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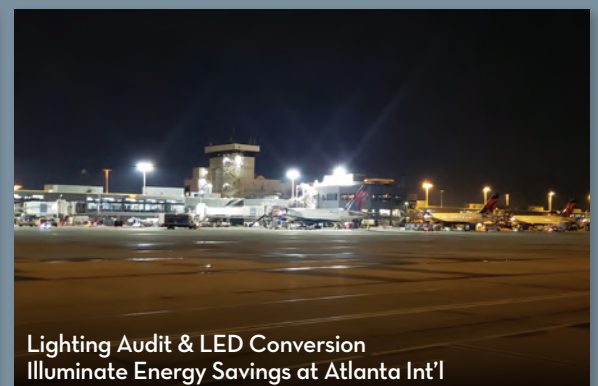


San Francisco Int'l Rebuilds Terminal 1 for \$2.4 Billion

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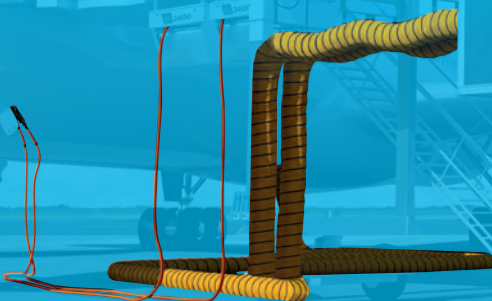
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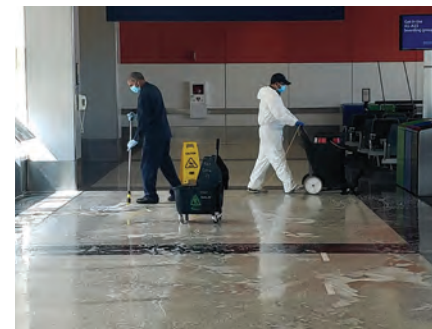
It's all about connections



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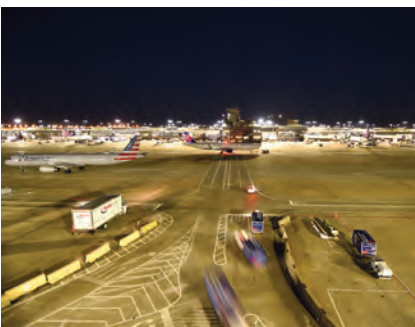
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Welcome to the Flat Side of Social Media

I don't know about you, but my social media feeds have been running overtime lately.

We're facing an information overload, accentuated by the pandemic, as a means to fill the communications gap created by sheltering in place. For a long time, I firmly believed that there was no such thing as too much information—that the more information we have, the more informed we are, and the better our decisions become. Now, I'm not so sure that this is the case.

The current overload from social media is fueling my doubt. On the plus side, content is easy to create and deliver. Everyone can do it. Plus, it's cheap.

But here's the problem: "Information" on social media is easy to create and deliver. Anyone can do it. And it's cheap.

The information is there, but is it good? Is it trustworthy? It's certainly plentiful, which is a problem of its own, because the time

involved sorting through the increased volume presents yet another challenge.

Not surprisingly, the best, most helpful information comes from *trusted* sources. And this is where social media's flat side comes through loud and clear.

What do I label as a trusted source? In the airport industry, it's our trade associations, media outlets, government agencies, industry insiders like consultants and suppliers, and of course airport public affairs offices. The delivery mechanism doesn't really matter. It could be print, e-mail, webcasts or social media. It's all about the source and value of the information.

So, what's the solution? Personally, my habits have changed. I have cut down the time spent on social media and the number of people I follow on LinkedIn, Twitter, Instagram, etc. because the gems I'm mining from them seem to be fewer and farther in between.

Lesson learned. Even with the exponential growth in posts, there's less valuable information worthy of action. There are simply too many sources posting every day, just for the sake of posting.

I'm also seeing companies presenting themselves as COVID-19 airport experts that, in fact, have no idea how airports work. Tactics and posts like these dilute the overall value of this medium.

Our lives will never go back to the way they were prior to COVID-19. Nor should they. However, we need to get a better handle on the role of social media—within our industry and *definitely* for political discourse. There's value, but not if everyone is shouting at the same time. Who's there to listen?



PAUL BOWERS, PUBLISHER

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San Francisco Int'l Rebuilds Terminal 1



Guided by the ambitious goal of revolutionizing the guest experience, San Francisco International Airport (SFO) is steadily making its way through the \$2.4 billion reconstruction of its recently renamed Harvey Milk Terminal 1. Constructed in the early 1960s, the facility required a substantial update to continue to accommodate growing numbers of passengers and evolving traveler needs. Completion is expected in 2023.

“We understand the people who use our facility are all different and want to make their own way, if you will,” says Geoff Neumayr, the airport’s chief development officer. “If we understand the journey of the different types of people and give consideration to them and build flexibility so they can create their own way, we can

really create a special place in a busy airport—and create this calmness, sense of ease, sense of good feelings about things.”

Early in the planning process, SFO officials held what they call a “barn raising” for the project. “This was really an exercise of getting SFO to set out the aspirations of what we wanted Terminal 1 to be,” explains Judi Mosqueda, director of project management, planning, design and construction for the airport. John Martin, airport director at the time, challenged those involved to “revolutionize the passenger experience,” but didn’t define



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for \$2.4 Billion

BY JODI RICHARDS

or direct staff on what that specifically meant. "That was for us to do collectively as SFO staff and stakeholders," explains Mosqueda.



JUDI MOSQUEDA

Four key qualities identified during that process became the guiding principles for Terminal 1: curated, crafted, community and quiet. "We've carried those qualities forward and check back in to

make sure we're meeting those original goals," Mosqueda says.

The airport divided the project into two separate pieces and contracts, Boarding Area B and Terminal 1 Center. Key components include:

- design and construction of the pre-security check-in lobby
- improvements to circulation and gate access in Boarding Area B, new passenger loading bridges and concessions



FACTS & FIGURES

Project: Terminal Reconstruction
Location: San Francisco Int'l Airport
Terminal: Harvey Milk Terminal 1
Cost: \$2.4 billion
Funding: \$64.2 million from TSA for baggage handling system; \$2.34 billion General Airport Revenue Bonds
Anticipated Completion: 2023
Major Projects: Terminal 1 Center; Boarding Area B
Timeline: 1st 9 gates, new consolidated TSA checkpoint & parts of Terminal 1 Center opened in July 2019; 9 more gates & south check-in lobby opened in May 2020; entire project expected to end in 2023

BOARDING AREA B

Size: 617,700 sq. ft. on 3 levels including MARS (multiple aircraft ramp system) stands
New Gates: 25 (including 4 int'l swing gates)
Amenities: 2 airline lounges, 1 common-use lounge; 19 food/beverage spaces, 14 retail spaces; SFO Museum exhibits; Children's Play Area; Pet Relief Room; 13 site-specific art commissions
Design-builder: Austin Commercial & Webcor Builders Joint Venture HKS/WoodsBagot/ED2 International/KYA
Construction Manager: WSP/AGS
Seating: Arconas; Vitra

TERMINAL 1 CENTER

Design-builder: Hensel Phelps/Gensler/Kuth Ranieri
Construction Manager: AECOM & Cooper Pugeda Management Joint Venture
Seating: Vitra
Shared-Use Technology, Resource Management Systems, Check-in Kiosks, FIDS: SITA
Dynamic Glaze Window: View Dynamic Glass
Automated Docking System: ADB SAFEGATE
Temporary Modular Walls: McCain Walls, supplied by PanAmar Inc.
Magnetic Stanchions: Lavi

- larger central concourse with an art gallery, food halls featuring local fare and integrated technology such as digital wayfinding/maps to facilitate passenger flow
- new mezzanine with connections to the AirTrain, public transit and Central Parking Garage
- new post-security corridors connecting to International Terminal A gates and Boarding Area C

The first nine of 25 gates in Boarding Area B opened last July, along with a new consolidated security checkpoint and part of the Terminal 1 Center. In May 2020, after a slight delay because of COVID-19, nine additional gates opened, as well as the south check-in lobby. When shelter-in-place orders were issued for California, SFO was just one week from moving into the second nine gates, Neumayr relates. While the pandemic has caused some construction delays, the project is deemed essential and has been able to continue. "From a time perspective, we've done fairly well, and I think we can overcome most of the issues," he states.

Laying the Groundwork

The Terminal 1 project required a substantial number of enabling projects, including the relocation of a firehouse, taxiways and

cargo facilities. "We started planning and executing those things in earnest around 2014," Neumayr notes.

The original 1960s Terminal 1 had received add-ons and updates over the years, relates Neumayr. One such project, labeled "temporary Boarding Area B," belied its name by lasting more than 40 years. In that time, it sank about 3 feet into the Bay mud, was at seismic risk and had reached the end of its useful life. "We had to completely renovate that terminal building to maintain any existence of what we had there as well as seismically upgrade the Terminal 1 facility, so it became economically our best choice," Neumayr explains.

Options for new construction are limited due to SFO's fixed footprint. "Because of our land constraints, we really did need to refurbish and expand Terminal 1 to serve our current needs," Mosqueda adds.

Big Project, Big Room

SFO officials chose to execute the \$2.4 billion project under two separate progressive design-build contracts—a delivery method that is allowing airport stakeholders to engage designers and builders in a single, safe environment throughout the process, says Neumayr.

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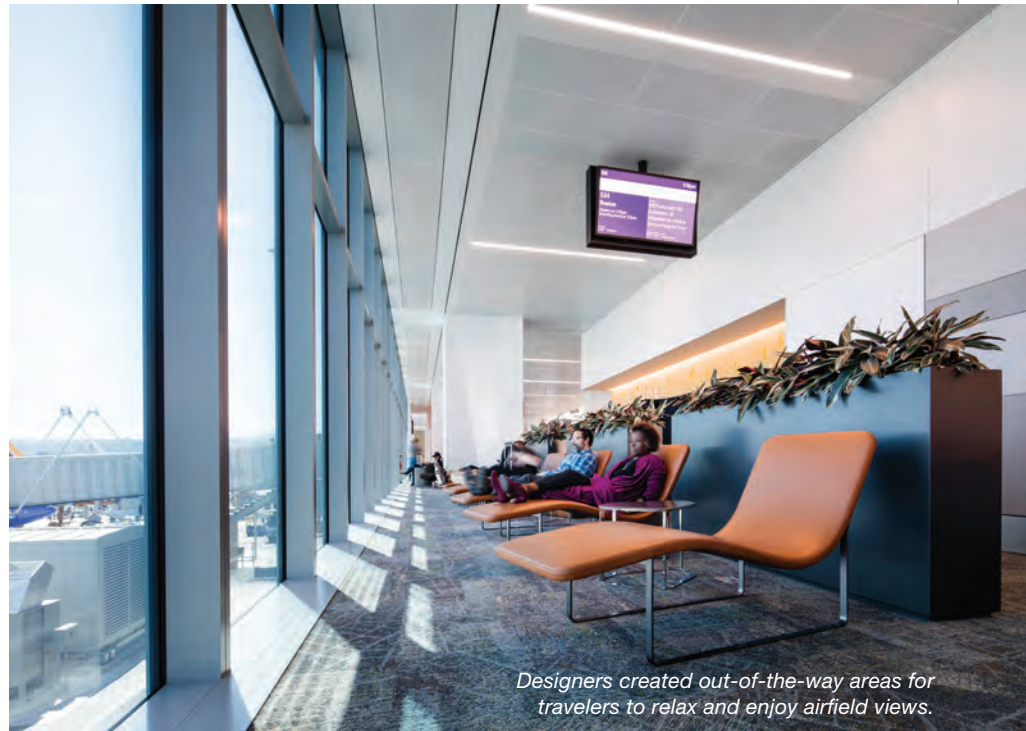
San Francisco International Airport, Harvey Milk Terminal 1

“When we went into this with two big design-builders required to work together, history told us that was one of the worst things we could do,” he relates. “We believe that building a partnership beyond the contract is much more effective, and strive for an integrative model.”

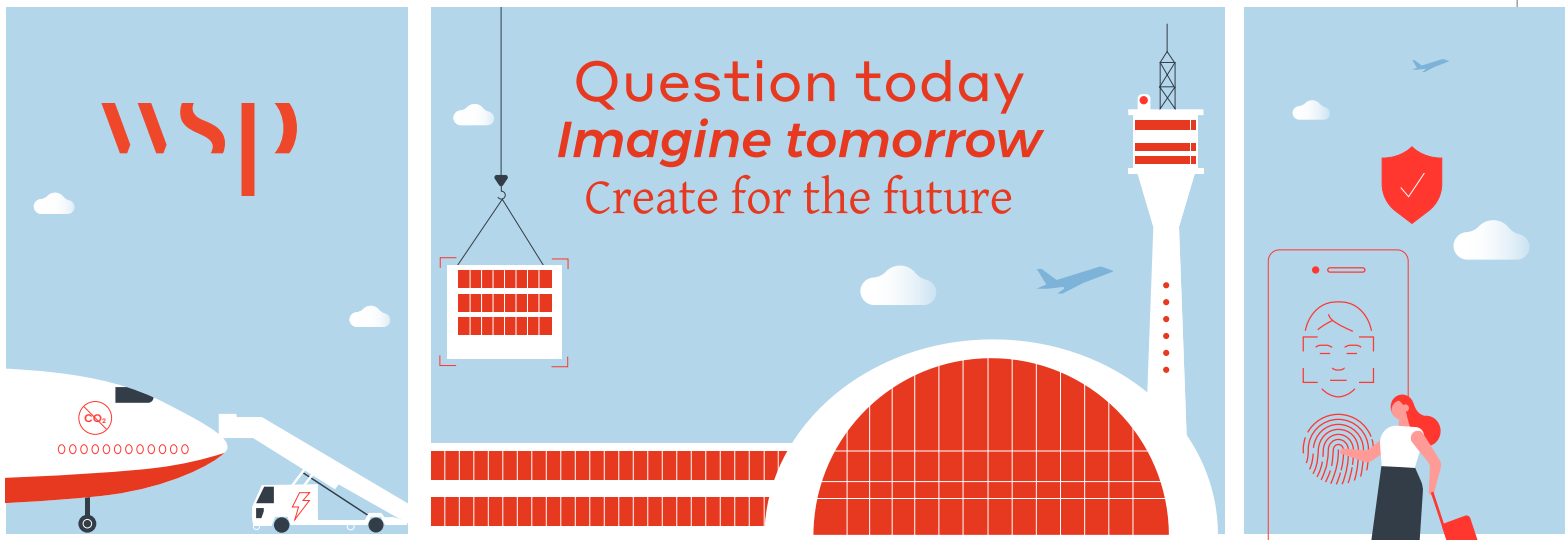
Mosqueda notes that the airport has been asked countless times why this project is not one contract. “At SFO, we always have a goal of supporting local businesses and sharing the wealth with the construction and design community as broadly as possible,” she explains.

The design-builder for Boarding Area B is Austin Commercial & Webcor Builders Joint Venture HKS / Woods Bagot ED2 International / KYA. The construction manager is WSP / Parsons Brinkerhoff / AGS.

The design-builder for the Terminal 1 Center project is Hensel Phelps / Gensler / Kuth Ranieri. Construction management



Designers created out-of-the-way areas for travelers to relax and enjoy airfield views.



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Lighting and shape changes in the ceiling provide subtle directional cues to passengers.



was awarded to AECOM & Cooper Pugeda Management Joint Venture.

Naturally, the separate projects contained elements that were interdependent. “One of the things that the project managers did exceptionally well was identify all the components that were linked between the two projects, and defined an MOU (memorandum of understanding) of committed deliverables that allowed both projects to be successful,” Mosqueda notes.

Much of that integrated planning and design occurred in what SFO calls the Big Room—a 30,000-square-foot building without any enclosed offices. The workspace, located inside an aircraft hangar, has room for 240 and is designed to encourage and support collaboration among partners on both projects.

“The Big Room was a huge success,” reports Kristi Hogan, senior project manager with AECOM. “Both teams have worked very collaboratively to deliver one project. A passenger wouldn’t know it was built by two different contractors, designed by two different designers.”

“We have a lot of stakeholders involved and, as a result, had multiple meetings to make sure everybody had an opportunity to voice their opinion and was made aware of what’s going on, what is expected and the progress of construction,” adds Henry Dumaran, senior program manager at WSP.

Instead of the traditional Primavera P6 method, SFO used a new method called Last Planner to work out commitments toward

schedule. “The idea is that we manage things that we can control and have a good idea of in the near-term,” Neumayr explains. “We are aware of what’s down the road, but focus on the next week ahead of us.”

The process encourages face-to-face discussion and problem-solving among project partners, he adds.

“By using Last Planner methods of exploring schedule, both the contractor and project manager have come to understand how they will meet schedule,” says Mosqueda. “That comes from that relationship-based method of working through project issues.”

Two Contracts, Holistic Design

Katy Mercer, principal and lead designer with WoodsBagot, notes that the design teams expanded on the key goals of curated, crafted, community and quiet to create a “quiet wow” inside Terminal 1. “It needed to be state-of-the-art, best-in-class in terms of experience, but in a quiet, subtle and calming way for the journey of passengers,” Mercer explains.



KATY MERCER

“The ceiling volumes are spacious, but there’s a calmness and ease of navigation through the terminal,” Mosqueda observes. “Passengers can see where they need to head, and they are accommodated each step of the way. And, we have created moments of surprise and delight.”

