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Which Team Are You On?

Years ago, my wife and I had a financial advisor who came with glowing reviews. He knew his investments, and also was passionate about politics. Unfortunately, his investment strategy for our portfolio was driven by *his* politics, which only benefited us about 50% of the time. Needless to say, he's no longer our advisor. We needed a full-time advisor, not a part-time political pundit/activist.

I was reminded of him last week when talking with a friend from the industry about an upcoming conference. This businessman is not going to attend because he "doesn't like the direction we are going." Did this person mean that his company didn't have orders coming in? No, business is good. Does he see air travel rebounding, with some airports even beating their 2019 numbers? Yes. In fact, he remarked about how ticket prices are high and planes are full. So what was his disconnect?

In a word: politics. He doesn't agree with the politics of our current White House administration and therefore assumes we're headed for a period of despair. As a result, he is going to sit out this dance for the time being.

Sadly, it seems there's no "we" anymore. It's either "us" or "them." At least that's how it feels too many days.

The truth of the matter is that airports specifically, and aviation in general, have done well over the years. We're in a market that seems largely agnostic to political parties. Airports have benefited from Washington's support. Period. To feel that we'll only do well if one particular party is in office is ludicrous.

We need to work with whoever is writing the checks. While each of us has our own valid opinions and votes accordingly, we're all in aviation first. In this industry, it's hard to succeed if you're on the bench because your political team didn't win.

Cheers to *all*,

Paul



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Seattle-Tacoma Int'l Modernizes, Expands North Satellite

BY JODI RICHARDS

SEA Seattle-Tacoma
International
Airport

FACTS & FIGURES

Project: North Satellite Modernization

Location: Seattle-Tacoma Int'l Airport

Cost: \$710 million

Funding: Airline fees; Airport Development Fund;
passenger facility charges

Timeline: Feb. 2017-July 2021

Labor: 2.1 million hours

Construction: Hensel Phelps

Designer: AECOM

Structural Engineer: MKA

Mechanical: Hermanson

Electrical: Veca

Passenger Loading Bridges: JBT AeroTech

Holdroom Seating: Vitra, Open Square

Aircraft Docking System: ADB SAFEGATE


Baggage Handling System Design: Daifuku

Baggage Handling System Controls: NORD

Smoke Detection System: VESDA Systems





 This summer, just as passengers returned in significant numbers, Seattle-Tacoma International Airport (SEA) opened Phase 2 of its \$710 million North Satellite modernization project, adding much-needed gates and square footage.

The investment, however, was about more than adding operating space. Making sure the new facilities meet or exceed passenger expectations was equally important for the Port of Seattle, which owns and operates SEA.

“We have some very ambitious long-term goals,” says SEA Managing Director Lance Lyttle. Among them is earning top marks in passenger satisfaction. For Lyttle, that means a five-star Skytrax rating and ranking in the top 25 for the worldwide Airport Service Quality awards—all by 2025. Within the next decade, the goal is to provide IATA’s Optimal level of service at all SEA facilities, even during peak travel times.



LANCE LYTTLE

Renovating aging facilities such as the North Satellite is just one way SEA plans to achieve its ambitious objectives. At nearly 50 years old, the facility was overdue for an upgrade.

The recently completed renovations were part of SEA’s capital development plan crafted in the early 2000s. Ken Warren, SEA’s capital program leader, notes that the North Satellite originally opened in 1973 and has only received minor facility upgrades since. The same is true for the South Satellite.



KEN WARREN

When SEA served 51.8 million passengers in 2019, lack of available gates became a major challenge. In fact, the eight new gates added to North Satellite were fully occupied by Alaska Airlines immediately upon opening. “There is a tremendous demand for travel in the Puget Sound region,” Lyttle explains. “Prior to the pandemic, we saw tremendous growth year over year, but didn’t have enough gates to accommodate the growth.”

Back in 2012, Alaska Airlines expressed an interest in expanding at SEA and establishing a home base out of the North Satellite. That prompted the airport to begin planning a renovation focused on four main objectives: technology upgrades, a seismic retrofit, improving the customer experience and creating a Pacific Northwest sense of place.

But in 2014, officials realized that demand was growing faster than they could renovate. That’s when plans for the North Satellite renovation changed to include an expansion as well. “So we took a pause for a year to figure out how we could expand without impacting other facilities and how many gates we could expand to,” Warren explains.

Between 2015 and 2017, planning and some preliminary shifting of airlines occurred to make room for expansion to the north. Ultimately, the North Satellite project added eight contact gate positions, for a new total of 20. It also provided 213,000 square feet of added and renovated space, more than doubling the facility footprint to 468,000 square feet.

After the expansion portion of the project opened in January 2019, Phase II began with construction of a new building directly over the old North Satellite. The original building was then demolished, and the new expansion was melded together to create a brand new facility that fully opened on June 29, 2021.

NEW FEATURE! AIRPORT VIDEO INTERVIEW

Click on the QR code to see a webcam interview with Ken Warren, program leader of the North Satellite Modernization project.



Customer Satisfaction Drives Design

Even before Lyttle came to SEA almost six years ago, airport leadership performed extensive surveys to determine what passengers want and need. “The customers themselves outlined the things they consider to be a priority,” Lyttle remarks, noting that restrooms always top the list. The diversity and volume of concessions is another perennial focus.

“We’re putting in these facilities from the feedback that we’ve gotten from our customers, but also for the standards that have been established by IATA’s Optimal level of service and Skytrax’s ratings,” says Lyttle.

Warren adds that improving the passenger experience was a key intention of the North Satellite program. “We call it the curb-to-seat experience,” he explains. “From the time you arrive at the airport and get over to the North Satellite, your stress level is going to be lower.”

Customers wanted to feel like they were outside even when inside the terminal, so designers included a vertical clerestory glass feature that allows sunlight to penetrate deep into the holdrooms. Wood tones, including columns painted to resemble trees in the forest, add to the outdoorsy feel. With ceiling tiles made of FSC-certified beechwood, the airport can assure patrons that the materials came from responsibly managed forests.

The architectural concept designers developed for the terminal prioritized expansive views and intuitive wayfinding, and was

dubbed “The River” accordingly. As passengers step off the escalator, they are directed into an open marketplace. From there, they are led through the meandering concourse, which curves in and out like a river. Along the way, there is space for travelers to congregate around various concessionaires and “islands” with kiosks and art installations. “It really does play with this Northwest sense of place and river concept,” Warren says.

Wayfinding in the new North Satellite is easier and more intuitive, says Frederick Robinson, a Port of Seattle project manager. “The openness and architectural features really do set your mind at ease,” he relates. “If you’re in The River, you can see the full length of the terminal, which gives you some confidence that you’re able to enjoy the full terminal, go to the shops, find your way around.”



FREDERICK ROBINSON

Lyttle describes the mountain views from the new Marketplace N as nothing short of spectacular. (The space itself is nearly 80 feet tall.) In early September, specific concessions were still under construction, but the new lineup was designed to provide more diversity and high quality customer service. “It’s extremely important for us to meet that level of service,” Lyttle emphasizes.

“It was really a matter of this terminal trying to rise and meet the expectations of modern design for aviation and operability,” Robinson agrees. “And we think we did a great job.”

Reimagined Restrooms, Etc.

Lyttle is particularly proud that the North Satellite earned recognition as a finalist for the 2019 best restrooms (transportation category) from Cintas.

Designers specified closely spaced ceramic tiles with minimum grout for aesthetic appeal and easy maintenance. A water turbine-powered system recharges lithium ion batteries for the infrared faucets, saving SEA about \$60,000 per year on batteries. Soap dispensers draw product from a common system to deliver a continuous supply.

In 2015, Warren challenged sink manufacturers to develop a multi-lavatory configuration with an impervious surface. “The industry responded with a wonderful white quartz, multi-bowl design that’s absolutely fantastic,” he reports. “It doesn’t splash our patrons, it’s easy to clean, and has that ‘opening day shine’ every day.”

The ventilation system is another standout feature. It changes the air in each restroom every six minutes—more than twice the minimum standard, Warren notes. Partitions are 32 inches wide, rather than the standard 24 inches; and shelves inside each stall mean

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New holdroom seating from Vitra includes power ports.

passengers don't have to juggle their belongings or search for a safe place to set them.

Responding to frequent requests from pet owners, SEA installed an animal relief area—equipped with artificial turf, a water station and even a simulated tree stump. A heavy-duty exhaust system and a stainless steel floor with drains help keep the space clean and comfortable.

Other enhancements for passengers include voice and visual paging, and a flight information display system that provides terminal-wide notifications as well as flight details.

The airport replaced all holdroom seating with new models from Vitra that include power ports—another highly requested amenity. Warren describes the terminal-wide WiFi coverage as the “latest and greatest,” noting that it allows airlines the flexibility and connectivity they need to operate effectively. “We’ve done a lot of things in coordination with our airline partners, as well as satisfying all the infrastructure needs of our airport,” he remarks.

Another change intended to resonate with the airlines was upgrading or replacing all 20 boarding bridges with equipment from JBT AeroTech. “They

all have better safety features, are better able to be guided and used by the airlines,” says Robinson.

On the ramp, each gate position includes power, potable water and access to the hydrant fueling system. The airport installed LED fixtures on the facility exterior for aircraft parking, and the SafeDock system from ADB SAFEGATE to facilitate safer aircraft operations.

Environmentally Sound

Sustainability was a priority for the North Satellite renovation/expansion, and officials expect the structure to achieve LEED Silver Certification from the U.S. Green Building Council. Energy-efficient LED lighting and heating/cooling systems were selected to save approximately 1.7 million kWh annually. Renewable natural gas, a low-carbon alternative often produced from landfill waste, is used to heat the building. Using captured rainwater to flush toilets is expected to save 2.8 million gallons of potable water annually.

“You have to listen to passengers, the ultimate customers, and your business partners,” Lytle remarks. “You have to design and build a facility to meet their needs; but you also have to understand that we have a responsibility to the

community and the people who are going to be on this earth in the future. So as you do that expansion, you have to do it in a sustainable manner.”

To support the project's environmental goals, designers kept as much as possible from the existing facility, including floors, columns and beams. In total, 76% of the construction waste—about 20,000 tons and nearly \$21 million of recycled materials—was diverted from landfills and re-used.

The need for a seismic retrofit of the North Satellite was highlighted by a 2003 earthquake in the Puget Sound region. The structure was then expanded with one structural bay around the perimeter of the building and an addition on the north end. “We knew that the columns, beams and floor plates were all great materials that we could keep, but how do you meet the code?” Warren relates.

To do so, structural engineers from MKA analyzed the entire facility and devised a way to maintain the existing building and encompass it with the new terminal—giving it what they call a “seismic hug.”

“We are hugging that existing building by buttressing it all around the perimeter with the new expansion to keep it safe and sound from a seismic and structural perspective,” Warren explains. He estimates that MKA's creative idea saved the Port \$50 million while meeting its seismic and sustainability goals.

Upgrades to the baggage handling system also support SEA's ongoing sustainability efforts. Variable frequency drives on the motors and control system save energy and money by stopping the system when no bags are present.

Similarly, escalators pause when not in use, saving about 30% in energy costs. A new building controls system and a Vesda smoke detection system further contribute to the airport's sustainability goals, adds Warren.

“We’ve employed a lot of new technologies that make it a very smart building,” he says. “It’s something that’s very infrastructure-robust because we are building for the future.”

Boundary, by John Grade, is the airport's largest interior art installation to date.



PHOTO: PORT OF SEATTLE

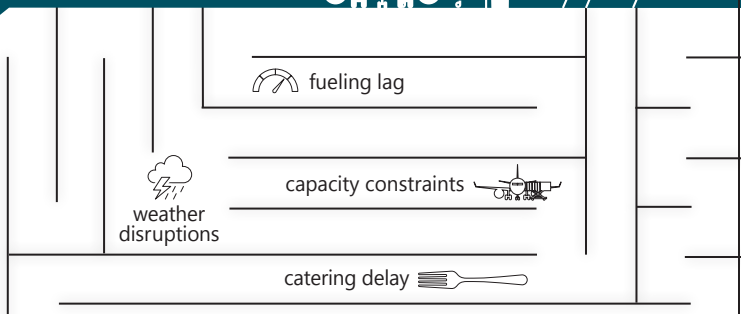
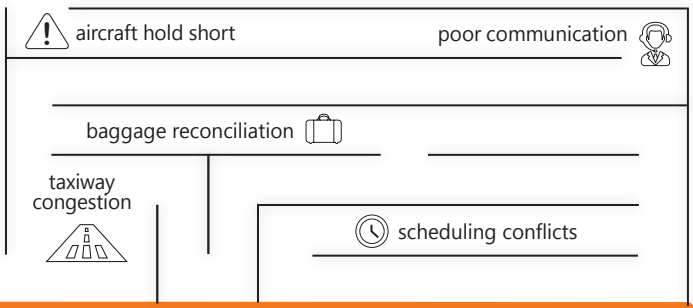
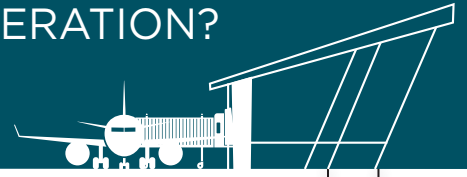
Integrated Art

Ten new pieces of museum-quality art adorn the renovated North Satellite, including SEA's largest interior installation to date. *Boundary*, by renowned Seattle sculptor John Grade, is an artistic representation of a tree trunk and root system constructed from 8,000 pounds of Western Red Cedar. The piece measures 80 feet wide, more than 40 feet tall and extends more than 25 feet off of the wall of Marketplace N. It doesn't portray tree branches, but implies to viewers that there is more to see above the roof.

"Art is built into the facility—it's purpose-built for each art piece," Warren advises. Many installations feature local and regional artists to reflect the diverse environment, culture, spirit, people and history of the Pacific Northwest.

The airport also included the performing arts by adding a space where visitors can watch live performances.

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The North Satellite expansion added eight new gates.



PHOTO: PORT OF SEATTLE

Sequencing for Success

Throughout construction, the North Satellite had to remain operational for main tenant Alaska Airlines. This proved to be “really complicated,” Warren notes, adding that the two-phase project included 22 micro-sequences. The project team focused on phasing work to keep a minimum number of gates, restrooms and passageways operational, while also meeting customer service goals and making sure contractors had enough space to work safely and efficiently.

“There was a tremendous amount of temporary barricades, scaffolding and temporary corridors to protect passengers and get them to the gates that were in operation,” recalls Jason Coyne, general superintendent with general contractor Hensel Phelps.



JASON COYNE

“We know time is money,” reflects Warren. “And we know the more we chop it up, the more time it takes and the more money it’s going to cost.”

“I think we did a good job of trying to marry a customer service level standard and do the things we needed to do to transform this terminal into a facility that’s going to be the home of Alaska Airlines for the next 50 years.”

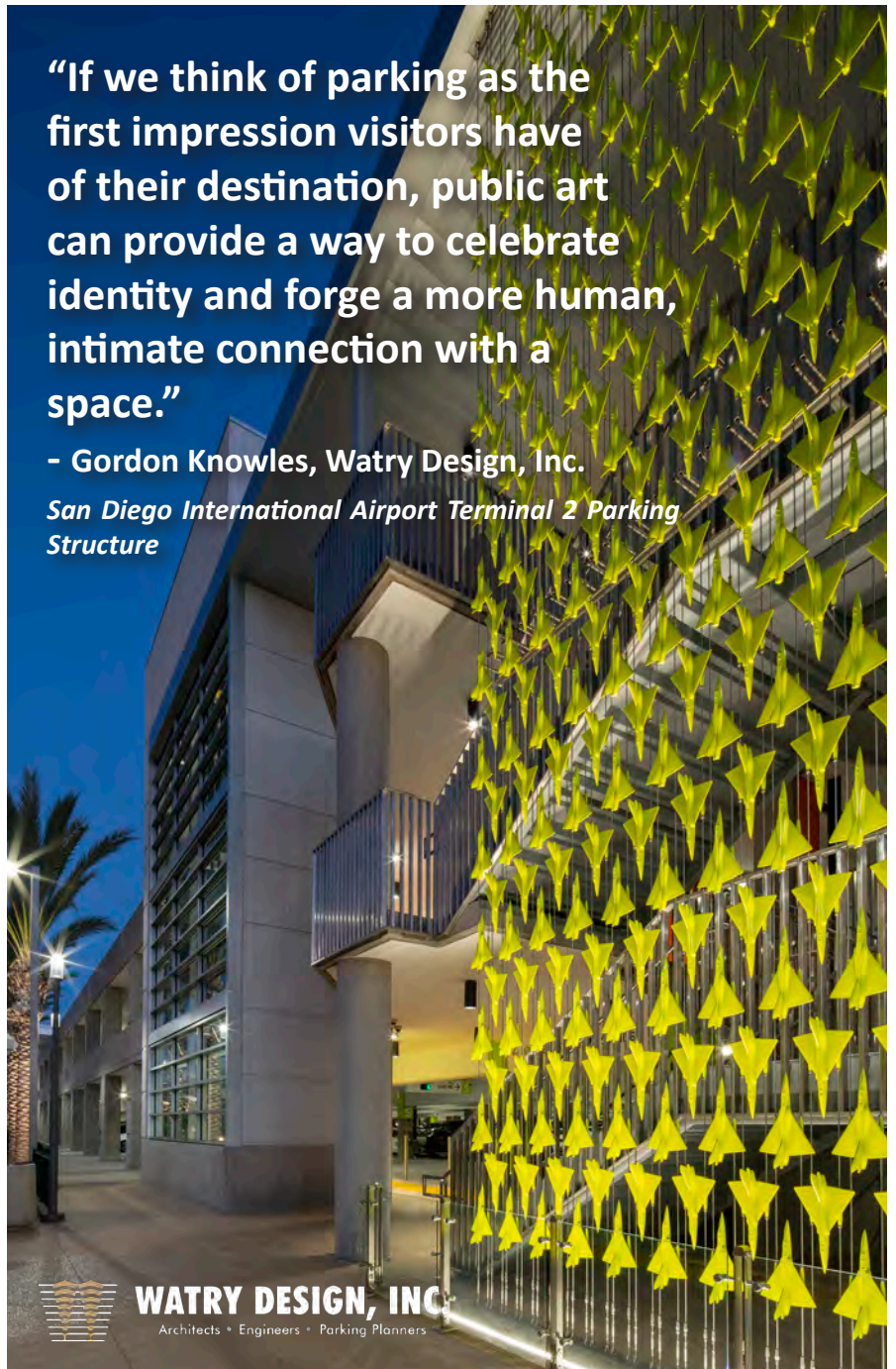
Robinson adds that SEA is a gate-constrained airport with a small footprint. “That’s why the sequencing and phasing were so incredibly important to the success of this project,” he explains.

