World Wide Web in its early days, blockchain is “hugely hyped” and has similar potential to impact the business-to-business engagement model in addition to the business-to-consumer model, he adds. “We just have to see how it pans out and how business and governments adopt it. The big shift, the big mental change people are going to go through, is to figure out how to change business processes to take advantage of it.”



KEVIN O’SULLIVAN

Single Source of Truth

The research project included multiple groups to make it “practical and relevant to the industry,” explains O’Sullivan. SITA

FACTS&FIGURES

Project: Blockchain Research Project

Research Team: SITA Lab

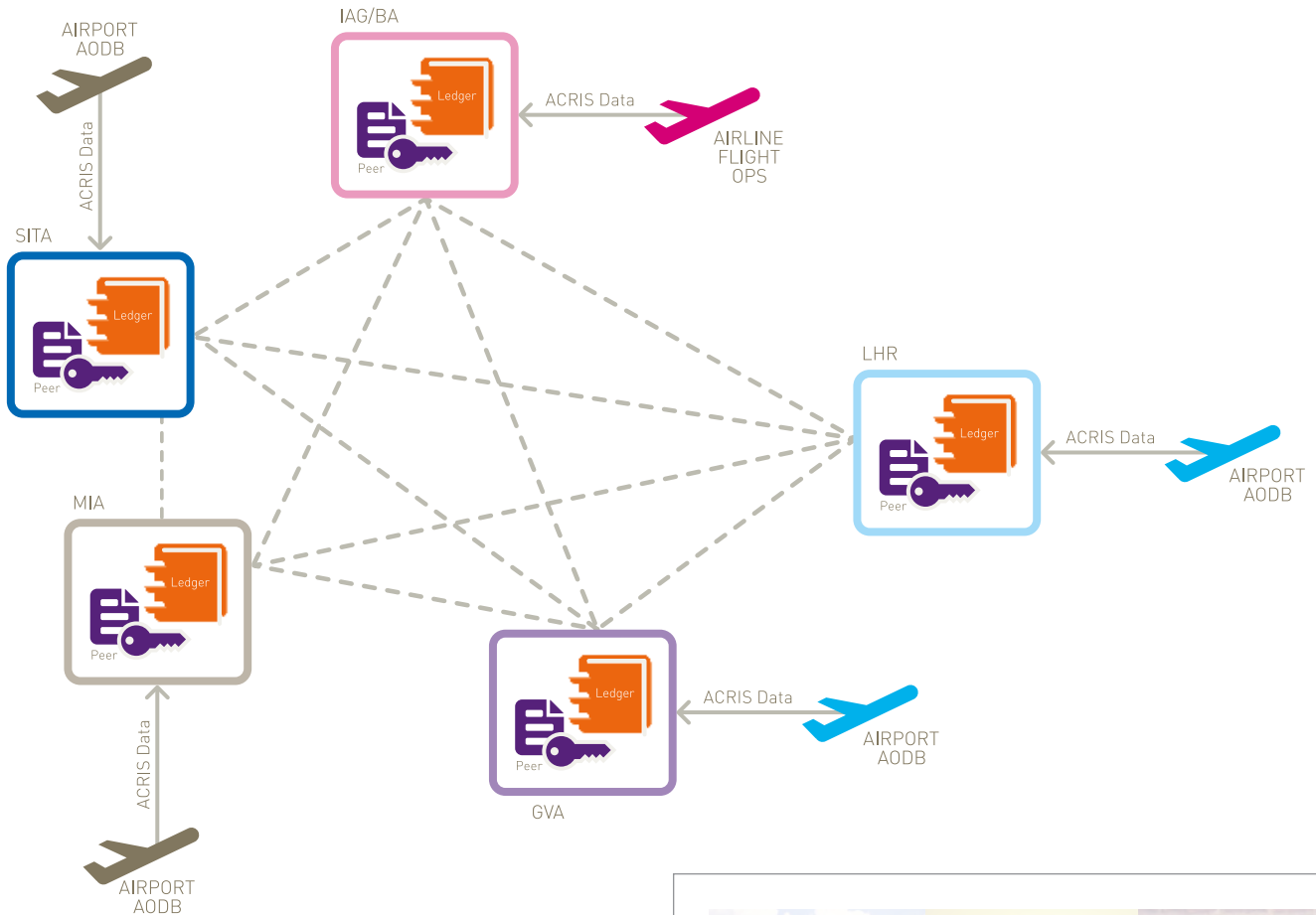
Project Timeline: About 90 days

Participants: Heathrow Airport Holdings Ltd; Int’l Airlines Group; Geneva Airport; Miami Int’l Airport

Objective: Study applicability/efficacy of using blockchain for flight information

Primary Conclusions: The technology is viable for creating & maintaining single set of flight data; more research is needed

Associated White Paper: sita.aero/resources/type/white-papers/flightchain-shared-control-of-data



coordinated with Heathrow Airport Holdings and International Airlines Group to create a blockchain network infrastructure that crosses organizational boundaries and deploys what he calls a relevant real-world use case: presenting a single version of the truth regarding flight data. Geneva Airport and MIA were added to the project after it was already in process to infuse more airport presence.

“There’s not much point in doing a blockchain trial if it’s just SITA—you don’t learn or prove a huge amount,” comments O’Sullivan, noting that the technology itself is inherently collaborative. “It’s a well-known problem that, as an industry, we’re not sharing and keeping in-sync that data as well as we should.”

Flight information is available from various sources such as airlines, departure airports and arrival airports; but the data often varies from source to source. Like his airport colleagues, Jenkins knows that inaccurate flight information can create stress or dissatisfaction for passengers. “Our responsibility is to ensure that we’re providing clear, concise data that allows travelers to make decisions as best as they can to ensure the journey is as comfortable as possible.”

The competitive nature of the air transport industry has historically discouraged participants from divulging operating information by sharing flight data. Creating a “single source of truth” that is easily accessible and could be relied upon by all partners was the goal of the project, says Sherry Stein, senior manager of projects and innovation at



SHERRY STEIN

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SITA Lab. “We were seeking to create that traceability so that the airport on the other end could have a better sense of accuracy in flight status,” she explains.

Because flight data does not include personally identifiable or commercially sensitive information, blockchain is an appropriate technology choice for this application, Stein adds. Specifically, she notes that blockchain implementations can:

- create a cryptographically immutable transaction ledger that is distributed to all participants in the network;
- provide a mechanism for multiple writers to update a common data set;
- record changes and share them on a ledger so participants can decide whether to accept or ignore the transactions of any participant; and
- allow multiple organizations to share control of data through the use of a smart contract.

The SITA Lab team conducted research on two types of open source, private permissioned blockchains—Ethereum and Hyperledger Fabric—to compare and contrast how they operate.

