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Change Before You Have To

Usually, our trade associations are very literal reflections of who we are. But recent proposals from ACC, AAAE and ACI-NA are creating a bit of a stir. Airports are, after all, heavily regulated creatures of government origins. The status quo has deep roots in our industry, and often for good reason.

But sometimes, a fresh, new approach is just what's needed.

On that note, ACC is attempting to revise its membership into a single category. If current members approve the change, suppliers will have the same privileges as consultant firm members — including eligibility for ACC board leadership positions. It's a bold move, and the consultant members feel secure enough with their roles in the association to allow others to become more involved. Bully! Everyone wins. I applaud ACC's leadership for bringing this to a vote.

Next, we have a joint announcement from the chairs of AAAE and ACI-NA: "The leadership of both organizations has commissioned a preliminary business evaluation of the potential for organizational coordination and integration highlighting the strengths, weaknesses, opportunities and threats to such an approach." Once you get beyond the PC language, the gist of the statement is again fairly bold. The two major airport trade groups actually looking at some sort of merger? Wow!

I give all of the players at these associations kudos for being bold. It's not easy, and the stakes are huge. Good luck! We're all counting on you.

My last example of industry change agents comes from the West Coast and beyond. Alaska Airlines is in negotiations with the Monterey Regional Airport and local wineries to allow up to 12 wine bottles bought in the county to fly for free. Is this a great marketing idea or what? Who says airports and airlines can't work together! This is potentially a win-win-win situation as well as a great example of creative thinking.

Cheers!

Paul

REFURBISH OR REBUILD?

By Rebecca **Kanable**

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Project: Constructing New Terminal
Location: Louis Armstrong New Orleans Int'l Airport
Owner: City of New Orleans
Governing Body: New Orleans Aviation Board
2012 Passenger Volume: More than 8.6 million passengers
Cost: $650 million
Timeline: 2014 - 2018
Project Management: Parsons Brinckerhoff
Design: Leo A Daly/Atkins
Environmental Impact Studies: RS&H
Financial Analysis: Unison Maximus Consulting Solutions
Land-use Options: Jones Lang LaSalle
Goals: Increase revenue; lower costs; create competitive advantage for new flights & business

The question to rebuild or refurbish is one that vexes nearly every airport at one time or another. Most need to undertake a significant terminal project about every 25 years to keep up with changes in aircraft size, security policies, ticketing or baggage processes and concessions trends, says Stephen Harrill, vice president, aviation service group leader for RS&H.

Louisiana's primary commercial airport is currently planning to build a new $650 million terminal to replace its 54-year-old terminal. Conversely, one of South Carolina's busiest airports is in the midst of a $115 million, four-year program to thoroughly renovate its terminal rather than building new.

In years past, airports would secure financing for large projects based on long-term agreements with airlines; but that's not done nowadays, Harrill notes. Today's airports consequently need funding streams that are not airline-driven, and that's why concessions programs have become more important, he explains.

The cost comparison for building new vs. renovating naturally varies with each location and circumstance, but Harrill encourages all airport executives to consider the impact and inconvenience of improvement projects to travelers. It might make sense to put up with some inconvenience to save hundreds of millions of dollars, but there are other costs to consider as well, he cautions.

Building a Better Business

Iftikhar Ahmad, director of aviation at Louis Armstrong New Orleans International Airport (MSY), characterizes the decision to build a new terminal as a strategic business move.

Iftikhar **Ahmad**

"This isn't a capacity project in response to us outgrowing our facility and needing more space," he clarifies, adding that it's also not strictly about aesthetics. "It is our strategy to increase non-airline revenue, decrease airline cost and gain more air service as a result."

In April, New Orleans' mayor, the aviation board and business and tourism leaders announced plans to build a new terminal on the north side of MSY's current location, at an estimated cost of $650 million. Possible

Greenville-Spartanburg Int'l is in the midst of four-year $115 million renovation program. Cost estimates to build new were roughly five times higher.

additions include a $72 million solar power plant, an $87 million fly-over addition to improve airport access to I-10, and a $17 million hotel.

Construction of the new terminal is expected to begin next year and be completed in 2018, during New Orleans' 300th anniversary.

MSY plans to pay for the project with self-generated funds as well as federal and state aviation grants.

"For decades, the community has wanted a world-class airport to complement its great city," Ahmad explains.

With MSY accounting for about 80% of the state's enplanements, airport officials feel it's important for the airport to create the best possible first impression of the New Orleans area and Louisiana. Last year, the airport served more than 8.6 million passengers.

Attracting businesses to the region requires low airfares and an airport that offers convenient passenger service, Ahmad insists.

Officially, New Orleans' primary commercial airport is located in Kenner, just 10 miles west of New Orleans. Part of Runway 10-28 is in St. Charles Parish, but most of the airport is located in Jefferson Parish. For years, even decades, consensus about what defines "a good airport" could not be reached among the stakeholders, Ahmad explains.

But with new leadership at the airport and in the mayor's office, a new era of cooperation has emerged, he notes. Ahmad and New Orleans Mayor Mitchell J. Landrieu assumed their current positions in 2010, both citing airport improvement as a primary focus.

Prior to this year's Super Bowl, the airport unveiled more than $300 million in enhancements. Upgrades included a new, brighter interior with a refurbished ticket lobby, expanded concourse, improved baggage claim, new concessions and remodeled restrooms. The exterior was also updated, and a new car rental facility was built.

While the improvements gave tourists and business travelers a better impression of the greater New Orleans area and its airport, they did not address MSY's aging infrastructure. Behind-the-wall issues were chronicled in a development plan released in April. Crescent City Aviation Team, a joint-venture partnership between Atkins and Leo A Daly Company, produced the report.

According to the Long-Term Infrastructure Development Plan, MSY's mechanical and electrical systems are nearing the end of their useful life, and aging base building elements need to be replaced and modified to meet new security requirements.

The plan also identified numerous operational issues: The current 1.2 million square-foot terminal exceeds the area needed for projected airline passenger volumes, and the excess space incurs maintenance and

GSP INTERNATIONAL AIRPORT
ROGER MILLIKEN FIELD

factsfigures

Project: Terminal Renovation

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

Owner/Operator: Greenville-Spartanburg Airport District

Cost: $115 million

Timeline: June 2012- Jan. 2016

Primary Elements: Modernize main terminal building; improve passenger flow; upgrad facilities

Annual Passengers: More than 1.75 million

Program Manager: Jacobs Engineering

Construction Manager at Risk: Skanska Moss (joint venture between Skanska USA Building and local contractor Moss & Associates)

Conceptual Design: RS&H

Architects & Engineers for Rental Car Customer Center, Baggage Claim & South Bridge: RS&H

Phase II & III Architect: Michael Baker Jr., Inc.

New Orleans Int'l is refining design details for its new terminal, which is slated for completion in 2018

heating/cooling costs. Current passenger and baggage screening are characterized as "inefficient." Specifically, there are four separate passenger checkpoints, which require more staffing than one single checkpoint. In addition, bags are screened manually through machines at multiple ticket counters, slowing processing rates and increasing wait times.

The Long-Term Infrastructure Development Plan also identifies problems with concessions— particularly, too much space on the non-secure side and not enough in the concourses. Inadequate accessibility (passengers are limited to concessions within their own departure concourse) was also flagged as an issue, with negative revenue implications for both concessionaires and the airport.

MSY's vehicular access, including access from the airport's west side and the arrivals/departures roadway system, is described as "constrained."

Patience, Patience

After Hurricane Katrina tore through MSY's terminal in 2005, Corgan and Associates created a strategic development plan for the airport in 2007. The plan identified three potential development sites at the airport to accommodate future growth, highlighting the north as the preferred alternative. In 2010, the plan was updated, and planners confirmed the north option as superior; but a final decision to rebuild, was further stalled by hurricane recovery efforts.

Business at the airport moved forward with high operational costs and relatively low revenue from parking and concessions — conditions that create higher airline costs, which makes it more difficult to attract new flights and business, Ahmad explains.

In August 2011, Mayor Landrieu took action by asking the New Orleans Aviation Board to analyze four terminal project proposals, all on existing airport property. The board, in turn, issued requests for proposals and assembled a team of consulting firms: Leo A Daly/Atkins (design), RS&H (environmental impact), Roger Bates of Unison Maximus Consulting Solutions (financial analysis) and Jones Lang LaSalle (land-use options). Parsons Brinckerhoff provided program management.

Performing a site alternative analysis of the four proposals was one of the consulting team's first steps. One alternative involved rehabilitating the existing terminal, and the other three replaced it. The board wanted an alternative that would improve revenue generation, provide a consolidated security

checkpoint, incorporate inline baggage handling, improve vehicle circulation, facilitate passenger convenience and ultimately be a world-class facility, recalls Todd Knuckey, P.E., Atkins' central aviation regional manager.


Todd **Knuckey**

Making Headway

Knuckey describes the decision-making process as "inclusive," with input coming from the board, mayor and airport representatives. The team also sought ideas from the FAA, state transportation department and MSY's airlines, as well as stakeholders in New Orleans, Kenner, and St. Charles and Jefferson parishes.

Teams analyzed the existing facility, evaluating the structure's age, its useful life and the cost to replace or renovate it. Given the age and condition of the existing facilities, it was no surprise when building new ranked as the top alternative, relates Knuckey.

All options allowed use of existing runways. The refurbishment and south location alternatives presented difficulty in improving the airport pavement while maintaining operations. The north alternative provides room for adding a parallel taxiway to Runway 10-28 as well as development on the south and southwest sides of the property.

To establish a base level for comparing the alternatives, analysts reviewed existing data and developed new forecasts. Looking out 30 years from 2018 (the target completion date of the terminal), enplanements are estimated to be 4.6 million, based on about 2% annual growth. A benefit-cost analysis helped the team compare alternatives against each other and relative to the base case of refurbishment.

"The decision-making process was objective and based on metrics and numbers," Ahmad summarizes.

The team used a matrix of criteria including cost, construction duration, impact to passengers during construction, passenger convenience, access to parking and rental car facilities, pre- and post-security concessions and other factors.

Key economic variables that were evaluated included airport cost savings (capital, operational and maintenance), incremental airport revenue, commercial aircraft variable operating costs, commercial passenger travel time, non-passenger (meeter/greeter) time savings and vehicle operating costs/vehicle miles traveled.

The results were summarized using a single metric: net present value. And the results of the benefits-cost analysis showed that the north alternative provides the highest positive net present value.

"The numbers spoke for themselves," Ahmad recalls.

According to the Long-Term Infrastructure Development Plan, the northside alternative's one-time construction impact on total spending in the regional economy is 39.4% greater than the refurbishment alternative. In addition, the annual operations impact on total spending in the regional economy is 5.7% greater than refurbishment — not including the economic impact of tourism attributable to the airport, which is projected to be $3.285 million per year from 2013 to 2028.

Building a new terminal on the north side was confirmed as having the best opportunities for revenue growth, sustainable operating costs and economic development potential, Ahmad summarizes. And after analyzing the airport's infrastructure, operations and finances, it became clear how to increase revenue and decrease cost, he adds.

While the refurbishment alternative had a competitive initial base construction cost, the Long-Term Infrastructure Development Plan demonstrated that the expense to replace the terminal after 20 years would have resulted in a higher lifecycle cost. The plan also delineated disadvantages of the other options: higher initial capital cost for the south alternative, due to complex constructing phasing and duration; and higher cost for the west alternative based on the demolition of existing facilities, relocation of tenants and additional square footage required to accommodate airport administrative functions.

In contrast, research showed that the northern alternative limits unforeseen conditions, simplifies construction phasing and reduces the duration of construction.

Taking Shape

The new terminal will initially have 30 gates, with the capacity to add 12 more. It will also include a rebalanced pre- and post-security concession program, consolidated security screening checkpoint, secure-side connector to link concourses, new short-term parking with rental cars and improved interstate access.

MSY plans to redevelop its existing terminal for general aviation or commercial airline use — an opportunity that would not be available if the airport had opted to renovate rather than build new, Ahmad notes. Concourse D will eventually house airport administrative staff, the FAA and TSA.

Potential complementary airport use includes a corporate campus office development, warehouses, manufacturing facilities and an intermodal logistics park that uses existing rail infrastructure. According to the Long-Term Infrastructure Development Plan, building a terminal on the north side will fill a regional void for large-scale development parcels.

Meanwhile in South Carolina

When David N. Edwards, A.A.E., became president and CEO of Greenville-Spartanburg International (GSP) in 2009, he quickly delved into the airport's 2003 master plan. Unfortunately, it chronicled functional deficiencies in the terminal's ticketing, security checkpoints, concessions and baggage screening areas.

David **Edwards**

Renovations in the ticketing lobby are slated for the middle portion of GSP's three-phase renovation program.

Before GSP was built, Greenville and Spartanburg had separate airports and competed for airline service. Textile giant and local businessman Roger Milliken rallied other upstate business leaders around the concept of a shared airport facility located between the two cities. When the airport was built in 1962, it was one of the few non-military fields constructed at the time.

Expansions in 1989 and 2001 increased the airport's footprint by 140,000 square feet and 13,000 square feet, respectively. Boarding bridges, a new lounge, dining facilities, rental car facilities and a travel agency were also added. WINGSPAN, the four-year $115 million terminal improvement program currently under way, will bring the most substantial wave of renovations in the airport's history. Airport funds will cover 80% of the renovation program; the remaining 20% will come from the FAA Airport Improvement Program Fund and TSA.

The facility currently accommodates 1.8 million annual passengers in a terminal building with about 226,000 square feet of space.

GSP contracted RS&H in 2009 to conduct a terminal improvement study that picked up where the 2003 master plan left off. It also examined whether the same areas still needed to be improved and identified new areas for improvement. The company also performed a parallel study to explore the option of building a new terminal on a Greenfield site.

"We spent about a year studying some of the deficiencies of the terminal facilities and what they needed currently," explains Steve Harrill, who served as RS&H project manager. The firm also projected GSP's future needs and assessed how well its existing facilities would meet them.