For instance, construction crews had to work from scaffolding 61 feet above the concourse floor to install the ceiling in Marketplace N. Coyne notes that erecting

“If we think of parking as the first impression visitors have of their destination, public art can provide a way to celebrate identity and forge a more human, intimate connection with a space.”

- Gordon Knowles, Watry Design, Inc.

San Diego International Airport Terminal 2 Parking Structure



WATRY DESIGN, INC.
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PHOTO: PORT OF SEATTLE

350-foot-long, 175,000-pound trusses over an operational terminal was a major challenge that took a lot of pre-planning and months of coordination.

Scott Thomas, senior construction manager for the Port of Seattle, notes that switching over from the old facility entailed shutting down mechanical and electrical systems more than 2,000 times—another feat that required coordination to keep the building operational and passengers comfortable.



SCOTT THOMAS

To ease the transition, the airport created an Operational Readiness Activation and Transfer (ORAT) Department. Robinson describes its role as bridging the divide between the end of construction and the beginning of operations in the new facility. Employees who will operate in and around

Designers leveraged natural light and wood tones in a nod to the local Pacific Northwest culture.

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The new expansion was constructed around the existing building to provide what structural engineers call a seismic hug.



the new facility need an understanding of how things work there, he explains. Additionally, the ORAT team test-drives systems and updates all standard operating procedure documents so that fire and police departments know how to respond to emergencies at the new North Satellite.

Working Amid COVID

When the coronavirus pandemic began, SEA's North Satellite project was deemed essential and construction continued with layers of extra precautions. As passenger traffic declined, the project team worked together to combine steps and managed to shave nearly three months off of the overall schedule.

"Instead of getting stuck with lemons, we made lemonade by closing part of the terminal and saving a tremendous amount of time and providing Hensel Phelps with more work area so they could get their work done," Warren recalls. "During a time when everyone was nervous and scared about what was happening, Hensel Phelps worked with the construction team to make everybody feel comfortable and safe."

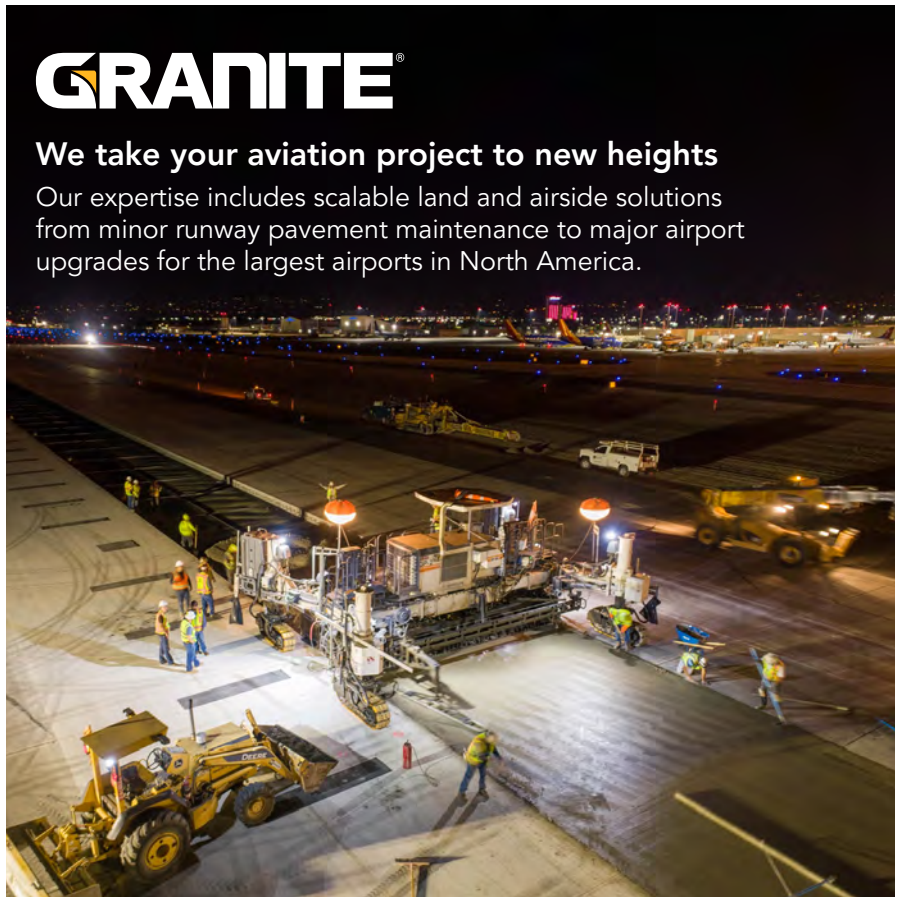
For example, separate break spaces were created outside on the tarmac; teams grouped together to provide redundancy if someone got sick; and smaller buses were used to transport workers to and from the jobsite.

As passengers enjoy the new facility and traffic rebounds, Lyttle reports that SEA is still short on gates, but the North Satellite modernization is a dramatic shift from the 1970s to a modern-day customer experience. ✈️

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Atlanta Int'l Installs First Integrated CT-Automated Security Lane Checkpoint System in U.S.

BY JENNIFER DAACK WOOLSON



FACTS & FIGURES

Project: Checkpoint Expansion

Location: Hartsfield-Jackson Atlanta Int'l Airport

Owner: City of Atlanta Dept. of Aviation

Cost: \$42.2 million

Funding: General airport revenue bonds

Timeline: Team received Notice to Proceed in mid-March 2020; project was substantial complete in mid-Nov. 2020

Delivery Method: Design-bid-build

Contractor: New South-Synergy (a joint venture)

Size: 30,000 sq. ft.

Scope: Doubled size of South Security Checkpoint area by adding 5 screening lanes, new TSA offices & breakrooms, a breach control unit, employee Interlock unit, training rooms & remote screening room

Automated Screening Lanes: L3Harris' Macdonald-Humfrey Mach-SmartLane™ Gen2 Automated Screening Lane (ASL)

Scanners: Analogic's ConneCT™ Computed Tomography (CT) Checkpoint Screening System

Of Note: First U.S. airport to fully integrate computed tomography & automated screening lane systems

In 2019, before COVID brought air travel to a trickle, Hartsfield-Jackson Atlanta International (ATL) was the world's busiest airport—hitting an all-time high of 110 million passengers. With that sort of traffic, TSA checkpoints are bound to be a pinch point. So to increase throughput and maintain its service level agreement of less than 20-minute wait times for passenger screening, ATL added five new lanes to its South Security Checkpoint. Now, that area has nine, the North Security Checkpoint has five and the International Checkpoint has 15.

ATL General Manager Balram Bheodari explains that the recent project wasn't just about making room for more lanes

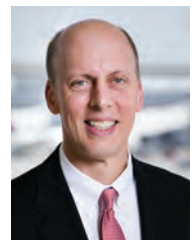


BALRAM BHEODARI

and queuing space. It was an opportunity to use cutting-edge technology to increase throughput, cut wait times and increase security. As the first U.S. airport to have automated screening lanes back in 2016, ATL has a history of embracing innovation to keep visitors and employees safe.

Risk vs. Reward

Tom Nissalke, the airport's assistant general manager for planning and development, notes that Atlanta's Department of Aviation partnered with TSA and Delta Air Lines to make it happen.



TOM NISSALKE

As the project was developing, Jason Hausner, managing director of passenger

facilitation for Delta, worked closely with the Innovation Task Force at TSA headquarters to stay abreast of the latest developments in technology. “Delta is very forward leaning and innovative in the approaches we take for the customer touch points that we can control,” Hausner explains. “We want to influence both TSA and CBP to make our customers’ experience at the checkpoint safe and secure, but with the least amount of wait time as possible. And that’s mostly done through innovative technology.”

Based on those discussions and other explorations, ATL elected to integrate computed tomography and automated screening lanes—something no other U.S. airport had done. The system combines L3Harris’ Macdonald-Humfrey Mach-SmartLane™ Gen2 Automated Screening Lanes (ASL) and Analogic’s ConneCT™ Computed Tomography (CT) Checkpoint Screening System.

Brian Morris, program analyst for TSA at the airport, notes that ATL accepted some risk by choosing technology that hadn’t yet been fully approved by TSA. If the vendor or technology was ultimately not approved, the airport could have been asked to remove the equipment at its expense.

But that was a calculated risk ATL was willing to take. “We and the TSA have performed a lot of research and development together on this type of technology in the field,” Nissalke says. “We can’t say enough about our local TSA, and what great partners they are—not only in day-to-day operations, but when it comes to trying something new. They’re always open to do what is best for the operation, and it’s been that way for the last 15 years, ever since the TSA was created and started operation here in Atlanta.”

Integration & Innovation

The first order of business was finding space to expand the checkpoint footprint. Delta pitched in by relocating some of its back-of-house offices and an employee breakroom to help clear the way.

Beyond adding new lanes, the project significantly increased the checkpoint’s

The new checkpoint combines 3D computed tomography and automated screening lanes to increase throughput and security.



queuing area. This reduces crowding of passengers as they wait to be screened—a protocol that has become increasingly important as the pandemic continues. The entire area also received all new finishes, such as tile flooring, metal ceilings, storefront partitions, signage and new granite wall tile.

The second-generation Macdonald-Humfrey automated screening lanes offer two key enhancements: On the front end, four passengers can place their items in bins at the same time and quickly access additional bins if needed. The machine automatically sorts and distributes the bins based on which passenger pushes his or her bin forward first.

On the back end, the system automatically returns bins for use by the next passengers. This feature not only frees up TSA officers from gathering and moving bins, it also analyzes each bin to make sure it’s empty before returning it to the front of the line. “The TSA really likes both of those features because it’s less wear and tear on our operators, and it makes it more efficient for the passengers,” Morris remarks.

The other crucial component of the integrated system is computed tomography—the same technology used for medical imaging. The eight Analogic

ConneCT™ scanners at ATL’s South Checkpoint create high-resolution 3-D images of everything in passengers’ bags. Each scanner uses thousands of X-ray sensitive detectors and sophisticated detection algorithms to identify potential threat items in carry-on bags being run through the scanners.

“You can rotate the image on all three planes and then zoom in and out,” Morris explains. “Additionally, the machine itself has all of the required algorithms to automatically identify what it thinks our officers should be looking at—whether it’s a shield or high-density metal, or explosives.” Due to the sophistication of the 3-D imaging, customers don’t have to take anything out of their bags, including electronics, approved liquids and toiletries. This increases convenience and throughput.

“Integrating the two parts of the system allows screening agents to get a much more comprehensive view of the items they are scanning,” Nissalke says. “Not only is it more secure, but the computing power of the scanners is much greater; so operators can look at and make a determination of the image faster than with legacy equipment.”

According to Delta personnel, passengers are moving through

ATL's South Checkpoint nearly 20% faster than before the new technology was deployed. And Bheodari reports that customers rave about the speed and ease of navigating through the new hassle-free system.

A representative from TSA's media department notes that enhanced security is the first consideration with new checkpoint technologies. TSA maintains strict performance requirements that added technologies must first significantly enhance security; the benefit of efficient screening and the passenger experience are important additional features and considerations, he adds.

Checkpoint Enhancements

The eight checkpoint property screening system lanes consist of eight new CT machines, five new Gen2 Mach-SmartLane ASLs and three Gen1 units retrofitted to the same Gen 2 Mach-SmartLane ASL configuration. Each lane is roughly 72 feet long and 6 feet wide.

Morris counsels other airports that are interested in installing a similar system to make sure they have enough space for at least four divest positions and eight recomposure positions. Shortening the layout too much hampers efficiency, he warns.

ATL created space for more lanes and ample TSA support areas. The renovated South Checkpoint includes manager offices, a training room, a breakroom and locker room—all co-located with the nine-lane screening area.

A close-circuit TV system has overlapping high-definition cameras that literally cover every inch of the checkpoint. "That is so critical for us in any investigations that we want to do while partnering with the airport," Morris says. "We're able to pull video, and it's just a world of help."

With the new equipment in place, TSA continues to refine the networking capabilities of the Analogic CTs. Cross-lane capabilities at all checkpoints will allow any image from any CT lane to be sent to the next available TSA officer so he or she can evaluate it. This leverages any downtime an officer may have while waiting on the next bin to be input for screening.

Remote capability also will allow the officers evaluating CT images to be located in a dedicated screening room away from the checkpoint. "We are seeing great efficiencies applying this networking technology to an already fantastic imaging system," Morris says. "When passenger volume is really heavy and all lanes are in use, adding additional remote operators reduces screening time."



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To help TSA officers become familiar with the new technology, Analogic provided five simulators—computers loaded with the same type of images officers would encounter once the machines were in place. Training began at TSA headquarters and then transitioned to ATL as the machines were installed and certified. After COVID hit, the airport shut down its entire South Security Checkpoint for a little more than 12 months, which provided officers the rare opportunity for additional hands-on training without slowing passenger traffic.

Fast-Tracking Construction

As it did for many other 2020 projects, the COVID-19 pandemic provided a few extra plot twists at ATL. Although construction and training had to be shut down several times after workers tested positive for the virus, the highly unusual circumstances mostly worked to the airport's advantage.

In fact, the project team took advantage of dramatically reduced passenger traffic to reassess its phasing schedule. Initially, the plan was to build the five additional lanes, and then go back and retrofit the four existing lanes with new equipment.

"After we spent time discussing it with the TSA and Delta, we decided to collapse it into a single phase," Nissalke explains. "That gave our contractor team the entire site to work with, which resulted in a much more efficient project execution."

The revised strategy was so streamlined, crews completed the job four months ahead of schedule. Much to management's delight, the newly updated checkpoint opened just before Thanksgiving 2020.

Over the Finish Line

The accelerated timeline was also made possible by help from Delta and TSA. Delta flew the automated screening lane equipment across the Atlantic so it didn't have to be shipped by boat—a move that saved several months. TSA worked closely with U.S. Customs and Border Protection to secure special permission for Macdonald-Humfrey technicians based in the U.K. to enter the U.S. to help install it. Because this was the first installation of its kind in the U.S., manufacturer support was especially important.

Hausner notes that constant communication in the form of contractor meetings, stakeholder updates and daily briefings



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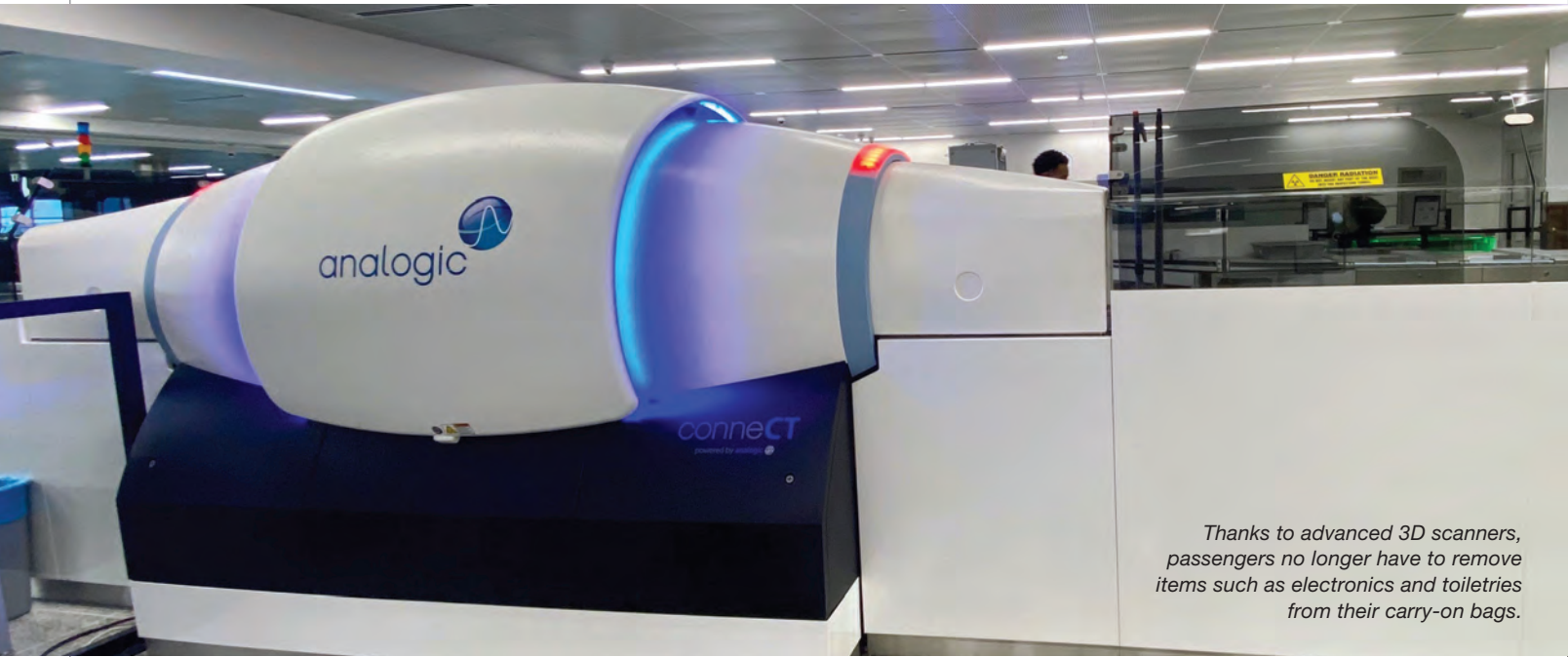
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Thanks to advanced 3D scanners, passengers no longer have to remove items such as electronics and toiletries from their carry-on bags.


allowed the project team to work through issues as they popped up and keep the schedule on track.

“Collaboration is key,” he emphasizes, “including ongoing collaboration with our government partners, TSA and CBP, as well as a strong partnership with our host airport and department

of aviation. This was not just a construction project. It was also a passenger facilitation project where you’re trying to move customers through the government channel as quickly and easily as possible. So having a collaborative group of stakeholders who understand that vision really paved the way for us to get it done in the allotted timeframe.”

Another important behind-the-scenes partner was the RCA (Requirements, Capabilities and Analysis) Team from TSA headquarters. It helps foster public/private partnerships to demonstrate, test and analyze new technology solutions like the CT system installed at ATL. The team’s findings help inform future requirements for purchasing, deploying, integrating and operating such equipment.

Morris notes that TSA is also using ATL’s enhanced checkpoint to evaluate non-material solutions such as new data collection strategies, concept of operations revisions, standard operating procedure adjustments and training enhancements. He adds that the federal agency is always looking for ways to optimize future security equipment and increase the technology readiness level of airports.

From Bheodari’s perspective, ATL couldn’t have asked for a better outcome. “The team was on its ‘A game’ in the delivery of this project,” he concludes. “The planning and design was comprehensive and, as a result, there was very little to no omissions once we started construction.” 

