AirportImprovement™

Express Curbsides at Tampa Int'l Will Allow Millions of Passengers to Bypass Ticketing/Baggage Lobby

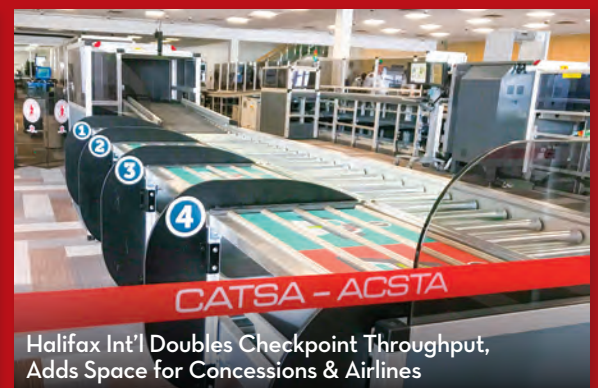Wilmington Air Park Welcomes Amazon as New Tenant

British Airways Performs Sweeping Renovation of JFK Terminal 7 to Enhance Passenger Experience

AIRPORT STORIES INSIDE: EUG | ILN | INL | JFK | LAX | MIA | OAK | PNS | RDU | SAN | TPA | VIA | YHZ

Falls Int'l Builds New Terminal to Welcome International Passengers

Halifax Int'l Doubles Checkpoint Throughput, Adds Space for Concessions & Airlines

A change of name for changing times

Since 2006 you have known us as Airport Lounge Development (ALD). Together with our airport and airline partners we have delivered an award-winning hospitality experience to millions of travelers across our network of airport lounges in the US and Europe. This experience and our partnerships with over 25 domestic and international airlines, have allowed us to build market leading insight on the changing needs of frequent travelers.

To meet the rapidly changing needs of travelers, Airport Lounge Development is changing to Airport Dimensions.

This change will allow us to deliver even greater value by exploring new dimensions in travel experiences designed around the traveler.

![Airport Dimensions — A COLLINSON COMPANY]

Spaces well built. Time well spent.

We understand how the spaces we create affect the quality of travelers' time at the airport. From a brief stop-over to a leisurely wait we aim to deliver great value in a travelers' time with us.

By designing, building and operating airport spaces for lounge and other experiences, we seek to enrich a travelers visit and also help airports become more competitive, retain airlines and generate more revenue.

Airport Dimensions will bring innovative new airport experiences informed by the experience of a leadership team with over 25 + years in hospitality, airlines, airline lounges, and the food and beverage industry. The expertise and unrivaled access to the world's largest lounge membership audience, Priority Pass™, results in an unmatched insight and understanding of what today and tomorrow's traveler want from their airport experience.

We are looking into new ways to bring entertainment time to real (and virtual) spaces.

Space
Connected | Playful | Exclusive

Time
Maximize | Leisure | Play

A growing network, exploring new spaces.

17	U.S.
4	U.K.
-	Middle East

COMING SOON

Airport Dimensions, operators of The Club, is a market leader in providing shared-use lounges for travelers with a network of 21 lounges in the U.S. and the UK and ambitious plans to continue our growth both in the US and globally. Look out for some exciting new openings in the coming months!

Since 2015, the Airport Dimensions Network has experienced:

80%
growth in locations

220%
gross revenue increase

278%
guest volume growth

Time for forty winks in a restful Space.

Space
Restful | Private | Exclusive

Time
Business | Leisure | Maximize

Going beyond traditional lounge services

This year, Airport Dimensions will deliver new airport experiences for travelers by offering sleep pods and cabins for the first time. Our exciting new partnership with industry leaders in the Middle East has given us a great opportunity to showcase this innovative new product in Doha Hamad International Airport, ranked in Skytrax World's Top 10 Airports.

This forward-thinking concept marks the expansion of our portfolio to provide guests with new spaces and choices in how they utilize their time at the airport. Our sleep pods and cabins can be used by travelers to catch a quick nap or do work in a private space. With our new sleep pods and cabins, Airport Dimensions brings everything important to the traveler: convenient location, safety, privacy and economical pricing.

Airport Dimensions
A COLLINSON COMPANY

As Airport Dimensions, we are committed to

Spaces well built. Time well spent.

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Recognition for our innovation

Our success in delivering an innovative shared-use lounge experience to millions of travelers and now our sleep pods and cabins is just the beginning. Airport Dimensions will continue to create innovative airport experiences meeting the demands of a changing traveler demographic.

Part of Collinson | COLLINSON

Airport Dimensions has grown rapidly and delivered strong financial returns to our airport partners because of the unique value proposition that we offer our airport partners: we are the only operator with guaranteed access to Priority Pass customers, the world's largest and most prestigious independent lounge membership program with 20m+ members worldwide.

Airport Dimensions are part of Collinson, the pioneers and innovators of travel benefits and the owner of Priority Pass. Collinson are the global experts in travel experiences and we collectively continue to grow our knowledge on the needs and wants of today's travelers, drawing insight that helps us design new experiences to meet the needs of this and the next generation of travelers.

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The Right Stuff

Coverage of airport projects is the glue that binds *Airport Improvement* together. Sharing these stories with the industry serves all of us well.

Detailing the construction of new terminals, the coordination needed for updated security systems, and the precise scheduling required for runway reconstruction are staples in every issue. However, airports also engage in important projects that don't necessarily add new infrastructure, yet still have a profound impact on passengers and operations. We feel these initiatives deserve coverage, too.

Last issue, we chronicled how El Paso International created an entrance that helped the airport engage, and literally connect with, the community directly outside its property. We also reported about 30 U.S. airports teaming up with the Airport Minority Advisory Council and several rental car companies to help increase opportunities for existing and potential ACDBEs in their markets.

This issue, we include two more examples of nontraditional projects.

The new multi-sensory room at Miami International Airport is not only a project worth knowing about, but also a case in point about serving a smaller demographic. Clearly, this was not a revenue-driven project; rather, the motivation was looking out for the well-being of a group of vulnerable passengers and their families.

Finally, our Industry Insider, written by Brian Ryks of Minneapolis-St. Paul International, discusses a brilliant project that is truly a win-win. The airport is partnering with a local organization to offer airport and vendor employees free English as a Second Language (ESL) instruction. The goal is to help attract and retain qualified employees, and to also provide better customer service to passengers.

There are no laws or guidelines that require airports to step in and provide services like ESL classes or special rooms for passengers with autism. Fortunately, we have bright, compassionate, entrepreneurial leaders who see a need and fill it. They create great examples for us to share with you.

Thanks for reading.

Paul

PAUL BOWERS, PUBLISHER

British Airways Performs Sweeping Renovation of

FACTS&FIGURES

Project: Terminal Renovation

Location: John F. Kennedy Int'l Airport, Terminal 7

Cost: $64 million

Terminal Operator & Project Owner: British Airways

Designer & Architect of Record: Corgan

Program Manager: GLEEDS USA

Construction Manager: VRH Construction

Baggage Handling System Designer: BNP Associates

Powered Seating: Zoeftig

Construction: April 2017-Nov. 2018

Primary Goals: Enhance passenger processing capacity; improve passenger experience; update/expand terminal infrastructure

British Airways' $64 million renovation of Terminal 7 at John F. Kennedy International Airport (JFK) represents a premium upgrade—and not *just* for premium passengers. The changes are tangible for more than 150,000 customers who travel through the terminal every month.

Although the project emphasized enhancements for customers flying in British Airways' premium cabins, all passengers flying in and out of Terminal 7 benefit from the sweeping upgrades completed last fall—including those traveling on Alaska Airlines and nine other international carriers that operate in the terminal.

"JFK is our flagship U.S. airport, and we've been flying to and from here for more than 50 years," comments Steve Thody, general manager of Terminal 7 for British Airways. "Our home

STEVE THODY

here is hugely important to us and to our customers, and we wanted to make sure we were offering them the best possible customer experience."

British Airways operates Terminal 7 under a contract with the Port Authority of New York and New Jersey that runs through 2022.

Comprehensive renovations of the 12-gate terminal began in April 2017 and were completed in November 2018. In addition to completely revamping the check-in hall with custom millwork and an updated security area, British Airways created a separate premium check-in area with a dedicated screening lane for its premier customers. The 29,700-square-foot First Lounge and Club Lounge located above the screening checkpoint were renovated as well.

Airside, other travelers are enjoying renovated departure gate areas with powered seating and worktops, custom millwork, upgraded wayfinding and locally influenced

JFK Terminal 7 to Enhance Passenger Experience

BY JODI RICHARDS

food/beverage concessions. New lighting, ceilings, finishes and floors were installed throughout the terminal.

Infrastructure upgrades include new information technology rooms, updated communications infrastructure and a higher capacity baggage handling system, which was designed by BNP Associates. Replacing the terminal's aging outbound baggage carousel with a larger, more efficient version was a key improvement.

Passenger Experience

The project's overarching goals were improving the efficiency and speed of getting customers to their flights, enhancing comfort and convenience throughout their journey, and upgrading the overall customer experience. "Judging from the customer feedback we've received, we have met or exceeded those goals," reports Thody.

As designer and architect of record, Corgan focused on improving the passenger experience from the moment customers enter the building to the time they board their planes. This was a challenge, due to the age of the existing facility and the need to remain operational throughout renovations, notes Chris Sale, a senior associate with Corgan.

"The overall largest challenge was trying to help passengers feel less stressed, more at ease and in a more premium environment, when we didn't increase the footprint of the building," Sale elaborates.

Enhancing the in-terminal experience for British Airways' premium passengers was a priority, adds Farhad Mody, a Corgan vice president. "They have a lot of premium passenger traffic from JFK to Heathrow, and catering to that clientele as well as all of the other tenant airlines in the building was another driver."

The design team considered British Airways' peak flight times and potential traffic from other airline tenants when determining the best layout for the new check-in area. "We had to meet a certain ticket counter count requirement, based on BA's projected flight schedules over the next several years and the anticipated new partner tenants," Mody says.

CHRIS SALE

FARHAD MODY

Gate areas were outfitted with custom millwork and new finish materials.

Given Terminal 7's limited footprint, designers had to look for strategic opportunities to maximize the number of check-in desks and also create a separation of circulation for premium passengers. Previously, the security checkpoint was located in the middle of the check-in area, which caused confusion and crowding in the queuing lanes. Corgan solved this issue by using translucent glass partitions to create a separate passenger holding area outside the view of passengers at the ticketing counters.

"We had a significant challenge to expand the divestiture area of the checkpoint within a constrained footprint," Sale notes.

That was accomplished by shifting the entire screening area forward one column bay and adjusting the layout to accommodate the same number of check-in positions. "We had to be really smart about the way we treated the finishes in the space, so it still felt light, bright, clean and open, when we were, in fact, reducing the square footage of the check-in experience," Sale explains.

The new checkpoint allows direct access to Fast Track Security for premium passengers; but if the airline is experiencing slower passenger flow, those lanes can

accommodate all levels of passengers to ensure adequate throughput. "Our enhanced check-in area and the addition of a new security lane speed up the time it takes customers to reach their gate," Thody remarks. "Our new Premium Zone check-in area has direct access to Fast Track Security, so customers traveling in our premium cabins can move from check-in to gate quickly and easily."

"British Airways wanted to have a clear differentiation between the premium passenger experience and the general check-in," adds Sale, noting that LHR to JFK is an important route for the carrier. After British Airways invested in premium passenger amenities for its First Wing in Terminal 5 at LHR, the airline wanted to create a comparable experience on the New York side of the journey, he explains.

For premium passengers, the check-in process at JFK is now similar to what they are accustomed to at LHR, with an enclosed area that still allows visibility. The private entrance for World Club and First Cabin passengers is located on the far west side of the check-in hall.

The design challenge was to replicate the LHR experience while also giving JFK's Terminal 7 its own New York identity. Sale says this was achieved by using a palette of materials similar to the rest of the terminal, with specific references to the airline's heritage. Designers posted the British Airways insignia at the entrance of the premium check-in area and used a wood wall treatment inspired by a finish that showed up mid-century in a lot of the aircraft.

"They wanted it to be aspirational, so other passengers can catch a glimpse of the premium check-in experience and aspire to be part of it in the future," explains Sale.

During British Airways' nonpeak hours, some of the premium passenger check-in and screening facilities are used for general passengers to provide day-to-day and long-term flexibility, he adds.

"Although we had some idea of what the future flight loads and counts would be, it wasn't actually nailed down," Mody says. "Our design had to have maximum flexibility in being able to accommodate tenant airlines and for simultaneous check-in."

Unique, Yet Inclusive

Sale describes the design process as very collaborative. "It's uniquely BA and feels very true to the brand, without simply applying the logo throughout the space," he explains. "It really became a subtle reflection of the brand and delivers the BA passenger experience."

Creating a brand-specific experience for British Airways while also accommodating other tenants was a careful balance, Sale notes. Most British Airways flights occur during an evening peak, with very few exceptions. The rest of the day, other tenant airlines are active in the facilities.

"It was important to them to have a distinctly BA experience when they were using the check-in facilities, but they wanted other airlines to feel equally at home," Sale explains.

The strategy used to achieve this balance was applying what he calls "timeless minimalism" to the overall aesthetics and incorporating design elements that felt "distinctly British, yet were also generic."

The materials palette includes a wood slat ceiling that provides directionality and organization to the large, open check-in space, explains Sale. But the warm, natural wood texture is juxtaposed with heavy use of glass throughout the space, which is distinctly modern, he adds. Also, there's no traditional branding behind the check-in counters. "Everything traces back to this idea of modern and timeless minimalism," says Sale. "And that dovetailed with a lot of the trends in British design that we were seeing."

Concourse Improvements

Airside, the team coordinated its design goals with improvements British Airways was making to the terminal's concessions program. "We assisted their concessionaires on how to best utilize the airside footprint," says Sale, noting that some upgrades were needed to bring the building up to current code standards and maintain egress capacity.

Because the building has a limited footprint for the 12 gates it serves, designers had to be prudent about what areas were slated for concessions. "We removed and relocated some of the concessionaires on the west side of the building to the east side to increase the square footage of the departure gate area," he says.

The project team worked closely with concessions planners to understand the psyche of passengers once they are post-security, and carefully wove concessions into some of the holdroom spaces accordingly.

Thody describes the redesigned concessions program as an immersive experience for travelers. New shopping options include Duty Free Americas; new food/beverage offerings include authentic New York brands like Brooklyn Rebel and the Brindle Room.

The terminal's condensed footprint means short walking distances for customers. Once beyond the security checkpoint, passengers can walk to any gate in less than three minutes, Mody notes. "It wasn't a concern that passengers would have to spend time getting to a gate," he says of the concessions planning.

Design elements from the check-in area are echoed airside. A minimalist palette of black, white and grey was used in bright, open spaces that can accommodate use by British Airways and other airlines.

According to Mody, the single-most important amenity added to holdrooms was a substantial amount of powered seating from Zoeftig. It goes a long way in making travelers feel productive and more at ease as they wait for their aircraft, he explains.

TORONTO-PEARSON INTERNATIONAL AIRPORT

CHARLOTTE-DOUGLAS INTERNATIONAL AIRPORT

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PUTTING THE WORLD ON DISPLAY

THE ROLE OF DYNAMIC SIGNAGE
IN THE AIRPORT INFORMATION ECONOMY

An average of 65,338,626 people pass through each of the ten busiest airports in the United States each year. Countless thousands more arrive and depart each day as airport and airline employees. These numbers increase annually and with them, the infrastructure constraints of each airport and the expectations of each traveler and airline. Pressure is constantly mounting on airports to optimize their efficiency, enrich the experiences of their passengers, and maximize the long-term viability of their existing infrastructure. As these pressures exponentially diversify and expand, so too must the solutions airports integrate to counter these demands. As with any transportation hub, the on-site experience for customers and businesses in an airport is intimately tethered to the availability of communications. The

logistics of moving these passengers and employees through vast terminals on tight schedules can be impossibly complex but precision and pragmatism are essential for a successful experience. Such a daunting challenge requires comprehensive communication tools to ensure that processes run smoothly, safely, and on time.

The most successful airports meet this objective with dynamic digital signage, using the technology to deliver broadly applicable yet highly specific real-time information to vast groups of transitory audiences. Visible from much greater distances than traditional signage and more effective at standing out amidst a sea of distractions, dynamic signage frees passengers to behave autonomously and frees airport

administrators to focus on their own operations rather than the needs of individual passengers. Though by no means a brand new technology, dynamic signage has expanded its futureproofed functionality in airport environments as a source for electronic visual information display systems (EVIDS) content, wayfinding, art, and advertising. This white paper will delve beyond the broad, surface-level utility of dynamic signage in airport spaces to explore several more specialized purposes for which many of the world's top airports have strategically deployed their dynamic signage assets. These exemplary use cases will serve as guiding inspiration for future airports looking to use digital technology to optimize their efficiency, engagement, and infrastructure.

CHANGI INTERNATIONAL AIRPORT

THE AIRPORT INFORMATION ECONOMY

DYNAMIC SOLUTIONS FOR A DYNAMIC ENVIRONMENT

BIGGER AND BRIGHTER EVIDS INSTRUCTS AND INFORMS AWAY FROM THE GATE

"JFK International Airport offers a particularly apt illustration of the effectiveness of dynamic signage solutions as EVIDS. "

John F. Kennedy International Airport (JFK) offers a particularly apt illustration of the effectiveness of dynamic signage solutions as EVIDS. Previous solutions proved hard to see for passengers shuffling throughout the space. Limited viewing angles and distances resulted in congestion near the displays and confusion away from them. This created stress for passengers and administrators alike, the former frustrated by inadequate communication, the latter by the obstructive crowds. Large groups of frustrated people can be problematic, so the airport addressed the underlying issue by introducing a 30-foot by 10-foot double-sided curved LED display. Suspended right in the middle of the space, the enormous display outshines ambient light in the area to give passengers a nearly 360-degree view of clear flight information, eliminating any need for travelers to cluster around a specific area. The size and brightness of the display allows travelers to see flight information, weather updates, and news alerts from far distances while the curve and pixel design of the display give viewers access from a wide range of angles. **Atlanta's Hartsfield-Jackson International Airport** experienced similar results following the introduction of their large-format LED display outside a baggage claim area.

DYNAMIC WAYFINDING DIRECTS AND CALMS

Restricted in both the beginning and end of their stay in the airport by security lines and departure times, respectively, passengers want to move about autonomously in the free time that they do have. This preference for self-service is a trend that consumer research experts have noticed in retail customers in particular. In part due to the proliferation of servicization and omnichannel selling, consumers have developed an expectation that everything they need will be at their fingertips. When it isn't, customers sour. Dynamic signage thrives as a solution to this problem because customers can see what they need, directions, from much further away –not physically at their fingertips,

but available immediately nonetheless. The principal mandate guiding EVIDS and wayfinding signage is clear: offer passengers what they want in ever-present excess so they can self-navigate. Then get out of the way so these passengers can enjoy the airport on their own terms while airport employees are freed to assist where they are actually needed. Whether travelers are looking for dining options, shopping areas, restrooms, or other airport facilities, the directions they need are brighter, clearer, more flexible and more visible when displayed on dynamic signage.

Vancouver International Airport came to this very conclusion when renovating their International Arrival Customs Terminal. Initial impressions matter immensely, and global travelers arriving to Canada, perhaps for the first time, are now met with the sleek, minimalist design of a 32-foot by 9-foot LED display welcoming them to Vancouver and providing them highly relevant information about how to proceed from their gate. Other airports have followed this lead and renovated their gate branding signage from the static or backlit to dynamic LED signage. These displays are visible from much greater distances and are capable of showing far more information to passengers. A static gate sign can only say the gate number. A dynamic LED wayfinding blade can show the gate number, flight number, flight destination, destination weather, boarding status, and the time all at once, changing each piece of information on the fly as new flights come and go throughout the day. With their questions answered before they even ask, travelers feel free to meander around the terminal, especially since they know other displays elsewhere will likely contain that same information should they need it again. Stress relieved, mood enhanced, and time freed, passengers will exhibit a much higher likelihood of spending money.

THE AIRPORT INFORMATION ECONOMY
ENRICHMENT OF EXPERIENCE
AUGMENTING INFORMATION WITH ENTERTAINMENT

The first place a traveler experiences when they arrive in a new city, the airport serves an important role in communicating and celebrating the culture of the region it services. Forgettable aesthetics divorce travelers from their travel experience and prompt equivocations between the blandness of the airport and the worthiness of its city. Travelers don't just want to be somewhere, they want to feel somewhere, so airports have a duty to create that sense of place for their customers. Dynamic digital signage can communicate culture in a more dramatic –and pragmatic- way than any other solution.

Consider "The Flower" found in **Toronto Pearson Airport.** The stunning LED display feature dominates a central gathering area of Terminal 1 with its beauty, transforming what once was dead space into among the most highly-trafficked locations in the entire airport. The installation serves the primary purpose of branding the airport with Ontario's provincial symbol of the White Trillium flower, thereby welcoming passengers into the Toronto environment and establishing a firm sense of place. That the displays also communicate flight information and weather details to busy travelers is a secondary function that gives audiences yet another reason to engage with the artwork. Other airports like **Charlotte Douglas International Airport** (CLT) use their LED signage exclusively for artistic purposes. The digital sculpture *Interconnected* is a pulsing visual experience that plays out on three massive LED displays in Charlotte's Concourse A, using airport data to influence the constantly regenerating content. The installation was pioneered to be a fusion of technology, art, and design, and it reflects both the interconnected community of North Carolina's biggest city and its technological ascendance. Both Toronto Pearson and Charlotte Douglas wanted to announce themselves as airports of the future; it's fitting they opted against the static art of the past.

ENRICHING THE AIRPORT ITSELF

One of the most obvious benefits of dynamic signage is you can showcase a wide range of content. While most commonly used for EVIDS and wayfinding content, airports can also take advantage of their dynamic signage by selling ad space to eager retailers. In doing so, an airport accomplishes their primary goal of informing passengers while also generating revenue as well. As Rosemary Vassiliadis, the director of McCarran International Airport in Las Vegas, made clear upon their latest dynamic signage overhaul, "we decided that the return on investment opportunity was very real, which convinced us that the time was right to undertake a complete renovation of the baggage claim area advertising displays." Today, airline travelers arriving in Las Vegas are met with a dazzling digital experience in line with the city's reputation. Many of the airport displays mentioned throughout these pages are used for advertising messaging in addition to their passenger-focused duties, and many advertising-centric displays show a token amount of EVIDS and wayfinding data as well just to preempt frustration from travelers. This versatility increases the value of the display space and the value of the displays themselves. As Arthur D. Little wrote in a paper on the digital transformation of airports for Amadeus:

"By leveraging existing FIDS infrastructure as an additional means to drive the in-airport retail offer, airports can achieve incremental revenue growth for only a moderate investment in existing infrastructure. This would see the role of FIDS change from flight information provider to multi-faceted marking tool."