“There was a lot of collaboration with the airlines and airports to design what it might look like,” Stein says.

A network of nodes at SITA and in the data centers of the participating airlines and airports was established, and whenever there was a change to flight information, that data was pushed into the network and processed through the smart contract, which is responsible for arbitrating any conflicting updates. Data from London Heathrow International, British Airways, Geneva Airport and MIA was merged and stored on the blockchain. Over the course of the project, more than 2 million flight changes were processed by the smart contract and stored on FlightChain.

Viable, but Not Yet Ready for Prime Time

Although blockchain is still an emerging technology and questions remain on how it could ultimately benefit the industry, Stein says that the recent FlightChain project shows there is, indeed, value in blockchain for airports, airlines and passengers.

According to O’Sullivan, the study demonstrates that blockchain is a viable and useful technology for sharing and updating flight information data—particularly when there are multiple organizations updating the same data set. “It is a good

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way to control access and then distribute the data so you have a single source of information,” he summarizes.

O’Sullivan also acknowledges that relatively speaking, blockchain is still in its infancy. “There’s a lack of maturity around the technology, and I think we’re still in an era where we should just be doing tests and trials, proof-of-concepts and evaluations,” he comments.


Jenkins adds that blockchain may not necessarily make things “faster, simpler, cheaper,” but could potentially provide the industry with true, empirical data that will “add a level of trust and transparency across a platform that we all can share and be comfortable with.”

Despite the current unknowns about blockchain, Jenkins advocates exploring its possibilities. Better data accuracy and even financial savings could be the rewards. “Given the result set of this study, we’re actually looking at other potential uses to see how the technology best fits within the industry,” he adds.

Blockchain is especially advantageous when applied to supply chain management, Stein notes. Other applications could include tracking baggage and cargo. Access to accurate data could help airports with more dynamic and intelligent gate allocation as well, she adds.

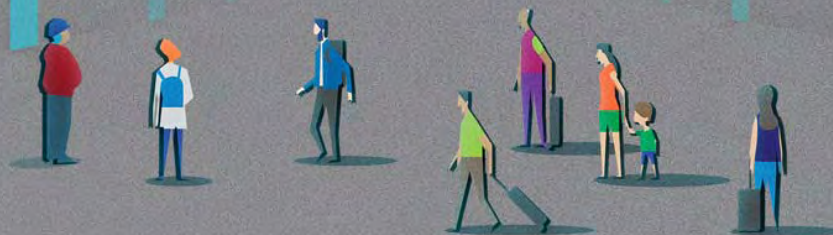
O’Sullivan reports that SITA’s blockchain white paper has garnered a lot of interest from airlines and airports. Even though the FlightChain project is technically closed, the nodes are still operating and the associated data set is growing. SITA will continue researching blockchain applications for the air transport industry, and is exploring the possibility of creating an infrastructure to act as an “industry sandbox” for others interested in performing their own trials and evaluations, O’Sullivan reports.

Jenkins hopes that the recent study MIA participated in will encourage more industry innovation, because it tested just one application for blockchain. “Any technology out there that could potentially have a benefit or impact to our operational environment is something worthy of evaluation and testing,” he states.

Because blockchain is a collaborative technology, O’Sullivan advises industry members to work in coordination to identify and understand relevant uses for it, and then develop models for appropriate management and use. “The quicker we can get away from our siloed tests of blockchain to work together on testing and trialing and proving it out, the better.” 

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Los Angeles Int'l Adds Automated Screening Lanes at Tom Bradley International Terminal

BY RONNIE GARRETT

FACTS&FIGURES

Project: Automated Screening Lanes

Location: Los Angeles Int'l Airport

Terminal: Tom Bradley Int'l Terminal

Design & Installation: General Dynamics Information Technology

Consultants/Systems Integration: K2

Architect: Lamb Associates

Electrical: PBS Engineering


Structural Designers: VCA Engineering

Equipment Manufacturer: McDonald Humfrey, an L3 company

Cost: \$12.3 million

Funding: Airport capital funds; \$6.8 million federal grant

Timeline: Design & planning began Jan. 2017; construction began in July 2017; project completed in March 2018

 With a whopping 85.5 million annual passengers, Los Angeles International Airport (LAX) is considered the second-busiest airport in the United States. But at the end of March, the bustling facility ranked first in the nation for the number of automated screening lanes (ASLs) it has in place.

By mid-April, the airport was already experiencing positive results. "We are seeing reduced wait times and as much as a 30% increase in the number of passengers we are able to screen, compared to a standard lane," says Aura Moore, deputy executive director, chief information officer for LAX. With the new lanes in place, 1,000 more passengers per hour can be screened through the checkpoint, she adds.



AURA MOORE

Fast Track Project

In March, the airport opened the final two of 14 ASLs in its Tom Bradley International

Terminal to slash security wait times and improve the passenger experience; but these ASLs are not firsts for the airport's nine passenger terminals. The technology is also installed in terminals 2, 4 and 7, putting the total number of ASLs at 27.

The installation in the Tom Bradley International Terminal is the airport's largest installation of ASLs from McDonald Humfrey, and the one having the biggest impact, states Moore. Before the new lanes were installed, that particular checkpoint suffered from lengthy wait times. Further complicating matters was the fact that the terminal lacks a large queuing space. "When queues are too long, and wait times exceed 30 minutes, it gets disruptive and impacts the passenger experience," Moore explains.

With passenger experience, security, safety and facility improvement as LAX's four strategic goals, this situation needed to change, she explains.

"Improving the passenger experience at this checkpoint was definitely one of the 'moving-the-needle' initiatives we needed," says Moore, noting that the airport had tried

to expedite security screening in other ways, including adding a TSA K-9 unit.

While deploying a K-9 unit helped, Moore says it was not a process that could “sustain passenger growth in the long-term.” Airport officials began seeking a technological solution and uncovered the answer while studying ASLs in action at Hartsfield-Jackson Atlanta International Airport.

“We saw they were screening more passengers using those lanes than a standard lane,” Moore says. “In a standard lane, the TSA can process about 150 passengers per hour; and they were processing well over that number, even though it was an early trial and their TSA agents were still getting familiar with the new technology.”

Securing a grant to cover part of the cost to add the technology propelled the \$12.3 million project into motion and put it on the fast track. The airport, which covered the balance of the project’s costs with LAX capital funds, began planning and design in January of 2017, started construction in July 2017, and completed the project this March.

Automated Security Screening

At a typical checkpoint, passengers grab bins, place their belongings into them, and then push the bins across roller tables into an X-ray machine. At this point, they then get in line for screening by the body scanners.

With the ASLs, five passengers can divest at the same time. “It’s not that single-file line, where one person has to wait for the next person to divest their personal items,” explains Keith Jeffries, the TSA federal security director at LAX. “Five people can do it simultaneously.”