Steve **Harrill**

New or "Like New"?

Deciding whether GSP's existing facility would be viable long-term or if a new facility in another location was needed was a big turning point in the project, Harrill recalls.

After engineers determined that the terminal could be renovated, it became clear that the cost of a new building, apron, roads, taxiway, site work and other elements needed for a new terminal far outweighed the value of a new terminal. Planners estimated it would cost $500 million to build new and $100 million to renovate.

The cost difference made the decision to renovate easy, Edwards recalls, noting that a different strategy may be required in 2035.

RS&H helped GSP determine how to redevelop the terminal and sought input from several chambers of commerce, economic groups, airlines and other stakeholders about what they wanted in the terminal modernization program.

While some parts of the facility worked adequately, some did not, explains Harrill. The airport's location, infrastructure, parking garages, roadway, apron and taxiway were determined to work well; both the size and number of gates were also validated.

"Eventually GSP will need to add a few more gates, but for the most part, the concourses were sized appropriately and are in good shape," Harrill says, noting that they do need an "architectural refresh."

The terminal's central core, however, will be torn down and rebuilt. "We had to squeeze a lot between the airside and landside, but the middle was, for the most part, empty," Harrill explains.

Explosives trace detection devices put in place post-9/11 had created inefficiencies in the terminal configuration and impacted checkpoint screening, baggage and concessions. In addition, each of GSP's two concourses has its own security checkpoints, and there were almost no concessions post-security. With a large, under-used restaurant pre-security, GSP's concession program simply did not meet today's expectations of variety and convenience, explains Harrill.

Although the ticketing lobby and bag claim were spacious, they weren't configured for efficient passenger circulation. Those spaces will be renovated.

"Our approach is to find the weak points and help the owner correct the weak points," says Harrill. "The whole terminal breaks down if one or two pieces break down."

Another primary goal is to help the airport reuse what it can, which saves money, he adds.

In addition to addressing functional deficiencies, the airport must be ready to accommodate additional passengers, Edwards says. FAA passenger forecasts predict GSP enplanements will double around 2032.

Time for the Hardhats

With renovations scheduled in three phases, GSP began renovations last June at the curb and will continue on to the gates. Major first phase elements include:

- new canopy for loading/unloading in front of Baggage Claim
- covered walkway to Garage A
- new glass front on the terminal
- relocating the Rental Car Customer Center

- expanding concourses A and B
- relocating utilities and other infrastructure
- new baggage claim carousels

Phase 2 will focus on construction of the building's core. Its main elements include:

- new food/beverage and retail concessions area in Grand Hall
- renovating existing ticketing lobby
- new customer service booths
- new landside garden
- new baggage screening equipment and facilities
- relocating and consolidating security checkpoints
- renovating concourses A and B

The third and final phase includes construction of new airport administration offices and a conference center. Historical elements, including GSP's numerous water features and airside garden, will be preserved and integrated into the new design.

The March opening of the $3 million Rental Car Customer Center was an early milestone in the series of improvements that are expected to continue into early 2016. The two-story facility houses five rental car operations with customer restrooms as well as office space for the rental agencies.

Renovations to the baggage claim area, including three new carousels, are under way and will continue into fall. Retail and food/beverage concessions are also being added to the baggage claim area.

Construction of the North Wing has also begun and will continue until the fourth quarter of the year. The North Wing will temporarily house airline offices and facilities, to allow renovations in the current airline ticketing area. Eventually, the North Wing will be home to the airport's administrative offices and the first phase build-out of the future second baggage claim area.

When renovations are complete, the terminal will be 365,000 square feet larger.

Sustainability improvements include natural daylighting, high-efficiency fixtures, solar-powered water heaters and rainwater harvesting.

"It had been 25 years since anything had really been done to the terminal," Harrill reflects. "We helped the commission make a decision that it was time to do something significant."

The terminal will remain operational throughout renovations and construction, note team and airport officials.

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Telluride Regional Invests in Extensive Runway & Airfield

factsfigures

Project: Airfield & Runway Improvements

Location: Telluride (CO) Regional Airport

Cost: $50 million

Funding: 95% FAA; 5% airport

Engineering Consultant: Kimley-Horn

Planning Consultant: Coffmann Associates

Contractor (Phase II and III): R.E. Monks

EMAS Designer/Provider: ESCO

Relocation of AWOS: Vaisala

Phase IA Construction Contractor: Jensen Drilling

Phase IB Construction Contractor: Delhur Industries

Phase IB Sub-consultant: Golder — Geotechnical

Phase IB Sub-consultant: San Juan Surveying

Phase II Design Sub-consultants: Golder; Terracon Engineering Consultants; San Juan Surveying; Roy D. Mcqueen & Associates Pavement Engineering

Phase III Design Sub-consultants: Terracon Engineering Consultants; San Juan Surveying

Located 9,070 feet above sea level at the top of the Deep Creek Mesa, Telluride Regional Airport (TEX) in Colorado is the highest commercial airport in United States. Thanks to a $50 million, multi-phase runway and airfield improvement project, operations there are safer than ever as the airport prepares for measured growth.

Planning for the multi-year project dates back to February 2000, when TEX's runway was "showing its life," and the airport approached the FAA for a $6 million grant to rehabilitate it, explains Airport Manager Richard Nuttall. While the FAA agreed that the runway was in need of repairs, the agency also asked TEX to bring it up to new standards, which required changing the runway's grade and widening its safety areas.

Richard **Nuttall**

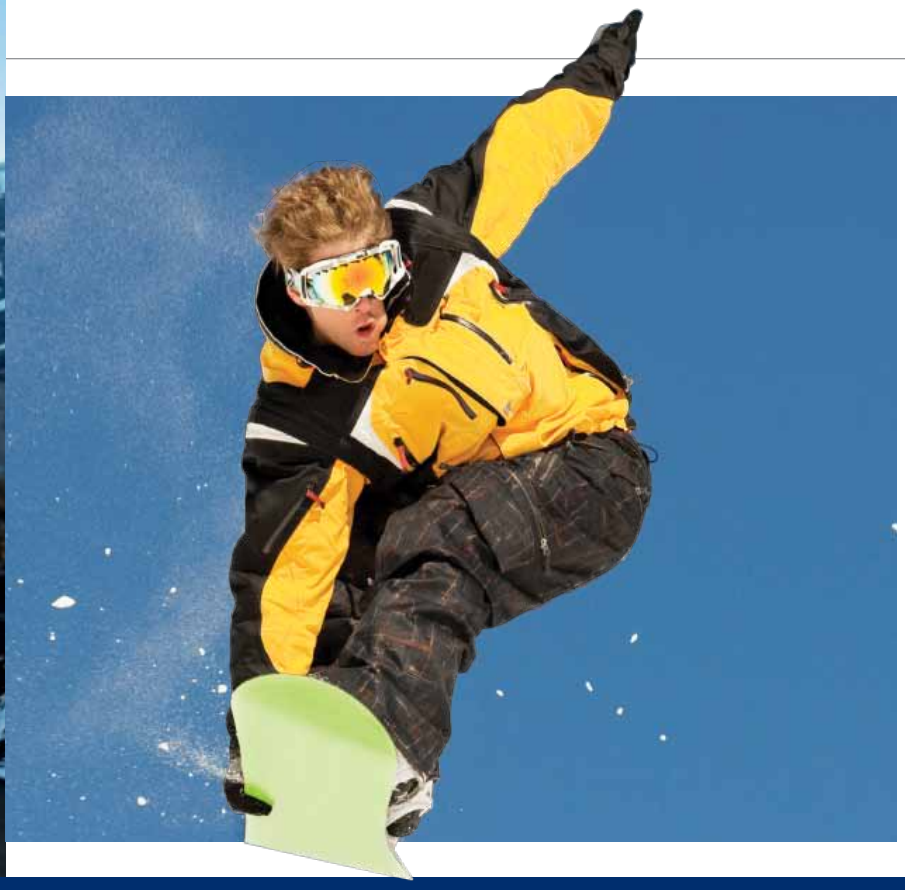
That's when TEX embarked on a study to determine how to meet the FAA's request and at the same time lengthen the runway to improve safety and accommodate larger aircraft. The study was completed in 2004 and resulted in the airport's multi-phase, $50 million project.

"It took a lot of different design reviews on our part to see what would work and what wouldn't," Nuttall recalls, noting that the airport worked with the FAA on 10 or 12 different iterations. "At one time, we looked at skewing the runway to one side or the other to see if we could get more length."

Phase I began in 2008, with crews increasing the size of an embankment on the north side of the runway so the safety area could be widened. Consulting firm Kimley-Horn was contracted to assist TEX with its runway and airfield upgrades, which eventually met updated FAA criteria.

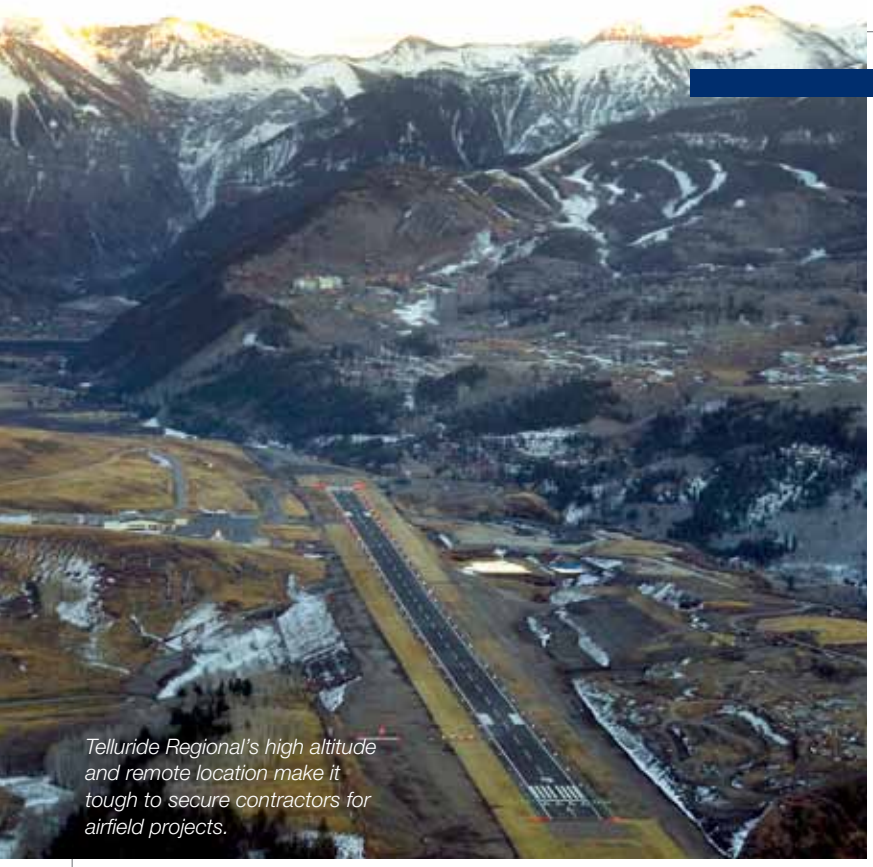
During Phase II, in 2009, the airport closed for seven months while crews reconstructed the entire runway. After the old 6,870-foot runway was removed, the grades were adjusted to meet new FAA standards: The west end was lowered 32 feet, the center was raised 16 feet and the east end was lowered 14 feet. Crews also performed more safety area work for the new 7,111-foot runway.

The runway closure was a financial challenge for TEX, Nuttall notes: "We are a self-sustaining airport. So all of our grant match and all of that money we needed while we were closed was



Improvements

By Jodi **Richards**



Telluride Regional's high altitude and remote location make it tough to secure contractors for airfield projects.

from money that we had saved from operating the airport." While FAA grants paid for 95% of the project, TEX needed to cover the remainder — despite the loss of income from being closed during Phase II.

Completely closing the airport during that time, however, was the only option, because the entire runway had to be torn out. "We couldn't do it in phases," Nuttall explains. "We had to do it all at once."

While 3 million cubic yards of dirt were moved around the airport during the project, none was taken off property. Additionally, many of the materials used to make the sub-base for the new runway were created onsite, from the property's native resources. "That was a unique part of the project," Nuttall notes. "We were able to make some of the materials that we needed for the project and not take any material off the airport, which saved a lot of money in trucking costs."

In 2010, crews widened the airfield's safety areas from 150 feet to 250 feet, installed an Engineered Materials Arrestor System (EMAS) and finished ancillary aspects of the projects. Work on the EMAS was scheduled at night to prevent disrupting operations.

A Mountain of Challenges


Mike **Olander**

The unique logistics of construction in Telluride added an unwelcome element to the bid process. "There are not a lot of contractors that come out and bid working out in the mountains at 10,000-foot altitude," explains Mike Olander, P.E., senior project manager with Kimley-Horn. "It's a hard location to get to, and it's just not the easiest place for a contractor to work."

R.E. Monks, based in Fountain Hills, AZ, won the contract for both the second and third phases of the project.

The timing of Phase III was another challenge. After receiving notification of FAA funding in December 2010, TEX had to get that $11 million portion of the project designed and bid in three months. "We had to get it ready to go so they could start construction as soon as the winter broke — basically around May first — and be done by the end of October, before snow started to fly," Olander explains.

The short construction season also means a short growth season. "We had a little trouble getting grass and vegetation to grow in certain areas because of the short season and the weather, so we had to make some adjustments," he adds.

With the majority of the main projects complete, Kimley-Horn is currently focusing on ancillary projects such as apron and deicing pad work, remedial erosion control measures and other supplemental projects, reports Olander.

The multi-phase project is "quite a process," with many different planning stages and ideas to make the best and safest use of the airfield, Nuttall notes.

"There was quite an extensive public process," he adds. "There were many folks who didn't want us to do anything. So that was quite a challenge to get through the public process at that time."