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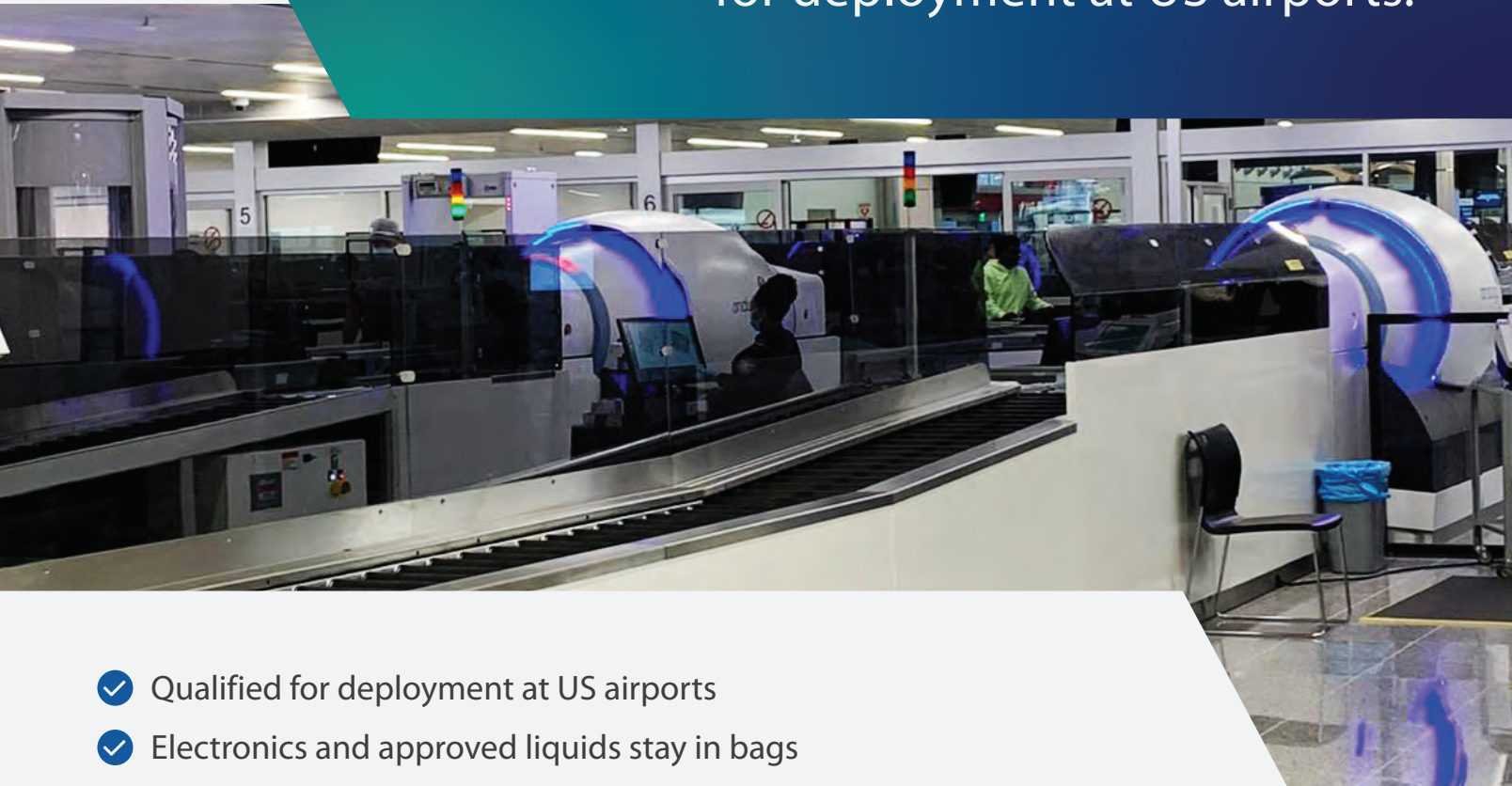
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Twin Cities Reliever Airports Live Up to Name

BY MIKE SCHWANZ

FACTS&FIGURES

Project: Metropolitan Airports Commission Reliever System

Location: Minneapolis-St. Paul metro area

Airports: 6

Relievers For: Minneapolis-St. Paul Int'l

Total 2020 Operations: 326,044

Runways: 14 (13 paved; 1 turf)

Leases: 828 (764 aircraft storage, 35 commercial properties, 28 non-aeronautical uses)

Based Aircraft: 137

Annual Fuel Sales: More than 6.2 million gallons

Combined Property: 5,007 acres

Engineering Consultant: SEH

Contractors for Lake Elmo Runway & Taxiway: Designing Earth Contracting; Minger Construction

Key Benefits of Reliever System: Reduces congestion at Minneapolis-St. Paul Int'l; bolsters economy of metro region



The six general aviation airports operated by the Metropolitan Airports Commission (MAC) are called relievers for a good reason: They significantly reduce traffic pressure that would otherwise congest Minneapolis-St. Paul International (MSP), the major airport of the system.

They surround the Twin Cities metro area, and provide valuable outlets for flight training, military operations, corporate and recreational flying, and emergency medical flights.

While MSP experienced a 40% decline in operations during 2020 due to the impacts of the COVID pandemic, total operations at the six relievers actually grew by 2% (to 326,000). Officials estimate that together, they contribute \$756 million in total economic output, and support more than 1,000 direct jobs.

Flight training and leisure flying was up at most of the relievers. "It's amazing to see the growth in grassroots aviation, even in the face of a global pandemic. The fact that people can operate aircraft safely while implementing COVID protocols is certainly positive," says Joe Harris, director of reliever

airports for MAC. "We have seen a tremendous demand in flight instruction in both new pilots and licensed pilots seeking advance training and certifications. I have met flight students who attend aviation programs around the United States who came back to the Twin Cities metro area to continue their training while distance learning."

Flying Cloud Airport (FCM), located in Eden Prairie, and Airlake Airport (LVN), located in Lakeville, recorded the largest increases within the MAC system. At FCM, flight operations increased by 19%—nearly 10,000 operations over 2019. In fact, it was the 13th busiest airport in the country (commercial and general aviation) on May 12, 2020, with COVID-19 raging.

LVN was up 5% from 2019, with close to 1,500 more operations in 2020.

Not everything was rosy, though. Operations at St. Paul Downtown Airport



JOE HARRIS

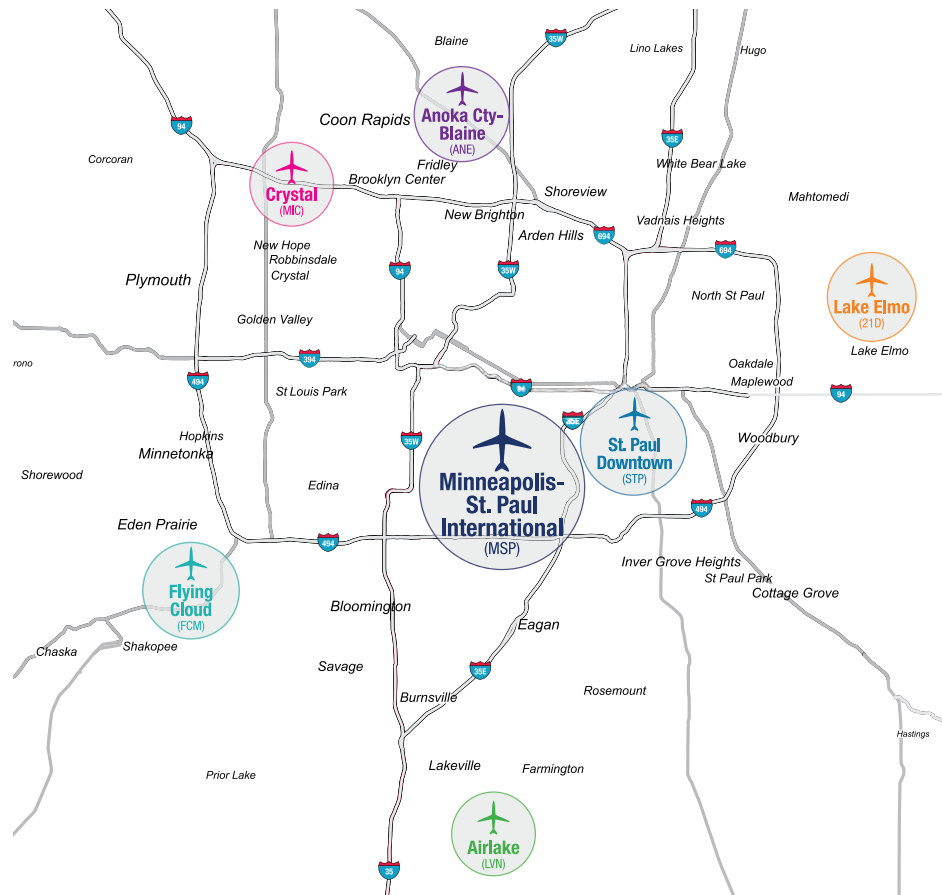
(STP), which usually hosts significant corporate jet activity, were down 26% in 2020, mostly due to the pandemic. However, business aircraft operations rose significantly this past summer, and that growth is expected to continue despite the impacts the pandemic continues to have on commercial business travel.

The other three reliever airports experienced minor decreases. Traffic at Lake Elmo (21D) was down 4.5%; Anoka County-Blaine (ANE) held almost steady with a 1.2% decline; and Crystal (MIC) dipped 4.9%.

Brian Ryks, chief executive officer of MAC, oversees the entire reliever network and MSP. “These reliever airports are a vital part of our community,” says Ryks. “They provide wealth to the region’s economy, so it’s important that we provide these airports with the proper infrastructure needed to allow them to grow and prosper.”



BRIAN RYKS



The reliever system was established so MSP could function efficiently as the primary hub for commercial passenger and air cargo operations. Due to the size of MAC’s network, general aviation pilots have a wide choice of which reliever airport to use.

The relievers were especially valuable during two huge recent events in Minneapolis. “In 2018, when we hosted the Super Bowl, we had 1,100 private aircraft come here,” Ryks recalls. “We only could handle about 150 of these planes at MSP; the rest of them flew into our reliever airports.”

A similar situation occurred a year later, when Minneapolis hosted the NCAA Final Four men’s basketball tournament in April 2019. Most of the 650 private jets that flew to the region landed at one of the relievers.

While most of Ryks’ daily responsibilities involve major projects at MSP, he has championed strategic infrastructure investments throughout the reliever system.

“We did a major runway project at Crystal in 2020, and at Lake Elmo we are in the process of completely relocating the main runway and reconstructing the existing runway as a taxiway,” Ryks remarks. “We are working with the FAA on a possible relocation of a new air traffic control tower at Flying Cloud. And at Airlake, we are planning a new development area so we can add more hangars.”

The pipeline to bring such projects to fruition begins with the three managers who oversee day-to-day operations at the six relievers. Each supervises two airports. Besides managing routine maintenance, working with tenants and providing regular financial updates, they also are tasked with providing input about forecasting demand and the timing for major construction projects.

Individual managers work closely with Harris to develop an annual budget for each airport. Major project requests are reviewed by the commission’s vice president of planning and development,

and presented to the executive staff. Then funds are allocated to each facility. Large-budget projects often depend on FAA and state funding to get the green light.

Community Engagement

Since becoming chief executive officer of MAC five years ago, Ryks has expanded community outreach efforts involving MSP and the reliever airports. “There are 24 cities or townships that are close to one of our relievers, and I often meet with the mayor and/or city council members when one of our projects affects their jurisdiction,” he says.

For example, Ryks and other MAC officials participated in 20 public meetings about the Lake Elmo project alone. “I met with various state senators and representatives who expressed concerns about reconfiguring a local road next to the airport, as well as possible noise increases,” Ryks explains. “The meetings allow us to explain our projects, and then to address concerns brought up during those discussions.”

One of MAC's biggest community outreach efforts, AirExpo, was held at Flying Cloud in late July. The annual two-day event (canceled in 2020 due to the pandemic) featured an air show and aircraft display. One particularly popular event allowed children to paint an airport plow. This year's attendance of approximately 7,000 people exceeded expectations.

Another example of community engagement is an online e-newsletter that runs on the MAC website. This August, it addressed the increase in planes flying over certain neighborhoods by student pilots from flight schools.

Money Matters

The budgeting process for MSP and the six reliever airports is a delicate balancing act. "We look at it as asset management," states Bridget Rief, MAC's vice president of planning and development. "We identify the priorities among these airports, and develop a capital improvement plan for MSP as well as the six general aviation airports."

Rief's division oversees property acquisition, planning, design, engineering, architecture and construction of all airport facilities.



BRIDGET RIEF

It also ensures that environmental standards and regulations are met and enforced. As a matter of course, proposals for capital improvement projects go through Rief. Larger projects, such as the multi-year \$19 million Lake Elmo runway project, receive input from all senior staff at MAC.

The development staff currently has 13 people, including seven project managers. With no in-house consultants on staff, Rief uses about one dozen outside consultants, on a rotating basis. Most are involved in large projects at MSP.

One consultant, SEH of St. Paul, is dedicated just to the relievers. "They have been instrumental during the current Lake Elmo runway project," says Rief.

On average, the annual operating budget for all six reliever airports ranges from \$5 to \$7 million. The most common annual line expenses are related to the operations and management of airfield infrastructure and capital equipment assets and facilities. Large-scale construction projects typically depend on FAA and state assistance. The Crystal Airport project in 2020 cost about \$7 million. The current Lake Elmo project is budgeted at \$19 million over a three-year period. Both were mostly funded by the FAA.

The total annual budget for MAC is somewhat fluid, which Rief considers a good thing. "There are many external factors that we

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face each year," she says. "MSP needs expensive upgrades each year, so projects involving relievers are prioritized based on their own budget constraints and other CIP demands."

One project officials hope to tackle soon is building a new control tower at Flying Cloud, the busiest of the six relievers. "We are coordinating with the FAA on where it should go if approved, and how it should be built to meet their regulations," Rief remarks. "The preliminary estimated cost of this is about \$10 million."

Budgets for the reliever airports are developed at least three years out. "In 2022, we have the funding in place to finish the Lake Elmo project; this will take the lion's share of our 2022 budget for relievers," she affirms.

A project in the pipeline for 2023 is a runway extension and reconstruction at Airlake. Its estimated cost is \$7 million.

Budget decisions for 2024 are currently in the works. "The St. Paul airport needs runway work as well as LED lighting," Rief details. "We will ask the FAA for federal funding for that. In addition, all six airports have pavement maintenance needs, so those projects are also candidates for grant money in the near future."

Daily Coordination

As the director of MAC's six general aviation airports, Harris leads a staff that includes 28 employees who help him manage the complex reliever system. His staff oversees the administration of more than 800 leases, including 35 commercial operators. About 1,300 aircraft are based at the six airports. Four of the relievers have air traffic control towers.

Managing all these pieces requires detailed organization. "Having a great team makes a huge difference," Harris says. "They deserve all the credit. They are master practitioners who are incredibly thorough and always willing to lend a helping hand to play a crucial role in MAC's success. I make a point to visit each location to interact with our staff as well as our partners."

Harris receives daily reports on all active construction projects. This year, the runway relocation at Lake Elmo required teamwork from on-site airport personnel, Harris' team and other MAC officials. He gets daily reports from Phil Tiedeman, the Lake Elmo manager, who also manages Anoka County-Blaine Airport. Brad Latvala, the senior airport maintenance worker under Harris, provides frequent updates on construction progress and related issues as well.

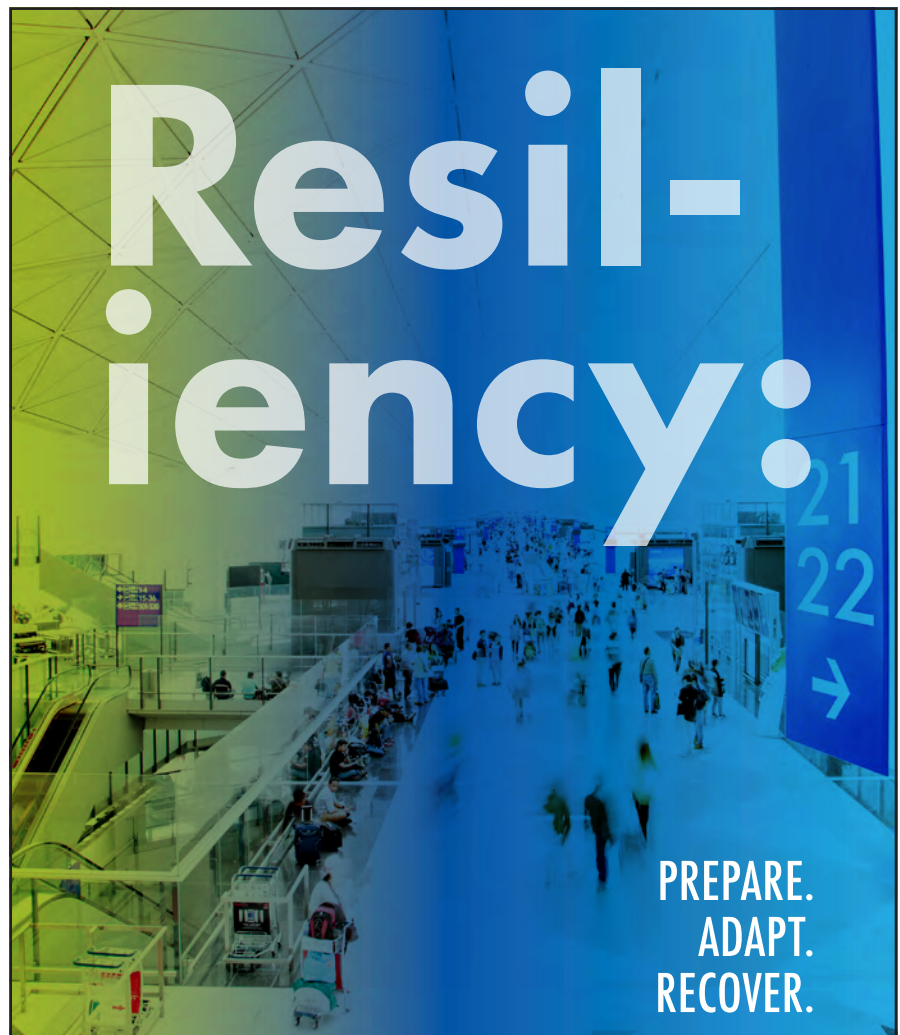
Each step of the Lake Elmo construction is also monitored by Lindsay Reidt, SEH's lead

consulting engineer for all six reliever airports. Jake Jorgenson from SEH is the on-site engineer. Harris usually tours the construction site with these consultants at least once a week.