He explains that with the new automated lanes, passengers walk up to one of five positions, pick up a bin from a shelf underneath, put the bin on a shelf in front of them, and the system automatically pulls it in. The unit X-rays bags and automatically diverts suspicious items into a separate area for manual inspection. After passengers leave their belongings, they move directly to a body scanner or metal detector.

The system greatly increases security, says David Borges, director of K2’s Security Solutions Group, the consulting firm retained by the airport to handle systems integration for the project. “Passengers, once they slide their bin forward, have no more control over their belongings until they are clear. They can no longer reach in and grab stuff, like they can do now,” he notes.



DAVID BORGES

The ASLs have two conveyor belts—one that brings empty bins to passengers and one that takes full bins to the scanner—from each divestiture position. This keeps lines moving even when individual passengers are slow to divest their belongings, explains Borges.

Bins in the new lanes are 25% larger than standard, and each is equipped with an RFID tag to provide a one-to-one correlation with the X-ray images. This provides greater flexibility when a bag

needs manual inspection, notes Moore. TSA agents no longer move suspicious bags themselves; the system automatically diverts them off the main system into the back system, where they are checked by other TSA officers. This keeps the line moving, even when a bag needs further inspection. The X-ray images travel with bags for manual inspection to the separate screening area.

“It doesn’t have to be checked at the same lane it was screened by X-ray,” she explains. “And, the RFID tag ensures bags and images do not get mixed up.”

The new lanes play a huge role in relieving traveler stress—especially for passengers who need a little more time, adds Moore. “They do not feel as rushed,” she explains. “With standard lanes, passengers had to wait for the person ahead of them. Now, they don’t have to wait. They can take their bag to another divest position to get it checked.”

Given the new ASL options, standard lanes may appear unnecessary; but Moore explains that standard lanes are needed

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to process larger items, such as strollers and car seats, which do not fit into bins. Tom Bradley International Terminal has two standard lanes for this purpose.

Beating the Budget

“The project came in ahead of schedule and under budget,” reports Moore, who reminds that all work had to be done in a working security checkpoint.

Moore attributes the project’s minimal impact on travelers to excellent collaboration and partnership between Los Angeles World Airports, TSA and the contractors involved, who met weekly.

“We also had a very thorough planning and design process,” she adds. This was especially important because of the small footprint of the checkpoint, which has structural columns throughout that could not be moved, and the size of the new security lanes, which are larger than the existing ones.

“We had to do a very detailed plan and specifically lay out where these lanes would go, because they had to be in different positions than the existing lanes to fit,” explains Moore. “There were some that required us to work with the manufacturer to modify the lane configuration slightly to fit around the columns. It took us around seven months to go through this detailed planning and design process. It was almost like building a new checkpoint.”

To further facilitate the process, the airport used the same contractor team, led by General Dynamics Information Technology, throughout the entire project, instead of using one for planning and design, and another for construction. “This project delivery approach minimized change orders,” she reports. “This is a new technology, and not something that is mainstream yet.”

General Dynamics, in turn, used subcontractors that had already worked on ASL projects in the airport’s other terminals. “This way we were working with contractors who were already familiar with the technology,” she says.

Moore notes that the airport kept TSA involved every step of the way, which also added to the project’s success. Because construction took place in an operating checkpoint, installation of new lanes was carefully phased with TSA. “The detailed phasing plan was all laid out upfront,” she remarks.

Borges highlights the collaboration that took place to make the project successful: “We teamed with LAWA, McDonald Humfrey, General Dynamics, the TSA, and everything went on without a hitch, on schedule, under budget—and it all works perfectly.”

Scheduling minute details helped keep the airport functioning well during construction, he adds. “Tom Bradley is one of the busiest checkpoints at LAX. The lines are usually crazy long, so we had to do a throughput analysis to figure out how many lanes could be taken down at a time without negatively impacting throughput.”

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The project was completed in seven phases, two lanes at a time. Crews walled off a section, broke down the area to the X-ray machine, and then installed and tested the new McDonald Humfrey system before bringing the lane back online. In addition, all lanes were tested by both K2 and Battelle Engineering, which performed an independent third-party operations test.

New Technology, New Processes

After all the new ASLs were operational, work remained for TSA. The first thing it did was train officers to use the automated lanes and help them “test drive” the new equipment. “It’s the same X-ray but with a software upgrade and a complex belt system,” says Jeffries. TSA provided classroom training for all screening agents, and within a half-day they were proficient in the new system, he reports. “It’s really just getting used to different screens and buttons, and the capability of the new system.”

TSA also helped educate LAX passengers using the new lanes. Though the process is designed to be intuitive, and signage is placed throughout the checkpoint, a TSA officer stationed between the document checker and the lanes expedites flow by directing passengers to specific positions and bins.

This is important, Moore emphasizes. “People naturally stand behind the person in front of them and wait for them to put their stuff in bins. They do not always notice that they can go around that person to another position.”

Jeffries says that many passengers don’t need prompting. “Most folks watch the automated process and jump right in and figure out what to do,” he remarks. “But for those who need some assistance, we have folks who can help.”


TSA also posted an employee in the area where passengers exit the scanners and reclaim their items. “We found people collect their belongings but leave the bin on the belt,” Moore says. “But the bin has to be placed into the automated position to return to the front of the queue. Without an agent there, the bins start piling up. So, placing a TSA agent there keeps the process running smoothly.”


Technology for the Future

According to Moore, LAX plans to keep adding ASLs as it grows and updates terminals. In addition, Terminal 1.5 (the terminal it is adding between terminals 1 and 2) will have ASLs. The airlines are also embracing ASLs in their security areas.

“Airports have a limited footprint,” she explains. “As airports expand, we need more screening capacity. ASLs allow us to increase passenger throughput without increasing footprint. That’s a huge benefit.”

Jeffries notes that ASLs are one of many improvements TSA has in store to speed passengers through airports while improving safety and security. “ASLs are just a pinprick of the technology that’s going to be rolling out in the future,” he remarks. “This technology will improve overall security while providing a better experience for passengers. ASLs are just a small part of what’s to come.” ✈️





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Nashville International Airport™



FACTS & FIGURES

Project: Converting Shuttle Operations to Compressed Natural Gas

Location: Nashville Int'l Airport

Major Components: 28 new CNG passenger buses; CNG fueling station

Shuttle Vehicles: 8 Ford StarCrafts; 17 Eldorados; 3 Arbocs

Fleet Owner/Operator/Maintenance Provider: ABM Aviation

Vehicle Distributor: Alliance Bus Group

Cost of Fueling Station: \$1.9 million

Facility Design, Construction, Operation & Maintenance: Clean Energy Fuels

Initial Results: Reduced greenhouse gas emissions; bus operation costs of \$1.62/gasoline gallon equivalent

Project Consultant: Greener Business Solutions

Fleet Debut: Early Jan. 2017

Fuel Station Opened: April 2017

Accolade: 2017 Governor's Environmental Stewardship Award from TN Dept. of Environment & Conservation

Nashville Int'l Transitions Shuttle Bus Fleet to Compressed Natural Gas



With its 10-year shuttle bus agreement nearing expiration a couple years ago, the Metropolitan Nashville Airport Authority seized the opportunity to investigate alternative fuel options for Nashville International Airport (BNA).