MCCARRAN INTERNATIONAL AIRPORT

OPTIMIZING YOUR INFRASTRUCTURE

According to research from the same Arthur D. Little paper mentioned earlier, executives representing airports from a broad range of sizes and complexities far and away ranked improving operational efficiency as their primary target benefit for investing in digital technology, specifically with regard to capacity enhancement. Large-scale construction efforts to expand capacity for both passengers and airlines have transformed the terminals of some of the world's largest airports. These modernization and expansion projects include O'Hare Airport's $8.7 billion expansion, JFK's $10 billion renovation, Los Angeles International Airport's $14 billion overhaul, and the brand new Istanbul Airport, built at a cost of roughly $12 billion and opened for the first time in April, 2019.

USING DYNAMIC SIGNAGE TO EXTRACT VALUE FROM EXISTING INFRASTRUCTURE

While maximizing foot-traffic efficiency during a big renovation is crucial for airports undergoing these expensive expansion projects, most airports target improving foot-traffic efficiency as a way to avoid costly construction projects in the first place. Lacking the resources of the world's largest hubs, smaller airports have turned to dynamic signage as a way to boost capacity by increasing flow rather than increasing size. As has been detailed extensively throughout this piece, dynamic signage empowers passengers and employees alike to move more decisively by expanding their access to information. Beyond the brightness, size, and off-axis viewability of these displays however, another trait that makes dynamic signage such a powerful communication asset is that they can integrate seamlessly into nearly any architectural environment. Dynamic signage, again, particularly of the large-format LED variety, can be made in nearly unlimited sizes and shapes, allowing airports to affix these solutions to unusual surfaces in uncommon locations. Airports are often cavernous spaces with creative architectures.

Dynamic signage embeds into these environments painlessly, swapping the costs of a massive renovation for the comparatively paltry price of a few displays. As the Arthur D. Little paper put it, "faced with the prospect of capital-intensive expansion projects that take years to deliver, digital technologies can, at the very least be used in a tactical way to help airports extract the maximum value from their existing assets, especially by enhancing passenger flows."

ADAPTABLE TO CHANGE IN THE MOMENT AND OVER TIME, DYNAMIC SIGNAGE FUTUREPROOFS PASSENGER COMMUNICATIONS

Just as airport environments change at a moment's notice, so too can dynamic signage. And just as airport must evolve over time, dynamic signage is there to facilitate this evolution and streamline flow throughout. Whether for EVIDS, experiential enrichment, or capacity maximization, dynamic signage is a necessity for any modern airport. JFK, Hartsfield-Jackson, and Vancouver each capture utility from dynamic signage as an informational tool, while Changi, Toronto Pearson, and Charlotte Douglas each use theirs primarily for artistic purposes. Stansted, along with several of the aforementioned airports, incorporated their dynamic signage solution as a way to optimize the infrastructure they had as they expanded, while countless others use this signage to expand capacity without expanding construction. Examples of each use case for dynamic signage are nearly ubiquitous to any perceptive traveler, or even imperceptive travelers for that matter. Dynamic signage is so universally powerful in airport spaces that it's nearly impossible not to notice what it's communicating. After all, that's the entire point.

Visit www.nanolumens.com or call 888-771-NANO for more information on your next Airport LED display solution.
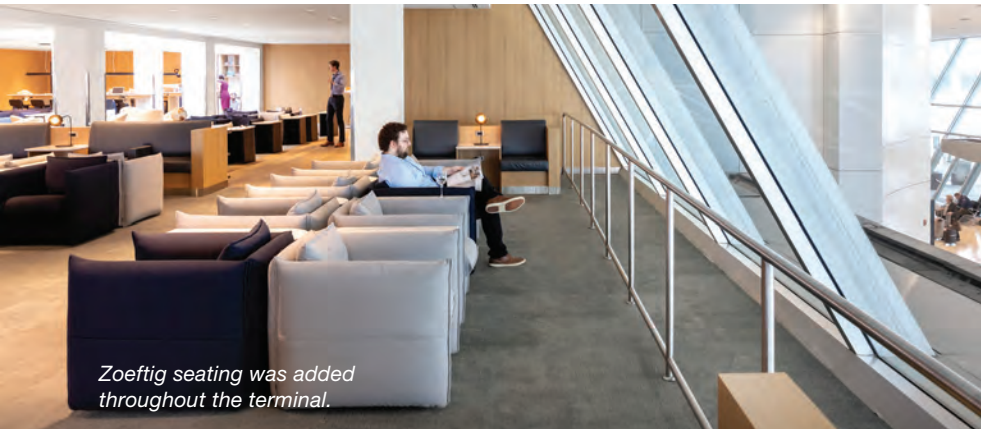
Zoeftig seating was added throughout the terminal.

Construction Challenges

Keeping Terminal 7 operational throughout the renovation was a challenge, but it did not impact the design team's ability to provide British Airways with an optimal solution, Mody emphasizes. It did, however, require Corgan to work closely with British Airways and VRH, its construction manager, to phase the construction work strategically.

"With a project of this size and scope, we knew there would be a few challenges; but there were opportunities as well," Thody reflects. Constant contact between the operation and construction teams ensured a successful and on-time delivery of the project, he notes.

Discussions with the airline's network planning department and analysis of flight schedules, aircraft and gate matrices prompted the decision to renovate one holdroom at a time to minimize disruptions.

"While we started with robust and detailed plans, we quickly found we needed to adapt to operational needs and take advantage of unexpected opportunities," Thody relates. For instance, amping up construction during periods with fewer flights allowed the team to finish certain areas sooner than originally planned. "It was a fluid environment that was well coordinated and managed throughout the span of the project," he adds.

As the project moved forward, the team subdivided some of the main phases into smaller areas to avoid disrupting customers. "Spaces needed to look presentable, and we had to consider things

British Airways completely redesigned its premium lounges.

like acoustic attenuation, so there was not excessive noise in construction areas adjacent to passengers," explains VRH Project Executive Steven Haussel.

Overhauling the security checkpoint was especially challenging, he recalls. The new screening area was designed to create a better flow and passenger experience by consolidating operations and adding a lane; but the checkpoint could not close while crews renovated the area. Work was consequently divided into three separate phases to ensure adequate throughput during construction.

Renovations in the premium passenger lounge above the check-in level were cordoned off as a landside project so crews did not have to clear a security checkpoint to access the worksite. But a lack of vertical transportation posed other challenges for the second-floor project. Because the only elevator in the area could not be used for construction activities, VRH cut two holes in the existing floor slab to access the lounge. Crews installed a stairway for materials and workers in one of the holes; the other was used to drop construction debris out of the building.

Concessions in the new premium passenger lounge include a self-serve wine room and craft beer area. "We've completely redesigned our First and Club lounges, which, at more than half an acre, offer our customers traveling in premium cabins elegant, yet relaxed spaces to unwind, work or dine before their flights," notes Thody.

These amenities, however, added a layer of complexity to construction: Installation of below-slab plumbing for the kitchen in the new Premium Lounge occurred over the active check-in hall and security checkpoint. "The challenge there was the projects were not on the same exact timeline," Haussel explains. VRH consequently prioritized much of the plumbing work for the lounge to allow crews to work within the ceiling plenums (the space between the upper floor and lower ceiling for HVAC) when making terminal improvements. "You don't want to be putting in new sanitary lines over brand-new constructed areas," he notes.

STEVEN HAUSSEL

Moreover, the existing ceiling plenums did not have adequate space for new utilities because they were filled with building structure, ducts and pipes. The design team coordinated with VRH to document the existing conditions and prepared a mechanical, electrical and plumbing relocation plan to facilitate installation of the kitchen utilities. Construction areas were barricaded, and the installation was phased to allow work in the active check-in hall.

Reuse of existing infrastructure was also a key component of the design. "Given the short timeline that we had to complete the project, we tried to reuse as much as possible," says Sale. "That was carefully considered when we were laying out the adjustments to the check-in area."

FACTS&FIGURES

Project: New Parking System

Location: Raleigh-Durham (NC) Int'l Airport

Key Components: Online reservation system; revenue management system; license plate recognition technology; new access & revenue control system

Cost: $7 million

Parking Consultants: Lumin Advisors; 20/20 Parking

Marketing/Promotion Consultant: InnovAt

Parking Access & Revenue Control System: SKIDATA

Online Registration System: ADVAM

Revenue Management System: IDeaS, from SAS

Project Timeline: Initial planning began in 2015; new system went online May 1, 2019

Key Benefits: Passengers can pre-pay & book space in advance to expedite process & ensure parking in facility of their choice; online booking system allows airport to maximize facilities by using dynamic pricing & executing targeted promotions; more options & better experience for customers

Raleigh-Durham Int'l Makes Parking a Priority With New Online Reservation System BY RONNIE WENDT

As airports throughout the U.S. wrestle with growing passenger volume and heightened security concerns, parking sometimes takes a backseat. Not so at Raleigh-Durham International (RDU). The North Carolina airport recently introduced a new $7 million system to make parking easier and faster for customers. The multi-component system is also helping RDU recapture revenue that is lost when passengers park offsite or drivers drop them off at the curb and don't park at all.

For Mike Landguth, president and CEO of the Raleigh-Durham Airport Authority, the "passenger experience" begins long before customers board an airplane. It begins as soon as they pull up to the terminal.

MICHAEL LANDGUTH

A 42% increase in passenger enplanements from 2013 to 2014 prompted Landguth and other RDU officials to evaluate the customer experience as a whole. As they pondered the products and services customers wanted, parking rose to the top. Passengers did not see the airport as the preferred place to park, despite ample options: 22,000 parking spaces in four parking decks and three surface lots. The airport needed to change passenger sentiment, recalls Landguth.

"We started looking at our parking market share compared to enplanement levels," he explains. "And while it's not a 1:1 relationship, we saw market share had declined by 10% over an eight-year period." He and other RDU officials attribute the decline to the rise of transportation network companies (TNCs), such as Uber and Lyft. TNCs were capturing approximately 13% of the market, seizing a portion of the business from taxi companies and cutting into the airport's parking revenue.

"We have got to be able to compete with the TNCs and the other options customers have to get here," Landguth says. "This requires us to provide a better experience."

That realization led RDU to invest in a new parking system that includes an online booking system, a revenue management system, license plate recognition technology, and a new parking access and revenue control system (PRCS).

After a soft launch in 2018, the airport rolled out the system to the general public this May. Coincidentally, the airport experienced a 10% increase in enplanements the same month. Typically, that would have led to a 3% increase in parking transactions; but with the new parking system in widespread use, parking transactions picked up 6%. "That's huge," comments Landguth. "My team is watching this very closely to see if we are starting to shift our parking market share."

Inspiration From Across the Pond

RDU began its research by looking abroad, because European airports are far more progressive when it comes to parking technologies.

"We traveled to Dublin to see their operation," Landguth says, noting that the Irish airport has operated an online parking registration system for nearly a decade and offers consulting services about the subject. "Dublin's business model is an online booking system with dynamic pricing, very similar to what you see with airlines and hotels. Those systems look at heads and beds or seats and butts, while a parking system deals with cars and stalls."

After seeing the system at Dublin Airport, RDU jumped right in to adding online parking technologies. The airport invested in improving service for customers parking off site, but it didn't work that way—at least initially.

The airport quickly found itself neck deep in technology integration issues that delayed the online booking system's launch for several years. "Our PRCS system wasn't integrating well with our online reservation system, and was starting to crash," Landguth recounts. "It would be 11 p.m., and we'd have a 30-minute wait for customers leaving the parking garage."

Customers who book parking online receive a QR code in their email confirmation that opens the appropriate entry gate.

Integrating with an online parking booking system proved more than the aging PRCS system could handle. So, airport officials took a step back and put the online booking system and other new parking products on hold until they could sort out the entire issue.

They tackled this step with help from two parking consultants: Lumin Advisors and 20/20 Parking Consultants.

The project that resulted proceeded in three phases. During Phase I, the consultants analyzed RDU's existing PRCS and advised replacing it with a new system. "Our evaluation examined the airport's future goals for their parking operation, and whether or not the current technology could support those goals," says Jim Maglothin, president of 20/20 Parking. "We concluded that they needed to update their technology to achieve their goals."

During Phase II, the RDU Airport Authority and its parking consultants solicited input from airport stakeholders, including key executives, information technology professionals, parking operations and maintenance. The information gathered enabled 20/20 to develop a functional specification for the new system. After the project went out to bid, 20/20 and Lumin evaluated incoming proposals from various PRCS vendors, and

ultimately selected SKIDATA, formerly Sentry Control Systems.

Airport officials then set an aggressive 12-month timetable for the project. Typically, PRCS projects take 18 to 24 months from contract acceptance to completion, notes Maglothin.

"There were several features the airport had been promising customers for a while, and had been unable to achieve. They wanted to put those on the fast track," he remarks. "SKIDATA was able to meet the airport's goals and aggressive timetable for the project; and they also had existing integrations with ADVAM, the airport's pre-booking system provider."

Ensuring Integration

Technology used in the new system includes license plate readers; the ADVAM parking online booking platform; QR code readers; cash and credit card pay-on-foot stations; automated exit lanes; PCI-certified, point-to-point encryption credit card processing; a Voice over Internet Protocol (VoIP) intercom system; and LED dynamic message signage throughout parking areas.

Phase III of the project confirmed that the various technologies could synchronize without a hitch. "The communication between the online booking system, the parking equipment and the servers that control everything needs to be seamless, so that they are constantly feeding upcoming reservations into the system," Maglothin says. "The transfer of data between the two systems updates the available parking inventory, so that the PARCS system knows how many spaces are already allocated."

The airport also wanted proof of concept before the project could proceed—a step not typically required for other parking projects, notes Maglothin. So SKIDATA installed one lane of each type in an economy surface lot to demonstrate the features and functions of the system. "They had to prove they could successfully do this over 30 days before the airport gave approval for them to move forward with the rest of the installation," he explains.

After SKIDATA passed the test, 20/20 began technical design review and performed multiple levels of testing.

"As SKIDATA installed each lane of equipment, we followed behind and did an acceptance test of each lane to ensure it met the requirements of the functional specification," says Maglothin. "The last test we did was a 30-day acceptance test, where you let the system run on its own to identify systemic flaws or reconciliation issues with revenue, and it was a success."

Overall, he says it was the most successful and smooth PRCS installation he's ever worked on. He attributes this success to

stakeholders being on the same page. "They had a driving directive and everyone was fully supportive of achieving that directive," reflects Maglothin. "The parking operations group, led by Jeff Slayton, was extremely responsive and knowledgeable about the project."

Open for Online Business

With a new PRCS in place, RDU could finally launch its online booking system—a key component for attracting visitors to its onsite lots.

Passengers access the new feature by clicking on the ADVAM online booking system, identified by a parking icon, on the website, parkrdu.com. The online booking system integrates with license plate recognition technology in the parking garage and surface lots so the two systems can work in tandem with each other. Passengers use a QR code sent with their email confirmation to open the gate. "All they do is roll down their window, put their phone in front of the scanner, and the scanner reads the QR code and it pops the gate open," Landguth says.

"The license plate recognition serves two purposes: It ties the license plate number to the ticket or other credentials used to enter, and it verifies that the vehicle exiting is the vehicle that pulled the ticket, and that prevents fraud," explains Maglothin.

The airport also utilizes IdeaS, a SAS revenue management system that dynamically prices the parking products that are advertised on the online booking system. The technology is a key component in competitively pricing parking while managing yield within RDU facilities.

The airport tested the process for three months before promoting the new online option. During that time, airport personnel worked with parking staff to help them learn the system and how to properly address customer concerns or questions.

"We put the product on our website and people who came across it used it, but we didn't advertise its availability right away," Landguth explains. "We didn't have a lot of bookings during that time, but we were able to demonstrate that our team was able to hold the stalls for online registrations, and operationally make it work. I'd rather start with 20 customers and do it right, and then roll it out to everyone, because we want to deliver a world-class parking experience to our customers. On May 1, we went live with a full-blown online booking system and began marketing our parking products and services to customers."

A New Menu of Options

RDU's marketing staff worked with InnovAt International to develop new parking products based on previous parking data and customer input.

"We looked at the numbers," says InnovAt CEO Jenna Buckner. "We looked at the products, the pricing, the brand, the look and feel, and staffing."

Branding and staffing were key areas, she emphasizes. "These online booking systems must be branded and have an airport look and feel, and someone from the airport needs to oversee that. They also need someone who can create the products and pricing. Then, you need someone looking at the data and feedback from the online booking system and adjusting messaging and pricing more frequently than if you had a straight drive-up parking system. Finally, you need an admin, who inputs new prices and products into the system."

JENNA BUCKNER

InnovAt's analysis led RDU to restructure its existing parking products and develop new pre-booked options:

- The Premier Section on the first floor of the parking garage is targeted at business travelers. As the closest option to the terminal, it is RDU's most expensive parking product at $3 per hour (with a four-hour limit) or $22 per day. And the airport made sure the area had a premium look and feel. "We cleaned it up, re-painted and re-marked the spaces to reflect that it's a higher end product," Landguth says.

- Park Central makes up floors two through seven in the parking garage. It is part of the airport's terminal parking, which is in the center of the campus. There are also Economy 3 and Economy 4 lots, which are remote lots that offer shuttle services to the terminal.

- Park Express provides "trunk-to-curb" service. When customers pull up to the lot, personnel transfer their luggage to van and drive them to the terminal curb. "We added

this service when we noticed we were pushing about 600 customers a week from a $15 product to an $8 product when we closed the deck. We had nothing in between to offer customers," says Landguth. "That product is a $12 product, so now I offer a $22 product, a $15 product, a $12 product, an $8 product and a $7 product to meet the needs of every visitor."

"All of our online parking prices are cheaper than the drive-up prices. Just like with an airline ticket. If you want the best prices, you book online," he adds.

The airport's marketing team worked with InnovAt to identify times when parking is slow and introduced competitive rates and ways to entice customers to upgrade. Upon learning that the parking garage is often only 50% full during Memorial Day weekend, the airport offered a $10 daily rate to anyone who booked online. (Typically, the same space costs $15 per day.) "We encouraged people to move up to a higher product and fill our parking deck," explains Landguth.

RDU's initial promotion for Memorial Day only saw 60 customers take advantage of the offering. Landguth expects better results in the future as the airport works further out to advertise holiday parking promotions. "We had very little time to put the Memorial Day promotion into play," he says. Better results were realized with the July 4th promotion, when 349 customers took advantage of the offering. "These promotions enable us to generate additional parking income, while customers get a better parking experience."

More highly-targeted marketing promotions will also follow as RDU further develops its business mindset. "We have to develop products and services just like concessionaires or airlines do," remarks Landguth.

The airport will base future promotions on customer feedback. Every time a visitor books online, the airport sends that customer a survey. So far, 82% of those who have used the system say they will book online again, and 14% say they might. Convenience is the No. 1 reason customers say they book online, followed by reduced rates and special offers at No. 2, and ensuring access to a chosen parking selection as No. 3.

"Booking online will continue to grow," predicts Landguth. "Our community is exploding with growth; everything is at capacity. Parking is at capacity, checkpoints are at capacity, and people have very little time. Online parking allows them to know for sure how much time it's going to take them to park and get into the airport, and they can build their schedule around that."

San Diego Int'l Rehabs Sole Runway 2,200 Feet at a Time

FACTS&FIGURES

Project: Runway Rehabilitation

Location: San Diego Int'l Airport

Managed by: San Diego County Regional Airport Authority

Runway: 9-27

Size: 9,401 ft. long, 200 ft. wide

Cost: $13.3 million

Project Scope: Full-length mill & overlay; associated lighting upgrades

Program Manager: AECOM

Engineer of Record: Atkins, a member of the SNC-Lavalin Group

Prime Contractor: Granite Construction

Electrician: Ensley Electric

Airfield Lighting: ADB SAFEGATE

Quality Control Testing: Kleinfelder Inc.

Timeline: 9 months

Completed: Aug. 2018

Lighting Components: Converting 600 centerline, edge & touchdown zone lights from incandescent bulbs to LEDs

Key Benefits: Maintaining pavement; increasing visibility for pilots; reducing energy consumption & maintenance requirements

As the busiest single-runway airport in North America, San Diego International (SAN) must plan and execute any airfield work with precision and efficiency. The recent full-length rehabilitation of its 9,401-foot runway was an especially critical project.

"The challenge is ensuring that the runway operates each and every day," says Michael Tilley, senior program manager of the San Diego County Regional Airport

MICHAEL TILLEY

Authority. Last year, SAN served more than 24 million passengers and logged more than 225,000 flight operations.

In August 2018, the airport completed a $13.3 million rehabilitation of Runway 9-27 two months ahead of schedule. The

nine-month project called for the milling and overlay of 3 inches of new asphalt on the entire 200-foot-wide runway. Crews also upgraded more than 600 airfield lights to LEDs with new transformers.

Every three to five years, the Airport Authority completes a pavement maintenance management study to chronicle the condition of all airfield pavement and guide plans to keep it in optimum condition. The 2015 study indicated that the runway was in "essentially fair condition," but rehabilitation was necessary; and the project began in mid-November 2017.

Overnight Strategy

Because SAN's sole runway had to be operational every day, phasing was paramount to the project's success. As lead designer for the project, Atkins worked with

To make the most of the abbreviated worktime and achieve the needed pace, Granite developed a unique paving method that increased productivity tremendously, notes Tilley. The company even custom built a paver to expedite the process. On average, crews placed about 850 tons of asphalt each shift.

Planners divided the runway into 40 sections to maximize production and prevent biting off more than crews could chew during each five-hour closure. "It was really trying to find the sweet spot of how much can we produce in a night," explains Jardine.

Each of the 40 sections was about 2,200 feet long and 20½ feet wide. A trio of 8-foot milling machines worked in tandem to grind out three passes of the 20½-foot width. After the old asphalt was removed, sweepers cleaned the milled surface to promote adhesion between the tack surface and new asphalt.

Belly dump trucks delivered asphalt in windrows, and then a material transfer vehicle scooped it up and placed it into the paver in a continuous motion. This increased the peak speed over conventional paving, explains Jardine.

A paver custom-built by Granite's mechanics to be wide enough to cover the 20½-foot pass also expedited the process. After steamrollers compacted the new pavement, workers replaced the runway striping, cleaned the worksite and exited the field by 5 a.m.