One example occurs in the boarding area, with a temporary 400-foot wall display dedicated to the life and times of the terminal’s namesake, LGBTQ+ leader and local politician Harvey Milk. “It’s a cool moment for passengers that reflects the culture and history of San Francisco and lets them know a little bit about



KRISTI HOGAN



HENRY DUMARAN

why the terminal was named after him,” says Mosqueda. The text and images of the exhibit, *Harvey Milk: Messenger of Hope*, will be on display for at least two years. The check-in lobby includes a more permanent display memorializing his legacy.

Mercer describes the design narrative of Terminal 1 as “Bay Area naturalism.” It begins outside at the curb with patterned glass reminiscent of Redwood trees, and carries through the children’s play area at the end of the Boarding Area B pier. Heritage oak tree trunks, sourced from a local heritage salvage company, anchor the interactive play area and provide a space for kids to climb and explore. The presentation is so artful, it appeals to older passengers, too, and also conveys Bay Area naturalism, says Mosqueda.

“Everything was brought back to natural materials, the play on light and integrative planting where possible,” she explains.

Local art throughout the terminal fulfills both aesthetic and wayfinding goals. “Marrying of the art and the space itself was quite successful,” notes Ryan Fetters, a Gensler principal. “They fit in nicely within the space so they don’t look like they were just tacked on at the end.”



RYAN FETTERS



A display just after the TSA checkpoint informs passengers about the terminal’s namesake.

CONGRATULATIONS

ACJV, a joint venture between AECOM and CPM Associates, is proud to work with the City and County of San Francisco in delivering the Harvey Milk Terminal 1 Project at the San Francisco International Airport. For the replacement of one of the oldest terminals at the airport, the joint venture team is providing project management support services, including project and construction management, project controls, special inspections, resident engineering and special systems support.

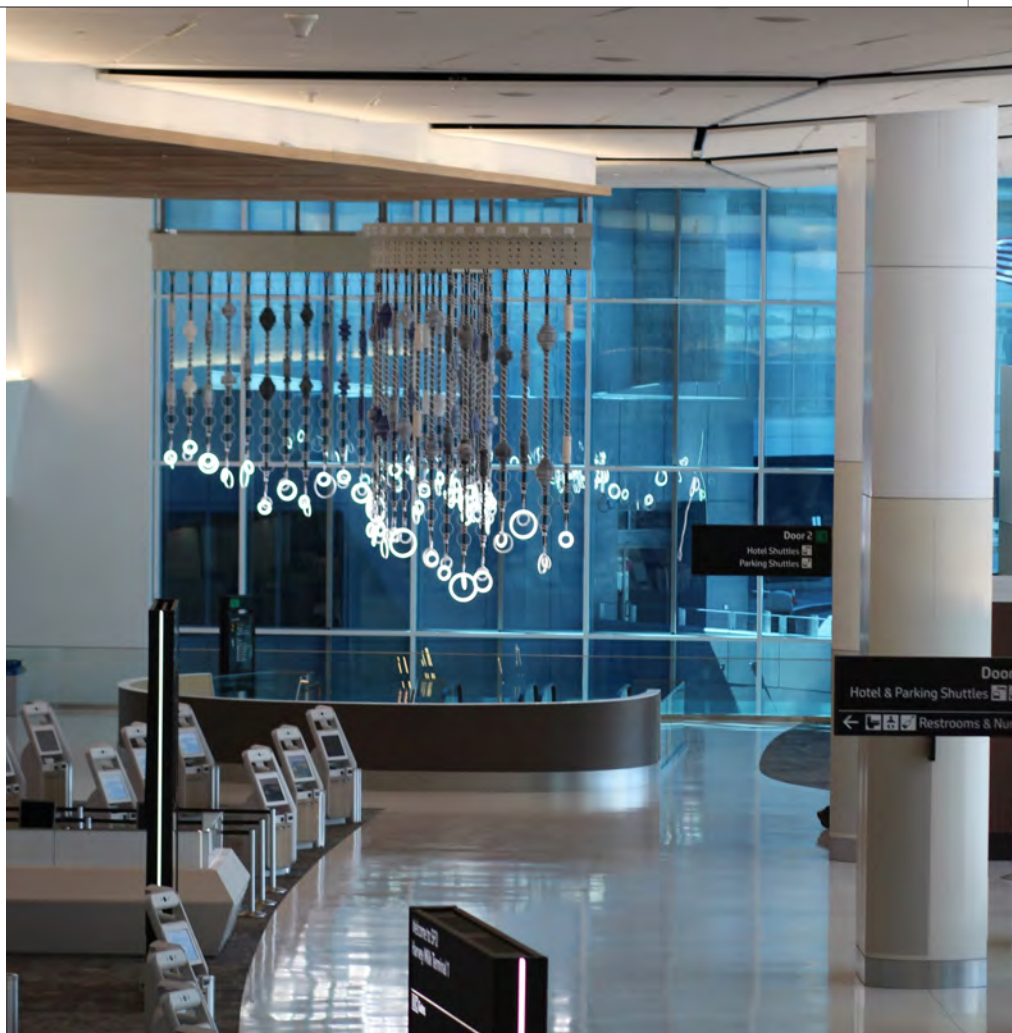


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Restroom clusters include male, female and all-gender facilities.

Terminal 1 Center Construction

Phasing of the Terminal 1 Center started with tearing down and reconstructing the south portion of the terminal, while the north portion remained operational for Southwest Airlines, JetBlue Airways and Delta Air Lines. In May 2020, the south portion was activated and Southwest, JetBlue and American Airlines moved into the newly constructed area while work kicked off on the north portion.

SFO provided five principles to guide the design: romance of travel, unique Bay Area, health and wellness, ease of travel and fun discovery/delight.

Fetters points to the inglenooks off the ticketing/circulation area as a successful application of the design goals. Seating nestled into some of the recesses allow travelers to rest, relax and even catch a glimpse of the rest of the airport through a glazing wall between landside and airside.

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Three large skylights provide daylighting in the tremendous space as well as intuitive wayfinding, he adds.

The layout of the terminal is designed to be flexible enough to allow for spikes in demand or future capacity needs, while also providing a visually pleasing experience for travelers. For example, in the security checkpoint area, a grid layout with magnetic stanchions supplied by Lavi allows the airport to expand the space to include up to 10 queuing lanes in 6,000 square feet, while a large local art piece hangs overhead to visually enhance the area. “Those kind of planning concepts lead to opportunities for that passenger experience and creating that right-sized space so you have the flexibility in the future to take on the demands,” Fetters says.

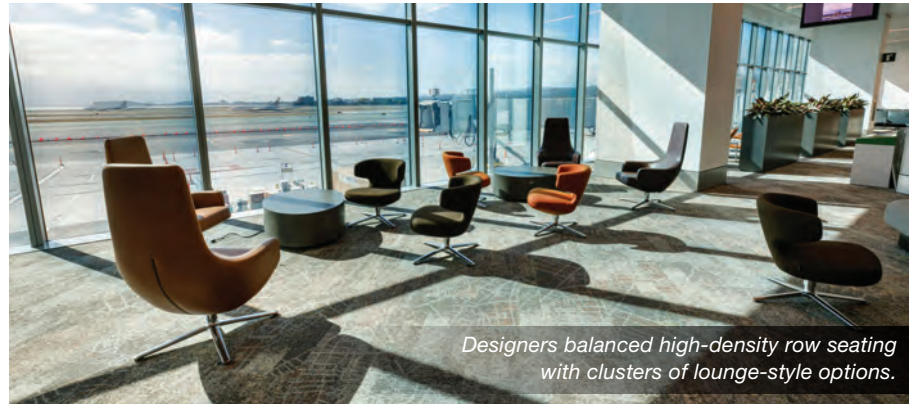
Future flexibility was a consideration for curbside design as well. “We spent a lot of time thinking that through—not just how we get through what we’re doing today, but what the future might look like,” Neumayr says. For example, as passenger processing evolves, the start of ticketing and baggage processes may move from inside at traditional ticket counters to outside at the curb. “So we began to build all those possibilities into the building to create the full opportunity that you could actually manage the passenger at the curb,” he explains. To that end, the former 8-foot or 10-foot-wide curb space for drop off is now 20 feet wide, which allows more space for passengers to gather themselves before entering the terminal building.

The emphasis on flexibility for operations is evidenced by the installation of shared-use technology from SITA called Flex. “That provides a lot of flexibility as airlines come and go, expand and contract,” Neumayr notes.

SITA Flex is common-use technology designed to facilitate contactless passenger processing, improved operational efficiency and a seamless, enhanced experience for travelers. “Flex is a cloud-based system that allows an airline to use its proprietary applications and then also allows the airline to develop, for example, their mobile applications to give more autonomy to passengers,” explains Edward Bauer the company’s vice president for Western North America. For example, passengers



EDWARD BAUER



Designers balanced high-density row seating with clusters of lounge-style options.



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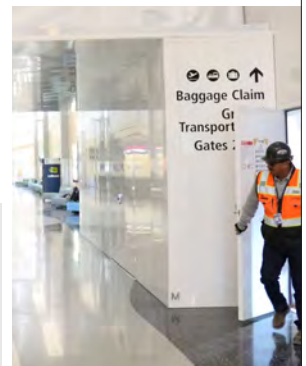
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Building for Boarding

Sophisticated phasing has been critical on the Boarding Area B project, Neumayr notes, because it needs to be constructed with minimal impact to operations. When complete, the area will be 617,700 square feet and span three levels. Moreover, it will include two airline lounges, one common-use lounge, 19 food and beverage spaces, 14 retail spaces, SFO Museum exhibits, a children’s play area, pet relief room and 10 site-specific art commissions. Seismic enhancements for Boarding Area B include supporting the structure with 100-foot-deep piles.

A temporary refurbishment of Boarding Area B allowed Southwest and Frontier to operate there during construction. On the ramp, all parking positions were removed, and crews constructed the new pier alongside the existing pier. “We’ve carefully done these puzzles, piece-by-piece, where we carve out a construction zone, shut down the operations of that area, move airlines around to accommodate them while we build our new structure,” Mosqueda relates.

Although the approach elongates the construction timeline, it also helps SFO keep its airlines operational and passengers comfortable throughout the project—even in temporary facilities.

Phasing discussions included detailed planning to ensure minimal negative impact to passengers, says WSP Design Manager Franco Marinaro. Specific topics included locations for temporary walls, what they should look like and how they might impact passengers’ ability to find their way through the terminal. “Each iteration of the multi-phased project is something that needs to appear as a finished project,” Marinaro relates.



FRANCO MARINARO

“We could not simply shut down the existing facility,” he says. “It was not easy and was a major driver to how and where the project was broken apart and how we looked at trying to maintain a level of service that the airport was comfortable with.”

Crews installed more than 1,000 linear feet of McCain Walls throughout the project, including at TSA checkpoints and automated screening lane areas to separate secure areas from non-secure areas. Thomas Osborne, project superintendent at Hensel Phelps, notes that the modular walls were easy to

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reconfigure from one purpose to the next, and supported SFO's sustainability goals because they will be reused during the next phase of the project, which is slated to begin in the fall.

When fully complete, Boarding Area B will increase SFO's operational efficiency with the addition of swing gates. Neumayr notes that this was important, as international traffic continues to grow, increasing 7% from 2018 to 2019. A sterile corridor connecting Terminal 1 to the Federal Inspection Station will allow gates to serve both domestic and international flights. "That gave us a creative and economical way of gaining international gates," he notes.

Architecturally, the ceiling and terrazzo flooring were crafted to naturally guide passengers through the concourse, continuing the intuitive wayfinding that directed them as they first entered Terminal 1.

Mercer explains how it works: Soft curves in the ceiling use light to gently guide passengers down through the concourse, while a strong curve at the bend naturally pulls them around the corner and down the pier. A large commissioned art sculpture hanging within the carved ceiling acts as a key landmark. In the middle of the pier, carved boomerang shapes over the moving walkways are indirectly lit, creating soft, subtle directional

This hanging sculpture performs double duty as a wayfinding element.



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encouragement. At the end of the pier, large sculpted carved clouds adorn the ceiling, creating a sense of arrival within the two-story volume and cueing passengers to slow down, relax and enjoy the available amenities.

The guiding flow of the ceiling is echoed in the terrazzo floor pattern, with darker colors used to anchor concession spaces. Small golden highlights were incorporated into some parts of the terrazzo to help indicate important areas.

“The highlights kind of insinuate, very subconsciously, that this is a place in the journey you’re going to want to pull off the concourse or start to pay attention,” Mercer explains. “So whether it was amenities like restrooms or specific gates, the yellow was sprinkled along these carves in the floor to help with indirect wayfinding.”

The holdrooms feature diverse seating options for various passengers, such as business travelers, families, elderly travelers, etc. The design team carefully examined what type of seating each might want/need to be most comfortable, says Mercer. That yielded everything from two- to four-person booths with integrated power to high-back lounge chairs around a powered coffee table against a window to fully powered community tables with integrated lighting. “The amount of high-density seating in

relation to lounge-type seating was a real balance to how we were thinking about each guest experience,” Mercer relates.

Because the terminal includes shared-use technology, the millwork is designed to accommodate any airline’s equipment. Designers also carefully considered the layout of gates to ensure maximum flexibility and efficiency for all airlines, notes Mercer. For example, Southwest uses pylons for boarding, while other carriers do not. The holdrooms and furniture near gates are designed to keep queuing off the concourse, and also allow arriving passengers to exit aircraft and navigate away from the gate area.

Holdroom flooring includes a grid of power under the carpet tile to provide airlines with the option to rearrange their equipment, etc. “Everything is basically plug and play,” says Mercer. “We built in that flexibility so that it could be shifted over time and not be a hinderance to SFO or the airlines.”

Flexibility and technology combine on the ramp outside Boarding Area B, where SFO deployed the Safedock T1 Advanced Visual Docking Guidance Systems and SafeControl Apron Management integration software from ADB SAFEGATE. The goal is to help optimize the airport infrastructure through more efficient and smoother operations.

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The project team focused on marrying artwork with the facility architecture.



SFO's Sustainability Scene

Beyond adding improved capacity and seismic resiliency, Terminal 1 is now incredibly energy efficient, Neumayr reports. "It's something we're extremely proud of, and it will help us financially over the long haul."

From choice of materials to electrical distribution, the project teams "turned over every stone" to incorporate sustainability into the new facility, he says.

"We were thoughtful about every element to reduce energy and make it as sustainable and as healthy for occupants as possible," agrees Mosqueda.

In terms of energy use intensity (EUI), airport terminals typically rate around 140. The goal for SFO's new Terminal 1 was 80, but multiple features have it tracking closer to 65 EUI. "That is an amazing reduction in energy use in a new, sustainable building," she emphasizes.

Neumayr cites dynamic glazing as one of the building's most impactful sustainable features, and View Dynamic Glass covers 112,000 square feet of windows. As the sun moves east to west across the building, the glass reduces heat-gain and glare, and improves comfort by lightening and darkening automatically.


In a similar vein, moving walkways feature a go-slow mechanism to reduce energy consumption when they are not in use; and elevators include a regenerative element that returns power to the

grid as they descend. An air displacement system, also in use in Terminal 2, conditions air only at the passenger level.

Mosqueda notes that the heat/venting/air conditioning system is highly efficient, with components specifically chosen for the health and well-being of people in the terminal as well as energy reduction.

In addition to striving for Gold-level Leadership in Environmental Energy & Design (LEED) certification, SFO is pursuing certification from the International WELL Building Institute and Fitwel.

The WELL Building Standard is a third-party performance and evidence-based system for measuring, certifying and monitoring built environment features that impact human health and well-being. Key attributes are: equitable, global, evidence-based, technically robust, customer-focused and resilient. Fitwel is a third-party building certification system that sets standards for design features and operational strategies that support improved human health in the built environment. "It really gets into the building and makes sure both passengers and employees are comfortable and have opportunities for mental well-being as well as physical," Mosqueda explains.

Looking ahead, officials expect the International Connector, seven additional gates and the swing gates to be operational in the second quarter of 2021. The entire initiative should be complete by the end of 2023. 

SUMMERFEST



MARKET

Milwaukee Int'l Adds Indoor Beer Garden, Coat Check Service & Other Local Concessions

BY VICTORIA SOUKUP

FACTS&FIGURES

Project: Concessions Overhaul

Location: Milwaukee Mitchell Int'l Airport

Scope: 22 new retail & food/beverage outlets

Cost: \$10.5 million (\$7 million retail; \$3.5 million food/beverage)

Timeline: 6 months of concept/design work; about one year of construction

Completion: Summer 2020

Food & Beverage Concessionaires: HMSHost; SSP America

Retail Concessionaire: Paradies Lagardère

Contractors: Triad Construction; Campbell Construction; Horizon Retail; Ott Development; Podojil Builders

Design: Haag Müller (Starbucks, Cousins Subs in Concourse C); O'Kelly & Kasprak, LLC (Barons' Beer Garden); SmartDesign Group

Of Note: Construction/location openings scheduled to accommodate traffic associated with Democratic National Convention & Ryder Cup golf tournament



Nothing inspires house cleaning and redecorating like company coming to visit. Officials at Milwaukee Mitchell International Airport (MKE) went one step further and completed a \$10.5 million concessions overhaul to prepare for a series of important guests expected to arrive soon.

Finishing the comprehensive update on schedule was especially important because the city has several high-traffic, high-profile events on the calendar for this summer and early fall. Beyond its usual series of ethnic celebrations and the Summerfest music festival on the shores of Lake Michigan, Milwaukee is also slated to host the Democratic National Convention in August. In addition, nearby Kohler is the site for the 2020 Ryder Cup, an international golf event scheduled in mid-September.

Together, the marquee events have the potential to boost traffic well beyond the 7 million passengers MKE served last year, and each presents a rare opportunity to

showcase the airport's facilities to visitors from around the world. Naturally, COVID-19 could change everything, but airport executives remain positive.