The research was well worth it, as BNA has reduced its greenhouse gas emissions associated with shuttle operations while maintaining the same hourly cost for labor, operation and maintenance. The game-changer was a fleet of 28 new buses that run on compressed natural gas (CNG) and a \$1.9 million facility to fuel them.

Christine Vitt, vice president of Strategic Planning and Sustainability for the airport authority, is extremely pleased with the results of the new system's first year in operation. The project team was hoping to lower bus operating costs to \$1.79 per gasoline gallon equivalent, but instead achieved \$1.62.



CHRISTINE VITT

"Once we started down that road and looked at the package, it seemed to be very



BY JENNIFER BRADLEY

beneficial for the environmental improvements as well as reduction in our overall cost of fuel, for the next seven to 10 years,” comments Vitt. “We were confident the CNG market was stable here, so it became an easy decision to make.”

The decision also led to formal recognition from the Tennessee Department of Environment and Conservation. The airport authority received a 2017 Governor’s Environmental Stewardship Award for its ongoing commitment to sustainability, including its recent deployment of CNG vehicles.

Weighing the Options

“They’re really on the cutting edge of sustainability practices,” says Wendy Schugar-Martin, owner of Greener Business Solutions and consultant on BNA’s alternative fuel project. “The airport has really

shown dedication to the environment and creating a more sustainable future.”

The airport authority had already decided to convert its entire shuttle fleet and build a fueling facility, but needed help figuring out fueling specifics, vehicle maintenance logistics and other details, she explains.



WENDY SCHUGAR-MARTIN

Schugar-Martin, who previously worked as a corporate attorney on environmental projects, encourages other airports thinking about a switch to consider several factors. First, what is the alternative fuel source going to be? BNA had already selected CNG, but her firm helps other clients decide based on the environment vehicles will travel in, what fuels are locally available or routable, and, of course, cost.

“Not all airports may have access to natural gas,” she explains, noting that BNA was fortunate to be very close to a main CNG line of Piedmont Natural Gas. As importantly, the size and pressure of the nearby gas line was able to support the facility, adds Vitt.

Another major factor for airports to consider is whether existing infrastructure can be used to distribute the new energy source, or new facilities should be built. Then, airport management must decide if the fueling center will be open to the public or used only by its in-house fleet. “These are the very high-level topics,” advises Schugar-Martin. “But once you start to dig into them, you need




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somebody to ask the vital questions so you understand and implement the right solution.”

Finally, she recommends considering the logistics involved with storing and maintaining alternative fuel vehicles. Does the existing maintenance building meet specific codes for housing or repairing CNG shuttles? (BNA needed to renovate its facility.) Does the exhaust system in the maintenance facility need to be upgraded? Who will train vehicle mechanics? How will equipment be implemented?

“As you see, the process can be very complex,” she says, noting that these are just a few examples of issues that need to be explored.

Timing Takes Patience

Vitt says she was glad to have Schugar-Martin as a project consultant, but the airport authority also needed a company to design, build, operate and maintain the fueling facility. Ultimately, it awarded a seven-year operation/maintenance contract with three one-year extensions to Clean Energy Fuels.

J. Russell Wharton, the company's senior project manager, explains that the project also included designated duty engineer requirements, so his team got involved in coordinating construction work and selecting the general contractor.

Because Wharton lives just south of Nashville and had more than 20 years' experience with local codes and permitting requirements, he personally led the permitting, engineering and construction components of the project.

Permitting was a particular challenge that took four months rather than the six to eight weeks as anticipated. “Nashville is a rapidly growing city, so we had some permitting challenges because we were one of very many construction projects going through the review and approval process,” Wharton explains.

Despite unavoidable bureaucratic delays, Clean Energy kept the construction schedule moving by “finding ways to stick a square peg into a round hole,” says Schugar-Martin. “They really have the expertise to address some of the specific challenges for alternative fuel projects.

“The airport did a great job of essentially going with the flow,” she adds. “Even when a challenge arose, they were quick to say that they could work within the new framework.”

Given the teamwork, BNA's new fueling station opened in April 2017. The new buses, however, were delivered in November 2016, and up and running during the first week of January 2017.

In the months between, the shuttles fueled up at a nearby station. Schugar-Martin counsels clients to develop relationships with other local CNG sources so they can continue to operate 24/7 even if challenges arise.

The cleaner-burning, quieter shuttle buses were an instant hit. “You don't see black soot coming out of the exhaust anymore,” Vitt reports. “It just makes for a more comfortable passenger experience. The customers love them, and they are great for our environment.”



RUSSELL WHARTON

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Doug Dunn, chairman and chief executive officer of Alliance Bus Group, notes that the airport authority was involved in every part of the vehicle specification and design process, so the CNG-fueled buses were built specifically for BNA. They have no steps, are compliant with the Americans With Disabilities Act and include television monitors for updated news feeds, as well as security camera systems.

Maintenance crews from fleet owner/operator ABM Aviation also like the new vehicles, because they don't include exhaust filters that require frequent changing.

"ABM is always excited to partner with our airport and airline clients to create a greener, healthier environment," says Kevin Warrenton, general manager for Nashville International Airport, ABM Aviation. "We provide clients around the world everything from environmentally friendly janitorial and maintenance services to energy efficiency improvements and sustainable facilities."

More CNG at BNA


Wharton notes that the airport had a clear vision for its CNG station and wanted multiple options for future expandability. The facility's location was key, adds Vitt. The new station is next to the bus maintenance facility and just across the street from the airport's consolidated maintenance building. It's near the terminal and parking facilities, but could also provide public access if BNA ever goes that route. Currently, the station only fuels airport vehicles.