"It was quite an operation each night," Tilley remarks.

The 40 sections were prioritized based on the other work that was also needed. "Depending on how much striping was in that subphase or how many lights are in that certain pull, that controlled how we performed that pass," Jardine explains. "That was a big part of logistical planning."

Additionally, a large part of the runway was paved west to east, rather than east to west because of the amount of striping that needed to be complete by the 5 a.m. opening. "Things like that are what made

BY JODI RICHARDS

the airport authority, airlines, airport operations and FAA to formulate a phasing plan that included a hard closure of the runway between 12 a.m. and 5 a.m. throughout the project.

But five hours of runway closure doesn't provide five hours of paving time. Crews must first mobilize their equipment, set up lights and prepare the surface. "We were able to actually perform work for about three hours because of all the cleanup and logistics that had to take place—that was definitely difficult," says Lance Jardine, project engineer at Granite Construction. "The logistical planning that had to be put into how we were going to accomplish it was the biggest challenge I've faced in my professional career."

LANCE JARDINE

Crews worked between 12 a.m. and 5 a.m.

the logistical planning of the subphases difficult and important," Jardine notes.

With 100 to 200 workers on the runway each night, it was a little like "controlled chaos," he quips. Once the clock struck midnight and crews received clearance from airport operations, workers moved quickly and efficiently to set up, perform the scheduled work, clean up and clear the field by 5 a.m. Making sure there were no materials left behind that could cause foreign object damage to aircraft was a priority every night.

Trucks, material delivery, equipment and workers had to be carefully choreographed. Often, there were 30 to 40 trucks entering and exiting the airfield, with workers dedicated to escorting vehicles in and out. Two staging/storage areas, one landside and one airside, allowed the contractor to keep heavy equipment nearby for easy access each night.

Because work was performed overnight/early in the morning, lighting the jobsite efficiently and effectively was a challenge. To do so, every person on the shift would tow a light tower and set it up in a preassigned area to illuminate the designated 2,200-foot stretch of runway. "Every tiny bit of the production had to be well thought out and well executed," Jardine emphasizes.

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The airport upgraded 600 lights to LED fixtures with new transformers.

Core samples were taken nightly to ensure proper asphalt mix and compaction of each lane. The quick response time of the quality control and assurance groups was key, Jardine notes. Core samples and in-place densities were turned around within two hours so the team could be certain the pavement that had just been placed met project specifications. "That was a huge helping point to see those results within a matter of an hour or two," he says.

After a 28-day curing period, crews used a sawcut groover to make shallow, transverse lines to improve aircraft traction on the runway. Additionally, new pavement markings were installed on the runway and some taxiways to improve delineation.

In total, Granite milled and repaved about 2 million square feet and laid 35,000 tons of new asphalt.

Lighting Conversion

In addition to paving, crews upgraded the touchdown zone, centerline and edge lights from incandescent fixtures to LED. Prior to this project, SAN's last airfield lighting upgrade was in 2006, when incandescent centerline lights were installed. Since then, technology has evolved and the airport opted to install light emitting diodes (LEDs) to provide higher visibility for pilots. Because there cannot be a mixture of incandescent and LED lights on an airfield, all 132 edge lights had to be replaced in a single night. In addition to careful planning and timing, the contractor had multiple crews performing the operation to complete the work, Tilley explains.

Prior to asphalt milling, electricians cored out the pavement lights and lowered them below the 3-inch threshold of asphalt that would be

Previous incandescent lighting
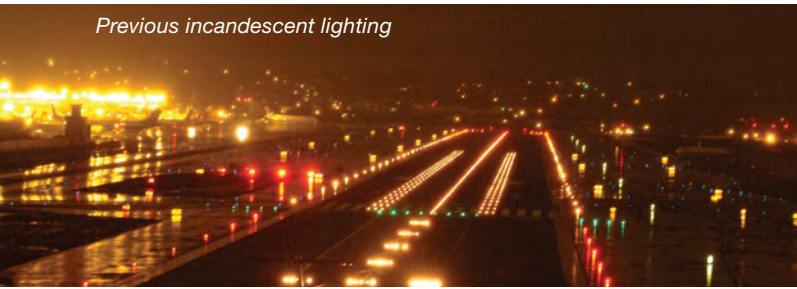
New LED lighting

removed and replaced to protect the lights from getting hit during milling. Once the prep and paving crews were finished, electricians located the lights via survey, cored them and raised them back up to elevation and replaced the fixtures with LEDs.

Centerline and touchdown zone lights were turned off throughout the duration of the project, so only edge lights had to be back on every morning. In total, crews upgraded more than 600 lights to LED fixtures with new transformers.

Precision Planning

The project proved to be a perfect example of how important advanced planning with all stakeholders is, Tilley advises. "We had numerous meetings with everyone involved so they knew what to

expect," he says. "What we tried to do was eliminate any surprises out in the field."

Because of the zero margin for error, the team held detailed contingency planning meetings. "We talked about everything that could go wrong and what we could do to make sure that we could get the runway open on time each morning," says Lori Steiner, senior project manager with Atkins.

LORI STEINER

For example, if a milling machine broke down, there had to be equipment to move it off site, plus a backup milling machine ready to go. Such contingencies were especially critical for the paving portion of the work. "If a milling machine

broke down and they couldn't mill, as long as they repaved that section, it's not a big deal," she explains. "But if the pavers broke down and couldn't repave, it would have been a big problem."

"Anything and everything that could go wrong we had to bring to light and discuss what we would do if it would happen," Jardine adds. Often, there were three or even four levels of contingency plans, depending on how critical the project element was. "It was a partnering between the airport and Granite to come together and put contingencies in place," he says.

Steep fines were established to discourage any delays to the workflow. If the runway was not able to open at 5 a.m., the contractor would have been penalized with liquidated damages at the rate of $1,000 per minute for the first 15 minutes and $15,000 per minute for any minutes thereafter. No fine had to be levied.

Local Factors

The soft nature of Southern California's aggregate required project planners to make special allowances for the material that would be used in the asphalt mix. Fortunately, the team was able to apply a lesson the airport learned from a 75-foot-wide keel section rehab in 2006. During that project, engineers discovered that when soft local aggregate goes through the plant, it creates dust that breaks up the bitumen binder and impedes full adherence. By washing the aggregate first, the team was able to achieve a tighter mix design, which ultimately led to a more reliable asphalt product.

Project planners also had to take into consideration the California Least Tern, an endangered bird that builds its nests from April through September on 20 acres at the east end of SAN's runway. During that time, crews reversed their usual workflow and proceeded west to east to avoid disturbing the nesting sites.

Another important aspect to the project was informing the public about what was happening at SAN. The airport communications team used traditional and social media channels to inform and update travelers about the runway rehabilitation. "The main goal is to be sure that it's a seamless experience from the passenger standpoint," says Jonathan Heller, SAN senior communications specialist.

While the runway rehab was less apparent to passengers than a terminal or curbside project, the airport took care to consider its impact on surrounding communities. Due to the area's topography, neighboring houses and businesses are at a higher elevation than the airport. "So there's the issue of lighting and noise at night," Heller explains. "We wanted to be sure that the community was aware so they wouldn't be surprised."

Noise did not prove to be an issue during this project, and special attention was paid to the position of work lights. "We look at the lighting layout and how it's going to be directed so no lights are going up into the public areas," Tilley says. "We're sensitive to the needs of the people who live around the airport."

Express Curbsides at Tampa Int'l Will Allow Millions of Passengers to Bypass Ticketing/Baggage Lobby

BY KEN WYSOCKY

Tampa International Airport

FACTS&FIGURES

Project: Express Curbsides

Location: Tampa (FL) Int'l Airport

Strategy: Add 16 lanes of curbside roadways, 8 on each side of main terminal, for drop-off/pick-up of passengers without checked luggage

Project Cost: About $310 million, including ancillary projects

Funding: Airport revenue bonds

Construction Timeline: June 2019-2024

Project Design/Engineering: HNTB Corp.

General Contractor: Hensel Phelps

Subcontractors: To be determined

2018 Airport Volume: More than 21 million passengers

Predicted Volume by mid-2030s: 34 million passengers

Key Benefits: Faster, more convenient flow for passengers with carry-on luggage only; less passenger traffic in main terminal; less vehicle congestion at existing curbsides; could help forestall predicted need for additional terminal by accommodating expected passenger growth into 2030s

Prompted by heavy traffic caused by vehicles dropping off and picking up passengers during peak travel times, Tampa International Airport (TPA) is overhauling its curbside operations. The strategy: express curbsides that provide departing passengers with only carry-on bags a direct path to TSA checkpoints and airline gates—no stops at the ticketing/check-in lobby required.

The system will work in reverse for arriving passengers. After disembarking from their flights, customers without checked bags will be able to go directly from their gates to the express curbsides for pick-up.

The curbside makeover is just one component of a $310 million project that also includes demolition of an old administration building and construction of a new utility plant. Designed by HNTB Corp., the curbside project broke ground in June; airport officials expect crews to complete the first phase by late 2021.

AL ILLUSTRATO

the 21.7 million passengers the Florida airport expects to serve this year. Airport officials feel it is important to accommodate the growing number of passengers traveling exclusively with carry-ons to avoid paying airline fees for checked baggage.

"They have no luggage and have a boarding pass on their cellphone, yet they still have to contend with all the traffic created by passengers that require full services," Illustrato explains.

Removing this subset of passengers from existing curbsides should significantly ease congestion there and in the ticketing/baggage-check lobby. In fact, it should help TPA accommodate additional passenger growth without building additional infrastructure.

HNTB predicts passenger levels will rise by nearly 3% annually in the coming years, reaching 34 million in the mid-2030s. "And HNTB's passenger predictions have been very accurate," advises Illustrato.

TPA's previous master plan initially predicted that annual passenger volume of 22 million to 25 million passengers would require a new north terminal complex—essentially a mirror image of the airport's current main terminal and satellite airside terminals. But express curbsides and other measures should forestall that for 15 to 20 years, he notes.

"We should be around 22 million passengers this year, which is around the point where the (old) plan said we'd need to add

The entire 16-lane project is tentatively scheduled to wrap up in late 2024.

"This express curbside will be the first of its kind in the United States," says Al Illustrato, TPA's executive vice president of facilities. "It will separate passengers who need full airline services from those who don't. It will improve the experience for both types of guests."

THOMAS ROSSBACH

"Some airports may have attempted smaller variances of this concept, but not a fully dedicated express curb for carry-on-only passengers," adds Thomas Rossbach, vice president of aviation architecture at HNTB.

The strategy is especially germane at TPA because about 53% of its passengers do not check bags. That equates to 11.5 million of

the north terminal," Illustrato says. "But now we're able to put off building a new terminal for another 15 years or so. That's huge."

Currently, the 3,300-acre airport includes 58 gates, three runways and 23,000 parking spaces. It handles about 500 flight operations a day, which ranks TPA in the top 30 busiest airports in the United States.

Reducing Curbside Traffic

Currently, TPA has 16 lanes of curbside traffic loops: eight on the "blue" (north) side of the main terminal and eight on the "red" (south) side. Each side has four lanes stacked on a double-decker roadway. The express curbside project calls for another 16 lanes built in the same configuration, adjacent to the existing curbside loops but farther north and south, respectively.

There's one key difference, however: When passengers arrive at the express curbsides, they'll enter "vertical circulation buildings," one located on the red side and another on the blue side. From there, they'll ride escalators or elevators up to a skywalk that crosses over the existing curbsides and enters the third floor of the terminal, which provides links to the airport's four satellite terminals via a monorail.

"This plan builds in twice the curbside capacity while reducing existing curbside traffic by about 50%,," Rossbach says.

The unique design also is rooted in safety. Many airports increase curbside capacity by building additional circles of roadway outside their existing curbsides, which forces passengers to cross existing curbside lanes to get to/from the terminal.

"Passengers have to cross lanes, and vehicles have to stop for passengers, which is a very inefficient way to keep passengers and vehicles moving toward the terminal," Rossbach explains. "This design keeps the throughput of these lanes moving at all times because there's no pedestrian-vehicle interface."

Decongestion Planning

In recent years, curbside congestion at TPA has risen 8% to 10% annually, fueled by more flights and larger aircraft carrying more passengers at peak periods. The increasing popularity of ride-hailing services such as Uber and Lyft also contributes substantially to the increase, adds Illustrato.

"Our peaks keep getting 'peakier,'" he laments. "During our busier times of the day and season, our curbs routinely get congested to the point that traffic backs up on our parkway, sometimes all the way out to the interstate (about one mile away).

"We're not at a point where it's severe or catastrophic," he clarifies. "But we don't like how it's been degrading our guests' experience over time."

The airport's revised master plan, developed by HNTB and approved in 2013, includes an estimated $2.2 billion worth of improvements. Its main components are aimed at reducing vehicle congestion and making access to airport services more convenient for visitors.

A key piece of the plan's first phase included a new 2.6-million-square-foot car rental center that opened in February 2018. That project enabled TPA to remove various car rental operations from the terminal and consolidate them into a new facility about one mile away, thus removing a major source of traffic congestion.

The airport also installed a 1.4-mile automated people mover to take passengers from the rental center to the main terminal, and added 50,000 square feet to the third-floor transfer level of the main terminal. "The new rental facility eliminated 4 million vehicles a year from our roadways, which provided immediate relief," Illustrato reports.

All told, the first phase of improvements cost about $982 million. Funding came from an increase in passenger facility charges at the car rental center, airport revenue bonds, the FAA and the Florida Department of Transportation.

Phase two, which began this June, includes the express curbsides plus a 35-acre commercial development near the rental center. The total cost for phase two is projected at nearly $543 million, and will largely be funded with airport revenue bonds. The third phase, which will cost an estimated $685 million, calls for a fifth airside satellite terminal with 16 gates.

The new system is designed to double the airport's current curbside capacity.

Funding will come from passenger facility charges and airport revenue bonds.

"We've preserved room for a north terminal complex of some type, which we thought we'd need sooner," Illustrato says. "But with the steps we've already taken, plus the express curbsides, we should be able to process more people and traffic through the existing main terminal. That's far better for customers and from an operating perspective, in terms of airport costs."

Challenges Await

Executing a large infrastructure project like the express curbsides while minimizing disruption to passengers will involve complex planning and maneuvering. "On a scale of one to 10, I'd say this will be a seven, because it involves moving utility lines and demolishing an administration building that includes a central utility plan," remarks Illustrato.

"Plus, we're building the new express lanes very close to the existing curbside lanes… and we still need to ensure that traffic keeps flowing," he says. "We have innovative phasing plans to keep access open to the existing roadways, curbs and the terminal all through construction."

Rossbach compares the project to heart surgery: "We have to keep the heart pumping while building new arteries, as well as a new nervous system (in the form of a central utility plant building). So we essentially have to keep the patient alive through heart and brain surgery."

Some of the work, such as splicing and merging new roadways into existing roadways and building elevated roadway bridges over active roadways, will occur at night to minimize the impact on passengers.

For other work, crews will erect temporary barrier walls to separate construction areas from landside operations and maintain full access for passengers throughout the project. Extensive wayfinding aids and signage already are in place one mile from the terminal to warn drivers and direct them through possible construction activity.

The airport also will implement a public outreach campaign that advises passengers about each stage of construction.

Lessons learned during the first phase of the master plan helped TPA and HNTB officials determine the best ways to work through phase two. "Phase one was probably a 9+ on a scale of one to 10," Illustrato reflects. "So having that under our belt helps us figure everything out. We're an airport first

and will always do our best to minimize the impact on our guests and tenants."

From a broader perspective, Illustrato is excited about the benefits the express curbsides will provide. He's also intrigued about the prospect of emerging technologies extending TPA's passenger capacity beyond 34 million without much additional infrastructure.

"In the years to come, other improvements in technology and passenger processing could enable our main terminal to handle even more passengers," he says. "And that would be wonderful."

EVENTS ON APPROACH
UPCOMING 2020 ACI-NA CONFERENCES

Collaboration is a top priority for North American airports. ACI-NA's leadership and knowledge is driven by engaged members who seek a robust forum for dynamic collaboration and the development of industry excellence. To support that goal, ACI-NA organizes more than 20 conferences annually to help broaden the industry's knowledge and enhance professional development. Attendees can often earn continuing professional education credits at ACI-NA programs.

AIRPORTS@WORK CONFERENCE

**APRIL 27 - 30
SEATTLE, WA**

ACI-NA's Airports@Work Conference brings together the most complex facets of airport operations — safety, security, environment, technology, and technical affairs — for a collaborative discussion about today's challenges and tomorrow's opportunities.

JUMPSTART® AIR SERVICE DEVELOPMENT CONFERENCE

**JUNE 1 - 3
RENO, NV**

ACI-NA's JumpStart® Air Service Development Conference is North America's premier air service development conference. The event will begin with a full day of educational sessions, followed by two days of airport-airline meetings.

BUSINESS OF AIRPORTS CONFERENCE

**JUNE 7 - 10
SCOTTSDALE, AZ**

The ACI-NA Business of Airports Conference is the industry's forum to help airports and stakeholders better understand the emerging airport business model. Join us and take a deep look at workforce planning, commercial management and finance best practices, and new trends in aeronautical and non-aeronautical revenue.

2020 ACI-NA ANNUAL CONFERENCE & EXHIBITION

**SEPTEMBER 13 - 15
GRAND RAPIDS, MI**

This event offers education and networking opportunities for North America's airport leaders. This conference offers opportunities for participants to attend unparalleled educational sessions, committee meetings and workshops, and create relationships with vendors in our exhibition hall.

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T70

SELF-PROPELLED
SNOW BLOWER

Capacity
5,000 metric tons/hour

Designed for small to medium-sized airports and urban environments, the **T70** blower is a snap to load. Its unique, eco-friendly engine makes it cost-efficient and easy to maintain.

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BROOMS

Soundproof cab + deluxe high tech and high def controls for operator comfort.
A range of options including vibrator, snow shedding hood, automatic variable speed, and ground speed control vs RPM.

Broom Rotation Speed
525 RPM

FB18   FB20   FB22

T85

SELF-PROPELLED
SNOW BLOWER

Capacity
5,000 metric tons/hour

Designed for medium-sized airports, the **T85** has two blower engines for more power and speed, plus off-center chute, right-handed seat, and wide-angle vision.

T95

SELF-PROPELLED
SNOW BLOWER

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The **T95** is our biggest blower and also the most efficient. Ideal for medium to large airports, it combines power, strength, and speed. It's easy to maintain, with readily available parts (engine, fuses, drain).

A SIZE FOR EVERY NEED

D25

Loader mounted
SNOW BLOWER

The **D25** is our smallest and most economical snow blower, designed for tight urban settings where snowfall is fairly abundant.

D50

Loader mounted
SNOW BLOWER

The **D50** is designed for municipalities or contractors who want both performance and maneuverability. It's ideal for hard and icy snow.

D87

Loader mounted
SNOW BLOWER

The **D87** blower combines reliability and performance. Its high capacity makes it the go-to machine for large snow dump sites.

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Los Angeles Int'l Improves Indoor Air Quality for Customers & Staff
BY MINDY HAMLIN

Los Angeles World Airports

FACTS&FIGURES

Project: Improving Indoor Air Quality

Location: Los Angeles Int'l Airport

Air Purification Strategies: Active bipolar ionization, from AtmosAir; photocatalytic oxidation, from Genesis Air; ultraviolet-C technology, from UltraViolet Devices Inc.

Lead Designer/Architect for Bradley Midfield Satellite Concourse: Gensler

Engineering: WSP

With nearly 2,000 takeoffs and landings every day, Los Angeles International Airport (LAX) is keenly aware of the impact airplane exhaust from the tarmac can have on customers and employees inside the terminal.

"Just like other airports, we operate terminals in the middle of our facility, and there is a lot of exhaust that creates some undesirable odors," explains Michael Christensen, deputy executive director of the Facilities Maintenance and Utilities group of Los Angeles World Airports. "Some people

MICHAEL CHRISTENSEN

are more sensitive than others. For some, the exhaust is an irritant."

LAX combines multiple strategies to combat indoor odors and their causes.

Ultraviolet-C technology from UltraViolet Devices Inc. is used in all terminals to kill microorganisms that cause mold, bacteria and viruses. In Terminal 1, the airport also uses Genesis Air's photocatalytic oxidation process, which captures and destroys airborne particles responsible for poor air quality.

Recently, the airport installed AtmosAir's active bipolar ionization system in Terminal 7 to reduce inhalable particulate matter and pathogens. Looking ahead, it plans to install the company's ionization tubes and air

exhaust emanating from planes leaving and approaching the airport, and what resulted was an unpleasant and unhealthy indoor environment."

The situation prompted the airport's heating/venting/air conditioning department to begin seeking solutions more than 15 years ago.

"We had been getting a lot of air quality-related complaints from travelers and employees at Tom Bradley Terminal," acknowledges Rich Yakel, LAX's HVAC supervisor. "Bipolar ionization was just being introduced at the time, and Bradley Terminal was going through a major renovation."

Yakel experienced the positive impact ionization systems can have on air quality while visiting a wastewater treatment plant that used the technology. "I saw, and smelled, for myself what it could do," he recalls.

Based on his first-hand experience and additional research, LAX decided to deploy an ionization system with three different types of filters into the terminal while other renovations were being made. Although the airport saw immediate improvements in the terminal's air quality, the new approach was costly and labor intensive.

"We operate in very tight quarters," notes Christensen. "We have tried to deal with removing exhaust from the air. In

monitoring technology in the Tom Bradley Terminal Midfield Satellite Concourse, which is nearing completion.

"Airports are worried about the customer experience and are worried about being as sustainable as they can be," comments AtmosAir CEO Steve Levine. "When you can create cleaner and healthier air, you positively impact people with allergies and asthma. On the employee side, you enable more productivity and improve employee retention."

STEVE LEVINE

The impact of exhaust and other contaminants is not a new problem for LAX and other airports, notes Levine.

"Outdoor air gets inside airports, and Los Angeles' outdoor air quality, although improving since the 1970s, can be bad on certain days," he relates. "A water treatment plant adjacent to LAX doesn't help matters. Add to that the foul odors and eye irritation caused by

The airport uses active bipolar ionization tubes to reduce inhalable particulate matter and pathogens.