"We had been contemplating a change in the concessions program, and it was time," notes Airport Director Brian Dranzik. "Our new retail shops now have a much bigger emphasis on handcrafted and locally made products. Travelers will also notice a wider variety of food items, including more healthy food choices and options for people with allergies or special dietary needs. These new locations will offer a greatly enhanced experience compared to many other airports."



BRIAN DRANZIK

In total, the airport added 22 new retail stores and food/beverage options, including an indoor beer garden modeled after the



popular outdoor versions in Milwaukee County parks. The facelift was completed earlier this summer after about one year of construction. The terminal's overall footprint, however, was not expanded.

Strong Emphasis on Local

The airport worked with Paradies Lagardère, SSP America and HMSHost to establish the new concessions lineup. Together, they focused on proven national brands and local brands with a strong Milwaukee following.

“We wanted to emphasize utilizing local in the program, and the teams went out and did a really nice job of getting participation from Milwaukee companies,” Dranzik says. “We felt it was important to have the local flavor come through.”

Pat Wallace, vice president of business development for Paradies Lagardère, notes that a tight timeline kept the project team energized. “Originally, the DNC was the driving force behind the schedule,” Wallace says. “This aggressive schedule required coordination and cooperation from all parties involved, so we created a plan that



PAT WALLACE

included five phases utilizing two general contractors working simultaneously on multiple locations.”

Changes are most visible in the terminal's largest retail footprint: a pre-security area with tall ceilings that gets flooded with natural light. The new Summerfest Marketplace fits right in with a bright, cheerful color scheme and smiley face logo from the music festival it helps promote. The shop's cream city brick façade is similar to the exteriors on many historic buildings throughout Milwaukee.

In addition to selling standard snacks and travel items, the store stocks products from local artisans. “Smaller vendors sometimes can't afford a store footprint, so we have included them in this and other retail spaces in the airport,” Dranzik says.

Paradies Lagardère highlights the local components of MKE's retail program with “Meet the Artisans” placards that share information about vendors from the Milwaukee area. “Travelers will certainly get a true taste of Wisconsin with Jim's Cheese, founded in Waterloo in 1955, and Linden Studios, which creates hand-made wood-burned art reflecting what is unique about Wisconsin,” explains Wallace. He also cites the Oil & Ash Soap Company, which began its natural bathing products business from the basement of the owner's home in Milwaukee's North Point neighborhood.



Local brands and beers figure prominently into the new concessions lineup.

Wisconsin-Style Amenities

In February, MKE introduced a coat check service for travelers leaving the area’s cold winter weather for warmer destinations. To save valuable luggage space, travelers can check their heavy coats at the pre-security Summerfest store for \$2 per day. Like some parking valets, store employees collect customers’ return flight information to expedite the pickup process.

The service, available December through March, was apparently an immediate hit. “We got a lot of great comments and positive reaction to it,” Dranzik reports.

Across from Summerfest Marketplace are two other shops with local angles: Miller the Brewery Shop pays homage to the history of the famous Milwaukee-based beer producer, and the PGA TOUR Shop plays off Wisconsin’s ranking as one of top 10 states for golf according to Golf Advisor. “It was an easy choice to carry forward our PGA TOUR Shop,” notes Wallace.

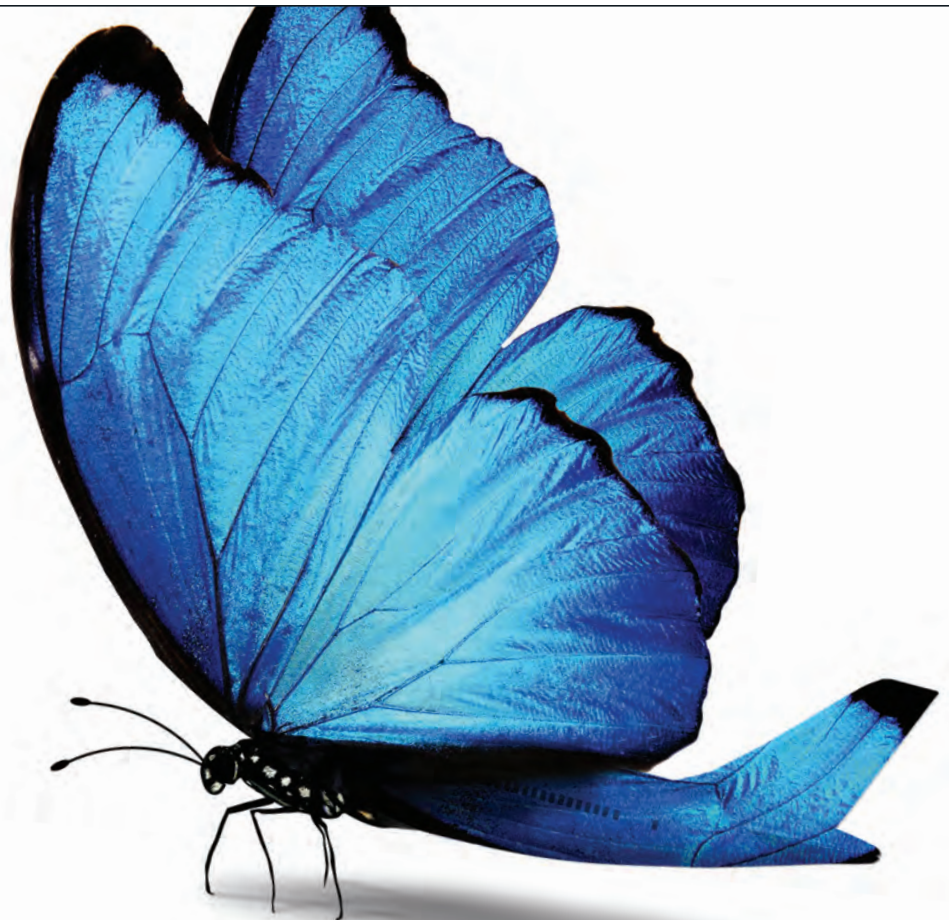
MKE Streetside Market, a new option for fresh and packaged food items, is adjacent to the existing Miller Brewhouse bar and restaurant, which features airfield views.

Accommodating the new retail spaces meant moving the Mitchell Gallery of Flight museum and the USO Lounge. Previously, the museum was tucked away in a corner, and the lounge was only available to travelers using one of MKE’s two operational concourses. Now, both amenities are centrally located and much more visible. “The new lounge makes it more useful for both C and D concourse travelers and has a larger footprint,” says Dranzik.

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One of the more noteworthy additions to post-security concessions is Barons' Beer Garden, which serves beer and food throughout the day in Concourse C.

"We thought it would be unique to have a Milwaukee flavor in that location, given the popularity of outdoor beer gardens here in Milwaukee County," Dranzik explains. "By cobranding it with our park system, we are giving travelers an idea that there is a wonderful Milwaukee County Parks System that they could venture out and enjoy."

Cousins Subs, a food and beverage option added to Concourse C, also has strong ties to the area. The regional chain of sandwich shops was originally founded in Milwaukee.

The airport opted to recognize some of its city's prominent neighborhoods with original retail and food/beverage storefronts such as the Bay View Exchange, Bronzeville Crossing, Miller Valley Market (featuring goods associated with Harley-Davidson motorcycles), and the Garden District Kitchen & Bar, which is named after the area where the airport is located.

"I am proud of this because those were locations where we could have easily installed generic concessions storefronts," Dranzik comments. "Instead, we incorporated some of the neighborhood concepts of Milwaukee."

Paradies Lagardère felt that a strong "sense of place" was critical for the project's success. "Our team and the airport spent months and months researching and then partnering with the most iconic brands, elements and neighborhoods in the Milwaukee area," Wallace explains. "The brands and areas we selected—and their people—are the heartbeat of the Milwaukee area, so we absolutely *had* to include them in our program."

Above all, Wallace knew that representing Milwaukee and Wisconsin is impossible without paying tribute to the Green Bay Packers. And Milwaukee Bucks. And Milwaukee Brewers. And the University of Wisconsin Badgers. That's where The Scoreboard comes in—a retail shop that carries all sorts of sports gear and fan items, including a Green Bay Packers helmet adorned with more than 12,000 hand-placed Swarovski crystals. In Wallace's mind, The Scoreboard was an essential retail concept for MKE. "A tradition-filled, die-hard sports city like Milwaukee warrants a centerpiece like this," he says.

National retail brands new to the airport will include Spanx and No Boundaries.

The airport's new agreement with Paradies Lagardère includes 30% participation from local Disadvantaged Business Enterprises, which exceeds the county's goal of 25%. "This partnership highlights Milwaukee County's commitment to racial equity by supporting local businesses owned by women and people of color," says Chris Abele, Milwaukee County executive during most of the project.

COVID Curveball

Like so many other airport projects, MKE's concessions overhaul was affected by the COVID-19 pandemic. In fact, the disease was spiking in Wisconsin just as crews were completing their work inside the terminal.

Dranzik, who has been head of the airport for nearly three years, notes that Barons' Beer Garden was set to have its grand opening when air traffic dropped precipitously. "But other construction continued on," he says. "We were going into 2020 anticipating a real positive year from the standpoint of all the things going on in the community. Now, we are adjusting and monitoring the situation as best we can, and hopeful we can still carry on with the events and be ready for them."

As of press time in early June, the Democratic National Convention was still moving forward, perhaps in a scaled-back version; and tee times had not been cancelled for the Ryder Cup. But even if COVID-19 disrupts plans for those two premiere events, MKE will be well positioned to serve other travelers visiting the Milwaukee region this year, and in many years to come. In October, the *Wall Street Journal* declared Milwaukee one of top 10 places to visit in 2020, citing the city's five semifinalists for the 2019 James Beard Awards, the Milwaukee Symphony Orchestra's new home and America's Black Holocaust Museum. Moreover, Airbnb announced that Milwaukee is its top trending destination in the world for 2020.

"We feel the stores that have opened to date were met with excitement by travelers and, prior to COVID-19's impact on our industry, were enjoying much success," Wallace reflects. "We absolutely love the final lineup we are delivering." ✈️

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Oakland Int'l Creates Task Force to Prepare for Current & Future Passengers

BY JENNIFER DAACK WOOLSON

OAKLAND
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FACTS&FIGURES

Project: Modifying operations during COVID-19 pandemic

Location: Oakland (CA) Int'l Airport

Owner: The Port of Oakland

Strategies: Implement processes, protocols & equipment to help minimize spread of COVID-19; encourage & plan for safe air travel; enhance comfort among current & future travelers

Timeline: Resiliency Task Force launched in early April 2020

Task Force Members: 15-20 OAK representatives from a variety of airport departments (communications, marketing, property, terminal services, ground transportation, facilities, airside security departments) & Port of Oakland employees

New Disinfecting Equipment: Clorox Total 360 Electrostatic Sprayer System

Cost: \$4,300

New Testing Equipment: 3M thermal reader, which shows how recently surfaces were disinfected

Cost: \$1,800

Enhanced Cleaning: Waxie, Starline, Veritiv & Home Depot products for disinfecting high-touch surfaces; intense attention to areas such as bottoms of chairs that are difficult to clean during high-traffic times

Tactical Strategies: Signage & floor decals to encourage social distancing; plastic glass shields to protect staff; suspension of high-exposure operations such as taxi stands, employee shuttles & volunteer ambassador program



In mid-March, just as most of us started using the phrase “social distancing” and began wondering how the impending shelter-in-place orders would affect our states, Oakland International Airport (OAK) in California was dealing with one of its first “unprecedented” events related to the COVID-19 pandemic.

Its mission: prepare to receive 3,500 beleaguered passengers and crew members from a Grand Princess cruise ship with numerous people who tested positive for coronavirus. After the ship diverted to the Port of Oakland, the massive group traveled by bus to OAK, where U.S. citizens boarded flights to military bases in Texas and Georgia for quarantine, and others boarded chartered international flights. (The Port of Oakland owns and operates both the seaport and OAK.)

Craig Simon, acting assistant director at OAK, was a key part of the operation. While working in the airport’s Emergency Operations Center, he was just coming to grips with how the pandemic would affect life as we know it. In retrospect, he says that having to manage the unknown so early gave his team a head start figuring out how to prepare the airport to deal with its new normal.



CRAIG SIMON



“It really gave us an opportunity, which we hadn’t had in the past, to make some solid contacts within the U.S. Department of Health and Human Services and to build on our current contacts with CDC and Alameda County Health,” says Simon. “It gave us an opportunity to sit down with them and have those discussions, comb through our pandemic plan, and make adjustments to it.”

Staying on Task

Accommodating passengers from the rerouted cruise ship was one of several key events that inspired OAK to create its Resiliency Task Force, which launched in April. The internal team is comprised of 15 to 20 OAK employees from communications,

marketing, properties, terminal services, ground transportation, facilities, airside, security and other departments. The group meets every Friday via Zoom to discuss and delegate ideas to help minimize the spread of COVID-19, encourage and plan for safe air travel, and find ways to make sure current and future travelers feel safe.

The other main factor that triggered the task force was declining passenger traffic. Keonnis R. Taylor, OAK’s aviation communications and airport



KEONNIS R. TAYLOR

spokeswoman, reports that April 2020 traffic was 96% lower than April 2019. The airport is seeing an uptick, however, and forecasts for May and June are both trending positively, with 37% indicating that passengers *do* plan to travel this summer. Taylor says that the airport is taking advantage of low passenger volume to perform intensive cleaning activities that will become more difficult as the terminal gets busier.

Simon notes that the task force’s efforts are helping OAK position itself for the return of a significant volume of passengers. “We were looking to create a large, diverse group from different departments to put their heads together to come up with some really thoughtful ideas about how we could position ourselves better,” he says. The group created a spreadsheet to brainstorm, implement and track both front- and back-of-house operations, from curbside drop off protocols to safe social distancing inside the terminal to baggage screening.

In addition to enforcing the Alameda County Health Order requiring the use of face coverings for all staff and passengers, that team has:

- Installed social distancing markings on the floors
- Reconfigured queue lines at ticket counters and security checkpoints with stanchion toppers providing social distancing instructions
- Installed plastic glass cough and sneeze guards for ticket counters,

boarding gate counters and Customs and Border Protection counters

- Evaluated heating/venting/air conditioning systems to ensure compliance with CDC recommendations for turning over and filtering air
- Adjusted gate, seating and staffing plans to allow social distancing in the terminals
- Temporarily suspended high-exposure operations such as taxi stands, employee shuttle bus services and the Volunteer Ambassadors Program
- Procured new cleaning and disinfecting equipment and supplies
- Adopted enhanced cleaning and disinfecting practices

The heightened cleaning protocol that began in early March has kept OAK Terminal Services Manager Stacy Mattson extra busy. Just before the new



STACY MATTSON

practices were needed, the custodial team’s superintendent told Mattson the airport needed to start ordering extra supplies immediately. “I can’t tell you how thankful I am that he did that,” she muses.

Mattson says if OAK had waited just two more days, they wouldn’t have had access to the amount of EPA-approved disinfectant cloths and other supplies her staff needs to handle frequent cleaning of all of the airport’s touchpoints. OAK also recently invested \$4,300 in the Clorox Total 360 System, which uses an electrostatic sprayer to disinfect the front, back and sides of surfaces. The airport purchased two machines, which use a special Clorox chemical, for large spaces like holdrooms. The system also includes several backpack systems custodians wear to spray medium-sized spaces like restrooms, as well as handheld devices for smaller spaces.

As an additional quality control measure, the airport uses a 3M brand thermal reader that workers place on

ticket counters, armrests, restroom counters and other frequently touched areas to indicate how recently a surface was disinfected. The scanner cost about \$1,800.

Mattson is pleased with how the frontline custodial staff is rising to the occasion. “They really care about our airport being the cleanest airport in the Bay Area,” she says. “I think they just cannot wait to see customers come back.”

OAK has had to look beyond off-the-shelf solutions, too. For example, the type of interaction that occurs at Customs and Border Protection counters—using cameras and fingerprint readers as well as checking documents—required a unique configuration of plastic and glass shields. The task force used internal resources to build clear barriers to provide extra protection for agents as they perform their tasks, and billed the Facilities Department for the production time. Custom shields are also in the works for gateside podiums throughout the terminal.

Partners in Prevention

As might be expected, the Resiliency Task Force has evolved and expanded since it formed in March. As far as Simon and Mattson are concerned, the more the merrier.

“It just brings additional horsepower and gives us a little more traction when we need to move on something,” says Simon. Since most of what the task force is doing costs money, having more people to guide decisions is important, he adds.

The task force is also collaborating with OAK’s airline partners and tenants about their concerns and ideas. For example, if concessionaires want to add branding to their social distancing floor stickers, Simon encourages them to do so. “It’s about working on those relationships to make sure they and their employees are comfortable,” he says.

The airport also helped out one of its biggest partners, Southwest Airlines, providing support in keeping their employees at safe social distances in crowded break rooms. The task force found new spaces inside and outside the terminal for crews to relax between flights.

Pivoting Toward the Future

Mattson notes that operational managers like she and Simon excel at reacting to whatever needs immediate attention. “In an airport environment, that’s just kind of the way it works,” she says. In the very midst of their COVID-19 response, they realized they also needed to start thinking about what the airport would need in two

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weeks, four weeks and beyond. “It’s not going to look like this,” acknowledges Mattson.

Although they both know passengers will return slowly, they also know that even a slow return while managing social distancing, enhanced cleaning and everything else they’ve put in place for passenger safety could be problematic if they don’t plan carefully. That planning includes determining which new systems, equipment and processes are short-term measures and what changes should be kept in place indefinitely.

“Having a touch-free experience is going to be something people will always appreciate—even in a post COVID-19 environment,” Mattson offers as an example.