Senior MAC officials, including Rief and Chad Leqve, vice president of management and operations, are continually updated about the progress of big projects such as Lake Elmo.

The reliever airports are expected to be as self-sustaining as possible. "At a minimum, we want revenue from these six relievers to offset their operational and maintenance costs," Harris explains. "Landing fees apply to Jet-A aircraft operators at St. Paul Downtown, Anoka County-Blaine and Flying Cloud.

Continued on Page 27



As the aviation industry continues to face increasingly varied challenges, the ability to bounce back is critical.

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MAC Relievers in a Nutshell

Airlake Airport (LVN)

Located south of the Twin Cities, near Lakeville and Farmington, LVN has a single 4,098-foot runway that logged 31,314 operations last year. Although it is used primarily by recreational pilots, LVN is located near one of Minnesota's largest industrial parks. A fixed-base operator provides fueling and other aircraft maintenance service. The airport does not have a tower.

Employees: 31

2020 Operations: 31,314 — up 5% vs. 2019

Total Economic Output: \$13.2 million/year

Anoka County-Blaine Airport (ANE)

This airport serves a very diverse mix of aircraft with two runways (one 5,000 feet long). MAC owns the tower, but contracts with the FAA for Air Traffic Control. A footprint of 3,000 acres makes ANE the largest reliever in the MAC system. Its collection of 400 based aircraft runs the gamut, from vintage 1920s planes to the most modern jets. The control tower, which opened in 1996, is used as a practice facility for air traffic controllers.

Employees: 130

2020 Operations: 70,852 — down 1.2% vs. 2019

Total Economic Output: \$118 million/year

Crystal Airport (MIC)

Crystal Airport borders Brooklyn Park and Brooklyn Center in the northwestern part of the Twin Cities metro area. Currently, MIC has two paved runways, one turf runway and three non-precision instrument approaches. It is the closest of all MAC relievers to Minneapolis' business district.

Employees: 100

2020 Operations: 39,509 — down 4.9% vs. 2019

Total Economic Output: \$71 million/year

Flying Cloud (FCM)

FCM is located in Eden Prairie, in the southwestern corner of the Twin Cities metro area. It features two runways, which are used by corporate jets, turboprops and helicopters. As one of the busiest airports in the reliever system, Flying Cloud has an FAA-operated control tower and an instrument landing system. Many large companies have hangars at FCM.

Employees: 340

2020 Operations: 124,382 — up 19.1% vs. 2019

Total Economic Output: \$229 million/year



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Lake Elmo Airport (21D)

Lake Elmo is located in the northwestern corner of the Twin Cities metro area and is served by a fixed base operator and an aircraft maintenance provider. Currently, the airport is in the midst of construction to relocate its main runway and convert the existing runway into a taxiway. It is a non-towered airfield.

Employees: 14

2020 Operations: 29,799 — down 4.5%

Total Economic Output: \$12.8 million/year

St. Paul Downtown Airport (STP)

Nestled along the Mississippi River, STP has three runways, including the longest (6,491 feet) in the MAC reliever system. Two fixed-base operators provide services such as fueling, flight training and maintenance. Many corporations rent hangars here. Because of its long runway, some large business jets based there can fly nonstop to several destinations in Asia.

Employees: 410

2020 Operations: 30,188 — down 26.3% vs. 2019

Total Economic Output: \$312 million/year

Source: Metropolitan Airports Commission

Continued from Page 25


Additional revenue throughout the reliever system comes from hangar rentals and fuel sales.”

A relatively new source of revenue is Holman’s Table, a restaurant that opened at St. Paul Downtown Airport in 2018. Harris notes that its views of the airport’s main runway and the Mississippi River make it a major attraction for both airport users and people from the Twin Cities metro area. In all, the reliever airports collect average annual revenue of about \$10 million, which meets the target goal of equalizing their annual operational and maintenance expenses.

Continued Growth

Harris is optimistic that traffic at the six reliever airports will continue to grow in 2021. “In the second quarter alone this year, our operations jumped 19% from 2020,” he reports. “In addition, fuel flowage, landing fees and rent from new hangar construction are all trending higher.”

Private investment in new businesses is also escalating. Flight schools are shattering previous enrollment records, and some have even ordered more aircraft to meet demand. Currently, private companies are investing about \$30 million in projects at the reliever airports.

Harris expects business traffic to increase as the economy strengthens in the second half of 2021. “We have jet activity at five out of our six reliever airports,” he says. “The number of operations in that category is surging past pre-pandemic levels.” 

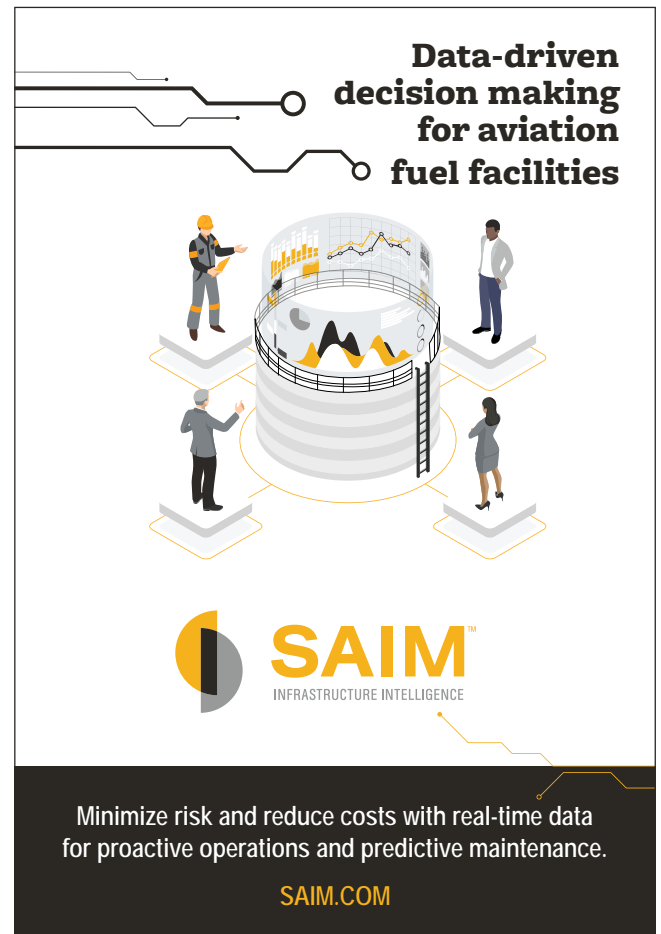


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Bigger, Better Fuel Farm Comes Online at St. Louis Int'l

BY VICTORIA SOUKUP

 The new \$50 million jet fuel storage facility at St. Louis Lambert International (STL) nearly doubles the airport's storage capacity to 3 million gallons.

The fuel farm, which began operating in August, replaces an aging underground storage tank facility constructed more than 60 years ago. The need for additional capacity and updated environmental protections prompted the modern above-ground replacement.

Construction of the 8-acre facility began in July 2019 and was completed in February 2021. The new facility includes three above-ground fuel tanks, each capable of holding 1 million gallons of jet fuel, plus room for a fourth tank if/when additional capacity is needed. The facility was constructed by STL Fuel Company LLC, a consortium of airlines operating at the airport. The consortium owns and operates the fuel farm on land leased from STL.

"We had an aging system with multiple challenges," says Airport Director Rhonda Hamm-Niebruegge. "This fuel farm has the



RHONDA HAMM-NIEBRUEGGE

newest technology and efficiency, allowing us to be a greener airport. It also builds on the partnership we have with our airlines to invest in the future of STL."

Updates Needed

Replacing the fuel farm was a long time coming. The previous facility consisted of 41 underground storage tanks with a combined capacity of 1.59 million gallons. There were no visible problems, but the equipment and tanks were old and there was no built-in way to visually detect releases. Some of the equipment was installed back in 1956.

The need to address significant operational changes that had taken place over the decades was another primary catalyst for the replacement project.

"The design of the previous fueling system fit STL's previous flight activity, which predominately operated out of one terminal," explains Ruvim Katan, chairman of the consortium's STL Fuel Committee. "As demand for air travel grew, the airport



RUVIM KATAN



FACTS&FIGURES

Project: New Fuel Farm
Location: St. Louis Lambert Int'l
Cost: \$50 million
Owner/Operator: STL Fuel Company LLC, a consortium of airlines that operate at STL
Storage Capacity: 3 million gallons
Pumping System: 5 horizontal pumps, each capable of delivering fuel at 1,200 gallons/minute

Key Features: Variable frequency drive system; automated level controls to prevent overflow; containment area; 15,000-gallon oil water separator; 3 bio-retention basins

Construction: July 2019-Feb. 2021

General Contractor: Burns & McDonnell

Engineering, Procurement & Construction: Burns & McDonnell

Mechanical Contractor: Corrigan Co.

Tank Contractor: Pittsburgh Tank & Tower Group

Civil/Building Contractor: L. Keeley Construction

Electrical Contractor: Schneider Electric

Electrical Contractor (Transfer Line): RJP Electric

System Integration: Custom Control Mfr. Inc.

Fuel System Leak Detection: Hansa Consult of North America

Fire Protection Specialist: Fire Tech LLC

Cathodic Protection: Kadlec Associates Inc.

Of Note: Consortium invested another \$50 million in fuel-related infrastructure, including improvements to existing hydrant system, new emergency fuel shutoff system, hydrant cart test facility, truck load facility & new fuel dispensing stations & parking for ground service equipment

grew along with it, eventually expanding into Terminal 2 where Southwest Airlines is now the largest carrier.”

The fueling system, however, did not grow with the traffic. “The previous system wasn’t economical any longer, and it was time for a major refresh,” continues Katan. “Instead of investing in antiquated technology, the decision was made to invest in new technology that would make the new fuel farm system more efficient, economical, environmentally friendly and able to support St. Louis’ air travel demand for decades to come.”

Project Manager Kurt Janisch, of Burns & McDonnell, explains that the main challenge with underground tanks is identifying leakage. “If those tanks develop a leak, it will occur until you have an indication. The underground storage tank facility was built back in the 1950s, and that was prior to any environmental regulations associated with them. There was



KURT JANISCH

nothing built into the system that would allow for ongoing tightness testing.”

Updates Provided

The new system is vastly different, with automated level controls to prevent overflow as well as secondary containment under the tanks. “The system will send a signal out that automatically closes valves to prevent fuel from entering and overflowing the top of the tank,” Janisch explains.

Other safety measures include a containment area to capture overflow or leaks, a 15,000-gallon oil water separator to process the discharge of stormwater and three bio-retention basins to trap sediment. “There are multiple layers involved to prevent any kind of discharge of petroleum-impacted water or petroleum itself from leaving the site,” says Janisch.

While the former fuel farm sat adjacent to the airfield, planners located a site for the new one near two petroleum product pipelines. Gerald Beckmann, STL’s deputy director of Planning and Development, notes that the consortium asked the airport to suggest a few

The new facility began operating in August.



potential sites. “Interestingly, the site chosen for the fuel farm was shown as potential passenger parking in our previous master plan,” Beckmann adds. “In this period of uncertain demand for parking, we think we have found the optimal use for the site; and it could still accommodate parking, if needed.”



GERALD BECKMANN

The distance between the fuel facility and terminal complex (almost 2 miles) necessitated an 11,000-foot underground pipeline that connects the new fuel farm to the terminal hydrant system. Installing the 16-inch diameter pipeline required careful orchestration between the contractors and several key entities.

“We encountered several challenges because we had to cross a public road and work in the aircraft movement area, which limited the use of the runways,” Janisch explains. “We had to shut down the runway and taxiways to complete that work. Not only did we have to coordinate with the airport about access to the site, but we also had to work with the FAA, which had an engineer on site at all times making sure their utilities were not damaged during construction.”

Parallel runways 12L-30R and 12R-30L both had to be shut down consecutively when workers installed part of the pipeline, but airfield traffic happened to be lighter at the time. “There aren’t too many silver linings associated with COVID, but this was one of them,” Janisch remarks. “During construction, the airport had significantly reduced usage; so that allowed them to utilize one of the parallels much of the time.”

Katan notes that new equipment increases reliability and enhances safety when it comes to fueling aircraft from the hydrant system. “The new fuel facility has five horizontal pumps, each of which is capable of delivering fuel at 1,200 gallons per minute,” he adds.

A variable-frequency drive system ensures that pumps are triggered by demand instead of using simple on and off switches. This also makes the pumps more efficient, resulting in lower energy usage and costs.

A leak-detection system from Hansa Consult of North America LLC allows testing of the main fuel line from the fuel facility to the terminals to ensure integrity of the piping. “Due to the length of this pipeline, we could run a smart pig through it to measure wall thickness,” Janisch says. “It’s expensive and won’t be done on a regular basis. But if there were ever a problem with the transfer line, we have equipment in place where we can actually perform an integrity test to determine if there is any degradation within the pipe and know where to fix it ahead of any potential leak.”

On site at the fuel farm, a 4,300-square-foot operations building includes a control room, offices and a vehicle maintenance garage. There is also a structure for storing a firefighting foam system and another for trash. The fuel farm is surrounded by perimeter fencing and monitored by security cameras.

Other Improvements

In addition to building the new \$50 million fuel farm, the consortium has spent another \$50 million on other fueling infrastructure

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improvements at STL. Nearly 1,000 feet of 16-inch carbon steel piping was installed underground between Terminals 1 and 2 in 2018 to prepare for the new fuel farm.

A major upgrade of the hydrant system was also completed for additional safety, Janisch adds. That project included installing hydrant pits and adding cathodic protection, as well as replacing transfer-site connectors and manifold equipment. "To improve the reliability of the system, airlines invested heavily to make sure the hydrant system would function and be as environmentally safe as possible," summarizes Janisch.

Two new components of the fuel system became operational this summer. A truck load facility allows fueling operators to fill tankers and fuel aircraft not parked near the hydrant system; and two fuel dispensing stations with both gasoline and diesel fuel allow crews to keep belt loaders, tugs, tractors and other ground service equipment on the move. In addition, the emergency fuel shutoff system for the whole fuel system was replaced and upgraded.

"Fueling vehicles is where you have your highest potential for spills," Janisch notes. "Centralizing that activity minimizes the risk."

Beckmann says that the airline fuel consortium was key to the project's success. "From STL's perspective, the airlines that serve this airport were very effective in speaking with one voice through the chairperson of the fueling consortium," he says. "This was even true during personnel changes at the airlines over the course of the multi-year project."

Beckmann advises other airports undertaking fuel farm projects to focus on strategic site selection. "A fuel farm is likely to be there longer than most other high-expense facilities your airport maintains," he reasons.

As airport director, Hamm-Niebruegge acknowledges the investment that air carriers made to plan and execute the project. "Our current airline partners invested a significant amount of money at STL to bring a state-of-the-art fuel farm," she says. "This commitment validates the strength of our partnerships, because airlines invest where they see a long-term future."

Closing and decommissioning the former fuel farm is the responsibility of STL Fuel Company. That process is scheduled to begin in October. ✈️

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Parking Improvements at Louisville Muhammad Ali Int'l

BY KRISTEN RINDFLEISCH



FACTS&FIGURES

Project: Parking Improvements

Location: Louisville (KY) Muhammad Ali Int'l Airport

Scope: Relocating rental car operations (\$30 million); adding premier parking lot (\$5 million); implementing parking guidance system (\$1.3 million); introducing customer rewards program (administered by contractor; no direct costs to airport)

Funding: Passenger facility charges funded relocation of rental car operation; airport authority funded for new lot & guidance system

Capacity: 3,200 spaces in parking garage; 1,500 spaces in surface lot; 500 spaces in new premier lot; 1,000 spaces in express shuttle lot

Parking Management: SP+

Construction Lead: Messer Construction Co.

Design Lead: Alliance Corp.

Automated Parking Guidance System: Park Assist®, by TKH Security

Valet Services: AmeriPark

Rewards Program: SP+, with administrative support from R Solutions

Parking/Access Control System: TIBA Parking System

AVI Equipment/Readers: Transcore

Key Benefits: Faster, more efficient parking; online reservations; contactless entry & exit; covered facilities for car rental services; perks & discounts for frequent parkers



With passenger traffic on the rise and dated parking facilities straining at the seams, Louisville Muhammad Ali International (SDF) began expanding and upgrading its parking operations in 2019. Since then, the Kentucky airport has invested more than \$36 million in new facilities, systems and related projects.

The changes are all part of SDF Next, a broader improvement program that began in December 2019 and will deliver more than \$400 million of enhancements to the terminal and airfield. The airport experienced

significant growth in 2018 and logged an all-time high 4.2 million enplanements in 2019. As of this July, SDF was running at about 93% of its record 2019 passenger levels; beginning in November, the airport will serve 36 nonstop destinations—more than ever before. To help meet demand and improve the customer experience, SDF hired a partner to manage its parking services and facilities, added a new premier lot and expanded the shuttle lot. It also moved rental car operations to the first level of the existing parking garage, installed an automated



system to help guide drivers to open parking spaces and created a rewards program for frequent parkers.

The airport used passenger facility charge funds for the rental car program relocation and airport authority cash to fund the new parking facilities and program enhancements.

With passenger traffic at an all-time high in 2019, total parking revenue at SDF was \$16.58 million for fiscal year 2019—23.9% of the airport's total annual revenue. Parking revenue for fiscal year 2020 was \$10.89 million. Officials estimate parking revenue at \$6.53 million for calendar year 2021, and it is budgeted to be \$9.5 million in fiscal year 2022. Adam Thomas, director of properties for the Louisville Regional Airport Authority (LRAA),

reports that parking revenue is already starting to rebound after COVID-induced dips. In July, SDF logged its highest week in total parking revenue since late February 2020.

Taking on a Partner

After decades of self-managing the parking operations at SDF, the airport authority sought proposals and ultimately awarded a 10-year contract to SP+ in March 2019. Replacing the airport's obsolete parking access and revenue control system was a key component of the contract. "They've been fantastic partners—helping us through the process and bringing the best practices from a customer experience perspective to the market," says LRAA Executive Director Dan Mann. "That's something we didn't have when we did it in-house."

As part of its agreement with the airport, SP+ committed to invest \$1.5 million in system improvements. While the company's primary responsibility is to manage parking and shuttle operations, it is also responsible for maintaining the parking facilities/systems, implementing customer service enhancements and promoting new touchless technology. Bob Reiser, senior vice president covering the company's airport operations in the East, notes that SP+ currently provides parking and/or ground transportation and valet services at 74 airports across the U.S. It maintains a staff of 50 employees at SDF.