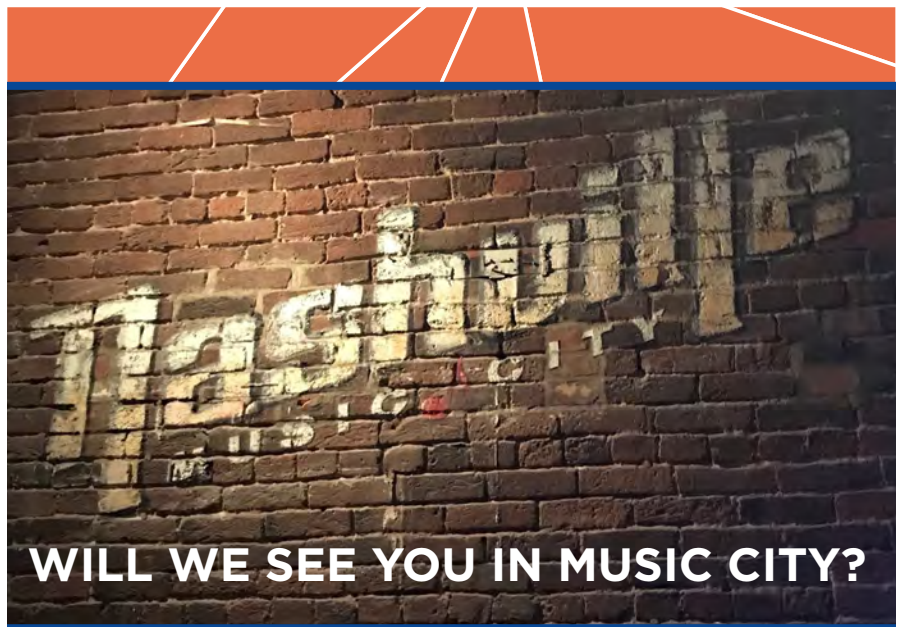
The airport installed three CNG compressors, and two are currently in use. The caps are already in the ground, so new dispensers can be dropped in to accommodate more demand, explains Schugar-Martin. The airport was cognizant of the hassles associated with installing expansion pieces later and opted to endure the extra work and expense on the front end.

"This is new territory here in Tennessee," Vitt adds. "It's very new for us, so we're looking at what we need to do to define it. The fueling station is not going to be open for public use anytime in the near future, but we'll look at our options to see if it makes sense later."

The airport's new CNG capabilities are already proving useful beyond the passenger buses. The entire maintenance fleet is beginning to transition as well. Last year, two CNG-burning F-150 pickup trucks were added; and this year, two F-250s and another F-150 will be replaced with CNG-capable counterparts.

Vitt explains that using CNG vehicles for day-to-day maintenance activities makes sense, given the associated long-term cost and emissions savings.

The team at BNA is all about resiliency, she adds, acknowledging that it was critical to have resident experts like Schugar-Martin and Wharton on board for this project. Wharton, in turn, compliments BNA's commitment to taking advantage of environmental opportunities as they arise. "The CNG station is just a smaller piece of the airport's bigger pie," he comments. "I find the staff at Nashville International to be absolutely committed to the vision." 



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Airports Find Creative Ways to Purchase Luggage Carts

BY MIKE SCHWANZ



FACTS&FIGURES

Project: Alternative Financing for Luggage Carts

Sample Locations: Harrisburg (PA) Int'l Airport; Lexington (KY) Blue Grass Airport

Strategy: Luggage carts are purchased by parking operator as part of parking contract; equipment costs are rolled into monthly operating expenses in multi-year contract

Vendor: Republic Parking System

Key Benefits: Bidding & bonding required for capital expenditures are avoided; airports provide customers with new carts & multiple payment options

Acquiring and managing luggage carts can be an expensive proposition, but Lexington Blue Grass Airport (LEX) and Harrisburg International (MDT) lighten the load by rolling equipment costs into their parking contracts.

In each case, Republic Parking System purchased luggage carts for the airport, and includes the equipment costs in its monthly charges for managing the cart concession. Because the costs are operating expenses for the airport, it avoids the bidding and bonding requirements associated with capital expenditures. After a preestablished concession period, Republic transfers ownership of the carts to the airport.

Timothy Edwards, executive director at MDT, reports that the new arrangement is working well at his facility. When the airport's



TIMOTHY EDWARDS

previous parking contract expired last year, MDT issued a request for proposals and selected Republic. Under the new contract, the parking operator agreed to supply 40 new luggage carts and two new dispensing systems within six months. That process was completed this March.

The airport placed one of the new cart stations in its parking garage and the other in Baggage Claim. Both dispensing systems accept cash and credit cards.

"We signed a five-year deal, with five one-year options, up to 10 years," Edwards says. "If it goes that long, we would do a new RFP, and then get new luggage carts at that point. So far, everything has gone very smoothly."

While contracts vary from airport to airport, Republic keeps all revenue from luggage cart operations at MDT. "This was a good deal for us, because we provide brand new luggage carts for our passengers, and they now have the option of using credit cards to pay for them, which they did not have before,"



A fleet of 40 new luggage carts was part of the parking contract at Harrisburg Int'l.

Edwards explains. "In addition, Republic personnel are in charge of returning all the carts to the dispensers, freeing up our own employees for other tasks."

A Different Model at LEX

Officials at Lexington Blue Grass Airport established a cart agreement with Republic in June 2010. The parking vendor purchased 30 new luggage carts and two dispensing machines for the airport, and in return, LEX paid Republic a monthly fee to offset their cost, and for managing the luggage cart operation. "By 2013, we decided to purchase the carts outright from Republic," says Don Sever, director of administration and finance at LEX. "We only had \$7,000 remaining to pay off our amortization on their initial purchase price of \$36,000."



DON SEVER

Now that the new luggage carts have been paid in full, the airport is beginning to earn revenue on the cart operation. "While the luggage carts are not a huge revenue source for the airport, it is very important for us to offer this amenity for our customers," Sever continues. "We typically average \$600 or \$700 a month from these rentals, and those dollars remain with the airport."

Sever and his staff are considering the option of reconfiguring the dispensers to accept Apple Pay, as well as cash and credit cards. "Younger travelers are using their cellphones for purchases, so we will probably add it as an additional customer service," he explains.



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Lexington Blue Grass Airport purchased its carts from Republic a few years ago and now keeps all the revenue they generate.



The Vendor Perspective

Don Barrett, a senior vice president for Republic, says that luggage cart concessions make sense for the company. Barrett oversees 34 of the 76 parking garages that the firm operates at U.S. airports, and feels that every airport deal is a bit different.

“At MDT, they wanted new carts and dispensing systems that accepted credit cards,” he explains. “Our contract with the airport is that they pay us a management fee each year to manage their parking garage and shuttle operation. We also manage the luggage cart operation; all luggage cart revenue goes to Republic to pay for the original investment of the luggage cart system.”

At LEX, Republic paid \$36,000 for the current system, and the airport agreed to pay a monthly fee to eventually cover that cost. That system had limitations, and during the most recent request for proposals process the airport wanted to update the luggage carts. With the new system the revenue for the luggage carts is part of the overall parking revenue from which Republic receives a percentage.