Ensuring that employees feel comfortable returning to work is an important objective for the task force, adds Simon. He says this is particularly important because the “new normal” isn’t just something they’re dealing with at the airport. “This is something that we are all also dealing with at home,” he says. “There are a lot of emotions and a lot of anxiety. But the group that we are working with has really done all they could to set aside everything that is happening out there and concentrate on the things we can do that will really help instill confidence in our passengers as they come back into the terminal.”

Taylor’s communications plan is forward-focused as well. OAK’s message has been one of hopefulness vs. gloom and doom—something she says even reporters and news anchors are appreciating. And she’s optimistic that passenger traffic will continue to rise throughout the summer. “We’re adjusting our approach so that we’re communicating with our customers and our internal stakeholders in the most effective and efficient way,” she notes. “We’re also communicating with our headquarters downtown at the Port of Oakland, and working with them to amplify our messaging and to make sure we are coordinated on our approaches.”

The bottom line: OAK is cleaner than it has ever been. “We want passengers to know, when they come into the airport, they can be confident that the places they’re touching, eating and sitting have been cleaned two or three times over,” she relates. “Quality control is very strong.” 



New cleaning strategies are in place for high-touch areas.

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FACTS&FIGURES

Project: Optimized Baggage Handling System

Location: Seattle-Tacoma Int'l Airport

Cost: \$540 million

Funding: \$93 million TSA grant; \$447 million airport development funds

Strategy: Combine six separate systems into a single consolidated system within the existing footprint

Key Components: 10 miles of conveyor with redundant track; explosives detection screening (EDS) machines from Smiths Detection; mobile inspection tables from Morcon; 600 motors & gear reducers in Phase I, with 4,000 motors expected when all phases are complete; switch-rated plugs and receptacles from MELTRIC Corp.

Processing Capacity: Up to 8,200 bags/hour once all EDS equipment is installed; system is expandable to serve up to 60 million passengers/year

Phase 1 Prime Construction Contractor: PCL Construction

Main Phase 1 Subcontractor: Daifuku Airport Technologies-Jervis B. Webb Co.

Other Contractors: Control Touch Systems LLC (now Intellimodus LLC); Veca Electric & Technologies; M.D. Moore Co. Inc.

Seattle-Tacoma Int'l Optimizes Baggage System with Cutting-Edge Screening Technologies

BY RONNIE WENDT



An updated logo referencing the Pacific Northwest is a graphic symbol of what's new at Seattle-Tacoma International Airport (SEA). But its most impressive new offering is a back-of-house system few will ever see.

SEA, operated by the Port of Seattle, just completed the first phase of a \$540 million outbound baggage handling project to help it meet current and projected passenger growth. The new system will eventually replace six current individual baggage systems with a centralized handling system that increases efficiencies, including the use of fewer state-of-the-art explosives detection screening (EDS) machines. Ergonomic

inspection tables and new conveyors are other key components.

The time was right for optimizing the baggage system, reports SEA Program Lead Ed Weitz. As the airport ballooned with 39 airlines serving 91 non-stop domestic and 27 international locations, its aging baggage system struggled to handle all of the additional suitcases, duffle bags, baby seats and other items passengers were checking.



ED WEITZ

“We projected that we would hit 45 million passengers in 2027, but exceeded that projection in 2019,” Weitz explains. Last year, SEA served 51.8 million passengers and moved 453,549 metric tons of cargo. On its busiest day, the airport processed 43,000 outbound bags.

Fortuitous timing enabled the airport to pick up \$93 million in TSA reimbursable grants for the project. Just as passenger bags began exceeding the current system’s capacity, TSA launched a funding program that encouraged airports to swap out aging EDS machines with state-of-the-art versions. The TSA program awarded funds to airports with projects that decreased the number of screening machines needed, and SEA fit the bill with a design that moved from 28 to 16.

“We have installed eight machines so far,” Weitz reported in May. “They run as fast as the old system with better security and other enhancements, and we will add the rest of the machines as we grow.”

Like other airports, SEA was able to use the special TSA grants for screening equipment and associated conveyor pathways, but not brick and mortar elements, which represented the lion’s share of costs.

The airport is budgeted to spend \$447 million of its development funds to eventually streamline 10 miles of conveyor and wiring, update telecommunications systems, and consolidate six screening systems into a single centralized version. “We can now input a bag at any airline ticket counter, send it through the screening system to a makeup device, and then send it out to any airline throughout the facility,” Weitz says.

The new system vastly improves processing speed, with each EDS machine scanning and analyzing up to 680 checked bags per hour. The centralized system also meets minimum connect-time goals and is designed to boost energy efficiency by up to 30%. “The system runs twice as fast as our old system, offers far better security, is safer for workers, and will meet our needs well into the future,” Weitz summarizes.

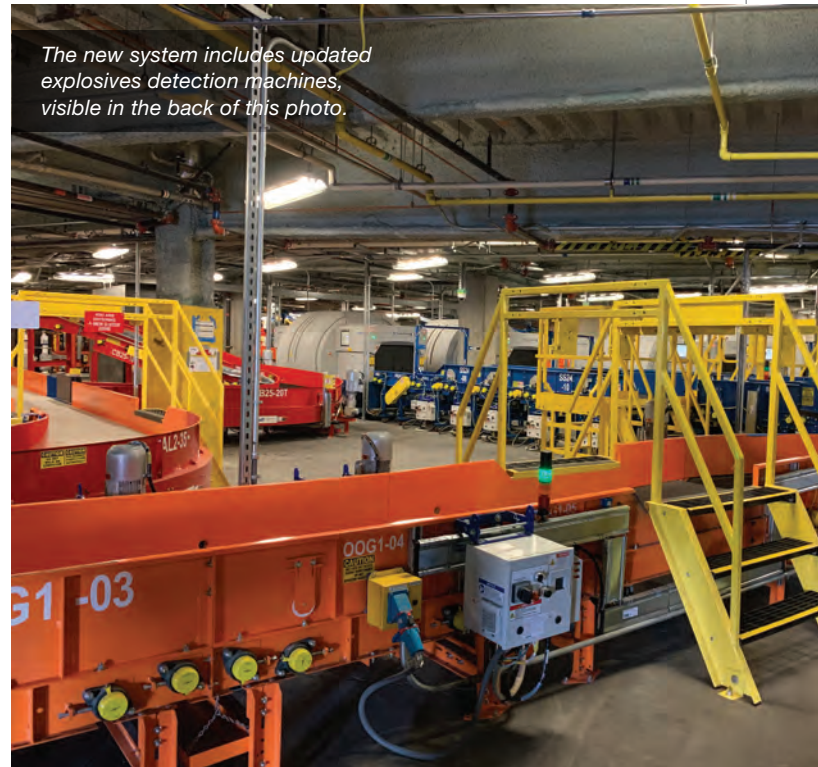
Proceeding in Phases

Seeds for the baggage handling improvements were planted in 2013 when the Port Commission authorized the work, and the project grew roots in 2017 as construction began. The initial blooms appeared in April, when crews completed the first of three installation phases.

Weitz notes that construction suffered setbacks, as most projects do. “The control system failed early factory acceptance tests, and it took roughly six months to get that up to speed,” he relates. “But in fairness to all involved, this system uses components that were never before used at this scale.”

With up to 70,000 outbound passengers passing through the airport on a typical day, shutting down the baggage system to build a new one was simply not an option. Construction proceeded with the old baggage system operating at full capacity right next to the new installation.

Understanding the complexity of such a worksite, airport officials opted for a phased construction process to keep existing



The new system includes updated explosives detection machines, visible in the back of this photo.

systems online until new systems were fully operational. “We had to phase the program because it takes so much time to do a baggage system in an operating environment where you have limited work hours,” Weitz explains.

The airport is shaped like a boomerang, with a north end, south end and central terminal. During Phase One, crews installed eight Smiths Detection EDS machines underneath the concourse, but the design allows room for eight more. The airport also added a centralized area for TSA screening operations with ergonomic inspection tables that reduce physical strain for inspectors performing secondary baggage inspections. Workers no longer have to lift bags for inspections.

Tony Vasquez, project manager for the Port of Seattle, describes Phase One as setting the table to optimize the baggage system, while Phase Two migrates systems, and Phase Three completes the process. “Phase One put in the screening technologies, Phase Two will integrate north-end carriers into the system, and Phase Three will integrate south-end air carriers into the system,” he specifies.



TONY VASQUEZ

With Phase One operational in April, SEA began the bidding process for Phase Two, which will add a sortation system and new conveyor systems that connect to the facility’s north end. Phase Three, which will add the same connections to the south end, is scheduled to follow about four years later.

“We’ve been running the centralized screening system in Phase One for about a month,” Weitz reported in mid-May, noting that decreased passenger volume due to the coronavirus facilitated onloading the new system. With the airport running at just 5%

of normal capacity and processing only 1,500 bags per day, baggage system operators were able to work out bugs before SEA resumes full operation.

Old vs. New

The previous system had 10 miles of conveyor belt, 3,000 motors and 28 EDS machines. It included a patchwork of technologies (some dating back to early 2000) and six independent baggage systems designated to serve specific airlines in limited areas.

The new system, built into the existing footprint, still includes 10 miles of conveyor with multiple bag routes but maximizes

throughput with 600 NORD high-efficiency C-FACE helical inline and helical bevel right-angle gear motors that boost belt speeds and redundant conveyor track. (When all phases are complete, 4,000 motors will be in place.) It replaces six separate systems with a single consolidated system that the airport can later expand to accommodate up to 60 million annual passengers.

“We made everything interconnected and built in redundancy to use the machines at their fullest capacity at all times,” Weitz says. He explains the airport has high volumes from 6 a.m. to 10 a.m. followed by a four-hour dip in traffic. Instead of being in constant motion, as the old system was, the new conveyor system runs on demand and saves energy by changing main lines and baggage routes on the fly.

“We program the energy management system through the control system,” Vasquez explains. “So if we know upstream that we have no more bags coming, the conveyor turns itself off, and restarts as bags move through the system. We also used special belting to reduce friction and other energy-efficient components and expect the changes to reduce the baggage system’s energy use by 30%.”

Smart controls and crossover between the main line conveyors keep bags moving, even when a backup occurs. Currently, the system has two main line conveyors. When the project is complete, it will have four.

“If we get a jam downstream, our control system alerts us, so we can divert bags to another line to move baggage around that area and out for screening and sorting,” Weitz explains.

The system is also designed to improve reliability by using redundancy to eliminate single points of failure. “The entire project has redundant redundancy,” says Vasquez. “Federal legislation regulates this environment, and we have to meet their requirements. Our maintenance and facility professionals also wanted redundancy. As a result, everything in this system has a backup, if not two to three levels of backup.”

Crossover components allow baggage workers to shift banks as needed, he adds. When a jam occurs, the system automatically closes the affected zone and reroutes bags to keep them moving. Operators no longer have to shut down the main line to let workers unload stuck bags and transport them past the jam. “We can get the bags to move in an automated fashion,” says Vasquez. “Workers only have to clear a few bags at the specific break point, but the rest keep moving. The system also has reversible conveyors in certain areas to clear jams.”



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Personnel working at a remote monitoring station in the lower level of the central terminal use 10 65-inch video monitors to keep a constant eye on conveyor operations. In the past, workers floated between six monitoring systems in six different control rooms.

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The new system also includes more physical access points, which helps workers cross the conveyor safely to reach areas needing repair.

"The average response time for a trouble call is now three minutes," reports Weitz. "Operators also can pull reports to look at different components. If they see problems, they can dispatch workers to perform preventative maintenance, which reduces downtime."

The various upgrades and design features add up to an optimized system that enhances efficiency and increases handling capacity at SEA—keys to getting travelers' bags where they need to go in a timely manner. It also demonstrates that sometimes the most important investments are the ones passengers will never see. ✈️

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With Traffic Down, Wilmington Int'l Advances Expansion Project

BY THOMAS J. SMITH



Wilmington International Airport (ILM) in North Carolina has officially turned coronavirus lemons into lemonade.

Fueled by vacation and business traffic alike, ILM crossed the 1 million passenger mark last year and was in the midst of a large terminal expansion project to accommodate its rising traffic when the COVID-19 pandemic hit in March.

A \$9.8 million renovation to the ticketing lobby and baggage system was nearing completion; and site work was beginning in earnest on a \$45 million terminal expansion that will add four new gates.

Both major initiatives were designed to eliminate pinch points that were hampering the on-time departure of early morning business flights, explains Airport Director Julie Wilsey.

With three years of double-digit growth and the prospect for continued annual increases of at least 10%, the facility and staff were at times hard pressed to process 750 passengers per hour through TSA checkpoints and the airport's antiquated, labor-intensive baggage makeup area.

And then the traffic stopped.

The lemons: In the first weeks of the pandemic, ILM's passenger traffic dropped by 95%—from more than 50 flights a day by its three carriers (American Airlines, Delta Air Lines and United Airlines) to five each way.



JULIE WILSEY



FACTS&FIGURES

Project: Ongoing Terminal Expansion & System Improvements

Location: Wilmington (NC) Int'l Airport

Operator: New Hanover County Airport Authority

Contract 2: Ticket lobby expansion; new outbound baggage makeup

Original Timeline: April 2019 - Aug. 7, 2020

Anticipated Completion: July 10, 2020

Construction Costs: \$9.24 million

Funding: \$9.1 million state grant; local funds

Contract 3: Terminal renovation; addition of 4 gates & passenger bridges

Contract 3/Schedule 1 Timeline: Jan. 2020 thru Jan. 2022

Contract 3/Schedule 2 Timeline: Jan. 2022 thru Jan. 2023

Construction Costs: \$45.7 million

Funding: Passenger facility charges; FAA funds; state grants; county loan; local funding

Project Manager & Civil Engineer: Talbert & Bright

Architect: The Wilson Group Architects

General Contractor: Monteith Construction

Structural Engineer & Building Geotechnical Engineer: Stewart Inc.

Mechanical, Electrical, Plumbing & Fire Protection Engineer: Cheatham & Associates, PA

Baggage Handling Systems Consultant: BNP Associates Inc.

Noteworthy Detail: Project team accelerated construction while passenger traffic was low during COVID-19 pandemic

The lemonade: During the state-imposed stay-at-home period, commercial construction projects were deemed “essential” activities, and work at the airport continued. In fact, drastically less passenger traffic allowed construction to proceed with fewer impediments. And, more construction crews are working on the terminal expansion than was originally planned.

“The pandemic has given us a little bit of breathing room,” Wilsey notes. “We can open up spaces and allow the contractors to do more work.”

As a result, the new ticket lobby may open in July—a month earlier than anticipated *and* at a slight savings for the airport. While it’s still too early to project whether contractors will finish the entire initiative before the January 2023 completion target, it’s now a distinct possibility.

Prior to North Carolina easing stay-at-home restrictions in May, not one case of COVID-19 had occurred at the airport or within the construction crews. Since then, however, one case was reported, and the worksite was temporarily shutdown.

March 2020

Granseur Dick, ILM’s facilities director, reports that work on a more spacious ticketing lobby with new ticket counters, space for a future fourth airline and self-service kiosks was 85% complete when flights stopped. New airline ticket offices were completed and crews had demolished the old offices to enable construction of ticket counters.

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Airport of the Future 2.0

Much was written about the “airport of the future” after the 9/11 terrorist attacks in 2001. Nearly 20 years later, it’s time for a new book, or at least a new chapter, to address the lasting changes associated with the coronavirus crisis.

Queuing passengers in the age of social distancing is one topic on the mind of Travis Pence, a partner in The Wilson Group architectural firm.



TRAVIS PENCE

“Right now at the security checkpoint you have switchbacks to keep people moving. With social distancing that does not work very well. What does a checkpoint look like when everyone has to be 6 feet apart?” he asks.

New queuing configurations/processes will also have a big impact on the space needed for ticketing and boarding areas, he adds.

As the industry begins to explore new ideas and concepts, Pence suspects that simple approaches like the taped lines on supermarket floors might be the answer.

Crews were just beginning to build out the new ticket counters and the finishing touches in the lobby.

When the virus first hit, the terminal expansion project was just 11% complete, Dick adds. A portion of the aircraft parking apron had been demolished to clear space, and crews were pouring foundations and support columns. The project is adding four new gates with passenger boarding bridges, new hold areas, restrooms and concessions.



GRANSEUR DICK

The expansion, designed by architects from the Charlotte-based Wilson Group, is being constructed in two phases to minimize passenger inconvenience. The first part, or construction schedule for this phase, which adds a new concourse and other space in the main terminal, is scheduled to be complete in January 2022.

After the first schedule is complete, the existing connecting concourse will be demolished and the existing interior terminal space will be renovated to match the new facilities. “We want the airport to look seamless, so it looks like one facility,” notes Wilson Group President Brian



BRIAN WILSON

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Wilson. The design theme is an update of the airport’s original southern charm that reflects the growing Wilmington area, he notes.

A new, larger TSA security checkpoint with four lanes will be built in the new concourse.

The final work is expected to be complete in January 2023.

Change of Plans

In mid-March, passenger volume suddenly dropped to just 5% of March 2019 levels.

That’s what sparked the idea to accelerate some of the work already in progress.

Dick and other airport personnel met with the project team to revamp scheduling for select components, particularly flooring and finishes. Key participants were the builder, Monteith Construction; architect, The Wilson Group; and project engineer, Talbert & Bright.

“The original plan took into account that we were trying to carry out a construction project in the interior space that was already at capacity,” Dick explains. “It presented a number of challenges that the engineers and contractors have overcome.

“We were going to break the project down into smaller footprints for the construction crews and we realized we had the opportunity to advance the project,” he continues. “We were able to take advantage of this unfortunate situation and combine some of the construction phases.”