Initial plans to use retaining walls at both ends of the runway to allow for more length was a hotly contested idea. "I had requested from the FAA that we use EMAS on either end of the runway so we wouldn't have to shorten [it]," recalls Nuttall. "And, at the time, the FAA refused to allow us to use EMAS."

When the FAA later allowed the use of EMAS, the airport benefited from an additional 100 feet of length of the runway by using it instead of retaining walls.

Overall, the project originally received a lot of resistance from the community, Nuttall relates: "We are a resort town, so there are a lot of emotions with the airport over the years."

Telluride's historic downtown district is a popular tourist spot.

Built in 1985, TEX is a relatively new airport compared to many facilities.

Although a series of runway improvements upgraded TEX's runway from a Category B3 to a C3, the runway's length and the airport's elevation still limit TEX from receiving airliner jet service. Currently, a Global Express is the largest private jet that uses the airport.

For the last 2½ years, however, the airport has been working with the FAA to secure a new Category C approach. Nuttall says the airport will hire Jeppesen to help design the approach and then submit it to the FAA for approval. "We have this new runway; we need a new instrument approach to match the category," he reasons. "If we are successful at that, then we hope to bring the Q400 airline into the airport, which would then really enhance our commercial service."

Moving Forward

Even though TEX's master plan update was completed in 2004, Nuttall says it isn't "old" because it was designed based on need rather than time. "So the master plan is still very valid in terms of what we want to get done," he states.

With the recession and reduction of airline service, TEX's operations have "kind of slid" the last few years, he adds. In 2012, the airport saw about 16,800 total operations. Visitors can reach TEX through Denver International via United Airlines, Great Lakes Aviation and Frontier Airlines.

The next phase of the master plan — replacing the terminal building — is tied to the airport attracting more commercial airline service. The current facility combines both general aviation and airline service in one building. Ideally, airport officials would like to divide the two into separate facilities to better meet the needs of both. A ramp expansion is also in the plans.

Plans for future hangar development on the south side of the runway will be facilitated by a tunnel that was added under the runway during its reconstruction. "That way motor vehicle traffic can access the south side very easily," Nuttall explains. "We put in all of the conduit and everything under the runway for the future expansion, so it's just a matter of need. As the need comes along and we can get the funding together, then we'll continue implementing our master plan."

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BILL AND HILLARY CLINTON NATIONAL AIRPORT LITTLE ROCK

factsfigures

Project: Airport Renovation & Expansion (Phase 1)

Location: Bill & Hillary Clinton National Airport, Little Rock, AR

Cost: $67 million

Construction Manager at Risk: Parsons

Planning: Leigh Fisher

Terminal Planning & Design: Architectural Alliance Int'l

Baggage System Design & Quality Assurance: Vic Thompson Co.

Baggage System Installation: Five Star Airport Alliance

Baggage System Controls: Alliant Technologies

Printers: VidTroniX

Technology/Security Consultant: Faith Group

Seismic Analysis/Structural Engineering: Simpson Gumpertz & Heger

Civil/Mechanical/Structural Engineering: Garver Engineers

Architectural Support & Design Implementation: Polk Stanley Wilcox Architects; Woods Group Architects

Supervision: Adevco Construction; LR Mourning Co,; ETC Engineers & Architects; Henry Peacock & Associates

Framing & Drywall: Platinum Drywall

Mechanical & Plumbing: Comfort Systems, USA

Fire Protection: Reliable Fire Protection

Millwork: Powell Creative Woods

Glass Systems: Architectural Products

Masonry & Limestone: CB Masonry

Paint & Wallcovering: Wood Painting Co.

Electric & Data Systems: Fleming Electric

Window Treatments: Arkansas Shades, Blinds, & Shutters

Site Work: Heritage Excavation

Electric & Data Systems: Nabco Electric; Staley Electric

Steel Erection: C&F Steel Erectors; All Steel Construction; Herman Binz Ironworks

Glass Systems: Ace Glass

Deep Foundations: Peterson Contractors

Concrete & Site Work: Bass Commercial Concrete; NBMC

Plaster Systems: Harris Plaster

Roofing: Seamless System

Metal Panels: Miller Clapperton Partnership

Flooring: JGP

Terrazzo Flooring: Doyle Dickerson

Landscaping: Little Rock Landscaping; Delta Grass Masters

Finish Carpentry: Rhinehart Co.

Millwork Supply: Greenfields Millwork

Interior Signage: Archway Graphics

Exterior Signs: Ace Signs

Clinton National Debuts, With

Bill & Hillary Clinton National Airport (LIT) — formerly known as Little Rock National Airport — recently celebrated its name change honoring the 42nd U.S. president and 67th secretary of state, complete with appearances by both politicians. The Arkansas airport also marked the substantial completion of the first phase of its long-term development. And while the specific timeline for future improvements is not yet known, the design and intent of its growth are well defined.

Ronald **Mathieu**

Phase I, estimated to cost $67 million, is currently on track to finish roughly $3 million under budget. In addition, the airport has paid off a $6.9 million bond, saving some $2.1 million in annual debt service, reports LIT Executive Director Ronald Mathieu. "And on top of that, we're still on track to be completely debt-free in the 2016 time frame," Mathieu adds.

The project grew out of two previously separate initiatives: the airport commission's plan to meet growing demand by building a new terminal just east of the existing terminal, and the airport's desire to remove the bulky baggage scanning equipment from its lobby and renovate the ticket lobby and passenger checkpoint.

Originally the commission considered the ticketing and screening projects separate from its vision of a new terminal, Mathieu explains. But around 2009, the commission decided to take a more "holistic view." After reviewing a number of different concepts, the airport selected the current strategy, known as the 2020 Vision Plan, with the help of its design partner, Architectural Alliance International.

"We can build it as we need it, and we can make it look like it was all done at the same time," Mathieu explains. The less-costly, pay-as-you-go, expand-as-needed approach "made all the sense in the world," he adds.

To ensure aesthetic continuity throughout multi-phase improvements, the commission had the airport plan the overall project in its entirety. Mapping out the long-term vision also helped demonstrate how Phase I fits in with the entire terminal, Mathieu explains. Architectural Alliance developed renderings of what the terminal will look like at various stages in the future, as additional phases of the 2020 Vision Plan are implemented, to help prevent "glaring awkward periods," explains Eric Peterson, principal with Architectural Alliance.

Eric **Peterson**

Future Improvements Already Charted

By Jodi **Richards**

In addition, Mathieu and his team had to show how the full project would be funded.

Getting Started

Phase I spans a variety of areas throughout the airport, including the addition of 15,000 square feet of space and redesigned ticketing and in-line baggage screening areas in the lobby. Other interior elements include passenger screening checkpoint improvements, a new communications control center, administration office renovations, a new multi-user flight information display system and energy-saving initiatives. Outside, crews relocated LIT's valet parking and erected a new entrance sign to visually announce its new name.

Peterson calls airport officials "visionary" for stopping the initial baggage screening project to flesh out the big picture first. "It maybe delayed things for them on that first phase, but they've got a much better project as a result," he says. "All the projects and phases that come in the future will be able to reinforce and support the previous work."

Airport development is often reactionary, Peterson notes: "Something happens in security or technology; or because of service changes, we have new demands on our facilities and need to do something fast. That isn't showing how the facilities meld or support each other; and if you leave it at that level, you're not really understanding where there might be variations that would enhance your end solution."

Design Principles

Phase I is about improving efficiencies at the airport, Mathieu says. He describes the previous lobby as congested, with inefficient systems. "We needed to remove the screening machines from the lobby because our ability to grow was limited by the capacity of those manual machines," he explains.

A new in-line baggage screening system helps free up lobby space and improves service for passengers and airlines.

While the project adds roughly 50,000 square feet of new space, Mathieu stresses that the changes are not just about expanding; they're also about improving the customer experience in a building that was designed in the 1960s and opened in 1972.

In addition, the airport required a design that relates meaningfully to the region, Peterson adds. "We wanted it to be a facility that was progressive looking and that was something the citizens of Arkansas could be proud of," he explains, noting that the design balances a desire for contemporary architecture while maintaining a relationship to its locale.

Using local materials, including native limestone and wood species, simultaneously addresses sense of place and sustainability. "It's smart architecture to use the resources that are close by," Peterson relates. "There is less freight, and it stimulates the local economy."

Along with creating a sense of Arkansas within the terminal, Mathieu says the airport also wanted to be open, airy and energy-efficient while making a statement for the future.

In the ticket lobby, the front wall was bumped out to help increase circulation. Above the ticket counters, the administration offices received a similar facelift, allowing for more daylight and

a more spacious, open feeling. “There’s continuity of space and volume from the ticketing hall up above the ticketing counters and into the administration offices and all the way through to the exterior wall on the other side of the offices,” Peterson chronicles. “There are places that you can stand and look out from both directions to the outside and have daylight all the way through.”

Neutral colors throughout the project will also add continuity, he adds. Light-colored oak combined with light-colored limestone, neutral terrazzo floors and cream tones on the walls work in concert with natural light that streams through glass windows to create a light feeling in the new space. Sinuous curves and forms in the terrazzo relate to the area’s rivers, oxbow lakes and rice field terraces, Peterson explains.

A 12-foot-by-28-foot photo mounted on the wall showcases the Arkansas River and skyline.

The new ticket counter is a more streamlined, smaller unit at Americans with Disabilities Act regulation height that spans the entire space. An under-floor duct system provides power and data distribution with access points throughout the ticketing area, so self-service units can be located as needed. As technology changes, upgrades will be relatively easy, Peterson notes. Detailing on the self-service units matches the ticket counters for continuity. “It helps create a less stressful, less chaotic environment,” says Peterson.

Other energy-saving aspects include LED lighting and water fixture upgrades. And a $9 million investment added primary power generators to run the terminal complex in its entirety and upgraded the HVAC system. Between improvements in the terminal and parking garage, LIT will save roughly $700,000 per year in energy consumption, Mathieu reports.

The new space uses high-efficiency glass, and lights in the administration area include motion sensors. “Every step of the way, we evaluated our options based on their energy efficiency,” Peterson reports.

Screening & Security Upgrades

In addition to including bulky machines that took up valuable lobby space, LIT’s previous baggage screening process was inconvenient, notes Theo Gargagliano, Parsons’ senior security program manager. Passengers had to double-handle their bags – first checking them at the ticket counter, and then taking them to a TSA agent in another location. Now, passengers check their luggage with a ticket agent and it enters the new conveyor system behind the counter, which takes it to the TSA screening area and

21,000-square-foot central bag makeup area. The new process facilitates a lot more bags and is more user-friendly for passengers and airlines, Gargagliano explains.

The new outbound baggage handling system includes two facilities: a single matrix in the airport's new 14,000-square-foot building east of the main terminal ticketing lobby and a separate 21,000-square-foot make-up building. The matrix building houses three L3 eXaminer 3DX-6600 EDS machines with the baggage handling and sorting equipment.

Overall, the system includes more than 2,000 linear feet of conveyors, four input belts, one oversize belt and four slope-plate make-up units. "Having the baggage system fully certified the first time out was great," Mathieu boasts.

At the security checkpoint, 3,000 square feet of additional space allowed room for an extra lane, bringing LIT's total to five. TSA upgraded its technology to full-body rapid scanners and increased queuing space. "Everything about the passenger efficiency of the checkpoint was increased," Gargagliano relates. "Before, it was just a really tiny, bottlenecked area; that expansion and the additional equipment allow a lot more capacity."

The airport also "significantly increased" its Wi-Fi bandwidth and is preparing another future upgrade. An improved public announcement system and new multi-user flight information display system were also added. Direct feeds from all the airlines ensure that LIT passengers receive the most up-to-date information possible, notes Mathieu.

Challenges

"When you start a renovation project like this, you're going to run into things that you didn't know," Mathieu says. To its advantage, LIT established a 15% contingency in the budget for such unknowns.

Orchestrating 17 separate phases within Phase I was challenging, but careful coordination allowed crews to complete them with minimal effect on passengers, recalls Robert Bramblett, project manager with Parsons at the time. "We had to shift people around like a game of checkers throughout this project," says Bramblett. "It was difficult, but we were able to do that with the airport and airlines and have basically no impact to their operations."

Mathieu agrees that building in place was a challenge. Constant communication among the construction, design and airport teams, as well as with airport tenants, made for little disruption to passengers, he notes. A significant portion of the work was performed after the last departure around 9 p.m. and before the first arrivals in the morning, around 4 a.m. — particularly in areas integral to passenger operations. "There was an army of people

out here working on the terminal," Mathieu reflects. "It was just an unbelievable symphony of work that went on here over about a two-year period."

The airport and Parsons are particularly proud of the high involvement of local businesses in the project. "I think the construction manager at risk delivery method was absolutely the right thing to do," Mathieu comments. "The results for this community were just outstanding." Nearly 94% of all funds spent on the ticket lobby through the CM at risk went to local firms, and disadvantaged business enterprise participation was 24% — exceeding the airport commission's goal of 15%.

In addition to complex phasing, the condition of the existing facilities also added challenges for the project team, Bramblett relates. "The building was old, and every time we tore a wall down, there was something there that just made you scratch your head," he recalls, citing examples such as steel components that didn't meet code and 20 or more years of unidentified wiring running through the ceiling.

In early June, LIT was moving into Phase 1a of the project, which includes restroom and baggage claim upgrades. "We need to soften the feel," Mathieu explains. "We need to make it lighter, airier and make it look and feel more like what we've just expanded." Currently, restrooms are located only on the west side of the concourse; but more are being added to the east side to accommodate future renovations.

The airport's next major project has yet to be determined. A concourse renovation is one possibility, notes Mathieu, and so is heading west to finish the front façade of the building and adding a federal inspection facility and other improvements. Meanwhile, however, LIT will continue with enabling projects.

Throughout it all, Mathieu adds, the airport will continue to conduct itself in a fiscally prudent way, despite ups and downs in the economy. "One of our biggest missions is to make a positive economic impact to the community," he says. LIT's current regional economic impact is estimated at $1.2 billion per year.