Barrett considers luggage cart operations an auxiliary service for Republic’s airport customers. “This is a value-added service that we provide to our customers,” he says. “It is not a huge revenue source. Some 25 years ago, before wheeled suitcases became popular, luggage cart rentals brought in more income than today. We would not go to a new airport just to manage



DON BARRETT

luggage carts; it would not make financial sense. But with current customers, we are open to providing this service.”

While LEX and MDT are mid-sized airports with about 1 million annual passengers each, larger airports—especially those with international service—could especially benefit from asking current vendors to foot the bill for luggage cart operations, suggests Justin Thompson, sales manager for Thompson Contract. (Thompson distributes Wanzl carts in North America.)

“This method can save upfront money, and eventually lead to a long-term profit,” Thompson says, noting that one large international U.S. airport pays \$4 million for its luggage cart operations. “Finding an alternative to that huge expense is just good business.”


Many Choices for Partners

Thompson says that an effective cart agreement covers these key points:

- The contractor purchases the carts, vending units, software and other needed infrastructure. The airport leases the equipment over a five-year period, covering both the initial outlay for carts and a monthly service fee.
- At the end of the initial contract, the carts become the property of the airport.
- All revenue generated from domestic cart rental accrues to the airport.
- Credit card sales are immediately deposited to the airport’s account.
- The airport pays a specified fee (per arriving international passenger or per re-staged cart, etc.) for the operator to shuttle carts to/from the Federal Inspection Station. (Since most new carts are equipped with radio frequency identification tags, counting their delivery is a simple electronic process.)

According to Thompson, most airports that follow this model should be able to recover their investment in about 36 months—and own the equipment after five years. Since high-quality luggage carts typically last 20 years with normal use and maintenance, such airports can use them for many more years at minimal cost.

While every airport has unique financial challenges, partnering with trusted vendors for luggage cart operation could save quite a bit of money over time, he emphasizes. “Based on this model, your costs are fixed, but revenue is not, and could continue to grow.”

Moreover, Thompson notes that similar equipment arrangements could be struck with other proven providers, such as janitorial services, security companies, aircraft cabin cleaners, shuttle bus operators, aircraft caterers, contract baggage handlers and rental car companies. 



JUSTIN THOMPSON

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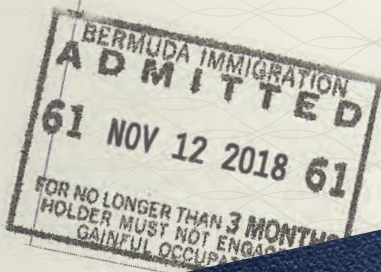
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FACTS&FIGURES

Project: Runway Extension & Rehab

Location: Cherry Capital Airport – Traverse City, MI

Cost: \$14 million

Funding: \$6.3 million - Airport Improvement Program; \$7.7 million - passenger facility charge

Project Timeline: Aug. – Nov. 2017

Associated Runway Closure: 14 days

Project Design, Engineering & Construction Management: Prein & Newhof

Environmental Assessment & Electrical Engineering: Mead & Hunt

General Contractor: Team Elmer's

Electrical Contractor: Ranck Electric

Lighting, Signage & MALSR: ADB Safegate

Hardware & Software for Automated Machine Guidance: Trimble

Runway Grooving: Cardinal Int'l Grooving & Grinding

Pavement Markings: PK Contracting

Landscaping: North Slope

Fencing: Action Traffic Maintenance

Barricades: Give 'Em a Brake Safety

Award: MI Dept. of Transportation-AERO 2017 Airport of the Year

Runway Extension/Rehab at Cherry Capital Gives Airlines a Literal Lift

BY ROBERT NORDSTROM

With the completion of an award-winning runway project at Cherry Capital Airport (TVC), Traverse City, MI, is well prepared to welcome travelers to Northern Michigan for the summer tourist season. The \$14 million project renovated and extended TVC's primary runway to 7,015 feet, thus remedying previous operational limitations.

The 115-foot extension was the sequel to a 2013 project that extended the 6,500-foot east/west runway to 6,900 feet. Prior to the recent improvements, airlines had to lighten aircraft loads during summer months to achieve adequate lift during takeoff, explains



KEVIN KLEIN

Airport Director Kevin Klein. As a result, TVC's three airlines (American, Delta, United) were taking penalties—up to 14 passengers for larger aircraft and three or four for lighter planes. In addition to sacrificing

revenue, the carriers incurred operational complications by having to constantly monitor temperatures to determine whether they could carry full passenger loads. With the longer runway, carriers are now able to operate aircraft at optimum capacities, thus increasing their own efficiency and enhancing service for travelers.

The runway extension and rehabilitation didn't come a moment too soon, Klein points out. Last year, the airport served 476,767 passengers, surpassing its previous record by more than 5%. "Traverse City is a seasonal market," he notes. "We handle three times more traffic during June, July and August than during December, January and February."

Tight Schedule

Although the project began with equipment mobilization and preparatory activities in early August 2017 and ended about three months later, crews completed most of the work during 24 days in September. Throughout the

With runway improvements in place, airlines should be able to take off with maximum loads this summer.



entire construction period, the runway was closed for only 14 days. During that stretch, the airport accommodated flights on its 5,378-foot secondary runway.

The Michigan Department of Transportation-Aeronautics recognized TVC's outstanding efforts during the fast-paced project by naming it the state's 2017 airport of year.

The original project schedule included a closure period of 56 to 72 days, but that proved unacceptable to TVC's carriers. "We worked closely with the airlines and contractor to find ways to get as much done as possible outside of the closure period," says Klein. "As it turns out, we accomplished 162 days of work in 24 days by running three shifts, each with multiple crews working 24/7."

To prepare for the major September push, the general contractor on the project—Team Elmer's—spent August staging equipment, setting up fencing and establishing protocols to meet security requirements. Crews also cleared and prepped areas for earthmoving operations, and installed conduit for the new lighting system. Simultaneously, improvements were made to a taxiway to ensure access to hangars and to the secondary north-south runway throughout the project.

After breaking for the Labor Day holiday, the clock started ticking and the heavy work began. On the first night between midnight and 5 a.m., workers shortened the runway from 6,900 to 6,008 feet in order to keep it operational during the daylight hours. The threshold was moved and temporary electrical components and runway markings placed. Security fencing and barricades were erected to isolate the active runway area; portions of two taxiways were removed to install the new threshold bar and new blast pad. Throughout this initial 10-day period workers were on the job 24/7.

The runway closed on Sept. 15. The intersection of the two runways was reconstructed and shoulder work within the influence of the two runways performed. To keep the north-south runway open during this period, much of the work was completed between midnight and 5 a.m.

During the closure period, the airlines stepped up to the plate by using aircraft that met the weight restrictions for TVC's shorter secondary runway. "Delta put in Embraer 175s, American used Embraer 145s and United maintained its schedules with 50-seat regional aircraft," specifies Klein. "Together, we devised a plan that worked out well."

