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**Publisher**  
**Paul H. Bowers**  
 paulbowers@airportimprovement.com  
 262.510.7832

**Editorial Consultant**  
**Rebecca Douglas**  
 rebeccadouglas@airportimprovement.com  
 815.621.4525

**Social Media Director**  
**Kristin Shaw**  
 kristinshaw@airportimprovement.com

**Creative & Production Director**  
**Becker 505, LLC - Chad Becker**  
 chad@becker505.com

**Circulation Director**  
**Lisa Monday**  
 lisamunday@airportimprovement.com

**Webmaster**  
**Matt Tews**  
 matttews@airportimprovement.com

**Contributing Writers**  
**Scott Berman, Nicole Nelson, Paul Nolan, Robert Nordstrom, Jodi Richards, Mike Schwanz, Kristin V. Shaw, Thomas J. Smith, Victoria Soukup, Jennifer Daack Woolson, Ken Wysocky**

**Advertising**  
**Paul H. Bowers**  
 paulbowers@airportimprovement.com  
 262.510.7832

**Adrienne Gibson**  
 adriennegibson@airportimprovement.com  
 262.844.4368

**Vicki Jensen**  
 vickijensen@airportimprovement.com  
 414-331-9768

**Editorial Advisory Board**  
**David Byers, Ph.D.**  
 Quadrex Aviation, LLC

**Paul Cudmore**  
 Eagle Integrated Solutions

**William Fife**  
 Peer Review Consultant

**Glenn S. Januska**  
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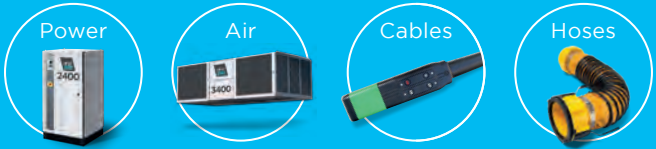
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## In Good Company

The storied FAA Airport Improvement Program turns 40 this month. In addition, overall federal grants-in-aid programs are 75 years old. That is a real achievement, and something that has made a lasting impact on the U.S. airport system. For more about what these programs mean, and how they evolved, turn to Pages 8 and 9.

The name Airport Improvement is universally recognized in our industry. Airports big and small know AIP and associate it with valuable resources that help our collective infrastructure grow with the changing times.

When launching this publication in 2008, we wanted a name that already had universal recognition and conveyed a sense of growth and strength. We had a list of options to consider, but none matched what we wanted our publication to represent better than Airport Improvement, literally and figuratively. And so it was that *Airport Improvement* magazine was launched. To this day, we have never regretted our decision. In this month of May 2021, with the

Airport Improvement Program celebrating its 40th anniversary, we thank Congress and FAA for AIP—for all the help it provides to airports and for providing the inspiration for the name of our magazine.

We also celebrate the beginning of a post-pandemic travel rebound, and look forward to seeing many of you at industry events that are slowly starting to be held in person.

I feel grateful for how we have endured, sustained and even *improved* over the past 14 months during the pandemic. Thank goodness for help from long-running programs like AIP!

Cheers!

*Paul*



PAUL BOWERS, PUBLISHER



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# FAA Airport Development Program Turns 75

BY THOMAS J. SMITH



This May marks 75 years of the federal government providing grants-in-aid programs to build and enhance U.S. airport infrastructure; and the FAA Airport Improvement Program (AIP) is in its 40th year.

What we now know as AIP began in 1946 as the Federal-Aid Airport Program. Twin Falls, ID, was the first community to receive money from it when the Civil Aeronautics Authority provided \$384,000 for the initial development of Joslin Field at Magic Valley Regional Airport.

Since that first award, the federal government has distributed about 82,300 grants worth \$96 billion via three different programs.

Tied to various congressional legislation and appropriations, federal investment in airports evolved from the Federal-Aid Airport Program, to the Airport Development Aid Program to the current Airport Improvement Program.

“Airport grants have existed in some form for the past 75 years, providing much-needed funding for airport infrastructure and development projects,” says



WINSOME LENFERT

FAA's Acting Associate Administrator for Airports Winsome Lenfert. “Although the goal of ensuring the safe and efficient operation of the nation's airports has never changed, the program itself continually evolves to keep pace with the growing importance of air transportation to the U.S. and the world.”

In the years prior to World War II, the federal government either provided funds directly to specific airports or through the Works Progress Administration projects.

The Federal-Aid Airport Program was the first peacetime program of financial

aid aimed exclusively at promoting development of the nation's civil airports. In 1947, Congress appropriated \$45 million from the general treasury specifically for airport construction.

During the first 24 years of federal grants, the money was appropriated annually from general revenues. In total, FAA distributed \$1.2 billion through the Federal-Aid Airport Program. But the funding didn't keep pace with the rapid growth of air travel, and severe strains on the air traffic control system began emerging.

With the creation of the Airport Development Aid Program and the companion Planning Grant Program in 1971, monies were appropriated from the newly created Airport and Airways Trust Fund, which was funded by an assortment of user fees and taxes. Over the next decade, about \$11 billion was invested in airport and airway modernization.

In the first five years of the Airport Development Aid Program, 85 new airports were built and more than 1,000 were improved, including the construction of 178 new runways.

The Planning Grant Program required a periodic assessment of the needs for the future of the U.S. aviation system. The first National Airport System Plan in 1973 forecasted a need for 700 new airports by 1983. The projected air traffic growth

required an associated investment of an estimated \$6.3 billion.

In 1982, when Congress reauthorized spending the aviation trust fund for airport grants, the two 10-year-old programs were consolidated into the Airport Improvement Program (AIP). The legislation also revamped the formulas used to award the grants. Since the creation of AIP, the federal government has distributed more than \$90 billion in about 65,500 grants.

For many decades Congress has set an annual appropriation for the AIP grants. The current multi-year appropriation for AIP is more than \$3.1 billion per year.

In the last 75 years, federal grants have funded an ever-growing list of eligible projects. Major categories include safety projects such as lighting, signage, markings and navigational aids, and capital investments such as land acquisitions, runway construction and terminal renovations. Other eligible projects have included new parking lots, firefighting equipment, zero-emission vehicles, snow blowers, refueling and recharging stations, instrument landing systems and fencing.

Per the program's guiding goals, AIP grants are issued to improve safety, security, airport infrastructure and environmental stewardship.

## 75 YEARS OF FEDERAL FUNDING FOR AIRPORTS


PROGRAM	VALUE OF GRANTS	NUMBER OF GRANTS
1947 - 1981: Federal-Aid Airport Program and Airport Development Aid Program	\$6 billion	16,774
1982 - Present: Airport Improvement Program	\$90 billion	65,500
<b>1947 - Present: All Federal Grants</b>	<b>\$96 billion</b>	<b>82,274</b>



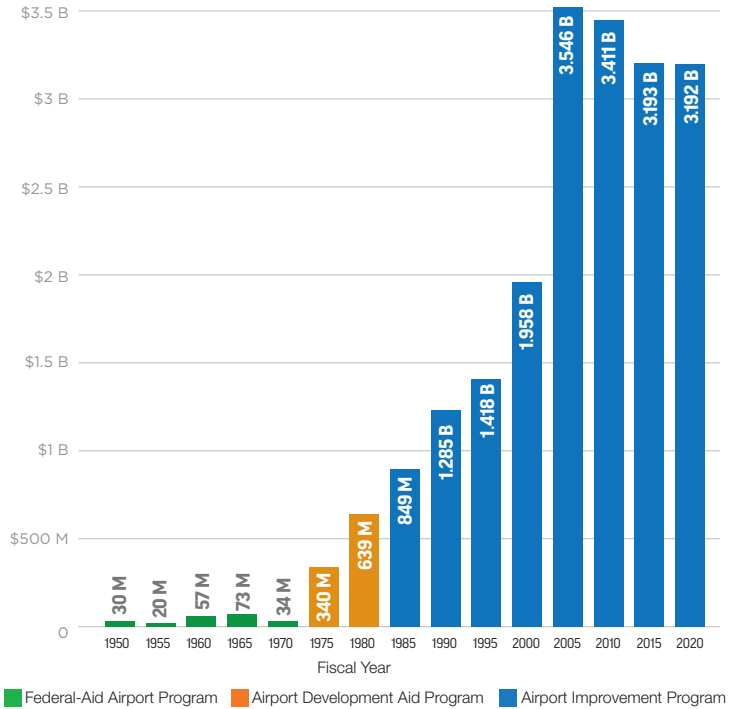
Typically, AIP grants cannot be used for routine airport operation expenses; and there has been only one major exception to that policy. In the wake of the Sept. 11, 2001, terrorist attacks, Congress directed AIP funds to be used to enhance airport security, including passenger and baggage screening. Airports were not only allowed use of AIP grants to purchase new security equipment but also to underwrite associated operating costs.

According to a March White House briefing document, President Joe Biden wants Congress to invest \$25 billion in airports as part of a \$2.3 trillion, 10-year infrastructure plan he is championing. The \$25 billion would include funding for AIP, upgrades to FAA assets that ensure safe and efficient air travel, and a new program to support terminal renovations and multimodal connections to support affordable, convenient access to airports that does not involve individual cars.

As of late April, the administration had not released a specific figure about how much money would be earmarked for AIP.

Meanwhile, as FAA marks the 40th year of its banner program, a spokesperson says that the agency continues to move forward as it has every other year—just faster, bigger and bolder. 

**75 YEARS OF FEDERAL GRANTS FOR AIRPORTS**



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# New Concourse at Reagan National Adds 14 Gates for American Airlines

BY JENNIFER DAACK WOOLSON



Ralph Waldo Emerson famously said, “It’s not the destination, it’s the journey.” Well, passengers accustomed to starting their journeys at Gate 35X at Ronald Reagan Washington National Airport (DCA) are in for some major improvements.

In April, the Washington, D.C., airport unveiled its new 14-gate concourse, a 230,000-square-foot facility built to replace its remote and cramped Gate 35X. Until recently, about 6,000 American Airline passengers rode airside buses every day to Gate 35X, where they boarded regional jets parked at 14 hardstand gates.

The arrangement was the airport’s way of continuing vital service while demand stretched beyond its contiguous facilities. Originally designed for 15 million annual passengers, DCA was accommodating more than 23 million passengers per year, straining the infrastructure and prompting the remote hardstand operations.

“That is not a good customer experience,” says Louis Lee, the Metropolitan Washington Airports Authority (MWA) architect who spearheaded the design of the solution.



LOUIS LEE



## FACTS & FIGURES

**Project:** New Concourse

**Location:** Reagan National Airport

**Owner:** Metropolitan Washington Airports Authority

**Scope:** 230,000-square-foot concourse with 14 gates; 378,000-square-foot aircraft apron

**Total Cost:** \$391.5 million (component of \$1 billion Project Journey)

**Funding:** Bonds; passenger facility charges

**Timeline:** Construction began in 2017; soft opening in April 2021; completion expected in July 2021

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

**Contractor:** Turner Construction Co.

**Foundation:** Wagman/Berkel

**Superstructure:** Berlin Steel Construction Co.

**Concrete:** Canyon Concrete Inc.

**Curtain Wall:** Icon EBS, LP/Baker Metal Products Inc.

**Roofing:** Gordon Contractors Inc.

**Mechanical/Plumbing:** Harris Co.

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

**Life Safety/Fire Protection:** National Fire Protection

**Wayfinding:** Walton Signage Ltd.

**Apron Paving:** Allan Myers

**Terrazzo:** Boatman & Magnani Inc.

**Hydrant Fueling:** Cherokee Corp.

**Electric Ground Service Equipment**

**Charging Stations:** American Airlines

**Elevators/Moving Walkways:** ThyssenKrupp Elevator Corp. (now known as TK Elevator)

**Baggage Handling System:** Jervis B. Webb Co.

**Passenger Boarding Bridges:** ThyssenKrupp Airport Systems (now known as TK Airport Solutions)

**Advanced Visual Docking Guidance System:** ADB SAFEGATE

**Docking System Installation:** AERO BridgeWorks Inc.

**Pre-Conditioned Air Units:** ITW GSE

**Ground Power Units:** ITW GSE

**Drywall/Acoustics:** Component Assembly Systems Inc.

**Ornamental Metals:** Crystal Steel Fabricators Inc.

**Wall Panels/Millwork:** ISEC Inc.

**Seating:** Arconas; Vitra



The new \$391.5 million concourse is just one part of Project Journey, DCA's \$1 billion project that also includes new security checkpoints that will be housed in two separate buildings across from Terminal B/C. The new concourse will offer passengers greater connectivity, more shopping and dining options, and a more pleasant post-security environment. "We saw this as a good opportunity to enhance the customer experience so that they don't

have to be exposed to the elements, and they have boarding bridges to get to their aircraft," Lee explains.

The project, which began in 2017, had a soft opening in April; and substantial completion is slated for July. To understand how DCA opened the new concourse nearly 100 days ahead of schedule in the midst of a pandemic, we need to go back to the beginning.

### Early Collaboration

The design process started in early 2016. Over 18 months, Lee and his team produced more than 20 deliverables for four construction packages. The first two packages outlined enabling projects to relocate existing American Airlines operations and to demolish two existing hangars and MWWA's previous corporate headquarters. That cleared the real estate needed for packages three and four: a 378,000-square-foot aircraft apron and construction of the new concourse.

On the design side, Ken Brown, president of PGAL, was part of AIR Alliance, a joint venture of PGAL and AECOM, which designed the new concourse in collaboration with Lee and his team.

Also at the table from the beginning was Jay Fraser, vice president and general manager of aviation for Turner Construction Company. As part of a construction management at risk contract, Turner was on board for close to two years working alongside the architects and engineers designing the project, developing the site and creating a final scope of work.

Construction began with demolition in early 2017, followed by the apron package work in



KEN BROWN



JAY FRASER

late 2017. When shovels hit the ground in early 2018 to start on the new concourse, the upfront collaboration really paid off.

Ryan Wolfgang, construction program manager for MWWA, says, "As Louis [Lee] and his team were developing the design, our construction contractor and I were also sitting in the room—all with the understanding of creating a more collaborative process."



RYAN WOLFGANG

On site, Jeff Klinger, vice president of Turner Construction Company and program director for Project Journey construction, reaped the benefits of all the preplanning. "When you invite the builder into the preconstruction and design process, they can play a role and get information that's critical to the dovetailing and phasing of construction around existing airport operations."

Lee adds, "The staggered design and construction process allowed us to fast-track the construction, and we didn't waste a single day. Once a package enabling project was completely approved, we pretty much hit the ground right after that."

### Built for Passengers

"We always design our terminals from the inside out," Brown explains. "I know everybody loves that aerial photograph of the overall project, but that's not what passengers experience. Our

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primary concern is: What is the experience going to be like when you walk down that passenger boarding bridge and into the holdroom?"

That question led the team to minimize columns and visual obstructions, so the space would feel more open. In order to increase the expanses between columns, designers reduced the number of dome skylights. "I think now when we look at it, we see that it was clearly the right move," Brown says. "It's a much more open experience."

Eliminating columns helped create more spacious waiting and boarding areas. For instance, the centrum, or hub of the new concourse, features a 45-foot high ceiling with fabricated metal panels. Acoustic insulation backing on the panels helps absorb sound, and vertical clerestory windows in the roof blur the lines between concessions and holdrooms.

Because the two-story centrum is a critical location for passengers to dwell, the design team included ready access to amenities. Five concessionaires will open in the surrounding area later this year: Mezeh Mediterranean Grill, Peet's Coffee, Wolfgang Puck Bar & Bites for dining; and Capitol File News and InMotion Entertainment for retail.

Concessions will also be integrated next to the holdrooms, so passengers have options nearby when they are waiting. Other amenities in the new concourse include diverse seating options, an indoor pet relief area for service animals, two spacious restrooms, a nursing room for mothers and a companion care restroom. There also will be touchscreen maps for enhanced wayfinding, and a moving walkway to shorten travel time between the existing Terminal B/C and new concourse.

As passengers leave the TSA checkpoint, they'll access the new concourse via a connecting corridor with a full-height curtain wall that adds natural light.

"These new spaces are game-changers for the customer experience," Fraser says. "And to not have to worry about getting on a bus and being taken out to the plane—it's going to be a totally different experience."

New TK Airport Solutions boarding bridges at each gate will considerably increase comfort and convenience for passengers. Pre-conditioned air units and ground power units from ITW GSE will also provide notable improvements.



Seating from Arconas includes armrests with drink holders and integrated modules under the tabletops for charging electronics.

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*The airport added swivel-based lounge chair/ottoman sets from Vitra to help passengers enjoy the views.*

On the airside, American will enjoy new docking systems at all 14 gates. The ADB SAFEGATE Advanced Visual Docking Guidance Systems (A-VDGS) help direct pilots safely to gates without the need for ground personnel on the tarmac. MWA and Turner selected AERO BridgeWorks to provide turnkey implementation of the new systems.

“When the new North Concourse was designed years ago, this technology really wasn’t even readily available,” explains Svet Neov, project manager for AERO. “In the past 18 months, A-VDGS has become more and more popular for airlines and airports because they improve safety on the ramp, and improve turnaround time at the gate for the aircraft.”

Neov notes that A-VDGS are particularly valuable when inclement weather, such as lightning storms, clear the ramp, or when crew members meant to be docking an aircraft are busy at another gate. A-VDGS lead to fewer delays and tighter turnaround times at the gate, he explains.



SVET NEOV

The system can also provide valuable data to the airline to improve operations, such as when a pre-conditioned air unit is hooked up or when a plane is chocked. To ensure that American personnel were up to speed using the new systems, AERO and ADB provided remote and in-person demonstrations, and were hands-on throughout the training and commissioning process.

AERO reports that it completes more A-VDGS projects in the United States than any other firm.

### Blending in the New

Architecturally, the goal was to integrate the new concourse in a way that makes it look compatible with the existing Terminal B/C, which was constructed in the late '90s. But the project team didn't simply copy the 20-year-old design. As Lee explains it, the new

**You kept us working.  
You kept us safe.  
We did this together.**



**THANK YOU** to our entire team, MWA, AECOM/PGAL, our small business partners, the community, and everyone else, for your excellence, dedication, and tireless efforts to successfully complete the New North Concourse at Reagan National Airport, during one of the most challenging years we have ever experienced.

Teamwork · Integrity · Commitment



architecture respects the existing design while incorporating new materials. For instance, the new concourse uses components of the color palette from Terminal B/C to provide visual continuity, and the domes and tree-like structures in the pier end are modified versions of what renowned architect Cesar Pelli included in the airport's existing concourses. But the new concourse also includes components such as energy-efficient glazing systems that weren't available 20 years ago.

In addition, the design capitalizes on the new concourse's location at the north end of the airport, by providing passengers with panoramic views of downtown Washington, D.C., including the Washington Monument and the National Cathedral. Visitors inside American's 14,000-square-foot Admirals Club on the upper level will enjoy the same views.

Although the airport chose not to seek LEED certification for the new concourse, the project team still took an eco-minded approach to design and construction. The high-performance curtain wall system has energy-efficient low-E glass that filters out ultraviolet light. And the entire concourse is equipped to support the use of electric ground service equipment to reduce carbon dioxide emissions. The biggest green benefit of all, however, is eliminating the buses that ran to and from Gate 35X.

A new, more efficient high-pressure fuel system at each gate is also eliminating the need for fueling trucks.

### Clever Cover-Up

One of the most significant challenges Turner faced was incorporating the north substation, which provides most of the airport's power, into the new concourse. The substation had to be kept intact and operational during the entire construction process—even when crews were building right on top of it.

Fraser explains that after crews enclosed the substation, they stripped off its exterior and removed approximately 8 feet from the top of the existing structure so it would match the concourse elevation. "During the whole process, we never lost power—thanks to the tremendous phasing and logistics plan that spelled out how things were going to happen."

Early planning, for instance, prompted Turner to purchase a special gantry crane that was built *inside* the building to remove demolished material and erect steel underneath the structure. "That's the kind of thing that enhances the schedule and really helps the overall project," Klinger reflects. "If we weren't able to develop that plan during design, and

instead tried to do it after the fact, we wouldn't be finishing 100 days ahead of schedule."

Another major hurdle occurred near the end of the project, when it was time for TK Airport Solutions to install the 14 new jet bridges it furnished. Priyam Shah, new concourse project manager for MAAA, explains that bringing the huge structures onsite was a "very interesting and challenging project all by itself" due to the amount of construction and renovation that has occurred at DCA over the last 30 years.