1. INCOMING POLLUTED AIR

2. IONIZATION TAKING PLACE

3. BI-POLAR IONIZATION

4. BI-POLAR IONS REACT WITH PM, VOCS, BACTERIA, VIRUSES, GERMS

5. ATMOSAIR IS THE ONLY TECHNOLOGY TO CLEAN AIR WITHIN A SPACE
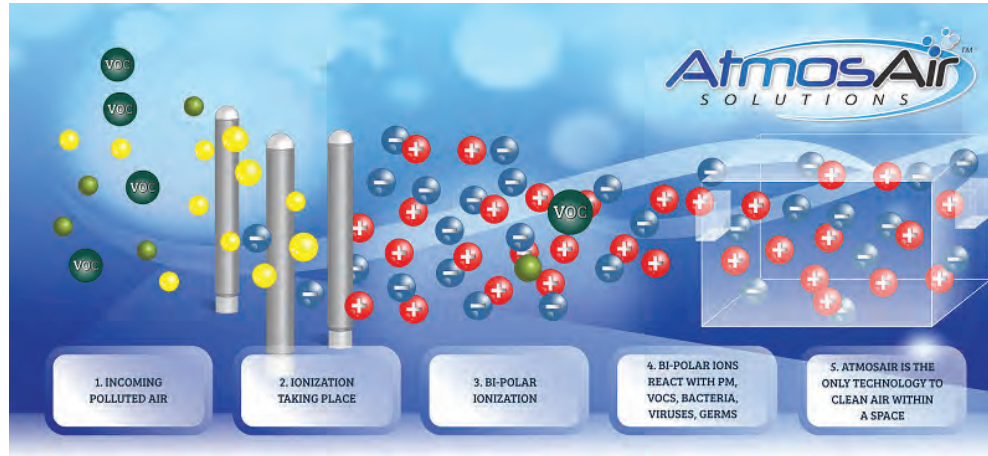
some cases, we have used activated charcoal carbon. It became costly and maintenance-intensive to remove hydrocarbons from the air."

Old Problem, New Solution

By working with the airport's existing air filtration system, AtmosAir's approach allowed LAX to improve its air quality with less time needed for ongoing maintenance.

"When airflow goes over the AtmosAir ionization tube, it creates ions that sanitize the duct and flows into the space where people are," explains Levine. "The system takes out of the air everything people should not be breathing."

AtmosSmart, the company's integrated in-duct air monitoring system, connects to the AtmosAir bipolar ion units and adjusts the ion levels based on real-time air quality measurement.

The significant reduction in dust, allergens and mold spores has been stunning, reports Levine. "Irritating odors are largely a thing of the past, as is the presence of unhealthy volatile organic compounds. The amount of harmful bacteria, viruses and germs is also greatly diminished. The result is clean, odor-free air."

According to Levine, AtmosAir's active bipolar ionization produces the same type of positive and negative air ions that are found in mountain ranges.

"Our technology is really good at agglomerating particles in the air," he says, noting that the technology destroys airborne contaminants rather than catching them.

Beyond enjoying improved air quality, LAX is performing less maintenance. "AtmosAir takes a lot of the load off of the carbon filtration system and reduces the amount of maintenance effort we have to put into it," explains Christensen.

According to airport personnel, the AtmosAir system costs $17,940 per month to maintain.

Additional Applications

Gensler, lead designer and architect for the 12-gate Midfield Satellite Concourse being added to LAX's Bradley Terminal, recognized the importance of air quality and invited AtmosAir to participate on the project.

"As designers, we use a holistic approach to ensure we create an excellent passenger and worker experience, from natural light to quality finish materials to the way people flow through the space," says Tim Sullivan, Gensler's regional aviation leader and lead on the Midfield Concourse project. "Indoor air quality is a crucial facet of that approach. AtmosAir's systems are state-of-the-art, so we were glad to see they were already in use at LAX."

When completed, the new Midfield Concourse will include more than 1,000 active ionization tubes.

Other airports using the technology to improve air quality include Portland International, San Francisco International and Ted Stevens Anchorage International.

"There are many airports that are undertaking major construction projects, and sustainability is playing an important role," observes Levine. "Change is literally in the air."

Halifax Int'l Doubles Checkpoint Throughput, Adds Space for Concessions & Airlines

BY VICTORIA SOUKUP

HalifaxStanfield
connecting means the world

FACTS&FIGURES

Project: Passenger Processing Terminal Expansion

Location: Halifax Stanfield Int'l Airport, Nova Scotia

Primary Benefit: Enhancing passenger checkpoint with new CATSA Plus security technology

Concurrent Efforts: Adding operational space for airlines; improving gate seating & concessions

Total Cost: $17 million (does not include cost of screening equipment which was paid for by CATSA)

Construction: Sept. 2017-Summer 2019

Design Consultant: WSP

Builder: Lindsay Construction

Checkpoint Equipment: Mach-SmartLane purchased by CATSA from L3 MacDonald Humfrey Automation

When Halifax Stanfield International (YHZ) recently expanded its security checkpoint, the Nova Scotia airport leveraged the associated construction process by dovetailing additional projects to add space for airline operations and new passenger concessions. Crews completed the security enhancements last spring and the other expansions this summer.

Airport officials report that the primary mission of the $17 million Passenger Processing Terminal Expansion project—installation of CATSA Plus screening technology—has dramatically increased throughput and enhanced the passenger experience at the airport's checkpoint.

Joyce Carter, YHZ's president and chief executive officer, notes that all components of the recent terminal expansion provide for better customer service. "We saw a clear opportunity to elevate the passenger experience not only at pre-board screening with new CATSA Plus technology, but also post-security in our holdroom," she explains. "Expanding the terminal building allowed us to take the Halifax Stanfield experience to the next level."
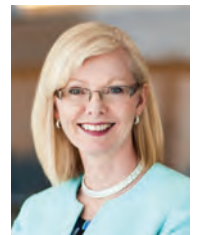
JOYCE CARTER

As Atlantic Canada's principal full-service airport, YHZ provides access to North America, Europe, Asia and the Middle East. Passenger traffic has steadily increased in recent years, and last year jumped 5.6% to 4.3 million travelers.

Growing volume put a heavy burden on the pre-board domestic/international security checkpoint. "Wait times were getting to be a concern, and we knew our maximum capacity was approximately 720 passengers per hour," says Dean Bouchard, director of planning and infrastructure for the airport. "During peak season and peak times, we were approaching that number and needed to add additional capacity."

DEAN BOUCHARD

Two things were certain: Terminal space was at a premium, and improvements would require substantial construction. As the airport strategized, CATSA rolled out its new CATSA Plus screening system, which provides more efficient screening via fewer, but longer, lanes. YHZ opted to increase the size of the checkpoint to install CATSA Plus lines, and significantly reduced its checkpoint wait times after less than six months of use.

"With this additional capacity, we're seeing results that are already better than predicted," Bouchard reports. The four CATSA Plus lines provide the screening capacity of eight standard lines.

The Canadian Air Transport Security Authority is a Crown corporation responsible for securing specific elements of the air transportation system—from passenger and baggage screening to screening airport workers.

Reducing Security Queues

Previously, YHZ had six lanes that were 13 meters long each. Now, it has four CATSA Plus lanes, each stretching for 28 meters. The lanes themselves are 21 meters long, plus 7 meters for queue space at the front and back for passenger flow.

Because the passenger checkpoint is located adjacent to the aircraft apron, the airport had to extend its terminal footprint by 12 meters onto the apron to accommodate the longer lanes. Overall, the extension was about 90 meters long.

CATSA Spokesperson Christine Langlois notes that the new lanes combine the latest equipment, technology and processes that have been successfully tested at various airports over the last few years.

CHRISTINE LANGLOIS

"The new CATSA Plus concept involves replacing standard screening lines with high-performance lines, while also addressing CATSA's vision for seamless security," says Langlois. "The 'plus' represents enhanced security effectiveness and a more pleasant experience through the checkpoint for air travelers, as the new lines allow for improved customer service and passenger flow."

One visible feature of the new system is parallel divest stations, which permit up to four passengers to place their belongings in bins at the same time. This allows faster, more experienced

travelers to move through the checkpoint quickly, while slower passengers can take their time without being rushed. Conveyor belts for the X-ray machines run continuously to further reduce slowdowns.

"Images are sent to the screeners in a nearby room; and whatever screener is available to look at an image takes it," Bouchard explains. "That actually moves the bags through the screening process more quickly as well."

The system also allows screening officers to reject bins and redirect them to a separate search lane for additional screening. Motorized rollers automatically return empty bins to the front of the line, eliminating the need for officers to manually perform the task.

A bin tracking system assigns a unique ID tag to each bin, and a camera photographs each bin before it enters the X-ray machine. Photos make it easier for officers to identify items during the inspection process.

At the end of the lanes, an expanded area with more benches and tables makes it easier—and faster—for passengers to repack their belongings and continue their journeys.

Additional Objectives

The recent expansion also increased operational space for airlines and concession offerings for passengers.

The airport added concessions in new space above its expanded security checkpoint.

"While the heart of the project was to create more capacity for screening, we also recognized that airlines would have a need for additional airside space for apron operations in the next three to four years," explains Bouchard. "We took advantage of the fact that we were undergoing construction so the space could accommodate those uses as well."

Air carriers gained square footage adjacent to the ramp for operational equipment, maintenance and supplies. And project planners extended the level above it to expand the hold area for three gates. "The initial need was on the ground floor; but because we were expanding the building, we decided to expand both floors," Bouchard relates. "The larger footprint offered an excellent

opportunity to also expand the holdroom on the second floor of the terminal, turning what would have been the roof of the ground floor expansion into the floor of the holdroom expansion."

The airport is using the new second-floor space to add concessions in a once-underserved area of the terminal. Previously, the hold area for gates 16, 18 and 20 only had seating. The new space will have refurbished seating and five new concessions, with both retail and food/beverage options. Two concessionaires have already taken root: the Firkin & Flyer Pub and Metalsmiths Sterling. Airport officials are in discussions with other concessionaires about the remaining three spaces.

"Because the airport has been expanded in phases since 1960, the three gates that are specifically affected by this seating area were a little bit crowded," Bouchard notes. "With this expansion, we were able to distribute the seating and make a nicer ambiance for the passengers. And the concessions now allow people at the gates to get food and drink without having to walk very far."

In addition, the airport plans to add soft, bench-style modular seating in the area. "Soft seating will liven up the area," Bouchard notes. "It's more flexible in terms of how people use it."

An art program is another planned addition. "As we look at the new space, we see we have a lot of canvas to work with," he remarks.

Overall, Bouchard considers the expansion/renovation a big success: "The processing of our pre-board screening facility reduced wait times and eliminated excessive queues. The ground floor expansion provided us with space for future requirements for airside operations. And on top, we expanded our holdroom, allowing for a better passenger experience with additional and more convenient concessions."

Heavy coordination and planning helped minimize disruption to operations during construction, he adds. "The area is a central and busy part of the terminal as it is adjacent to one of the bag halls. There was a time during construction where we had to reduce gate access, so it was important to carefully plan."

As CEO, Carter emphasizes how the expansion project supports the airport's long-time focus on providing the best passenger experience possible. "At Halifax Stanfield, we're known for customer service excellence," she remarks, citing the airport's volunteer Tartan Team and self-serve bag drops as two of many specific examples. "Based on customer feedback, the terminal expansion is an investment that will enable us to better serve our passengers and airport partners now and in the future."

Why Smart Airports Need

REAL-TIME INTELLIGENCE

INTRODUCTION

*Every airport is competing to be the number one destination for travelers. Improving all levels of service is a proven way to create value for passengers. Airports often focus on amenities to position their terminal as a destination or preferred transfer point. Enticing customers goes beyond good food or fast internet. For example, the **Denver International Airport** created a plaza with an ice-skating rink and mini golf course, the **San Diego International Airport** hosts a performing arts residency program and **Minneapolis-St. Paul International Airport** offers screenings of short films and documentaries. Yet in addition to keeping customers entertained, a smooth, uninterrupted experience is one of the biggest factors that motivates travelers to return on future trips. The role of airport operations cannot be overlooked when competing for passenger favor.*

Airport operations face evolving challenges that range from sustainability and energy management to cybersecurity threats and lean staff levels. Yet **budget and regulatory pressures are an opportunity to implement operational improvements that ultimately serve airport customers.** This can be achieved through the power of data analytics.

Operational technologies (OT) are typically focused on **the safe operation of physical devices and processes** while counterparts in IT oversee data, information management and communications. These two groups **have historically had little interaction because they** managed separate sets of systems with no overlap.

All of this is changing with Internet of Things (IoT) technologies. Connected devices are creating a data-rich network that needs the oversight of both OT and IT professionals. Without coordinated data, airports will face operational gaps filled with inefficiencies.

The convergence of IT/OT is well underway in the industrial automation sector. Airports can adopt the same approach and unify their operational data. Real-time intelligence from IT/OT systems can uncover misdiagnosed or unknown problems. Proactively **managing airport operations is not only a responsible** way to utilize resources, but it directly translates into better customer experience.

AIRPORTS TODAY

THE COMPLEXITY OF AIRPORT SYSTEMS

Airport operations have become increasingly multifaceted. Airside and landside operations depend on a vast and growing number of systems to provide a safe, enjoyable experience to travelers. Each of these systems produces a unique but siloed set of data (figure 1):

- **Mission critical systems in airside operations:** Central utility plant, steam distribution, fuel tank management, weather monitoring, fire control, security and surveillance systems, energy generators, airfield ground lighting, communications, network infrastructure and renewable energy.

- **Terminal management in landside operations:** Lighting, energy management, hot water, jet bridges, HVAC, baggage, light rail, EV charging and passenger movement (elevators, moving walkways, and escalators).

Despite the wide availability of performance data, **it remains a challenge for airports to harness this information and use it to improve their operations.** Without a central dashboard or IT/OT software solution to collect these separate data streams, **airport operators are unable to place this volume of information into context.**

Figure 1: Real-time data is being created everywhere at airports

THE INTRICACIES OF DATA INFRASTRUCTURE

A single airport could have millions—if not billions—of data points. Managers need a birds-eye view into their operations in order to uncover and address efficiencies. The ability to trend and analyze system performance is the best way to flag equipment issues and then stay ahead of them moving forward.

But there are two complications that airport managers face when turning data into action. The first is the lack of a single communication protocol. Building and **equipment systems are relayed through a variety of** protocols, such as BACnet, Modbus or OPC. The data is then sent through one of several transmission modes, including Ethernet, IP, Zigbee, MS/TP or RTU. Airport operators need a way to consolidate different data formats into a uniform interface.

The second challenge is that data is isolated if there's no IoT infrastructure in place. When system information is trapped inside a silo, managers can only use it reactively to address problems. They also cannot see how one system affects another, such as lighting and HVAC, and make coordinated adjustments to improve performance.

Despite the size and complexity of airports, operations **managers have many opportunities to centralize data** infrastructure. These smart airports are in a better **position to protect their operations from interruptions** and rising costs. Using integrated data to uncover operational efficiencies ultimately enhances the customer experience.

5 Ways Airport Operations Can Benefit From a Converged IT/OT Data Infrastructure:

1. PROVIDING MORE GREEN ENERGY

Environmental stewardship can be an attractive selling point to travelers. Energy management is a key sustainability bench for airports, even though terminals don't have the latitude to turn off lights or lower the temperature on nights or weekends as they do in commercial buildings. With so many mission-critical systems, managers need real-time data to finetune behind-the-scenes operations without affecting passengers.
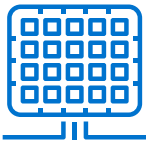
2. MEETING SUSTAINABILITY GOALS & CO_2 TARGETS

Greenhouse gas emissions are another priority thanks to green building standards such as LEED and regulatory incentives. In addition, a growing number of airports must comply with state or city reduction programs. Tactics to lower an airport's carbon footprint can range from plant and HVAC upgrades to lighting retrofits and water metering. On-site renewable energy, such as solar panels or geothermal, is another way to offset electricity demand. It is easier to manage energy demand when operators can trend performance data.

3. USING FEWER RESOURCES BY OUTSOURCING ENERGY SERVICES

Airports are increasingly outsourcing operations and maintenance (O&M) to service vendors in order to adopt lean operations and reduce staff expenses. However, third-party vendors need increased real-time data visibility for the same reasons as internal staff—to uncover inefficiencies, respond to problems and proactively manage resources. In other words, O&M providers can deliver better outcomes when they have access to centralized, actionable data.

4. DECREASING CYBERSECURITY THREATS

Another reason to merge OT and IT data is to decrease cybersecurity threats. Passenger information such as credit card numbers or birth dates isn't the only data that attackers want. Imagine if a hacker gained the ability to shut down generators, runway lights, communications systems or security scanners. A distributed denial of service could target servers, knocking out any system connected to the network. Even a simple malware ransom could hold all computers hostage, which could effectively incapacitate all incoming and outgoing flights.

5. PROVIDING REAL-TIME INSIGHTS

Real-time insights are also critical if an airport wants to make rapid operational changes to capitalize on efficiencies. This capability is essential if an airport is participating in demand response, which is a voluntary opportunity through its utility to shed energy loads. An airport might only receive a four-hour notice when a demand response event is slated—managers need current data in order to target which systems or equipment to scale back.

AIRPORTS TOMORROW

BRIDGING THE GAP

The key to bridging the gap between better airport operations and improved traveler satisfaction is the ability to turn data into action. It's not enough to have accessible data—airport operators also need tools that connect, analyze and trend their data. Real-time insights into operations allows managers to proactively address issues before they become problems.

The first step to data integration is unifying operational and information technologies. Both groups are hidden from a customer standpoint because there's no direct interaction, yet OT and IT departments oversee equipment and systems that affect all airport travelers. Customer success is frequently met by providing uninterrupted services, from terminal transportation and bridge operation to fuel delivery and baggage handling. Travelers don't think about these invisible support teams until a delay or malfunction interferes with their flight schedule. With converged data infrastructure, airport operators can ensure passengers have a seamless experience.

CONVERGE OT/IT DATA WITH THE PI SYSTEM

The OSIsoft PI System unites OT and IT to improve operations and efficiency. Its highly scalable, open data infrastructure simplifies asset, process and operational intelligence. Airports can transform data into actionable knowledge by identifying how and where to improve operations. Data insights are no longer scattered across incompatible systems, formats and processes.

By centralizing key data points, airports can uncover new ways to improve operations. The PI System collects, analyzes and visualizes large amounts of high-fidelity, time-series data from multiple sources. It interfaces with enterprise operations infrastructure, including central utility plant, building management, health and safety, people and baggage, airfield and rail systems. Data from these formerly isolated control networks is consolidated through a secure system architecture (figure 2).
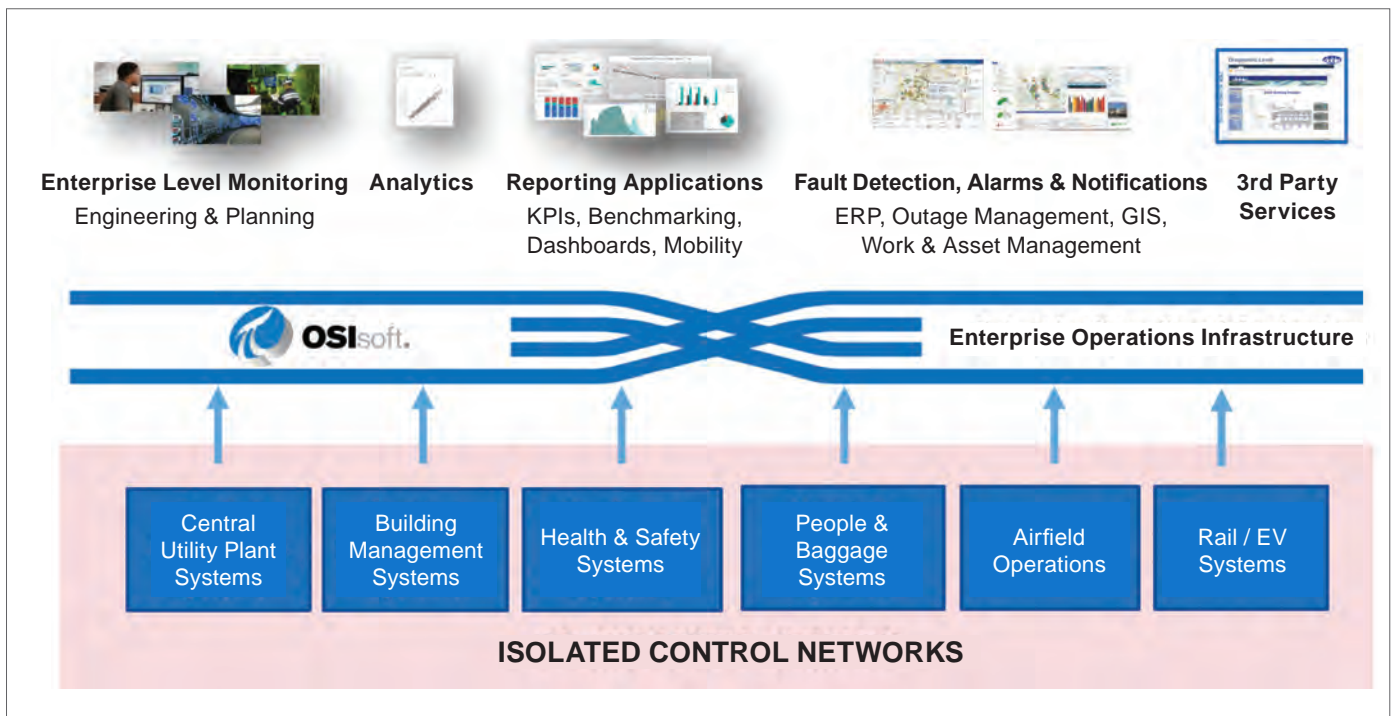
Figure 2: A secure system architecture starts with separating data from control
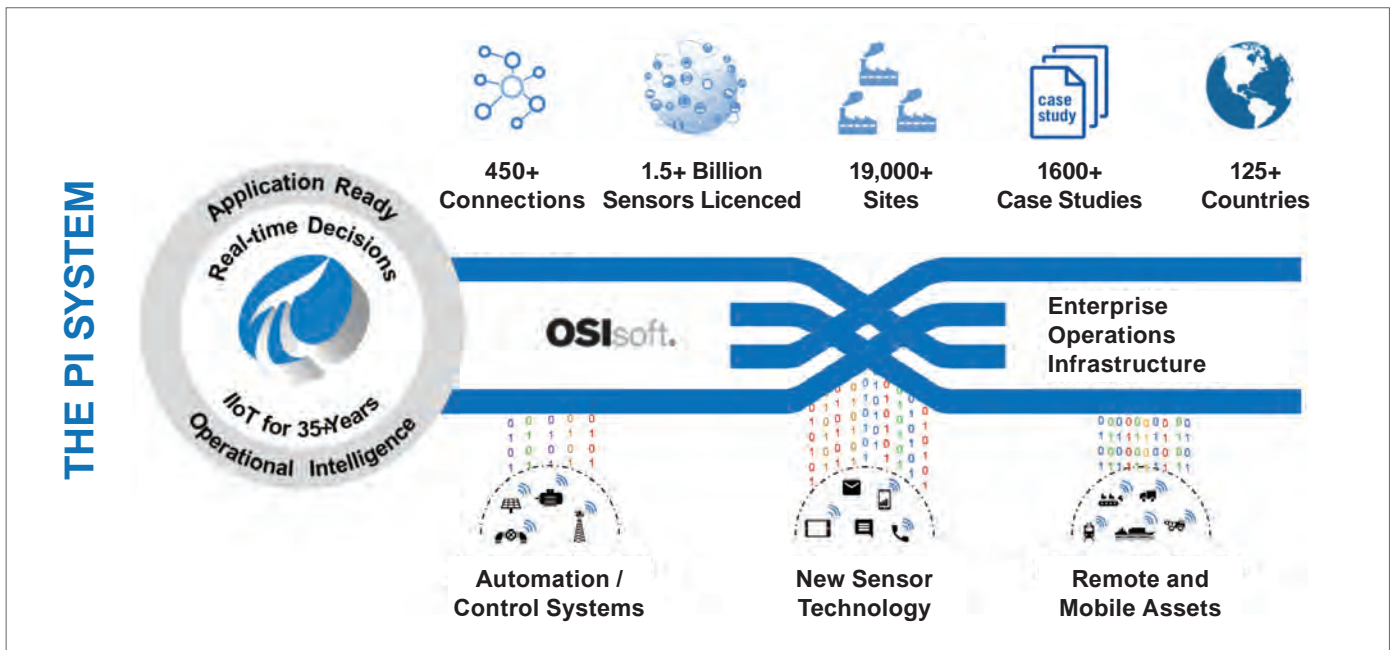
Figure 3: A proven data infrastructure approach

The PI System stores millions of time-series and event-based data points, eliminating information silos. Unified, integrated data can be used to:

- **Investigate intermittent issues**
- Troubleshoot equipment failures
- Compare current vs. past production performance
- Produce KPI reports.