From start to finish, workers moved 122,000 cubic yards of earth and placed 21,000+ tons of P-209 base material, 30,000+ tons of millings and 41,000+ tons of asphalt. All told, crews logged more than 38,000 hours of labor.

Bob Nelesen, project manager for Prein and Newhof, kept his finger on the pulse of the rigorous schedule. "Not only was it 24-hour work days, but all of the contractors put on multiple crews per shift in order to accomplish the work," he recalls.



BOB NELESEN

Needless to say, the timetable was extremely tight. "Because of the compressed schedule, we were driven to work as fast as we could, which creates enormous risks when you're laying down 5,000 tons of asphalt a day at \$65 per ton. If something goes wrong, you're not only risking more than \$300,000, you also have to remove it and redo it. You're constantly having to meet a rigorous schedule while moving at a pace that is hard to comprehend. Backup resources are critically important. If you need something at 9:30 p.m. on Saturday and you can't get it until Monday, you've basically lost three days of work. It makes everything a critical task item."

To help stay on task and on time, Team Elmer's used automated machine guidance for grading work. "The FAA's specs and tolerances are very exact," Broad notes. "We knew we had to hit it perfectly every time. With this system, we didn't have to wait for a surveyor to set stake; everything is



NICK BROAD



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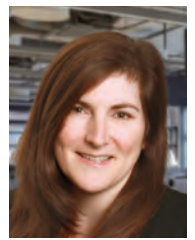
automated. All the driver has to do is move forward and back."

All of the old runway edge lights were removed and new cable and conduit installed, informs Mead & Hunt Electrical Engineer Bill Ropposch. LED upgrade kits were installed in all the signage, and a new precision approach path indicator (PAPI) and medium-intensity approach lighting system with runway alignment indicator lights (MALSR) put in place.



BILL ROPPOSCH

Mead & Hunt also took the lead in environmental planning, land acquisition and obstruction removal for the project. Approximately 1,600 trees had to be removed or topped, and environmental mitigation and property issues resolved. Stephanie Ward, vice president and manager of aviation planning, worked with TVC's legal counsel to acquire aviation easements for 54 properties, one of which was a mobile home community. Securing the legal rights to fly in the airspace above the properties, and also create associated aircraft noise, was a complex process that included boundary surveys, development of exhibits and extensive coordination with property owners, Ward explains.



STEPHANIE WARD

In the end, the project included about \$2.7 million of improvements in the surrounding community. "We made it clear to homeowners that in addition to the easement payments, mitigation required them to return their properties to their natural states, but with trees that would not grow as high," says Klein.

Security was a challenge throughout the project, recalls Dan Sal, the airport's assistant director of operations and maintenance. "We had to work closely with FAA and TSA," he says, noting that more than 25,000 feet of security fencing was installed. "From earthwork to electrical, you name it, we had a lot of people working in a



DAN SAL

pretty small area. Communicating with everyone about safety and security issues was a challenge; it required talking and meeting with a lot of people on a daily basis.”

It Pays to Wait

When airport officials began discussing this project back in 2007, they projected that the runway would need to be about 7,300 feet long. The economic downturn in 2008, however, delayed the project. After the 400-foot extension in 2013, officials consulted with the airlines to determine whether their original 7,300-foot estimate was still correct. They learned that once the runway exceeded 7,000 feet, it was rated as having the same engineering performance value as a runway length up to 7,499 feet.

Moreover, the aircraft using TVC’s primary runway have changed since the early planning stages for the project in 2007. “A great example is the DC-9 falling out of service and the Boeing 717 coming into service,” Klein explains. “Performance improved significantly.”

With this new information, officials conducted another study, which ultimately indicated an optimum runway length of 7,015 feet vs. 7,300. This proved to be great news for the airport, because it allowed the project to remain on airport property and



Multiple crews worked 24/7 for a brief portion of the project.

eliminated the need for extensive—and expensive—roadwork. Overall, the length change saved the airport about \$5.5 million.

The overall value of the runway improvements will become evident in the coming summer months, when aircraft are able to take off with maximum loads. It took a lot of coordination and communication, but everyone did a fantastic job, Klein summarizes. In addition, passenger traffic actually increased slightly during the height of construction. ✈️

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Greenbrier Valley Airport Takes Over Management of Terminal Restaurant

BY LAURA WAVRA



FACTS&FIGURES

Project: Restaurant Revamp

Location: Greenbrier Valley Airport - Lewisburg, WV

Size: 1,900 sq. ft. inside, 1,600 sq. ft. outdoor veranda

Est. Cost: \$460,000

Capacity: 110 seats

Opened: Nov. 2017

Facility Design: Lindsay Architecture

Kitchen Design/Equipment Supplier: Modern Kitchen Equipment Co.

Construction: Agsten Construction


Flooring, Counters & Tabletops: Mountain Lumber

Custom Hickory Doors: Tom Hickman

Custom Seating: Twists & Turns

Blown Glass Lighting: Black Dog Salvage

Noteworthy Detail: Airport authority decided to operate restaurant itself, after concessionaire backed out

 When Greenbrier Valley Airport (LWB) opened its new restaurant last fall, the West Virginia airport raised the concessions bar for rural airfields everywhere. The menu at Landings features selections such as arepas, bolitas de mofongo and profiteroles. The refined décor includes custom wood furniture and hand-blown light fixtures. Moreover, LWB manages the restaurant itself rather than hiring an outside operator.

About three years ago, Airport Director Stephen Snyder decided it was time to upgrade LWB's restaurant, which had operated under various names and concessionaires for the last 45 years.

The restaurant had always attracted local customers, but Snyder wanted the new iteration also to showcase the best of West Virginia to visitors passing through the "small country airport with a world-class clientele."

In 2015, the airport authority issued a nationwide request for proposals to find a new restaurant concessionaire. The winning bidder, however, backed out and left LWB back at square one. Instead of selecting another candidate, the airport opted to

assume management of the restaurant and began a major \$460,000 renovation.

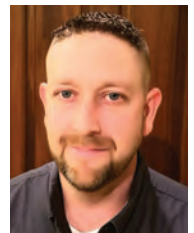
Snyder personally worked with the contract architect, food equipment supplier and general contractor to modify a set of early design plans. Crews from Agsten Construction, a local contracting company, gutted the restaurant to its bare floors, walls and ceilings. "The walk-in refrigerator was the only thing left behind," Snyder muses.

The new design Agsten constructed incorporated 450 square feet of an adjacent office space. Like most major renovations, LWB's project included a few unexpected challenges. Removing several layers of old flooring led to the discovery of an adhesive containing asbestos, which required careful abatement. The grease trap was deemed inadequate due to its size and placement, so the airport invested in a new 500-pound underground model.