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Airport administration offices were upgraded during Phase 1 renovations.

Midway's New Consolidated Rental Car Center Relieves Terminal Congestion & Delivers Green Benefits

By Victoria Soukup **Jensen**

CHICAGO CDA DEPARTMENT OF AVIATION

factsfigures

Project: Consolidated Rental Car Facility

Location: Midway Int'l Airport

Owner: Chicago Dept. of Aviation

Cost: $55 million

Facilities: 5-story garage w/ 18,000 sq. ft. on ground level for customer service counters, rental car offices & public restrooms; quick-turn facility with 10 wash bays, 9 fueling islands, 18 fuel pumps & two 20,000-gallon underground fuel tanks

Capacity: 300 rentals, 300 returns/hour

Project Architect/Designer: The HOH Group

General Contractor: Walsh Construction Co.

Precast Concrete Supplier: Dukane Precast

Benefits: Airport gains 325 premium parking spaces in its main garage & terminal space for future passenger amenities.

Chicago's Midway International Airport (MDW) created a new traffic pattern for travelers who rent vehicles with construction of a $55 million consolidated rental car center. The new facilities not only give the urban airport desperately needed space for current use and future development; they also add service options for customers and support the airport's agenda for long-term environmental improvements.

The project, which has been in the planning stages for more than a decade, was completed this spring. The new center includes a 1,870-vehicle parking structure with customer service areas for eight rental car agencies and a new quick-turn operation, where rental vehicles are fueled, washed and cleaned.

Rosemarie S. **Andolino**

"Our new facility greatly enhances the overall travel experience at Midway," says Chicago Department of Aviation Commissioner Rosemarie S. Andolino. "It increases capacity for rental cars at Midway by more than 500% and also creates a more efficient and greener operating environment. Instead of multiple rental car company shuttles circulating the terminal roadways and driving around the community, there is now one bus operation between the terminal and the rental car center."

MDW sits in a high-traffic area on the city's densely populated southwest side, just minutes from downtown Chicago. Previously, rental car agencies were located in separate facilities in the terminal and on properties surrounding the airport. Travelers would either take agency-owned shuttles to offsite locations or pick up their vehicles in the terminal parking structure. As a result, there were numerous shuttles crisscrossing the surrounding neighborhood, adding to the area's traffic woes.

Relocating the rental car companies allowed MDW to gain valuable space in the terminal and add 325 premium parking spaces in the airport's main garage. The reclaimed terminal space can be used for future passenger amenities such as additional seating and concessions, notes

Andolino. Now, customers take a five-minute ride to and from the new facility on shuttles owned and operated by the rental car companies.

The center includes two buildings: a five-level parking structure and an adjacent single-story quick-turn facility. The ground level of the garage includes 18,000 square feet of ground-level space for customer service areas and rental agency offices. The quick-turn facility contains 10 wash bays, nine fueling islands, 18 fuel pumps and two 20,000-gallon underground fuel tanks.

Together, the facilities are designed to handle 300 rentals and 300 returns per hour. They also form the "greenest" airport rental car center in the nation, say MDW officials.

Sustainability was Key

The quick-turn facility features several environmental elements, including a 17,000-square-foot vegetative green roof that captures storm water and helps improve air quality, wash bays that use recycled water, and solar panels on the fueling island canopy.

Shuttle buses are powered by bio-diesel fuel and travel on a dedicated airport road to and from the terminal; wind turbines generate power for the facility; an underground storm basin collects water for landscape irrigation; and the parking structure's white, reflective concrete roof helps reduce air conditioning in the summer.

Mark C. Miller, project architect with The HOH Group, notes that 90% of the project's materials were procured regionally — 54% from within a 250-mile radius. Bicycle racks and showers were also added to encourage rental car employees to bike to and from work.


Mark C. **Miller**

"Going green is part of our culture at the Chicago Department of Aviation," Andolino explains. "Sustainability is not simply an 'add on' or afterthought; it is built into everything we do, and is equal to our other core missions, such as safety and security."

Based on ratings in the Chicago Department of Aviation's Sustainable Airport Manual, the project's design and construction received three and four green airplanes, respectively. According to Andolino, this is an impressive feat, given that earning even one green airplane is considered significant.

The Sustainable Airport Manual is a comprehensive guide created by the Chicago Department of Aviation to incorporate and track sustainability in various areas of airport operation, including planning, design and construction, as well as maintenance and concessions. The manual guides the implementation of sustainability initiatives at O'Hare and Midway, and is also used by several other airports around the world.

Rental agencies gained extra room for their customer service areas.

Consolidating shuttle services reduced roadway congestion.

The new consolidated rental car center also incorporates many aspects of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program, notes HOH's Miller, and airport officials are seeking LEED certification for the project.

More Space for More Service

Enterprise Holdings, which represents Enterprise, Alamo and National car rental agencies, is enthusiastic about MDW's new facilities. "You cannot compare the two environments," says Barbara J. Mathey, the company's director of airport properties and relations. "We have more space, and it's a beautiful, vibrant facility."


Barbara J. **Mathey**

Mathey is also keen about the center's emphasis on sustainability: "The ability to fuel and wash our cars next to the parking garage is reducing emissions, reducing traffic on the terminal roads and is making it more efficient to operate."

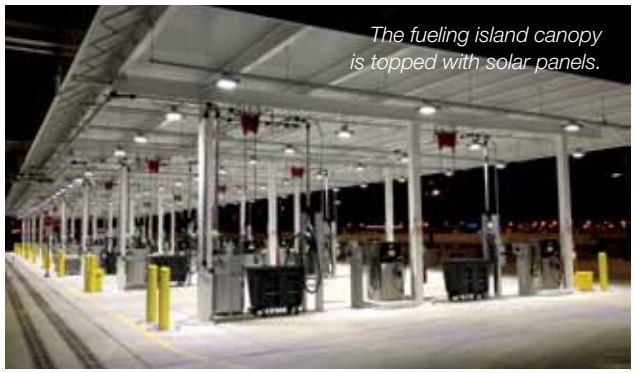
Joshua Blum, director of properties and concessions for Hertz, is similarly pleased with the new facilities. "Our old space was extremely undersized for the rental car market at Midway," Blum explains. "We've gotten space that's closer in size to what is needed, helps make it a more efficient operation and allows us to serve our customers better."


Joshua **Blum**

Customers, he adds, seem to like the "new way of doing business" at MDW. Previous space constraints often made it difficult to serve customers quickly during peak travel times. "Chicago has huge ebbs and flows in terms of passenger traffic," Blum explains. "Sometimes, it became an important balancing act. We're now able to implement customer service programs that we weren't able to implement before because we didn't have enough space. We now have our full package — our Gold Booth and our Gold Reader Boards — so customers can choose cars and upgrade on the fly, which just wasn't available to us under the old program at Midway."

Some Assembly Required

The parking structure, which was completed on time and on budget, is made of precast concrete. Individual pieces were designed by Dukane Precast and transported from its Chicago-area plants via semi trucks for assembly onsite.


The fueling island canopy is topped with solar panels.

"It was a pretty flawless project," reports Travis Parton, Dukane's director of business development, "What made the project go smooth was all of the upfront design and review that was done. That was the approach we used from day one, and it paid off."

Jeff Rodgers, project manager for Walsh Construction Co., notes that installing a stoplight at the site helped the work flow by easing traffic congestion into and out of the area. The site's overall small size, however, created other challenges. "Since it was a complete precast garage with over 2,200 pieces, we had to have significant space for the precast trucks to stage onsite," he explains. "But by doing this, we weren't able to start construction in some of the other areas until later, which was another challenge."

The project also came on the heels of the busiest year in MDW's 85-year history. In 2012, the airport served 19.5 million passengers. And despite the busy atmosphere, the project moved smoothly, notes Andolino.

"Construction of this facility was a tremendous success due to the great teamwork between the rental car companies, our design and construction contractors, elected officials in Chicago and what I like to call 'Team CDA'," Andolino says. "The end result is a fantastic new facility that truly benefits the airport community — especially the millions of travelers who fly through Chicago's busiest square mile: Midway International Airport."

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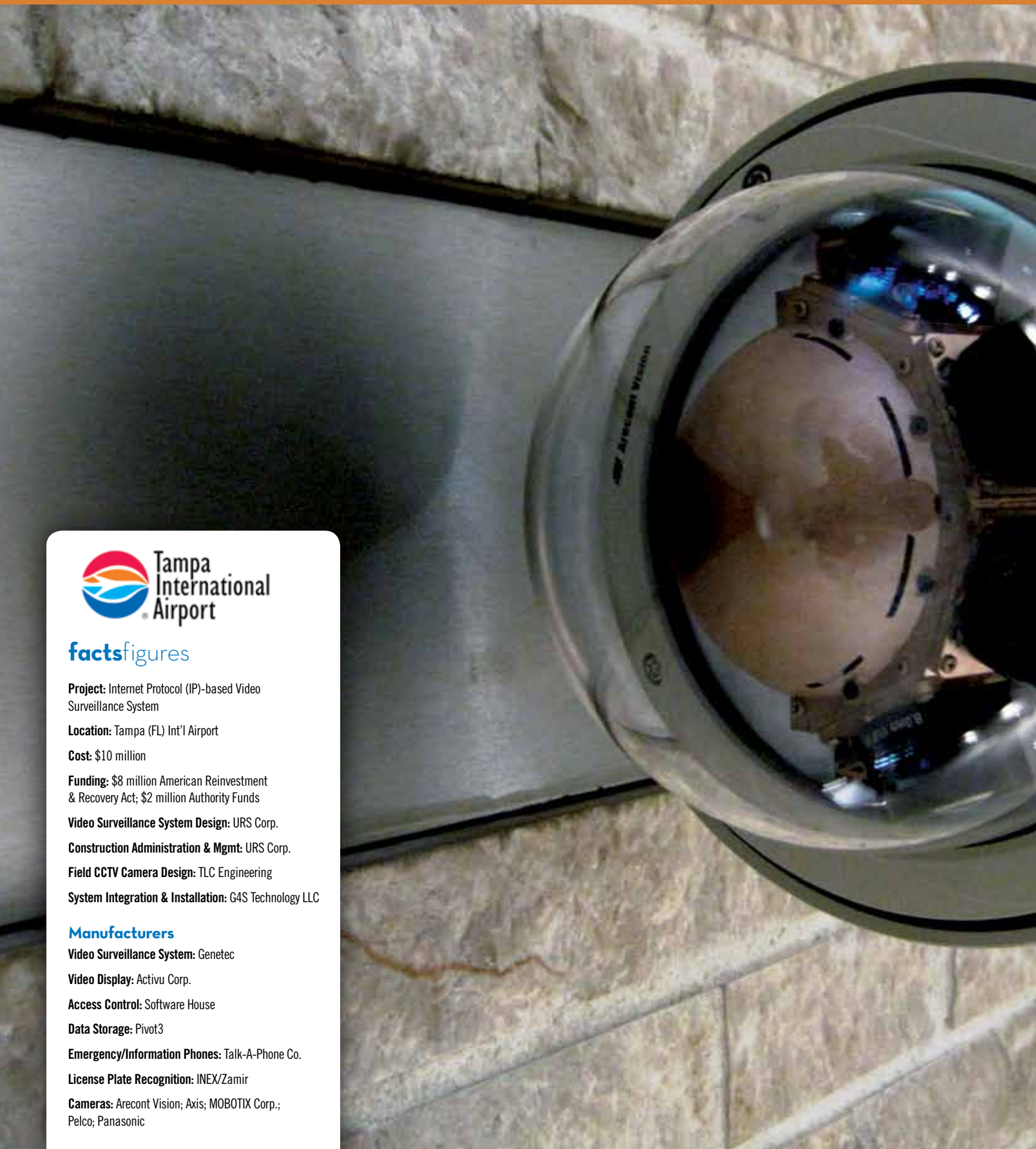
Tampa Int'l Installs New IP-based Video



Tampa International Airport

factsfigures

Project: Internet Protocol (IP)-based Video Surveillance System

Location: Tampa (FL) Int'l Airport

Cost: $10 million

Funding: $8 million American Reinvestment & Recovery Act; $2 million Authority Funds

Video Surveillance System Design: URS Corp.

Construction Administration & Mgmt: URS Corp.

Field CCTV Camera Design: TLC Engineering

System Integration & Installation: G4S Technology LLC

Manufacturers

Video Surveillance System: Genetec

Video Display: Activu Corp.

Access Control: Software House

Data Storage: Pivot3

Emergency/Information Phones: Talk-A-Phone Co.

License Plate Recognition: INEX/Zamir

Cameras: Arecont Vision; Axis; MOBOTIX Corp.; Pelco; Panasonic

Surveillance System

By Robert **Nordstrom**

Tampa International Airport (TPA) is seeing things more clearly these days, thanks to the recent installation of a new video surveillance system that virtually covers the airport from landside to airside. The $10 million project converted the airport's previous analog system to an enterprise-class Internet Protocol (IP)-based system, explains Safraz Samad, TPA's manager of access control and CCTV (closed-circuit television).

"In the terminal and on the airside, we cover every inch of public space," Samad reports. "We have very tight camera angles at the security checkpoints. We cover the entrance and departure drives, elevators, long-term and short-term garages, even our economy parking facility, which is on campus but a little bit offsite."

Crews completed the two-phase, 18-month project in April. The $8 million first phase included installation of surveillance equipment and infrastructure upgrades throughout the main terminal and airside. During the second phase, which cost approximately $2 million, crews installed cameras throughout the parking garages and upgraded the emergency telephones.

"Hanging a camera is the easy part," Samad informs. "The difficult part is getting the infrastructure in — laying conduit, pulling cable — designing a network to handle the increased load, programming software, installing hardware."

Camera positioning and range of view were optimized during recent surveillance upgrades at Tampa Int'l.