The PI System's connection capabilities include over 450 different interfaces (figure 3). This enables airport **users to access a wide range of operational and business** data sources, including SCADA, DCS, equipment, databases, text files and HTML pages.

Through PI Server, airport operations managers can use calculation tools to transform raw data, combine data values from multiple systems into robust analyses, **automate calculation of vital day-to-day metrics and** deliver new insights. PI Server capabilities include:

- **Data Archive:** Uses time-series data to monitor processes, data analytics and process optimization.
- **Asset Framework: Organizes your equipment** and processes data with configurable analytics and event frames.

- **Advanced Computing Engine:** Writes simple or complex equations with minimal effort that are reusable for similar data sets.
- **Event Frames:** Stores important process or business time periods, which represent a deviation that impacts your process or operations.
- **Batch Comparison:** Maps process or events to slices of time and data, as well as stores batch and process-based events.
- **Automatic Notifications: Receives alerts when** specific conditions are met.
- **Continuous System Availability:** Creates **collectives to provide redundancy and ensure** continuous data collection, storage and availability.
- **System Monitoring:** Monitors the underlying IT infrastructure to ensure system reliability and performance.
- **Asset-Based Analytics:** Performs everything **from simple averages and totals to sophisticated programmatic calculations with a suite of** calculate tools.

THE NEXT GENERATION OF SECURITY

The next generation of security requires a new level of awareness into airport operations. The old security **model of isolation should go the way of the castle wall and moat. In other words, security shouldn't consist of a single defense but rather should have an evolving model that has the ability to adapt to changing needs and risks.** (figure 4)

Today's data security must include strong barriers to **entry while also providing constant analysis of the data** for unexpected changes in behavior. One of the first **steps in the digital age of industrial control systems** is the separation of data from control. While more people require data access for maintenance, awareness, performance monitoring and energy management, most of these people do not need access to control.

Consider the airplane itself as a model. If a pilot **had to deal with every data element created by the** airplane, they would be overwhelmed and have a difficult time focusing on control. Instead, the airplane **has computers that manage the data and make** the pilot aware of actionable intelligence. Airplane **computers help improve reliability by streaming** data to the airlines, ground control and even engine manufacturers. All of this data ensures operational safety and security.

Data awareness is a reliable mechanism to ensure the security and efficiency of an airport's critical infrastructure. OSIsoft was purpose built to collect data **from all real-time systems using a secure method to** access and store the data.
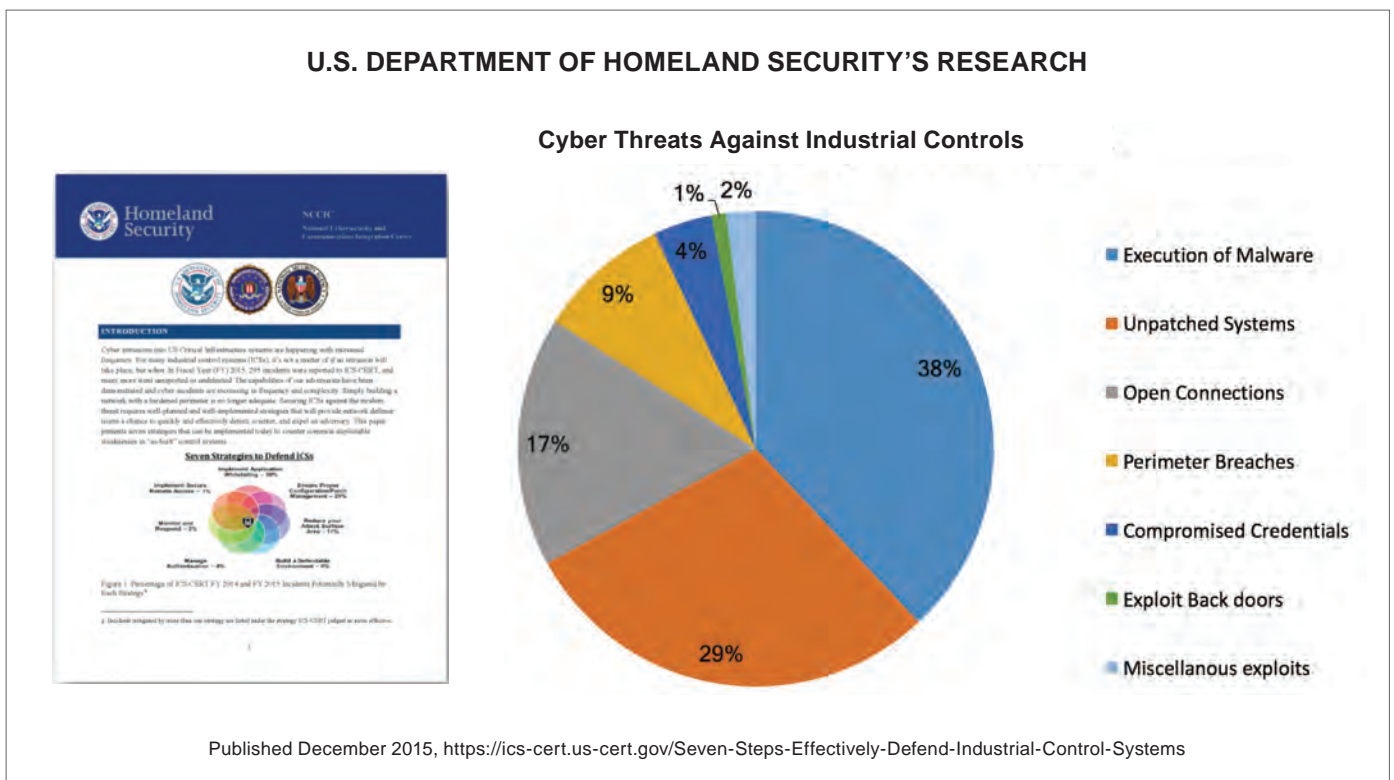
Figure 4: Next generation security must match these threats

HOW DOES OSISOFT FIT IN?

What differentiates the OSIsoft PI System is that it provides tools to harvest value from the data. This creates actionable intelligence and avoids a data deluge. The PI System can gather data from diverse systems such as power turbines, boilers, electrical distribution, light rail and baggage movement and generate real-time insights that have a direct impact on customer experience.

By adopting the OSIsoft PI System, airports will **experience new levels of control over their building** systems by:

- Collecting quality time-series and event-based data
- Comparing, contextualizing and leveraging **information**
- **Avoiding lost data by centralizing it in one repository**
- Switching from reactive to proactive decision-making

- Analyzing remotely from tablets, phones or laptops
- Expanding the system's open infrastructure to **match future growth**

OT/IT convergence is an exciting opportunity for airports to bridge the gap between data silos. By using the PI System, managers will have a proven method to increase services and efficiencies. Data-driven **operational improvements help airports enrich the customer experience, placing their destination closer to** the coveted Number One spot.

WHY CHOOSE THE PI SYSTEM
FOR YOUR OPERATIONAL DATA INFRASTRUCTURE?

21,000+
sites deployed across
diverse industries

PROVEN
You can trust the
PI System infrastructure.
Our customer base
demonstrates this.

24 out of 24
of our first customers
are still with us
after 30 years

PI System installed in
140+ countries

Big and **Fast**

One customer monitors
532 measurement stations
each with **40** data streams...

x532

at **60** samples
per second...

1 PI System

spread over
3.1 million km²
and **10 US states...**

all in **real-time**, all with

SCALABLE
The PI System will perform
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ABOUT OSISOFT

Scott Smith is the Industry Principal for Facilities and Data Centers at OSIsoft. OSIsoft has over 38 years of history in the critical infrastructure industries providing secure access to process control systems and data. Scott has spent the initial 15 years of his career in IT system design and operations for critical infrastructure companies in the electrical distribution, transmission and power generation industries. Scott's focus then turned to the advancement of smart meters and meter data management with global utilities driving the beginning of the utility Smart Grid. Scott's focus at OSIsoft is taking the same lessons learned and moving this to Smart Facilities a microcosm of the utility grade Smart Grid. You can reach Scott directly at scottsmith@osisoft.com.

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Northern Ontario Airports Transition to Digital Safety Management System

BY KRISTIN V. SHAW

FACTS&FIGURES

Project: Digital Safety Management System

Location: Northern Ontario, Canada

Airports: 28 commercial airports; 1 aerodrome for charter service

Method: Web-based app

Development & Design: Veoci

Timeline: Bid request issued July 2017; system operational spring 2019

Key Benefits: Faster, more efficient recordkeeping & reporting; enhanced safety; actionable data

A network of nearly 30 remote airports in Northern Ontario recently took a giant step into the digital age by transitioning from paper records and fax communications to a web-based safety management system (SMS). The electronic switch is significant, as most of the airports serve First Nations and Indigenous communities that lack year-round road access to the rest of the province.

"We take pride in running a very safe fleet, which is why we wanted to make enhancements for even better, safer airports," says Bruce Caldwell, manager of the Remote Northern Transportation Office (RNTO) for Ontario's Ministry of Transportation.

BRUCE CALDWELL

The digital upgrade occurred at all 29 airports operated by the RNTO—28 commercial facilities and one aerodrome for charter service. The new electronic SMS program establishes one data and tracking system for incident reports, runway conditions, wildlife tracking and routine operational information.

"Implementing a digital system meant we could streamline paperwork processing and data analysis," explains Caldwell. "We wanted to get to the point to where we could see trends in the data, study what it was telling us, and enhance our compliance."

Vendor Selection

In July 2017, the Ministry of Transportation requested for bids on systems that would enable RNTO personnel to perform all tasks related to recording, monitoring, analyzing and reporting about safety at their airports.

Capabilities needed to include recording and investigating safety-related occurrences, inspections, audits, and tracking corrective actions in response to safety-related findings.

The system in place at the time of the bid was entirely paper based, and airport staff faxed it to the RNTO central office in Thunder Bay, where it was logged into spreadsheets. The goal of the bid request was to enhance airport compliance through digital tracking.

Using the competitive tendering process, the Ministry selected Veoci as the winning bidder. The evaluation included technical and financial reviews, and RNTO staff assessed software functionality during onsite demos. Caldwell notes that the flexibility of Veoci's system was particularly appealing on two fronts: It could be adapted for a number of uses; and it could work in a multi-airport environment.

"If I were running one airport, that would be enough of an undertaking; but we have 29," he says. "We found the administrative burden of [SMS] on paper was enormous. And the paperwork didn't necessarily allow us to extract the best value and data. Also, our main mode of communication was fax. For our remote airports, a phone line was our main communication; we wanted to modernize and streamline that."

Enhancing the Lifeline

The Ontario Airport System is Canada's largest airport network, stretching from the Manitoba border on the west to the border with Quebec on the east. Its northernmost facility is Fort Severn Airport (YER) on Hudson Bay, more than 1,000 miles from RNTO headquarters.

Scores of Indigenous peoples living in Northern Ontario count on airports for access to goods and services from across the province and around the world. Winter ice roads link First Nations and cities together, but the 29 system airports that dot the map provide other critical, year-round connections. With some of the original trading posts in the New World from the 1600s, the region has a long history of person-to-person commerce.

"This project highlights the importance of humans," says Swaraj Kler, solutions manager for Veoci. "The airports are their lifeline, and they serve the local society. The airports have been well taken care of because they're so critical."

SWARAJ KLER

Northern Ontario's network of remote airports support passenger, cargo and turboprop charter airlines such as Northstar Air, Thunder Airlines, Wasaya, Air Creebec, Perimeter and Air Bravo. In addition to

Portable tablets make it easier for airport staff to record safety and operational data.

providing critical transportation during medical, police and evacuation emergencies, they facilitate the delivery of everyday food, supplies, fuel, freight and equipment during the majority of the year, when roads are not available. (Typically, the winter ice roads are only open from about mid-January to mid-March.)

Easing the Transition

Kler has been working with RNTO staff for the last year and a half to train personnel throughout the airport system—some with limited computer experience.

"Transitioning from paper to digital is a common problem," she notes. "It's a relatively slow conversion, and it was part of our charter to help the staff quell their fears about new technology and help them understand they couldn't break anything in the process of learning it."

To address concerns about the potential travel costs of providing onsite training at so many airports, RNTO teamed with Veoci to create a phased approach and arranged a few whirlwind sessions to kick things off.

"It's going even better than we anticipated," reports Caldwell. "Our staff at the airports are using tablets, which are more like phones than computers. The adaptability has been beyond expectations."

Where possible, Kler and RNTO staff trained airport personnel themselves. In other cases, they trained airport personnel to share their training with peers in other locations. Veoci also sent Kler to provide on-site technical support when needed. After multiple touch points, she reports that airport teams are finding the app to be customizable and user-friendly.

"You don't have to be technically qualified to make changes to this system, like adding a field. Via dashboards, staff can configure data without requesting help," explains Kler, noting that this capability will save RNTO money over the long term.

Digital Champions Emerge

When moving from paper to computer, the airport teams discovered the value of mapping out their process flow before implementation. Caldwell says this thorough approach helps ensure that work flows through the organization effectively before embedding it in

a software solution. Honing the workflow up front also saves steps during implementation.

One member of the RNTO staff took the initiative to create a series of how-to videos for the rest of the team, and the videos are now embedded in the software for easy access.

"We have to remember that our remote staff is not only serving an Indigenous community; our staff are community members, too," says Caldwell. "There could be cultural differences and language differences to which we must be sensitive, and that's where video is very helpful."

So far, the staff doesn't miss the era of paper-and-pen reporting. Some have even suggested more ways to digitize, as they find the new processes to be faster and simpler.

"I was surprised and delighted that our staff took it up more quickly than we thought they might," reflects Caldwell. "Natural champions have come out of the woodwork. One staff member with very little prior computer experience has become one of our all-stars."

The new system's portable tablets have greatly improved working conditions for airport staff reporting aircraft incidents, runway conditions and other safety/operational data. "Before implementing this app, a team member would have to stomp off their boots, take off their coat, and sit down to create a report and fax it over. Then, they would have to start that process over every couple of hours," Caldwell explains. "When it's -40 Celsius outdoors, they can record data from the warmth of their vehicle, which also improves the likelihood that the reports will come in promptly and be more relevant and current for air carriers."

The new app has appreciably evolved SMS for airports throughout the system, says Kler. "They have a clear idea on how it has to be done and recorded," she remarks. "The staff has been trained to report all incidents, and they are doing a great job. Even the smallest incident—if someone slips and falls at a facility, for instance—is reported on the app. It's key to the goals of the RNTO."

The new system is also providing more meaningful data, adds Caldwell.

"The focus before this upgrade was on the data collected as a requirement," he says. "Now, we're able to trend it, plan action, and determine root cause analysis to address any operational concerns. We expect our staff to have more time for making improvements because reporting will be a by-product."

Innovation Lab at San Diego Int'l Tests Potential Parking Solutions
BY NICOLE NELSON

SAN DIEGO INTERNATIONAL AIRPORT. LET'S GO.

FACTS&FIGURES

Project: Improving Efficiency & Customer Service of Parking Operations

Location: San Diego Int'l Airport

Strategy: Develop & test new solutions from outside vendors in onsite accelerator lab

Venue: SAN Airport Innovation Laboratory

Size: 3,500 sq. ft.

Inaugural Session: April 2018 call for innovators; participants selected in Aug. 2018

Program Duration: 16 weeks

Ideas Tested: Online parking reservation system that allows parkers to rent out their cars while they are away (TravelCar); cloud-based valet services app (Vark); rental car valet services (FreedomPark); parking booking system (Park Connect); baggage pick-up, storage & delivery service (Baggage Nanny)

Outcome: Contract negotiations ongoing with all 5 companies

Of Note: SAN converted part of former Commuter Terminal into testing area for companies developing new products & services; airport requests proposals for specific focus areas (parking, children's entertainment, etc.) & general customer enhancements; successful ideas will be shared with other airports

In search of answers to common parking challenges, San Diego International Airport (SAN) is fostering the development of several prospective solutions in its own in-house accelerator lab. Concepts in the works range from a cloud-based valet services app to an online booking platform that allows parkers to rent out their vehicles while they are traveling.

The ideas are being developed in SAN's aptly named Airport Innovation Lab, a program designed to reduce barriers for innovators trying to break into the airport industry. To support the project, SAN converted 3,500 square feet of its former Commuter Terminal into a space where developers can test their products and services in an airport environment without passengers or security concerns to work around. The functional mini-terminal even includes ticket counters and a baggage claim carousel.

"The first solutions the lab focused on were airport parking and easing the airport experience," explains Gina Jacobs, SAN's program manager for Innovation.

GINA JACOBS

Call for Participants
After issuing a request for applicants in April 2018, the airport selected five companies to test seven solutions in its maiden 16-week Airport Innovation Lab program in August 2018. Ultimately, six concepts moved forward for contract negotiations—five related to parking, and one regarding baggage services. The common goal was to help solve problems or issues faced by airports.

While parking solutions fall outside the parameters of the lab's simulated terminal, its conceptual testing format proved highly relevant for the companies developing their ideas. In addition to potentially being deployed at SAN, successful innovations tested in the program could also be rolled out to other airports and businesses outside the industry, such as shopping malls, convention centers and ground transportation hubs.

With more than 24 million passengers last year, SAN ranks among the top 30 busiest U.S. airports and has a reputation for being on the forefront of airport innovation.

Inaugural Innovator
TravelCar was one of the five companies selected to participate in the first round of the innovation program.

Currently available in 60 countries, the TravelCar booking platform allows users to compare parking options by providing information about rates, reviews, locations and available services. The new twist the company tested briefly at SAN is a car-sharing platform.

"TravelCar offered both parking reservations and optional car sharing, allowing parkers to rent out their cars and earn money while they are traveling," says Jacobs. "Their solution was in line with the focus area of that 16-week program."

Samuel Saint-Jean, head of U.S. and Canadian Network Development for TravelCar, says the company was pleased to field test the idea in a live, North American airport environment.

SAMUEL SAINT-JEAN

"The lab allows innovative companies like us to test our products and solutions directly to their customers," Saint-Jean explains. "It provided us with a live testing environment to prove our concept and also give the airport a firsthand experience to see what we do and what we can bring to the table."

Using TravelCar's platform, SAN patrons can search, compare and book airport parking online.

"They have the ability to find the parking that best suits their need," Saint-Jean says, noting that patrons can prepay to ensure a parking spot is available when they arrive. "In the near future, we are hoping to develop specific products and options to enhance the SAN customers' experience even more."

In the meantime, SAN and other airports can benefit from TravelCar's "Travel Agent Program," a platform that allows travel agents to book airport parking for clients. Airports also benefit from the company's multiple global partnerships with airlines, online travel agencies, hotels and other businesses that direct their customers to the TravelCar platform to book airport parking.

"The San Diego County Regional Airport Authority was seeking innovative solutions that would add value to the parking customer experience and/or increase the operational efficiency of parking," Saint-Jean relates. "With the rise in ride-sharing, we believe it's important that airports such as San

SAN DIEGO INTERNATIONAL AIRPORT INNOVATION LAB

The next area of focus in the Innovation Lab will be interactive entertainment for children.

Diego better understand the necessity of providing multiple access to their parking inventory as well as finding additional ways to promote their parking."

Successful Outcomes

Feedback and reviews from TravelCar's limited field tests at SAN were favorable, and the parking aggregator was ultimately awarded the opportunity to enter into an agreement with the airport.

Similar success stories also unfolded for the lab's four other inaugural participants: Vark, a cloud-based valet parking services app; FreedomPark, a rental car valet service; Park Connect, a parking booking system; and Baggage Nanny, a baggage pick-up, storage and delivery service.

In July, SAN was negotiating contracts with all five companies.

Much like the products and services it helps develop, the lab's mission will continue to evolve. The airport plans to solicit ideas for 16-week development programs twice yearly. As with the first session, subsequent rounds will solicit ideas for general customer experience enhancements as well as targeted solutions to specific issues and challenges. While the first session sought proposals about parking, interactive children's entertainment options is the focus area for the second round.

For both categories of entries, the lab seeks ideas that will increase revenue, enhance operational efficiency, decrease

costs and/or improve the passenger experience.

"At the beginning of the program we select solutions that are a good fit for the industry, and at the end select solutions that are a good fit for SAN," adds Jacobs. "Our goal in the near future is to identify third-horizon concepts that will address gaps identified by our customer experience design. We are constantly iterating our program and looking for new and exciting ways to enhance the customer experience at SAN."