Despite such issues, Sam Hull of Agsten reports that everything from demolition to final painting "fell into place," and construction was completed last November. Hull attributes this success not only



STEPHEN SNYDER



SAM HULL



From food to furniture, the new restaurant features local products.

to planning and discussion, but also to Snyder's passion for the project. "He put his heart and soul into creating Landings," Hull says.

Local Supplies, Local Benefits

Snyder admits there are times he feels bogged down by the restaurant. Managing it requires a lot of time and energy—and stretches the typical job description of an airport director. Usually, however, he enjoys seeing his vision being realized.

To be sure, Snyder considers Landings much more than a restaurant. He sees it as a way to revitalize general aviation traffic by providing "something fun and unexpected" for pilots and passengers flying into and out of LWB.

By design, the new restaurant has had a positive impact on the local economy.

Artisans and product suppliers throughout Greenbrier Valley benefited from its renovation. A local craftsman created the 10-foot wood doors in the meeting area. The hardwood floors, counters and tabletops were made in the airport industrial park. Custom furniture was crafted locally from freshly harvested West Virginia hickory wood. And the glass bar lights were hand blown by a local artist.

Custom steel seating that features the logos of local resorts and tourist attractions helps generate conversations with visitors about what the area has to offer, notes Snyder.

Even the restaurant logo has local ties. It includes the image of an aircraft wing from the Airframe and Powerplant mechanic test taken by Snyder's father in 1961—right

down to the FAA inspector's "Approval" stamp indicating that he passed. The project team developed the idea as a surprise for Snyder while he was away on holiday.

With renovations complete, Landings continues to deliver benefits to the community. The restaurant displays the work of a different local artist every quarter and proudly serves locally roasted Black Dog Coffee. It also provides jobs for between 13 and 15 local residents at any given time. To ensure everyone is successful, servers receive a higher-than-average base rate and are guaranteed to earn \$10 per hour, notes Snyder.

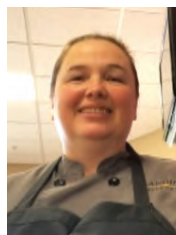
General Manager Estela Estrada, who is also a classically trained pastry chef, is currently working with the local school system's Career Tech Education program to train the next generation of chefs for employment at area restaurants such as Landings.



ESTELA ESTRADA

A Better Workplace

Executive chef and assistant manager Melissa Graham notes that the attention to detail evident in the restaurant's décor also extends into its kitchen. Meats are smoked in-house, and breads and salad dressings are homemade. The menu changes seasonally and features farm-to-



MELISSA GRAHAM

table selections made with local ingredients. Crowd favorites include Graham's smoked trout dip—made with fresh, local fish, of course.


The newly renovated kitchen provides a much nicer work environment for the entire staff, she comments. Graham has been with the airport restaurant for 13 years, but she and the rest of the Landings crews only recently became employees of the airport authority. As such, everyone had to undergo drug screenings and federal background checks. "Our entire staff does, indeed, meet very high standards," says Snyder.

The restaurant serves ticketed and non-ticketed passengers alike. And since the renovations, it can also host large gatherings and cater off-site events and corporate flights. Soon, it will provide catering services for commercial flights, as well. In early April, the airport announced new non-stop service to Chicago O'Hare and Dulles International on United Airlines. With the addition of new essential air service flights, passenger traffic has increased significantly, and so has business at Landings.

Although the restaurant experienced a lull after closing for a year during renovations and reopening in the middle of winter, Snyder expects its spacious veranda and live outdoor music to draw large crowds as the weather warms.

"We are especially proud of the restaurant and what it represents for the local area," he says. "We believe with our new menu and atmosphere, that will only grow." ✈️

The Time Has Come for Dynamic Parking Pricing

 Parking is a vital revenue source for airports. On average, it's the second biggest money-maker, trailing only gate fees; and at some airports, parking even surpasses gate fees. Yet, as important as parking is to the bottom line, most airports don't earn nearly as much as they should.

The problem is that unlike other products and services, it has always been difficult to apply market-driven pricing to parking. Whereas, the price of such commodities as food, clothing, or even entertainment can be adjusted based on demand, cost and other market factors, the price of parking remains relatively static. Until recently, there hasn't been a good way to constantly measure parking demand and adjust prices as demand rises and falls. The best airports have been able to do was to look at historical data to predict future behavior, and then set prices accordingly. Pricing is based on little more than guesswork, because no matter how much data you have about past parking demand, it's impossible to know for certain how much demand there will be in the future.

The good news is that these challenges have finally been conquered. Modern parking guidance technology and access and revenue control equipment now make dynamic pricing possible. In recent years, many airports have installed parking guidance systems to monitor spaces and guide drivers to those that are available. The software that runs the technology also analyzes utilization and can be customized to continuously monitor occupancy levels



DALE FOWLER

Dale Fowler is president of INDECT USA. INDECT has provided parking guidance systems to airports across the globe, including Dallas/Fort Worth International Airport, Dallas Love Field, Tampa International Airport and San Diego International Airport.


and automatically modify pricing in real-time. If occupancy rises above a certain level, the price is raised accordingly; if it falls again, the price is dropped. The appropriate pricing information is transmitted to the access control equipment, which charges the appropriate rate when the traveler exits the facility. For the first time, airports can base their pricing on utilization, rather than on guesses about how full or empty their facility will be.

Of course, as with guidance, communication is required for the system to work. Just as the sensors communicate in real-time to tell parkers how many open spaces are available on each floor or aisle, the system must also communicate how much parking costs at that exact moment. You can't have drivers entering a parking lot or garage expecting to pay one amount, only to be charged more when they leave.

With dynamic pricing, airports can finally earn the actual value of their parking assets. Experience shows that dynamic pricing can increase parking revenues by as much as 35%, and if you factor in decreased labor and associated costs permitted by the system, increased profits can actually reach 50% per month.

One concern airport administrators may have is that market-based pricing will drive away business. However, experience shows that business actually tends to increase because parkers seem to appreciate knowing that the rates they are being charged are based on the actual value of the space, and not some arbitrary number. Of course, the sensors that are managing the system also continue to guide drivers into open spaces, which makes the entire parking experience more convenient and pleasant—and attractive—to travelers. It also gets travelers into the terminal more quickly, where they can patronize restaurants and shops.

Not all sensor systems can manage dynamic pricing, though. While accuracy is essential in any type of parking guidance system, it's particularly important when the price of parking is being adjusted on the fly. Inaccurate systems can cost airports thousands of dollars by improperly dropping prices when occupancy is too low. With dynamic pricing, anything below 99%+ accuracy is unacceptable.

Dynamic pricing can provide extraordinary benefits to airports. It's a concept whose time has come, and we finally have the technology at our disposal to make it a reality. 



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