With the work complete, TPA is now reaping the rewards: "We've gone from a technology that gave us low resolution images to a high-resolution megapixel IP system with nearly complete CCTV coverage of the airport and surrounding areas," says Samad.

From 20 Gigs to More than 1 Million

URS Corp. provided detailed design for the CCTV enhancement project, including the video surveillance system headend and Ethernet network designs. It also provided overall construction administration and management. Subconsultant TLC Engineering was responsible for the field CCTV camera design, and G4S Technology installed the system.

Key design elements included an enterprise-class video surveillance system, upgrade of the airport's existing access control system to Software House's more advanced C-Cure 9000 and a regionalized storage area network (SAN) system. The 455 new Internet Protocol (IP) network cameras added resolutions ranging from 1 to 10 megapixels; 289 existing analog cameras were cutover to digital via high-density encoders. In addition, the Operations Center was upgraded with a new video display system, workstations and servers.

The airport's existing Ethernet local area network (LAN) was expanded to support the exponential increase in video data of the new surveillance system. To reduce the overall impact on the network, the SAN was regionalized.

Kevin **Richmond**

"One of our biggest concerns initially was the impact of all of this video data on the network," explains Kevin Richmond, senior security system designer for URS Corp. "The airport doesn't have a separate network for its security system, so we had to work under the constraints of its corporate LAN. To resolve this issue, we regionalized data storage within five regions throughout the airport. The only time video has to be moved through the core of the LAN is when an individual outside a region where data is stored requests access to archived video."

Each region stores data in a main distribution frame room, with Pivot3 vSTAC Watch™ appliances. Each room holds 10 stacked appliances that store and share data. Should one appliance fail, a redundancy feature triggers another appliance to pick up the load without interruption. The system was also designed to be expandable, to accommodate future camera/storage needs.

"In effect, we have an intelligent cloud storage system," Samad explains. "If I need to pull video, I merely access data stored within that region. Under the old system, if I wanted to pull a couple of hours of video, I'd just walk away from the computer and come back the next day. That's how long it took. Now I can bring up several days of video in an hour's time. We've gone from 20 gigabytes to over 1 petabyte of storage. That's equivalent to a million gigabytes. The new



cameras require huge amounts of bandwidth and storage. Our smaller cameras use up to 300 gigabytes a month."

Designers' efforts to minimize the impact of the new CCTV video surveillance system on the airport's LAN with regionalized storage and the system's overall architecture appear to be working. "We saw less than a 10% increase in overall bandwidth across the network core," Richmond reports.

Say "Cheese"

Megapixel cameras were strategically placed throughout the air operations, parking, restricted and public areas of the airport to enhance TPA's CCTV coverage. Four-imager 180- and 360-degree cameras were installed at specific heights to provide optimum fields of view, resulting in nearly 100% coverage of sterile areas. The new fixed-placement cameras allow security staff to forensically search archived video if needed.


Frank **Soltero**

The airport's image quality is also considerably better, notes Frank Soltero, senior security systems consulting engineer for G4S Technology. "These new megapixel cameras produce far more detailed images than what would have been possible with older analog camera tech-

Switching from analog to an enterprise-class Internet Protocol system dramatically enhanced image quality.



nologies," Soltero explains. "By switching out an analog camera with a megapixel camera, you're able to cover a much larger area with a single camera and capture exponentially more detail. You can go from recognizing there's a person in an area to being able to identify … facial details."

Using fixed cameras in lieu of pan/tilt/zoom (PTZ) cameras allows the airport to reduce maintenance costs while maximizing area coverage without losing data. When using PTZ cameras to monitor a very wide field of view, activity may be missed when the camera focuses on another area within the camera's range. Fixed digital cameras capture crisp, high-resolution images, explain the system designers. Some of the cameras support 180- to 360-degree views and consequently provide greater coverage and situational awareness. Both the 180- and 360-degree cameras require a single Ethernet connection to transmit video back to the Pivot3 video storage appliances, which substantially reduces the amount of supporting IT infrastructure required to deploy cameras.

Genetec Omnicast™ was installed to provide enhanced situational awareness and to record and manage streamed video across the airport's IP network.

"The Genetec system provides the airport with a state-of-the-art ability to capture significant events and build actionable cases if necessary," explains Soltero. "Security personnel can use Genetec's embedded video search and analysis tools to identify an event in a fraction of the time than would have been possible under the previous architecture."

In addition, the Pivot3 storage allows TPA to retain video far longer than before, he adds.

By integrating the Genetec VMS (video management system) with its new C-Cure 9000 access control system, the airport provides its operators with automated single-seat alarm notification, identification and verification. If, for instance, someone attempts to access a restricted area by using an emergency exit push bar, the access control system will transmit that alarm data as well as images from the associated camera to an operator's desktop.

Instead of having to dispatch security personnel to investigate every alarm, Samad elaborates, someone in the dispatch center can now view the event and make an educated decision as to the severity of the event: Was it an accident? Does the person have a badge? Did he or she swipe the card and hit the door too quickly?

"It helps eliminate those nuisance alarms that everybody in this industry is faced with," he summarizes.

Beyond Security

A cutting-edge video display system is at the heart of TPA's new surveillance equipment. The system uses off-the-shelf commercial servers and video cards to drive three large-format LCD display walls in the Operations Center and several discrete displays and a projection system in the Command Center.

Fully integrated with the VMS, the system encodes discrete video feeds from television tuners, media players and the airport's legacy train and monorail systems. The display allows for the creation of scenarios for different types of events. The scenarios can be preconfigured and triggered when needed to re-map the display system with images relevant to the event at hand. The system also displays bitmap images such as aerial photos, site maps, terminal maps and procedural checklists.

"It's kind of like a NASA command center," Samad describes. "In the Airport Operations Center, we have three huge video walls that we can partition as we wish."

Beyond security surveillance video, the displays also provide operational intelligence. "We can simultaneously look at what's happening in the airside areas, the ticket counters, the airport entrance and exit drives," Samad relates. "It facilitates our day-to-day operations by letting us know where we're getting backups, for example, so we can put people and resources where they are needed. By being able to visualize areas throughout the airport, we can understand it without having to explain it. As they say, 'A picture is worth a thousand words.' "

It's a Hit

From operations staff to security personnel, everyone at TPA seems to have good things to say about the new video surveillance system.

"Our airport police absolutely love the new system," Samad exclaims. "They are getting real-time and archived information when they need it. They are able to close cases faster because they are able to get the information more quickly.

"Our operations staff love it because they are able to access camera views on their desktop. They can zoom in on recorded or live video. Several people can look at images from the same camera but zoom into different areas of that image simultaneously. They can view it, manipulate it, even run basic analytics on the video. They can ask the system: 'Was something here five minutes ago?' and it will search for the video to let them know."

Richmond, who has been designing video surveillance systems for over 20 years, considers TPA's the nicest system he has ever designed. He further predicts that systems like it will become his new standard.

"The big thing is the camera coverage, storage and not being afraid of all of this video data," he elaborates. "If the system is designed right and implemented correctly, it will ride on the network and offer great coverage with high-quality video."

Richmond considers network infrastructure the key to supporting technology advances as they become available. He says that once the infrastructure is in place, owners can add cameras, update software and increase storage as needed, while feeling assured that they have a system that will serve their needs well into the future.

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High-Tech Video Displays Put Denver Int'l at Forefront of Digital Advertising

By Ken **Wysocky**

factsfigures

Project: Digital Advertising Program

Location: Denver Int'l Airport

Cost: $8 million

Funding: Clear Channel Airports

Components: Four 26-foot video tower displays, 100+ LCD screens, 8 ultra-thin bezel video walls

Projected Ad Revenue: $95 to $100 million over next 10 years

Ad Revenue Split: 67.5% airport; 32.5% Clear Channel

Equipment Manufacturers: Mitsubishi; Planar Systems

Timeline: Early 2012 - April 2013

A new digital video advertising program at Denver International Airport (DEN) is expected to boost the airport's ad revenue by about 40%, grossing $95 to $100 million over the next 10 years. A blend of advertising and custom content is displayed on an eye-catching array of large, high-definition monitors — the largest digital footprint of any North American airport, say DEN officials.

John **Ackerman**

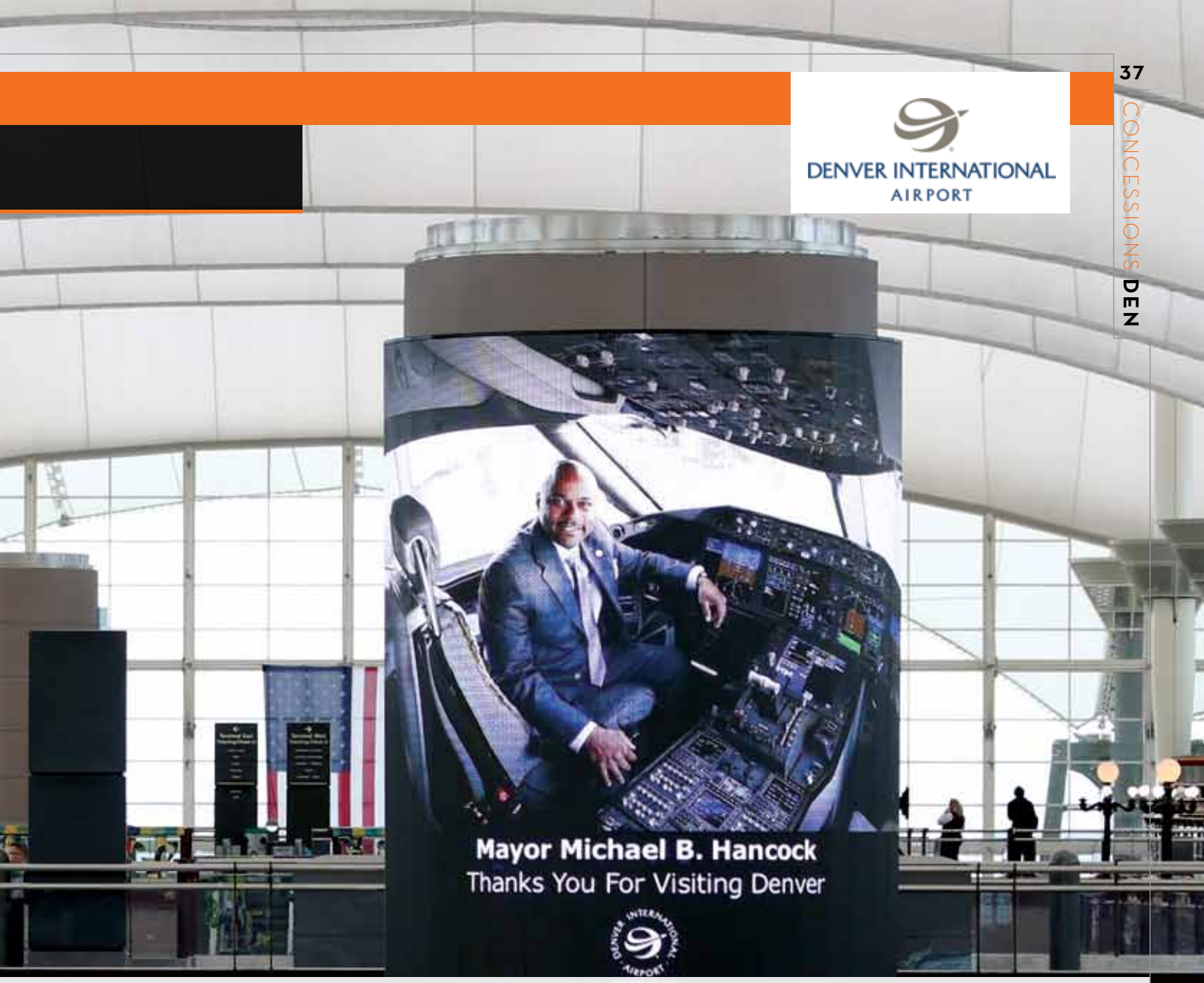
"Our new state-of-the-art advertising program gives businesses the opportunity to showcase their brands in new and creative ways to more than 50 million passengers a year," says John Ackerman, DEN's chief commercial officer. "We pump that advertising revenue right back into the airport."

Under the terms of a 10-year contract, Clear Channel Airports paid for the $8 million digital-platform installation and will receive 32.5% of the ad revenue it helps create. DEN retains the remaining 67.5% of ad revenue.

"We can essentially raise revenue three ways: borrow money, charge the airlines higher fees to land here and lease gates, and earn money from parking, advertising, food and beverage concessions," Ackerman explains. "We're trying to shift as much as possible into that last bucket and optimize revenue from non-airline sources.

"That, in turn, reduces the need to borrow money, and we don't have to charge airlines — which are very cost sensitive — as much. And if we charge airlines less, they may respond by adding more flights, which is good for the city, the region and our customers."

DENVER INTERNATIONAL AIRPORT



Extreme Advertising Makeover

The new equipment adds a Times Square-like visual flourish to America's fifth-busiest airport. Four 26-foot, high-definition Mitsubishi LED screens are mounted in the central Great Hall and nearly 120 LCD screens, made by Planar Systems, are spread through the airport. Four of the LCDs are 70-inch, freestanding units located throughout Level Six of the Jeppesen Terminal. Eight ultra-thin, bezel-video walls hang overhead on soffits — two each in the post-security areas of concourses A, B and C, and two more in the main terminal.

In baggage claim areas, 42-inch touch screens, made by Meridian Zero Degrees, replace older phone boards. Now, passengers can connect with restaurants, hotels and car rental companies with the touch of a finger. They can also send information from the system to their mobile devices.

The new displays replace about 250 individual media locations — primarily signs, banners, posters and the like.

Planning for the digital makeover began more than a year ago, as Clear Channel's advertising concessionaire contract with DEN neared the end of its 10-year term. The last significant upgrade to the airport's advertising program occurred in 1995, and officials wanted an upgraded ad platform to complement the facility's distinctive, award-winning architecture and design, Ackerman explains.