Wilmington Air Park Welcomes Amazon as New Tenant

BY ROBERT NORDSTROM

WILMINGTON AIR PARK

FACTS&FIGURES

Project: Airfield & Facility Upgrades

Objective: Prepare for Amazon's air gateway & package sorting operations

Location: Wilmington (OH) Air Park

Owner: Clinton County Port Authority

Airfield & Facilities Management: LGSTX Services

Airfield Engineering Consultant: Michael Baker Int'l

Investment: More than $4 million over the last 3 yrs.

Funding: Port Authority; OH Transportation Dept. grants; State of Ohio Capital Budget grants

Airfield Improvements: Crack & joint repair on runway & associated pavement; selective concrete slab replacement; new runway visual range system; 2 new windsocks; incandescent lighting & signage is gradually being replaced with LED fixtures

Other Improvements: 2 airport buildings removed to make room for 800 additional parking slots for Amazon employees; new space also helps facilitate vehicle movement & product flow in/out of the sorting facility

The landscape at Wilmington Air Park (ILN) in south-central Ohio has been changing steadily for the last few years, and the various airfield and landside improvements are beginning to pay big dividends. On June 26, e-commerce giant Amazon opened a new package sorting facility at the 1,900-acre aviation and logistics business park.

As part of its air gateway system, Amazon leases space at multiple airports for sorting and forwarding packages flown by "wet-leased" aircraft. This allows the huge web retailer to control all aspects of fulfillment and delivery without having to rely on third parties such as UPS and FedEx. Its five-year lease at ILN was a major win for the Clinton County Port Authority, which owns the air park and contracts LGSTX Services to manage the airfield and facilities.

With the addition of Amazon's eight daily flights, ILN now averages 14 flights a day. The associated economic benefits are especially welcome, as the community suffered significant losses when DHL, which previously owned the air park, ended operations there about one decade ago.

"When the Port Authority took ownership of the air park from DHL in 2010, we began marketing it aggressively," reflects Dan Evers, executive director of the Clinton County Port Authority. "Our goal was to diversify the air park's economic and employment base."

By all measures, the Port Authority has achieved remarkable success. The air park had four companies with 700 to 750 employees working throughout its facilities when the Port Authority acquired the air park. Today, it boasts 13 companies that will employ more than 2,000 workers by year-end.

DAN EVERS

As the newest and one of the largest tenants, Amazon is the icing on a cake that ILN has been baking for nearly a decade. Other key tenants at the air park include ATSG, Airborne Maintenance and Engineering Services, Airborne Global Solutions, Air Transport International, ABX Air, Global Flight Source, LGSTX Services, Santa Rosa Systems, Robert A. Schuerger Co. LPA and JMCC.

Nearly all of the airpark's 2.7 million square feet of industrial, office and hangar is currently leased.

Maintain It & They Will Come

ILN has two runways, one of which is currently not in service. Its primary 10,701-foot Category III runway is capable of handling Boeing 747-class aircraft.

a major challenge," emphasizes Lance Wanamaker, associate vice president with Michael Baker International. "And the rainy weather didn't help."

In addition to making airfield repairs and improvements, crews demolished two airport buildings to add a new truck court and accommodate 800 additional parking slots for Amazon employees. The new space also

LANCE WANAMAKER

helps facilitate vehicle movement and product flow in and out of Amazon's two-story sorting facility, which was formerly used by DHL.

Amazon has invested significantly in renovations to the package-sorting facility, upgrading the building's docks, making structural modifications to parts of the building and completing significant interior improvements. All told, the company is retrofitting and re-equipping 1.2 million square feet—more than 30% of the entire air park's total square footage of building space.

Future Looks Bright

Ohio ranks among the top four states in the U.S. for logistics and is ideally situated within a strategic infrastructure network. It boasts the seventh largest highway system in the country and is within 600 miles of 61% of all U.S. and Canadian manufacturing locations.

"For now, our 9,000-foot runway will remain closed," says Evers. "However, we have maintained it at a level that would allow us to reopen it quickly with some additional reinvestment. Our primary runway is sufficient for the air traffic we have today."

Over the past three years, the Port Authority has invested more than $4 million in aviation-related infrastructure. Improvements include the installation of a new 20-antenna array instrument landing system, enabling the air park to secure FAA Category III ILS certification. "Fortunately, we have good partners in Ohio's Department of Transportation, Office of Aviation, and have secured critical grant dollars from the state of Ohio, through both ODOT's Office of Aviation and the state's capital budget," says Evers.

The Port Authority recently hired Michael Baker International as engineering consultant for airfield work. Major components included:

• 5,820 linear feet of crack sealing;

• 455 square feet of spall repairs on Runway 4L-22R, Taxiway A1 and Ramp A;

• 292,917 linear feet of concrete joint resealing on Runway 4L-22R, Taxiway A1 and Ramp A;

• removing and replacing 25-foot-square concrete slabs: six on Runway 4L-22R, three on Taxiway A, five on Taxiway C, four on Taxiway A1 and 20 on Ramp A;

• installing a runway visual range (RVR) system;

• replacing and relocating two wind cones, one on each end of the runway;

• gradually replacing current airfield lighting and signage with LED fixtures.

To get the work done, ILN used a series of soft runway closures from 9 a.m. to 5 p.m., and one full closure for five days in early June. "The tight deadline for getting the airfield work done was
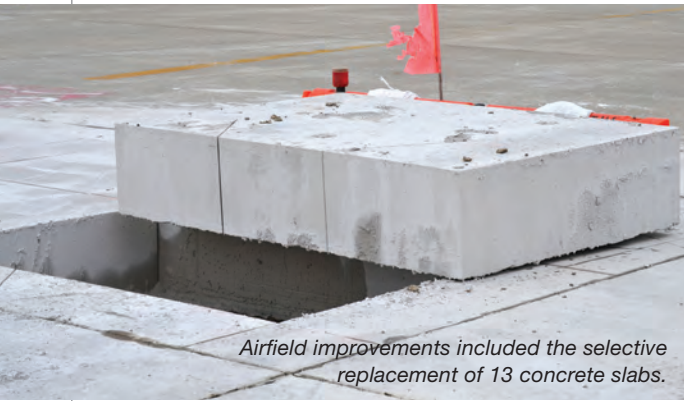
Airfield improvements included the selective replacement of 13 concrete slabs.

Located in the heart of Ohio's aerospace and logistics region, ILN offers easy access to Interstate highways and the metropolitan areas of Cincinnati, Dayton and Columbus. It is within 50 to 70 miles of three airports with international passenger service and within a day's drive of 60% of the U.S. population. The air park also lies within a Foreign Trade Zone (FTZ 101), affording another benefit to clients handling international freight shipments.

Not surprisingly, Evers believes the future is bright for ILN and the surrounding community. "To prepare for Amazon, we've had to beef up personnel," he notes. "From air traffic controllers, field and maintenance staff, even our ARFF staff, we've had to gear up to become a 24/7 airport again."

After DHL left, the Clinton County community resolved to "never let our guard down," he explains. "We were and are fortunate to have ATSG and its affiliated companies as foundational tenants and vendors. That has been a significant factor in our ability to prepare for aviation-related opportunities."

The structure of the Port Authority-owned, privately managed airport is unique. Although ILN is a fully certified Part 139 airport and handles both corporate and private air traffic, it does not offer scheduled passenger service. As the largest non-NPIAS (National Plan for Integrated Airport Systems) airfield in the U.S., it does not receive any funds from the FAA. "We are a Part 139 airport, so we do meet all the FAA protocol requirements for operations and systems; but we are 100% self-funded," notes Evers.

Jeremy Heard, director of airports and facilities for LGSTX Services, proudly notes that the Port Authority has maintained a viable airport suitable for any airline in the world, with a staff of just 25 people. "After DHL departed, it would have been very easy for Clinton County to turn off the lights at the airport," Heard observes. "But they didn't, and we made sure that the Port Authority had a facility ready, operable and attractive from a marketing standpoint. The big new tenant, Amazon, took us up on that."

JEREMY HEARD

The challenges have been significant. "It took a lot of work to undertake all the planning and execute all the improvements required for expanded operations in just over a year," Evers reflects. "We essentially added an entire third shift of operations while ensuring all systems remained rigorous and robust to support existing tenants and air traffic operations. But everyone took up their yoke and plowed their acre."

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Houston Airport Systems SH8000 (3)

Charlotte/Douglas Int. Airport - SH8000

Miami Int. Airport SH8000

Newark Liberty Int. Airport - SH8000, SH5500

Seattle-Tacoma Int. Airport - SH8000, SK2000

Minneapolis-St. Paul Int. Airport - SH8000

Detroit Metropolitan Wayne County - SH8000

Laguardia Airport SH8000 (2), SH5500 (2)

Pittsburgh Int. Airport SH8000

INTERNATIONAL

Perth Airport - SK2000

Airports Authority of India - SK5500 (10)

Mumbai Int. Airport - SH8000 (2)

Incheon Int. Airport - SH8000

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Prague Int. Airport - SH8000

Montreal Int. Airport - SH8000, SH7500

86% OF AIRPORTS IN NORTH AMERICA THAT OWN A WATER BLASTER, OWN A STRIPE HOG.

Falls Int'l Builds New Terminal to Welcome

FACTS&FIGURES

Project: New Terminal

Location: Falls Int'l Airport—International Falls, MN

Size: 25,000 sq. ft.; 1 airside gate

Total Cost: $15 million

Funding Partners: FAA; MN Dept. of Transportation Office of Aeronautics; state bonds; city & county

Prime Consultant: SEH Inc.

General Contractor: Kraus-Anderson

Architectural Engineering: Alliiance

Mechanical Engineering: Bartlett & Associates; ABE Associates

Electrical Engineering: LHB

Passenger Boarding Bridge: Ameribridge

Facility Features: New U.S. Customs & Border Protection area, TSA screening lane, conference room, administrative offices, ticketing & baggage areas

Design Highlights: Fireplace; Nordic accents; increased natural light; airport's 1st boarding bridge

After 10 years in the making, the city of International Falls, MN, recently debuted a fully rebuilt airport terminal to greet passengers travelling through the small community on the U.S./Canada border.

Falls International Airport (INL) now includes a new U.S. Customs and Border Patrol area, TSA screening lane, National Weather Service office and the facility's first jet bridge. Given the area's cold winter weather, a large fireplace is proving to be a popular feature of the new 25,000-square-foot, single-gate terminal.

"We rebuilt the whole thing," says Bob Anderson, a longtime civil servant who simultaneously serves as city mayor and chairman of the International Falls-Koochiching County Airport Commission, a joint powers board that owns and operates INL.

BOB ANDERSON

Increased aircraft operations and greater security demands after the 9/11 attacks led to the absolute need for a new terminal, explains Anderson.

The process began in 2009 and wrapped up this May. SEH Inc., which has worked with the airport for more than 30 years, served as the prime consultant for the project, and

Alliiance provided architecture and interior design services. In addition to addressing operational improvements, the team upgraded the facility's dated appearance, with Alliiance offering a nod to the city's European heritage via a design theme dubbed "Nordic Voyage, Nordic Frost."

Bob Cohrs, SEH's project manager, describes the result as a modern transportation space for a busy northern town. Specifically, the new terminal offers additional amenities and space for up to 100 passengers airside.

BOB COHRS

"They need air service," notes Cohrs. "From the community standpoint, this is their gateway; and today it's a much more comfortable and inviting experience for the travelers."

International Intersection

Anderson explains that proximity to the Canadian border is a main attraction of International Falls. Travelers from around the world fly through INL to hunt, fish and enjoy other outdoor fun. Another economic driver for the small town is its climate, which provides the right conditions for cold weather product testing. Affectionately known as "the icebox of the nation," International Falls has also

International Passengers

BY JENNIFER BRADLEY

served as a backdrop for winter-themed commercials for Cream of Wheat and DieHard batteries.

Beyond the airport, the town is home to the busiest rail port in the United States, and a large bridge that connects Canada and the U.S.

During summer, INL offers 14 commercial departures per week; in winter, the frequency drops to a dozen. In summer, the planes are often at full capacity, Anderson reports. Aircraft also refuel at INL before proceeding to destinations throughout Canada and the United States.

In order to meet the growing need of its international audience, the airport enhanced its Customs area. The new space occupies about one-quarter of the facility's overall square footage.

Destin Nygard, project manager at Alliiance, notes that designing the TSA and Customs areas for INL required about the same involvement with regulatory agencies as projects for large airports.

DESTIN NYGARD

The new fireplace is proving to be particular popular with passengers.

"You have almost as much interaction and discussion if installing single gates or 10," he observes. "You still need one of everything."

Step by Step

A terminal feasibility study conducted a number of years ago by SEH Inc. revealed that the best location for INL's new terminal was exactly where its current terminal stood. The project team subsequently split the project into two completely separate construction packages that happened to be about one year apart. During the first phase, the airport demolished part of the terminal and continued operating out of the remaining portion. Then, the second phase completed the new terminal.

"It was 18 months of challenge," jokes Anderson. "We had to build some temporary facilities to accommodate the ground handling crew and their equipment, because we had torn down their facility to make room for the new building."

Marcelo Pinto, Alliiance's lead architect for the project, notes that functionality and flexibility were key concepts in the design. For instance, the airport needed a gate big enough for chartered 737s that occasionally visit.

MARCELO PINTO

A covered entrance provides visitors with protection from the area's snowy weather.

Cohrs says the biggest challenge of the decade-long project was securing the necessary funds. That challenge ultimately led the team to divide the project into two separate portions. Phase One addressed the public space for passengers, and the second focused on the TSA checkpoint, Customs facilities, a National Weather Service office, new conference room and administrative offices for the airport.

"The funding was always an interesting component of this project, as the whole building needed to be split into different areas that were eligible, or not, for various funding pots," he explains.

The first ribbon cutting was held on Oct. 10, 2017, and the second on May 23 of this year.

"Those were really proud moments—to be able to open it up and show the public," says Cohrs. "Both of them were pretty incredible and memorable."

Anderson agrees: "We were very exuberant and satisfied that we were able to accomplish this after so many years and months of construction."

Cohrs credits the long-term vision and dedication of the airport team for making the project possible. "The commission and Bob [Anderson] really just continued to push forward and didn't always know where the money's coming from, but we figured it out."

The Cold Is No Joke

After funding, the second-biggest challenge was the weather. Scheduling construction activity was of the utmost importance, as frost doesn't leave the ground in International Falls until May and often returns in September.

The short construction season drove the decision to use precast tilt-up panels for the terminal exterior. "We knew that we could very quickly get the shell of this building up and enclosed so they could

continue to work through the winter to meet the construction schedule," Nygard explains.

Sometimes limitations encourage people to explore other options and discover how far the envelope can be pushed, notes Pinto.

Nygard recalls steel workers battling frigid weather to get the gluam beams set. "It was 20 below, and they were up on these lifts with the wind howling," he marvels. "It showed us how truly extreme the conditions are up there—and that was always in the back of our mind."

Given the bitter local conditions, INL's new passenger boarding bridge from Ameribridge is a major upgrade and welcome safety and comfort enhancement for passengers traveling during winter. Anderson considers it one of the biggest accomplishments of the entire project. "This is where weather is made," he says with a laugh.

It's the Little Things

April Meyer, senior interior designer with Alliiance, led the campaign to create a strong sense of place based on the area's deep Nordic roots. The design of the carpet is based on ice crystals, and the geometric patterns throughout the facility are very Scandinavian.

"What's beautiful about the project is that the materials themselves aren't really anything special,"

APRIL MEYER
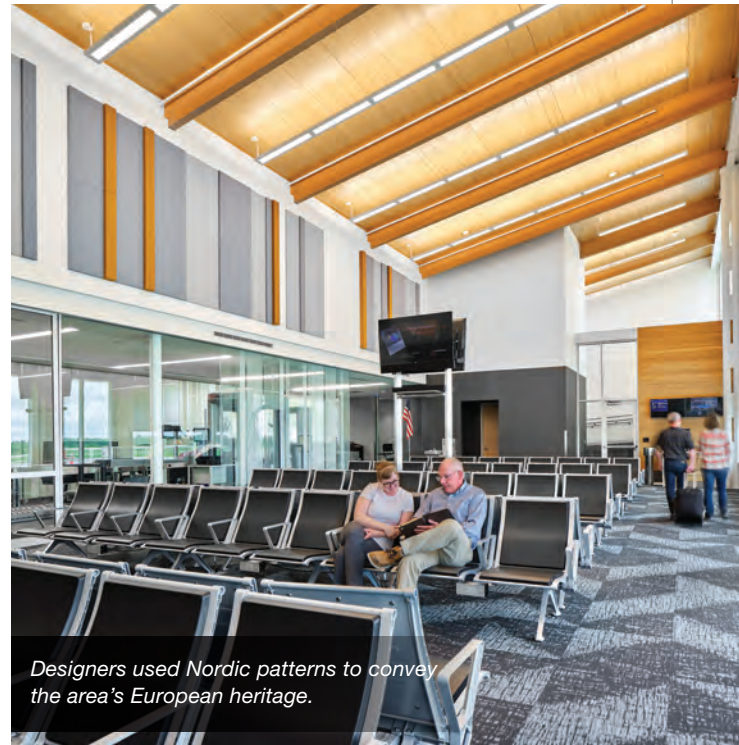
Designers used Nordic patterns to convey the area's European heritage.

Skylights and windows are positioned to maximize natural sunlight and minimize heat loss.

Meyer comments. "It's how they were *used* that made them more special—and that made the design affordable."

Natural sunlight was added with skylights and strategically placed windows. But architects were also cognizant that the area is cold for most of the year. "Despite some of the interior views, where it looks so light and bright and open, the building itself has relatively few apertures," notes Eric Peterson, principal in charge at Alliiance. "They're just carefully positioned to accentuate the sense

ERIC PETERSON

of the interior, while being a very efficient building."

These little, but thoughtful, touches have created an exciting new terminal for INL, he remarks.

One particularly popular feature is the new fireplace, which comes into view as passengers walk into the terminal and includes a blower system that circulates heat throughout the area. "It was not extravagant in terms of cost, but created an appealing area," explains Peterson. "Smaller airports deserve every bit of comfort and feeling of hospitality as anybody else."

While Anderson was initially worried that the airport would be criticized for allocating money to a non-essential design element, the fireplace has been an appreciated accent. "Many passengers, and locals, have said how wonderful it is to be able to sit in the terminal with a fireplace going," he reports.

The addition of bathrooms, drinking fountains and vending machines in the secured area of the terminal were also well received. Such amenities may sound trivial, but they increase passenger convenience, notes Anderson.

"Bob [Anderson] is a great ambassador for his city," Nygard emphasizes. "It's so rewarding to see people embracing and using the facility. When we were just there, we saw people from all over the world coming through with their fishing gear. INL is the gateway to the Great North." ✈

PHOTO: LUSTER

JFK Terminal 4 Creates Buzz With Interactive Social Media Events

BY LAURA WAVRA

Customer engagement in Terminal 4 at John F. Kennedy International Airport (JFK) is taking another social/digital turn, this time in the form of billboard-size mosaics created with thousands of photos from passengers and airport staff. It's all part of an ongoing series of interactive guest-driven marketing campaigns sponsored by luxury traveler retailer DFS Group.

During the various installments, travelers and employees are invited to use their phones to take photos and post them on Instagram and Twitter with hashtags created to reflect a particular event's theme. Within seconds, each image is converted into a small photo sticker that is printed and analyzed for optimal placement to create a larger design. Participating passengers and staff hand-place their individual photo stickers onto the DFS-branded wall, creating a large, attention-grabbing mosaic that is displayed outside the concessionaire's main beauty store.

In essence, DFS and Terminal 4 have a huge new staff promoting the store on their behalf—and everyone is working pro bono.

Sheer Delight for Customers

Terminal and DFS staff report enthusiastically positive results from the social media activations.

Ed Midgley, vice president of Commercial and Customer Experience for the terminal, explains that the goal was to bring passengers a little bit closer to the store and engage them in an activity beyond getting to and from their gates. In broad terms, the team wanted to enhance passengers' overall experience and help create a sense of place within the terminal.

ED MIDGLEY

The response has been "sheer delight," he reports.

DFS brought the idea for hashtag mosaics to Terminal 4 in summer 2018 and launched the first installment—the Swarovski Holiday Event, #BrillianceForAll—in early December 2018. Luster, a New York-based company that specializes in experiential social media interaction projects, provided the engineering/design services and equipment needed to execute the event.

"Travelers love documenting their journeys via social media photos, and that made the Luster mosaics a great way to draw passengers to the DFS store," explains Martin Matthews, DFS managing director of North America.

MARTIN MATTHEWS

Based on the success of the initial Swarovski event, Terminal 4 and DFS decided to collaborate on additional hashtag mosaics. Subsequent events included #GIVEJOY, a fundraiser held later in December for St. Jude Children's Research Hospital, followed by #DFSLunarNewYear and #DFSCelebratesCarnival—both in February 2019.

"The events give passengers a chance to have their photos become part of DFS' campaign installations and support fun customer engagement," Matthews comments.

Collaborative Process

Midgley describes the activation process as uncomplicated. DFS develops the themes and creative elements, including the design of the final mosaic, image library and event hashtags. It also promotes the various campaigns to customers. Terminal 4 handles the contracting with Luster and event logistics.

Once the creative aspects of the initial event were planned, the primary issues the team addressed were safety, security and finding an optimum location. To ensure passenger safety, the equipment technician from Luster is accompanied by an airport escort at all times, and the equipment is inspected per TSA requirements each time it enters the building. "The T4 team is amazing at their jobs, honestly, and makes it easy for us," notes Jen Finger, Luster's senior account executive.

JEN FINGER

Maximizing visibility was the main factor in selecting a location for the campaigns. Terminal personnel searched for a spot where the most people would see the mosaic display and gravitate toward it. As it turns out, the ideal location did not have a wall; but that didn't prove to be a problem. The Terminal 4 team purchased a temporary wall that assembled in a Lego-like fashion, and crews affixed the 8-by-6-foot mosaic canvas to its surface. The photo printing equipment is placed nearby.

Once the area is set up, Terminal 4 uses social media and internal resources such as help desk staff and airport signage to attract participants. Midgley says that personnel at the help desk are a great resource during these events, because they describe what the

PHOTO: LUSTER

Small stickers made from customers' photos are arranged to create themed mosaics.

PHOTO: LUSTER

mosaics are and personally encourage passengers to participate. Interestingly, it's not just millennials that give it a try. According to Midgley, the mosaics attract a broad spectrum of curious passengers, with no single demographic dominating the final mix.