Crews were able to operate more efficiently due to longer work hours during the day and more continuous construction zones, he details. And, with few passengers in the building, there were fewer restrictions on noise and the scope of work.

Installation of the new terrazzo floor is a specific case in point. Instead of dividing the expanded lobby into five installation zones to work around passengers, crews poured terrazzo in two larger zones. The result was a better product because there are fewer seams and joints, Wilsey notes.

Transitioning from the old baggage system to the new this summer will likely also be easier. Planners envisioned temporarily shutting down the system and using a porter service to carry the bags during the final phase. With lighter traffic, ILM will be able to leave the old system running longer, giving the project greater flexibility for the changeover.

Adapting to the New Situation

As the project builder, Wilmington-based Monteith took a three-prong approach to keeping work on track. The firm won all three contracts to serve as general



The terminal expansion project will add four new gates.

contractor for ILM’s expansion as well as other recently completed projects, including installation of a new roof.

Monteith President Bryan Thomas says that it was paramount to take the right steps to protect the company’s employees and subcontractors. “We tried to see how we could best do this with social distancing.”

The company consequently divided its site managers and superintendents into two teams and added a second office trailer. This was a precautionary step so if someone on one team became ill it would not shut down the whole project. Monteith also coordinated with various team members and airport staff via conference calls, video meetings and emails to maintain physical separation.

Naturally, it was relatively easy for crews to “social distance” during outdoor work, but indoor tasks such as hanging drywall



BRYAN THOMAS




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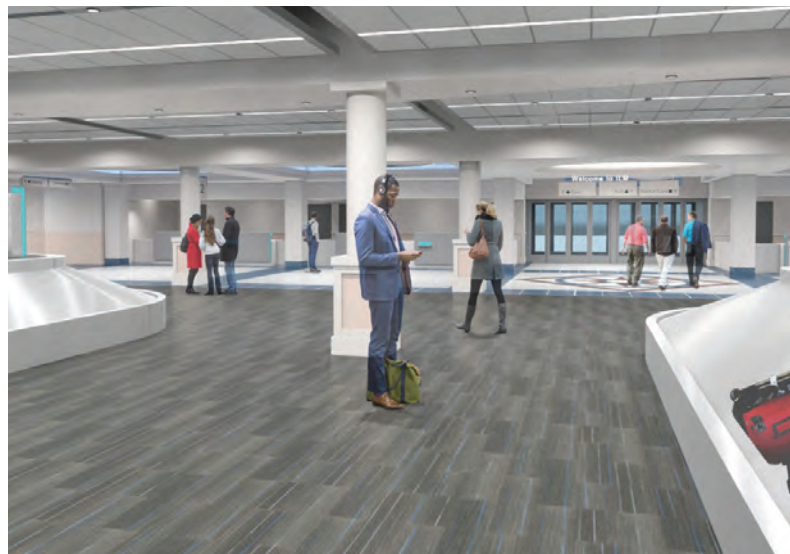
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Three years of double-digit passenger growth prompted renovations to the ticketing lobby and baggage claim.

presented more challenges. Monteith procured masks in bulk, bought hand sanitizer in 100-gallon drums and installed hand-washing stations. It also hired a full-time site sanitizing company to clean frequently touched surfaces such as entry fencing and gates, scaffolding, equipment, tools and office spaces.

Additional portable toilets were rented. Instead of one unit for 20 employees, the company's new ratio is one unit for four workers. And, some subcontractors brought in their own toilets.

Thomas estimates Monteith will spend about \$40,000 more than usual on site safety—costs that will not be passed on to ILM. On balance, he says \$40,000 of extra expenses is better than completely shutting the project down for a few weeks and then resuming.

The second portion of the company's three-prong strategy was to ensure the financial stability of the subcontractors.

Payment procedures were put in place to keep cash flowing to all the vendors.

The final prong was seeking opportunities to advance the project schedule.

Monteith had six projects elsewhere in the state that were either sidelined or reduced; so it re-deployed crews to the ILM projects. Some subcontractors were also able to beef up staffing at the airport.

Thomas reports that there has been a 15% increase in construction staffing beyond the original plan. "It is always a challenge to get the number of subcontractors you want. You are always trying to gain a little bit of time because you don't know when you will have a week of rain or hurricanes," he relates. "We are getting the personnel as we need them a little easier now."

Crews working on the expansion project also had greater schedule flexibility because they could complete utility line shutoffs during the day without disrupting passengers.

While the lobby project may open as early as July 10, Thomas still expects more challenges. For example, the vendor building the ticket counter cabinetry had a COVID-19 "scare" that caused it to shut down operations and delay installation at the airport. "There are a lot of different parts and pieces yet to be put together," Thomas notes.

Executives from Talbert & Bright, the project manager and engineer of record, consider it noteworthy that the project has actually gained momentum during the pandemic. "It is evident that the team has worked to lessen the impact of the coronavirus,"

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says company principal Steve Bright. “We are fortunate to have a design team and contractor that are exceptionally competent.”

Continuing Operations

Although traffic was markedly down, ILM was still operating as of press time in early June. “We have not reduced any of our staff and we remain open 24/7,” Wilsey reports.

Like the project’s construction crews, airport maintenance staff took advantage of the situation by performing deep cleaning at night. The staff also worked on small projects that had been delayed because of heavier traffic—sealing the parking lots, deep cleaning sidewalks, landscaping, etc. Concession operations were reduced because of fewer customers and the state-mandated closure of bars.

“We are now working to get people back,” says Wilsey. “We are encouraging masks in the terminal. It will take a confident traveler to come back to the airport and that will determine how quickly we recover.”

In early June, ILM’s passenger load had increased to 13% to 15% of similar periods in 2019. ✈️



Site work for the terminal expansion had just begun when the coronavirus crisis hit the U.S.

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Austin Int'l Modernizes Ground Transportation Management System

BY KRISTIN V. SHAW



FACTS & FIGURES

Project: Improving Revenue Tracking of Commercial Vehicles

Location: Austin-Bergstrom (TX) Int'l Airport

Key Components: Commercial vehicle management system; transportation network company system

Timeline: Project initiated in 2018; completion expected by summer 2020

City-Approved Budget: \$300,000

Vehicle Tracking & Identification Technology: TransCore

System Software: GateKeeper

IT Consultant: The JW Group

Wiring: Schmidt Electric

Hardware Installation: Signature Controls

General Contractor: Austin Commercial

Key Benefits: Automated fee collection from commercial vehicle companies; more accurate tracking of TNC vehicles to verify appropriate fee payment

The emergence of transportation network companies, or TNCs, has been a charged topic in Austin, TX. Uber and Lyft left abruptly in 2016 after a squabble with the city over fingerprinting requirements. One year later, the regulation shifted, and they were back in the city and operating in full force at Austin-Bergstrom International Airport (AUS). Over the past few years, the airport has shifted its parking operations and ground transportation flow to adapt to TNC and commercial vehicle operations by adding a large cellphone lot with food services and a coffee shop nearby. It also recently built a new parking lot and ground transportation center where TNCs, taxis, limos and shuttles stage pickups.

Not long after the TNCs resumed their active pace at AUS, the transportation team was given two objectives: decrease traffic on Presidential Boulevard (the main arterial roadway into the airport) and modernize the vehicle tracking system. The team knew what it needed: a new ground transportation management system.

Carlton Thomas had just transferred to the airport from the city of Austin's transportation department, where he had been an infrastructure operations division manager for several years, when the project started to take shape in 2017. Now the landside access manager for AUS, Thomas' experience in ground transportation dovetailed nicely with the airport's improvement plans.



CARLTON THOMAS

"We were in dire need of a solution to replace our existing operating system," says Thomas. "It was approaching end of life, and we were experiencing a lot of failures. This project enabled us to secure better technology to manage our ground transport operators and provided us an opportunity to utilize a new platform that interacted with TNCs."

The airport's 2040 Master Plan includes forecasts of more than 31 million annual passengers by 2037. AUS has

been on a rocket trajectory for several years, and while the coronavirus has derailed passenger flow for now, the city is optimistic that growth will return to its previous arc. Given the typical rate of development, the airport team recognized that ground transportation protocols required future-facing management.

Assembling the Team

To begin the search for a vendor, AUS turned to business management consultant Steve Ritter of The JW Group, an information technology firm.



STEVE RITTER

"This was initially a project that was part of the AUS IT Master Plan," says Ritter. "The IT staff at the airport was looking for one vendor that could provide the required TNC management and reporting to better understand the traffic and activity that TNCs generate on the airport. The other part was that the same vendor could replace the existing vehicle tracking system used for limos, taxis and other commercial vehicles."

After two months of research, planning and requirements definition, the company recommended GateKeeper and TransCore, based on the scope of work and anticipated return on investment. TransCore was already operating at the airport and could have worked with any backend solution. GateKeeper has the unique ability to remotely monitor the TransCore readers through its software. "They checked all the boxes as a single solution that provides modules for TNC, ground transportation management and taxi dispatch, which made the most sense," Ritter explains.

Although Thomas had never worked with GateKeeper before, he says it became clear that the company was right for the project because it builds specialized software for airports that manage all types of ground transportation—including TNC

operations, parking access and airfield inspections.

"The system is designed to track the movements of ground transportation operators on campus and allows us to accurately charge fees for their use," Thomas explains. "With the old system, if some readers were failing, we'd lose revenue. We wanted to address the failing system and at the same time implement newer technology."

The proposal included a solution to fix the airport's broken commercial vehicle management system and address TNC challenges, Thomas relates. AUS was ready to take more control over its curbside operations and associated revenue. The new system sends a digital ping when a TNC vehicle enters and exits the airport campus. That provides the airport with information about pickups and drop-offs, which directly relates to revenue generation.

"The complexity and size of this project was fairly aggressive," says GateKeeper Systems President Lynn "Doc" Richardson. "For an airport of this size to invest in so much technology, it's significant."

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New technology is helping the airport manage ground transportation operators.

Wendie Bidwell, one of the company's project managers, agrees. "For the Austin airport to make this kind of commitment to the city, the travelers, their staff, and everyone else impacted using ground transportation, it's significant."



WENDIE BIDWELL

Creating the Plan

After studying the airport layout, TransCore selected a half-dozen major capture points for drop-offs and pickups. It was important to differentiate the two groups, notes TransCore Vice President Forrest Swonsen. Next, the team worked with Schmidt Electric to ensure that power and electricity would be provided in the right places.



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"We identify, classify and track all commercial vehicles transiting the airport," says Swensen. "The airport had no independent audit trail for what the TNCs said they did, and this would allow them to look at the feed of TNC apps and reconcile."

The JW Group developed the designs and specifications for the pathway and IT infrastructure required for the TransCore readers at those drop-off and pickup areas, and GateKeeper imported the airport's data to the production system.

Implementing the TNC tracking module occurred first. This allowed the airport to immediately begin tracking TNC activity and was a "quick win" because it did not rely on the reader and infrastructure setup.

Next the commercial vehicle system was installed, configured to meet AUS' specific needs, and existing accounts and vehicles were loaded into the system. This environment was then used to train airport staff both onsite and remotely and allowed AUS to refine and document its administrative processes.

"Having an almost fully functional system with airport data was invaluable in ensuring knowledge transfer and accuracy of source information. Additionally, as readers came online, it facilitated verification of the new system without impacting

existing operations," says the GateKeeper primary project manager Anne Turner, who was involved with the AUS project since the beginning. "This hands-on use allowed [Austin-Bergstrom International Airport] ground transportation staff to develop their own training material and quick reference guides for the taxi companies".



ANNE TURNER

Modernizing the Software

Pushing associated administrative work to the taxi companies was a stated goal, but the new system greatly simplifies their processes because it allows taxi companies to manage their accounts while allowing ABIA the control and insight to monitor operations. GateKeeper uses readers to track commercial vehicles at the airport, and the system automatically deducts fees for each trip from accounts where taxi companies deposit money and manage their accounts online. Previously, companies had to send someone to the airport to pay for trips in person.

"I'm pleased with that functionality," says Thomas. "A portal allows them to make changes online vs. making an appointment and having our staff take time to add money to their accounts.



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*based on length of stay



Universal toll antennas (left) and transponder readers (right) are key components of the new system.

Each company has an account with us and draws down every time they make a trip. Now, they can add money at will, which saves time and gives them more freedom.”

Essentially, all trips are now prepaid.

Both the commercial vehicle management and TNC systems offer real-time data about vehicles operating at the airport. Turner notes that this insight helps the airport manage traffic, and the systems’ reporting features allow trend analysis for future changes and improvements.

She highlights the auditability and streamlining of financial processes as other key features. “This allows the airport insight into both sides of the operation: an accurate and immediate record of commercial vehicle activity along with detailed tracking of the charges and payments through the system,” she explains. “The system also allows direct notification to taxi companies of pending balance issues, which allows them to be proactive in managing their accounts.”

The automated dispatch feature will be enabled this summer, allowing AUS to automatically manage and direct taxi traffic based on target levels at the ground transportation center.

Construction Delays & Integration Strains

Dovetailing the commercial vehicle tracking upgrades with a nine-gate airside expansion and construction of a new parking garage and new Administration building brought the team opportunities and unexpected challenges. On the downside: Its timeline was largely at the mercy of the larger airside and landside projects.

In the meantime, Thomas discovered that the airport’s existing tag readers were in bad shape. The old system had been in place a long time and had not been taken care of as well as it might have been, he explains.

“It was like peeling back the layers of an onion,” he recalls. “The more we studied the situation, the more we realized that we needed to update our expectations. We hadn’t planned to have to make so many changes with the existing hardware.”

Maintenance is key in a system like this, he emphasizes.

“With proper maintenance, the lifetime of a system can be lengthened,” Thomas reflects. “With improper maintenance, on the other hand, you have to make unnecessary investments or expenditures.”

The project did not include provisions (or a budget) for massive hardware and infrastructure work because it was largely a software project with some refurbishing. When the airport learned it had to replace hardware, progress slowed considerably while personnel requested funding for the new project elements.

“We had to figure out how to quickly get the civil work done—the conduit, new gantry poles and the IT infrastructure,” says Ritter.

The team worked directly with the general contractor from the new parking garage and Administration building construction team to address coordination and resource challenges and resolve scheduling conflicts. It was important to continually deliver the message that the ground transportation project was a priority, notes Ritter.

When Bidwell from GateKeeper came on board during the final year of the project, AUS was in the middle of building the new ground transportation center. That created competition for resources, and the airport had to close some traffic lanes to install power and hardware. In addition, the city of Austin received an unusual amount of rain and thunderstorms, with lightning that caused delays mounting the antennae.

“There were a number of stumbling blocks with finances, weather and construction,” reflects Bidwell. “You almost couldn’t make up some of this stuff.”

Facing the prospect of six- to eight-month material delays associated with recent steel tariffs, Thomas found another source for the cantilever poles needed to hold the transponder readers. He procured unused traffic poles from the city, and crews compensated for their heavier weight and different dimensions by digging a deeper pier for the structure. But when the general

contractor was about 75% of the way down to its 12- to 14-foot target depth, crews encountered an unmovable water main. As a result, project designers had to recalibrate the pier to work around the new depth limitations, and the project was delayed for about two months.

“You would never think a gantry pole would cause a project delay,” muses TransCore’s Swonsen. “Fortunately, the readers are lighter than a traffic signal, so the poles didn’t bear additional weight over capacity.”

The money saved by using existing traffic poles offset some of the costs incurred with the associated delays, adds Thomas.

Troubleshooting & Data Recovery

Unlike the airport’s previous system, the new hardware can continue collecting data from vehicle tags if the power is out or the internet connection fails. The readers simply store the data that is collected, and the GateKeeper software initiates a troubleshooting sequence when it detects a lack of information coming in. With the new system in place, Thomas is confident that AUS will capture 100% of the fees it is due.


“It’s getting to the point that if you’re not monetizing your roadway, you are going to miss out on revenue opportunities,” Swonsen observes. “Having the ability to look by day of the week or time of day to determine your roadway utilization on Tuesday at 11 a.m. is important.”

GateKeeper’s Turner recommends that landside ground transportation teams considering an upgrade or new system visit other airports to observe automated systems that are already operating to understand how they work. Speaking with colleagues is one of the best ways for any airport to learn and get a better understanding of potential pitfalls, she says. Now AUS can serve as a model for others to study.

“Carlton Thomas’ group has worked really hard to get to this point,” says Bidwell. “Most of the team has been there throughout the duration, and they have been committed to getting it right. From what we have heard, they have received a lot of positive feedback from vendors.”

Ritter agrees that compliments are in order. “It was important to have Carlton working hand-in-hand with IT and finance from the beginning,” he says. “We had all of the different groups represented: network and infrastructure, Carlton and the ground transportation side, plus revenue and accounting. Together, it was a great team,

and everyone attended the required meetings, collaborated and coordinated when needed. We had all the right stakeholders in the airport with the right teams to pull this off and make it successful.”

Looking ahead, he notes that the recent improvements will be especially helpful during large events. “This system will be instrumental during South By Southwest, the Grand Prix, Austin City Limits Music Festival, F1, and more,” says Ritter. “The airport can capture movements in a way that is more reliable and accurate, and, they should see an uptick in revenues. It is not only a good commercial vehicle tracking solution but a good revenue solution, too.” 

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Lighting Audit & LED Conversion Illuminate Energy Savings at Atlanta Int'l

BY NICOLE NELSON



FACTS&FIGURES

Project: LED Lighting Conversion

Location: Hartsfield-Jackson Atlanta Int'l Airport

Private Operator: Atlanta Airlines Terminal Co.