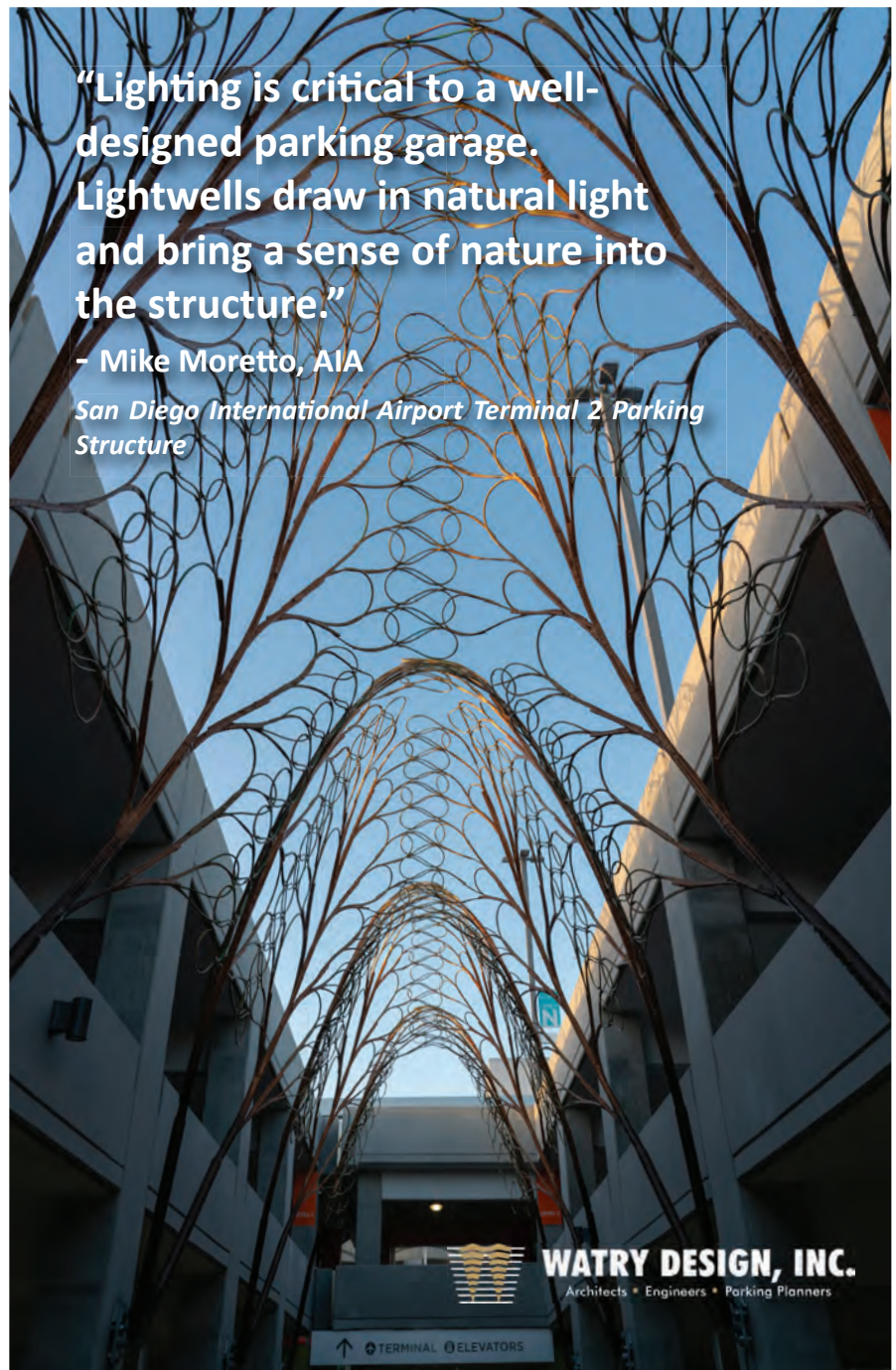


PRIYAM SHAH

**"Lighting is critical to a well-designed parking garage. Lightwells draw in natural light and bring a sense of nature into the structure."**

**— Mike Moretto, AIA**

*San Diego International Airport Terminal 2 Parking Structure*



The process required coordination of transport with police escorts, staging equipment outside the airport and using laser tools to measure spaces inside the airport to ensure that trucks carrying the bridges would be able to fit. Shah notes that crews deflated the truck tires and lowered the cargo beds to clear especially tight spaces by mere inches.

### Adapting to Pandemic Protocols

The biggest challenge of all, of course, was dealing with the COVID-19 pandemic. “We realized that we could keep this project open if we put the right protocols in place to protect our workers,” says Klinger. “Because we were proactive, we never shut the project down. In fact, our workforce increased by 25% to 30% because other area projects shut down, and those people came out to work on the concourse.”

When communication became 100% virtual, strong existing relationships between MWAA and its outside designers and construction teams really paid dividends. Klinger notes that everyone had to work a little bit harder, but meetings quickly became even more efficient.

Shah adds that the project team had to adjust quickly when the pandemic hit, because working remotely was a new concept for construction-oriented personnel and companies. The team adapted by conducting field visits and visual inspections via FaceTime and videoconferences. “They actually worked out much better than we thought they would,” he reports.

In fact, Fraser suspects that some of the communication and collaboration methods used during the pandemic just might stick around for good. “I think it changed what we do pretty much forever,” he says. “Even when COVID is long gone, I think there are going to be things that we take away from our experiences—like how we share information and doing virtual inspections—that we realize have increased efficiency.”

Shah says that under Lee’s leadership, coordinating with the MWAA engineering team was easy even when they couldn’t meet face-to-face. “Louis was very helpful through this time, especially when I needed answers to a lot of complex problems we came across on the project site.”

Brown agrees about the importance of collaboration and how Lee fostered it. “Louis is a very involved owner’s representative,” he explains. “I have done programs where that has *not* been the case. And I can tell you specifically, the reason this program was successful, is because Louis was involved in absolutely every detail. He made sure that his user groups, their interests and their concerns were represented. Having that sort of mentality and approach was a tremendous asset for us.”

Lee credits the project’s success to building trust and relationships. “There are no special ways to get it done,” he reflects. “You just need to put in time and effort to engage everyone early in the design stages, to ensure that you understand different requirements and put them into the design.”

### Ahead of Schedule

The airport held a soft opening for the new concourse in April, with passengers flowing through the 14 new gates.

To accommodate the soft opening, the team had to pick and choose what it finished first to best serve passengers, like ensuring holdrooms were complete and installing temporary concessions and amenities. Items left on the to do list for the July opening include:

- behind-the-scenes work on the ground floor operations level and third-floor club level;
- finishing a feature wall;
- landside projects such as paving roadways, landscaping, finishing exteriors and exterior lighting;
- demolishing the pavement at the remote gates; and
- building out concessions.

Even though more work lies ahead, the project team is proud and excited about what it has accomplished so far—and the deadlines already met. “The goal has always been to maintain American Airlines operations during construction,” Wolfgang says. “COVID-19 has given us some flexibilities that we would have never had. We could take more real estate on during the construction phase that would typically have been allocated for American’s operations.”

Beyond marking the completion of construction in July, passengers and staff alike will celebrate the retirement of DCA’s busing and remote hardstand operations. “I think the entire D.C. community will probably throw a virtual party when Gate 35X is gone,” Brown muses. ✈️

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# Skyxe Saskatoon Expands Use of Common-Use Systems

BY KRISTIN V. SHAW



## FACTS&FIGURES

**Project:** Departures Hall Renovation/Common-Use Systems

**Location:** Skyxe Saskatoon Airport, Saskatchewan

**Scope:** 50 common-use terminal equipment workstations; 36 common-use self-service kiosks; 4 self-serve bag drop systems; associated facility renovations

**Cost:** \$21 million

**Funding:** Saskatoon Airport Authority

**Architect:** IBI Group

**Planning:** Airbiz

**Construction:** PCL

**Common-Use Consultant:** Aerodata IT

**Kiosks & Self-Service Bag Drops:** Embross

**Common-Use Terminal Equipment & Passenger Processing:** Materna IPS

**Virtual Reality Presentation:** Kindrachuk Agrey Architecture

**Baggage Handling Technology:** Glidepath

**Timeline:** Preliminary planning started in fall 2017; construction began in 2018; common-use terminal equipment & passenger processing equipment was operational in 2019; self-serve bag drops installed at end of 2020



Stephen Maybury, president and chief executive officer of Skyxe Saskatoon Airport (YXE), aptly proclaimed 2020 a year of “resilience and fortitude.” At the low point in April, passenger volume at YXE was off fully 98%, and it remained down 69% through year-end.

However, as the entire industry reeled from the hit delivered by COVID-19, the Saskatchewan-based airport readied itself for travel to resume by finishing a \$21 million project to integrate a comprehensive common-use platform. In addition to optimizing the check-in process for passengers, the project also eliminated the need to physically expand the check-in hall.

Previously, some airlines servicing YXE had manual check-in operations while others were automated. Now, all of them (Air Canada, WestJet and multiple charter carriers) use shared equipment, including counters, check-in terminals/kiosks and bag drops.

It was a big change to transition all facets of the check-in process to common use—especially since most of the project occurred while the airport remained fully operational, at pre-pandemic traffic levels of about 1.5 million passengers per year.

## Kicking It Off

The project began in 2016, when a new master plan with an outlook to 2040 revealed that

YXE needed to fortify its check-in area. Shaun Grinde, manager of Airport Development for XYE, explains that the airport was out of room in the terminal, and building out into the apron space would have been costly. Instead, the project team focused on technology-based solutions: common-use self-service check-in kiosks and bag drops.



SHAUN GRINDE

Andrew Leeming, vice president of operational excellence for the Saskatoon Airport Authority, notes that it was an opportune time to make the change, especially for baggage handling.



ANDREW LEEMING

“Our existing baggage system was 10 years old, and we had outgrown it,” says Leeming. “CATSA [Canadian Air Transport Security Authority] had a three-level bag drop requirement, and we were one of the last to implement it. We had the benefit of learning a lot of lessons from what had been done before us.”

The first order of business was to create a common-use road map. Airbiz, the consulting firm leading YXE’s master planning, agreed that leveraging technology was the best way to free

up valuable real estate and facilitate better workflows.

“The Saskatoon airport had a small space to work with, and they were looking for efficiencies,” says Kerr Lammie, an Airbiz director. “At that stage, they had a common-use platform isolated to certain areas, including the boarding system and baggage handling. They wanted to realize the benefits of common use across the platform.”

Airbiz and Aerodata IT worked with airport management to establish a clear vision, set business objectives, roll out tasks, provide technical support requirements and write specifications for a new common-use system.

“We started looking at ideas and benchmarked different types of check-in products,” says Karl McGrath, a senior manager with Airbiz. “Then, we presented ideas on the types of equipment they’d need, setting the goalposts.”

From there, the team developed a 12-month design arc. Airbiz provided an overview of how two-step check-in systems work around the world and counseled airport officials to set parameters for traffic of more than 1 million passengers, which was typical at YXE before the pandemic hit. To improve traffic flow and make the departures hall feel more open, the airport relocated 22 airline offices to a previously undeveloped area on the main floor.

## Piecing It All Together

Leeming recruited Aerodata IT, an airport information technology consulting company from Vancouver, for the project after seeing a 2018 white paper about common use written by Sam Ong, the firm’s principal.

“Our team flew out there to interview stakeholders in order to understand their existing challenges, culminating in the creation of the detailed RFP requirements,” Ong says. “Several vendors responded, and we were able to summarize [the airport’s options] by price point, ability to meet goals and so on. It was a very tight schedule and we wanted to be sure that the client and vendor continued to have a solid relationship for the life of the contract.”

The airport chose Embross to provide 36 self-service kiosks and two to four self-service bag drop stations. Leeming and his team felt the Toronto-based company had



KERR LAMMIE



KARL McGRATH

a cost-effective solution, and heard positive feedback about the equipment from neighboring airports in Ottawa and Calgary. Materna IPS was selected to install 50 common-use terminal equipment stations to support the airlines’ needs throughout the terminal.

Together, the team developed a comprehensive plan that detailed how the system would be implemented. Establishing a timeline for the rollout required careful examination of airline schedules—locally and at headquarters—to determine when and how to perform testing and training. Convincing the airlines to give up their own kiosks for common-use self-service kiosks was another key factor. The plan also reviewed passenger flow to determine the best locations for self-service bag drops.

“The airport authority had a solid vision from the get-go as to what they wanted to achieve,” says Ong. “That focus helped us greatly to precisely craft a detailed RFP for all common-use systems and their support requirements, and that was a big chunk we got out of the way. Sometimes clients are unsure of what they’re trying to achieve, and that creates a larger challenge.”

## Soliciting Support

At first, not all of the airlines were on board with the proposed changes. Common sticking points included giving up counter space and taking on operational challenges. Leeming notes that one of the main carriers at the airport initially opted out of the self-serve bag drop stations because it didn’t feel the time and cost it would

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require made sense at an airport the size of YXE. But the pandemic, and the project team's collaborative approach, eventually brought it and other reluctant carriers around.

"You have to do your homework to demonstrate you're doing the heavy lifting and give the airlines an opportunity for buy-in," says Leeming. "It takes a fair amount of time going back and forth."

Part of the back and forth was a simulation exercise to show how the proposed system would improve business operations. The team also informed airlines that they would be able to use YXE and its support team as an in-house information technology provider/troubleshooter, thus saving them time, money and stress.

"When we positioned the utilization of the space and shared the simulation data with the airlines, we were able to demonstrate that we could save a lot

of money by avoiding construction on the apron," says Leeming. "Also, at an airport our size, it's difficult for airlines to respond to IT problems; they would have to fly people in to address them. With this system, we proposed relief to that burden with local staff."

At that time, none of the airlines had tech staff on site. So when kiosks broke down, a carrier might have to wait hours or days for someone to fix it. The airport authority implementing a service-level agreement with the airlines and each system provider supports quality for everyone, notes Ong.

### Engineering Success

IBI Group, architect of record for the project, was responsible for overseeing the construction side, and Aerodata IT worked directly with the airport on the common-use IT systems and the design of a new

common-use network infrastructure. The airport authority continued to be the main facilitator and informed vendors when to prepare for installation. In the background, IBI Group conducted studies about capacity, passenger flow, bags movement rates, etc. and created a preliminary concept and construction rollout plan.

"We began discussions about a year before a shovel hit the ground," Leeming advises. "It had to be well phased to minimize the impact to operations."

To facilitate coordination, the airport led monthly operations meetings, held bi-weekly construction meetings and initiated separate consultations with the safety committee and airlines to cover issues such as flight planning and passenger processing. McGrath notes that it's crucial to make sure you're "knitting all the pieces together" when making major changes like this.

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The project was phased with construction in three areas: the baggage room, departure hall and airline offices wing. New offices for airline operations were constructed in an unused terminal area, which enabled the departure hall to be enlarged.

During construction, daily baggage screening was temporarily relocated to enable the old conveyor system to be demolished in the baggage room and the new CATSA Level 3 screening equipment to be installed. This included new conveyors to the check-in desks. Finally, the departure hall area was renovated in three phases, allowing check-in operations to continue throughout construction.

The age of the existing facilities and the fact that the departure hall occupied areas of three building expansions created challenges for the project team.

“It was a bit of a shoehorning exercise,” remarks IBI Group Project Manager Ken Pugsley. “Any time you renovate an older building, you have to bring it up to code, including architectural function, mechanical and electrical systems. We’ve all seen home improvement shows when they open up something old—you never know what you’ll find.”



KEN PUGSLEY

Speaking from YXE’s perspective, Grinde notes that the terminal building envelope was established for the three construction projects, and the architects and engineers got creative and designed renovations that were constructible and allowed airport operations to continue. The general contractor provided expertise in working with existing buildings and found solutions to many of the obstacles, he adds.

### Virtual Reality

During the concept planning process and design phases, Airbiz created simulation models to help airport officials visualize the best way to incorporate common-use elements into the terminal. Highlighting points of congestion and areas of concern helped all parties understand the value and visualize the potential results, explains Lammie. The goal was to shore up the IT strategy for the check-in hall and determine where carriers would operate. The team studied entry points at the curb, sightlines to the check-in area, passenger flow inside the terminal, locations of specific carrier operations and more.

“Kindrachuk Agrey Architecture provided a virtual reality program equipped with VR glasses to allow people to see first-hand what the space would look like, and Airbiz provided the passenger traffic simulations,” explains Grinde. “This was useful to allow our partners to walk through the space before it was built.”

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## What's in a Name?

Saskatoon Airport Authority recently adopted a new name for its facility by adding Skyxe (pronounced “sky ex ee”) before Saskatoon Airport.

SK is the postal abbreviation for Saskatchewan, the province where the airport is located;

SKY is a reference to the area's clean air and clear views of the Northern Lights; and

XYE is the airport's same three-letter identifier, which passengers, pilots and airlines were already accustomed to.

The airport's new logo features an ascending stroke connecting two dots. The stroke symbolizes the uplifting experience YXE works to offer passengers, and the dots represent departure and arrival points. The green and blue color scheme denotes Saskatchewan's natural resources and environmental conscience.

Lammie notes that terminal simulations are effective ways to provide airport management with proof of concept and dynamically test passenger flow. “In the simulation, we diagram where the points are that people stop and orient themselves,” he explains. “We simulate a peak hour demand using data from the airport or other sources.”

IBI Group and Aerodata worked closely with Airbiz to complete the simulation. For instance, Pugsley used the passenger simulation to determine the volumes, timing and waves for baggage processing.

“There were originally 10 auto bag drops, and we got that down to four. We also determined how to divide the desks, remote terminals and more,” he explains, noting that the iterative approach required architectural and IT personnel to work together.

Lammie notes that in the U.S., carriers often want to use their own equipment and branding, but Canadian and European airports have an airport-centric approach when considering common use as a solution. That said, the strategy is increasingly gaining wider acceptance at



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U.S. airports, he adds. Common-use systems empower airports to coordinate the use of counters at different times of day for different airlines and also require smaller areas for check-in, which dovetails with the trend of more passengers using smartphones to check in.

“Fewer people need to interface with the check-in counter because they are checking in using their devices,” Lammie says. “It serves passengers, the airlines and the airport to allow for a more flexible approach to check-in. Putting in more check-in counters with a bigger footprint would not have been the most efficient way to move forward.”

### Great Time to Go Touchless

The new kiosks at YXE allow passengers to check in by scanning boarding passes stored on their own cellphones and other devices.

“The pandemic has caused technology to move toward the touchless trend,” Lammie observes. “In the past, we presented these ideas to airports in the name of efficiency and flexibility and additional capacity. Now, health and security with biometrics are finding their way into the conversation.”

Ong adds that restructuring check-in has optimized the airport’s footprint. “YXE now has the flexibility to allocate airlines throughout the check-in hall to ensure each has the necessary space to operate with social distancing measures, additional to being able to accommodate more airlines within the same footprint,” he says. “Furthermore, the airport’s vision of having self-service bag drop units was so timely, especially with today’s restrictions and the move to go touchless. A passenger can walk up to a unit, scan their phone without touching anything, check in and drop their bags with minimal contact.”

McGrath sees this as a model that similar size airports may want to emulate. With common-use systems such as YXE’s, airports that are cash-strapped or space-constrained can get more out of their facilities without having to build, he explains.

“Passengers very much like the changes. And with self-service bag drop, they are able to use a touchless system, which is good for the airlines,” Pugsley adds. “By employing common use, the airport has the ability to reallocate counter space.”

That’s a big factor for YXE. “We increased our circulation space by 40%, and we got it done in the same footprint we already had,”

Leeming summarizes. “We think the results came out really well. That extra space has been invaluable.”

Moreover, he expects the benefits to last. “I think we saved ourselves 10 years because we won’t have to touch this area again anytime soon. It moved our horizon and had trickle-down effects we’re still realizing,” he reflects.

Today, passengers can see at a glance which check-in stations and kiosks are available, and the streamlined ticketing desks in the bright-white hall are soothingly uniform. As traffic returns to normal, YXE will be ready. ✈️

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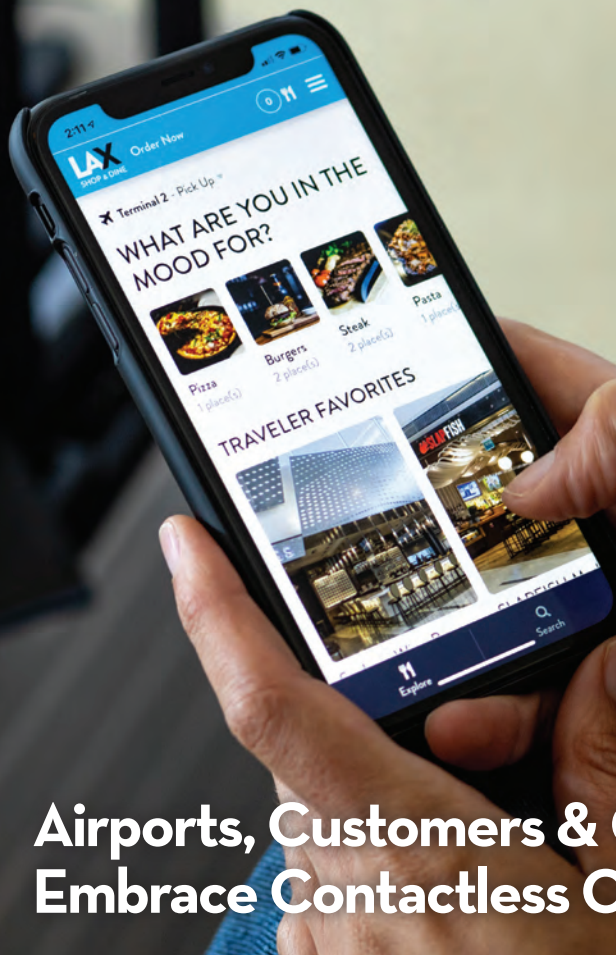
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# Airports, Customers & Concessionaires Embrace Contactless Ordering

BY NICOLE NELSON

## FACTS & FIGURES

**Project:** Contactless Food & Beverage Ordering

**Estimated Industry Acceptance:** 70 airports worldwide, with 6.25 million orders processed on the Grab Airport Marketplace



LOS ANGELES WORLD AIRPORTS

**Early Adopter:** Los Angeles Int'l Airport

**Program:** LAX Order Now

**Program Partners/Developers:** Los Angeles World Airports; Unibail-Rodamco-Westfield Airports; Sery (Grab Airport Marketplace)

**Launched:** Sept. 2020

**Current Participation:** 25 concessionaires

**Customer Usage:** More than 7,000 mobile orders filled since launch



**Early Adopter:** Miami Int'l Airport

**Program:** MIA2GO

**Program Partners/Developers:** Miami-Dade Aviation Dept.; Unibail-Rodamco-Westfield Airports; Sery (Grab Airport Marketplace)

**Launched:** Nov. 2020

**Participation:** 18 concessionaires

**Customer Usage:** 1,300 QR codes scanned within first 90 days of operation

**Key Benefits:** Enhances safety for customers by offering touch-free alternative to ordering, paying & picking up food/beverages at staffed counters; enhances safety for concessionaires by limiting physical contact with customers; helps minimize time airport employees spend waiting in concessions lines



Well before the coronavirus pandemic intensified demand for contactless transactions, Los Angeles World Airports (LAWA) embarked on a quest to enhance the travel experience at Los Angeles International Airport (LAX) by creating a seamless digital experience from curb to gate. The effort extended to busy airport eateries with LAX Order Now, a digital platform that allows customers to order food and beverages from their own mobile devices.