Although no formal data is available for the Terminal 4 hashtag events, Luster reports that similar campaigns typically reach 390,000 people per event, in person and online. The *real* benefit of these events, Midgley says, is passenger and staff engagement. "People are genuinely having a good time, and it's nice to see," he muses.

Not surprisingly, terminal management plans to host more social media events. The next three, however, will be oriented around food/beverage providers rather than retail concessions. One is slated to occur during the annual Terminal 4 employee picnic this summer, and two more are on the calendar for the holiday season.

Eugene Airport Sets Ambitious Master Plan

BY MIKE SCHWANZ

Many airports create master plans for future development, but the roadmap recently commissioned by Eugene Airport (EUG) in Oregon takes the process to an entirely new level.

The extensive document analyzes, justifies and phases significant facility improvements to accommodate the fast-growing demand for increased air service in the Eugene community. The plan took 22 months to prepare, and the guideposts it contains are designed to help the airport move forward for decades.

"We last did a master plan about 10 years ago; but since then, we have seen significant growth in traffic," says Airport Director Tim Doll. "We expect that growth to continue, so we knew we had to come up with a plan not only for the next 20 years, but with recommendations on what we could do even as far as 40 or 50 years out."

The planning process required the input and hard work of many people, he adds.

TIM DOLL

After a standard bidding process, the airport chose RS&H consulting firm to help create its master plan.

"From the initial detail-oriented planning conference to the wrap-up meeting at the end, the airport and consulting team worked collaboratively to create a living document that wouldn't just gather dust on a shelf," Doll states. "This master planning process also focused on environmental responsibility and sustainability with several additional studies including an energy audit, a recycling reuse and water production plan, a solar energy feasibility study and an economic development study—all in tandem with the FAA's move toward sustainability master plans. A document with solid visioning while addressing current challenges, built collaboratively, was key."

Plan development started in October 2016. The first step was to set several benchmarks, including:

- airport stakeholder visioning;
- inventory of existing conditions;
- FAA-approved forecast of future aviation demand;

- assessment of facility requirements needed to meet demand;
- development and evaluation of alternative options for required facilities; and
- implementation and finance planning to describe development phasing, timing, estimated costs and funding mechanisms for airport improvements.

Getting input from all stakeholders was a vital part of the project, Doll emphasizes. Two formal groups provided guidance throughout the process: a Citizen Advisory Committee, composed of local community leaders and other local/regional airport stakeholders; and a Technical Advisory Committee, which included key airport users, airport staff and other aviation experts. Public workshops were held at two critical milestones in the master planning process to present compiled data, solicit public input on preliminary development alternatives, and ultimately present the preferred airport development plan. "The feedback offered by many different groups in the Eugene community was very important," says Doll. "We wanted everyone to feel we were all working together to improve the airport."

Keeping Up with Growth

A key element of EUG's master plan was forecasting facility requirements throughout the property. The need for new or expanded facilities is often driven by capacity shortfalls that leave an airport unable to accommodate potential growth or maintain a desired level of service within existing facilities.

MICHAEL BECKER

"Our technical analysis provided a deeper, more defensible, and clear direction for the implementation of future facilities at the airport," says RS&H Project Director Michael Becker. "In a community such as Eugene, which has experienced significant annual growth in commercial passenger traffic, the real value in airport facility planning comes from providing practical and implementable solutions that offer flexibility as demands change over time."

The Airport's Role

During the master planning process, stakeholder groups unanimously agreed that the airport's primary role in the community is to serve commercial passengers. With that understanding, a future land use vision was developed, and facilities were organized as either leading or trailing elements. The airfield is the leading facility, because its design is highly dictated by terrain, predominant wind patterns and mix of aircraft using the airport.

The airfield is then followed by the commercial terminal, which was deemed essential to the overall Eugene community. Terminal building design is driven by its connection to the airfield and landside facilities as well as operational needs and the desired passenger level of service. The terminal landside and access roadway system connects passengers to the terminal entrance. The design of this system is driven by passenger mode choices, vehicle design and the configuration of the terminal building.

Finally, airport support facilities need to be located and designed to be compatible with leading facilities while maintaining and optimizing operational safety and efficiency. Analyzed support facilities include airport administration and maintenance, fuel storage, airport rescue and firefighting, air charter, air cargo, deicing and various forms of general aviation infrastructure.

Airfield Configuration Changes

While improving the airfield is one of EUG's most daunting near-term challenges, adding more pavement was not the most practical solution. The runway and taxiway system has undergone generations of airfield infrastructure projects patched together over time, Doll explains.

Most of the airport's existing facilities are oriented around a historical airfield configuration, which creates awkward angles and inefficient use of available land. While the two parallel runways provide enough capacity to satisfy future aircraft operational demand through the planning period, the supporting taxiway system is unnecessarily complex and ineffective for several different aircraft user groups. This was one of the first challenges Doll and his staff wanted RS&H to address.

"The airport started in 1943 as a military base. Pavements were fragmented," Becker explains. "Back in the 1940s, there were four different runways and lots of taxiways going in different directions. It was a real hodgepodge."

Development Phasing Plan

Short-Term Projects (PAL 1)

1. ARFF Vehicle*
2. SRE Vehicle*
3. Taxiway A1-A5: Phase I - Design and Environmental*
4. Fuel Storage Facility: Phase I - Design and Environmental*
5. Fuel Storage Facility: Phase II - Construction and Decommission of Old Facility
7. Terminal Roof Replacement
8. Taxiway A1-A5: Phase II - Construction
9. EA - Runway 34R Wetland Fill for Wildlife Hazard*
10. Reconstruct Terminal Taxiways: Phase I - Design and Environmental*
11. Advanced Terminal Planning Study*
12. Stormwater Master Plan - Basins B and C*
13. Reconstruct Terminal Taxiways: Phase II - Construction
14. EA - Terminal Area and Landside Facilities*
15. Runway 34R-16L Rehabilitation: Phase I - Design and Environmental*
16. Runway 34R-16L Rehabilitation: Phase II - Construction
17. Runway 34R Wetland Fill for Wildlife Hazard
18. New Rotating Beacon and Removal of Old Beacon
19. Landside Roadway, Parking and Rental Car Improvements
20. New Landside Equipment and Materials Storage Facility
21. Mitigate Asbestos in Old Air Traffic Control Tower
22. Taxiway C/M Rehabilitation: Phase I - Design and Environmental*
23. Taxiway C/M Rehabilitation: Phase II - Construction
24. Demolish Old ATCT, Old Landside Equip/Materials Storage, and Friendly Hangar
25. Employee Parking Lot Construction and Reconfiguration
26. TSA Office Relocation and Demolition
27. Ticketing, Airline Ticket Offices, and Outbound Baggage Area Expansion
28. New Terminal Concourse (includes PBBs, Charter, and Admin)
29. New Terminal Concourse Apron

Mid-Term Projects (PAL 2)

31. EA - Airfield and Support Facilities*
32. Relocation of Taxiway B2 and Taxiway R
33. Acquire Land Runway 16R RPZ 5 Acres*
34. Runway Designation Change - All Runways*
35. New North General Aviation/Corporate Area (Hollis Lane)
37. Acquire Land for Green Hill Road Realignment
38. Terminal Curb Road Widening and Commercial Vehicle Staging Lot Expansion
39. Runup Pad - Taxiway A/Runway 34L End
40. Airport Master Plan Update*

Long-Term Projects (PAL 3)

41. EA - Terminal Area, Airfield, and Landside Facilities*
43. Deicing Facilities and Segmented Circle Relocation
44. Runway 16R-34L Rehabilitation
45. Replace Runway 34L VASI with PAPI (LED) Approach Guidance System
46. Landside Vehicle Parking Expansion*
47. Construct Vehicle Access Tunnel Under Taxiways C and M
49. EA - Terminal Area*
50. North Ramp General Aviation Hangar Removal
51. New Terminal Concourse Expansion (Including PBBs)
52. New Terminal Concourse Apron Expansion
54. Runway 16L RPZ Land Acquisition*
55. EA - Primary Airfield and Landside Support Facilities*
56. Taxiway L and Taxiway J Construction
57. Rental Car Maintenance Garage*
58. Taxiway B Reconstruction and Shoulder Paving

Notes:
(1) "*" denotes project is not in graphic.
(2) Pavement Management Plan Update is a project occurring every three to four years and is not depicted on this graphic. Phasing order numbers are: 6 30 36 42 48 53

CREDIT: RS&H.

Legend
Short-Term Projects (2018 - 2022)
Mid-Term Projects (2023 - 2027)
Long-Term Projects (2028 - 2037)

500' 250' 0 500'

Planners consequently configured the future airfield around the main runways that were accommodating the two most demanding aircraft using them: the Boeing 737-900 and Bombardier Q400. The 737 is a heavier and faster

aircraft, but the Q4 has a much wider main wheel configuration, which makes taxiway design a bit tricky. That had to be factored in.

"We also had to look at land use," Becker elaborates. "For example, cargo operators need a lot of open space for their aircraft to maneuver, and the space must be configured so their delivery trucks can approach the aircraft. In the passenger terminal area, we must preserve room for the planes, jet bridges, passenger circulation, vehicle parking and access. The air traffic controller must be able to see the airfield. Therefore, we had to figure out where to place support facilities, maintenance areas and other support buildings without obscuring their view."

The RS&H planning team collaborated with local air traffic controllers, airport staff and key user groups to identify areas where pavement should be removed and areas where new pavement could streamline the airfield, improve airfield connectivity and strengthen the system's operational efficiency.

Accommodating Bigger Crowds

Despite recent improvements to baggage claim, concessions, holdrooms and the TSA screening checkpoint, EUG's terminal faces pressure stemming from continuing increases in passenger demand.

The RS&H team recommended additional concourse expansion. In order to expand the passenger terminal, airfield construction was necessary to improve taxiway safety and provide remain-overnight parking pads to meet interim demand.

The new concourse begins the strategic process of reorienting the terminal facilities to align with the airport's ultimate vision of developing passenger facilities in between the runway system.

In addition to identifying developments for the passenger terminal, analysis revealed a need for additional auto parking for customers, improved roadway access safety, expanded rental car facilities and solutions to address congested curb activity during peak times.

Financial Projections & Implementation

"Planning for planning's sake does no one any good," Becker comments. "A functional implementation plan must begin at the onset of the project."

Throughout the process, RS&H planners worked with designers and financial analysts to move potential concepts through the full range of implementation steps to create realistic solutions.

"We had around a dozen associates from our company involved at some point or another, including architects, engineers and financial planners," recalls Becker. "Then, including the airport

staff and other stakeholders, we probably had about 30 people involved in the development of this plan. We obviously did not have meetings with all 30 people all the time, but we were in constant communication with various stakeholders. There was always some sort of a project-related discussion occurring. We held conference calls, video chats as well as many in-person meetings."

Beyond customer demand, the team considered other drivers for new or improved facilities, such as updated FAA standards, an evolving strategic vision for the airport, the replacement of outdated or inefficient facilities that are prohibitively costly to maintain or modernize, or the desire to introduce new services and facilities. The facility requirements analysis uses forecasted aircraft operation and passenger enplanement demand levels to define Planning Activity Levels (PALs) that trigger the need for investment to accommodate user demand in a way that maintains acceptable levels of service.

The implementation plan provides a roadmap for airport development by:
- providing a phasing plan for 5-year, 10-year and 20-year planning horizons;
- updating the airport's 20-year Capital Improvement Program (CIP);
- providing rough order-of-magnitude cost estimates for all CIP projects; and
- describing justifications, sequencing and triggering demand levels for short-term projects.

Implementation planning and financial planning were coordinated to provide a realistic, achievable development plan. Like other airports, EUG is required by the FAA to operate in a self-sufficient manner, so no municipal tax dollars are used to fund airport operations or capital development. The total CIP program, including adjustments for inflation, is estimated at $227 million over the 20-year planning period. More than half of the program's funding is anticipated to come from the FAA Airport Improvement Program. Remaining funds are expected to come from a mix of airport revenues, passenger and customer use fees, municipal bonds and external private funds. A small portion of project funding is not yet assigned. (See pie chart on Page 69.)

Nearly 60 individual projects were identified and divided into three phases. (See chart on Page 66.)

Short-term development (slated for 2018 to 2022) begins by focusing on airfield safety projects. Improvements continue for Taxiway A, and Runway 16R-34L taxiway connectors will be relocated according to analytical modeling and FAA design

guidance. The terminal area airfield and apron are determined a priority to prepare for the construction of a new terminal concourse. Expansions are also programmed for the terminal airline ticketing and outbound baggage handling areas. Landside projects were designed to improve roadway safety, parking capacity and fuel storage security, all of which serve dual roles as they begin the process to enable terminal concourse development. Other projects in the short-term period fulfill environmental requirements, replace or repair aging infrastructure and provide planning and phasing to enable future airfield projects.

Mid-term development projects (planned for 2023 to 2027) will further improve airfield safety through a pull-off run-up pad located near the threshold of Runway 34L and taxiway connector improvements serving the secondary runway. New general aviation mid-scale and larger

20-Year Funding Projections

External Funds (2%) $4M
AIP Entitlement Funds (31%) $69.6M
Municipal Bond (10%) $23.7M
Unassigned Funds (10%) $22.2M
Airport Revenue (13%) $30.1M
Customer Facility Charges (2%) $5M
Passenger Facility Charges (10%) $21.8M
AIP Discretionary Funds (22%) $50.6M

CREDIT: RS&H.
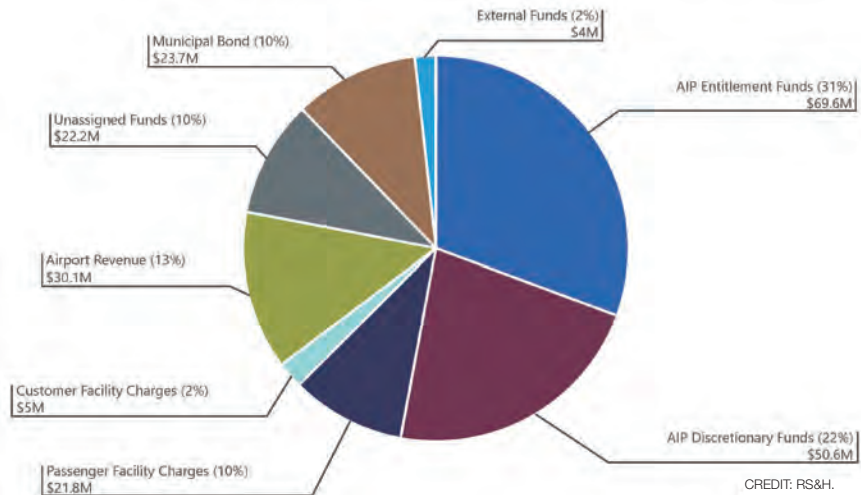
hangar development will be directed toward a dedicated area north of Taxiway C, separate from commercial airline activity. Landside improvements, land acquisition and a master plan update are also programmed during the mid-term phase.

Long-term development (tentatively scheduled for 2028 to 2037) continues the

Commercial Terminal		Aeronautical Revenue	
General Aviation		Non-Aeronautical Revenue	
Landside		Charter	
Fuel Storage		Air Traffic Control	
Airport Maintenance		Aircraft Rescue & Firefighting	
Cargo		Access Roads	
Runway Protection Zone		Vehicle Service Road	
Airport Property Line (Existing)		Taxiway/Taxilane Centerline	
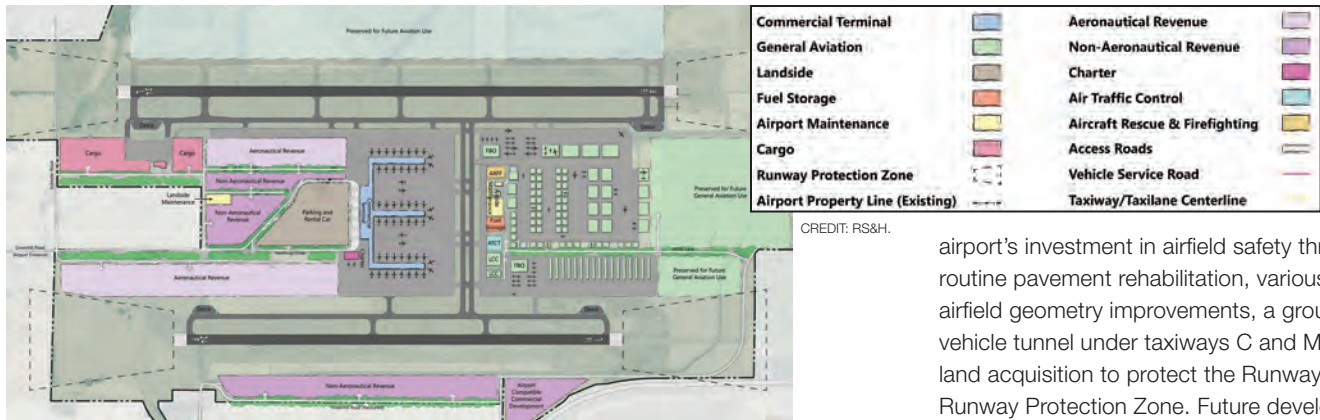
CREDIT: RS&H.

airport's investment in airfield safety through routine pavement rehabilitation, various airfield geometry improvements, a ground vehicle tunnel under taxiways C and M, and land acquisition to protect the Runway 16L Runway Protection Zone. Future development of the new concourse and surrounding apron is programmed to meet expected demand levels and begin the reorientation of terminal facilities to align with the parallel runway system. Additional long-term projects include navigational aid enhancements, parking and rental car infrastructure investments, and deicing facilities.

"Knowing any decisions we made now will impact the airport negatively or positively into the future, we were careful to look further out than the 20-year look of the master plan," Doll says. "The consulting team had us look well out, 40 to 50 years in the future, and what the needs of the community might be at that time."

The improvements suggested in the first phase, known as Planning Activity Level 1, are prioritized. "We have to reconfigure the taxiways and runways in the next five years to comply with FAA requirements," Doll says. "Fortunately, we already have budgeted for that, as part of our Capital Improvement Program. In fact, some of that work already has begun, such as removing the high-speed taxiways and replacing them with perpendicular taxiways requiring a 90-degree turn on or off the runway."

Full Approval Pending

In retrospect, Becker says that input from airport staff and the onsite fixed base operator was key to creating a sustainable picture of development that meets EUG's current challenges without sacrificing future needs. "This project was a success because of everyone working together," he remarks.

Though certain master plan projects such as runway and taxiway improvements already have been funded and are under construction, the Eugene City Council must still adopt the complete master plan. Once that occurs (likely later this fall), many of
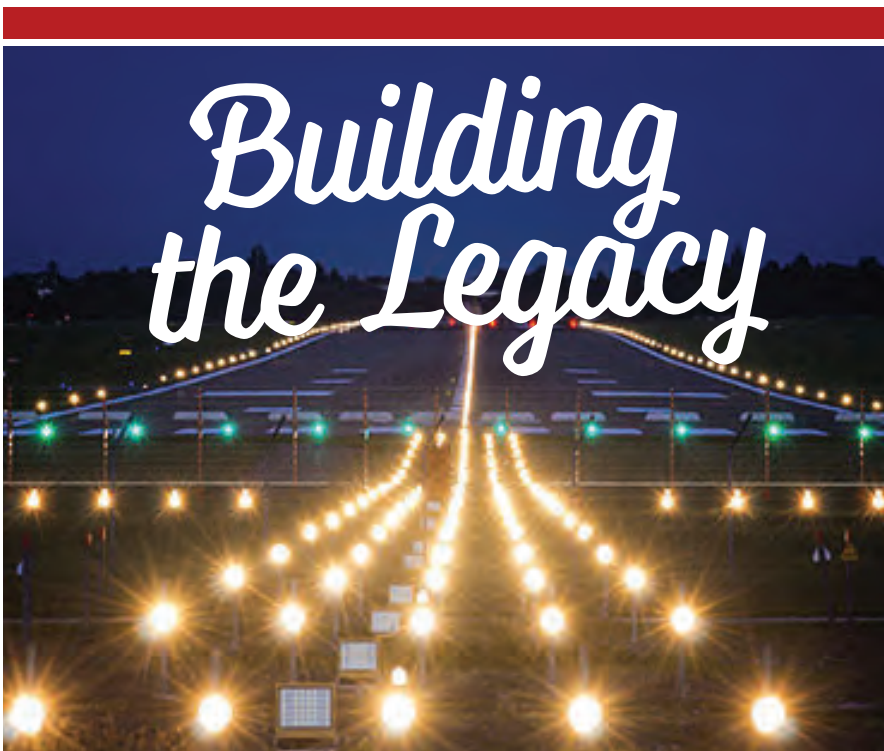
the other projects recommended in Planning Activity Level 1 will start in 2020, Doll adds. Some of the next Capital Improvement Program projects scheduled include finishing the rehabilitation of the full length of Taxiway A, additional realignment of Runway 34-16L and a terminal area improvement that includes a Concourse C build-out.

"This plan will be invaluable for us, and will be a blueprint we can follow for many more years," Doll concludes. "It also is good for the city, because the city council members will know what projects have to be funded for at least the next 20 years. While no one can predict the future, we are confident that all of the projects listed in this master plan are valid and will eventually be done."

Airports Use Decorative Flooring to Create

When Pensacola International (PNS) and Valley International (VIA) replaced flooring in their respective facilities, the two airports selected different materials; but both chose colors and patterns that portray their local Gulf Coast water and landscapes.

PNS, located in the panhandle of Florida, installed a combination of porcelain tile and carpet. Across the gulf, at the southeastern tip of Texas, VIA replaced its old pink and gray ceramic tile with new blue and white terrazzo.

"This project was all about the customer experience," explains PNS Director Dan Flynn. "We wanted something very appealing and aesthetically pleasing. The lighter tile makes the terminal look so much brighter, and overall the tile and carpet create a comfortable and attractive atmosphere."

DAN FLYNN

The airport turned to design consultants from Mott MacDonald to help select a durable, long-lasting alternative to replace the carpet along the center concourse. The carpet that was removed was from a project that ended in 2011. "Carpet typically has a usage of about seven to eight years, so it was time to replace it," notes Flynn.

After considering a variety of materials, the team selected porcelain tile for the concourse hallways and carpeting for the holdrooms. While PNS management and staff like the terrazzo flooring in the ticketing area, terrazzo would not have been practical to install in the 400-foot-long, 35-foot-wide concourse.

"Terrazzo requires a very long installation process, and large areas would have needed to be blocked off, interfering with operations and passenger travel," explains Anne Brooks, Mott MacDonald's lead interior designer for the project. "We had to identify a material that could be worked on overnight and did not interfere with passenger traffic. We chose porcelain for its durability, ease of maintenance and the fact that it is similar to terrazzo."