ADAM THOMAS



DAN MANN



BOB REISER

Relocating Rental Operations

In 2019, LRAA consulted airport partners and stakeholders about changing SDF's rental car operations, which were located adjacent to the terminal in an uncovered facility. In lieu of building a new standalone rental car facility, the airport authority decided to relocate operations to the first level of the parking garage. This would facilitate future improvements and enhance service by allowing car rental customers to go straight into the garage. Previously, an uncovered walk left them exposed to the elements. However, the changes also removed 900 covered parking spaces during SDF's record-setting year for passenger traffic—and it was already challenging for customers to find open spaces.

The authority evaluated existing infrastructure and worked with SP+ to develop a request for proposals in January 2020 to meet customers' current and future needs. Specifically, SDF sought a turnkey camera-based guidance system for levels two through four of its public parking garage. "These were old and dated facilities," Mann notes, adding that the airport saw an opportunity to upgrade the structure while traffic was low due to COVID-19.

Multiple Improvements

SP+ hired Signature Control Systems to replace all ticket dispensers, pay stations, gate arms and express lane technologies.



The new 500-space lot includes a covered walkway to the terminal.



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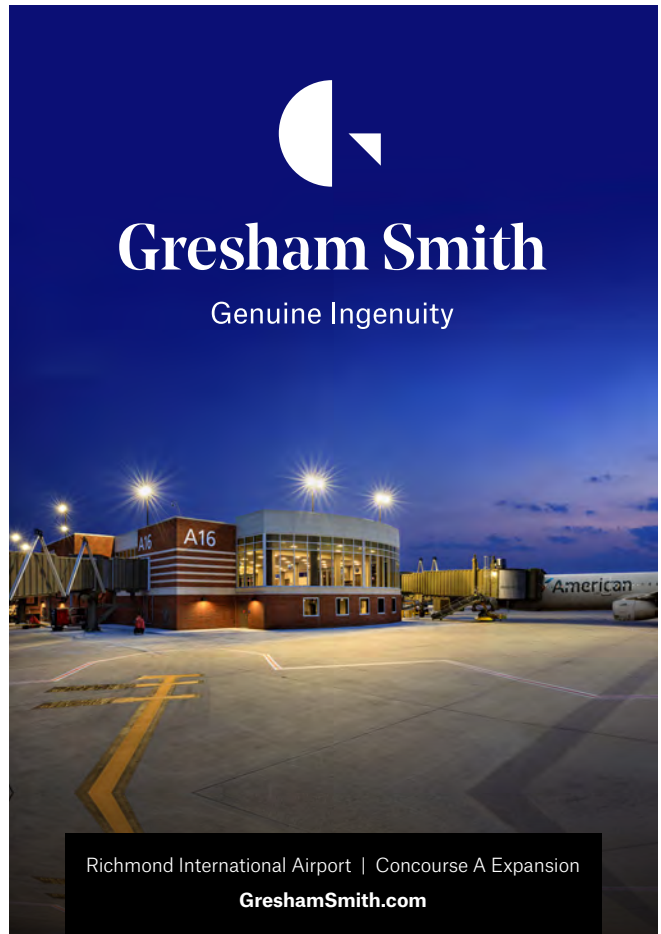
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With consulting support from SP+, the airport purchased TKH Security's Park Assist® Guidance System for its garage. The strategy was to make the most of the spaces that remained by improving ingress and egress and helping customers identify open spaces quickly and easily with color-coded LED lights. Upon entering the garage, visitors can see real-time counts for each level in the garage. "It was a great initiative that prevented people from needing to drive around looking for spaces and allowed us to maximize the utilization of the garage," Reiser explains.

"They had a somewhat antiquated system that did not have full automation and the ability to provide online services, marketing and reservations," says Reiser. "The [TKH Security] Park Assist system was a tremendous enhancement to the overall parking program."

Crews installed the new guidance system during the fourth quarter of 2020 without closing the garage. "That's the beauty of the installation," explains Darrell Brantley, TKH Security director of Airport Programs—North America. "With the camera-based guidance system, it installs down the middle of the drive aisle, so we install in live parking environments. An airport never has to shut down levels and clear vehicles out of spaces. We install without affecting their parking operation."



DARRELL BRANTLEY

Levels two and three of the parking garage use the company's M4 smart-sensor system to provide vehicle guidance, video surveillance and full-matrix signage with directed wayfinding and space counts. Because level four is uncovered, it leverages the S1 rooftop solution for space counting and video surveillance.

Brantley explains that TKH Security's parking guidance system benefits customers *and* airports. For customers, it improves the parking experience by showing drivers where available spaces are and can take anxiety out of the equation by allowing them to reserve spaces online. On the flip side, it can help airports manage their parking operations by allowing them to implement variable-rate pricing and control parking areas within a garage without installing barriers or new gates.

Brantley reports that the TKH parking guidance system has been implemented in about 25 major North American airports, and that number continues to grow.

Speaking from the airport authority's perspective, Mann reports that customers have been very pleased with the parking upgrades. The system's cameras help employees locate lost vehicles, and high-definition footage is valuable for security purposes. On the administrative side, the platform offers a web-based dashboard that shows real-time space availability and occupancy, usage levels and dwell time reports.

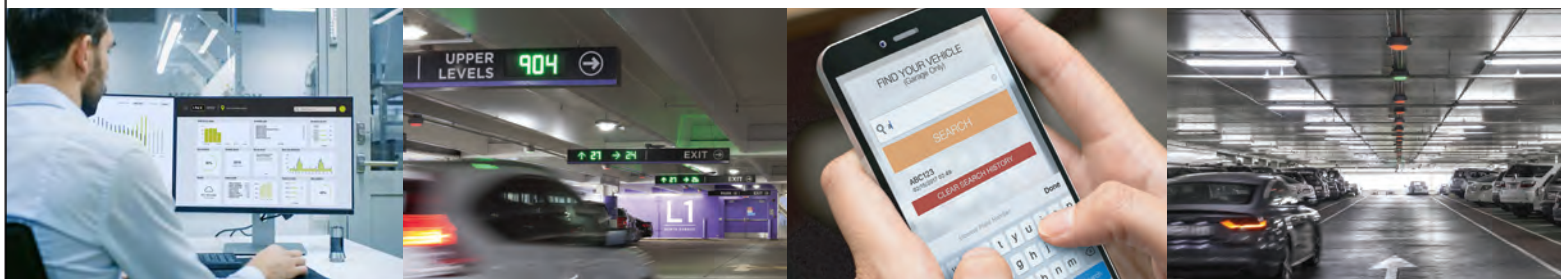
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More Options

As part of the SDF Next program, officials added a 500-space premier parking lot with a covered walkway to the nearby terminal. It replaces an aging surface lot that had about 30% less capacity.

Mann says that the pavement of the previous lot—formerly branded as a credit card lot—wasn't in great shape. In fact, construction crews discovered holes underneath the surface that delayed the project by about 45 days.

Originally, SDF planned to build the new premier lot in phases, but COVID-related passenger declines allowed crews to complete it all at once, from March to December 2020. The new lot offers parking close to the terminal at a reasonable price point (\$10/day), says Thomas.

Farther from the terminal, SDF then converted its former cellphone lot to a new express shuttle lot with 1,000 spaces, providing an additional parking option for customers.

Rewards Program

Leveraging the automatic vehicle identification technology of the new the revenue control system that SP+ installed, the airport was able to launch a frequent parker program called SDF Rewards in late 2020. "This touchless and fully automated program enables users to drive up, drive in and drive out without having to talk to anybody, hold tickets or make payments because they have credit cards on file," explains Thomas. "It's very easy to use."

With the installation of barcode readers, SP+ can also send customers interactive marketing messages, discounts and promotions through online parking reservations and purchases.

SP+ manages SDF Rewards and covers all costs associated with the program. According to Reiser, the company administers 15 rewards programs at U.S. airports. R Solutions, its partner



The biggest lesson learned for Mann involved signage. “You think you’ve communicated well, but there’s never enough signage,” he reflects. The airport learned a lot by simply asking customers if they had any problems finding their way to the terminal from the long-term parking area. “We did that very early on in the process, and it really helped us modify our signage and perfect our communication plan,” he advises.

Work continues on the parking garage, with crews rehabbing the exterior, repairing concrete spalling, repainting the deck and fixing leaks in skylights. Mann notes that the airport took the opportunity to overhaul the entire structure while moving rental cars and upgrading systems and services for customers. ✈️

for more than two decades, provides 24-hour customer assistance, issues parking credentials and handles reward redemption and other administrative details.

Lessons Learned & Ongoing Work

Thomas notes that collaborating with SDF’s partners and stakeholders was key when planning and executing recent parking improvements. Feedback was solicited from rental car providers, SP+ and various internal departments, such as public relations and marketing regarding passenger trends and customer requests. “It was really important that we cast a wide net in terms of who we’re asking about what kind of improvements we’re making,” Thomas says.

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WATCH IT SWEEP

Dallas Fort Worth Int'l Fills New Terminal Extension With Technology to Wow Customers

BY JODI RICHARDS



 This past May, Dallas Fort Worth International Airport (DFW) opened an extension of Terminal D, its primary international terminal. Although the \$202 million project added just four gates, the impact on operational capacity and customer satisfaction is expected to be tremendous.

Khaled Naja, the airport's executive vice president of Infrastructure and Development, says that the new extension, known as Terminal D South, is filled with technologies and amenities that provide customers with "moments of wow." It is also designed to enhance the boarding process and reduce passenger stress.



KHALED NAJA

"Whatever we do at DFW, we always keep the customer first in mind," explains Naja. "Our No. 1 priority is enhancing the customer experience."

When Terminal D originally opened in 2005, it had 26 gates and was key to DFW's plan for growing international arrivals and departures. But, it quickly became clear that the second-busiest airport in the United States would need even more gate space. Naja explains that two of DFW's nine daily peaks caused traffic in

Terminal D that was "beyond jam-packed" because that's when most domestic connections as well as international arrivals and departures occurred.

To help alleviate the congestion, DFW added 140,000 square feet and four gates to the south end of Terminal D. "The day we opened up, the gates were full," Naja reports.

In 2019, DFW served more than 75 million passengers. Fully 10 million flew in and out of Terminal D.

System Enhancements

In addition to providing operational relief, Terminal D South is designed to create a calm environment and experience for passengers. The project team prioritized comfortable seating and making sure that flight information can be seen from any location in the integrated gate area. Motion lights were also added to highlight the boarding process. As a whole, the approach is referred to as "gate of the future." Airport and project executives describe it a logical evolution of the overall gate lounge concept.

"DFW has always been a trendsetter in trying new things," says Naja. "Innovation is part of our DNA." Importantly, management is

FACTS&FIGURES

Project: Terminal Extension

Location: Dallas Fort Worth Int'l Airport

Site: Terminal D South

Cost: \$202 million

Construction: July 2019- July 2021

Rolling Opening: Some domestic operations began in May 2021; int'l arrivals began in mid-June

Architect of Record: Luis Vidal with HKA & Arup, joint venture LVHKA

Project Manager: HNTB

Construction: The Walsh Group (Archer Western), Phillips/May & Reyes Group Joint Venture

Passenger Boarding Bridges: TK Airport Solutions

Elevators: TK Elevator

Escalators & Moving Walkways: TK Elevator

Seating: KryptoMax; Global Furniture Group (Supra)

Dynamic Glass: View

Content Management System/Custom Digital Content: Synect

Air Quality Monitors: ViewSense

Concessions: Trinity Groves

Smart Restroom System: Trax Analytics

Lavatories: American Standard

Toilet Partitions: ASI Global Partitions

Water-Efficient Urinals: TOTO

Faucets: Splash Lab by Lovair

Stall Occupancy Lights: Tooshlights



not afraid of testing new concepts to determine how and where they work best, he adds.

One of the new concepts applied in Terminal D South is something he calls the “full digital experience.” The strategy focuses on using innovative technologies to optimize operational and energy efficiencies, while also improving the customer experience.

For instance, the airport partnered with View for three separate applications of smart glass. “DFW is an innovation partner for us,” says Kristi Crase, aviation strategy director for View. “They are a frontrunner and leader from an



KRISTI CRASE

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D3

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On Time



innovation perspective, and are very intentional about how they approach technologies.”

View Smart Windows are made of electrochromic glass, with a nanotech metal oxide coating that tints in response to electrical current. Using a predictive algorithm, View's proprietary software analyzes a number of variables, including weather, outdoor temperatures, cloud cover, the amount of sunlight hitting a particular window and the location of interior passenger seating to proactively adjust each window's tint to mitigate heat and glare throughout the day. In addition to providing unobstructed views for guests, the Smart Windows are designed to reduce energy consumption by eliminating up to 90% of solar heat gain in the terminal.

Crase notes that changes in the tint of the glass are so subtle, building occupants do not notice them happening. “The net result is we’re maximizing the amount of natural light, but minimizing the negative impact of glare and heat,” she explains.

At a busy airport like DFW, the high-tech glass helps maximize space, because guests can sit right next to the windows without overheating or needing to shield their electronic screens.

“We’re giving DFW back 100% of their real estate,” Crase remarks. “People naturally peel away from the windows if it’s hot or they can’t see. It’s improving the passenger experience.”

Another tech-forward feature is ViewSense, a system from the same company that monitors indoor environmental conditions. It provides DFW with real-time readings from dozens of sensors installed throughout Terminal D South that measure conditions such as air quality, carbon dioxide levels, volatile organic compounds, air temperature, humidity, light quality and noise levels. Using ViewSense, the airport can track activity throughout the airport and optimize conditions for customers and staff. For example, ViewSense can help staff identify and monitor high-traffic areas as carbon dioxide levels naturally rise when passengers queue at gates. Among other things, this prompts the airport to keep an eye on localized temperatures, which also tend to rise where passengers gather. “The HVAC might be set at 72, but at the gate it may be much warmer,” Crase relates.

The system also helps management assess how various technologies support the airport’s sustainability goals. Crase explains that ViewSense can integrate with the building management system, so it provides a deeper dive into efficiency measures than what is normally available.

Even though these new technologies won’t be visible to passengers, Naja is confident they will enhance their comfort, health and safety—and further improve the

airport’s energy performance. “Typically when people think about customer experience, they think about offerings [tangible changes such as concessions and amenities],” he says. “We’re also improving *how* customers experience the terminal.”

The OLED displays, which are positioned to be clearly visible from anywhere in the integrated gate area, display color-coded boarding prompts. They work in concert with motion lights that help guide the boarding process and reduce stress for passengers.

The airport partnered with Synect to develop the content that runs on the screens and a system to manage it. Synect deployed its Passenger360® system and collaborated with DFW’s customer experience team, YCD Multimedia and local content creator DHD Films to develop a suite of custom digital material that includes still images, short videos, graphic displays and written information.

“The curated elements work together to create an immersive lounge-like experience,” says Synect Founder and Chief Executive Officer Yahav Ran. “It’s a customer-centric approach that creates an intuitive ADA-compliant boarding experience with easily consumable visual instructions. There is also live-action content from the Dallas Fort Worth region that creates a memorable sense of place and ambient images that reflect the time of day and thrill of air travel.”



YAHAV RAN

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The airport even leveraged technology to enhance concessions and restrooms.

Customers can use smartphones or kiosks to place orders for food and beverages from Trinity Groves, and choose to pick them up from a locker or have items delivered to them at a specific seat in the gate area. Traditional counter service is also available. Remote ordering and pick-up lockers are especially popular with COVID-cautious passengers who want to eliminate their interaction with concessions workers.

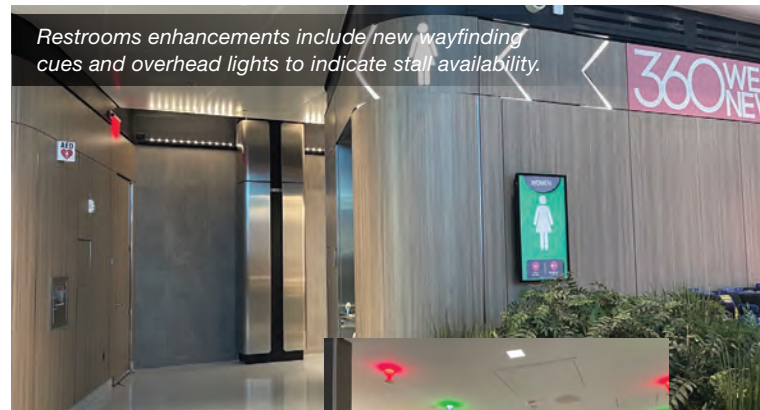
In the restrooms, Tooshlights above each stall indicate availability, and sensors in the paper towel and toilet paper dispensers alert maintenance personnel before supplies run out.

Touchless (and splashless) faucets, hand dryers and soap dispensers are energy-efficient and give customers peace of mind regarding germ spread. "We went through thorough analyses to find out what the customers care for and what touchless technologies we should include," Naja relates.

Ultra water-efficient toilets and urinals support the airport's commitment to sustainability.

COVID Complications

Construction on the project began in July 2019 and encountered typical supply chain issues caused by the coronavirus pandemic.



Restrooms enhancements include new wayfinding cues and overhead lights to indicate stall availability.

Thomas Haag, vice president for The Walsh Group, reports that the construction team responded rapidly to the new challenges.

"We kept moving full-speed ahead, but had to quickly adapt and develop new best practices for addressing the pandemic and mitigating risk," Haag remarks. Extra measures included frequent health screenings for employees, new social distancing policies, split shift work schedules and contact tracing. "We worked hand-in-hand with all partners to make sure best practices were being broadly adopted across the campus," he adds.



THOMAS HAAG

Amid the global pandemic, DFW also experienced 12 days of record cold in February 2021 that crippled much of Texas. Naja gives high marks to the entire project team for the partnership and leadership displayed in the face of both unusual challenges. "The job was still delivered on time, and it was top-shelf quality," he reports.

Sweet Success

With Terminal D already at peak capacity before the expansion project began, airport officials stressed that new construction could not negatively impact operations. In particular, an existing underground tug tunnel that connects the two sides of the airport had to remain in operation 24/7 throughout the project. This required crews to build over and around the tug tunnel, preserving it as an active airport operations area.

A rolling opening of Terminal D South allowed domestic operations to begin in early May 2021, and the new facility fully opened for international arrivals on June 12. "We were just trying to keep up with American Airlines' growing operations," relates Christopher Arman, program director/senior vice president at HNTB. Daily coordination calls about progress and when the airline could establish crew schedules were consequently crucial.