Launched in September 2020, LAX Order Now provides customers with convenience and also helps create a safer airport environment. By eliminating the need to order and pay at a staffed counter, LAX is helping passengers observe crucial physical distancing guidelines even when they need a quick drink or bite to eat.

“As the gravity of the global pandemic became apparent in early 2020, it was essential that we provide a solution to reduce physical contact within the airport and decrease touch points,” explains Jeffrey Utterback, deputy executive director of Commercial Development at LAWA. “We accelerated



JEFFREY UTTERBACK

our work to enhance our online and mobile ordering platform, and LAX Order Now has become a popular option for people who have an essential need to travel.”

Utterback lauds the service for allowing customers to view menus from many airport restaurants at the same time—from home, while en route to the airport or as they stroll through a terminal.

“All guests need is a web browser to visit LAXOrderNow.com, or they can scan one of the many QR codes posted throughout the airport to pull up any restaurant’s menu,” he explains.

As of mid-February, more than 35,000 people had scanned quick response codes spread throughout LAX terminals, and concessionaires had filled more than 7,000 mobile food orders since the program launched last fall.

## Good, Better, Best

LAX Order Now emerged from a foundation that LAX built more than a year ago with terminal commercial partner Unibail-Rodamco-Westfield (URW). LAWA and URW worked with airport e-commerce provider Sery on a digital marketplace that allowed airport guests to browse menus and order online for the first time.



That foundation allowed the airport to be more nimble when the pandemic struck, and the partners collaborated again to make LAX Order Now a reality.

Utterback describes LAX Order Now as a top-to-bottom improvement over the original system because it not only provides contactless ordering and pickup, but also includes training about safe handling procedures for concessionaires and advertising support to promote the service. The associated surge in use by customers demonstrates just how much demand there is for such technology, he adds.

Customers use Grab, Servy's airport e-commerce platform, to browse menus from participating restaurants and pay via credit card, debit card, Apple Pay and Google Pay. The system sends updates and alerts as orders become ready, and customers retrieve their seal-packaged orders from designated pickup locations.

"We know that the easier we make it for guests to purchase, the more likely they are to do so," Utterback says. "As those orders come in, we are able to learn so much about the customer—when they buy, what they buy, where they buy. That allows us to further enhance our offerings through special promotions, sales and discounts. And as those sales increase, the more our airport concessions partners are able to hire employees to meet the demand. It's a win for every stakeholder in the airport, all made possible by putting the customer first."

**Perk for All**

The LAX Order Now option is a boon for airport workers, too. By ordering ahead, employees are able to spend less time waiting in line during their breaks. Employees also receive special promotional codes and ongoing discounts for online orders.

Not surprisingly, more food and beverage vendors are choosing to participate on the digital platform. Currently, LAX Order Now includes 25 restaurants throughout seven of the airport's nine terminals—up from 20 restaurants when the platform first launched in September.

"The last year has been incredibly challenging for all of our concession partners, but we believe that the more we innovate, the more we can maximize revenue and jobs for the airport and our partners," says Utterback. "Technology alone can't solve the challenges facing airports today, but if new technologies like LAX Order Now increase safety for our guests with essential travel needs this increases the likelihood of air travel returning to previous levels sooner. And the sooner air travel increases, the sooner airport concessions will see associated increases in customers."

**Wider Deployment**

Shortly after launching LAX Order Now, URW and Servy contacted Miami-Dade Aviation Department about working together to drive sales for concessions at Miami International Airport (MIA). In November 2020, the partners launched MIA2GO with 18 restaurants. More are expected to sign on as travel recovers and concessionaires return to full operation.

"We are proud to partner with URW and Grab in making MIA the newest U.S. airport offering a mobile food pre-ordering service," says Lester Sola, the airport's director and chief executive officer.

So far, MIA considers the program a success. In fact, the airport logged 1,300 QR code scans within the first 90 days of operation.

Mike Salzman, executive vice president and group director of Airports for URW, says that facilitating contactless ordering is a vital step in helping airports rise to the occasion during this unprecedented period for the industry.

"If new technologies like LAX Order Now and MIA2GO help travelers feel safer when they fly, that increases the likelihood of air travel returning to previous levels sooner," Salzman says. "And the sooner air travel increases, the sooner all airport personnel can



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get back to work...There's a snowball effect that we create as we begin to digitize the airport."

Beyond the options at LAX and MIA, about 70 airports across the globe participate in similar partnerships, with 6.25 million orders processed on the Grab Airport Marketplace to date.

Response to the contactless option has been fantastic, he reports. "This is what airport customers have always been asking for—a way to get what they want, when they want it. It has also been well-received by our frontline workers, who have a safer experience interacting with customers."

For Salzman, contactless ordering is about much more than an app or website. "This is about setting the airport up for a digital future by creating an adaptive, responsive service that caters to the ever-evolving needs of the traveler," he explains. "LAX Order Now and MIA2GO will continue providing a more convenient, efficient experience for years to come when the pandemic is behind us."

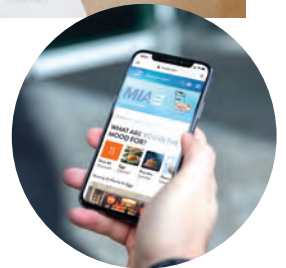
Servy Chief Experience Officer Jeff Livney concurs, noting that restaurant menus can also be integrated into third-party channels



JEFF LIVNEY



Contactless ordering and seal-packaged orders help assuage COVID-related concerns.



such as airline and airport apps, making them even easier for the traveling public to access.

"Servy always sets out to enhance the hospitality experience for guests through our technology," Livney says. "We have been very pleased with the results."

Looking ahead, he notes that food and beverage programs such as LAX Order Now and MIA2GO can be expanded to include retail concessions as demand warrants. ✈️

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# New Parking Ramp Prepares Minneapolis-St. Paul Int'l for Post-Pandemic Rebound

BY PAUL NOLAN



It pays to plan well into the future, even if the unimaginable occurs.

Last August, Minneapolis-St. Paul International Airport (MSP) completed construction of an 11-story parking ramp and transit facility at Terminal 1. When the \$443 million project broke ground three years earlier, MSP was in the midst of a 10-year growth trend that peaked with a record 39.5 million passengers in 2019. But by the time the project was finished, the airport was only serving about 25% of its normal volume due to the COVID-19 pandemic.

It was a little like getting a Lamborghini just as the autobahn temporarily closes for a year. The new Silver Ramp will not be used for passenger parking until demand warrants. However, other multimodal functions housed beneath the parking areas are in full operation: a rental car center, light rail transit stop and off-airport shuttle services and metro buses.

The Metropolitan Airports Commission (MAC), which operates MSP and six other reliever airports, expects passenger traffic to rebound and considers the new facility an important investment in the future of MSP. The April announcement from the U.S. Centers for Disease Control and Prevention that gave the go-ahead for fully vaccinated people to resume travel at low-risk was welcome news for the entire industry.

## Identifying the Parameters

In 2015, the commission began developing plans to ensure that MSP's main terminal could meet a wide range of needs well into the 21st century. The multi-year, multi-project program included three main components: expanding public parking to meet increased demand, relocating rental car agencies and completely reshaping the airport's connection to light rail service, shuttle buses and other public transportation.

Enabling projects began in 2016, and construction on the ramp kicked off one year later. The \$443 million project was paid for with a combination of general airport revenue bonds and customer facility charges from the rental car center.

“Our team did a fabulous job delivering this program,” says Bridget Rief, vice president of planning and development for the airports commission. “It is not only beautiful and functional, with sustainable elements and art pieces; it truly creates an enhanced passenger experience in a multimodal hub for MSP.”



BRIDGET RIEF

Capacity was definitely an issue when the proposal for a new parking and transit center came before the airports commission. For years, potential customers were turned away when all of the Terminal 1 ramps filled up almost every Tuesday due to early week demand. At the time ramp construction started, the ramps were still full on many Wednesdays as well. “People who were parking at the airport were parking for more days, which created more of an impact,” explains Rief.

The new facility, one of the tallest structures at MSP, adds 3,000 public parking spaces on floors six through 11 and frees up another 2,000 public parking stalls in the Red and Blue Ramps with the relocation of the rental car center—bringing the airport’s total to 29,000 parking spaces. The first floor houses the rental car center, transit station and restrooms. Levels two through five are where passengers pick up their rental vehicles.

The Silver Ramp also builds capacity before other parking ramps require annual maintenance, major rehabilitation or full replacement.

### Numerous Challenges

Designing and building the Silver Parking Ramp presented significant challenges for program manager Kimley-Horn and the rest of the consultant and construction team. To maximize multimodal connectivity and pedestrian access to Terminal 1, the new facility had to be located between existing

buildings. This meant that the construction site was bordered by the airfield and adjacent roadways, and located on top of the existing underground light rail station.

“We had to develop some very innovative engineering solutions to tackle the challenges presented by this once-in-a-lifetime project,” relates Ben Henderson, a Kimley-Horn vice president. “I equate it to open-heart surgery. That may sound overly dramatic, but the reality was that we were trying to build one of the largest infrastructure improvements in one of the busiest and most operationally sensitive areas in our region.



BEN HENDERSON

“We couldn’t go up; we couldn’t go down; we couldn’t go left or right. We needed to be so precise with everything we did, and always aware of how one thing could impact something else. We didn’t have tolerance for mistakes being it would impact some operation at the airport. We spent a significant effort to both manage

## FACTS & FIGURES

**Project:** New Parking Ramp/Transit Facility

**Location:** Minneapolis-St. Paul Int’l Airport

**Cost:** \$443 million

**Funding:** General airport revenue bonds; rental car customer facility charges

**Size:** 11 stories; 2.1 million sq. ft.

**Key Elements:** 6 floors/5,000 spaces; ground-level rental car center, transit station & restrooms; 4 floors for rental car pickup

**Notable Features:** Terracotta façade, with gradient vertical shading; large perforated aluminum mural

**Construction:** 2017–Aug. 2020

**Program Manager:** Kimley-Horn & Associates

**Project Architect:** Miller Dunwiddie Architecture

**Mechanical, Electrical, Plumbing, HVAC & Security Consultant:** Michaud Cooley Erickson

**Construction Coordinator:** Kraus Anderson

**Prime Contractor:** PCL Construction

**Geotechnical Consultant:** CNA

**Honors:** Grand Award from the American Council of Engineering Companies of Minnesota; contender for national recognition

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design and construction risk, and ultimately put forward the best solution to maximize real estate for MAC long term.”

Determining where the parking structure should be sited relative to the underground light rail station that already existed was a major consideration. It was also a considerable challenge, because the station’s roof is about 30 feet underground and made of naturally occurring limestone bedrock. “The rock in the earth is the roof of the station, and we were proposing to put an 11-story parking structure over the top of it,” Henderson explains. “There was a very extensive effort to understand how much the roof of the station could safely support. We completed a risk analysis to determine where to best place the parking structure to maximize the benefits of the new facility, while simultaneously managing the design and construction risk of placing it over the top of the LRT [light rail transit] station.”

The design team’s solution was to use foundation load transfer beams, the largest of which was 90 feet long and 15 feet wide. Henderson explains that, except for the size, such load transfer beams aren’t unusual; but they were applied in a unique way: wrapped with an impenetrable waterproofing system and constructed of highly durable concrete, buried underground, never to be seen again.

### Multiple Precursors

During planning, the project team considered several different locations for the new facility, and ultimately chose the site closest to Terminal 1 and on top of the transit station even though it required numerous enabling projects. Key preparations included:

- relocating and re-profiling a stretch of road that connects to the airport post office, which allowed for realignment of an outbound roadway;
- razing a Delta cargo building where the new outbound roadway was going to be realigned, and rebuilding the cargo facility in a new location;
- relocating the parking exit plaza where fees are collected and connecting it to the new outbound roadway;
- realigning the frontage road because of associated changes to the outbound road;
- building a bridge over the outbound road; and
- constructing a new outbound roadway.

In total, enabling projects accounted for nearly half of the entire budget. “Any one of these enabling projects would be a significant stand-alone project for any municipality,” remarks Henderson.



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## Style & Sustainability

Beyond functionality and more parking capacity, MAC officials wanted visual impact. As Rief puts it, “We wanted to build a parking ramp that didn’t look like a parking ramp.” So the team focused on creating a distinctive, aesthetically pleasing façade.

Designers ruled out traditional precast concrete or metal panels to prevent potential interference with airfield navigation communications. Instead, they specified a system of 2-inch square terracotta baguettes (tubes) spaced 5 inches apart. To enhance the visual appeal, they created a custom palette and placed darker colors toward the ground and lighter colors at higher levels, so the building appears to fade into the sky on sunny days.

Moreover, a lower portion of the west-facing façade features a 15,000-square-foot perforated aluminum mural called *Interrupted Landscapes of the Incomer* that is visible from the ground and through windows on a nearby connector bridge for passengers. The 40-foot-high artwork, by Minneapolis-based photographer Steve Ozone, features seven portraits that illustrate the stories of newcomers to Minnesota.

The engineering and design teams also incorporated sustainability throughout the new facility. Examples include:

The rental car center and transit station are located on the first floor of the 11-story building.



- durable construction materials that are recyclable,
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*Designers specified terracotta baguettes on the airfield façade to prevent interference with navigation communications.*

Additionally, the structure was designed to accommodate a future solar installation that would expand MSP's existing solar generation capacity. Currently, the airport has a 4.3-megawatt solar system mounted on top of several existing parking ramps.

### **A Tricky Build**

Conquering challenges during the design phase was not the only obstacle to overcome. The FAA determined that the four cranes needed for construction could potentially cause problems for runway approach systems during inclement weather; so crews had to suspend work and stow them when visibility was limited. Because of the cranes' size, they couldn't be simply tied off. An operator had to sit in each of the cranes and hold them in place. "We estimate that we spent over \$1 million in time and additional contractor costs related to having to stow the cranes," Rief reports.

Henderson notes that the entire team was aware of the challenges going in, and everyone

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committed to over-communicating to keep processes on track.

“One of my biggest takeaways from this project is how important it was to keep everyone apprised of the ongoing status, whether it pertained to design or construction,” he reflects. “Being transparent with how decisions were made and working together made for a much smoother process.


“The MAC was wise to understand that we needed to step out on the right foot by putting together an executive leadership team, which included MAC leadership, that would meet monthly, or more often as needed, to make sure we were talking about these critical decisions frequently and that everyone was very involved. By having direct access to and involvement from MAC leadership, the project leadership team had the great advantage of a collaborative, efficient and comprehensive decision-making process. This communication strategy is one that every consultant should consider. Treating every project with the care needed to make sure there is good communication and collaboration throughout each project makes all the difference in the world.”

In retrospect, Henderson acknowledges that it would have been easy for MAC leadership to decide that building the parking ramp in such a difficult area involved too many challenges. “But with the right team, extensive due diligence, and the patience to

investigate different options, we developed great solutions that met MAC’s needs.

“The MAC had great foresight to engage the design team early,” he continues. “They had the patience to afford the team the time to find the right solution. Because of MAC leadership’s planning mentality and willingness to get out in front of the design challenges early, the team was provided the opportunity to put forward the best solutions.”

While some may consider it odd to complete a new parking ramp/transit center during a pandemic, MSP officials are confident that soon, it will serve the airport and traveling public well. And passenger levels *are* improving. In fact, traffic through MSP’s checkpoints was just 25% to 30% below pre-pandemic levels for four straight weeks during the spring break travel season.

“It’s unfortunate that the COVID-19 pandemic hit just as we were nearing the conclusion of construction,” Henderson remarks. “Because the MAC is always planning for the future and knowing parking demand at MSP is going to come roaring back at some point soon, we all knew that pressing forward toward completion of this award-winning, transformative project was the best thing to do.” 

## Great markings are no accident.

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# Philadelphia Int'l Finishes Airfield Rehab Months Early Despite Multiple Challenges

BY THOMAS J. SMITH

 The multi-year \$25 million East Airfield Rehabilitation at Philadelphia International Airport (PHL) was completed 71 days early—and that was after having to shut down due to COVID-19.

With construction progressing so fast and money still in the budget, PHL even managed to take advantage of reduced airfield traffic from the pandemic to add extra taxiway overlays to the project scope.

The addition of an extra 38,500 square yards of mill-and-replacement work toward the end of the project was in keeping with its roots. Originally, the work scope only included the replacement of the North Apron, but it expanded to cover eight separate areas totaling 132,500 square yards and was eventually dubbed the East Airfield Rehabilitation project.

Jay A.C. Kellogg, project manager for general contractor Haines & Kibblehouse (H&K), notes that the firm did not receive deadline extensions associated with the COVID-19 shutdown or additional work.



JAY A.C. KELLOGG

Kellogg credits effective collaboration between PHL and all the stakeholders for the notably early finish. He also says that having the opportunity to tweak project plans after securing the work in late 2018 was a pivotal factor.

Much of the design work by Johnson, Mirmiran & Thompson (JMT) was completed on schedule in 2017 and early 2018. It included meetings with airport operations, the airlines and the FAA to assess safety zones and work timelines. Kyle Watson, JMT's construction manager for the project, notes that all the stakeholders had a good feel for what was needed regarding phasing and night shifts by 2018 and 2019.



KYLE WATSON

After the design project was bid and awarded to H&K, the airport assigned JMT to manage the construction of the project under a separate program management/construction management contract.

Because construction contracts were awarded late in the 2018 construction season, electrical suppliers were not able to get materials needed in the first phase. At H&K's request, the airport delayed construction until spring.



## FACTS & FIGURES

- Project:** East Airfield Rehabilitation
- Location:** Philadelphia Int'l Airport
- Cost:** \$25 million
- Funding:** 75% federal; 25% state & local
- Scope:** 132,500 sq. yards of new pavement in 8 areas, including 2 aprons, multiple taxiways & taxiway intersections
- Unexpected Element:** Crews had to remove more than 26,500 sq. yards of asbestos-tainted asphalt
- Construction:** March 2019-July 2020
- Of Note:** Project completed 71 days ahead of schedule
- Design & Construction Manager:** Johnson, Mirmiran & Thompson Inc.
- Prime Contractor:** Haines & Kibblehouse Inc.
- Construction Safety & Phasing Design:** Airport Design Consultants Inc.
- Airfield Electrical Design:** Arora Engineers Inc.
- Airfield Pavement Design:** RDM Int'l Inc.
- Electrical Subcontractor:** Carr & Duff Inc.
- Asphalt Supplier:** Delaware Valley Asphalt, an H&K plant
- Concrete Supplier:** The Silvi Group
- Concrete Services & Environmental Remediation:** Mattiola Services Inc.
- Pavement Marking Subcontractor:** Zone Striping Inc.



“We planned through the winter and tweaked the phasing schemes that had originally been put together,” explains Kellogg. “We re-aligned them to get some phases done faster.”

Construction began in March 2019 and was completed in July 2020.

To meet the deadline, H&K had multiple crews working around the clock. One group was active in a given area during the day, and another crew worked at a different site at night. Night work on active taxiways could only occur from 10 p.m. to 6 a.m.

Although H&K had experience with airport projects, this was its first at PHL. The firm has subsequently won several other PHL bids.



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*Multiple crews worked day and night to meet, and ultimately beat, construction deadlines.*



## Scope Sprawl

The East Airfield project was originally conceived in 2016 as the rehabilitation of the North Apron. The area was the site of PHL's old overseas terminal, with pavement dating back to the 1970s. Portions of the concrete had deteriorated to the point that it posed a debris hazard to aircraft.

Lia Sutanto, PHL's airport engineering assistant manager, explains that the project team initially planned for a standard mill-and-replace project for the asphalt pavement sections. But further sampling and evaluation of the future parking operations indicated that full-depth reconstruction was necessary.



LIA SUTANTO

JMT had completed about 90% of the design work for North Apron reconstruction when the airport decided to expand the project scope.

PHL's pavement management program, prepared by JMT and RDM International, had identified several other areas on the eastside of the airfield that warranted repairs, pavement rehabilitation, or even complete reconstruction, explains Darren F. D'Achille Sr., design manager with Johnson, Mirmiran and Thompson. With the availability of federal funds, it became a "no brainer" to include the taxiways near the two aprons that were in poor condition and critical to accessing the runways, D'Achille explains. These new areas were rolled into the larger project with the North Apron.



DARREN F. DACHILLE SR.

Project designers took into account that the area is frequently used for remote overnight parking of large aircraft—specifically, that the apron pavement is now holding aircraft heavier than it was originally designed to handle. The pavement on the South Apron, which is used as a "fuel-and-go" area for diverted aircraft and sport charters, only needed a new 4-inch overlay.

H&K crews consequently milled and replaced 66,600 square yards of asphalt apron and taxiways, reconstructed 36,300 square yards of asphalt taxiway pavement,

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and installed 29,600 square yards of concrete pavement on aprons and taxiways.

Initial planning meetings with stakeholders resulted in construction phases that only closed half an apron at a time, Sutanto notes. In addition, work had to be scheduled when deicing would not be needed, and sport charters were not using the area. "There were certain months we could get away with taking whole areas out of service," she explains.

Moreover, PHL had several other airfield projects underway with other contractors at the same time.

### Blast From the Past

Everyone was taken by surprise when crews discovered the widespread presence of asbestos in the North Apron asphalt.

While older plans indicated some asbestos mitigation and removal on the North Apron, Sutanto explains significantly more asbestos-laced pavement was discovered than what was expected.

"Asbestos has not been used in asphalt pavements for over 50 years and removal of the material is not a standard construction item for airfield projects," notes D'Achille.