Key Stakeholders: City of Atlanta Dept. of Aviation; tenant airlines

Lighting Audit: Energy One Consulting

Timeline: Conversion began in 2016; completion expected in 2021

LED Fixtures Installed to Date: 84,750 of 119,750

Energy Savings to Date: \$1.75 million annually

Savings in Progress: \$650,000 annually

Rebates Received: \$520,000

Rebates in Progress: \$150,000

Product Specs/Implementation Support: Energy One Consulting

Installation/Lighting Suppliers: ABM Industries; Jacobs Engineering Group; MC Dean; Phoenix Lighting; Player and Co.; Regency Lighting

Ramp & Bag Area Project Management: Comprehensive Program Services

Key Benefits: Reduced energy consumption & costs; improved work environment for employees; enhanced aesthetics for airport guests



As the world's busiest airport, Hartsfield-Jackson Atlanta International (ATL) spans more than 7 million square feet of property. Naturally, it takes a lot of supplies and materials to keep the facilities that large running smoothly. Everything from carpeting and trash cans to paper towels and window cleaner is purchased and used in high volume.

Just "keeping the lights on" requires more than 120,000 fixtures. That's why the airport and its private operator, Atlanta Airlines Terminal Company (AATC), are in the midst of a comprehensive lighting overhaul. Spoiler alert: The project is improving aesthetics, enhancing safety and reducing energy and maintenance costs to the tune of \$1.75 million per year. And the return on investment has been quick.

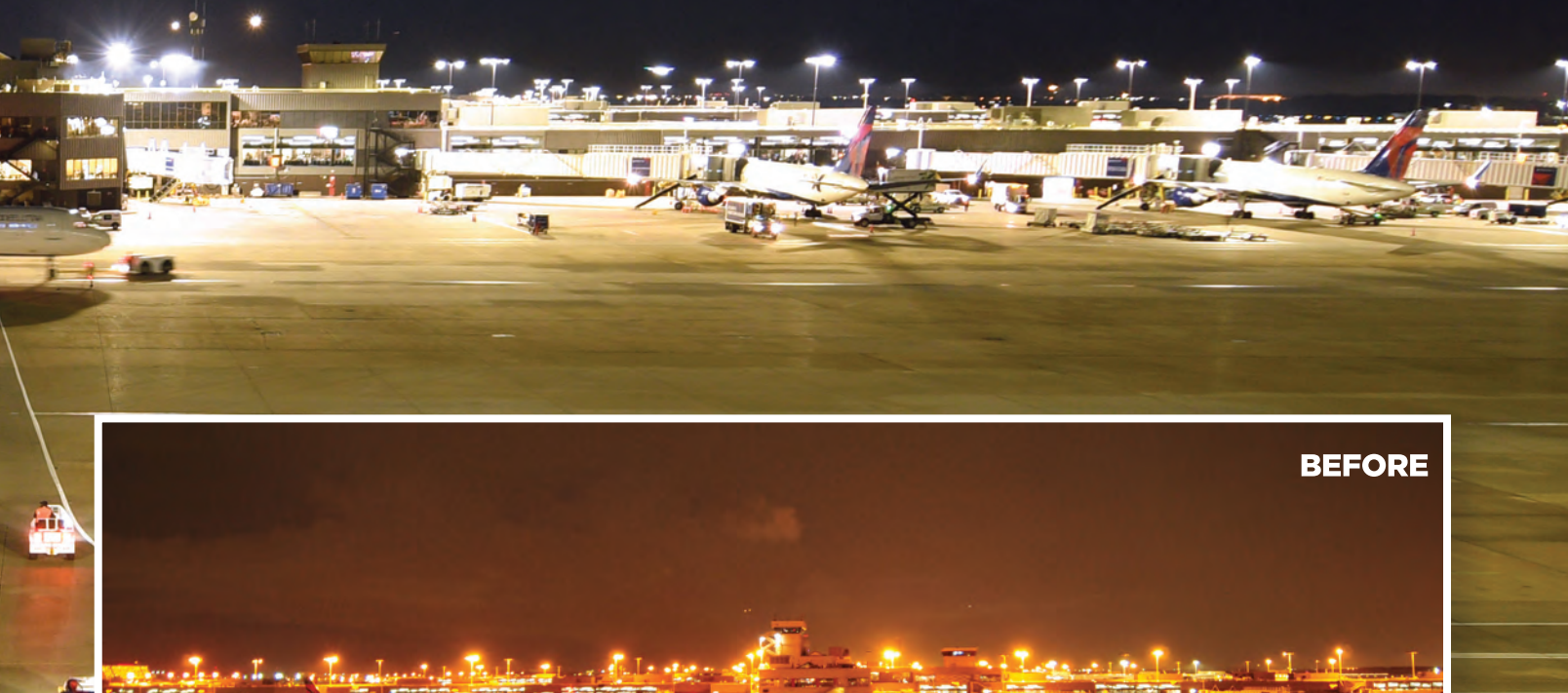
The initiative began in February 2016, when AATC President and Chief Executive Officer Kofi Smith first

met with Energy One Consulting, AATC's eventual energy partner. The firm's strategy of methodically assessing and analyzing an organization's energy profile—and subsequently improving it—struck Smith as genius. So he lobbied his board and ultimately granted Energy One the opportunity to optimize energy consumption at ATL.

In retrospect, Smith says he couldn't be happier, especially regarding Energy One's early support to swap out fluorescent lamps for light-emitting diode (LED) fixtures throughout the airport's many restrooms. That small change improved conditions for passengers by providing brighter, purer light. Technically speaking, restroom color temperatures increased from the low-3,000 Kelvin range to 4,000



KOFI SMITH



BEFORE

degrees with LEDs. The coloration changed from underlying yellow tones to brighter, naturally whiter hues, and lighting levels increased by more than 50%. What's more, the initial restroom project involving 4,000 lights returned \$50,000 in annual savings. When combined with an associated rebate from Georgia Power, payback for the investment was achieved in less than three years.

Smith, who has a doctorate in business administration, likens the subsequent wide-scale lighting conversion to finding a diamond in the rough. He also gives Energy One high marks for its dedication and success in reducing energy consumption and returning financial savings to ATL and its shareholders. "Our carriers have been ecstatic with what we have been able to achieve with our partnership," he reports.

Expanded Execution

Given the impactful results of the restroom project, AATC and Energy One teamed up to yield even bigger energy savings and return on investment by executing more LED replacements throughout the airport.

Energy One Consulting President Mike Elmers highlights improvements in passenger facing areas. Between 2017 and 2020, a total of 50,000 fixtures were converted to LEDs in the main walkways, gatehouses, check-in areas and other main spaces in the Domestic Terminal, and T North, D, E and F concourses. Additional fixtures in the T South A, B and C concourses were upgraded to LEDs during a



MIKE ELMERS

concourse modernization project. The resulting savings has been \$1 million annually, with a payback period of less than one year.

Graham Thorsteinson, chief technology officer for Energy One, notes that the massive undertaking was broken into multiple smaller projects for each area with breaks in between each project. In order to improve the return on investment, Energy One worked with AATC's existing maintenance contractor, ABM Industries. In total, the firm installed 70,000 new LEDs purchased from Regency Lighting. Jacobs Engineering Group installed approximately 1,500 lights on the immigration level of Concourse E that required rewiring, as well as several demo lights elsewhere.



GRAHAM THORSTEINSON

Using more efficient LEDs with five-year warranties had a positive snowball effect on the deployment of maintenance workers. "Previously, two people were dedicated to replacing failed lights," Thorsteinson explains. "As a critical mass of lights were changed to LEDs, it freed up additional resources for further LED installation because there were so few failures."

Airside & Underside Improvements

As LED lamps proliferated inside the airport, AATC and Energy One also turned their attention outside. Together, they executed a two-pronged strategy to improve sustainability and employee safety by

more than doubling lighting levels in key ramp areas where service personnel work.

In 2017, a team managed by Comprehensive Program Services demoed several different types of lights, performed numerous lighting studies and solicited feedback from pilots and ramp employees. Ultimately, Player and Company installed 750 pole lights nearly 80 feet in the air. Throughout the project, crews measured light levels in various ramp areas and made adjustments to the tilt and angle of the lights to achieve optimum lighting.

The updated bulbs from Phoenix Lighting, which register at day white-range (4,000 Kelvin), received positive feedback from ground personnel and pilots who navigate in the ramp areas.

Bill O'Connor, vice president of aviation for Phoenix Lighting, led the effort to install the 750 high-mast lighting fixtures supplied by the company.



BILL O'CONNOR

"AATC seems very pleased, and the airlines couldn't be happier with the improvements and the results," reports O'Connor. "The safety and security and efficiency of their nighttime ops have been improved tenfold. Literally, from the first night, they could see a difference. It just made it a safer, more productive place to work."

Safety and aesthetics were also improved for employees working in areas underneath each concourse. Elmers, from Energy One, notes that the installation of 5,000-Kelvin high-lumen LEDs nearly quadrupled lighting levels in the apron baggage areas and on spine roads where employees handle bags and drive tugs.

Comprehensive Program Services managed the projects, and MC Dean installed the new lights. The installation was especially challenging because the areas were packed with conduit, ducts, piping and conveyors. The firms also converted lighting in the ticketing area of the Domestic Terminal. In total, their crews installed about 12,000 lights.

Smith is proud that the new ramp lighting exceeds standards outlined in the Illuminating Engineering Society's IES RP-37-15, *Outdoor Lighting for Airport Environments*.

"The color temperature was increased from 2,100 Kelvin to 4,000 Kelvin, and the color rendering index improved from 22 to 80, which is a significant visibility improvement for people and equipment," he explains.

The improvements also enhance footage from security cameras, he adds.

Glare shields ensure that the day-bright light goes only where it is needed/wanted.

"The photometrics of these lights are designed so they can be aimed straight down," Smith says. "The pilot can't see the bulbs shining, but light is 'thrown' to the tail of the plane. This is incredibly important in airport ramp applications as any 'up light' or glare negatively impacts the pilot's visibility."

In total, the new LED high-mast fixtures reduce energy consumption by 50%, while doubling the light levels at the tails of

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Fixtures throughout the airport have been converted to LEDs, and more are in the works.

planes, he reports. The new lights also have an expected lifespan of more than 20 years. In contrast, crews replaced older-generation high-pressure sodium lights every few years.


Airline-Only Areas

With lighting projects complete in the ramp, baggage support and passenger-facing areas, the current focus is on improving airline offices and maintenance areas. In late May, the conversion of 18,000 fixtures was 80% complete. Total savings for the completed phase is estimated at \$250,000 per year.

When work resumes later this year, Smith anticipates the team will continue to focus on other airline-exclusive areas and begin to address back-of-house spaces such as concessions, Customs and Border Protection offices, space used by the Centers for Disease Control, maintenance areas for the Plane Train and mechanical/electrical rooms.

“The priority remains saving energy and improving the light quality for the airport’s passengers and employees until the entire airport is converted to LED, including areas not visible to passengers,” Smith summarizes.

Ultimately, the completed conversion will save 22 million kWh per year—the equivalent of removing 2,000 houses from the power grid, he notes.

“Eighty percent of the entire airport and 99% of the passenger facing, non-exclusive and concession areas have already been converted over to LED lights,” Smith reports. “The amount of money we have been able to save in energy reductions through these initiatives has not been done at any other airport globally. It is nothing short of amazing what we have been, and will be, able to do.” 

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Runway Rehab Allows Anchorage Int'l to Accommodate Largest Cargo Jets

BY MIKE SCHWANZ



FACTS&FIGURES

Project: Runway Rehabilitation

Location: Ted Stevens Anchorage Int'l Airport

Project Scope: Crews widened & strengthened base of main north/south runway; moved thresholds at both ends; installed new LED lights; strengthened adjoining taxiways

Project Cost: \$68 million

Funding: \$59 million in Airport Improvement Program grants; \$9 million airport funds

Strategy: Improve runway to accommodate largest cargo jets

Construction: May 2018 to Oct. 2019

2019 Passenger Volume: 5.7 million

2019 Flight Operations: 270,000 (48% cargo, 52% passenger)

Passenger Destinations: 21

Cargo Destinations: 44

Project Engineer: Alaska DOT/Aviation Design Section

Electrical Engineer: Stantec

Pavement Contractor: Quality Asphalt & Paving

Lighting Equipment Supplier: Airside Solutions/ADB SAFEGATE

Electrical Contractor: NPC Energy Services

Wedge Lock Washers: HEICO-LOCK

PAPI & NAVAIDS Lighting: FAA NAVAIDS Engineering Center

FAA Contractor: Burton

Key Benefits: Accommodating largest jumbo jets; meeting FAA airfield standards; improving safety; reducing operational & maintenance costs



It's common for airports to uncover unexpected challenges such as unmarked utilities, protected wildlife or even buried aircraft and other military surplus during airfield projects. At Ted Stevens Anchorage International (ANC), the ground beneath the airfield literally shook during its recent runway rehabilitation.

But even a significant earthquake didn't derail the major project. Officials were determined to ensure that the airport's main north/south runway (15-33) could continue to safely handle its always-busy cargo operations. As a gateway for cargo planes traveling between North America and Asia, ANC is the fifth-busiest airport in the world in terms of cargo throughput, behind only Hong Kong International, Memphis International, Shanghai Pudong and Incheon International in South Korea.

To accommodate this traffic, the runway had to be able to handle newer Aircraft Design Group (ADG) VI equipment, such as the Boeing 747-8F and Airbus 380-800. This April, an Antonov An-225 Mriya, the world's largest cargo aircraft, landed on Runway 15-33 and drew crowds of local spectators.

Airport Manager Jim Szczesniak points out that several factors converged to make this project a necessity. "We get about 100 747 landings here every day, and many are the 747-8F cargo jets," he explains. "UPS, one of our main clients, is taking delivery of more 747-8Fs in the near future, so we wanted to not only repave the surface of Runway 15-33, but strengthen its base to handle these larger, heavier planes.

"In addition, the FAA requested that we relocate the thresholds at both the southern (33) end of the runway as well as the northern (15) end. We also had to work on several taxiways."

Besides Szczesniak, two of the other key officials involved in the planning and implementation of the project were John Johansen, the airport's engineering, environmental and planning manager,



JIM SZCZESNIAK



JOHN JOHANSEN



and Jenelle Brinkman, an aviation design project manager for the State of Alaska Department of Transportation. Brinkman served as the lead engineer for the project.

“This project required that several jobs had to be accomplished simultaneously,” Brinkman says. “Taxiway Y, which runs parallel to Runway 15-33, and is just west of it, was reconstructed in 2017. Then, when 15-33 was being rebuilt in 2018 and 2019, we simultaneously worked on taxiway R, the second parallel taxiway to 15-33 just east of it.”

FAA requirements dictated several geometry changes for 15-33 and its interlinking taxiways. As a result, both ends of the runway were significantly altered. At the south end, the location of the runway end remained the same, but Brinkman and her team shifted the displaced threshold 200 feet to the north to remove the overlapping runway safety areas from runway 15-33 and runway 7L-25R (the main east-west runway below it). At the north end, project designers relocated the runway end 100 feet farther south to remove the displaced threshold.

Moving the threshold at the south end of the runway was especially important, because there was an overlapping safety area for both Runway 33 and Runway 7L-25R. “When maintenance had to clear snow on 15-33, the airport sometimes had to close 7L-25R as well while the snow removal equipment was in the overlapping



JENELLE BRINKMAN

safety areas. That is now no longer a problem,” Brinkman says.

Another key element of the construction was widening Runway 15-33 from 150 feet to 200 feet. In addition, crews installed LED lights on 15-33 and its connecting taxiways.

The runway’s newly strengthened asphalt base is now 15 inches deep and contains two different types of asphalt to accommodate larger, heavier jets.

The project also modified and improved several taxiways. Taxiway R, which runs parallel to 15-33 to the east, was extended farther north and bolstered with a new structural section. Its existing displaced threshold was removed. Improvements include utility adjustments, storm drain repairs and new LED lighting, markings and signs. The taxiway safety area also was widened 24 feet on each side to meet the design standard for ADG VI aircraft (a total width of 262 feet). Elevated taxiway edge lighting was relocated and replaced to match the related edge lines.

Finally, all of the interlinking taxiways that connect 15-33 to taxiway R were reconstructed to fit the new FAA Advisory Circular fillet geometry. Taxiway Q was reconfigured to allow access to the far end of Runway 15.

Intricate Coordination Needed

After three years of planning and design, and after all parties signed off on the plan, construction began in May 2018. Timing was everything, Szczesniak emphasizes. “We have a short construction

season here, from late April to late September,” he says. “We decided to do this project during a two-year period. In 2018, we did the work on the runway’s southern end, and shortened it from 10,500 to 8,800 feet. That was still long enough to accommodate all of our passenger jets plus many of the cargo planes.”

In spring 2019, however, the entire runway had to be closed to complete the project, and that caused consternation for jumbo jet pilots and some citizens in Anchorage. (ANC is located only 4 miles southwest of downtown Anchorage, and it borders Cook Inlet, an arm of the Gulf of Alaska.) “Normally, about 95% of the time, we route aircraft over the water, which serves as our

western border. Normally, aircraft seldom go over the city. But during this project, we had to send all aircraft over the city itself,” explains Szczesniak.

The temporary change prompted a few noise complaints from citizens, and pilots were not always enthusiastic about having to land and depart on 7R-25L and 7L-25R—the east/west runways. “We have strong winds from both the north and south depending on the season,” Szczesniak says. “747 captains don’t like landing huge planes in crosswinds, but we did not have a choice last year.”

Another challenge was that the big cargo carriers, including UPS, FedEx and DHL, schedule departures around the same time of day, so there was a regular parade of large aircraft taking off over residential areas, one after another.