"Clear Channel wanted all their best technology in one place … to make it a showcase," he adds.

Ryan Kovalchick, director of digital media at Clear Channel, stresses the importance of attracting the attention of airline travelers and other airport guests. Just as sports fans expect bigger and better high-definition scoreboards at stadiums and other venues, tech-savvy passengers expect state-of-the-art, razzle-dazzle visuals at large airports, he explains.

"Entertaining passengers is important," says Kovalchick. "Digital advertising is more attractive to advertisers and more interesting for consumers — especially large-format advertising."

The four giant video screens in DEN's Great Hall serve as the centerpiece of the airport's new digital program and are the largest digital displays in any American airport, he notes. Each weighs about 3 tons,

Free Phone Service

Getting caught with a dead cellphone battery, or traveling without a phone, can be a formidable challenge — except for passengers at Denver International Airport (DEN). Under the terms of a 10-year digital advertising agreement with the airport, Clear Channel Airports and its partner RMES Communications installed about 280 landlines that provide free domestic and international phone service.

There's no time limit on local and national calls. International calls are free for the first 10 minutes, and then cost 25 cents per minute, plus a 15% tax. The program is supported by 15-second advertisements that run on 17-inch LCD video screens on a panel above the dialing pad of the corded telephones.

"Passengers can literally pick up a phone and dial France or Egypt — more than 190 countries around the world," explains John Ackerman, DEN's chief commercial officer. "While you make a call, you're watching ads on a video screen. We think it's really unique and novel."

While Ackerman acknowledges the ubiquitous use of cellphones, he considers the free landline service a valuable perk for customers who do not have a mobile phone, are traveling abroad or simply need to recharge their phone's battery.

"This is another example of how we continuously look for ways to enhance the customer experience and provide world-class service," he adds. "This service offers travelers the ability to call most areas of the world for free, connecting customers with loved ones and business partners around the globe."

and is attached by custom-made 3/8-inch steel mounting brackets, bolted on through the 6-inch-square steel tubing that supports the elevator infrastructure. The bottom edges of the giant screens are 20 feet above the hall floor.

Each of the towering screens is actually comprised of 120 smaller high-definition monitors; sleek, beveled edges on each monitor create the visual impression that the collection is one giant screen, explains Leah Older, DEN's director of commercial operations and analysis.

Similarly, the ultra-thin, bezel-video displays that hang on soffits are formed, puzzle-like, from smaller LCD screens. The number of screens varies according to the size of the soffit.

While the four tower screens display the same content simultaneously, other screens scattered throughout the airport can broadcast different content at the same time. The four tower screens run one-minute loops of advertising that contains six 10-second spots, followed by 30 seconds of visually soothing video art, such as scenic landscapes and experimental videography, Kovalchick explains.

"We've commissioned art by blue-chip video artists, and we also display public-service announcements and tourism information," Ackerman adds. "People are reacting well to it, because it's not just static advertising messages. It's dynamic and active."

Before the new digital displays were installed, about 98% of DEN's advertising was static, he relates. "The newer approach is more interesting for consumers, and it catches their eyes and delivers messages more effectively, which is the whole point of advertising."

Non-advertising content can be customized to individual markets, notes Kovalchick. Louis Armstrong New Orleans International Airport, for example, features segments about Louisiana cuisine. At Dallas Love Field, messages highlight the area's western history.

"This approach gives airports something of their own — helps them feel invested in the program," he explains. "And as an added benefit, it turns passengers into tourists by motivating them to go out and explore the community."

Clear Channel recommends using positive programming in between ads, so passengers aren't bombarded with negative messages, such as newscasts that often contain downbeat information.

"We wanted programming that enhances the aesthetics of the facility — digital art that creates a soothing, ambient feel in between the advertising," Kovalchick says.

Less Ads, More Revenue

In designing the new advertising approach, DEN and Clear Channel took care not to overwhelm passengers with a dizzying volume of messages. In fact, the airport reduced its advertising locations by 30%, reports Ackerman.

"The whole point of ads is to get people to absorb a message," he explains. "We didn't want visual clutter, so we reduced the amount of advertising. What's left is more valuable to advertisers, so we can charge a higher price. It's basically quality versus quantity."

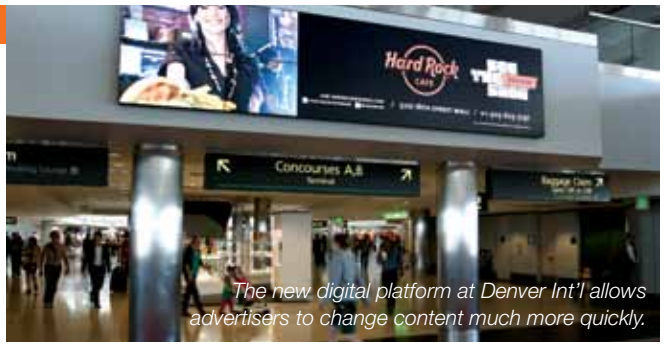
The less-is-more strategy appears to be working. Although DEN is running fewer overall messages, advertising revenue for the first half of this year is running ahead of last year — and the program isn't fully implemented, Ackerman notes.

The new digital format also allows advertisers dramatically more latitude to adjust their messages. Previously, with printed banners and posters, it took a month or two to change a campaign. But with digital media, it can occur much more quickly — "with the click of a computer key," is how Ackerman describes it. The new speed allows advertisers to be nimble and offer fresh, new messages that are more immediately relevant to consumers, he explains. And eliminating the printing of vinyl posters and banners allows the airport to offer advertisers a more eco-friendly medium.

"We also can create a dominant ad package for a specific portion of the airport," Older adds. "For example, if Southwest Airlines wants ads in a specific security area, we can do that. It's very easy with a digital platform."

Hassle-free Project

Although DEN's massive makeover left virtually no part of the airport untouched, officials say it progressed smoothly without any major setbacks. Much of the work required installation of additional data cables throughout the airport, so Clear Channel coordinated contractors and scheduled work to occur in stages to minimize loss of concession revenue and reduce passenger inconvenience, Older notes.



The new digital platform at Denver Int'l allows advertisers to change content much more quickly.

DEN engineering teams worked closely with Clear Channel, particularly on the details of attaching the four large LED screens to the Great Hall elevator towers. "It wasn't just a matter of using four drywall anchors," Ackerman quips. "A lot of engineering went into that."

At the mid-point of its new 10-year contract, Clear Channel is required to pay for refurbishing the digital program's hardware, which has a useful life expectancy of five years, Kovalchick notes.

"We believe we'll see more of these (digital advertising platforms)," he says, noting that the company is talking with other major airports about upgraded programs. "It makes a lot of sense for airports. We see it as a trend."

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Salt Lake City Int'l Welcomes New Light Rail Line

By Dan **Vnuk**

A new light rail link connecting Salt Lake City International Airport (SLC) to the downtown of Utah's capital city opened recently, making it easier than ever for passengers to get to and from the airport. The $350 million extension whisks passengers to the Welcome Center that connects to the south end of Terminal One.

The new TRAX light rail line includes six miles of ballasted and imbedded double track that runs in separate rights-of-way for some stretches and in-street along roadways for other sections. The initial schedule has trains leaving SLC every 15 minutes, with projected ridership reaching 14,000 daily passengers by 2030.

The new link is part of the Utah Transit Authority's Front Lines 2015 program. The six-mile light rail line extends the existing TRAX system from downtown to the airport and provides a direct transfer from a station on top of a newly renovated viaduct to FrontRunner commuter rail, which serves commuters from Ogden to Provo. There are six stations along the route, plus a station and Welcome Center just outside the airport's Terminal One. Passengers can ride from downtown to the airport in about 20 minutes.

The Airport TRAX line began regular service in mid-April and is part of the transit authority's existing Green Line. Special features include art projects at each station and power poles in 23 different colors that create a "ribbons of color" gateway to the city. The spur's biggest feature, however, is the convenience it offers air travelers.

Fast-track to Ticketing

Utah Transit Authority officials are excited about the ease its new link provides passengers. "You get off the train, walk into our Welcome Center, go around the corner — and, boom, you are at the JetBlue ticket counter," enthuses Project Manager Jim Webb.

One section of the new TRAX line also includes bicycle lanes. Soon, it will be what Salt Lake City Mayor Ralph Becker refers to as the city's first "complete road" — a thoroughfare designed to accommodate mass transit, cars, bicycles and pedestrians.

"We are thrilled with the way the new extension of our Green Line to the airport has turned out, and it has been well-received," reports Mike Allegra, general manager for the transit authority. "People who have used it have given us some wonderful feedback. And if early ridership numbers are any indication, the service is everything we hoped it would be."

The global firm of Hatch, Mott, McDonald was the lead systems engineer for the SLC project. As such, it provided traction power design and simulation to validate substation requirements

Salt Lake City Department of Airports

factsfigures

Project: Light Rail Link

Location: Salt Lake City Int'l Airport

Connection Point: Terminal One

Cost: $350 million

Funding: Utah Transit Authority

Departure Frequency: Every 15 min.

Daily Ridership: 14,000 by 2030

Lead Systems Engineering Firm: Hatch, Mott, McDonald

and spacing, overhead contact system engineering and design, communication system design, signals engineering, systems design and integration, combined ductwork design and construction engineering support.

City Airport

Located just five miles northwest of downtown Salt Lake City, SLC is one the closest airports to its city center anywhere in the United States. In addition to being a major hub for Delta Air Lines, it has a strong presence from Southwest Airlines. In total, seven major U.S. airlines serve the two-terminal, five-concourse airport. Last year, SLC served 20 million passengers.


Maureen **Riley**

"We are pleased to be able to offer airport users another transportation option," comments Maureen Riley, executive director of the Salt Lake City Department of Airports. "It is exciting to have an additional component of an integrated transportation system develop."

While airport rail links have been popular in Europe and Japan for decades, they're relatively new in North America. Riders enjoy the faster travel time and easy interconnection with other public transport they provide, and cities benefit from less highway and parking congestion, less pollution and additional business opportunities. The transit links benefit airports by drawing in more passengers via easy access. For airports built within or close to the city limits, extending rapid transit or light rail to airport terminals allows full integration with other public transport in the city.

More Connections

Given the many benefits of linking light rail or other mass transit systems to airports, a variety of cities have projects in the works or under consideration: Sacramento, Oakland, Dallas, Ft. Worth, Phoenix, Denver, Jacksonville and Washington, D.C.

Las Vegas officials have been discussing extending the famous monorail that runs throughout "the Strip" to McCarran International Airport, and the city's still-in-the-planning-stages reliever, Ivanpah Valley Airport, is projected to include high-speed rail service. XpressWest, a privately funded venture backed by a Las Vegas hotel developer, hopes to connect the new airport in Primm, NV, to Las Vegas, some 30 miles away, in addition to shuttling passengers to and from California.

Even more futuristic is an ultra-high-speed magnetic levitation line, which is proposed to connect Las Vegas and Anaheim, CA, with a station located in Primm. Top speed of the Maglev train is projected at more than 300 miles per hour.

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Delta Air Lines Expansion Brings New Customers & Concessions to JFK's Terminal 4

By Robert **Nordstrom**

factsfigures

Project: Terminal Expansion & Redevelopment – Phase 1

Location: John F. Kennedy Int'l Airport, Terminal 4

Key Elements: Inline baggage system; 9 new wide-body gates; consolidated security checkpoint; redeveloped post-security concessions; new baggage carousels; expanded Customs and Border Protection areas; indoor taxi stand; Terminal 3 demolition

Terminal Manager: JFK IAT

Anchor Tenant: Delta Air Lines

Cost: $1.2 billion (Phase 1)

Funding: Tax-exempt public bonds; passenger facility charges; Delta-backed New York City tax-exempt public financing; TSA grant

Architect of Record: Skidmore, Owings & Merrill

Delta Sky Club Architect: Corgan Associates

Design Team: SOM/ARUP JV

General Contractors: Lend Lease; TBL Construction; Turner-Scalamandre JV; Sweet Construction

Concessions: DFS North America; Hudson Group; SSP Americas

IT/Electrical: Unity Electric EJ Electric; GMA Electrical Corp.

Inline Baggage System: Vanderlande Industries

Electrical (inline baggage system): GMA Electrical Corp.

Millwright (inline baggage system): LMC Industrial Contractors

Controls Design (inline baggage system): Brock Solutions

Gearmotors: SEW EURODRIVE

Security Monitoring: Diebold

Next: Phase 2 will add 11 regional jet gates & 75,000 sq. ft. to Concourse B at an anticipated cost of nearly $200 million

This is the second installment of a two-part series about the expansion and redevelopment of Terminal 4 at John F. Kennedy International Airport (JFK). It highlights the concessions and other passenger services added as Delta Air Lines assumes its new role as the terminal's anchor tenant. See our May/June 2013 issue for Part 1 of the series, which described infrastructure preparations for the expansion.

In late May, Terminal 4 at John F. Kennedy International Airport (JFK) celebrated the opening of its newly expanded and redeveloped Concourse B, including nine new and seven renovated wide-body gates for Delta Air Lines, the terminal's new anchor tenant.

Other primary elements of the $1.2 billion project include a new inline baggage system, centralized passenger security checkpoint, redeveloped post-security concessions and a new Delta Sky Club. The recently enhanced Arrivals Hall now includes a new domestic baggage retrieval area, expanded customs and border protection facilities and ground transportation. In total, ½ million square feet of space was added to the terminal.

With its expanded presence in Terminal 4, Delta discontinued operations in Terminal 3, which will be demolished in the future. The airline also continues operating out of Terminal 2 through its seven mainline gates and 13 outside parking positions for regional jets.

"With the nine new gates, we are able to consolidate all of our transcontinental flights and all of our international departures into one terminal," explains Henry Kuykendall, Delta Air Line's vice president of airport customer service. "Our passengers will now have a dedicated terminal to fly into and out of rather than having to go to one of three terminals."