"PHL does have an alternative method/protocol in place to remove the asbestos," Sutanto explains, "but it was deemed both inefficient and could potentially inflate cost and schedule to an unacceptable limit. We had to come up with a new method that allows us to remove it safely and quickly—allowing us to preserve the schedule and stay on budget."

As few best practices for asbestos removal are available, the project team had to develop a new one. Two procedures were considered: a wet-milling operation that JMT designers suggested based on a standard from the Pennsylvania Department of Transportation, and a saw cut and removal method, which would slice and cut the top layer of asphalt and remove it intact. Coordination with local air quality agencies indicated a preference for the slice-and-cut method.

The slice-and-cut plan was selected and approved...but ultimately did not work.

Despite contractors using a variety of heavy excavation equipment and saws, the pavement broke apart into chunks of



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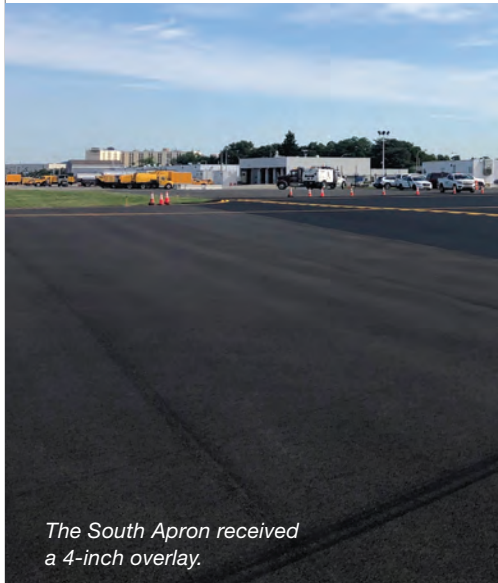
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*The South Apron received a 4-inch overlay.*



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asphalt and concrete. Apparently, the binder holding the asbestos-laced asphalt to the concrete base had a stronger bond than either the asphalt or concrete. “It was not separating the way any of us had anticipated,” explains John Mast, manager of H&K’s Philadelphia operations at the time. “We had to find another method to take it out.”



JOHN MAST

Using the slice-and-cut method would have required a much larger amount of debris to be disposed of as hazardous materials.

So H&K revived the milling strategy and attached extra misting sprayers to its equipment to keep the entire area wet. Mast explains that most of the dust was captured with special HEPA-equipped vacuum hoses at the grinding heads, and additional sprayers were attached to the tip of the conveyor belt to wet down debris as it fell into specially lined dump trucks.

In total, crews removed more than 26,500 square yards of asbestos-tainted asphalt from the North Apron. Air was continually monitored throughout the process and Mast reports no asbestos fibers were becoming airborne.

Kellogg notes that it took crews 15 days to remove the asbestos-tainted pavement, but the team spent about three weeks trying to get the slice-and-cut method to work and

then developing safeguards for the grinding system that was ultimately used.

With the tainted asphalt removed, crews pulverized the concrete base to clear the area for full pavement reconstruction.

### Construction Suspended

When the novel coronavirus pandemic struck the United States last March, H&K had completed the bulk of the originally contracted work and was beginning the additional taxiway portions. Then, Pennsylvania’s governor ordered all construction projects to shut down, and the East Airfield project stood idle for two weeks.

After the project was deemed essential, the team was allowed to re-start with COVID-specific health and safety plans. “We were the first to open again at the airport,” Mast notes.

Plans included provisions for social distancing, additional portable restrooms, hand-washing stations with hot water, virtual meetings and mask mandates.

Sutanto notes that none of the contractors working on the project reported any positive COVID-19 tests.

Looking back, Watson says that less traffic on the airfield benefited the project, but only slightly because most of the work was already completed. The slowdown did, however, help crews complete the newly assigned taxiway work faster, because additional areas were closed. ✈️

Airport Master Plan Update, Unalaska Airport  
Dutch Harbor, AK

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# Colorado Springs Airport Reaps Rewards of Digital Work Orders, Asset Management

BY VICTORIA SOUKUP



**COLORADO SPRINGS  
AIRPORT**

## FACTS&FIGURES

**Project:** Central System for Cataloguing Assets & Work Orders

**Location:** Colorado Springs Airport, CO

**Annual Support Fee:** \$35,000

**Consultant:** Veoci

**Development/Implementation:**  
Less than 1 year

**Key Benefits:** Digital tracking of maintenance & work orders for airfield, landside, terminal/facilities & information technology; data helps management monitor work flow, determine costs for parts & labor, track inventory & plan asset replacement; documentation supports Part 139 inspections; communications module alerts personnel to emergencies

**Of Note:** Program can be customized & changed as needed

To-do lists at Colorado Springs Airport (COS) are no longer paperwork manila files, sticky notes or even email threads. Instead, maintenance tasks and work orders are managed in a sophisticated software program that tracks all aspects of general operations, from airfield and landside to terminal/facilities and information technology.

As a result, COS management is finding it easier to monitor work orders through completion, determine costs for parts and labor, track inventory and simplify Part 139 inspections.

"This system required quite a bit of hands-on work to develop, but that is what we liked about it," says Director of Aviation Greg Phillips. "To create something like this, you've got to be open to do the



GREG PHILLIPS

work to make it fit your particular airport. And we are happy with how it worked out. This provides good task notifications and serves as the work order system for our airport."

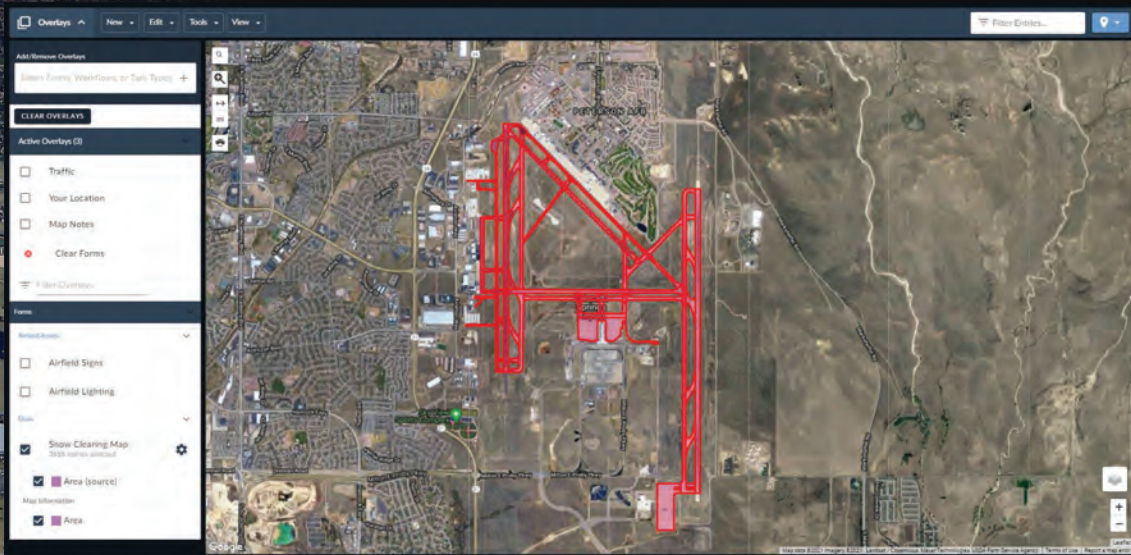
Officials from COS contracted Veoci to develop the software in 2017. The initial work was completed a year later and since then, the airport has relished having its information catalogued into one central system as opposed to different systems in different departments.

"We never had a system that tied everything together from a maintenance and operational standpoint," says Brett Miller, the airport's assistant director of aviation. "We had been using an antiquated spreadsheet to track

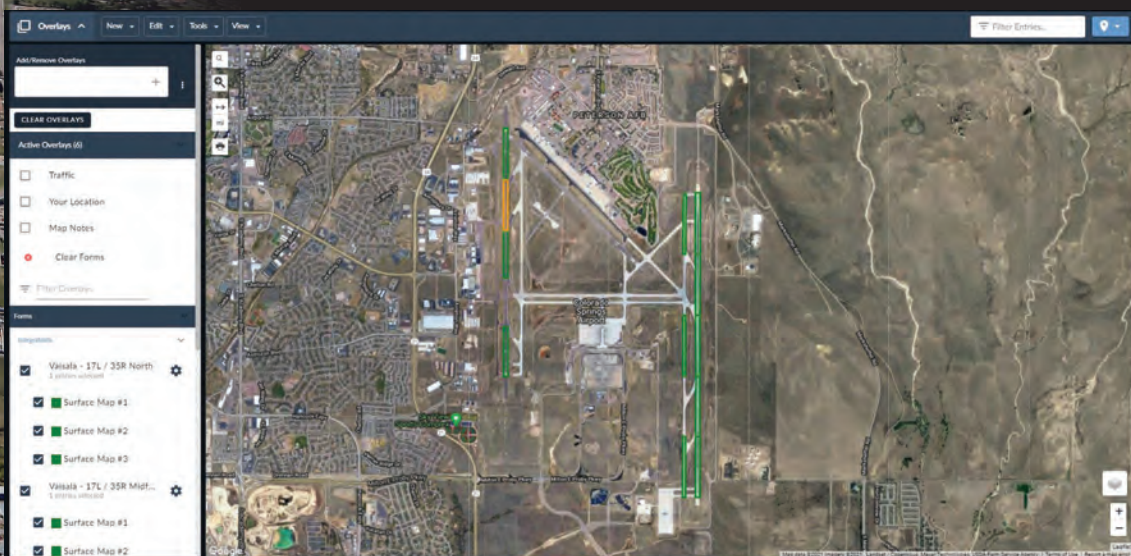


BRETT MILLER





Snow Map



Viasala Integration Condition Map

opened maintenance items. We wanted something that could create better efficiencies and tracking as it relates to the bottom dollar so we could make good decisions in relation to airfield and facilities assets.”

### One System for Work Orders

The program covers asset and inventory management, inspection and preventive maintenance for four departments: airfield, landside, terminal/facilities and information technology. “We are able to integrate four different work order processes in one system since they use the same inventory and accounting methods with only small differences, explains

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Alex Nguyen, airports solutions manager for Veoci.



ALEX NGUYEN

Given the critical nature of Part 139 compliance factors, Airfield-Operations was the first department organized under the new system. It then laid the framework for the rest of the program.

Miller notes that the system's Part 139 tracking has been especially valuable for COS. Instead of fumbling through piles of paperwork when inspectors ask to review open work orders, personnel are now able to show them the exact status. "It greatly simplifies tracking and displaying historical Part 139 work orders for inspections," he says.

Switching to the Veoci program required the building team (COS and Veoci personnel) to load all of the airport's asset information into the system. They also had

to gather information related to inventory, inspection requirements and maintenance schedules.

Work orders are automatically triggered for routine maintenance, repairs identified during inspections, visual/technological reporting, etc. Orders with detailed information about what needs to be repaired at specific locations are sent to the maintenance department, where a supervisor reviews them and determines whether each job should be performed, what parts are needed and whether they are in the airport's inventory.

Employees search for needed parts from a drop-down menu and request them from inventory personnel, who review the requests and authorize parts. The program deducts approved parts from the inventory database and assigns the work orders.

Nguyen highlights the utility of having all work order information in one platform that is available on a mobile app. "No one has to look at a piece of paper or print

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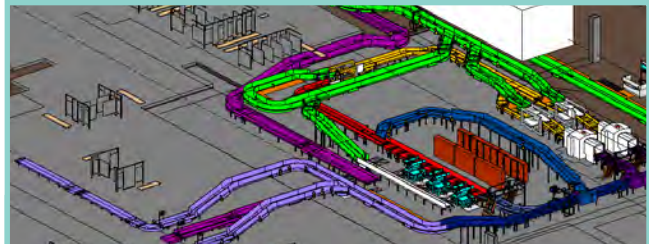
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something out to make sure they have everything they need to do the work," he says. "All the details are there."

The program also documents who performs each job, when it was performed and how long it took before final documentation closed the work order—all valuable information for COS executives. "From an efficiency standpoint, it absolutely improves the airport," says Miller. "We now have a one-stop shop. If I want to analyze what work orders are out there, how long have they been out there, how much we've been spending and the status of our inventory, I can find out with one click of a button."

### Inventory Tracking & Location Mapping

The Veoci program has improved inventory tracking at COS, because the airport's previous system did not account for costs or the value of existing inventory for new parts, restocking or returns. "Tying our warehouse to the work orders helps determine what is needed to complete a job and track available inventory," Miller explains. "That information can instantly determine the exact cost of a specific repair."

Moreover, safety is improved when inventory and work orders are on the same page. "You're not having to travel back and forth in case you forgot something," Nguyen says. "The more time one

spends on the airfield, the greater the likelihood something could happen. A person should only be out there for a specific reason. They need to go straight there, get the work done and get out."

The system allows field personnel to use online mapping services such as enterprise Google Maps to pinpoint the location of assets that need to be repaired. "Someone assigned to the work can get an aerial on their mobile device to find the exact location," Nguyen says. "Previously, the technology was paper. With this tool, they get the aerial map and know exactly where to go. They're not spending time on the airfield hunting and pecking around."

In addition, the system integrates with the airport's Vaisala sensors that monitor pavement conditions and temperatures. Aerial maps of pavements or roads include transparent boxes that indicate surface conditions. "These boxes change color depending on the conditions being seen," Nguyen explains. "It's green if it is dry, but if a contaminant such as water or ice is picked up by the Vaisala sensor, the system changes the colors accordingly."

This supports safety and efficiency, he adds. "On top of completing their work order, they can use the sensors to see what the surface conditions are to determine if they should also do brake testing or something else."

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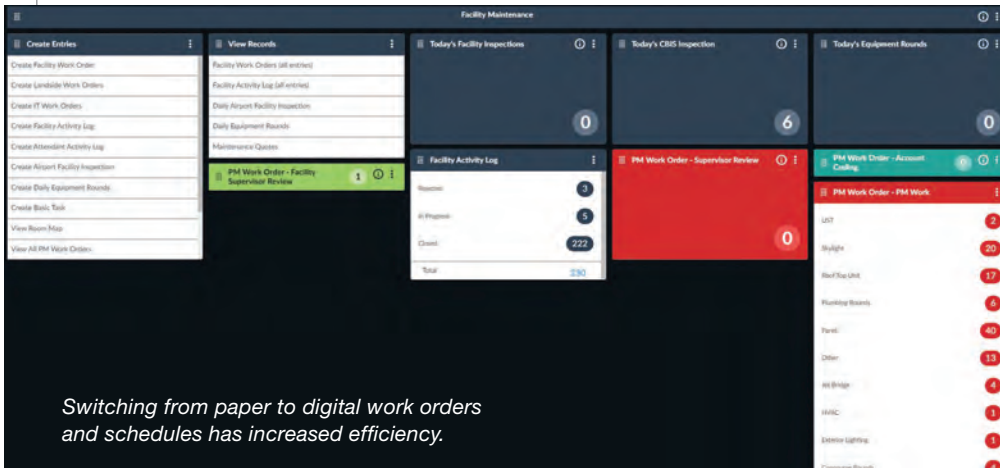
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*Switching from paper to digital work orders and schedules has increased efficiency.*

### Data to Drive Decisions

An asset management module tracks preventive maintenance on everything from airfield signs to snow-removal equipment. The program catalogues manufacturer name, model number, purchase date, maintenance schedule, inventory, repair needs and operational costs for each

piece of equipment. When the time comes for an inspection or service, the system alerts a supervisor to assign the job.

This allows airport personnel to generate a report about when maintenance needs to be performed on a certain piece of equipment, how much an anticipated repair will cost in labor

and parts to the associated cost-benefit analysis on whether older equipment should be replaced.

“When COS looks at their assets now, they can see the preventive maintenance work done on it and all of the work orders that were applied to it,” Nguyen explains. “Because the work orders track costs, we can pull up an item and say, for example, ‘This old jet bridge costs us \$40,000 in the past year because of these repairs.’ It gives the airport the big picture of what’s going on with their assets. They can then take this hard evidence to the table to see whether they need to budget and replace an asset because of its costs.”

### Emergency Alerts

The communications module in the Veoci system allows COS to issue instant message alerts for situations such as a medical emergency inside the terminal at a specific gate, or an aircraft issue on the

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# Part 139 Operations



## AUTOMATED MOBILE INSPECTIONS

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## MOVING MAP CAPABILITIES

Veoci's map automatically shows your current location and moves with you, making it easy to visualize all assets around you.



## WORK ORDERS, NOTAMS, WILDLIFE LOGS

You never have to remember if there are any NOTAMs or Work Orders related to a particular inspection item. The system does all the heavy lifting for you.



## SMS & FAA COMPLIANCE

Dashboards track compliance operations across your airport. Streamline and simplify the inspection process by creating a digital compliance portal on the web.

# Airfield & Administration

---

## Digitized Maintenance Management

Veoci's digitized maintenance solutions streamline every aspect of an airport's maintenance, repair, and supply operation. Design and implement any process through a revolutionary no-code, drag & drop interface. Transform your paper and manual processes into a live-interactive workflow. Build a distinct work order management system for each department.

## Inventory Management & Tracking

Create and manage an asset inventory and automate reordering processes. Collect financial information on each inventory item and build reports which tie directly into the maintenance/work order system. Collect and centralize data across every department, create an unlimited number of databases and real-time dashboards. Leverage proactive insights from instant ad-hoc reporting.

## SOLUTIONS

- Part 139 Operations Airfield & Inspections
- Lease Management
- Wildlife Reporting and Tracking
- Environmental Management
- Purchase Order Management
- Vendor Management
- FBO Service Request
- Personnel Training Management

## Automated Administration

Administrative operations should be as efficient as airfield operations to ensure everything at an airport runs smoothly. Veoci's no-code configuration lets airports build an efficient digital workflow for any process. Automatically send notifications as a process progresses, escalate workflows to personnel across the airport, track and manage digital documents like contracts, and stay on top of important dates and deadlines.



# Safety Management System

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## SOLUTIONS

- Hazard reporting
- Anonymous/ public form submittal
- Risk assessment matrix
- Customized SMS processes that comply with your own SMS Manual
- Industry best practice in SMS processes
- Cluster mapping
- Comprehensive ad-hoc reporting and analysis

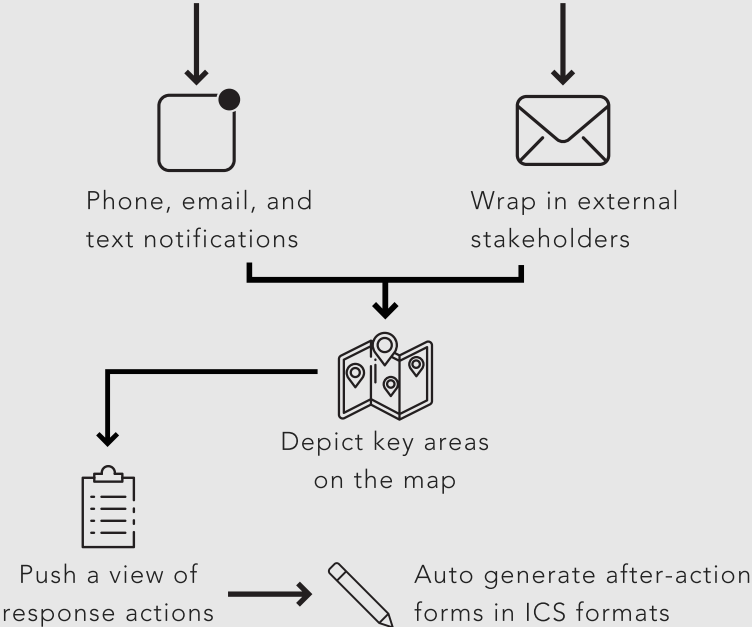
# Emergency Management



Veoci is a powerful Emergency Management Platform. It allows you to create, share, and manage all information related to any number of incidents, addressing all processes including the phases of mitigation, preparedness, response, and recovery. Emergency response plans, checklists, and procedures can be digitized and launched from any mobile device.



## Launch a Plan



# Veoci Solutions Directory

## Airport Administration

- Lease Management
- Contract/Vendor Management
- Concessions Reporting
- Purchase Order Requests
- FBO Service Requests

## CMMS/Work Orders

- Airfield Work Orders
- Landside Work Orders
- Terminal Work Orders
- Building Work Orders
- Preventive Maintenance Schedule
- Public Tenants Portal

## Emergency Management

- Digital Incident Response Plans
- Virtual EOC
- ICS forms
- Phone, Email, Text Alerting

## Environmental

- Environmental Spill Log
- Construction Assessment
- Balanced Scorecard
- Stormwater Pollution
- Prevention Plan
- Environmental Observations
- Tenant Inspection Form
- EMS Facility Exposure Assessment
- EMS Tenant Checklist
- Outfall Characteristics

## External System Integrations

- Digital NOTAM
- METAR
- National Weather Service
- Esri ArcGIS
- FIDS/Flight Aware
- Pavement Sensors
- GPS Transponders
- FAA Bird Strike Database
- Active Directory
- Crash Phones
- ASD-X Data

## Inspections & Daily Logs

- Fuel Farm Inspections
- Ramp FOD Log
- Escort Log
- Runway Closure Log Taxiway/Runway FOD Log
- Equipment Checkout Log
- Circuit Lock Out/Lock In
- Obstruction/Crane Logs
- Deicing Logs
- Surveillance Reports
- APU Action Logs Shift Log
- PAPI Inspection Log
- Noise Complaints

## Part 139 Operations

- Part 139 Inspection Checklist
- Wildlife Log
- Operations logs
- Runway Condition Reporting
- Training Records

## Mapping

- Airfield General Identification Layer
- Signs & Lights
- Mowing Areas
- Ditch Lines
- Drainage Structure
- Inventory
- Cranes/Obstructions
- Hangars & Tie-downs
- Fire Hydrants
- Drone Sightings
- Snow Removal Areas

## SMS

- Anonymous Incident Reporting
- Risk Assessment
- Recommended Actions & Mitigation Plans
- Heat Mapping
- Safety Assessment
- Screening Process
- Calendar of Incidents
- Aircraft Alert Reports
- Airfield Incident Reports
- Cut Cable Reports
- Environmental Spill
- Runway Incursions
- Surface Incidents



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airfield. It also monitors weather conditions such as lightning strikes and winter storms. Pre-programmed lists tell the system who should be notified for various emergencies.