As demand at DFW continues to grow, officials are looking ahead to the addition of nine new gates in terminals A and C, and renovations to Terminal C, announced in early August. ✈️

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Charlotte Douglas Int'l Rises to the Challenge of Managing Peer-to-Peer Car Rentals

BY KRISTIN V. SHAW



FACTS&FIGURES

Project: Car-Sharing Service Agreements

Location: Charlotte (NC) Douglas Int'l Airport

Vendors: Turo; Avail

Agreement Highlights: Each vendor pays 10% of its gross revenue from airport business & receives 49 covered parking spaces to conduct deliveries/pickups. If vendor's car owners need 50 or more spaces, it pays airport \$5 per space & 5% of gross revenues (same percentage as traditional rental agencies)

Primary Benefits: Provides passengers with additional ground transportation option; establishes efficient operating processes; develops new revenue stream; ensures equity for other ground transportation providers

When air travel hit the skids in 2020, rental car companies struggled right alongside airlines and airports. With business slowing to a trickle, rental fleets were decimated by the sale of dormant vehicles. Hertz reported a 40% reduction in cars between the end of 2019 and the end of 2020.

Although "car-sharing" services Turo and Avail have been around since 2009 and 2018, respectively, the COVID-19 paradigm shift is making them more viable competitors for traditional rental agencies such as Hertz, Avis and Enterprise. In general, Turo and Avail haven't taken as hard of a hit during the pandemic travel slump because they mobilize privately owned vehicles rather than bearing the costs of maintaining their own fleets. Some call the model "Airbnb for cars"

or "peer-to-peer vehicle rental" since it's more commerce than sharing.

Regardless of the nomenclature, airports are a logical place for these services to operate due to their ready pool of business and leisure travelers needing ground transportation.

When Charlotte Douglas International (CLT) discovered that Turo was starting to pick up business in its long-term parking lots, the team reached out to the firm to establish a protocol. That was three years ago, and the two organizations reached an operating agreement this spring (more details to follow). Avail, which is owned by insurance giant Allstate, started working with CLT's business team this year to set up a contract for its car owners and operates under the same terms.



“Avail is a car-sharing service that uses underutilized assets—personal cars—to get them on the road and put dollars back in folks’ pockets,” says Alex David, the company’s business operations director. “When you look at the ecosystem of airports, it seems like a good match. People pay for their cars to be parked and collect dust, so we thought it was a good opportunity to take what is typically a cost—parking, rideshare, public transport, for instance—and make money.”



ALEX DAVID

Needless to say, many airports feel threatened by the prospect of peer-to-peer car sharing/rental companies targeting their crucial revenue stream from onsite parking, not to mention the business of their rental agency tenants. And some are taking legal action.

In April 2020, an injunction went into effect that prevents Turo from operating at Boston Logan International Airport (BOS). The injunction resulted from a lawsuit filed in 2019 by the Massachusetts Port Authority (Massport), which owns and operates BOS.

Per the injunction, vehicle owners associated with the company are prohibited from picking up or dropping off vehicles anywhere at BOS or its properties, including roadways, terminal curbsides and parking lots. Moreover, they aren’t permitted to travel on airport roadways to pick up or drop off vehicles, or to list the airport as their home location.

Turo instructs car owners who operate under its purview to disable BOS as a delivery option for customers and urges them to honor the injunction while the company appeals the court’s decision. In the meantime, Turo provides car owners, whom it refers to as “hosts,” with a link they can share with their “guests” to help find nearby delivery locations.

It’s just the kind of standoff CLT wanted to avoid.

“As a federally-funded facility we have obligations to make the airport open and available to companies who want to do business here,” says CLT Chief Business and Innovation Officer Theodore Kaplan. “When a company approaches us and says it wants to have a business at the airport, we strive to negotiate acceptable terms,” says Kaplan. “Turo is a service our guests are interested in using, and we want to find outlets for all of the interests of our passengers. It’s yet another option for them to have access to a vehicle.”

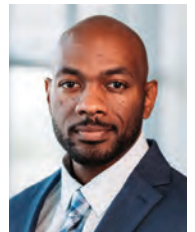


THEODORE KAPLAN

Kaplan considers accommodating car-sharing services a new opportunity to earn revenue in different ways, and likens them to transportation network companies (TNCs) such as Lyft and Uber. When demand for the app-based ride-hailing services began to bloom, airports had to devise ways to protect their interests and cover associated costs while also facilitating a new ground transportation option that was quickly becoming a favorite for some passengers. That wasn’t always easy, but airports rose to the challenge. Today, many designate special areas for ride-hailing/TNC drop-offs and pickups to eliminate associated curbside congestion and other operational strains.

From a revenue standpoint, transportation to and from airports is a major business. Taxis, shuttles and TNCs are all priced differently, with separate agreements to operate on airport campuses. The agreement CLT established with Turo requires it to lease parking spaces for vehicle delivery/pickup and/or pay a percentage of the revenue that originates or ends at the airport.

“TNCs like Uber and Lyft are charged by the trip,” explains Donovan Jones, the airport’s business and relationship manager. “With Turo, it’s a unique situation. They are leasing 49 spaces in our Express Deck 2 parking deck, and the company pays per transaction.”



DONOVAN JONES

Collaborative Approach

“This is a new line of business for us,” says Jones. “We came into an agreement in May, and we’re working out how to enforce this agreement. All activity by Turo’s hosts should take place within the [parking] deck, and it’s currently an honor system. We’re still in the process of trying to figure out how to track the activity.”

As part of the new agreement, the airport does receive a report of how many transactions Turo vehicles have had, and Jones can compare that to activity on the designated parking deck. Jones notes that geofencing works well for TNCs, but that's currently not an option for car-sharing services due to the costs for them to set up software for car owners.

At CLT, rental car companies pay the airport 10% of the gross revenue from business conducted there. In contrast, TNCs are charged per-trip fees of \$3.25 each. For Turo, the airport proposed a hybrid solution: If the company leases fewer than 50 parking spaces for vehicle delivery/pickup, it pays a flat 10% of gross revenue. If its car owners need 50 or more spaces, Turo pays \$5 per space, per day, plus 5% of gross revenue.

Turo accepted CLT's hybrid format and signed a one-year agreement that auto renews at its conclusion.

Kaplan notes that the company had already dealt with other airports when CLT proposed its plan. "Turo understood they needed to collaborate with us in order to be here," he explains. "Once we got them started, it was a negotiation and we got to a mutually acceptable space."

Give and Take

According to AAA's Leisure Travel Index, average daily car rental rates have nearly doubled since 2020. Examples pulled for the popular July 4th weekend showed the average U.S. rate of \$89 per day in 2020 increased to \$166 in 2021. Rental rates at airports in select markets are skyrocketing to \$250 or more per day.

Prices like that inspire many customers to seek alternative arrangements and create an open lane for companies like Turo and Avail.

Sean Mayo, director of airport partnerships for Turo, reports that sky-high rental car prices and the resurgence in air travel is causing business to boom for its car hosts. "Turo is uniquely positioned to alleviate the rental car crunch, because we leverage existing, underutilized cars," he adds. "It is a much more efficient model that provides a win-win for both guests in need of a car and hosts looking to earn extra income."

The vast majority of Avail's business is based in airports, and that's where the company is focusing its attention. When a passenger rents through Avail, the fee includes \$1 million of insurance coverage from Allstate and no charge for a second driver. As the company's business operations director, David

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boils it down to convenience and value. “We aim to be an affordable player in the space, and you’ll find our prices are lower,” he says. “Especially now after lockdown, people are being met by exorbitant rental car rates. We’re very transparent and upfront about our all-in prices.”

David notes that CLT understands the benefits that car sharing provides consumers and emphasizes its benefits for outbound passengers: “When you think of a family of five who wants to go on a vacation, and they’re parking for \$10, \$15, or \$20 per day, Avail is a good value that includes insurance. It makes traveling out of CLT that much more affordable.”

Mayo also highlights the potential for mutual benefits. “Being able to work with airports like CLT represents a huge step in increasing consumer choice and allows companies, like Turo, to help generate revenue for the airport,” he explains. “This partnership signals that CLT is a pioneer in welcoming innovation and new technology. We are eager to work with CLT and are hopeful that this is a sign of things to come.”

Speaking from the airport’s perspective, Kaplan predicts that new rental options such as Turo and Avail will grow in many markets and consequently considers the topic an industry-wide issue.

To be sure, CLT and BOS are not the only airports wrestling with the issue. Legal action has occurred regarding Turo operations at several airports, including Tampa International, Los Angeles International and San Francisco International. While each case is different, there are common themes. Airport operators often argue that traffic from Turo adds to curbside congestion and the company should sign agreements, follow operating rules and pay fees like traditional car rental agencies to help cover costs associated with them operating on airport property. Turo generally argues that it’s not a rental company because it connects private vehicle owners and renters via an app rather than owning its own fleet, and it doesn’t affect airport infrastructure the same way rental companies do. It also cites the importance of competitive choices for consumers.

“Airports are trying to figure out how to regulate car-sharing businesses operating at their facilities,” Kaplan observes. “If they are making money off an airport without paying their share, that wouldn’t be fair to everyone else. It has been a new process for airports, and we’ve been playing catch-up. [At CLT], we like to be a good partner to all of our vendors.” 

Airports throughout the country are grappling with how to manage peer-to-peer car rentals/sharing operations.



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Tampa Int'l Plots New Course to Enhance Airfield Safety

BY KEN WYSOCKY

FACTS&FIGURES

Project: Dedicated Apron Service Road

Location: Tampa (FL) Int'l Airport

Owner/Operator: Hillsborough County Aviation Authority

2020 Operations: About 166,000

Approx. Project Cost: \$78,500 (\$69,000 for design, \$9,500 for materials)

Funding: General airport revenue

Design/Project Management: RS&H Inc.

Roadway Length: About 2.3 miles

Markings: 117,976 ft.

Painted: March 2020 through July 2021

Labor: 1,112 hours (in-house maintenance workers)

Materials Used: 400 gallons paint; 3,400 lbs. reflective glass beads

Key Benefits: Enhances airfield safety through better speed control, more predictable driving paths for ground service vehicles; facilitates separation between vehicles & aircraft; reduces spread of foreign object debris; reduces distraction of unpredictable vehicle traffic for pilots

While many airfield safety programs focus on runways, Tampa International (TPA) recently finished a \$78,500 project that honed in on its apron area.

The Florida airport established a well-defined route specifically designed to decrease the speed of ground service vehicles and help keep them a safe distance from parked and taxiing aircraft. The roughly 2.3-mile apron service-roadway system also is expected to limit the spread of foreign object debris such as pieces of luggage tags and nuts and bolts by making it easier to spot and collect.

Jordan Biegler, senior manager of airfield operations and emergency management, notes that the two-lane road will help keep workers who drive fuel trucks, tugs, catering trucks and other service vehicles on a safe path during inclement weather. "This dedicated apron road enhances our already established low-visibility operation plan," he notes.



JORDAN BIEGLER

The new road, which was completed in July, is expected to be popular with pilots because it will minimize unpredictable traffic from service vehicles. Previously, ground vehicle drivers tended to take the most convenient paths when traveling on the apron. At times, however, they drove vehicles into areas on the apron where pilots might not expect traffic.

"Before this, we basically had a huge piece of concrete airside apron [335,000 square yards] with no defined path," Biegler explains. "It was left up to drivers to see and avoid aircraft."

Of note, TPA had not experienced any major vehicle accidents on its apron, and FAA does not require airports to create such apron roadways for ground service vehicles. The Hillsborough County Aviation Authority, which owns and operates TPA, proactively initiated the project.

"As we've implemented safety management programs, we felt there was a gap here—an area where we could enhance overall safety," Biegler explains. "With a clearly delineated path, drivers aren't confused about where they can go."



Challenging Design

The airport hired RS&H Inc. to evaluate its apron traffic and propose an optimum route for service vehicles.

“The major consideration was understanding all the separation requirements for aircraft, both while parked and while taxiing,” says Chris Ryle, the RS&H senior aviation engineer who served as project manager.



CHRIS RYLE

Biegler notes that it was essential for the road to not route service vehicles too close to any aircraft tails or wings. “The biggest challenge was that some areas of the commercial terminal apron just aren’t designed to accommodate a roadway system like this,” he adds. “So we had to be very deliberate about where we put it so it didn’t infringe on wingtip clearances along taxi routes and the tails of airplanes parked at gates. It was kind of a tightrope walk.”

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Engineers considered what vehicles would use the road and the turning radii they require. They also factored in federal and state roadway standards.

"It was a very intricate process to work within the existing site constraints and meet all the required criteria for aircraft and vehicles," Ryle says. "If you're designing a brand new airfield layout, you can provide all the spatial requirements for object-free areas, service roads and parked aircraft. But we had to work with a geometric layout for a service road within existing constraints... and resolve all the issues stemming from that."

To ensure that the road design considered all possible factors, RS&H met regularly with the airport's engineering and operations departments, tenant airlines, airport vendors and other stakeholders. Then, engineers produced a schematic design that was used to elicit further feedback.

"It was an iterative process, with many meetings and updates as we gathered input from various stakeholders," Ryle recalls.

Speed Control

The final plan created a roadway with two lanes, each 11 feet wide. The lanes are designed to be wide enough to accommodate all pertinent service vehicles, but narrow enough to induce "traffic calming." Ryle explains that the narrower a lane is, the slower people tend to drive.

Crews began painting the carefully engineered lanes on the west side of the apron in March 2020, and proceeded on the east side in 2021.

"That was done to minimize disruption to operations," Biegler says. "In addition, starting on one side allowed us to take lessons learned there and carry them over to the other side."

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Airport maintenance workers, rather than outside contractors, painted the lines. Biegler notes that this not only saved money, it also enhanced safety because airport employees are used to working in and around aircraft.

It took crews about 1,000 labor hours to paint nearly 118,000 feet of various markings. They applied 400 gallons of traffic-striping paint and roughly 3,400 pounds of glass beads, which provide a reflective effect.

While most of the job was painting white lines, workers used stencils to create traffic signs, such as “stop” and “yield” on the pavement. They also painted black-and-white checkerboard patterns called “zipper markings” that alert drivers to proceed with caution because they’ve entered a wing-tip safety zone, such as an active taxi lane.

How did workers know where to paint the lines? A surveyor following GPS coordinates on the final design plan placed stakes about every 50 feet to indicate the correct contours and paths. All airport employees had to do was connect the dots between stakes with a stripe-painting machine.

“It was very important to provide a precise layout,” Ryle notes.

Educational Outreach

The airport’s traffic control efforts extend beyond painting lanes on the apron. The TPA Operations team also conducts safety briefings for outside contractors, airline baggage employees, catering personnel, tenants, workers who drive fuel trucks and so forth.

“Roads like this are very common at larger airports and some smaller ones, but we’ve never had a comprehensive route at Tampa before,” Biegler explains. “So we had to educate folks as it was installed. Luckily, it’s pretty intuitive to follow a road.”

The educational outreach meshes with a larger safety program that covers a wide variety of topics, such as speed limits, minimizing foreign object debris, use of personal protective gear, securing vehicle cargo, surface markings and signage, emergency notification procedures and so forth. Whenever possible, trainers brief workers in person, right on the airfield.

“We don’t interfere with their work operations,” Biegler specifies. “We pick our spots carefully...and ask them if they have five minutes to talk. It gets our managers out there in the field and helps develop rapport.”

Airport police and TPA operations personnel enforce the airfield’s 15-mph speed limit. More

often than not, they issue a safety briefing in lieu of a citation, Biegler notes. “It’s easy to reach the management levels of all these groups, but it’s harder to get our messages to filter down to the frontline workers. So this is a good way to bridge that gap,” he explains.

Ryle says that TPA’s new apron service road reflects a wider industry-wide trend of enhanced efforts to manage airfield safety.

“There’s been a heightened level of attention on safety management for the last five or 10 years, and this project falls in line with that,” he comments. “I think it’s more of a recognition of an existing, ongoing need to approach airfield safety more systematically.” ✈️

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Lehigh Valley Int'l Opens the Doors on New Bulk Hangar

BY RONNIE WENDT

FACTS & FIGURES

Project: New Bulk Hangar

Location: Lehigh Valley (PA) Int'l Airport

Total Size: 54,000 sq. ft.

Class A Office Space: 2,700 sq. ft.

Cost: \$16.3 million

Funding: \$8.8 million grant from Pennsylvania Dept. of Transportation Bureau of Aviation

Construction: Oct. 2018-June 2020

Features: Clear-span design; hangar floors & apron designed for aircraft up to 100,000 lbs.; 3 vertical-lift Megadoors™ (115 ft. wide, with 28-foot height clearance); fire protection system that uses fluorine-free foam; gas radiant heat with make-up air unit & heat recovery ventilation; bathrooms & private showers in hangar area; overhead coiling doors for large equipment or vehicle access

Design Engineer: C&S Companies

General Contractor: Grace Industries, Inc.

Electrical Contractor: Boro Construction

Plumbing Contractor: Guy M. Cooper, Inc.

HVAC Contractor: Shannon A. Smith, Inc.

Hangar Doors: ASSA ABLOY Entrance Systems

Key Benefits: New capacity to accommodate growing passenger traffic & newer/heavier corporate jets



Even though COVID-19 put obstacles in its path, Lehigh Valley International (ABE) never veered from its mission of adding more hangar space. Last July, the eastern Pennsylvania airport opened a new 54,000-square-foot hangar to accommodate soaring passenger traffic and newer corporate jets that weigh up to 100,000 pounds.

When the project began in October 2018, ABE had experienced 26 consecutive months of steady growth in traffic. With 120 based aircraft and an average of 65,000 general aviation operations per year, ABE had even stopped accepting new aircraft due to a lack of hangar and apron space.

But turning business away was not something Executive Director Thomas R. Stoudt was willing to accept. Instead, he wanted to help boost economic and jobs development for the entire Lehigh Valley region. "Hangar space is extremely limited in the Northeast corridor," he explains. "We needed a hangar that could hold the next generation of corporate jets. We were



THOMAS STOUDT

getting larger and heavier aircraft and had a lot of interest in finding a place to put them."

So Stoudt and his team added Hangar 11, the first new hangar built at the two-runway airport since 2006. Now, ABE has more than 250,000 square feet of bulk storage hangar space and 50,000 square feet of T hangar space. General aviation traffic is served out of the airport-operated FBO, separate from commercial service at the main terminal.

An \$8.8 million grant from the Pennsylvania Department of Transportation Bureau of Aviation helped ABE complete the \$16.3 million project. The grant provided funds needed to offset costs for site development and the design and construction of the hangar, apron and adjacent parking lot.

Sen. Lisa Boscala cut to the chase about the project when she spoke at the groundbreaking: "Through this prudent investment of state funds, we will now be able to compete against other airports, such as Morristown and Teterboro, for corporate clients."

Meeting Customer Needs

The new clear-span facility features a host of amenities designed to appeal to corporate and



upscale general aviation aircraft owners, including 2,700 square feet of Class A office space and hangar doors that accommodate the latest generation of corporate jets. The entire building has gas radiant heat with a make-up air unit and heat recovery ventilation to increase interior comfort and reduce operating costs. The hangar area includes bathrooms, private showers and overhead coiling doors for large equipment or vehicle access. The hangar also includes compressed air hookups and an advanced security camera system.