In Phase 2 of the expansion project, Delta will add 75,000 square feet, encompassing 11 new regional jet gates adjacent to the nine new wide-body gates on Concourse B to replace its Terminal 2 hardstand operations. Phase 2 is scheduled to begin this summer and end in 2014.

"We're moving our RJ (regional jet) operations to Terminal 4, so passengers won't be on the tarmac anymore," Kuykendall reports. "We will still have seven mainline gates in Terminal 2, and after we move the RJ operations, we're planning to add three more jet bridges, which will give us a total of 10 gates at Terminal 2."

Henry **Kuykendall**

Concessionaires look forward to increased revenues in their new post-security locations.

Delta Plants Flag in New York

The expansion and redevelopment of Terminal 4 is the result of agreements among the Port Authority of New York and New Jersey, Delta Air Lines, JFK IAT (which operates the terminal) and Schiphol USA (JFK IAT's parent company) to make Delta the anchor tenant of Terminal 4.

Throughout the past decade, Delta has invested heavily in operations throughout the New York City region. The airline is the city's fastest growing carrier and provides service to more destinations from New York than any other carrier. With the completion of the Terminal 4 project, Delta's total economic contribution to the state is expected to be more than $19 billion annually.


Janice **Holden**

Terminal 4 passenger volume is projected to increase dramatically, indicates Janice Holden, JFK IAT's vice president of airline relations and corporate communications. "With Delta operating out of five gates in 2012, we moved approximately 10.6 million passengers through Terminal 4. That number will increase to around 15 million as early as 2014. This is all the result of Delta expanding its operations in Terminal 4."

The Concourse B expansion features nine new gates and 346,000 square feet of additional space as well as renovation of 122,000 square feet on seven of the concourse's existing gates.


Alain **Maca**

Under the previous business model, with Terminal 4 as a common-use facility, the largest tenant typically generated 5% to 7% of overall business. Under the new model, with Delta as anchor tenant, Delta will represent as much as 60% of Terminal 4's capacity, reports JFK IAT President Alain Maca.

Post-Security Concessions

One of the most significant structural changes at Terminal 4 is the consolidation of two passenger security check-

When construction is complete, Terminal 4 will include 16 new and expanded food/beverage concessions.

points at the third-floor entrances to Concourses A and B into a single, centralized checkpoint on the fourth floor.

Under the old configuration, most of the concessions were located before the security checkpoint. Now, passengers can move through the new fourth floor checkpoint, then proceed to the third floor to shop and dine without having to worry about clearing security in time to catch their flights.

DFS North America's 12,000-square-foot duty-free shops form the centerpiece of the hall. Ed Midgley, JFK IAT's vice president of concessions management, describes the change: "When you descend from the fourth floor, the first thing you see is the duty-free shops, with offerings of beauty products, alcohol and tobacco and fashion merchandise. Immediately, you sense that you're in a vibrant retail environment. Attached to the hall are the two concourses. But with that initial descent, you're through security, relaxed and in a different mindset."

Ed **Midgley**

DFS North America Managing Director Polly Nelson considers pre-security concessions an outmoded approach for any retailer, and downright problematic for duty-free shops.

"The principal benefit of the new configuration is additional passenger dwell time," Nelson explains. "When 'departure anxiety' fades, shopping and dining move to the forefront. We expect to pick up at least 20 to 30 minutes of additional shopping time, which we're confident will yield a nice increase in per-passenger spending."

In addition to the duty-free store in the main hall, DFS operates a full-service shop on Concourse A and three traditional retail spaces on Concourse B, including a Jo Malone fragrance store and MAC cosmetics location.


Polly **Nelson**

"It is a privilege to continue our long-term relationship with JFK IAT during this historic expansion," notes Nelson. "Our relationship began with modest pre-security duty-free facilities when Terminal 4 opened in May 2001, and we've been very pleased to now introduce new state-of-the-art, post-security duty-free facilities that will enable us to offer the world's leading brands to Terminal 4's existing passengers as well as all the new Delta passengers entering the terminal."

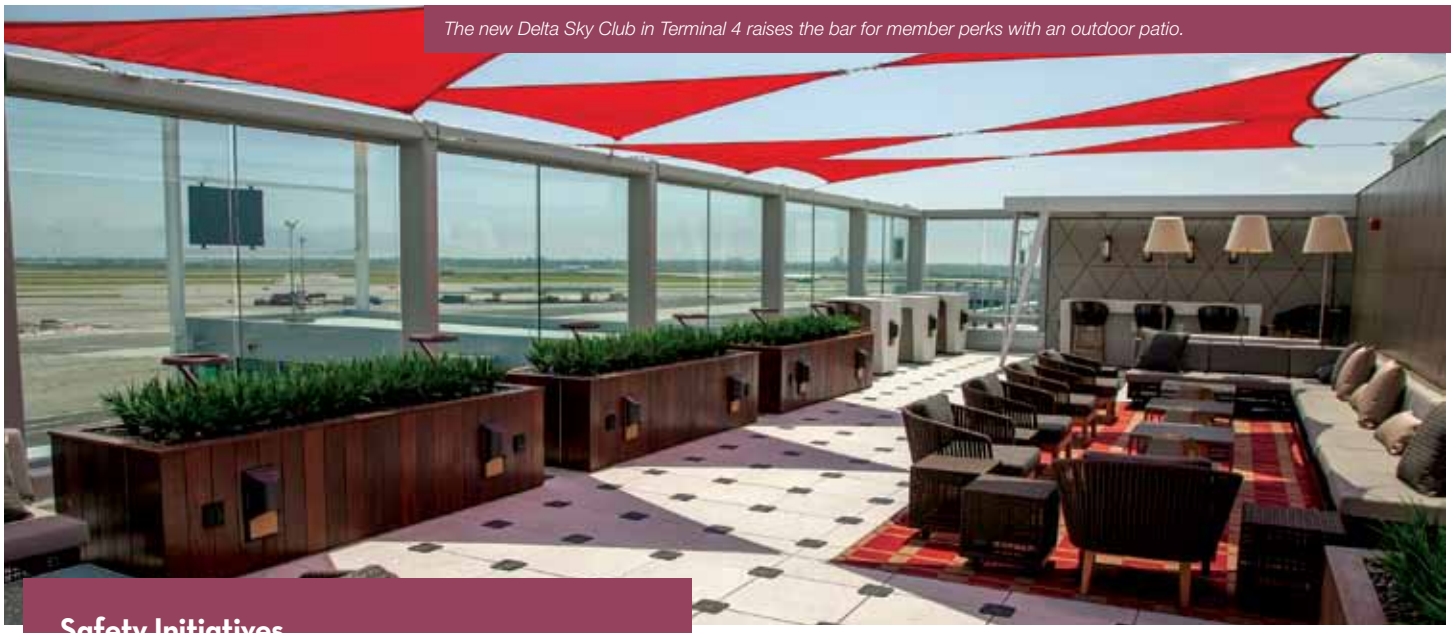
Additional retail options flank both sides of the duty-free centerpiece. Hudson Group, which has had a strong presence at Terminal 4 since 2003, increased the number of stores it operates from 10 to 14. The expanded lineup features seven new Hudson travel essentials stores, a Discover New York souvenir shop and five new specialty shops: Michael Kors, Coach, Thomas Pink, Solstice and Victoria's Secret.

The stores are scheduled to open in three phases between May and October.

Hudson Group President and CEO Joe DiDomizio is impressed with the Terminal 4 changes: "I am grateful to JFK IAT's management for having the confidence in Hudson to allow us to play a major role in this dynamic project."

SSP, which operates the food and beverage concessions at the airport, has invested $28 million into new locations, directly on the heels of approximately $16 million in renovations three years ago. While the signature restaurants opened in late May, construction of the remaining food and beverage facilities will not be complete until later this year.

SSP Executive Vice President Pat Murray chronicles some of the concession company's new food and beverage concepts on Concourse B: "(We) partnered with award-winning Chef Marcus Samuelsson to open Uptown Brasserie, serving classic American favorites in a stylish restaurant setting. And soon to follow will be



The new Delta Sky Club in Terminal 4 raises the bar for member perks with an outdoor patio.

Safety Initiatives

One of the ways JKF IAT prepared for Delta's move into Terminal 4 was launching a safety awareness campaign early in 2011. With a dramatic increase in travelers moving through the facility, ensuring the well-being of passengers, visitors, employees and tenants became a top priority, explains Barbara Margulis, JFK IAT's vice president of safety and performance.

The initiative is structured to enhance awareness of job safety and hazard prevention by creating a "safety culture" throughout the terminal. The program includes a Safety Risk Management system (SRM) designed to identify hazards before they occur. The system and its methodology provide tools to identify processes requiring safety analysis and mitigation of potential risk.

The campaign encourages all employees working at Terminal 4 to be aware of safety issues, to report safety-related incidents immediately and to share suggestions and ideas about eliminating risks and improving safety.

The Safety Sentinel, JFK IAT's monthly newsletter, addresses safety-related topics and announces the Safety Employee of the Month, who receives a $50 reward for promoting safety within the terminal.

Every JFK IAT employee at the terminal, from top management to frontline staff, must participate yearly in safety training. Employees learn general safety guidelines, how to evacuate the building and strategic housekeeping practices. As part of the CPR Heartsaver Program, all JFK IAT employees are instructed and certified for operation of the automated external defibrillators (AEDs) located throughout the terminal.

In addition, two safety training sessions are offered each month to terminal partners, including airline employees, concessionaires and subcontracted security staff. AED training is also offered to Terminal 4 tenants and contracted employees.

"There are many ways — small and big — to prevent injuries and make a terminal safe," explains Margulis. "But it takes focus, ownership and discipline to make safety a priority for everyone. We engage the employee community from our organization as well as every employee who works at the terminal to create and maintain a safety culture."

another great concept with Samuelsson, Street Food, featuring an eclectic mix of food from around the world. Our new program has also debuted Shake Shack, by the renowned chef Danny Meyer, which has a cult-like following in the New York area. These are all airport firsts in the U.S."

When construction is complete at the end of the year, Terminal 4 will present travelers with 16 new and expanded food and beverage establishments. Options range the gamut from national and international brands to local and proprietary concepts.

SSP expects sales to double with the increased enplanements Delta's move into Terminal 4 will bring.

Pat **Murray**

"In 2012, the last year before sales were affected by construction work, we grossed $35 million," Murray reflects. "In 2014, we project $65 million in sales. We look at this (Terminal 4) as one of the best airport development projects in the world. For us, this is as cool as it gets."

Outdoor Terrace

Terminal 4's new Delta Sky Club, located on the second floor at the entrance to the Concourse B extension, is the airline's flagship club. At 24,000 square feet, it's also the largest. In addition to a VIP room, café and full-service bar, it also includes Delta's first-ever outdoor Sky Deck.

"It's absolutely gorgeous," enthuses Kuykendall "Passengers can get outside to get some air, hear the airplanes taking off and landing. They have panoramic views of the airport and Jamaica Bay."

Jay **Liese**

Jay Liese, architect and principal with Corgan Associates, agrees: "It's a lovely space with great views. It has shaded areas and large seating arrangements for conversation. It's really an extension of the club into an outdoor space."

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By Jennifer **Bradley**

Super Bowl Accelerates & Expands Runway Improvements at New Orleans Lakefront

NEW ORLEANS LAKEFRONT AIRPORT

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Project: Runway Pavement & Safety Marking Improvements

Location: New Orleans Lakefront Airport

Cost: $868,565

Funding: 2 FAA grants

Airport Owner: Orleans Levee District

Airport's Managing Sponsor: Non-Flood Protection Asset Mgt. Authority

Engineers: URS Corp.; Design Engineering

General Contractor: Hi-Lite Markings

Length of Primary Runway: 6,880 ft.

Rubber Removed: 300,000 sq. ft.

Sealant & Pavement Conditioner: RejuvaSeal

Amount Applied: 115,000 sq. yds.

Aug. Annual Operations: 75,000

Based Aircraft: 159

Super Bowl Traffic: 500 aircraft

Long before football fans knew it would be the Ravens and 49ers facing off at Super Bowl XLVII in New Orleans, the FAA and New Orleans Lakefront Airport (NEW) began preparing for the increased air traffic the big game would bring. In early 2012, the FAA sent its Super Bowl team to scout the airport that would support general aviation traffic for the February 2013 event.

Andy **Velayos**

The agency's dedicated Super Bowl team is charged with reviewing the most-traveled airports for football's marquee event to flag issues that could potentially cause problems, explains Andy Velayos, lead program manager for the FAA Airport Districts Office. "What came to the top immediately at Lakefront was the issue with incursions," he says.

With planning beginning in March 2012, major pavement and safety renovations were finished earlier this year, right before the pre-game excitement began to build. The entire project was completed in less than one year, and NEW served 500 additional aircraft during Super Bowl season — more than triple its population of based aircraft.

Dave **Smith**

These days, the airport's deviation stats are better than ever. Since the project, there has been only one deviation at NEW, and it wasn't related to airfield markings, reports Dave Smith, NEW's airport operations manager.

The timing of the Super Bowl returning to New Orleans couldn't have been better, says Velayos, because it was an opportunity for NEW on many levels. The airport had just begun working to earn back its Part 139 certificate after voluntarily surrendering it following extensive damage from Hurricane Katrina in 2005. "If we could get them up and running at 139, it would be the safest an airport can be," he explains.

A special FAA team scouted the airfield at New Orleans Lakefront Airport about one year before Super Bowl XLVII.