Miller notes that improving communications was a priority for the airport. “We’re able to push instant messaging based off the type of situation taking place,” he says, adding that some personnel use radios, but all have smartphones readily available. “The message hits everyone all at once. And as the event transpires, we follow up with additional alert notifications. Of course, there is also the actual physical dispatching and communications with ARFF or law enforcement officers over the radio. But now we can reach out to those who are not directly involved in the operation but probably have a need to know. And we’re able to pull all of them in with one click of a button.”


Such messaging is also helpful during snow events when the airport utilizes Veoci to activate its snow plan and alert staff of snow call outs. Alerts are sent to snow teams regarding forecasted snowfalls, which helps them decide what type of action to take. “When it comes to a snow call out, the system utilizes an automatic dialer and messenger that will automatically alert all appropriate individuals that they need to respond to the airport,” Miller says.

## Changes & Updates

The initial cost to build the system was not disclosed, but COS pays Veoci a \$35,000 annual support fee. “It’s like a forever build,” Miller says. “And that’s the nice thing with this package—it’s so customizable that you can do the changes and upgrades you want as your operations change.”

Miller and Phillips advise other airport officials interested in a similar system to decide exactly what they want out of it, and to stay actively involved in its construction. “We wanted all our information in one place,” says Miller. “We wanted everything to communicate together. We did not want different work order systems for each department.”

Officials were reminded of the system’s value in March, when Southwest Airlines began service at COS and its overall traffic returned to pre-pandemic levels. With 13 new daily departures from Southwest, the airport now has 33 daily departures.

“The ease and speed in which we can now track issues is a long way from paper documentation,” Phillips remarks. “If an airport hasn’t gone the direction of an automated system like this, it really needs to think about it.” 



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# Akron-Canton Airport Updates Gates to Prepare for Growth

BY JODI RICHARDS

 When Akron-Canton Airport (CAK) completed a \$37 million gate modernization and concourse expansion last fall, the northeast Ohio airport also celebrated the culmination of its 10-year, \$115 million capital improvement program. Together, the projects update the 1960s terminal, allow it to accommodate all current aircraft and right size the facility for future growth.

Airport President and Chief Executive Officer Ren Camacho explains that CAK was in its heyday when the project was originally conceived more than a decade ago. “We had AirTran, which really started off with a boom here,” says Camacho, noting that the airport hit its peak volume of 1.8 million annual passengers in 2012. Then Southwest Airlines acquired AirTran, and CAK’s passenger numbers started to decline, as Southwest consolidated existing operations to other airports in the region instead of CAK.



REN CAMACHO

Following the downturn in traffic after Southwest’s departure, CAK attracted Allegiant Air and started to see some growth. When Allegiant moved its operation to neighboring Cleveland-Hopkins International Airport, traffic dipped dramatically; but Spirit Airlines established service at CAK and incumbent carriers began backfilling routes. This period of changing carriers, aircraft and markets served made it particularly important for CAK’s expansion plans to remain flexible.

The airport served about 1 million passengers in 2018 and finished 2019, pre-pandemic, with 830,000 passengers. “But

we were having conversations with air carriers—both incumbent and new opportunities—to turn around to get us back to at least 1.2 million by 2021 or 2022,” Camacho advises. “Obviously, the pandemic hit, and it has adversely turned the industry as a whole.”

Despite the downturn, airport officials are optimistic that travelers will return to CAK. And the gate modernization project is designed to make sure that the facilities will be ready. “We wanted to right size the terminal in a way that we could still expand into the future if needed,” Camacho explains.

The airport hired CHA Consulting Inc. to provide conceptual planning for the capital improvement program as a follow-up to the Master Plan update the firm developed for it in 2015.

Paul Puckli, vice president of market development at CHA Consulting, says that airport officials asked the civil engineering firm to present options that would bring the aged terminal up to modern standards. Second-level boarding and eliminating the Y-shaped concourse were among the specific requests. After exploring several options, CAK felt that expanding to the south was the simplest solution, even though it required roadway modifications and finding a new site for some employee parking and the rental car ready/return lot.



PAUL PUCKLI

The project team spent several months planning the construction phases to reduce operational impacts associated with replacing old gates with new. In the end, reduced passenger levels due to COVID-19 actually made the construction and installation processes easier.



## FACTS&FIGURES

**Project:** Gate Modernization & Expansion

**Location:** Akron-Canton (OH) Airport

**Key Components:** 9 gates with boarding bridges; 2-level concourse with 41,600 sq. ft. of space

**Cost:** \$37 million

**Funding:** FAA grants; private bonds; state infrastructure bank loans; passenger facility charges

**Timeline:** Aug. 2018-Nov. 2020

**Architecture/Design:** LEO A DALY; Sol Harris Day

**Master Plan Lead & Initial Conceptual Planning:** CHA Consultants Inc.

**Civil Engineering/Design:** CHA Consultants Inc.

**General Construction Contractor:** Knoch Corp.

**Structural Engineering:** A+F Engineers

**Mechanical, Electrical, Plumbing, Fire Protection Engineering:** Dynamix Engineers

**Geotechnical Investigation:** Timmerman Geotechnical Group

**Surveying:** Environmental Design Group

**Cost Estimating:** Connico

**Environmental Testing:** Environmental Support Network

**Civil/Sitework Contractor:** Great Lakes Construction

**Apron Underground Detention System:** Advanced Drainage Systems Inc.

**Passenger Boarding Bridges:** Ameribridge Services

**Seating:** Arconas

**Key Benefits:** Allows airport to accommodate all narrow-body aircraft at any gate; lays foundation for future growth; new boarding bridges, amenities enhance customer experience

To minimize inconveniences for passengers and the airlines, planners divided the ambitious program into three phases:

- utility and drainage work, plus construction of a 22,900-square-yard concrete aircraft parking apron;
- construction of a 41,600-square-foot, two-level concourse with nine new gates
- demolition of the Y-shaped concourse, allowing 7,500-square-yards of aircraft parking apron.

### The Passenger Experience

Improving comfort and amenities for passengers was a primary focus for airport administration. Camacho explains that some of CAK's infrastructure was challenged to provide many of the modern conveniences travelers expect at today's airports, holdrooms were undersized and concessions were limited. Additionally, the corridors used to access gates were narrow and boarding occurred on the ramp, which meant passengers were exposed to weather.

The gate modernization project broke ground in August 2018, and crews spent about two years expanding the concourse from 210,000 square feet to 367,000 square feet and installing new boarding bridges at each of the nine gates. Camacho notes that beyond improving conditions for passengers, the new gates allow CAK to accommodate narrow-body aircraft such as 737s at any gate, and position the airport for many years of growth.

The remodeled facility is designed to be modern and timeless, with features that the community wanted, including ample seating to allow for social distancing, abundant power outlets and free Wi-Fi throughout the terminal. Other new conveniences include a



**Congratulations to the Akron-Canton Airport on the Gate Modernization Program**

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Mike DeVoy  
317.694.9672  
mdevoy@chacompanies.com



The new business lounge includes areas to work and to relax.

business lounge, mothers' room, children's play area, sensory room and an indoor pet relief area.

"Ultimately, it comes down to the guest experience," Camacho remarks. "Whatever we can do to make the experience from the parking lot to the gate as seamless as possible is what we continue to strive for."

Avery Sarden, vice president and director of operations for project architect/designer LEO A DALY, echoes that sentiment. "Our goal was to design and create an experience that works for the passengers and the owners," Sarden says. "The airport experience should be part of the fun and enjoyment of travel."



AVERY SARDEN

"On the design side, we have an effective, efficient, aesthetically pleasing facility that seamlessly transforms the existing façade, and goes a long way toward achieving the goal of creating a modern facility and enhancing the passenger experience," he adds.

A new centrally located concessions area provides additional options and views of the airfield to travelers. In mid-April, many of the retail and food/beverage outlets were still temporarily closed due to the COVID-19 pandemic; but Camacho is confident they will come back stronger than ever. United Concessions Group, of Cleveland, recently took over the concessions program and

  
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plans to focus on local food, beverages and merchandise. “We want to make sure that the first and last impression folks have of our airport is as much local as possible,” Camacho explains.

Because CAK was adding new gate and support areas to an existing concourse, designers borrowed from the prevailing aesthetic to create a smooth transition between the two iterations. “As you walk down the concourse,

you don’t know where the original ends and the new begins,” reports Dean Schuerman, senior associate/senior project manager at LEO A DALY.



DEAN SCHUERMAN

Designers also used a curtainwall to complement the existing façade and improve the overall building aesthetic.

The project team opted for a clearspan design, with no intermediate columns for the full width of the concourse, to keep the facility flexible well into the future. The design also includes space for additional gates. Moreover, major mechanical rooms are located on the lower level to minimize constraints on future modifications of holdroom layouts.

Schuerman explains that the placement of columns and adjustments to ceiling height intuitively inform passengers how to navigate the space, which becomes more intimate as they move into the holdrooms. A glass façade allows an expansive view of activity on the ramp and contributes to the open feeling of the space. It also connects passengers to the Akron-Canton community outside—a design goal for airport leadership, he adds.

Designers updated the concourse’s original electrical system and heating, ventilation and cooling systems to make the facility more energy efficient. New skylights bring in more natural light, and LED fixtures help make the facility more sustainable.



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New amenities include an indoor animal relief area.


Incorporating art that reflects the community was a priority for Camacho and other CAK executives. One example is a terrazzo floor design in the atrium called *Tree of Life*. Local artist Lenny Spengler created it to be a timeless piece that contributes to the airport's sense of place and creates a lasting impression on travelers.

Specifically, *Tree of Life* includes 46 leaves to commemorate the 1946 inception of CAK. Individual leaves feature important people, places and events that helped shape the Akron-Canton community. Honorees depicted on the leaves were selected for their leadership, social responsibility, mentorship and effective changes to the region.

### Looking Ahead

Funding for the \$37 million gate modernization program and overall \$115 million capital improvement program came from FAA grants, private bonds, state infrastructure bank loans and passenger facility charges. Camacho notes that both support the airport's focus on community engagement, asset preservation and increasing non-aeronautical revenue such as parking, rental car operations and business development at its two industrial parks. The airport sits on 2,700 acres.

In line with the airport's master plan, the recent gate modernization project allows for future expansion as passenger demand warrants, with room to add three more gates to the south, two more gates at the north end of the terminal and a centralized baggage inspection system. Such expansion may be necessary once CAK gets back to or exceeds 1.2 million passengers, says Camacho. "We just want to make sure we're prepared and we're leaving room to grow."

He and other airport executives consider the capital programs investments that position CAK for future growth and prosperity. "We are an economic engine in the community and want to ensure we can continue that and improve the quality of life and improve the travel experience for our customers," Camacho explains. "We exist for the community. We're an asset to the community, and whatever we can do to ensure a healthy, safe and seamless experience is what we seek for the benefit of the traveling public." 



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# Investments at Rocky Mount-Wilson Regional Pay Quick Dividends

BY MIKE SCHWANZ



A renaissance is underway at Rocky Mount-Wilson Regional Airport (RWI) in Elm City, NC. And master plan improvements are propelling it forward.

Airport Director Dion Viventi reports that several infrastructure projects executed in 2019 and 2020 are already boosting RWI's bottom line. All 23 spaces in three new hangars were completely booked before the facilities officially opened, and general aviation customers have started ringing the register on a new self-serve fuel system that opened in late April/early May.



DION VIVENTI

"Almost immediately, both of those projects started to bring in income to pay off our investment," Viventi reports.

Cargo business, bolstered by airfield improvements made in 2019, is expected to double in the next few years.

Reconstructing the main runway to improve safety and attract more traffic was the crucial first step. WK Dickson, the airport's consulting and engineering firm for nearly 30 years, assisted in the design, planning and construction administration for all of the key projects.

"The runway's impressive length (7,100 feet) did not have to be changed. However, the surface dated back to the 1960s, and was badly in need of a complete overhaul," explains Jason Kennedy, WK Dickson's aviation project manager.



JASON KENNEDY

The recommended fix was a full-depth reclamation, with crews pulverizing the existing asphalt pavement, and mixing it with underlying stone and cement to make a solid base. Then an asphalt topcoat was added, saving the expense of hauling away old runway materials. Crews also renovated taxiways to meet FAA geometry standards and installed new LED signs and lighting.

## FACTS&FIGURES

**Location:** Rocky Mount-Wilson Regional Airport (NC)

**2020 Annual Operations:** 30,000

**Project:** Hangar Construction

**Size:** 3 T hangar buildings; each hangar averages 48 ft. wide x 14 ft. high x 37 ft. deep

**Combined Capacity:** 23 aircraft (small twins & single-props)

**Cost:** \$3.5 million (includes hangar taxiways & new maintenance building)

**Associated Revenue:** \$82,800/year

**Consultant:** WK Dickson

**Contractor:** PLT Construction

**Subcontractor:** ABCO

**Construction:** April-Oct. 2020

**Key Benefit:** Additional revenue stream

**Project:** Self-Serve Fuel Farm

**Cost:** \$586,000

**Funding:** FAA nonprimary entitlement grant

**Contractor:** First Petroleum

**Consultant:** WK Dickson

**Construction:** March 2020 to April 2021

**Key Benefits:** Additional revenue stream; convenience for customers

**Project:** Runway/Taxiway Reconstruction

**Cost:** \$14.3 million

**Funding:** NC state aid to airport grant

**Scope:** Full-depth, full-length reconstruction of 7,100-foot main runway & taxiways; new LED signs & lighting

**Construction:** April-Aug. 2019 for main runway & taxiways; secondary improvements to be completed by Aug. 2021

**Contractor:** Allega Cement

**Subcontractor:** Slurry Pavers

**Signs & Lighting:** Southeast Sight Services

**Key Benefits:** Improves safety; helps attract more cargo & corporate aircraft

**Associated Accolade:** FAA Southern Region 2019 Airport Safety Award



## 23 New Tenants

After crews finished the runway and taxiway work in 2019, RWI focused on adding more hangars for small twin-engine and single-prop aircraft at a cost of \$3.5 million.

Since the building site was upstream from a river reservoir that serves as a local recreation site, preserving water quality was a focus before and during construction.

Planning and obtaining state and local approvals went smoothly, but PLT Construction, based in nearby Wilson, encountered a few challenges. Due to manufacturing delays, the steel had a longer than expected turnaround of 10 weeks, compared to a normal delivery of six to eight weeks. The region also experienced wet weather from November 2019 to March 2020, making the soil too soggy to start construction when originally planned. "But once it got warmer and drier in spring, we were able to put up the buildings fairly quickly," reports Craig Taylor, vice president of PLT's commercial division.

The first hangar complex, which holds six planes, was completed by May 2020. The next hangar added room for seven more aircraft; and the last 10-aircraft building was finished in October 2020.

Each hangar averages 48 feet wide, 14 feet high and 37 feet deep, and offers remote-control doors. Pilots can



CRAIG TAYLOR



The new self-serve fuel system is available to customers 24/7.

CREDIT: GARRY HODGES/SUNSET STUDIOS



manually push their planes in and out of their hangar, or make arrangements with RWI for help from an automated tug.

All of the new hangars are insulated, and are connected to a new stormwater drainage system. They also include epoxy painted floors, LED lighting and inside electrical outlets. Tenants have access to free Wi-Fi and centrally located restroom

facilities. Concrete sidewalks wrap all the way around the new buildings.

Finding tenants was no problem. “A strong pent-up demand for the T hangars was obvious; the airport had not built any in at least 20 years,” Viventi explains. “All 23 of the spaces were leased out before we even received the certificates of occupancy from the county. So far, the

tenants have given us positive feedback.”

Rent for an individual space in one of the new hangars is \$300 per month, netting the airport an additional \$82,800 per year. All funding for the hangar project was part of a \$3.5 million grant from the North Carolina Department of Transportation, through the Strategic Transportation Investment Law. A small portion of the same grant was also used to add new taxiways to the hangars, as well as a new 1,500-square-foot storage facility for maintenance equipment that was completed by PLT last October.

### New Fueling Option

RWI opened its new self-service fuel system, located near the new hangars, in late April/early May. It allows pilots to taxi up to the pumps at any hour and pay with a credit card, just like at a gas station. The facility has two 8,000-gallon fuel tanks—one with avgas, another with Jet A—and caters to small aircraft, such as single-prop planes and small jets.

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When designing the system, WK Dickson focused on safety, airport operations and convenience to pilots. First Petroleum Services, which had experience with similar facilities, was in charge of building the system. Construction was delayed due to a severe steel shortage that delayed delivery of the fuel tanks. The COVID pandemic also made it difficult to secure other specialized materials and labor.

“We lost at least four months just getting the raw materials to the site,” states Charlie Allsopp, president of First Petroleum. “Once we had everything we needed, the construction went smoothly.”

Strict environmental regulations and fire codes had to be met, especially concerning potential fuel spills and stormwater runoff.

“The tanks are double-walled, and the whole facility is built on a concrete containment area. This containment section contains a 6-inch concrete curb around the perimeter to provide additional protection and to collect leaks or spills from the system. Stormwater collects in one corner of the containment area so that it can be inspected by the airport for contaminants prior to release,” Allsopp explains. “It also helps that both fuel tanks are placed above ground, avoiding additional costly underground environmental requirements.”



CHARLIE ALLSOPP

Other safety measures include a safety shutoff valve, a 911 phone and detailed instructions posted by the pumps. Hoses are 75 feet long, to make use easy for pilots.

The new fuel system cost \$585,844, and was fully funded with an FAA nonprimary entitlement grant.

### Cashing in on FBO Services

The self-serve station is expected to account for a fraction of the airport's overall income from fuel sales. Assuming control of the airfield's fixed base operator (FBO) in August 2019 significantly increased RWI's fueling revenue. Beyond fueling, the airport also took exclusive control of aircraft handling, catering, rental car operations, etc.; but a third party continues to provide aircraft maintenance services.

Taking over all fueling services has been very profitable. “It has been a very lucrative part of our operation,” says Viventi. “We started out selling only 8,000 gallons of fuel a month. By February 2021, we were up to 74,000 gallons a month.

“We did have to purchase more equipment to run this FBO operation, and hire people to do that,” he continues. “Nevertheless, we were in the black our first year.”

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*The newly constructed runway surface can now accommodate larger corporate jets and heavier cargo aircraft.*

### Rebuilt Runway Attracts Larger Aircraft

While smaller aircraft are expected to primarily use the new self-service pumps, large cargo jets serviced by fuel trucks often purchase 3,000 or 4,000 gallons each to fill up their tanks. And more cargo planes are using the airport since RWI reconstructed its main runway in 2019.

Closing for three months during construction was a short-term financial hit, but RWI officials decided it was best to perform all of the work at once. “We did give our tenants a two-year advance notice, and also gave them a break on their leases during this time,” says Viventi.

When the airport reopened, larger cargo aircraft started taking advantage of the lengthy runway’s new surface and boosted fuel sales accordingly.

One of RWI’s main cargo customers is Cummins Engine Company, which has a large operation in nearby Brattleboro that ships diesel turbine engines out of the airport several times a week. In addition, the company uses a corporate jet to shuttle personnel between RWI and its headquarters in Columbus, IN.

Cummins hires cargo operators with specially designed planes to deliver its heavy engines to customers. RWI personnel help load the engines onto the planes, often using a forklift with a built-in scale.

The airport’s long, reconstructed runway is expected to draw new cargo customers in the future. In fact, officials expect this side of the business to at least double in the new few years.

### Expansion Plans

The next major project on Viventi’s agenda is to add more hangars for corporate jets. He and his staff are talking to potential tenants who indicate that they would base large planes at the airport if hangars were available. One prospective client operates a Gulfstream V, which has a range of more than 7,700 miles and would require a lot of fuel.

This spring, the airport staff is putting together funding requests for larger hangars, and Viventi hopes to get the green light within the next year.

Although his airport is relatively close to Raleigh-Durham International Airport (RDU), Viventi believes RWI has several selling points to attract more corporate aircraft. Its location between several major interstates allows executives to fly into RWI and rent cars for the 45-minute drive into Raleigh, NC. In addition, cargo operations are less congested and pilots can avoid the controlled airspace of RDU, adds Viventi.

Another big selling point for RWI is the cost of its fuel. For instance, in early April, Jet A and avgas both cost \$3.60 a gallon at RWI, compared to \$6.96 at RDU.

“Perhaps most importantly, we think our level of service is a real plus—we are small and personal,” Viventi adds. “We are selling that hard to prospective new customers.”

Other long-range plans include adding an extra parallel runway and an industrial park. “We have a good amount of space on the property, so that gives us a lot of flexibility for future projects,” he concludes. ✈️



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# Greenville-Spartanburg Int'l Builds Bigger, Better ARFF Station

BY ROBERT NORDSTROM



Firefighters at Greenville-Spartanburg International Airport (GSP) are thrilled with the new aircraft rescue and firefighting (ARFF) station they moved into last November. At 24,000 square feet, the facility is triple the size of the previous station, and also includes updated features and comforts for crews and equipment.

Even though the old station was remodeled in the mid-1980s, size was still a problem. “Everyone knew we had to get bigger,” says GSP Fire Chief Tony Lohrman.