Advance planning and communication were vital to keep all the stakeholders satisfied, Johansen states. “We have about 45 air carriers here—27 domestic and 18 international. We started planning this project three years in advance, and made sure we communicated what we were doing at every stage of the process,” he says. “With the shorter runway length during 2018, some cargo carriers going long distances had to reduce their loads in some cases.”

The airport kept Anchorage residents and businesses informed about changes throughout the project via local news articles, postings at public events, presentations at city council meetings, a public meeting and a website. For the most part, complaints were minimal, says Szczesniak. Ironically, one local resident affected by the new routing was Brinkman herself. “I live at the south end of Anchorage, and when we had to close 15-33 in 2019, many of the planes took off to the east, and these huge jumbo jets flew right over my house as they departed,” she recalls. “But I couldn’t complain much, since I was involved in planning and designing this whole project.”

Johansen reports that most work went according to schedule during the two years of construction. The first phase, at the southern end of the runway, was completed right on schedule by fall 2018. Runway 15-33 remained open throughout the winter of 2018-2019, at its full length.

However, Mother Nature added an unexpected challenge in late 2018. On Nov. 30, the Anchorage area experienced a magnitude 7.1 earthquake. “There was some damage in the region, but we were lucky here

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at the airport, and did not incur any significant damage," Johansen says. "None of the buildings or airside surfaces were damaged at all. Flights were delayed for maybe 15 minutes, as a precaution. It could have been a lot worse."

New Lighting

During the project, Runway 15-33 and some of its adjoining taxiways received a complete new lighting system. Installation required advance planning and careful timing to coordinate with various stages of construction, says Lucas Schneller, the Stantec electrical engineer who led the lighting design.



LUCAS SCHNELLER

"Stantec has done various projects for ANC for more than 15 years, so we were very familiar with the airport's layout and the staff," Schneller says. "We actually started planning for this project as part of the preceding Taxiway Y project. We developed a three-year plan for the electrical work, and this enabled a smooth transition between projects."

The first stage was to replace the lights for Taxiway Y, which runs parallel to 15-33. That occurred when the taxiway was rebuilt in 2017.

For the 15-33 rebuild, Stantec added a lot of new equipment, including new light bases, conduits and circuitry, edge lights, LED centerline lights and signs for the runway and intersecting taxiways. New lighting for Taxiway R also was installed as part of a separate project happening concurrently.

"Our main challenges in planning were to keep all of the circuits connected when the runway and various taxiways were shut down, while also maintaining coordination with the ongoing FAA project," Schneller says. "Fortunately, the project engineer and the electrical contractor, NPC Energy Services, did a great job with the construction. Everything went very smoothly throughout this project."

Another lighting project supervised and financed by the FAA occurred during the runway construction project. Separate contractors hired by the FAA installed new precision approach path indicators and upgraded the approach lighting system from ODALS to MALSF.



In addition to improving pavement, the airport also installed new runway lighting.



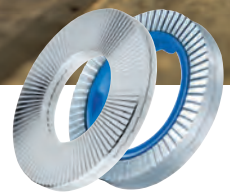
Worth the Wait

The Runway 15-33 project was one of the largest ever completed at ANC, and was a big challenge considering the short construction seasons and complexities of the job. The end result earned accolades from all the stakeholders involved, says Szczesniak. “We are very pleased that everything went smoothly, and we really had very few unexpected challenges—besides the earthquake, of course,” he exclaims. “Our project engineer and contractors did a fantastic job. We came in at budget, and had very few change orders, which can be expensive.”

On a separate note, Szczesniak says that the COVID-19 crisis has not affected ANC as much as it has other airports. “I think we were lucky we completed this project last fall. Through June this year, our passenger traffic has declined somewhat due to the pandemic, but the cargo traffic has remained very strong. In fact, during two Saturdays this spring (April 25 and May 2), ANC was the busiest airport in the world! That was a first for us.” ✈️



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Norman Rogers Airport Breathes New Life into Kingston

BY BRIAN SALGADO



Just as home renovations turn life upside down for families, infrastructure projects complicate life for airport operators. Kingston's Norman Rogers Airport (YGK) in eastern Ontario, Canada, worked dilligently to keep operations running smoothly for customers while completing \$16 million of improvements spanning landside and airside areas alike.

Ultimately, the work scope included a 6,000-square-foot terminal expansion with renovations and extensions that added 1,000 feet to one of the airport's two asphalt runways. Construction started in April 2018, and the expanded runway was operational in December 2018. The grand reopening of the terminal building occurred in July 2019.

Aron Winterstein, acting manager at YGK, explains that the overriding goal was to create a beautiful gateway to the picturesque place on the shores of Lake Ontario known as Limestone City.

"For this project, we had a significant focus on customer experience," says Winterstein. "We're making sure we have an efficient, modern facility that we can continue to use long into the future."

Taking Off

The project focused on three main objectives: extending the primary runway, expanding the terminal building and enhancing the customer experience at YGK.

First, Runway 01-19 was extended from 5,000 to 6,000 feet. Project designers added 300 feet to the south end, and another 700 feet to the north. This work required approximately 200,000 metric tonnes of new granular material.

Winterstein explains that airport and city officials considered the extra runway length an essential component to help YGK stay connected to the world now and in the future. With a 6,000-foot





runway, the airport is not only safer for small aircraft, it now has the capacity to bring in larger aircraft such as the Dash 8, Q400 and Boeing 737.

The construction team was tasked with building the runway extensions to meet Transport Canada's new TP312-5th edition Aerodrome Standards and Recommended Practices. According to Jeff Simpson, project manager/estimator for design/builder H.R. Doornekamp Construction, several changes were incorporated between the fourth and fifth editions of the standard. Some of those changes include the types of paint markings required for short lines such as taxiway lines

and new standards for runway signs. But the integrated design/build team, the city's team and agencies including Transport Canada and NAV Canada worked together to make sure that the airfield project at YGK achieved compliance.

In addition to building the runway extensions, crews upgraded the instrument landing system with new technology and installed LED lighting.

Material Matters

Handling the massive amount of fill that was required for the north side of the runway extension proved to be a key challenge for the

FACTS & FIGURES

Project: Expansion & Renovation

Location: Norman Rogers Airport – Kingston, ON

Owner: City of Kingston

2018 Passenger Volume: 80,000

Primary Projects: Extending runway; expanding & renovating terminal

Total Cost: \$16.1 million

Timeline: Construction began April 2018; runway operational Dec. 2018; terminal grand reopening July 2019

Key Runway Components: 1,000-foot extension; new LED lighting; designed to meet Transport Canada TP312-5th edition

Key Terminal Components: 6,000 sq. ft. of new space; limestone wall art installation; elevator to 2nd floor; new departures lounge

Design/Builder: H.R. Doornekamp Construction Ltd.

Architect: HDR Architecture Associates Inc.

Civil, Structural, Mechanical & Electrical Engineer: EXP Engineers

Airfield Lighting: Approach Navigation Systems Inc.

Paving: Coco Paving

Required Fill for Runway Extensions: 200,000 metric tonnes



Baggage
Bagages

Local references were added throughout the renovated terminal.

Welcome to Kingston

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project team. Trucking in 200,000 metric tonnes of fill would have presented logistical and environmental challenges. So the team devised another way.

Instead of relying on trucks, H.R. Doornekamp transported the fill on barges that run along the shores of Lake Ontario. The fill came from the company's quarry in Picton, which is about 37 miles west of the airport. Winterstein notes that this strategy was not only more efficient, but it also reduced the project's greenhouse gas emissions by keeping a parade of trucks off the road.

Construction of the runway extensions was extended for about one year when the poor condition of existing power cabling for lighting and communications was detected early in the design and construction phases.

The city elected to incorporate additional upgrades to the primary electrical cabling for runway lighting, which involved the complete replacement of existing aging infrastructure that was previously identified to remain. In addition, a wireless system replaced some of the former communications lines.

Improving Facilities & Service

The terminal building, which was previously about 11,000 square feet, now stands at 17,000 square feet—an increase of approximately 54%.

Beyond expanding the physical size of the building, the city and airport focused on giving passengers a better overall experience at YGK. Jason-Emery Groen, vice president and design director of HDR Architecture Associates Inc.,

notes that the terminal expansion was designed not just for functionality, but also to give arriving passengers a sense of place.

“This is not just a building designed to get as many passengers to move through it as possible,” Groen explains. “We were thinking about how people will arrive in the city and what their first impression will be.”



JASON-EMERY GROEN

Kingston has long been known as a place where history and innovation come together, he adds. To communicate Kingston's notoriety as the “Limestone City,” Groen and his team designed an artistic wall installation that prominently features limestone. The wall was created using state-of-the-art parametric digital technology, and was designed to convey Bernoulli's principle by coursing and positioning each piece of stone to demonstrate how the shape of an aircraft's wings help it take flight.

Typically, when architects design such features, they leave it to the masons to install them according to drawings. However, in this case, Groen and his team arrived onsite daily to help lay the stones with the mason to ensure it would be assembled properly.

Planning Ahead

After the city issued the original concept design to design-builders potentially competing for the job, HDR and H.R. Doornekamp determined that the construction sequencing

could put work crews in the way of tarmac operations, which would prove complicated and expensive. That inspired a plan to expand the terminal laterally—extending west to east—and thus avoid protruding onto the tarmac. This way, Groen explains, if the city of Kingston wants to expand the terminal again, it can avoid dismantling the tarmac, which provides value well into the future.

“The city told us this is one of the reasons we won the project,” he notes.

As the acting airport manager, Winterstein acknowledges this was an important part of HDR’s bid. However, there is some dispute in his mind over who the real winner is at the end of the day. “This beautiful facility is a resource for our residents, and our region,” he remarks. “With the renovations behind us and new infrastructure in place, we are looking forward. YGK Airport is ready for takeoff.” 



A new art installation highlights Kingston’s moniker, Limestone City.

PHOTO: HDR © 2019 KEVIN BELANGER



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Trenchless Sewer-Lining Project Helps Prevent Glycol From Entering Groundwater at Minneapolis-St. Paul Int'l

BY KEN WYSOCKY



FACTS&FIGURES

Project: Lining Storm Sewers to Prevent Potential Glycol Seepage

Location: Minneapolis-St. Paul Int'l Airport

Cost: \$3.5 million

Funding: Airport revenue bonds

Phase One: Aug. 2018 – June 2019

Phase Two: August through Sept. 2019

Engineering Consultant: TKDA

Project Scope: Lined 7,288 ft. of concrete storm sewers; rehabbed 50 manholes

Pipe-Lining Contractors: Granite Inliner; Visu-Sewer Inc.

Pipeline Inspections: Visu-Sewer; Hydro Klean

Manhole Sealing: Visu-Sewer; Thul Construction

Key Benefits: Protects nearby eco-sensitive river from contaminants; pipe-lining is faster, less expensive & significantly less disruptive than excavating & replacing pipes

 Minneapolis-St. Paul International Airport (MSP) recently completed a roughly \$3.5 million project designed to prevent the glycol used to deice planes from potentially seeping into groundwater. By sealing select sections of concrete storm sewers with leak-proof liners, the airport avoided the higher cost and disruption associated with excavating and replacing pipes.

Performed in two stages, the project included lining 48 segments of storm sewers totaling 7,288 feet of pipe. The trenchless lining technology used is known as cured-in-place pipe, essentially a resin-impregnated felt liner that, once cured, creates an impregnable pipe within a pipe.

The seeds of the project were planted several years ago when the Minnesota Pollution Control Agency (MPCA) expressed concerns about potential seepage of glycol from airport storm sewers into groundwater, explains Pat Mosites, project manager for the Metropolitan Airports Commission.



PAT MOSITES

The state environmental agency was worried that such seepage could impact the nearby Minnesota River, which drains into the Mississippi River about two miles to the east. Glycol consumes oxygen in water as it degrades, which can stress fish and other aquatic wildlife.

The Minnesota River runs near the southeast side of the 3,400-acre airport and the majority of airport stormwater drains into it. As such, the agency asked MSP to inspect the storm sewers to see if any were leaking, Mosites explains.

All pipes passed the inspection, but some were close to the lower end of acceptable leakage tolerances, which could eventually lead to groundwater inflow and infiltration. So after reviewing the inspection results, MPCA and MSP officials worked out an agreement regarding which pipes should be lined.

TKDA, a design/engineering and construction management firm based in St. Paul, consulted with the airport about the project.

General revenue airport bonds issued by the Metropolitan Airports Commission, which operates MSP and six other area



airports, paid for the project. Last year, MSP handled nearly 39.6 million passengers and 406,076 operations.

Going With the Flow

The first stage of the project cost about \$1 million and ran from late August 2018 to June 2019. Visu-Sewer Inc. lined 17 storm sewer segments totaling 1,964 feet. The pipes collect glycol and stormwater runoff from the airport's 10 in-gate deicing operations. The company also resealed 10 manholes to eliminate groundwater inflow and infiltration.

Granite Inliner LLC, a wholly owned subsidiary of Granite Construction Inc., performed the \$2.5 million second phase during a six-week stretch last September and October. The project involved lining 31 segments of storm sewers and totaled 5,324 feet of pipe. In addition, Thul Construction resealed 40 manholes as a subcontractor.

Most of the pipe-lining was performed on storm sewers that run under in-gate deicing areas. When the pads are in use during winter, the airport seals off sections of those sewer pipes with mechanical plugs to hold glycol and water runoff. "It's like putting in little dams," Mosites explains.

A contractor periodically pumps out these sealed-off segments with a vacuum truck and then tests the glycol content. All the collected water is pumped into three underground concrete storage vaults; each one can hold slightly more than 3 million gallons.

Water with more than 2% glycol content is pumped into one of the three underground vaults. Water with less than 2% glycol



content is pumped into the other two vaults. All the vaults are lined to prevent leaking, notes Mosites.

A recycling company then collects the water with a higher concentration of glycol, which ultimately is used to make products such as hydraulic fluids for the automobile industry. The water with a lower concentration of glycol is discharged into a sanitary sewer line that is connected to a local municipal treatment plant. Discharge rates are regulated to ensure that the plant isn't overwhelmed, Mosites says.

MSP also has five dedicated deicing pads, one at both ends of the two parallel runways and one at the north end of its crosswind runway. Stormwater runoff from three of the pads drains directly into the storage vaults via pipelines. Runoff from the other two pads gathers in plugged-off sewer lines, where it's collected by vacuum trucks and pumped into the appropriate vaults.

Trenchless Technology

Lining pipes is a viable solution for leaking lines only if the host pipe is structurally sound. The so-called trenchless technology has become increasingly popular and accepted during the last decade or so because it eliminates the need to excavate and replace substandard pipe—a more time-consuming and typically more expensive proposition.

While cured-in-place pipe technologies and processes vary by liner manufacturer, here's how a typical installation works: Crews begin by thoroughly cleaning the pipe, typically with high-pressure water. Then they use robotic wheeled cameras to inspect the pipe.

At MSP, Visu-Sewer inspected and cleaned the pipes during the first phase of the project. During the second phase, Granite Inliner inspected the pipes and Hydro Klean cleaned them, working as a subcontractor.

After the prep work is completed, contractors use a winch and a cable to pull a felt liner that is fully saturated with epoxy resins into a pipeline, usually running from one manhole to another. Then either water or compressed air is used to inflate the liner until it fully conforms and adheres to the host pipe.

After the liner cures, it creates a like-new pipe inside the host pipe that should last for at least 50 years. Some liners cure by ambient temperature while other processes use hot water, steam or even small "light trains" with ultraviolet lights that slowly travel through the pipe on wheels.

Ron Stensby, a project manager for Granite Inliner, notes that crews working at MSP used steam to cure smaller-diameter pipes, a process that takes about one to one and one-half hours, and hot water to cure larger-diameter pipes, which takes about 12 hours. The company makes its own liners.



RON STENSBY

Timing is Everything

The lining work was performed at night to minimize disruption to airport and airline operations. MSP never had to close down, Mosites notes.

"Some of the lining occurred in gate areas," he explains. "We tried not to interfere with both tenants and airlines by working within their schedules...But at times we had to close some gates, so we had to ask airlines to use different gates."

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“Projects like this almost always required dancing around the airlines’ schedules,” he adds. “But they realize that the end product supports their operating goals as well. We have good working relationships with airlines here at MSP.”

Working on airport grounds and completing the associated badging process made the project more involved than some of Granite Inliner’s other projects. “It took a lot of coordination. But once we figured everything out and got it all scheduled, it went very smoothly,” Stensby reports.

Paul Blum, a senior registered engineer with TDKA, notes that it’s challenging whenever work occurs inside a secure airport perimeter. In this case, much of the work occurred at gates near areas where airplanes are parked, which upped the ante a bit.



PAUL BLUM

“Sometimes we had to vacate a site on short notice and jump over to a different manhole because an airline had a plane unexpectedly coming in late at night,” Blum comments. “But we do a lot of work at airports, so were used to dealing with things like that.”

Keys to Success

Collaboration, communication and coordination among all stakeholders were critical to the projects’ success—especially with the Minnesota Pollution Control Agency, notes Mosites. “We had to see the situation from their point of view as well as get them to see the situation from our point of view,” he reflects.

Investigative pipeline inspections were performed early on, followed by a report that helped officials from MSP and MPCA form and agree on an action plan. In all, the projects took about three years from initial talks to completion.

“Initially, we were projecting it would take about five years,” Mosites notes. “But the pipe inspections helped us shorten that to three years because it narrowed the amount of lining required.”

Getting to know all the key stakeholders also was critical, he adds. Establishing familiarity, particularly with the state agency and airlines, nurtured a collaborative atmosphere that led to faster and easier agreement on solutions, says Mosites.