RYAN MEYER

Three Megadoors™ facilitate access for large aircraft and vehicles. Ryan Meyer, director of Planning and Programming for the Lehigh-Northampton Airport Authority, explains that the project team opted for vertical lifting doors clad in durable fabric because they work better in Snow Belt states like Pennsylvania.

“We found that sliding doors or other track systems require heating loops and other temperature control devices in the pavement and tracks to prevent snow and ice buildup in the winter,” Meyer says. “Fabric doors fold up like a roman shade; there’s no track system. We’ve been very pleased with their performance in our other hangars.”

Pierre Varlamoff, aviation sales for ASSA ABLOY Entrance Systems, adds that eliminating the door pockets and rail systems required by traditional

horizontal rolling hangar doors helped the architect maximize the available space and design a more compact, efficient and cost-effective facility.

At 115 feet wide, each of the Megadoors can accommodate the Bombardier Global Express 8000 and Gulfstream G650.

Outside the hangar, ABE added a new 77,000-square-foot apron designed to withstand aircraft that weigh more than 100,000 pounds.

The airport sought design input from current customers, aircraft operators on the waiting list and its business development department. “We got a lot of feedback regarding office space and where to position it in the hangar,” Stoudt says.



PIERRE VARLAMOFF

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Many of the seven other bulk hangars at ABE have offices located in the front, so customers and visitors must pass through them to access the aircraft and apron. Hangar 11 has a corridor running between the offices and hangar portion to eliminate that issue. The corridor extends from the landside parking lot to the airside apron and includes windows that look into the hangar.

Adding radiant heat, temperature controls and a high-tech circulation system helped improve air quality when the doors are closed, which is important to customers, Stoudt adds.

Prospective tenants also wanted a facility that could house larger, heavier aircraft. This prompted the design team to consult geotechnical engineers because ABE is located in a region known to have Karst geology, which is more prone to sinkholes given the presence of underground limestone rock formations.

“We had to make the concrete slab in the hangar thicker with additional reinforcement — so if a sinkhole were to form under the hangar itself, it would not jeopardize the integrity of the bay,” Meyer explains. “Making the concrete over 12 inches thick alleviated these safety concerns, while also accommodating the heavier aircraft. We also worked with engineers to make sure the hangar was tall enough and able to support wind and snow loads.”

Because customers often prefer to wash their aircraft inside, the airport equipped each bay of the new hangar with its own trench drain. Cold water is provided from a domestic supply, with two hookups and 100-foot hose reels.

Meyer notes that the trench drains can collect fire suppression foam as well as wash water. “This way, the foam goes into one of the detention basins, not the groundwater,” he says.

Safe and Secure

The high cost of large jets drove home the importance of tight security. (The list price for a new G650 is \$65 million, and used models start at \$39 million.) Project engineers consequently outfitted Hangar 11 with an access control system that requires cards for entry, and a closed-circuit TV monitoring system that links to the Airport Operations Center.

“We provide 24/7 monitoring,” says Stoudt. “Providing a high level of security for our corporate clients was really important to us and them. It’s always an essential element of every hangar, but we provided it in a way that doesn’t feel cumbersome. We were very thoughtful about the locations of security cameras. The cameras have a very low profile, and we placed them in unobtrusive places, so they are not the first thing you notice when you walk in.”

The facility’s fire safety system is particularly noteworthy. In fact, Hangar 11 is currently the largest hangar in the nation to be protected by fluorine-free fire suppression foam supplied by Solberg Versagard, a division of Perimeter Solutions.

In 2018, Pennsylvania’s governor issued an executive order creating a PFAS Action Team to devise strategies to limit use of per- or poly-fluoroalkyl (PFAS)—the substances in firefighting foam that have been linked to health problems if they enter the groundwater.

As the state addressed this controversial public health issue, ABE was already on a mission to reduce PFAS runoff. “We worked with our aircraft rescue and firefighting (ARFF) chief, the Airport Authority and the FAA to make this improvement,” says Stoudt. “I believe it is one of the largest hangars to include a fluorine-free system, rather than more common high-expansion foam.

“This was really important to us from a sustainability perspective,” he adds. “We wanted to work with products that met the latest specifications while moving away from older products that posed a potential health risk.”

The Lehigh Northampton Airport Authority partnered with C&S Companies of Syracuse, NY, to develop an engineering plan for the fire sprinkler system. The team based its design on the Pennsylvania Uniform Code and various National Fire Protection Association requirements.

“There are a number of considerations that needed to be incorporated into the design of a fluorine-free foam system,” says Meyer. “Fluorine-free foam requires different valves and other components versus those used in a PFAS foam system.”



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The resulting system includes:

- two 2,600-gallon horizontal bladder tanks
- 5,200 gallons of 3% fire suppressant foam concentrate
- seven proportioners with hardware that supplies foam to the overhead sprinklers and hose reels
- five hose reels located throughout the hangar for use by firefighters

Plans for Growth

With Hangar 11 completed, ABE's marketing team sprang into action sending information to prospective clients throughout the New York metropolitan area.

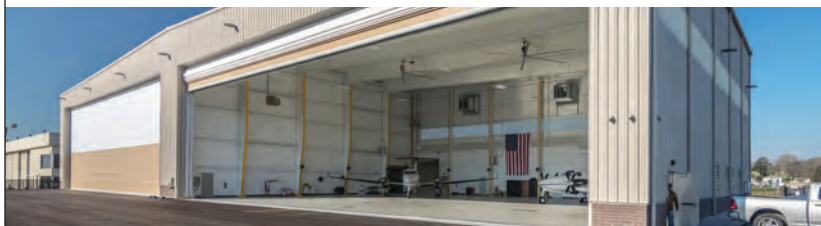
Once the new facility is full, the airport does not plan to rest on its laurels. Stoudt notes that officials are on a constant quest to improve, and recently completed a new airport master plan that will consider capacity requirements for the next 20 years.

"We have other areas on the airport that are identified for future corporate hangar development," he says. "So as demand grows, we can add more hangar capacity."

If growth continues at the current pace, the airport may not wait another 15 years for its next new hangar. ✈️



The fire protection system for the new 54,000-square-foot hangar uses fluorine-free foam.



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Airports Find New Way to Track Airfield Traffic

BY VICTORIA SOUKUP



FACTS&FIGURES

Project: Measuring/Tracking Airfield Traffic

Locations: Murfreesboro (TN) Municipal Airport; El Paso (TX) Int'l Airport

Method: Capture positional data from aircraft ADS-B & transponders

System: VirTower

Average Cost: \$500/month for general aviation airports; commercial airports pay \$1,000/month or more, based on their size

Benefits: Data can be used to determine operational counts/limits, track receipts, assess pavement usage, address noise complaints, etc.

Timeline: Both airports installed system in 2021



For years, personnel at Murfreesboro Municipal Airport (MBT) manually tracked aircraft to estimate daily traffic at the central Tennessee airfield. Based on crude visual tallies, MBT officials began this year thinking the general aviation facility logged about 225 operations per day.

But with a master plan update looming next year, Airport Director Chad Gehrke wanted more definitive figures; and MBT installed an automated tracking system this past spring. The first day the new system was in service, it recorded 200 operations from 2



CHAD GEHRKE

p.m. onward. "And on March 16, we had 683 operations, which is unbelievable for a single-runway, no-tower airport," Gehrke remarks. "In fact, we got a call within the first day or two from the system's president in Florida who asked, "What's going on at your airport? The numbers are crazy! Do you have an airshow?"

Installing the new system has been a game changer for staying on top of airfield usage, airspace management and noise abatement issues. "If I were to tell people what is happening here, they might question our figures," says Gehrke. "But here is the hard, raw data that is being collected by a third party, which you can't dispute."

Even more importantly, accurate operational data will be pivotal when the airport begins its



PHOTO: FRISCOLLA HARRIS PHOTOGRAPHY

Murfreesboro Municipal

master layout plan in 2022. “The information is invaluable, and it’s all at a touch of a finger,” Gehrke comments. “When we did our last plan seven years ago, consultants had to do an incredible amount of work to get this data. Now, all we have to do is pull up a report.”

Increasing enrollment in the flight program at nearby Middle Tennessee State University spurred his interest in collecting better information about airfield traffic. The university bases and operates 36 training aircraft at MBT. With the student population jumping 127% in the last four years, Gehrke wanted to quantify how the uptick was affecting the airfield’s operational numbers.

Leveraging Aircraft Tech

The airport’s new VirTower system collects data about airfield traffic by using a virtual geofence to detect aircraft based on signals transmitted by their ADS-B and transponders. Now, MBT officials log onto its web-based system to receive detailed information about

landings, takeoffs, taxi times, runway/taxiway usage, touch-and-go activity, FBO visitations and other aircraft movements.

“The system tracks real-time data at one-second intervals,” says VirTower President Les Goldsmith. “Airports can track aircraft activity, investigate noise complaints and generate reports on airport operations.”



LES GOLDSMITH

The system is relatively easy to install, he notes. At MBT, the VirTower team took a half-day to map out the geofence around the airfield and ensure that signals would be accurately captured. The airport then installed a sensor box at the base connected to internet and power with two antenna at the top of a light pole that is adjacent to the terminal.

“With this system in place, if an aircraft has either ADS-B or a transponder, we can track it,” explains Goldsmith. “If it has ADS-B, that gives us the GPS position of the aircraft every second. If it only has a transponder, we use multiple sensors to triangulate the aircraft’s position every second.” Data is made available to the airport within 200 milliseconds after VirTower receives it, he adds.

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| Registration | Time | Status |
|--------------|----------|----------------|
| N565MT | 11:26 AM | TAKEOFF RWY 1B |
| N585MT | 11:24 AM | LANDING RWY 1B |
| N349DS | 11:23 AM | TAKEOFF RWY 1B |
| N89539 | 11:23 AM | LANDING RWY 1B |
| N913NC | 11:22 AM | TAKEOFF RWY 1B |
| N582MT | 11:20 AM | TAKEOFF RWY 1B |
| N60451 | 11:18 AM | LANDING RWY 1B |
| N584MT | 11:17 AM | LANDING RWY 1B |
| N597MT | 11:15 AM | LANDING RWY 1B |
| N571MT | 11:15 AM | TAKEOFF RWY 1B |
| N734SE | 11:14 AM | TAKEOFF RWY 1B |
| N595MT | 11:07 AM | TAKEOFF RWY 1B |
| N583MT | 11:05 AM | LANDING RWY 1B |

Tracking aircraft traffic is no longer a manual process at Murfreesboro Municipal.

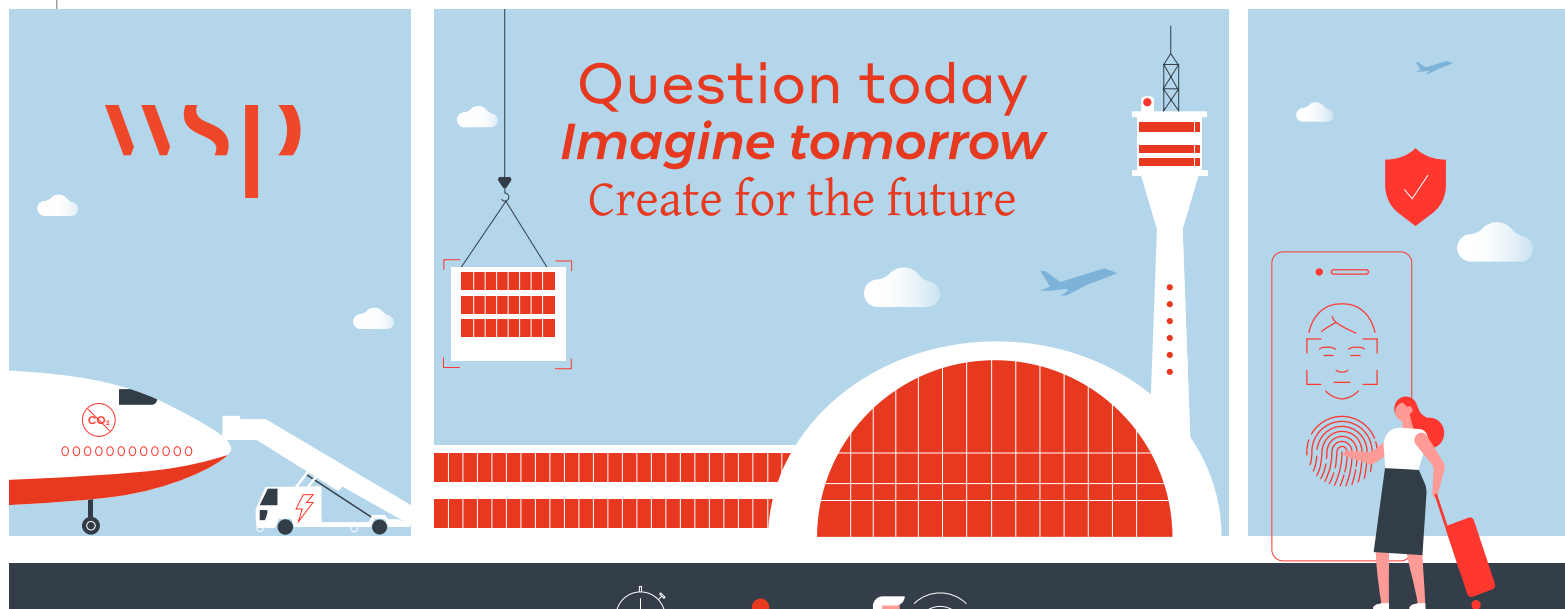
Given the volume of flight training that occurs at MBT, Gehrke is especially pleased that the system records touch-and-go traffic. Previously, it wasn't tracked because airport personnel would have had to watch the airfield and manually count flight operations.

The system also documents peak traffic times and chronicles noise and congestion issues, which have spiked as traffic increased over the past few years.

"We have also been receiving complaints from pilots who were trying to come in and get out," Gehrke says. "We started looking at what we could do. If you don't have a tower, it's next to impossible to count operations on a regular basis. And our traffic is not like the airlines that are consistent throughout the year. It changes from September to September with school sessions. We needed to do something to get accurate numbers."

Commercial Applications

El Paso International Airport (ELP) in Texas uses the same system, but for different reasons. As a towered



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airport, ELP already had a handle on operational counts. Officials there wanted more detailed information about airfield utilization. In June, ELP began using VirTower to track traffic and ground movement, and to monitor pavement and parking issues.

“We had been going through FAA reports to get the data, but it was very laborious; and we could not get it as fast as we wanted,” explains J. Antonio Nevarez, ELP’s assistant director of Aviation Operations and Security. “We also wanted additional data we could not get from the FIDS or the FAA, such as the type of aircraft and the runways and taxiways each aircraft used. We knew exactly how many landings and departures we had for commercial aircraft, but we didn’t have data for which runway they used, and we couldn’t pull any of that information for military or general aviation flights.”



J. ANTONIO NEVAREZ

Better information is prompting ELP to adjust some of its plans. For instance, officials previously intended to rehabilitate one taxiway, but thought another nearby taxiway could wait. “Right away, the data told us the second taxiway was being used more in a month than what we thought it was being used in a year,” Nevarez explains. “Now, we know we must go back in there and rehabilitate and improve both taxiways.”

The new system also provides documentation when the airport bills aircraft operators for overnight parking. Previously, staff manually jotted down aircraft tail numbers. “Now, we have verification,” notes Nevarez. “We have historical proof that a certain aircraft was in El Paso for an overnight.”


Surprisingly, VirTower is helping with gate assignments for charter airlines. “We don’t have a gate management system at ELP,” says Nevarez. “Most gates are assigned, but a few are reserved for common-use. When a charter is coming in, I can now see historically what times gates are being used. This has been the first time it has been so easy to assign a gate and be confident there won’t be a conflict.”

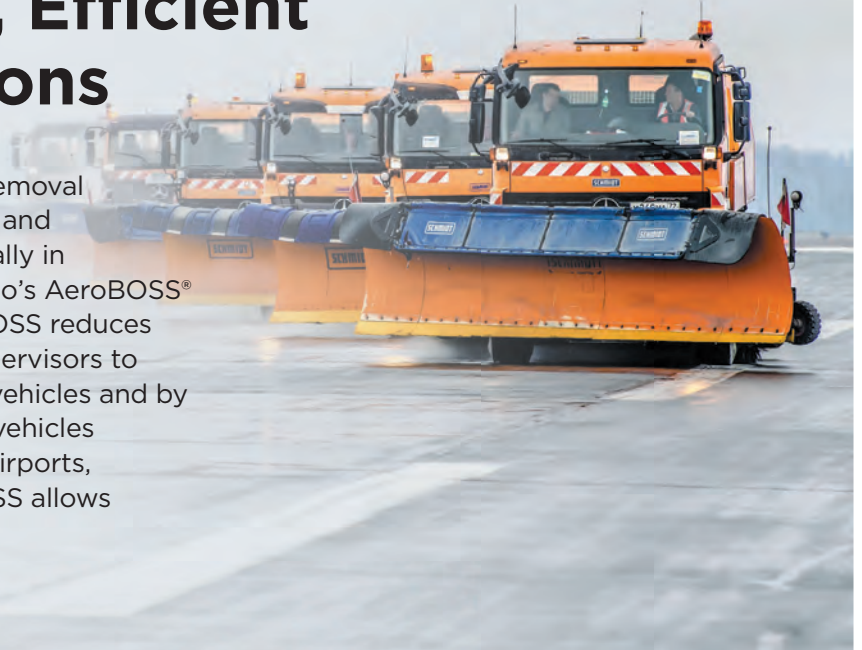
In addition, ELP utilizes the system to monitor safety issues, such as when aircraft cross a closed taxiway. Looking ahead, ELP plans to use the system to confirm payments for fueling, landing and overnight parking that are collected by the FBO and paid to the airport. “The FBO self-reports,” explains Nevarez. “Now, we can do a general check to verify that information.”

VirTower’s Goldsmith notes that airports also use the system to support noise abatement programs. After plotting the location, date and time of a noise complaint, personnel can generate a report about the air traffic in question. Information such as aircraft

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type, speed and altitude can be shared with the person making the complaint, and possibly used to ensure there is not a repeat occurrence.

Costs/Benefits

General aviation airports such as MBT pay \$500 per month for VirTower service. Fees for commercial airports like ELP begin at \$1,000 per month and vary according to airport size.

Goldsmith says that when the system is launched, airport officials are amazed at the data they receive. The information is also valuable for airport consultants, such as David Byers, of Quadrex Aviation, who is producing a usage report to assess MBT’s airfield capacity.



DAVID BYERS



The sensor box was installed on a light pole adjacent to the terminal.

“The ability to retrieve reliable data is important,” says Byers. “You can go back and look at specific timeframes and find out who was flying where during that period. Having access to the data is incredible.”