When the original station was built in 1962, the airport had just one pumper truck and one paid firefighter who was supported by several volunteers. These days, GSP has 23 state-certified aircraft and rescue firefighters who work 24-hour shifts and use 10 trucks and other pieces of equipment to accomplish their missions. (See Page 59 for a complete list.)

“With the bigger crash trucks and increased manpower, over time the infrastructure just wasn’t able to support our needs,” Lohrman explains. “We had everybody piled on bunkbeds in a single 10-foot-by-15-foot bunkroom supported by two bathrooms, one shower, and no locks on the doors.”

The new station was designed to be more of a home away from home for crews—with 10 single-person bunkrooms (each 100 square feet) and five unisex bathrooms with showers. “Our firefighters refer to it as their Taj Mahal,” Lohrman quips.

The \$9 million station was funded at approximately 65% by Airport Improvement Program funds, with the remainder drawn from airport funds.



TONY LOHRMAN

## Big Station for Big Responsibilities

The station’s 9,000-square-foot apparatus bay alone is bigger than the entire old station. It has five drive-through bays for a foam trailer and 10 vehicles from various manufacturers, including two new 1,500-gallon Rosenbauer Panthers that recently replaced an Oshkosh Striker and E-One Titan. A positive-pressure HVAC system keeps contaminants from the apparatus bays out of the living quarters, and Airhawk Air Purification Systems scrub and filter the air in the bays.

High-speed doors from Rytec open in three seconds, making it possible for at least one ARFF vehicle to reach the midpoint of the runway and discharge agent within three minutes of a call as required by the FAA. Other vehicles and apparatus are capable of arriving and discharging agent within the required four minutes.

“We are responsible for 3,700 acres of airport property, including the terminal, airfield, roadways, buildings and undeveloped land,” Lohrman informs.

In addition, GSP is designated as a Special Purpose District, which allows its firefighters to respond to off-property fires and emergencies in the Greenville-Spartanburg area. Typical off-airport calls include structure fires, vehicle accidents, gasoline tanker fires, warehouse fires and other related emergencies that may require crash trucks with foam capabilities. In return, if GSP needs additional assistance at the airport, they receive mutual aid from community fire departments.

Lohrman estimates that GSP emergency crews respond to vehicle accidents on nearby interstates and highways two to three times a week. “We also get a lot of medical divers from outside flights that have to land for medical emergencies,” he adds.



## FACTS&FIGURES

**Project:** New Aircraft Rescue & Firefighting Station

**Location:** Greenville-Spartanburg (SC) Int'l Airport

**Size:** 24,000 sq. ft.

**Cost:** \$9 million for station; \$1.4 million for 2 new Rosenbauer Panther vehicles

**Funding for ARFF Station:** 65% Airport Improvement Program, 35% airport funds

**Funding for Firetrucks:** 90% Airport Improvement Program, 10% airport funds

**Construction:** Nov. 2019-Dec. 2020

**Personnel:** 23 firefighters working 24 hours on/ 48 hours off

**Equipment:** 2 Rosenbauer Panthers; 4x4 E-One Titan; Pierce Contender; foam trailer; Dodge Durango pickup; Chevy Silverado truck; custom-built International vehicle; Ford F250 & F150 trucks; Ford F550/KME

**Architect of Record:** LEO A DALY

**Associate Architect:** DP3 Architects

**Site Design & Project Management:** WK Dickson & Co. Inc.

**General Contractor:** Mavin Construction

**Construction Materials Testing:** S&ME

**Electrical:** H&W Electrical Corp.

**HVAC:** B&K Services Inc.

**Plumbing:** Donbuss Plumbing LLC

**Fire Sprinkler:** A&A Fire Protection

**Sitework:** Bishop Mays Inc.

**Wash Unit for Personal Protective Equipment:** Dexter Laundry

**Personal Protective Equipment Dryer & Gear Racks:** Ready Rack

**High-Speed Doors:** Ryttec Corp.

**Apparatus Bay Fans:** Big Ass Fans

**Apparatus Bay Air Filtration Units:** Airhawk Air Purification Systems

**Alert System:** Zetron

**Of Note:** New station is 3 times larger than previous facility, which was built in 1962 when airport originally opened

## Efficiency & Comfort

Because the ARFF station responds to emergencies on and off the airport, it was important for designers to provide both airside and landside access for emergency vehicles and equipment. The parcel of land available for development, however, didn't make that easy for WK Dickson, the firm providing site design services (and also project management).

"The site was constrained but had to match existing grades on three sides while providing direct access to and from both the airside and landside," explains WK Dickson Vice President and Director of Aviation Services Paul Smith. "In addition, the soils evaluation



PAUL SMITH

completed for the site prior to design indicated that portions of the site were comprised of pockets of loose fill material placed on the site unknowingly many years ago. In some areas, these near surface soils were potentially on top of loose, uncompacted underlying soils. To account for these areas, the engineering team developed a remove/replace strategy to replace any encountered soft spots with proper backfill material, compacted to specific density requirements."

To stabilize the building site and prevent foundation settlement issues, engineers from WK Dickson specified over-excavation and a 2-foot replacement of in-situ soils for the building and pavement footprints.

When designing the building, a team led by LEO A DALY focused on situating the apparatus bays to optimize airfield access. Ultimately, designers settled on five drive-through bays, with five landside doors pointing toward the highway and five airside doors that are perpendicular to the airfield. The public has limited access to non-secure areas of the building. Firefighters and other airport personnel use secured doors to access secure areas of the building.

"The new ARFF [station] is better positioned closer to the middle of the runway and thus better able to respond quickly to emergencies on the runway and across the airport campus," adds Avery Sarden, a vice president at LEO A DALY.



AVERY SARDEN

The station is divided into four areas:

- 1) the public zone, which includes a lobby, training room, public restrooms and a breakroom;



PHOTO: BRIAN FRINKS, REEL VIDEO & STILLS



PHOTO: BRIAN FRINKS, REEL VIDEO & STILLS

Dormitory rooms and a new kitchen are welcome upgrades for the firefighters.

- 2) administrative offices, conference rooms and duty rooms;
- 3) living quarters with a kitchen, dayroom, exercise room, dormitory rooms, bathrooms and showers; and
- 4) firefighter work areas, including apparatus bays, support rooms, a decontamination room, laundry room and storage spaces.

The kitchen facilities in the new station are much larger than those in the old building. “We went from a single refrigerator with no pantry to three refrigerators and three pantries,” says Lohrman, noting that firefighters no longer have to take their food home after each shift.

A 2,300-square-foot mezzanine at one end of the apparatus room has an open balcony with removable rails to allow for additional storage, rope and ladder work and a manhole opening for confined space and rescue exercises.

The training room also doubles as the airport’s emergency operations center. “It’s state-of-the-art,” Lohrman emphasizes. “We have two 86-inch TVs and a 55-inch touch-screen smart board with webcam. The room will accommodate 49 people. The area is public, so we can host events without having to worry about escorting people through secure areas of the station.”

The living and administrative areas were designed to minimize response times from anywhere in the building. “The corridors look like a racetrack with the bathrooms and storage rooms on the interior and living areas and administrative offices on the exterior,” explains Michael Pry, a principal at DP3 Architects.



MICHAEL PRY

“The private bunk rooms are equipped with LED red lights tied to the alert system to help reduce stress when firefighters are awakened during

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emergencies, and the individual dorm rooms and restrooms provide privacy and flexibility to create a true gender-neutral facility.”

### COVID Complications

The airport broke ground for its new ARFF station in November 2019. Contractors spent the first few months on structural and civil infrastructure work, and then the pandemic hit—just as walls were going up and crews needed to work inside.

General contractor Mavin Construction responded by implementing strict COVID protocols and adapting to the ever-changing information about ways to prevent infection spread. “It was a very difficult challenge,” recalls Evan Pyle, the firm’s assistant project manager. “It affected all of our subcontractors, with regard to materials lead times, scheduling, social distancing. We had to work through all these issues.”



EVAN PYLE

Mavin installed additional porta toilets and hand washing stations, and scoured the internet for cleaning supplies, masks and hand sanitizers. As a stopgap measure while waiting for shipments from China, the company purchased sanitizing products by the gallon from local companies and fashioned wipes to distribute at the jobsite.



PHOTO: BRIAN ERKENS, REEL VIDEO & STILL

*Gear racks help keep personal protective equipment orderly and at the ready.*

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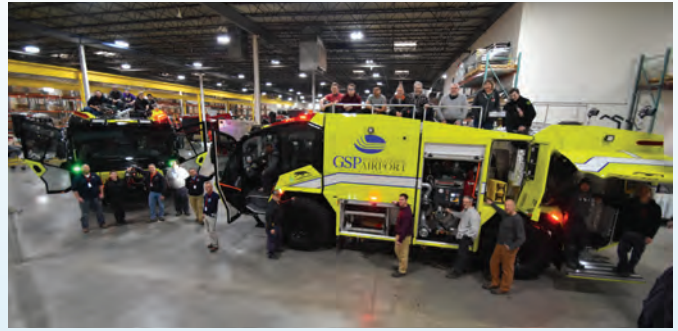
## New Panthers at Home in New Den

In April, Greenville-Spartanburg International Airport (GSP) took delivery of two brand new Rosenbauer Panther 4x4 ARFF vehicles. Each holds 1,500 gallons of water and 200 gallons of foam, and can discharge 1,000 gallons per minute from roof or bumper turrets.

Fire Chief Tony Lohrman notes that the technologies included on the new vehicles are a significant step up for the airport. “The difference between these new trucks and the ones we are replacing is night and day,” he remarks.

Importantly, the new vehicles are able to test and calibrate foam proportioning equipment without having to discharge foam onto the ground. “This is a major environmental concern facing airports today,” Lohrman explains. “These trucks are equipped with an internal testing device that allows us to calibrate the units to ensure they will discharge the correct amount of foam when emergencies occur.” [See July/August 2019 issue of *Airport Improvement* for more details about potential implications of discharging foam for testing purposes.]

An auto-start feature helps reduce response times out of the station by allowing firefighters to start the vehicles from outside the trucks while donning their firefighting gear. A color camera with a digital video recorder provides operators with better scene views and captures video for potential follow-up investigations. “Safe to approach lights and a 360-degree camera system provides another level of scene safety by telling firefighters the truck cannot



The airport's new Panther 4X4s, shown here at the manufacturing facility in Minnesota.

move and allowing the vehicle operator to monitor the entire area around the truck,” says Duane Kann, a regional sales manager for Rosenbauer America.

The trucks cost \$1.4 million and were funded at 90% by an Airport Improvement Program grant. Lohrman notes that purchasing two identical vehicles is beneficial for maintenance purposes and meeting FAA training requirements, but most of all, for keeping firefighters safe during high-risk operations when seconds count.



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“Although it’s tough to segregate subcontractors within a work space, to the extent possible, we consolidated workers within their specific teams and required everyone to wear masks in the field,” Pyle explains. “We had a couple of positive COVID cases within the companies that were working on the project, but fortunately none of the workers onsite had interactions with them. In the end, we hit all of our critical dates and had a ribbon cutting in November 2020, the completion month originally scheduled by GSP. In normal times, we would have been concerned about rain delays. The pandemic made such concerns seem like peanuts in comparison.”

Matt Infanti, Mavin’s project manager, considers the project a big success. “It speaks volumes that despite the pandemic, we were able to move forward,” he says. “We’re grateful that the airport stuck with it.

A lot of businesses shuttered up.” 



MATT INFANTI



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# McCarran

INTERNATIONAL AIRPORT

## FACTS&FIGURES

**Project:** Asset Tracking System

**Location:** McCarran Int'l Airport, Las Vegas

**2020 Volume:** 22.2 million passengers

**System:** ALIS (Airfield Location-based Inspection and Service)

**Vendor/Consultant:** ADB SAFEGATE

**Approx. Cost:** \$100,000, plus \$15,000 annual subscription fee

**Funding:** General airport revenue

**Installation:** Late 2019

**Airfield Lighting Fixtures:** ADB SAFEGATE

**Digital Torque Wrenches:** Ingersoll Rand QX Series

**Key Benefits:** Replaces handwritten records for runway light maintenance; boosts efficiency & saves time with automatic uploads of bolt-torque values; enhances data for FAA audits; integrates with existing IBM Maximo work-management software; cloud-based platform allows all personnel to see status of all tracked assets in real-time

Photo was taken prior to COVID-19 pandemic.



# Asset Tracking Software at McCarran Int'l Boosts Efficiency, Documents FAA Compliance

BY KEN WYSOCKY

Maintenance personnel at McCarran International Airport (LAS) no longer put pen to paper when they log maintenance performed on runway lights. Instead, a digital asset management system uses GPS technology to track the work performed and pushes the information to a cloud-based platform to enhance the accuracy of maintenance records.

Doug McMahan, assistant director of facilities/management at the Clark County Department of Aviation, reports that the Airfield Location-based Inspection and Service system (ALIS) from ADB SAFEGATE increases operational efficiency by reducing human errors and minimizing runway downtime. It also helps ensure that maintenance of airfield lighting complies with FAA standards and makes it easier for the agency to review maintenance records during annual audits.

"We have limited time and staff," McMahan says. "So from a work management perspective, this technology maximizes our efficiency. For example, we can specify runway closure times much more accurately and reduce [them] because we now know exactly how long it takes to bolt down cans in a runway closure area. Instead of relying on institutional knowledge, we know exactly how long the work will take.

"And we avoid redundancy by not mistakenly torquing down lights we already torqued," he adds.

The subscription-based ALIS system went online in late 2019 and cost LAS about \$100,000 to install and integrate with its existing management system. In addition, the airport pays about \$15,000 annually for software updates, maintenance, security patches, etc.

LAS uses the system to track scheduled maintenance on more than 6,450 flush-mounted in-pavement light fixtures on runways and high-speed taxiways, plus roughly 38,725 bolts that anchor the lights.

About 1,500 airfield lights and their bolts are checked more frequently, on a bimonthly basis, because aircraft frequently land on or run over them, subjecting the components to more stress and vibrations.

"There's a lot of side pressure and sheer force on the bolts that anchor those lights," explains Jason Zoccole, an electrical supervisor at LAS. "The FAA requires us to inspect and tighten down those bolts at a minimum of every three months. But we do it every two months on those 1,500 lights, just to stay ahead of things, instead of waiting for them to fail."



DOUG McMAHAN

## Digital Efficiency

Before the ALIS system was installed, technicians used standard torque wrenches to manually tighten bolts and kept handwritten records of when they checked each light. Zoccole notes that the system generally worked OK, aside from the human error factor.

"The problem was, we didn't have any real data to prove that anyone did anything," he explains. "Someone could write down that a light was checked, even if it wasn't."

Now, technicians use torque wrenches with Bluetooth, GPS and ALIS technology that automatically document what work is performed and who performs it. The Ingersoll Rand QX Series tools also document that bolts are tightened to the correct specifications.

"It keeps very accurate records in real-time," Zoccole remarks. "It's a very impressive system."

He also prefers providing computerized data rather than handwritten logs during the airport's annual FAA inspections.

Niels Burez, ALIS product owner for ADB SAFEGATE, notes that hand-written records inevitably end up disorganized in file drawers, which makes it difficult to find specific records for audits.



NIELS BUREZ

"That data is of little use if it's not digitized," he says. "There's so much more value when information is registered digitally, and it's what people expect these days. It's the wave of the future, without a doubt."

Technicians use iPhones, mounted on the high-tech torque wrenches, to activate an app that uses GPS to verify that they're checking the correct light. When the technician triggers the tool, it registers the value of how tight the bolt should be, based on pre-set data standards.

When all six bolts on a light are tightened to the correct parameters, a red light on the app turns green, indicating that the task is complete. At the same time, the wrench registers the bolt-torque value and sends the data to the ALIS app, which then transmits the data to the cloud.

Because cellphone screens aren't big enough to provide crews with detailed maps of all the lights they are assigned to check, technicians also use iPads for a better overall view of their work areas.

"It doesn't require much training," Zoccole says. "All the equipment basically is plug-and-play—just turn it on and it all syncs up. Even some of our less tech-savvy individuals don't have a problem using the tools."



JASON ZOCCOLE

The ALIS system even shows how much a bolt had to be tightened to achieve the correct value. Furthermore, if the bolt gets stripped or breaks, it automatically tells the airport's IBM Maximo system to generate a work order and schedule the repair.

Burez explains that knowing how loose a bolt was before it gets tightened helps maintenance crews determine which bolts might need tightening more often. As such, the system supports risk-mitigation efforts, he adds.

Another benefit: If technicians don't finish a job in one shift, the system shows where work stopped. "It takes the guesswork out of which cans you already hit and which ones still need to be addressed," Zoccole says.

### Info at a Glance

Burez notes that the system's cloud-based platform ensures that all maintenance personnel can see the latest, most up-to-date information in real-time.

"With just one click, you can see on a monitor all the assets an airport wants to track," he says. "Basically, anything that's located on the airside and has an aesthetic location can be put into ALIS so you can track its condition."

For example, some airports track photometric measurements that determine if airfield light fixtures provide adequate illumination. ALIS can combine the results of those inspections

with data about bolt-torquing and other maintenance tasks to give airport officials an overall view of the airfield's operational status.

"It's all about making sure an airport is in a good operational state, with no risk of non-compliance," says Burez. "The more we can show you all the different things that are going wrong, the better you can manage your maintenance priorities."

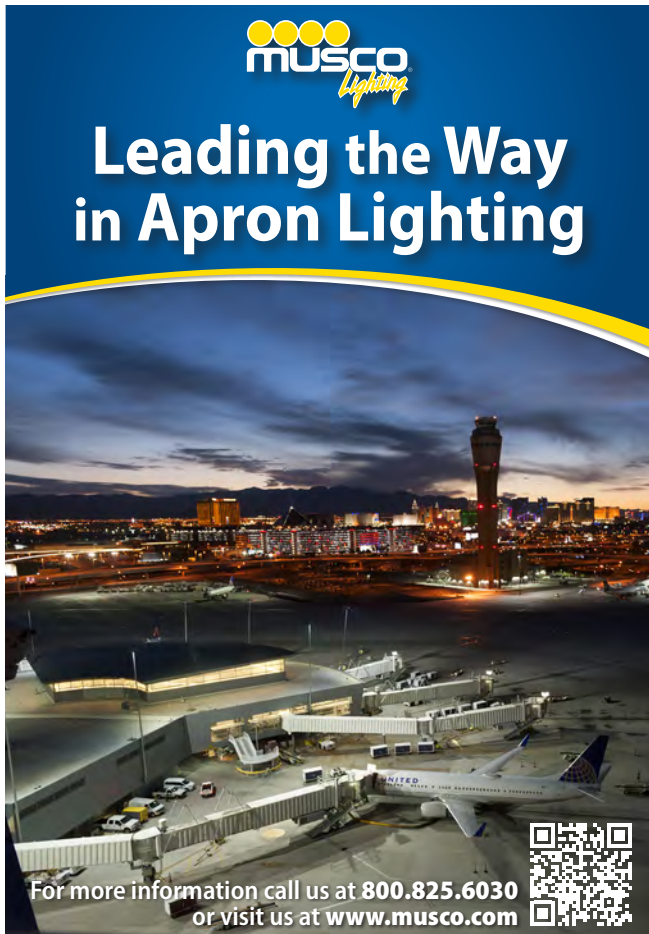
### Integrated Systems

One reason airport officials opted to use ALIS was that ADB SAFEGATE programmers were able to write a software interface that integrates it with the Maximo platform LAS has used since 2006.

"That's a huge plus for us—a very big deal," says McMahan. "We use Maximo to track all our assets: mechanical, electrical and others. Maximo also autogenerates work orders and sends them to ALIS.

"This increases efficiency, because instead of two different systems generating two different work orders, it all comes from one system," he explains. "By integrating the two systems, we don't have to enter work orders in both ALIS and Maximo."


Technicians at LAS receive hundreds of work orders each week, so eliminating that redundancy significantly streamlines the work-management process.



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"The integration of the two systems is what makes our deployment of ALIS different from other users," says McMahan. "In fact, we're proud to say we were one of the first, if not the first, domestic airport to integrate ALIS with IBM Maximo."

LAS is one of 14 international airports that use the ALIS system. Other U.S. airports include Cleveland Hopkins International, Hartsfield-Jackson Atlanta International and Detroit Metropolitan. Burez notes that an installation is in progress at Boston Logan International and the system at Detroit is being expanded. ADB SAFEGATE developed the system in 2014.

### Collecting Data

The length of time required to implement the system depends on the volume of an airport's data and how well it is organized. On one end of the spectrum, some airports might have 10,000 to 15,000 data points to input, while others may have no data collected or the existing data needs to be updated, Burez explains.

"For data entry, all we need is an Excel spreadsheet that shows the type of asset, its name and its location," he says. "Then it can be loaded into the ALIS, which typically takes one or two days if all the necessary information is ready. It's a fairly low threshold for getting started."

If no data is already collected, the company performs an on-site asset survey.

Zoccole notes that the implementation at LAS was time-consuming because the team had to start from scratch. But collecting comprehensive, accurate information is critical to creating the most robust ALIS database possible, he adds.

"We basically went from a macro approach to a micro approach," McMahan explains. "We had to account for every single bolt in every single fixture. The difficulty for us stemmed from taking information from paper records and putting it into a GPS-based digital system."

### Saving Time & Money

McMahan reports that the ALIS system installed in late 2019 already is saving LAS money, improving efficiency and increasing safety. Minimizing the time technicians spend maintaining airfield lighting is one of the more tangible benefits.

"Runway closures aren't cheap," he remarks. "So if we're more efficient and reduce downtime by spending less time on runways, that gives the airlines more access to runways. It's hard to quantify, but if we're more efficient, then the airlines are more efficient, too—and more profitable."

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“We also save money by reducing work redundancy,” McMahan continues. “Fixtures often would inadvertently get checked and retorqued prior to a scheduled interval, which takes away valuable time that technicians could be using to do something else. Light bolts aren’t the only assets these electrical technicians maintain.”