“The key is getting to know the people in the trenches,” he concludes. “When you can collaborate, everybody wins.” ✈️



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Evansville Regional Leverages Federal, State & Local Funds for Terminal Expansion Project

BY JENNIFER BRADLEY



Evansville Regional Airport

FACTS & FIGURES

Project: Terminal Renovation/Expansion

Location: Evansville (IN) Regional Airport

Construction: Nov. 2017-Dec. 2018

Cost: \$20 million

Funding: \$8.9 million FAA Airport Improvement Program Grant; \$5 million Indiana Regional Cities Initiative Grant; about \$6 million in airport funds

Design: Hafer Associates, PC

Consultant: CHA Consulting

Contractor: Weddle Bros. Building Group LLC

Electrical: Boyd Electric

Skylight: Kalwall

Key Benefits: Add modern amenities; update design elements; increase energy efficiency; improve passenger flow





Even though the terminal at Evansville Regional Airport (EVV) was more than 30 years old, personnel there still called it the new building because it replaced the airport's original 1928 terminal. So after crews finished a major runway rehabilitation in 2015, Airport Executive Director Nate Hahn quickly turned his focus to making the "new building" live up to its name.



NATE HAHN

In just 18 months, the southwest Indiana airport and its partners completed a \$20 million update. In addition to constructing a small addition to provide more office space, they also overhauled the building's interior design, customer conveniences and overall functionality.

The project's key design partner, Hafer, also designed EVV's original 1988 terminal.

"The airport is an integral part of the economic development efforts in the Tristate area," says Jeff Justice, the company's president. "It serves as a front door to our region, and the modernization project has enhanced the flying experience for passengers with improved amenities, enhanced security measures and efficiency of flow."



JEFF JUSTICE

The company originally began the project in 2013 by reimagining the terminal's future and providing concept imagery and preliminary cost estimates; but the runway work was a higher priority. A few years later, however, Indiana provided the incentive EVV needed to take the next step—a tax amnesty program that would feed millions of dollars into an Indiana Regional Cities Initiative.

The airport and 14 other entities became important pieces of Indiana's \$42 million Great Southwest Plan, and EVV received \$5 million in funding. "Once we



The new Business/WiFi Lounge, sponsored by Berry Global, includes common areas and private work spaces.

knew that was in play, we really kicked our plan into high gear," says Hahn.

The FAA Airport Improvement Program contributed another \$8.9 million, and the airport provided about \$6 million.

The result was, indeed, a new terminal—brighter and more spacious, with remodeled ticketing counters, updated concourses and new passenger amenities. In addition to modern touches such as charging stations for electronics and filling stations for water bottles, the airport added energy-efficient chillers, variable fan drives, LED lights and other upgrades to decrease its energy bills and improve system functionality.

Exterior improvements have also been impactful. Justice notes that the revamped front entrance and new landscaping make an astounding first impression on travelers. Separating pedestrian and vehicle traffic was another marked improvement.

Matt Hoon, project manager with Weddle Bros. Building Group, reports that the terminal overhaul turned out just as the airport and Hafer envisioned. "It's a great win for the collaborative team," he

says.

"Personally, hearing direct or indirect compliments of how wonderful EVV looks is a highlight," Hoon adds. "And this project had zero safety incidents for some very tricky tasks. I am very proud of my team."

Redefining Spaces

The only addition to the terminal footprint was for new administrative office space. The new facilities provide a more efficient space for airport staff and free up square footage in the terminal for passenger amenities.

One particular design goal was to add transparency through the terminal. New glass walls allow families and friends to see into the secure side of the terminal and the airfield. "People enjoy being able to watch the planes take off and see loved ones arrive," says Justice.

The TSA checkpoints were another primary focus. Previously, the airport had two lanes at opposite ends of the terminal. Neither had modern technology, and sharing staff between the two was tricky, notes Hahn. Today, the airport



Exterior improvements include new landscaping and an updated front entrance.

This Amenity Brought to You by.....

The recently renovated terminal at Evansville Regional Airport (EVV) is filled with concrete evidence of local support. Numerous new amenities were made possible by direct financial sponsorships from local companies:

- Animal Relief Area – Midwestern Pet Foods
- Mothers’/Nursing Room – Deaconess Women’s Hospital
- Business/WiFi Lounge – Berry Global (an international packaging manufacturer headquartered in Evansville)
- Children’s Play Area – Children’s Museum of Evansville and Evansville Public Library System

Executive Director Nate Hahn explains that the new spaces and names that adorn them were a way to bring the community into the airport. “These companies wanted to greet people as they arrive and leave a lasting reminder as they depart,” he relates.

While the associated funding helped offset expenses such as furniture and other necessarily equipment, Hahn says that the sponsorships weren’t meant to simply be a way to pay for new spaces.

“They are Evansville-centric companies, even the multi-billion dollar ones, that you could not see in any airport,” he explains, adding that the unique partnerships offered a way for planners to get creative. The chair in the mother’s room, for instance, is the same style that is found at the Women’s Hospital.

For the new play area, working with the Children’s Museum and Public Library created a well thought-out and designed space for kids to play, Hahn adds. “In my opinion, that community involvement goes a long way.”

has a centralized checkpoint with two lanes featuring updated equipment. Project designers allowed room for a third lane when traffic growth requires it.

The new checkpoint is also brighter and more open and inviting. “No more gray on gray on concrete,” Hahn jokes. Justice points to the large wood ceiling, new floor tiles and recomposure area as huge improvements in design and function.

Open architecture, LED lighting throughout the building and natural light from a building-length skylight have made a world of difference. Hahn explains that the Kalwall skylight looks like glass, but is much lighter and refracts light more effectively. “It’s better in every way,” he raves. “It’s cheaper than a full-glass system, and we’re not fighting leaks anymore.”

“It’s a beautiful area we are all proud of,” Hoon agrees. “EVV is now more modern, appealing and accommodating for today’s travelers.”

Passenger-Focused Amenities

A new canopy between the terminal and parking lot makes the 100-yard dash from one to the other much easier in rough weather; and the animal relief area is an extremely popular addition for passengers traveling with “man’s best friend.” But the new restaurant, business lounge and kids’ play area top the chart of recently added amenities.

The Iron Compass café and bar is named for the way early pilots used railways to track their courses between locations. “The space has a special feel,” Hahn says, referencing the 1960s photographs of Evansville that cover the walls. “It went from



The local children's museum and public library provided input and financial support for the new play area.

feeling like an outdated diner to a modern eatery that embodies the history of the city and airport.”

With the addition of about 4,000 square feet for administrative offices, space in the terminal was repurposed for amenities such as a nursing room and a work lounge with private meeting areas. Discussion about features for the work lounge led the team to decide that *all* passengers would likely appreciate free Wi-Fi and workstations. So instead of adding an elite members-only lounge, the airport built an area that provides space for business travelers and other passengers who just need a space to refresh. “EVV wanted all passengers to feel like VIPs,” explains Hahn.

The airport also revamped its children’s play area with help from the Children’s Museum of Evansville and Evansville Public Library System. Hahn notes that the new area is much more interactive, and kids especially enjoy the magnetic wall and an animated version of downtown Evansville.

“We truly tried to find a way to provide all the things someone would expect in a large airport and still be Evansville,” he explains. “We know who we are, who our passengers are and wanted to be accommodating to them and meet their expectations.”

The airport recently picked up service from Allegiant Air to increase its appeal for leisure travelers. Hahn explains that the new routes will help EVV increase its reach into the vacation market. (American, Delta and United also serve the airport.)

“We talk about the family side of things, but this airport is a huge economic engine for the community,” Hahn specifies. “When we get more flights, it’s good for everyone.”



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Between business and leisure passengers, 250,000 travelers passed through EVV last year. Notably, traffic at the airport has increased 35% since 2016, and its airfares have dropped 11% over roughly the same period.

Key Takeaways

The airport broke ground on its terminal modernization program in November 2017 and toasted the new facilities in December 2018. Construction was completed in stages, starting with the administrative office addition.

In retrospect, Hahn says that he and the team did well gathering input, but could have done better. For example, information was gathered about what equipment the restaurant would need, but not about specifically where items would be placed to maximize operations. The same was true for rental car operations. "I think we did some things the right way by asking, but the more input you can get from both the public and tenants is helpful," Hahn reflects. "I wish we would have asked for more *detailed* information."

He also advises including deadlines when seeking input. "We wanted to be accommodating, but should have added 'by next Friday' so we weren't delayed."

Another bit of hindsight: Sometimes construction crews had to push hard to meet timing restrictions associated with grant funding, when just six more months in the schedule could have provided breathing room for the entire project team.

Hoon adds that constant coordination with contractors was key to maintaining the safest environment possible for travelers and airport employees.

"There was heavy demo and construction traffic for most of the job," he recalls. "It was our obligation to make sure no one was put at risk—construction trades are trained for this. And we understood that travelers had flights to catch, business to attend to and family to visit."

Justice emphasizes the importance of phasing the construction work and maintaining a definitive line between secure and public areas. "Everyone worked well together to make sure the airport remained completely operational the entire time," he notes.

Consolidating two TSA checkpoints into one required extra security measures. Managers from project consultant CHA, Hafer Design, Weddle Bros. Building Group and Boyd Electric held several in-depth meetings to plot the strategy in advance. "Due to the team collaboration, it was a major success," Hoon reports.



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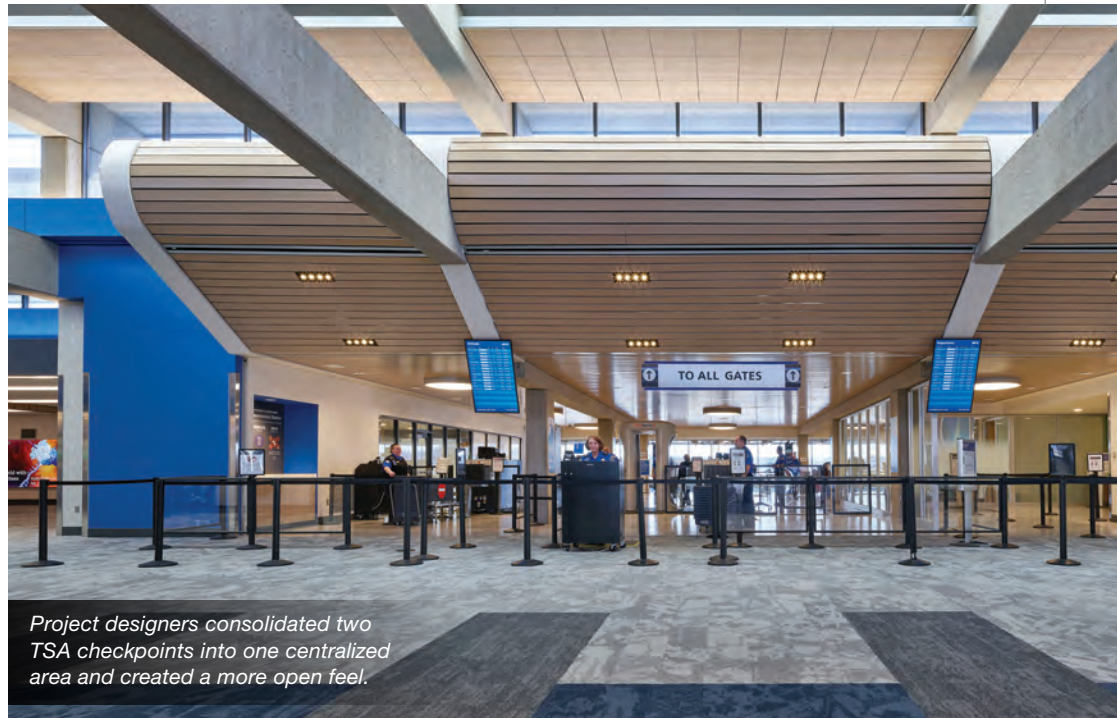
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Looking back, Hahn says that his personal experience relocating to Indiana from Midland, TX, taught him how to plan at least 10 years out. As a result, he suggests telling architects, engineers and designers, “Don’t tell me what I need now. Plan for the future; make space.”

Regarding EVV’s future, Hahn knew that it was important to build flexibility into the terminal modernization project and continually stressed that to the design team. Meanwhile, excitement abounds about recent improvements. Passengers say the terminal is brighter, easier to navigate and just more fun. Airport personnel are also enjoying the “new building”—and looking forward to occupying it for another 30 years. ✈️



Project designers consolidated two TSA checkpoints into one centralized area and created a more open feel.

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CIRCLING



CRYSTAL MOUNTAIN



Two of the most loved art installations at Dallas Fort Worth International Airport (DFW) are two of its largest and most interactive pieces.


Circling is a labyrinth of curved glass panels more than 30 feet in diameter. Sculptor Christopher Janney created the piece as a soothing and contemplative game for airport visitors, and many enjoy experiencing it every day.

Passengers on the upper levels of Terminal D can clearly see the sculpture's four sections of concentric circles. But from ground level, it appears more like a maze or series of translucent veils. There's even a riddle in the center. When guests solve it correctly, the sculpture responds with lights and soothing regional sounds such as birds and other animals.

"As an artist, it is my concern that public spaces not only have a unique sense of place, but also are places of creative rest—not only visually interesting but physically engaging to pass the long hours waiting," says Janney. "To that end, this conceptual proposal attempts to make people both aware of the scale and beauty of this grand space while, at the same time, develop a sense of ownership, a sense of it being their place through creative play with interactive systems."

Crystal Mountain is also extremely popular with DFW travelers. Dennis Oppenheim's 45-foot-tall aluminum-frame sculpture includes an arched tunnel through the center that is wide enough for two-way pedestrian traffic. Adults and children alike both delight in passing through the jagged artwork on their way to the gate area. In the artist's words, the piece explores the "innate relationship to movement and human experience of space as it is traversed."

Not surprisingly, *Crystal Mountain* is a common spot for photos and selfies. And it undoubtedly inspires plenty of *Frozen*-themed stories and play from families traveling with children. What better way to pass time before boarding than an imaginative romp in Anna and Elsa's castle?

The massive art installation also serves as a wayfinding element, because it is visible from the entire village on the north side of Terminal D. 

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Airports Adapt in Novel Coronavirus Time

“When time marches on, it steps on your nose and tail, and leaves boot prints down your back.”

- Hank the Cowdog (a mystery-solving ranch dog from a popular series of children's books)

 Demand for U.S. air travel nosedived to 10% of its normal daily volume in the 20 days between March 5 and March 25. In the subsequent 60 days, passenger volume “rebounded” to 15%. Our descent was quick, our recovery will not be.

Mathematics aficionados recognize this phenomenon as time complexity, where the time to execute a task proceeds on a logarithmic scale. Hank the Cowdog, like almost everyone else, recognizes it in more earthly terms. Our time scale has been radically altered and we are sporting boot prints down our backs.

In just a few weeks, the world has been introduced to epidemiologists, immunologists and ablutomaniacs, to say nothing of the ubiquitous soothsayers. Not since 2001 have we seen such a torrent of predictions about the “airport of the future.” It is a grand time to be a fantast.

A 90% drop in customers has a way of separating wheat from chaff, though. In the linear time world, flights, passengers and revenue continue a very gradual climb from a low point. Most signs now point to a recovery measured in months and years. In the logarithmic time world, guidance to reestablish health and confidence emerges, flourishes briefly and evaporates in a matter of days.

Enthusiasm for fever detection, blood testing, sneeze guards, quarantine rooms, touchless travel, surveilled/enforced personal distance, stickers on floors, hand-washing stations, disinfection tunnels, health immunity certificates and many other proposed solutions has waxed and waned as we learn more about viral transmission. Airports are not laboratories; they are critical infrastructure that has the responsibility to balance the interests

of health security with other operational requirements (like effective processing, cost containment and a hospitable customer orientation).

Airports were born of the public fascination with powered flight and grew up to accommodate millions of travelers—about 900 million last year—safely, efficiently and with as much comfort and joy as possible. A judicious approach has always been a hallmark of U.S. airport leadership. Jolts like the novel coronavirus test our equilibrium, whether we are operators, providers, practitioners, builders or users.

Living in dual time—the rapid changes wrought by the virus and the far slower return to the air—leaves us with a very special problem of adaptation. In a period of dramatic stimulus, the temptation to produce an equally dramatic response is strong.

“Between stimulus and response there is a space. In that space is our power to choose our response. In our response lies our growth and our freedom.”

- unknown

This aphorism has a murky paternity, ranging from Viktor Frankl to Stephen Covey, but its applicability to our predicament is clear. The airport industry must adapt by being discriminating. And we are. Many airports are choosing wisely and advancing immediately practical and available programs for dealing with SARS-CoV-2. Some examples include:


- Requiring face coverings for employees, encouraging them for passengers
- Enhanced sanitization of high-touch areas, restrooms and shuttles

- Additional hand sanitizer stations
- Social distancing floor markers
- Restricted capacity on shuttle vehicles
- Socially-spaced seating
- Audio and visual messaging for healthy travel tips
- Adding Plexiglas barriers in customer interaction areas

And for the always-ready technology advocates, there are plenty of sound technologies available now or very soon:

- Mobile applications
- Digital wallet purchasing
- Touchless kiosks using mobile app
- Face recognition for international travel

Airports are sidestepping schemes involving expensive surgery to facilities and problematic technologies, favoring gentler approaches that are flexible enough to move with the changing understanding.

And for the future? Most airports adopt what Hank the Cowdog calls “Hide and Watch” mode. This is not a passive posture, as we are all monitoring the scientific and social effects of COVID-19, but rather an alert and balanced perspective that respects the gap between the stimulus and our response to it. 



David Kipp, P.E., is vice president of Technology Services for Burns Engineering. He leads the firm's national practice in airport technologies and has led technology projects for airports across the U.S. and around the world.

Although Kipp is based in St. Louis, he has family roots in the Texas panhandle, where Hank the Cowdog works.

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