Being able to essentially reconstruct activity at the airport during various periods will help Byers develop a report that addresses issues such as runway queues and overall flight operations. “We’re entering an era where we have much better data on airports that traditionally did not have any objective aircraft counting going on,” he comments. “Now, I have an aircraft’s geographic position, with accurate detail, their altitude and the timestamp.”

Ultimately, the usage report may help determine the future of MBT, Gehrke says. Having pertinent data will help put the pieces of the puzzle together.

“Finding this equipment has been a blessing,” Gehrke says. “In the past when we did master plans, we had to come up with operational counts. And the best we could do is use information from Middle Tennessee State University, data from other flight schools and information from invoices because everything is based on hours. And for every hour, there’s one takeoff and one landing. But we also wanted to account for every touch-and-go. That really adds to the count.” ✈️

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Pittsburgh Int'l Boosts Energy Resiliency, Reliability With Its Own Microgrid

BY PAUL NOLAN



Pittsburgh International Airport (PIT) made history in June when it flipped the switch on its own natural gas and solar energy powered microgrid. In an era when energy resiliency and independence have become a Holy Grail of sorts, PIT is the first airport in the world to be completely powered by its own microgrid. And, it did so at no cost to the airport or local taxpayers.

A microgrid is an independent electricity source that can operate autonomously while typically maintaining a connection to the traditional local grid. The version at PIT includes five natural gas-fired generators capable of producing 20 megawatts of electricity plus nearly 10,000 solar panels that can produce another 3 megawatts.

Currently, the airport's peak demand is 14 megawatts, and the new on-site microgrid powers all of its landside and airside

terminals, as well as the commuter tram, airfield, hangars, a Hyatt hotel and gas station. As a backup, PIT remains connected to the Duquesne Light electrical grid for emergency power.

The \$30 million project was completely financed by Peoples Natural Gas, which serves more than 750,000 homes and businesses in Pennsylvania, West Virginia and Kentucky. Because most construction occurred outside the airport's FAA-secured area, contractors did not have to pass through security for construction activities.

Natural Resources

While airport officials hope this project can serve as an example for the industry, they also recognize it would be difficult to duplicate because few other airports enjoy PIT's confluence of natural assets. Namely, it has ample real estate that sits atop the Marcellus Shale,



a natural gas reserve that runs under parts of Pennsylvania and five other states. With 8,800 acres, PIT is one of the 10 largest airports in the U.S.

The recent microgrid project is not PIT's first foray into tapping the natural gas of the Marcellus Shale. In 2013, the airport struck a deal with Consol Energy (now CNX Resources) to develop natural gas wells on its property. PIT signed a 20-year agreement with CNX that includes royalty payments to the airport on gas that comes from the ground, and the company has operated more than a dozen wells there ever since.



The system includes nearly 10,000 solar panels capable of producing 3 megawatts.

The contract with Peoples Natural Gas to own, finance, maintain and operate the new microgrid is also a 20-year agreement. It entitles PIT to purchase power generated by the microgrid at a below-market rate, and Peoples Natural Gas is allowed to sell the excess power on the wholesale market. Purchasing its power from the microgrid is estimated to save the airport \$500,000 in the first year alone, notes Tom Woodrow, PIT's vice president of Engineering.



TOM WOODROW

The airport also collects a nominal ground lease fee for the land the microgrid occupies. After its current 20-year agreement expires, PIT has the option to sign a new contract with Peoples Natural Gas, or find a different company to operate the microgrid.

"Pittsburgh International Airport is now one of the most site-hardened [energy-resilient] public facilities in the world, while at the same time becoming more sustainable," PIT Chief Executive Officer Christina Cassotis told the airport's news service, Blue Sky



CHRISTINA CASSOTIS

FACTS&FIGURES

Project: Onsite Microgrid

Location: Pittsburgh Int'l Airport

Cost: \$30 million

100% Funding: Peoples Natural Gas Co.

Total Capacity: 23 megawatts

Key Elements: 5 natural gas-fueled generators capable of producing 20 megawatts; nearly 10,000 solar panels that can produce 3 megawatts

Airport's Current Peak Demand: About 14 megawatts

Microgrid Operator: IMG Energy Solutions

Airport's Engineering Consultant: Burns Engineering

Requests for Qualifications/Proposals Issued: 2018

Development Contract Awarded: Oct. 2019

Developer/Owner: Peoples Natural Gas Co.

Term: 20 years

Engineers: Lake Superior Consulting, LLI Engineering

Construction: June 2020-June 2021

General Contractors: PJ Dick

Concrete Trade Partner: Charter Construction

Natural Gas Generators: Northeast Energy Systems

Solar Field Design & Construction: EIS Solar

Natural Gas: CNX Resources

News. “That’s a tribute to the innovative culture of our team, and we hope this project can be a model across the industry.”

4 Key Objectives

The airport worked with Burns Engineering’s Pittsburgh office to issue a request for qualifications and a request for proposals for the microgrid project in 2018. The four primary goals of the project were:

- increasing power reliability and resilience
- supporting PIT’s sustainability goals
- lowering electricity costs for the Allegheny County Airport Authority and PIT tenants
- supporting the local natural gas industry

Airports around the world share PIT’s goal of increased energy reliability and resilience, as loss of electrical power causes disruptive and expensive standstills. An 11-hour power outage at Atlanta Hartsfield-Jackson Airport (ATL) in December 2017 threw air travel throughout the U.S. into disarray. Delta Air Lines alone had to cancel 1,400 flights during the outage. This year, power outages have already affected McCarran International in Las Vegas (LAS), Denver International (DEN) and Los Angeles International (LAX).

David Smith, director of Energy Services at Burns Engineering, notes that PIT initiated discussions with his company about developing a microgrid before the ATL outage



DAVID SMITH

occurred. But that event accelerated officials’ desire to become more energy resilient. “When Atlanta happened, that’s what reinforced the decision to proceed with some urgency and determination,” Smith recalls. “They were already looking to go this direction, but Atlanta sealed the deal.”

Airports throughout the world are reviewing options to enhance energy and power resilience as they shift away from fossil fuels and transition toward electric ground service vehicles and other equipment, Smith adds.

“As more and more systems are electrified, you become increasingly dependent on reliable and resilient power, therefore a general trend is emerging to build in resilience as you electrify,” he explains. “On top of that, you have more frequent extreme weather and other new threats like cyber terrorism that are reinforcing concerns about the grid.”

Other U.S. airports that have installed microgrids in recent years or that plan to install one include Detroit Metropolitan Wayne County Airport (DTW), John F. Kennedy International Airport (JFK) in New York City, San Diego International Airport (SAN), Chattanooga Metropolitan Airport (CHA) and California Redwood Coast-Humboldt County Airport (ACV).

The microgrid at PIT connects to the traditional power grid but can operate independently—what is known as “island mode.” It is noteworthy, however, because it powers the entire airport and related facilities.

When the airport began looking for a partner to develop its microgrid, officials purposely left the specific design parameters wide open. “We let them propose any combination of technologies they wanted to meet the goals we identified,” Woodrow explains. A group of 16 companies responded

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to PIT's request for qualifications, and the project team invited eight to submit proposals. Peoples Natural Gas was ultimately selected with a plan for a microgrid that would supply 100% of the airport's electrical needs and meet all the goals of the project.

Innovative Arrangement

In October 2019, the Allegheny County Airport Authority awarded Peoples Natural Gas a 20-year contract to build, maintain and operate a microgrid at PIT. Construction started in June 2020 and lasted about one year.

Peoples Natural Gas subcontracted IMG Energy Solutions to provide the drawings that served as the basis for the natural gas generation plant and to operate it. IMG also constructed and now owns and operates the solar component of the project. The unique structure of PIT leasing land to a utility company to build and operate a microgrid that powers the airport has been dubbed microgrid-as-a-service.

"Typically, infrastructure like this would be owned by the customer, not the utility," explains Jeff Nehr, vice president of business development at Peoples Natural Gas. "But we're trying to make the point that these are projects that are possible, feasible and economical. If it can offer cost savings along with resiliency, it's a good option for airports."



JEFF NEHR

Looking ahead, PIT's management team and airport authority officials are bullish about development opportunities for more than 3,000 acres of airport land. Low-cost energy now available through the microgrid or a new microgrid would be an attractive perk for tenants at a business park, should one be developed.

"Our region has innovation in its DNA, and the construction of this microgrid reflects the work that has been done at the airport to maximize public safety and sustainability," says Allegheny County Executive Rich Fitzgerald. "I'm extremely proud that the airport is utilizing nearly 10,000 solar panels as a source of sustainable energy. It, along with the other mix of energy generated at the airport, continues to position this facility as an industry leader." ✈️



The \$30 million project was completely financed by Peoples Natural Gas.



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FACTS & FIGURES

Project: Air Cargo Logistics Park

Location: Halifax (NS) Stanfield Int'l Airport

Cost: \$36 million

Funding: \$18 million from federal government; \$13 million from airport; \$5 million from Nova Scotia provincial government

Main Facilities: 62,000 sq. ft.

Notable Feature: Cold chain space/capabilities for time-sensitive exports such as live lobster & fresh seafood

Related Projects: New apron; aircraft deicing facility; truck docks; access roads; airside & groundside operational areas

Tenants: First Catch Fisheries; Cargojet

Construction: Fall 2019-fall 2021

Design/Build Partner: BD Stevens Group

General Contractor: Northern Construction Ltd.

Halifax Stanfield Builds Cargo Park With Cold Chain Capabilities

BY KIMBERLY GIBBS

As airports around the globe are seeing an uptick in passenger traffic, Halifax Stanfield International (YHZ) is experiencing incredible growth in cargo operations. Despite the COVID-19 pandemic, officials at the Nova Scotia airfield believed in the old maxim, “If you build it, they will come.” And they were right.

This year, with its new \$36 million Air Cargo Logistics Park nearly complete, YHZ processed 25,000 metric tonnes of cargo from January through August—up from 22,400 metric tonnes over the same period in 2020.

“The growth and demand we were seeing prompted us to move forward with this important investment,” explains Glen Boone, director of cargo and real estate development at Halifax International Airport Authority. “We knew we needed to act when we saw that our partners didn’t have the ability to get cargo to market quickly when multiple aircraft were on the ground.”



GLEN BOONE



The airport constructed its new 62,000-square-foot facility on 25 acres of previously vacant land and flanked it with a new apron with eight aircraft parking positions dedicated to cargo handling. It also designated space for cargo logistics on the airside and groundside, and has future potential for a deicing facility.

The new processing and logistics area, which was on the cusp of completion in August, includes spaces for aircraft as large as a B-747-400 and allows greater ease for crews loading and unloading freight. Before the new cargo facility was built, aircraft had to wait for one of three parking spots to open, and the waits were sometimes lengthy.

“As we saw the need to grow cargo, we focused in on a couple of areas,” Boone explains. “We looked at adding aprons for parking large cargo aircraft. We also wanted a cargo facility that had specialized cold chain capabilities.”

Planning and Finances

The airport engaged directly with cargo operators to understand what they wanted. Then, project planners narrowed their myriad of wish list items to the two most impactful components: parking and processing.

“We held cargo roundtables with our stakeholders and reviewed opportunities,” recalls Boone. “The key areas the airport focused on were designed to enhance our ability to service the cargo industry, but also to enhance our overall facility.”

With a plan in place, the airport authority needed \$36 million to execute it. The airport was able to proceed with construction thanks to \$18 million of federal funding and \$5 million from the provincial government. The airport itself invested an additional \$13 million to bring the Air Cargo Logistics Park and operating area to fruition.

The significant federal support came through the National Trade Corridors Fund. This multi-billion dollar fund’s sole purpose is funding infrastructure projects throughout Canada to improve the flow of goods and increase trade. The YHZ cargo facility project directly supports the fund’s goals because it was designed to use air cargo to change transportation in Nova Scotia and improve trade.

“Without this program, we would not have been able to proceed with the Air Cargo Logistics Park,” Boone reflects. “We needed these valuable programs to move forward with this project.”

After the airport received funding approval in 2018, it began planning and preparations to issue a request for proposals for a design-bid-build contract. Major components of the contract included clearing vacant airport land for the new cargo apron and adding multiple cargo handling buildings, a

deicing facility, truck docks, access roads and associated operational areas landside and airside.

The request was initially issued for four weeks and included 3-D conceptual designs of what the airport authority envisioned. Strong response from potential bidders and numerous requests for more information prompted the airport to extend the process to address questions about the project.

Go Time

The design/build contract was awarded to BD Stevens Group, which has operated in Nova Scotia for more than 50 years. The general contractor services contract was awarded to Northern Construction Limited located in New Brunswick.

Construction began in fall 2019, slowed during winter because of inclement weather, and then ramped back up once milder temperatures returned to the region. The 62,000-square-foot facility is set to be completed this fall, at which point the facility’s two tenants, First Catch Fisheries and Cargojet, will take over the space and begin configuring it for their use. That work is slated to complete early next year. Both companies signed long-term leases, in excess of 15 years, with the airport authority in spring 2020.

“We intentionally sought out long-term agreements because of the significant investment we were making with the tenants on specific features,” Boone explains.

The new cargo facility will be the largest of its kind east of Montreal, providing more throughput of goods and fostering business throughout Atlantic Canada.

Prior to full completion of the new facility, cargo flights are already up 21% at YHZ. Boone notes that in addition to an increase in technical stops, the region is also experiencing higher demand for its exports—especially those that are time-sensitive, such as lobster and other fresh seafood.

“We rely on air cargo to get our high-quality, high-value live product to market,” says Geoff Irvine, executive director of the Lobster Council of Canada. “A live and perishable product like Canadian lobster will benefit from the development of the air cargo park and this new space with direct airside access. The additional cargo aprons are a potential game changer, allowing multiple aircraft to be serviced at the same time.”



GEOFF IRVINE

In addition to live seafood, other important cargo categories for YHZ include industrial machinery, aircraft and spacecraft parts, medical and surgical instruments, electrical machinery and pharmaceutical products.

As the airport enters into its very own cargo renaissance, officials say that stakeholder engagement was one of the keys that unlocked more growth.

“We invested the time and energy in understanding what we needed to do to support the industry,” Boone explains. “It sounds cliché, but airports should know their strengths, their weaknesses, the opportunities for growth and the challenges to the industry.”



Construction of the new 62,000-square-foot facility is scheduled to be complete this fall.

He adds that recent investments to build the new Air Cargo Logistics Park will positively impact Halifax Stanfield, the region, cargo operators and Canada for years to come. ✈️

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Larger Than Life

Two passengers stand head and shoulders above the crowd at Jacksonville International Airport (JAX)—a woman in Concourse A and a man in Concourse C. Collectively, they comprise a work titled *Gotta Go*, by Gordon Huether.

At more than 35 feet tall, each appears to be striding across the tarmac behind a large arched window at opposite ends of the terminal. The figures are so large, they can be seen from the central security checkpoint in between. While their silhouettes are muted shades of gray, the travel bags they carry feature intensely colored maps of the local Jacksonville area. The map sections appear to fluctuate in color with the time of day and viewing angle due to dichroic coating, making them “passively kinetic.”

Jen Jones Murray, Arts and Culture Program manager for the Jacksonville Aviation Authority, notes that the highly visible pieces

provide a soothing distraction for passengers who may be stressed from their travels. Others find the figures inspiring, she adds.

“*Gotta Go* was installed in 2008, and is really standing the test of time thanks to its complete and total universality,” observes Murray. “It effectively plays off the immense amount of the light in that part of the airport and complements some of the other super-successful artwork in our growing 13-piece permanent collection.”

From a practical standpoint, the giant silhouettes produce some of the best seats in the house by providing shade when it is especially sunny outside.

Throughout the last 26 years, JAX has showcased the work of more than 700 artists to more than 130 million visitors. ✈️



The New Town Square

There is a paradigm shift occurring in the world as we know it. In the travel industry, the pandemic is driving major changes that are providing opportunities to learn from the way passenger behaviors have adapted and their expectations have been redefined. At Gensler, we see airports becoming the new town square.

Terminals as Town Squares

Typically found in the heart of a downtown core, a town square includes a mix of program elements and amenities that weave together the threads of a community and its people. By integrating these types of functions into a terminal—perhaps a curated mix of local retail and food/beverage concessions, performances from celebrated community organizations, or outdoor fire pits—we can create a tailored experience for travelers and locals. This experience, in turn, gives the airport a repurposed role as a place where people want to gather, not necessarily tied to arriving or departing via airplanes.

This design point of view was a primary driver behind Gensler's Skyport Mobility Hub concept, which focuses on a town square design approach to draw the local community to an aerial transportation hub. It is a place to gather, and we disguise the transportation aspects of the facility by wrapping it with retail, dining and healthcare functions.

For Eagle County Regional Airport, we designed a central hearth to provide an opportunity for visitors to interact while sitting around a fire conversing, eating

or relaxing. We created a setting at the airport meant for a much wider group of users than passengers.

The opportunity to impact current terminal paradigms and thinking is upon us. We can make airports community-centric and welcoming to all.

Commuting Gateway

The concept of working from home has been accelerated to a new reality, driven by using technology for connectivity. More employees than ever can effectively perform their job responsibilities from home through web-based calls, presentations and seamless information sharing. As a result, more people and families have moved to the suburbs or smaller cities for a better quality of life, while still accomplishing their job responsibilities remotely.

This move outward has created an opportunity for regional and municipal airports to transform into commuting gateways, providing connectivity to larger cities through localized, community-influenced terminals. A more scaled, right-sized personalized travel experience will make travel a simpler process, from curb to gate. Commute times to and from home will be minimized, passenger processes will be streamlined, and the overall time spent traveling will be reduced, thus supporting expectations for a newly discovered work-life balance.

Looking Forward

We have been presented the valuable chance to analyze how current airports and terminal facilities are being utilized,



Tim Hudson,
Aviation Practice leader and principal at Gensler, brings more than 25 years of experience in the planning, design and delivery of regional, hub and international

airport terminal projects. He has led project teams at some of the world's busiest airports, including Hartsfield-Jackson Atlanta International, Dallas Fort Worth International and Los Angeles International, supporting both airport and airline clients. He excels at understanding how to successfully deliver design solutions in active airport environments.

and how they are adapting as travel trends change. With change comes the opportunity to re-shape the overall travel experience, including modifications of existing facilities, or establishing new paradigms for new terminals.

As we look ahead, terminal designs need to be flexible to accommodate evolving travel needs, as well as being transitional to adjust to permanent change. That includes how regional airports that support the suburbs and municipalities become commuter facilities, providing connectivity to larger markets with the ease and features of a community airport. As we look toward returning to "normal," designers need to take advantage of what we are learning from change in travel behaviors and work methodologies to redefine a tailored travel experience. ✈️

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