Moreover, he notes that ALIS reduces the airport’s operational liability by ensuring lights don’t come loose when an aircraft runs over them during landing or takeoff, which could potentially prove dangerous.

“Ultimately, it boils down to passenger, airline and airport safety,” he emphasizes. ✈️



*The airport has thousands of in-pavement airfield lights to maintain.*

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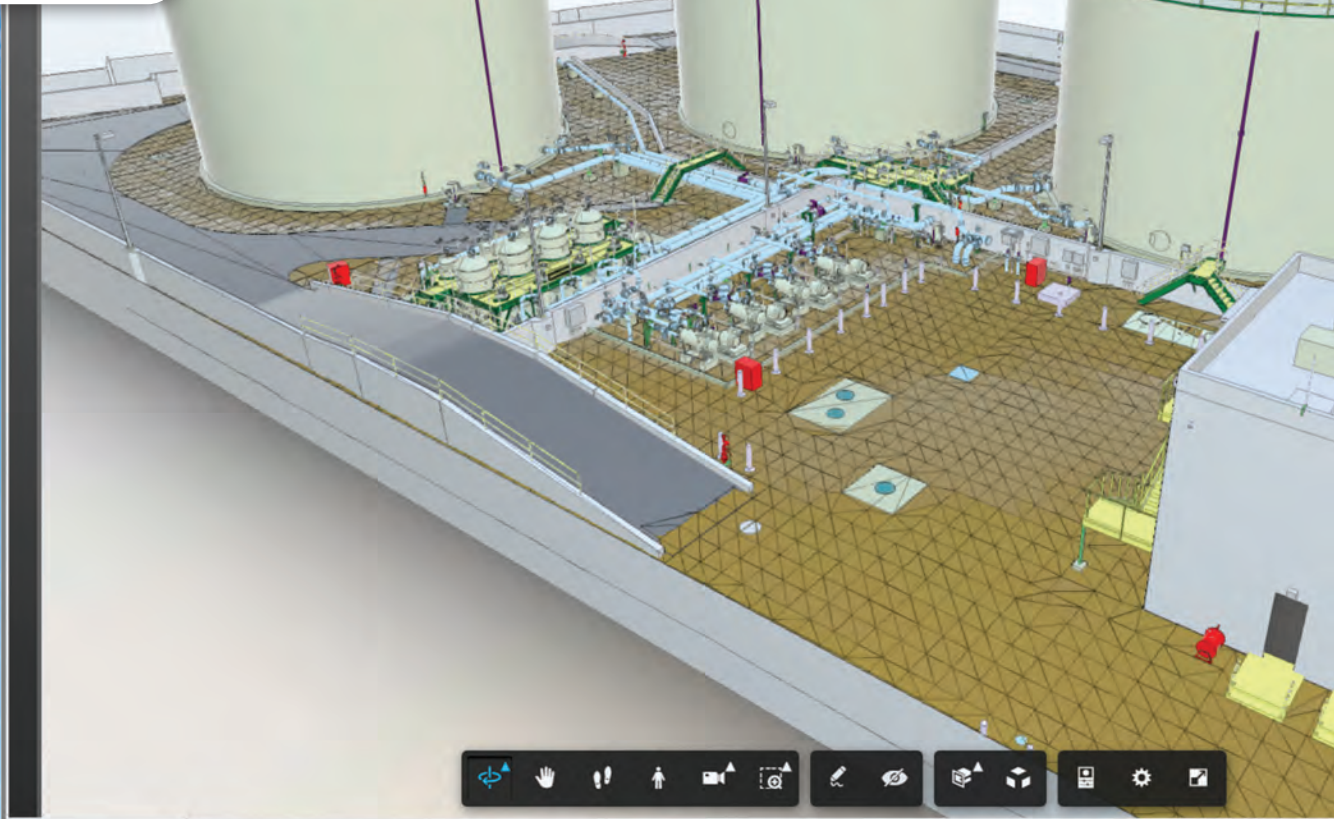
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# McCarran & Oakland Int'l Complete Pilot Tests of New Fuel Farm Management Platform

BY JENNIFER DAACK WOOLSON

## FACTS&FIGURES

**Project:** Asset Management for Fueling Facilities

**Locations:** McCarran Int'l Airport in Las Vegas; Oakland (CA) Int'l Airport

**Timeline:** In development since 2017; pilot programs launched in 2019

**System Deployed:** SAIM, Smart Asset Integrity Management

**Developed by:** SAIM LLC, a subsidiary of Argus Consulting Inc.

**Key Benefits:** Single, centralized source for engineering, inspection, operations & maintenance data; 24/7 access by authorized users to facilitate real-time decision making

**Assists With:** Scheduling; budgeting & resource planning; turnover challenges; achieving maintenance milestones; centralizing documentation; tracking & trending of data

 Fuel storage facilities at McCarran International Airport (LAS) in Las Vegas and California's Oakland International Airport (OAK) are using a new cloud-based asset management system to overcome obstacles that plague the entire industry—problems such as a lack of timely, accurate information and multiple software programs that don't speak to each other. After two years of pilot testing the platform, personnel from facilities at both airports report ready access to real-time operating information and better visibility of asset performance. Longer-term, they foresee the new management system facilitating a more proactive approach to maintenance that will help prevent premature equipment failure and decrease overall repair expenses.

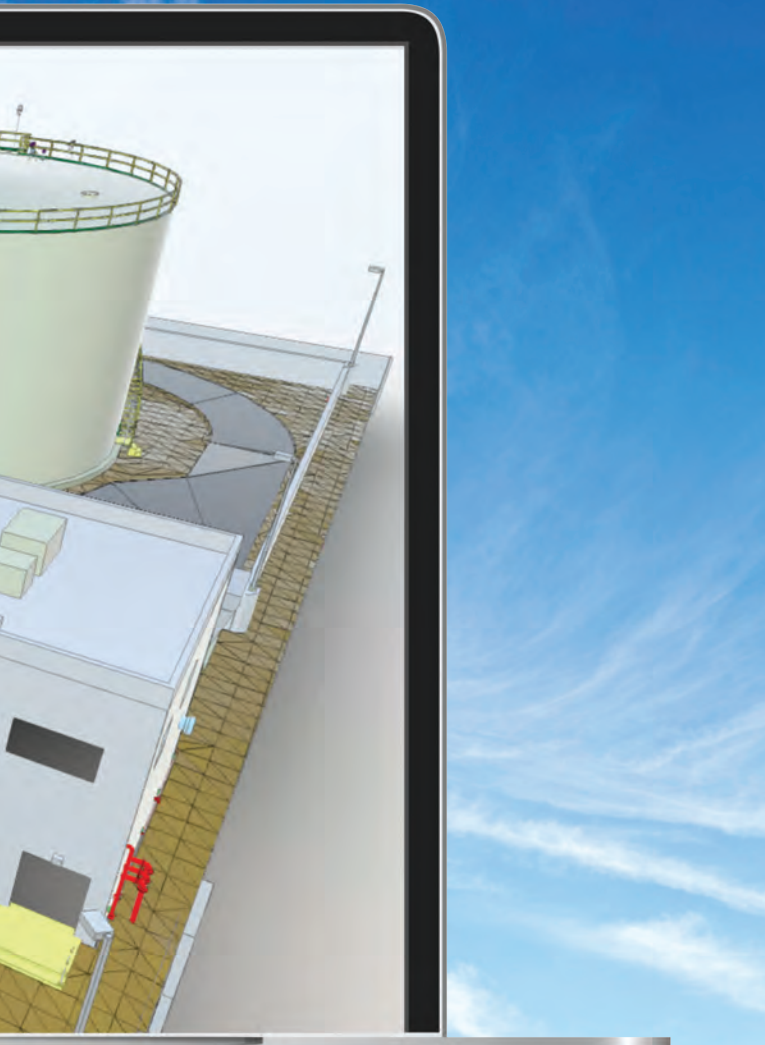
A subsidiary of Argus Consulting Inc. developed SAIM™, the Smart Asset Integrity

Management platform, to put all of a fuel farm's stakeholders on the same page by providing them with a single source of current and historic operating data. SAIM personnel explain that real-time data collection to a cloud-based system gives all stakeholders—the airport, facility owners/users and key technical staff—information to make better decisions about engineering, inspection, operation and maintenance.

Nearly five years in development, the platform recently completed pilot testing at LAS and OAK and is now ready to expand to airports across the United States and beyond.

## Addressing Specific Needs

The SAIM platform includes customizable modules to address each facility's specific needs. The foundational capabilities—



and maintenance, and it brings that piece of the facility up to the 21st century.”

The SAIM team goes on site to help operators digitize important facility documentation, which is then stored in an online document management archive so it’s available to all authorized stakeholders for the life of the facility. Files typically include maintenance records, equipment manuals, training information, record drawings, inspection documentation, photos and compliance documents. Moving forward, new inspection and maintenance records are captured using handheld devices that sync with the platform and tie the data to specific assets, so it’s streamlined for operators and easier to recover for planning and compliance purposes.

**Monitoring** - The Real-Time Signals Module captures live feeds coming in from critical facility equipment and assets. Visual dashboards display trends, signal alerts and provide on- and off-site staff with early indications of issues to avoid costly equipment downtime and/or failure.

The dashboard allows Mark Bourdeau, manager of global fuel procurement and operations for Delta Air Lines, to keep tabs on one of his biggest recurring costs at LAS and OAK: energy consumed by the high-demand electric motors that drive the facilities’ fuel pumps. The SAIM system provides real-time



MARK BOURDEAU

maintenance, monitoring and as-built—were developed to help fuel facilities organize their information, streamline workflow and provide critical data to onsite and remote stakeholders that are responsible for maintaining continuity of service. Although these are important objectives for everyday operations, they become even more crucial when something in the facility malfunctions. That’s when personnel rely on a management system that helps them access information, communicate clearly and act quickly. SAIM is also designed to help prevent malfunctions and failures from occurring in the first place.

Here’s how its three main components work.

**Maintenance** - The Tank Farm Manager Module takes the paper out of traditional inspection and maintenance processes by capturing electronic work orders, inspection logs and maintenance records in one central location. Daily, weekly and annual inspection and maintenance tasks are clearly defined for operating staff, and progress can be monitored and communicated using dashboards designed for various stakeholders.

This aspect has been a game-changer for Nolan Getty, fuel category manager for Southwest Airlines and chair of LASfuel Corp. at LAS and Oakland Fueling Facilities Corp. at OAK. “We’re in 2021, and across the industry we’re still pretty much paper-based on any type of inspections or maintenance,” Getty observes. “Instead of binders upon binders of paperwork, with SAIM, our operators can log everything into a digital system. It gives them a tool they can count on to keep track of inspections

Minimize risk and reduce costs with real-time data for proactive operations and predictive maintenance.

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data about pump operation that allows Bourdeau to analyze costs, including run time and how the pumps are sequenced, from his office in Atlanta. “Using that data, we can streamline the operation where we have choices about things like time of day,” he explains. “As a result, I might move certain parts of the operation into a different time of day when the energy cost is either lower or more available.”

The system is also valuable when something goes wrong— if, for example, a pump vibration sensor indicates an alignment issue at 3 a.m. No matter where they are, everyone identified for that scale of notification receives real-time data to facilitate an immediate response. Of equal importance, operating data from monitored

assets is captured to establish key performance metrics that ultimately support planning and budgeting for capital and operating expenditures.

**As-builts** - The Photos and Measurements Module and the 3-D CAD Model modules work together to create a digital online replica of the tank farm or other physical assets.

Meraj Mohebi, Ph.D. and chief technical officer at SAIM LLC, explains that his team engineered the entire backbone of the platform around 3-D representations produced from LIDAR scans, photogrammetry and 3-D as-built models of existing assets. The digital



MERAJ MOHEBI

twins are particularly useful for off-site

owners, consortium members, engineers and operational management. Mohebi notes that the 3-D models are also incredibly valuable for infrastructure improvement and development projects, because they can be used for accurate measurements and calculations for engineering and estimations.

Having a 3-D digital proxy of the fuel farm at LAS came in particularly handy when the design process of the recirculation system and oil water separator was impacted by COVID-19 travel restrictions. Using SAIM’s as-built module allowed engineers to avoid traditional survey and site visits.

### Simplicity & Accessibility

As a longtime partner to airports, airlines and fuel facility operators, Argus Consulting saw gaps that were increasing risk and creating budget headaches. “An airport’s fuel handling system is incredibly valuable in terms of investment and operational importance, but the innovation of utilizing data and available IT advancements for fuel has been missing,” says Mohebi. So the company developed SAIM to give owners and operators a clear view of how their fuel systems are performing, and to facilitate preventive maintenance and help extend the life and value of infrastructure.

“In the last 25 years in fuel system design, engineering and maintenance support, we have watched the collaborative efforts between the operators, engineers and owners of the facility strain as each site and the companies involved work with their own communications and document management structure,” Mohebi says. When each entity uses a different type of software or a variety of internal company servers, it is difficult to share information or collaborate on critical or timely decisions.

To remedy such issues, SAIM LLC developed a central, common-ground system



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that integrates technologies and provides visual dashboards so stakeholders can see what is needed to keep fuel flowing and systems compliant.

Having a centralized repository has been invaluable for Bourdeau. "In a world in which people are constantly changing, you need a constant. And that constant is good information," he explains. "With SAIM, no matter who, individually or as a group, is making a decision, the data is very clear. And if the data is very clear, that's 90% of the decision."

To be truly valuable, data has to be readily available to everyone who needs it. That's why SAIM is a cloud-based platform, explains Mohebi. In fact, the development team's motto was "simplicity and accessibility 24/7 from anywhere, anytime." System engineers wanted to spare fuel farm operators, airlines and airports from having to install new software or use special equipment. Instead, authorized users can access the platform through a computer, phone or tablet connected to the internet. "In our view, new software is a new problem," says Mohebi. "You have to install it, and someone has to train you. With SAIM, we've worked to make it very simple."

Although off-the-shelf asset management systems already existed, they were not flexible enough for the unique needs Argus had identified, he notes. SAIM LLC consequently formed a technical steering committee with consortium members from several large fueling facilities to provide feedback and insight about its alternative.

"This is not an out-of-the-box cookie-cutter product," Mohebi emphasizes. "It was thoughtfully engineered with the needs of the aviation fuel industry in mind."

For example, the SAIM Tank Farm Manager Module includes template maintenance and inspection tasks that are specific to aviation fueling facilities. Real-time signals, dashboards and analytics show post-processed quantities that are important to fuel facility operators and engineers; and the system's predictive fuel inventory algorithms are customized for the aviation fuel supply chain.

### Return on Investment

Dan Liss, director of asset management services for Argus, served as the "boots on the ground" when the new platform was implemented at LAS and OAK.



DAN LISS

Before joining Argus Consulting six years ago, Liss worked in fuel farm operations for

15 years. "I've seen the big challenges most operators face," he comments. "I've lived the nightmares, having received calls in the middle of the night when systems weren't functioning properly—pumps failing, generators failing. We needed better tools to get our arms around the challenges and operate more efficiently."

Without a doubt, Liss considers improving infrastructure reliability and sustaining fuel flow to aircraft as SAIM's biggest benefits. He also considers its maintenance tracking capabilities critical for keeping complex storage and dispensing systems up and running.

Using the trend data SAIM provides, facility operators can often predict rather than react to mechanical problems. "They

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can make maintenance-driven decisions to prevent early failures,” Liss explains. “Plus, the system tells you what workload you have. It prompts you with what maintenance tasks need to be done and when they are due, so managers know what resources will be needed and operators—even if new on the job—have a clear understanding of the inspections and tasks at hand.”

Personnel at LAS saw a clear return on investment for the new management platform when airlines asked them to engineer a transfer line in an area already densely populated with pipes and tanks. “The laser scan and 3-D model of the facility allowed the engineering team to develop the design without visiting the facility or conducting additional surveying,” Liss reports. “It also expedited the permitting process with authorities [by almost two months].”

Moreover, SAIM provides visibility and transparency to help stakeholders work together during stressful times. For instance, if a fuel supply issue occurs, the platform uses real-time fuel inventory data and historical fuel consumption data to predict how long the facility can continue to operate before another delivery of fuel arrives.

Such information recently proved invaluable when the facility at LAS experienced quality issues that disrupted supply. Even though Getty is based in Dallas and his engineering team was based in Kansas City, both knew precisely how much fuel was available

and were able to collaborate with the local operators to rapidly communicate and implement measures to avoid any flight delays. “With SAIM, we can all be in the same software looking at the same information in order to make our decisions to mitigate any issue,” Getty explains.

When talking with a facility operator or general manager about a specific piece of equipment, he uses SAIM to look at the component in question—without incurring travel costs or delaying a decision about corrective action.

Liss cites another example, when a defective valve was identified at a facility. “We conducted a virtual walkthrough with a contractor the day the issue was identified, and they were able to understand the issue, provide a proposal and procure the equipment without scheduling a visit to the facility, which significantly reduced their price and time to execute the work,” he reports. “With all these examples, we had a clear return on investment for the airlines and the operator. Add up the many ways these capabilities are used from week to week, and it’s easy to see how valuable this tool can be.”

Bourdeau adds that the operating and performance data collected from SAIM makes it easier to gain consensus for capital investments among the large group of stakeholders involved in budget decisions for large projects.

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## Continuous Improvement

As stakeholders at LAS and OAK became more familiar with the new asset management system, they provided honest, ongoing feedback that was invaluable to the development of the SAIM platform.

“The team at Argus does a really great job of taking the feedback from several different parties—and sometimes different feedback—putting it into the tool, and then deploying it out and into operations,” says Getty.

The SAIM platform is continuously collecting real-time signals from critical assets at the facility and related performance data. “Right now many facilities don’t have the tools in place to operate in a proactive mode,” Mohebi explains. “As more facilities begin using SAIM, anomaly detection and predictive analytics will continue to increase service life, lower operating cost and inform decision making. Additionally, owners can use the information across locations to create standardized metrics, measurable key performance indicators and benchmarking goals.”

Getty and Boudreau both look forward to additional facilities going online with SAIM and the benchmarking information that will be provided. “We consider Argus to be an industry partner,” Bourdeau says. “They’re not just a contractor to us. With SAIM, they saw the value it would provide, not just to us as customers, but also to their portion of the industry. The data that I’m going to use to drive accountability and performance metrics is beneficial to them as well.”

That data will help facilities answer questions such as:

- Are we spending our limited budget in the right places to support continuity of service?
- Does my staff have a clear understanding of what’s expected of them and the tools to respond accordingly?
- Is critical maintenance occurring to minimize risk, maximize service life and maintain compliance?
- Are we operating efficiently?

Such questions help develop best practices, says Boudreau. “Sometimes we don’t know what those best practices are until we see data to reveal them,” he remarks. “But they’re essential if you’re going to drive an overall improvement to everybody across the board.”

“Everybody” is a key word for Liss. For him, all of SAIM’s high-tech bells and whistles boil down to one primary goal: getting fuel facility owners, operators and engineers on the same page to ensure total quality assurance in asset management. ✈️



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# Airports Use Digital Platform to Manage Gate Utilization, Aircraft Parking

BY NICOLE NELSON



Boise Airport

Spokane International Airport  
www.SpokaneAirports.net

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## FACTS&FIGURES

**Project:** Gate Management/Aircraft Parking Software

**Deployed at:** Boise Airport (since April 2021); Eisenhower National Airport (since Jan. 2021); Spokane Int'l Airport (since Nov. 2020); Glacier Park Int'l Airport (since Nov. 2020)

**Platform:** GoApron

**Cost:** \$10,000-\$100,000/yr, depending on annual flight volume

**Key Benefits:** Prevents conflicts between multiple aircraft wanting to use same gate at same time; automates manual processes; enhances equity/transparency of gate requests & approvals; improves billing/receipts for overnight aircraft parking; visualizes real-time gate activity, automatically tracks landing information

Until recently, the common-use gates at Eisenhower National Airport (ICT) were a bit like Wichita's version of the Wild West.

"Anyone could use them at any time on a per-turn basis," explains Brian Cowles, Airport Operations manager for the Wichita Airport Authority. "If the gate appeared to be open, then an airline could park an arriving aircraft there."

The system worked fine when gates were, in fact, open. But when two different airlines wanted to use the same gate, there was no clear way of deciding which had priority.



BRIAN COWLES

To fix the problem, Cowles developed a standard operating procedure that required all airlines to submit requests for slots at ICT's five common-use gates to the Operations staff 30 days before the next month's flight operations began. To ensure that all carriers operated off one common form, the airport created an Excel spreadsheet to receive and track requests. Staff then manually input requests into an existing software system to provide airlines with information about gate utilization for diversions or other unscheduled arrivals.

"This turned out to be a very time-consuming process for my staff," Cowles recalls. "But, at the time, it was the best that we had."

In December 2020, something better came along. Cowles and Airport Director Victor

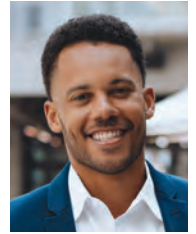


Spokane Int'l Airport

Airport personnel can choose to receive notifications via text messages, emails or both.

### Beyond Paper & PDFs

Shadrach Vaughn, chief executive officer of GoApron, reports that four U.S. airports (including ICT) use customized versions of his firm's proprietary software to improve gate utilization, management of remote parking spots and per-turn use landing billing.



SHADRACH VAUGHN

"Before GoApron, our customers were using manual workflows such as pen, paper, PDFs and spreadsheets," Vaughn says. "GoApron's features have helped streamline manual workflows, identify availability and capacity with gates, improve relationships with air carriers, and eliminate revenue leakage."

Spokane International Airport (GEG) falls squarely into this category. Ryan H. Sheehan, chief operating officer for the Washington airfield, recalls how different it was to manage GEG's 14 jet bridges, various ground loading locations and



RYAN H. SHEEHAN

White began discussing GoApron gate management software, and agreed that the digital platform could automate the airport's entire gate request/assignment process. They saw the potential for it to make financial reporting about gate utilization more accurate and less labor intensive.