ANNE BROOKS

Acoustics were also important to the airport, so designers chose a large tile with small grout joints to reduce noise from rolling luggage and carts. Since the porcelain was untested in the concourse area, the design and installation teams conducted a roller board test on the first area of tile installed.

Pensacola Int'l installed porcelain tile in hallways, and carpeting in holdrooms.

Sense of Place
BY MINDY HAMLIN

"We were pleasantly surprised," says Brooks. "The roller boards were not any louder on porcelain than they were on terrazzo."

Carpet was installed in the boarding areas to absorb noise and create a comfortable space for departing passengers. Its custom color is designed to hide soiling, and the plank-style installation allows the airport maintenance team to remove, replace and clean individual pieces.

All of the previous carpeting that was removed was pelletized and will be recycled into new carpet. "The fibers and backing are melted down, and new yarn and backing materials are created to refabricate carpet tile," explains Brooks. "Not one carpet tile taken up from the terminal will end up in a landfill as a non-biodegradable item."

Pressing Need

Valley International Airport (VIA), in Harlingen, TX, replaced pink and gray ceramic tile flooring that had been installed in the late 1980s. In some areas, the bond to the subfloor had failed, causing tiles to lift and crack. For years, the airport had dutifully replaced tiles, but its stock of replacement tiles eventually depleted and the same product was no longer available.

"It was falling apart and becoming a trip hazard to our passengers," notes Bryan Wren, VIA's assistant aviation director. "It was also a porous, heavily textured tile, and years and years of dirt and wax had built up inside it. It was impossible to maintain or clean."

BRYAN WREN

The airport contracted the architectural firm Megamorphosis to help it select a new material. "We were in need of an easy-to-maintain flooring that was modern and would look great for decades," explains Wren.

Terrazzo again emerged as the material of choice. "Terrazzo is a seamless solution without grout joints that makes it easier to maintain than many other tiles," explains Doug Junkin, a project manager with Megamorphosis. "The seamless floor also makes it easier for rolling luggage, provides improved accessibility and reduces noise levels from rolling luggage and carts,"

DOUG JUNKIN

Before installing the new terrazzo, the project team conducted a moisture test. Because the test indicated high levels of moisture

Valley Int'l Airport opted for seamless terrazzo.

in the concrete slab, crews installed a moisture mitigation layer to prevent cracking and lifting in the new terrazzo.

The new terrazzo flooring cost $1.2 million, and is the final and most visible component in a renovation and modernization project that cost $12 million.

The flooring has not only given the terminal a new modern look, but it is also proving easier to maintain and clean. Wren reports cleaning the new terrazzo costs a fraction of what VIA used to pay to fix/repair its old tile.

Creating a Sense of Place
Like many airports, PNS and VIA wanted their new flooring to help create a sense of place for the thousands of customers who travel through their terminals each day.

At PNS, the project team was tasked with reflecting the city of Pensacola's brand: "Welcome to the Beach." When selecting tile for the concourse, the team took its cues from the terrazzo installed on the ticketing and baggage claim level, which features a marine life design.

"Since the concourse is above the ticketing level, we went with a design of the birds that literally fly over the beach," explains Brooks. "Pensacola is known as pelican city, so the porcelain tile features birds that are taking off and landing, bringing to mind airport travel."

The team chose a palette of light grays and beige to bring to mind sandy beaches. Gentle waves etched in the tile encourage movement along the concourse. The carpeting has blue and green hues to complement the city's branding.

The new terrazzo is proving easier to maintain than the previous aging ceramic tile.

The team selecting new terrazzo for VIA also took design cues from the natural environment.

"The main influence was our region— mainly the beach, Laguna Madre, Gulf of Mexico and the Rio Grande River," explains Junkin. "The design can be interpreted a few ways: as sandbars with water on either side, as a meandering river, or as the beach at the Gulf of Mexico. The design was also meant to help guide passengers through the airport, from ticketing to the main lobby to baggage claim."

Miami Int'l Builds Multi-Sensory Room for Children With Autism

BY PAUL NOLAN

Winding through busy terminals, waiting in security lines and enduring flight delays are just a few stressful facts of life for air travelers. Imagine, however, navigating these challenges while traveling with a child who has autism and is extremely sensitive to sights, sounds and physical touch.

Or how about ushering *two* children with autism into a crowded holdroom as a swarm of irritated arriving passengers sprint to catch their connecting flights? (One large study notes that nearly 20% of families affected by autism have more than one child with the disorder.)

The bustling crowds, bright displays, overlapping audio announcements and sweeping architecture in airports can easily overwhelm children with autism. One of the first steps in their journey—passing through a TSA checkpoint—is a process some simply don't understand. A requirement that is tedious for other travelers can prove extremely upsetting for children with autism.

Many common travel stressors are multiplied exponentially for such families. Sometimes, the challenges are so difficult, they avoid flying whenever possible.

Miami International Airport (MIA) recently took action to help. In April, it celebrated Autism Awareness Month by unveiling a multi-sensory room to make travel easier for young passengers with cognitive or developmental disabilities. The space is dimly lit, with sensory-soothing features such as an aquatic bubble tube, interactive wall puzzles, beanbag seating and a light projector that creates moving images on a wall.

FACTS&FIGURES

Project: Multi-Sensory Room

Location: Miami Int'l Airport—North Terminal, Concourse D

Strategy: Provide private space to help ease travel stresses for children with autism & other cognitive or developmental disabilities

Room Features: Dim lighting; aquatic bubble tube; wall puzzles; soft, cushioned seats; light projector

Project Cost: $22,650

Funding: $15,000 from donors, partnerships & Miami Beat Team contributions; $7,650 from Miami-Dade Aviation Dept.

Partners: University of Miami-Nova Southeastern Center for Autism & Related Disabilities; Miami Beat Team

Umbrella Program: MIA Instruction & Readiness (MIAair), which helps travelers with special needs practice navigating the airport before their actual travel dates

Located just beyond security checkpoint No. 4 in Concourse D, the room is open seven days a week from 6 a.m. to 10 p.m. The airport uses signage and a local marketing campaign to help spread the word about its new retreat.

Local Support

MIA worked with the University of Miami-Nova Southeastern Center for Autism and Related Disabilities to design the room's soothing features. The organization also educated airport staff and provided information that helped get the project greenlighted.

"For people with autism, preparation for what they're going to experience is one of the best things that help," explains Diane Adreon, the center's associate director. "It's great for our community to become more sensitive and provide support for people with autism. Airline travel, like anything that is outside of their routine, can be difficult to handle."

The project also was completed in coordination with the Miami Beat Team, a group of 15 local business professionals who assist with community service projects. Among other things, the group coordinated fundraising that provided $15,000 for the project. The remaining $7,650 came from the Miami-Dade Aviation Department.

Three Aviation Department employees who are on the Beat Team spearheaded the multi-sensory room project as an expansion of MIA Instruction & Readiness (MIAair), the airport's support program for passengers with special needs. Launched in 2015, MIAair provides educational materials and opportunities for passengers with special needs to practice crucial aspects of the travel experience (navigating the terminal, passing through a security checkpoint, boarding a plane, etc.) before their actual travel dates.

Growing Need

One reason MIA and other airports are making such efforts is an increase in the number of children being diagnosed with autism. In the United States alone, one in 59 children has an autism spectrum disorder, according to a 2018 report from the Centers for Disease Control and Prevention. That's up from one in 68 children just two years earlier. And many, including Adreon, say that statistics understate the issue, because there are more children on the spectrum who have not been diagnosed.
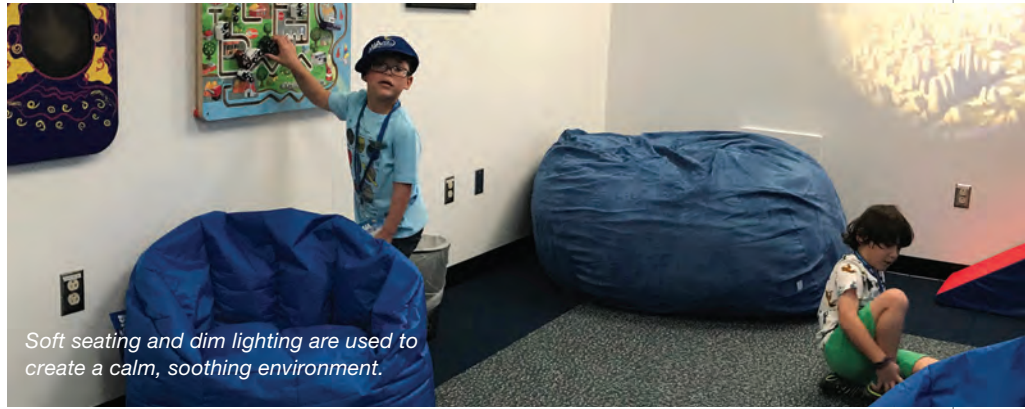
Soft seating and dim lighting are used to create a calm, soothing environment.

"Multi-sensory rooms have proven to be a helpful amenity for traveling families at other airports, and MIA wants to be on the forefront of accommodating the needs of all travelers," says Lester Sola, MIA director and chief executive officer. "Early feedback from users of the multi-sensory room has been overwhelmingly positive, with parents telling us how thankful they are that the airport has provided a quiet, private space for their children to de-stress and prepare for the next step in their airport experience."

LESTER SOLA

Airport officials are consequently exploring the possibility of opening a second multi-sensory room in MIA's South Terminal. Multi-sensory rooms can also benefit children and adults with cerebral palsy, intellectual disabilities, brain injuries, dementia and mental health issues such as stress or anxiety.

For Sola, it's all about inclusivity and providing travel opportunities to families that may otherwise be hesitant to fly: "The goal of the MIAair program is for *everyone* to experience the magic and wonder of flight."

More Work to Be Done

Miami International is reportedly one of only eight airports in the world with a private lounge for travelers with autism and other sensory disorders. But if Tanya Acosta has her way, more airports will add facilities for passengers who are extra sensitive to the cacophony common in all terminals.

TANYA ACOSTA

As founder and executive director of Sensory City, Acosta is working to make a variety of facilities more accessible for children and adults with autism, attention deficit/hyperactivity disorder, dementia, post-traumatic stress disorder and related conditions. "People understand what a wheelchair or white cane with a red tip means, but most don't know what sensory disorders look like," she explains. "They're much less visible disabilities."

Acosta's nonprofit organization provides staff training and facility design support to help airports make their terminals more accessible and inclusive for customers with sensory needs. Inclusive bathrooms, for instance, don't have loud hand dryers or toilets that flush automatically. Staff training can demonstrate the differences between tantrums and sensory overload—and teach airport employees how to help de-escalate a sensory meltdown.

"Sensory overload affects the person having it and everyone around them—their family members, other passengers and airport employees," advises Acosta. "We want to promote awareness and provide education to make it better for everyone."

Staff training from Sensory City costs $50 per person, or a flat fee of $1,800 to $2,500 for groups of 50 or more. The price for facility design is quoted on a case-by-case basis because it varies widely, but free consultations are provided.

The nonprofit organization also sells kits that include weighted lap pads, noise-cancelling headphones, therapeutic toys and other items to make airports more comfortable for travelers with sensory challenges.

Beyond leveraging the products and services offered by Sensory City, Acosta encourages airports to tell their customers about TSA's passenger assistance program. "They don't do a great job publicizing it, but it can really help customers with special needs get through the security checkpoint."

In addition to her academic and professional credentials, Acosta also brings an insider's perspective to the subject as the mother of a young child with Down syndrome and daughter of a parent with Alzheimer's disease. She recounts one particularly difficult trip when her mother was in the throes of dementia: "She was kicking and punching because she was scared and confused. She didn't know where she was, and sometimes didn't know who I was. She took food off someone else's plate in the restaurant, spit on the floor and screamed on the way to the gate. Scenes like that can look weird or dangerous to others; but caregivers need understanding and help, not judgment or rude comments."

Difficulties notwithstanding, Acosta loves to travel with her family and is passionate about making travel less complicated for families like hers. She applauds the 38 U.S. and Canadian airports with programs that help passengers practice the travel process, and urges the entire industry to take the next logical step: making facilities more accessible and inclusive.

To view a two-minute video that portrays sensory overload, visit sensorycity.org.

Oakland Int'l Using Dual-Technology Scanner for Employee Screening

BY THOMAS J. SMITH

Oakland International Airport (OAK) is one of the first U.S. airports to deploy a dual-technology scanner to screen employees working in secure environments.

In May 2018, the California airport began using an Edge scanner from Evolv Technology. The equipment combines the screening properties of traditional metal detectors with the nonmetallic screening abilities of millimeter wave equipment, the newest scanners used by TSA at most U.S. airports.

DOUG MANSEL

The portable scanner is deployed on a random schedule at OAK's main employee entrance to secure areas, including the airfield. Security personnel wheel the machine in for use, then store it until the next unscheduled use.

The airport originally established an employee screening program in 2015, after a marijuana smuggling ring involving baggage handlers was uncovered at the airport. "We put together a holistic threat mitigation program so it would not happen again," explains OAK Security Manager Doug Mansel. "One part of that program is employee screening."

The recent investment in an Edge scanner is the latest evolution in that program. Before OAK added in the new technology, security personnel patted down employees and searched their bags.

"You can imagine that this is not real popular with employees," Mansel muses.

OAKLAND INTERNATIONAL AIRPORT I ✈ OAK

FACTS&FIGURES

Project: Employee Screening

Location: Oakland (CA) Int'l Airport

Scanner: The Edge, by Evolv Technology

Points of Difference: Walk-through scanner combines metal detection with millimeter wave technology; allows employees to leave cellphones, wallets & keys in their pockets during screening

Throughput: 75-100 employees/hr at OAK; equipment capacity is 600-800 people/hr

Key Benefit: Maintain security while providing more palatable process for employees compared to physical pat-downs

The portable scanner is one element in a multilevel strategy for passenger and employee security.

Welcome Change

With the new scanner, employees simply walk through the device, without having to remove keys, wallets and cellphones from their pockets. Only large bags and purses are still opened. Lunch bags pass right through. "The whole process is much more comfortable for the employees," relates Mansel. "The employees like it primarily because they don't have to be patted down."

The scanner is not necessarily used every day. Instead, it is deployed on an unpredictable rotation, so employees cannot anticipate the day or shift it will be used. When the new machine is not in use, workers are patted down and must divest everything in their pockets.

When the scanner is being used, employees walk between two tall blades/columns at a regular pace. "We scan at the speed of life," says Bill McAteer, an Evolv account executive. "Just walk through at your normal pace with your hands at your side."

BILL MCATEER

The millimeter wave technology scans individuals as they approach the device for nonmetallic threats. It bounces microwaves off the body, looking for dense materials consistent with that of a "suicide vest" between the skin and clothing. The blades on the device are the metal detectors that screen for weapons. As employees walk beyond the blades, more microwaves complete the search.

Incorporated smart technology provides security officers with a report on a mobile tablet before each employee leaves the device. If an anomaly is detected, a square will appear on a body image at the location in question, and the officer will pat the individual down or use a hand wand to check for security threats or banned items.

Mansel reports that the scanner has not detected any guns coming into the airport, but it has caught knives. Some were deemed necessary for an employee's job; the rest were confiscated.

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Smarter with Each Scan: Stay ahead of the threat landscape. With the Evolv Cortex AI Software Platform, Edge becomes more intelligent as new threat profiles are discovered.

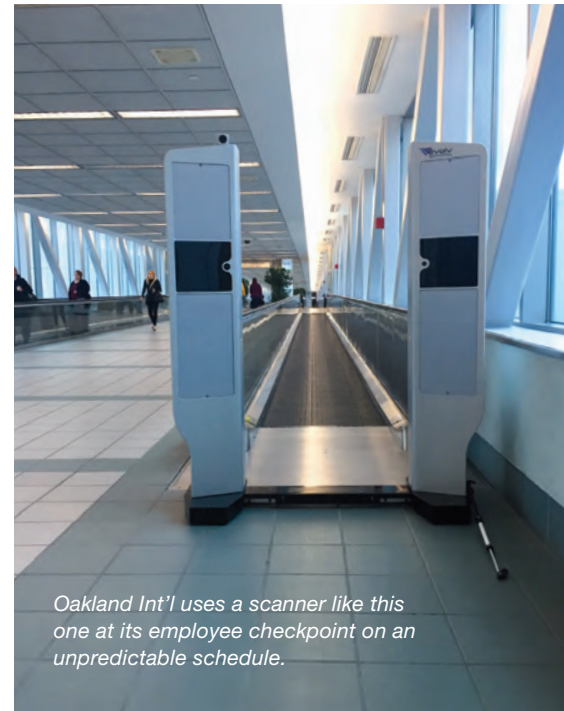**No More Random Searches:** Guards see a real-time image on a screen showing them precisely where the threat is on a person's body.

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Throughput

In total, OAK has about 6,500 security badge holders. Depending on the day and shift, the airport runs 75 to 100 workers an hour through its employee checkpoint.

"The machine has great throughput, which is one of the reasons we like it so much," Mansel remarks.

The Edge can screen 600 to 800 people per hour, which meets the peak traffic periods at shift changes and is much more efficient than the throughput capabilities of a metal detector, notes McAteer.

Oakland Int'l uses a scanner like this one at its employee checkpoint on an unpredictable schedule.

Occasionally, OAK screens employees as they are leaving secured areas. Like the entry checks, these screenings are also performed on a random schedule. "We are not seeing an interest in these [exit] screenings from other airports," says McAteer.

Mansel initially learned about the Edge scanner at a conference sponsored by the Airports Council International-North America. Evolv subsequently shipped a unit to OAK for a one-week trial, and airport personnel gave the equipment good reviews.

"That was huge to test the device, as it is a big investment," Mansel remarks. "We put it through the paces, and it worked well."

While OAK purchased their scanner outright, Evolv no longer sells its machines. Instead, the company issues the equipment under a four-year lease program that includes service, maintenance, upgrades and remedial training.

According to McAteer, a handful of other airports including Dallas Fort Worth International and San Juan Airport in Puerto Rico also have the machines. One U.S. airport that will soon go live with the equipment is considering Evolv's optional facial recognition technology. Facial scans are performed as employees approach the device, and security officers get the reading and identification confirmation as the rest of the scans are being performed.

Additional Applications

The primary purpose of Evolv scanners is to prevent mass casualty events. The company, formed five years ago, spent several years researching the technology to combat mass casualty threats. The first device was deployed in 2017 at a performing arts center in New York City. "They are used to detect guns and bombs and supplement security in areas where there are large groups of people assisting in making public areas safe," explains McAteer.

Today, Evolv has about 100 machines deployed in the U.S. The largest users are performing arts centers, large sporting venues, hospitals and corporations. For the most part, they are used in private venues where the public is being screened upon entry for large, crowded events. "We are in a couple of iconic locations," notes McAteer. "One is in Seattle, where they screen 1 million people a year using two machines."

According to Evolv, one London airport will soon install a scanner to screen people entering the public areas of the terminal, not just ticketed passengers and/or employees. McAteer does not foresee U.S. airports following suit anytime soon absent a major threat.

Minneapolis-St. Paul Int'l Breaks Down Language Barriers

Like many large airports, Minneapolis-St. Paul International (MSP) is a global facility—not only in terms of its air service destinations, but also in terms of its workforce.

The Twin Cities area has a very large immigrant community, particularly from Southeast Asia and Africa, especially Somalia. More than 23% of MSP's 19,000 badge holders were born outside the United States. They perform many vital functions throughout the airport, in leadership and administrative roles, ground services, passenger services, janitorial services, concessions, security and many other jobs. Often, they are on the front lines helping customers by providing food and retail services or wheelchair assistance.

Last year, participants in MSP's broad-based Customer Service Action Council discussed barriers to recruitment and retention of airport workers. Language barriers were cited as challenging for airport workers and the customers they serve. How could we help employees overcome those workplace barriers and at the same time improve services to customers?

The answer came via a partnership with the Ronald M. Hubbs Center for Lifelong Learning, a local adult education facility that provides classes to help participants improve basic skills, earn a GED, prepare for employment or learn English. We worked with the Hubbs Center to begin offering English as a Second Language (ESL) courses to MSP workers at no cost to the employees or their employers. The Metropolitan Airports Commission covers the cost as a way of helping concessionaires and other MSP businesses attract and retain employees and improve services to our customers.

BRIAN RYKS

As executive director and CEO of the Metropolitan Airports Commission, Brian D. Ryks, A.A.E., is responsible for the administration and management of Minneapolis-St. Paul International and six general aviation airports. Previously, he held similar positions at Gerald R. Ford International Airport in Grand Rapids, MI, and at St. Cloud Regional Airport in Minnesota.

Ryks serves on the board of directors for the American Association of Airport Executives and Airports Council International-North America (ACI-NA). He is chairman of the ACI-NA Audit Committee and serves on the organization's World Governing Board.

An instructor from the Hubbs Center presents ESL classes on-site at the airport, making it simple and convenient for employees to participate. MSP's light rail connection to downtown Minneapolis and downtown St. Paul makes it easy for residents who don't speak English to work at the airport and participate in the language classes.

Employees who enroll in the 14-week program complete coursework online and meet in person weekly. The first course began in October 2018 and was attended by 12 employees. As word spread about the program, 20 employees signed up for the second session, which ended in June. In both cases, we held ceremonies to honor the achievements of program participants.

Based on feedback from program participants, we have increased class length from two hours per week to three, and have further strengthened the in-class learning opportunities.

In July, we began offering two courses simultaneously, Workforce English I for beginners and Workplace English II for more advanced ESL employees. We advertised the new sessions throughout the airport campus in several languages, including Amharic, Somali, Hmong, Spanish, Oromo and English.

Looking forward, we will continue to work with participating employees and their employers to assess and improve the program.

Customer service is a shared obligation at airports, and the best way to ensure a consistent, positive experience for travelers is for airport partners to work together to define shared service goals and approaches. The Customer Service Action Council is where that partnership takes shape at MSP, and you can see results throughout the airport campus. The current investment in English language training for employees is just one of its recent efforts.

Like other large airport operators, we invest billions of dollars in infrastructure, and we work to ensure our facilities are safe, attractive and efficient, and also reflect our community. But the best facilities in the world won't make an airport great if the workers don't have the tools they need to connect directly and effectively with passengers.

Our ESL program recognizes the power of bringing together diverse cultures, and it provides the language skills some employees need to build thriving careers and provide the level of service customers expect. By embracing and reflecting our community, we differentiate MSP from other airports, give travelers a true sense of Minnesota and help make it a place people want to return to again and again.