"I brought in several other members of the airport staff to look over GoApron, and we all agreed that if it would work as advertised, it would be a big benefit to the airport," Cowles recalls.

After the company tailored its standard platform to ICT's particular needs and trained airline and airport staff to use it, GoApron went live in January 2021. In April, Cowles reported that the product does, in fact, work as advertised and has already been beneficial for ICT.

"The process for making and viewing requests is very simple to use," he remarks. "And I like the fact that my staff is automatically notified when a request has been made, and that we are the approving authority for these requests."

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*Eisenhower Nat'l recently adopted a digital platform to help manage its ramp activity.*

remote parking situation back in mid-2019, without the significant data the airport has now.

“All of the jet bridges were full, and we had four or five aircraft that we were parking off gate,” Sheehan explains. “It was emails and paper schedules or Excel spreadsheets and manually tracking and recording which aircraft was on which spot each night. It was taking several hours a week out of our staff time just to manage who was going to be parking where any given night.”

And increasing volume only compounded the issue.

“We received a notification from one of our carriers that they were planning to increase their overnight parking by another two to three aircraft, and we were scrambling with how to manage all of that,” he recalls. “GoApron came along at the right time for us to be looking for a solution that would automate some of those processes and get us off the Excel spreadsheet, paper-based system that we had been using for a long time.”

GEG signed up for a one-year subscription effective November 2020. Looking back, Sheehan notes that some of the biggest improvements involved the way reservations are displayed on the daily schedule.

“GoApron developed a Gantt chart-type schedule that allows us to see at a glance what gates are occupied and which ones are available,” he relates. “Initially, the product was set up to report aircraft in terms of tail numbers, and when we explained that tail numbers mean a lot less to us than flight numbers do, they were able to modify the product to show the air carrier or the flight number.”

Sheehan and GEG personnel also appreciate the presentation format, because it supports quick interpretation of data. For instance, gate conflicts are color-coded in red.

“Visually, it is easier to use, and it also works well with each of the air carriers,” Sheehan says, noting that each airline can log in to submit its reservation requests, and Operations automatically receives notifications. “Having those requests come into a central location and having them cataloged, and being able to see when the request was made, who reviewed the request and who approved it, is probably the biggest benefit.”



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He also appreciates being able to resolve request conflicts *before* aircraft land at the airport.

“You don’t have an aircraft arrive, assuming they are going to the gate they always go to, find out it’s occupied, and have to coordinate use of a different gate on short notice,” Sheehan explains. “You’re able to do that deconfliction earlier in the process and make things more streamlined for the airlines and for the customers.”

**Improving Equity, Accountability**

Sheehan finds that the GoApron platform also helps democratize aircraft parking.

“It definitely brings some fairness to the process, because everybody is seeing the same data,” he relates. “The requests come into a single location, so it is not a first-come, first-serve situation, where whoever sends the email first gets the gate. We are able to look at what we have available and assign the gates in a more democratic, equitable and efficient way.”

Vaughn reports that the gate management portion of GoApron gets heavy use, and airports with apron construction find it particularly helpful. Additionally, he notes that the digital platform helps airports identify and bill for remain over night costs that are not always self-reported.

Boise Airport (BOI), which added GoApron this April, has yet to see its effect on revenue leakage and other financial measures. But Airport Operations Manager Scott Gwiazda fully expects it to provide a more accurate accounting of gate use and aircraft parking.



SCOTT GWIAZDA

He reports that carriers at the Idaho airport have been positive about transitioning from outdated spreadsheets to the automated platform.

“They realize we are short on space to park aircraft, and at the same time, many of them would like to increase flights,” Gwiazda shares. “This system versus a spreadsheet is much more efficient, much more accurate, and much easier to use. It is a lot quicker, and the information is much more accurate.” ✈️



Carriers at Boise Airport welcomed the switch to a more automated system for gate assignments.

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# High Seas, High Stakes: Coastal Airports Respond to Climate Change

BY SCOTT BERMAN

PHOTO: SFO



San Francisco Int'l Airport

## FACTS&FIGURES



**Issue:** Rising Sea Level

**Location:** San Francisco Int'l Airport

**Proposed Project:** Shoreline Protection Program

**Est. Cost:** \$587 million

**Expected Funding Sources:** Bonds; airline fees

**Size/Scope:** New steel & concrete seawall to add height & storm surge protection

**Est. Construction:** 2025-2035

**Status:** Completion & release of Environmental Impact Report targeted for 2021

**Report Consultant:** Environmental Science Associates



**Issue:** Rising Sea Level

**Location:** Philadelphia Int'l Airport

**Projects Include:** Using climate-resistant materials in construction & renovation projects; studies of long-term risks & responses; incorporating climate-resilient design standards in future construction work & master planning

**Size/Scope:** Steps include flood barriers; construction upgrades redundant IT & communication systems; various plans & assessments

**Climate Adaptation & Resiliency Plan:** \$200,000

**Climate Vulnerability Assessment:** \$50,000

**Plan & Assessment Consultant:** VHB



As U.S. airports prepare to turn the corner on the pandemic and the harsh winter of 2020-2021, some still face a significant long-term challenge: the rise in sea levels resulting from climate change. Although the biggest risk is to airports located along the Atlantic, Pacific and Gulf coasts, experts predict secondary effects for inland airports as well.

According to the *2017 National Climate Assessment*, 13 of the nation's 47 largest airports are located on coasts and have at least one runway with an elevation within reach of moderate to high storm surge—within 12 feet of current sea levels. (See Page 83 for a list of airports in this category.) Naturally, levels of vulnerability vary with elevation and water level projections for coming decades. The *2017 National Climate Assessment* is a federal report under the auspices of the U.S. Global Change Research Program, an initiative by 13 federal agencies, including the U.S. departments of Transportation, Commerce, Defense and the U.S. Environmental Protection Agency.

In addition to sea level issues, climate change also presents challenges associated with higher temperatures and more intense storms, including rain events with river flooding. Concerns about high temperatures prompted the cancellation of some flights at Phoenix Sky Harbor International Airport (PHX) when temperatures reached 118

degrees Fahrenheit during a heat wave there in June 2017. Such extremely hot temperatures can prove dangerous for workers, and may exceed the operating limits of some aircraft.

The cancellations at PHX were due to a lack of airliner performance charts for temperatures that high, explains Heather Shelbrack, public information manager for the City of Phoenix Aviation Department, which owns and operates the airport. "Sky Harbor is well prepared for Arizona summers," adds Shelbrack. For instance, during extreme heat, PHX schedules time-sensitive outdoor work at night, and pumps air conditioning into underground manholes to help protect airfield electrical workers.

Of course, rising sea levels and other signs of climate change are not exclusively an American problem. In fact, "Coastal Airports and Rising Sea Levels," in the September 2020 issue of the *Journal of Coastal Research*, points out that because "most of the world's major cities are located along coastlines...their large international airports are typically built either very close to sea level or on filled shallow coastal waters."

More intense and frequent storms caused by climate change could prove especially problematic for such airports that sit beside already high seas with tides to match. Thus, planning and adapting, and steering projects to boost resiliency accordingly, are crucial.



Airports have responded in various ways. For instance, a perimeter dike project is well underway at Oakland International Airport (OAK) in California. “This project is designed to protect OAK against flood risk from severe storms and sea-level rise,” explains Airport Spokesperson Marilyn Sandifur. “The project will strengthen and raise the dike by 1 to 2 feet at a cost of approximately \$62 million.”

Massport, the public authority that owns and operates Boston Logan International Airport (BOS), has been working on sustainability and resiliency initiatives for years. Key elements at BOS include the installation of flood barriers and raising electrical infrastructure.

## The Situation at SFO

With eight miles of shoreline along the San Francisco Bay, San Francisco International Airport (SFO) is a telling example. Officials there are studying and planning a proposed \$587 million project to protect the airport from flooding and rising waters. As envisioned, the Shoreline Protection Program would replace an aging, incomplete patchwork of perimeter concrete and pile berms and seawalls. The proposed system calls for a strategic combination of concrete walls, steel sheet walls, and king pile walls capped with concrete. The plan is designed to fill unprotected gaps in about 20% of the airport’s eight-mile bay shoreline and also add 5 feet of protection against flooding and rising sea levels.

The walls are designed to shield SFO runways, infrastructure and buildings from rising sea levels and storm surges expected to occur during the next 60 years or more. If enacted, the plan would remove the airport from the Federal Emergency Management Agency’s Flood Insurance Rate Map.

Other considerations for SFO include groundwater seepage and regional earthquakes. Both issues will be addressed in the draft Environmental Impact Report that Environmental Science Associates expects to complete and release sometime this year.

As the nation’s seventh-busiest airport, it is vital for SFO to have a solid plan. “We think of airports as critical infrastructure to a region,” says SFO Director Ivar Satero. “Even during this period of reduced

passenger activity [57.6 million travelers in 2020], airports are such a lifeline, facilitating the delivery of much-needed medical supplies, vaccines, personnel and more. Outside of our current pandemic, airports are economic engines, powering jobs and revenues throughout the area.”

Although the pandemic has postponed various facility initiatives in SFO’s Capital Improvement Plan, initial preparations for the improved shoreline system continue in earnest. “We hope to have a draft environmental impact report ready this year, with physical construction scheduled for 2025 to 2035,” reports airport spokesman Doug Yakel.

Not knowing precisely how much waters will rise, or by when, presents significant challenges to resiliency planning. Thus, SFO is taking an approach geared toward the middle range of forecasts, with measures designed to mitigate sea-level rise of as much as 42 inches between 2035 and 2085. “Since we hope to have this work done by 2035, we’ve built in decades of cushion here in the event the actual levels are greater, requiring further mitigation,” says Satero.

In addition to such flexibility, there is collaboration. “This isn’t a project that can be done in a vacuum,” notes Yakel. “We share our shoreline with other cities and agencies, and it’s important that we communicate fully with our neighbors to



IVAR SATERO



DOUG YAKEL

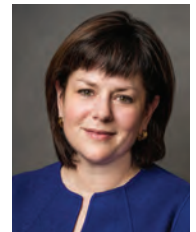
ensure awareness and foster collaboration where possible. For example, the impact study that informed our project was funded through a grant awarded jointly to SFO and the county we operate in...a true example of collaboration.”

## Factors in Philly

The approach toward sea level rise at Philadelphia International Airport (PHL) is proactive and evolving. The airport, which served 33 million passengers in pre-pandemic 2019, sits on a 4-square-mile section of land with water on three sides. In fact, a portion of the airfield was built on a parcel reclaimed decades ago with materials dredged from the abutting Delaware River, which meets the Atlantic Ocean. Some of the varied elevations at PHL are as low as 4 feet above sea level. Its lowest runway is slightly more than 8 feet above sea level, and its highest runway is about 30 feet above sea level.

In recent years, more frequent and more intense storms have hit, raising red flags about climate change throughout the region. Hurricane Floyd in 1999 and Sandy in 2012 really drove home the point. When a severe thunderstorm hit PHL eight years ago, it knocked out pumps, cut off power in one terminal and caused flight cancellations.

Chief Executive Officer Rochelle “Chellie” Cameron notes that PHL is actively working to combat the effects of climate change and sea level rise. More specifically, the airport’s current master plan update will outline a 10-year vision to protect its terminals, roadways and airfields.



ROCHELLE CAMERON



*The nearby Delaware River creates inherent challenges for Philadelphia Int'l.*

Efforts will center on taking action now, before sea levels potentially reach damaging heights. Key plans include incorporating various responses into master planning as well as identifying and preparing critical infrastructure needs in the shorter term. PHL also has conducted comprehensive studies on the threat and associated responses with input from airlines, the federal government and local stakeholders.

In addition, the airport commissioned VHB to perform a Climate Adaptation and Resiliency Plan and a Climate Vulnerability Assessment, which assessed vulnerabilities in various sea-level rise scenarios and recommended that Philadelphia's Division of

Aviation, which owns and operates PHL, continue its climate resiliency planning and preparedness efforts as part of master planning at the airport.

Florence Brown, director of communications for the Division of Aviation, reports that there are also a variety of projects in conceptual evaluation, design and construction. Smaller projects range in price from \$50,000 to \$200,000, while larger projects could potentially cost millions of dollars.

The more significant point is that those initiatives are setting the climate change bar for PHL. "We are incorporating appropriate design standards to address climate change, which will be implemented in the construction phase of upcoming projects," Brown explains.

Ray Scheinfeld, PHL's Planning and Environmental Services manager, reports that the airport has identified and is incorporating several critical infrastructure components that will need to be protected to allow the most rapid return to normal operations after an event. They include:



RAY SCHEINFELD

- constructing flood barriers at electrical supply feed locations and substations;
- providing redundant IT feeds, computer centers and backup communication systems located both on and off site;
- upgrading climate control systems for airport buildings and incorporating rapidly employable temporary climate control replacement systems; and
- installing properly designed weather-resistant airfield lighting and communications systems.

In still other steps, the airport is enhancing building structures for existing and future facilities, to prevent extreme weather-induced failures. It is also specifying airfield construction and repair materials that can resist extreme heat, cold and pressure, as well stand up to abrasion during cleaning and plowing.

For Scheinfeld, the most challenging aspect is determining what extent and timing of sea level rise/climate change to use for engineering decisions. "The current predictions have a wide range, which makes the selection of endpoint conditions more difficult," he comments.

Such multi-pronged initiatives do not come easy for any airport, and ongoing collaboration and research are informing PHL's work. As Scheinfeld explains, the airport has conducted

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a series of studies to incorporate insights from stakeholders, including the FAA, airlines, the Division of Aviation itself and local police and fire departments. Recommendations stemming from the discussions, include:

- integrating risks related to climate change into training programs, communications protocols, capital planning and asset management;
- evaluating specific flooding vulnerabilities and potential impacts; and
- working with local/regional/state entities to develop climate resilience partnerships and adopt best practices.

Another ongoing initiative that Scheinfeld considers critical is an airport and regional hydrology and hydraulic study. He explains that it will guide responses in the future by allowing a

more detailed engineering analysis of vulnerabilities and identifying the best actions to take to protect PHL.

In a broader sense, preparing for sea-level rise and other results of climate change may boil down to being proactive and keeping the issue front and center. As SFO's Satero sees it, "It's vitally important to ensure that airports can continue to serve their communities, and deliver all the benefits they provide. That's why our Shoreline Protection Program is so important, and why we're moving forward with it."

As noted, sea-level rise stemming from climate change is taking various forms, and so are airports' responses to it. But some elements may be useful across the board. As initiatives at SFO and PHL show, plans that are well researched and collaborative can point the way forward—even amid changing times. ✈️

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## The Beat Goes On




Passengers, flight crews and staff who loved the sound of live music at Seattle-Tacoma International Airport (SEA) were understandably disappointed when the popular program was suspended in March 2020 due to COVID-19. In the meantime, the airport continued to play music from Northwest artists over its public address system and soon discovered a virtual alternative to fill the void.

This February, SEA debuted a 12-by-7-foot digital music wall in Concourse C that runs a two-hour loop of performances by local musicians. The production includes a variety of genres, with a heavy dose of soothing acoustic guitar and vocals. Some of the segments were recorded in artists' homes, while others show musicians performing in natural outdoor settings or at local venues that closed due the pandemic. Local radio DJs introduce each act and appeal for donations to help support the artists, as many struggle to make a living while Seattle's live music scene is on pause.

Some of the selections playing on the high-resolution video wall seem to be direct references to the pandemic that inspired

the virtual showcase—songs such as *Love Without Location*, *Where Do We Go Now*, *Without You*, and a cover of Bob Marley's *Redemption Song*.

Gigs4U, the agency that books live performers for SEA, spearheaded the project and plans to make a new video every six weeks. It also took responsibility for distributing donations received via PayPal and Venmo to the performers, and for paying the associated taxes and royalties. Promosa, an event production company headquartered in British Columbia, donated the large LED display and server technology; and Stingray/Chatter supplied the interactive technology. Gigs4U provides the content and program management; and SEA rounds out the collaboration by promoting the program with QR codes throughout the airport.

While additional music walls may be in the airport's future, visitors and staff alike are eager for live performances to resume. Prior to the pandemic, local musicians performed from 9 a.m. to 3:30 p.m., seven days a week. In 2018 alone, SEA staged 5,790 hours of live local music at the airport. 

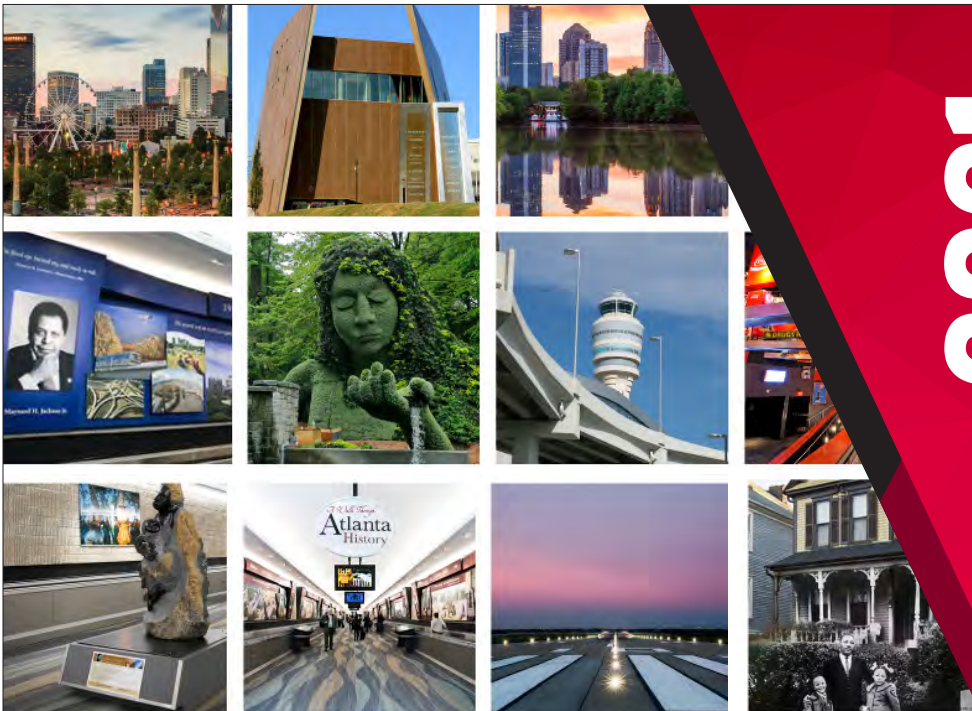




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# Livestock Shipments Figure Prominently in Growth Plans for St. Louis Lambert Int'l

In a recent edition of this magazine, you may have come across an announcement about a new facility at St. Louis Lambert International Airport (STL) serving as a point of origin for live animal shipments to Brazil. With population growth continuing around the world, the global need for breeding stock has created an important export opportunity for the United States. As our airport team watched this trend grow in recent years, it prompted us to consider STL as a viable option for these charters.

Like other airports, we are always looking for creative revenue streams that can leverage our infrastructure as an economic engine—not only for the airport, but for the wider regional/statewide footprint as well. At STL, we are located in the center of the United States and have a magnificent runway system that is not used to full capacity. Furthermore, Missouri and the surrounding states produce a large percentage of the nation's livestock. Looking at all these attributes, it became clear that specialized air cargo must be part of the future focus for STL.

In 2020, our total air cargo numbers grew to just under 185,000,000 pounds—a one-year increase of 26 million pounds, or 16.5%. This was the fifth straight year of increasing cargo tonnage, with double-digit increases in two of those years. DHL, FedEx, UPS and Amazon have all contributed to our recent growth in cargo, as well as a growing number of dedicated cargo charters. Additionally, St. Louis has

become a hotspot for fulfillment centers, further adding to air cargo growth, as companies need to move products to fulfillment centers for distribution.

However, STL is still not the large player we would like to be, and there is room to grow if we enhance and foster long-term partnerships. As an airport, strategic planning is crucial and community buy-in is critical to our success. Eight years ago, our air cargo consultant helped us form a partnership with the Midwest Cargo Hub Commission to focus on cargo opportunities for our region. That partnership helped us establish a live animal inspection and embarkation center that earned approval from the U.S. Department of Agriculture (USDA), and we continue to work with the Commission to unify our approach in growing the logistics sector within the St. Louis region.

Our USDA-approved facility spans 31,000+ square feet, with a dedicated penning area of 18,000 square feet and a 12,000-square-foot open bay with a roller and ball deck. The design is customizable and, when needed, allows shippers to move livestock directly from their vehicles into the shipping containers, which saves time and minimizes stress on the livestock. The facility is very competitive and sets STL apart from other airports. We feel strongly that it gives us an advantage for live animal shipments and will become a preferred facility in the coming months and years. Agri-business experts know



**Rhonda Hamm-Niebruegge**

*has been the director of St. Louis Lambert International Airport (STL) since January 2010. STL is the primary air carrier facility for the St.*

*Louis region, serving nearly 16 million passengers annually.*

that St. Louis lies in the center of a six-state area rich in livestock supply, and this becomes an important benefit when considering the proximity of an airport.

Moving livestock is a multimodal initiative, and we are one of the best connecting points in the United States for freight. St. Louis has a great waterway system, a robust rail system and four major interstate highways dissecting our city. In the midst of this multimodal logistics heaven, lies STL, the region's largest airport and home to the above-mentioned USDA live animal port of embarkation.

In summation, these recent successes in livestock shipments are important not only to STL, but to the entire St. Louis region. We are encouraged by what we have been able to accomplish with this endeavor; but success will be measured by our ability to sustain and grow our revenue streams for air cargo. We will continue to concentrate on this effort knowing that it will provide a valuable global-economic resource for our region. ✈️



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