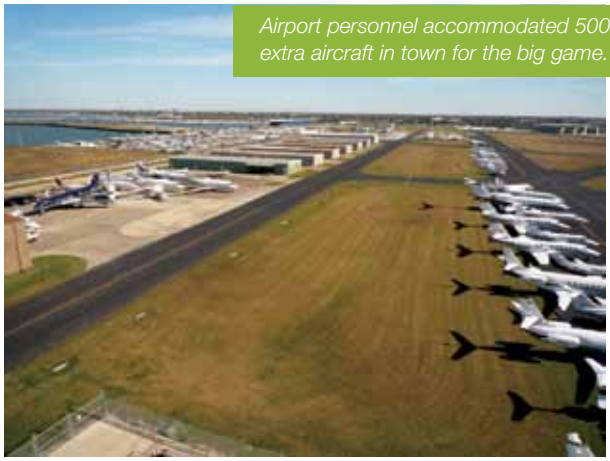
While NEW has yet to clear all of its certification hurdles, the recent runway safety improvements helped propel it toward that goal.

Third Down

Built in the 1930s, NEW was dedicated as the "Air Hub of the Americas" and the first major airport in its region. Since then, three new runways were built to service private, corporate, military and commercial aircraft; and a new FAA control tower was constructed in 1988.

Fred **Pruitt**

Prior to the recently completed improvements, its main 6,880-foot runway was in need of repair — specifically rubber removal and sealcoating to protect its drying pavement, explains Airport Director Fred Pruitt. A basic runway/taxiway rejuvenation already in the planning stages became a much bigger undertaking when the FAA found three safety hotspots on one of NEW's taxiways during its Super Bowl inspection, Pruitt recalls. Officials were concerned that although local pilots know the airport



Airport personnel accommodated 500 extra aircraft in town for the big game.

intimately, transient pilots would be confused by the directions around the grounds.

URS Corp. and Design Engineering were drafted to help design the solution. Fixing the three hotspots, one at each end of the southern taxiway and another in its center section, was added to the scope of the original project, notes Tim Gaines, URS engineer of record.

The taxiway, which heads west to Runway 36L, used to change names at the very end, from Taxiway F to the parallel Taxiway B. "This seemed to confuse pilots severely," Pruitt acknowledges. The engineers changed the layout so that Taxiway F now reaches all the way to the end of the runway. Designers also added a non-movement line around the edge of the ramp, to make the delineation more apparent to pilots.

Velayos credits local air traffic controllers and FAA Part 139 Inspector John Dougherty as key components in the plan. The controllers, he explains, were quick to ask for improvements in the field's phraseology and faded markings. Dougherty, he adds, quickly devised a solution after he experienced the airfield situation firsthand when piloting an aircraft into the airport.

Before Dougherty's visit last May, the FAA performed a "paper study" of the incursions, analyzing the reasons for the three hotspots. In retrospect, it was essential to have all the data on paper and consider potential fixes before the FAA's visit, Velayos reflects.

Remove, Rejuvenate, Reconfigure

From a construction standpoint, rubber removal was the biggest portion of the project, says Rhonda McNeely, vice president of sales for Hi-Lite Markings. Rubber buildup causes a runway to become slippery, she explains, and fully 300,000 square feet was removed from NEW's runway.

The pavement on the runway was also crack-sealed and rehabilitated with 115,000 square yards of RejuvaSeal. Using a product that penetrates the pavement and binds it back together saves airports money, explains McNeely. "A lot of airports don't have money anymore to resurface," she says. "They can easily get eight to 10 more years out of their asphalt if they rejuvenate it."

In addition to applying a standard sealcoat to the north end of Taxiway B and repairing cracks on the parallel taxiway and terminal apron, Hi-Lite crews also removed and repainted marking throughout the airfield, especially on the runway and high-traffic taxiways. "When the paint builds up, it starts cracking," says McNeely.

It's a "huge issue" if pilots can't see the intersections, she explains; so crews enhanced taxiway centerlines and added surface painted hold short signs. The enhanced centerlines for taxiways are also a new requirement for Part 139 certification.

New markings were added to match the operations for various aircraft classifications, and reflectors were added to enhance non-usable pavement, chronicles Gaines. Some taxiway lights were also removed, and signage was relocated or renamed to match the airport diagram.

Bub McNeely, vice president of project management for Hi-Lite, says that the electrical aspect of the project grew as a sizeable number of change orders were added. Once the safety measures were added to the scope, additional signs needed wiring and reinstalling, and a major electrical job ensued, he recalls.

Much of the work on one hotspot was achieved by narrowing it from 200 feet wide to 50 feet, explains Smith. Non-usable pavement was closed with markings, and some was painted green to resemble grass, notes Velayos. While these measures were originally taken on a test basis, the pavement is now slated for removal because of the results the airport has seen in eliminating deviations at that spot.

Consulting local pilots about possible solutions for the intersection was very helpful, notes Velayos. It also helped the pilots understand and accept the changes, he adds.

Team Effort

Coordination between the designer, contractor, airport and FAA was crucial to ensure efficiency — especially when the project turned from a mere pavement rehab to a full-blown safety initiative. "Safety is paramount to the FAA, so they get pretty involved," recalls Gaines.

An 18-person crew from Hi-Lite worked around the clock, for nine days straight at one point, to get the job done. Bub McNeely, who ran the on-site crew, characterizes the job as "very challenging." Although airport tenants were initially concerned about the duration of the project, they were pleasantly surprised in the actual time it took Hi-Lite to finish, he notes.

Pre-Super Bowl airfield improvements included rubber removal, crack repair, sealcoating and new pavement markings.

Tina Wilson, URS' onsite engineer during construction, commends the contractor for dealing with challenging schedules during Thanksgiving and Christmas, noting that 24-hour workdays helped reduce the runway closure. "Hi-Lite did an excellent job, completing the project in about half the (anticipated) time," adds Gaines.

Between lost fuel sales and the inability of some corporate jets to land on NEW's parallel surface, Pruitt says the 12-day runway closure "moderately" affected airport business.

Super Bowl or not, the airfield improvements would have been completed, says Gaines. The big game simply shifted the scope and timing of the projects. Importantly, he adds, the work has removed hotspot tags from the airport maps pilots use to make their landing plans. "Now that we've improved them, it's a safer, better laid out environment for the general aviation population," Gaines summarizes.

With airfield improvements complete, commercial service will return to NEW this summer for the first time since 1946. Memphis-based Southern Airways Express plans to offer three or four flights daily from the airport in nine-passenger aircraft, beginning in late June.

Elsewhere on the airport, the newly constructed Bastian-Mitchell Hangar with 43,000 square feet of hangar, office and shop space will be available for long-term lease in July. The 29,000-square-foot James Wedell Hangar office and shop space will be available for long-term lease in fall.

The newly restored Art Deco terminal will be completed later this summer, bringing the total amount of post-hurricane improvements to more than $80 million.

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Orlando Int'l Battles Full-scale Emergency (Exercise)

factsfigures

Project: Full-scale Emergency Exercise

Location: Orlando Int'l Airport

Participants: 600 volunteer victims; 400 first responders; 16 hospitals

Cost: $100,000

Funding: Urban Areas Security Initiative Grant

Exercise Initiator & Manager: East Central Florida Regional Planning Council

Site: Airport Training Facility

Airport Equipment Dispatched: Mobile command post; 2 ARFF units - Oshkosh (Striker and T3000 models) Mobile Command Post - Grumman Olson, Air Stairs - Stinar Corp.

Exercise Scenario: An Airbus A-320 carrying 93 passengers and 5 crewmembers crashes into a hotel one mile from the airport. In addition to including standard response elements such as patient triage & hazard identification, the off-site scenario also included the transfer of incident command to the jurisdiction of non-airport entity & area hospitals' surge capabilities.

In March, Orlando International Airport (MCO) hosted the largest full-scale emergency exercise in Florida history. The four-hour training event included more than 1,200 participants — 600 volunteer victims, each with a specific injury; 400 first responders from four different counties and multiple agencies; and staff from 16 hospitals throughout the region.

At most full-scale emergency exercises (FSEs), the airport emergency responders take the lead and usually include local fire departments. Sometimes airline personnel, business partners, tenants and local community members are invited, too.

MCO took a different approach this year, with a scenario involving an Airbus A-320 that experiences hydraulic problems and crashes into a hotel while on a short final return to the airport. Because the scripted crash "took place" one mile away from the airport and included an aircraft carrying 93 passengers and five crewmembers, the exercise tested two key elements: area hospitals' surge capabilities for a mass casualty accident and the transition of incident command to the jurisdiction of an off-airport entity.


Duane **Kann**

Evaluating the effects of patient surge was one of the biggest benefits to participating in the FSE, notes Duane Kann, fire chief for the Greater Orlando Aviation Authority. "We wanted to test off-site response to evaluate how the airport fit into the local community response plan instead of how they fit into ours," Kann explains.

"We also wanted to gain a better understanding of transport times.

By Kathy **Scott**

This meant assessing turnaround time during a mass casualty incident: triaging and treatment at the incident site, loading patients into air and ground transport units, off-loading the patients at selected hospitals, and then returning back to the airport for more victims.

"The turnaround times allow a matrix to be developed to determine how many patients can be taken to each of the 16 area hospitals per hour and how many units would be needed depending on the number of patients."

This is Not a Drill

FSEs are designed to come as close to real disaster response as possible. In order to satisfy FAA requirements, all airport emergency plan functions must be exercised to assess the capabilities of the plan and personnel. In addition, response teams must coordinate with federal, state and local agencies, and activate the airport's Emergency Operations Center (EOC). During MCO's March FSE, the city of Orlando's EOC was also activated, so it and the airport EOC communicated via video link to share information.

In contrast, an airport emergency drill focuses on a single operation and exercises only.

The more comprehensive FSE that MCO participated in evaluated:

- on-site incident command
- communications
- victim rescue, decontamination, triage and treatment
- hazard identification
- responder safety and health
- site security and crowd control
- management of friends and family
- media relations
- transport to medical facilities
- surge capacity of medical resources at local hospitals

A number of "injects" were also used to move the exercise down a controlled path and introduce additional elements to the FSE. One injected false information via social media and Internet sites that suggested a terror attack brought the plane down. This set in motion joint information center activities to quash the rumor and establish a unified message from all the entities involved.

Other injects involved injuries to firefighters during victim extrication to assess the capabilities of responders to help their own.

Dual Duties

Although the scenario script described the crash occurring one mile away from the airport, the exercise actually took place at MCO's on-site training facility, which includes a classroom, four-story burn building and three aircraft – passenger and cargo.

"Having an on-site training facility provides us with a tremendous advantage, allowing for training in a multitude of disciplines to prepare for the FSE. The training facility also provides valuable props to enhance the realism of the exercise and tools for developing the improvement plan from lessons learned," says Kann.

"The MCO mobile command post was used by unified command and the operations section chiefs for on-site incident management. The ARFF Airstair unit was used to gain access to the interior of the aircraft, and the special services vehicle brought our medical supply trailer to establish the treatment area," he chronicles. "These units are not included in the FAA 139 requirements for ARFF, but are absolutely essential for an incident of this magnitude."

Holding the exercise at the on-site training facility required airport personnel to manage a full-scale emergency response while MCO remained open and operational. Two of the airport's ARFF vehicles

were used for the exercise, while four others remained in service at MCO to maintain normal Index E operations, explains Kann.

"We had normal flight operations with additional medical helicopters transitioning in and out of the airspace," he recalls. "The terminal operations were split between the EOC and friends and family area exercise activities while tens of thousands of passengers processed through the airport. Managing one of the components by itself is challenging; so doing each simultaneously is an additional test."

Safety was the key to all, notes Tom Draper, director of operations for the Greater Orlando Aviation Authority. "With over 1,200 participants and multiple functions taking place, there were no exercise injuries."

The FSE also tested the Safety Officer Team, adds Draper: "At the EOC, the finance/admin chief had to determine how worker's compensation would flow within the mutual aid agencies."

Who Picks Up the Bill?

All indexed airports are required to participate in an FSE at least once every 36 months. Other emergency response organizations must also conduct FSEs to assess capabilities making integrated operations across counties a plausible option.

MCO was invited to participate in the March event by the East Central Florida Regional Planning Council (ECFRPC), an organization that works with six different counties in the region. Because of its status within the local community, ECFRPC qualified for a $100,000 Urban Areas Security Initiative Grant to manage the exercise. The grant would have been difficult for MCO to obtain by itself, notes Kann.

With so many different entities wickering in, planning the exercise took 12 months. All of the agencies participating played a role in the planning process, notes Tim Kitchen, ECFRPC's manager of emergency preparedness. The FSE was developed,

The full-scale emergency exercise at Orlando Int'l was engineered to come as close to real disaster response as possible.

conducted and evaluated by a team of subject matter experts and local representatives from numerous agencies in accordance with the Homeland Security Exercise Evaluation Program (HSEEP). The training event consequently met the National Incident Management System (NIMS) compliance required of airports in the newest version of A/C 150/5200-31c Airport Emergency Plan (2009).

Internal & External Resources

MCO personnel have participated in several FSEs over the past decade. Kann has published papers on NIMS compliance at airports, international airport public health threat responses, and NIMS compliance for meeting the FAA triennial exercise requirement. To date, more than 450 MCO personnel from 20 departments have been certified in NIMS; and participation in the March FSE satisfied the NIMS exercise requirement.

MCO supplemented its internal resources by contracting Emergency Response Educators and Consultants to serve as evaluators for the recent FSE. According to the company's CEO, Lee Newsome, there are several possibilities to accomplish an HSEEP-compliant FSE for airports without dedicated personnel like Kann.

"Some airports choose to use internal participatory evaluators, and others elect to utilize external independent evaluators to create a fair and unbiased exercise evaluation environment that is free of institutional contamination and 'halo effect' by prior knowledge of the exercise participants," Newsome explains.

The ARFF Working Group is an international non-profit organization that acts as a conduit for building networking capabilities to help provide airports with FSE expertise while reducing the institutional contamination and halo effect. Kann, for instance, has evaluated several airport exercises in Florida, and many other airports are following suit. He also serves as a section director for the organization, covering Florida, Georgia, the Carolinas and Alabama. The members in his section assist nearby airports to gain free expertise; in turn, the volunteers grow from the information gained at these other airport exercises, Kann explains.

"In smaller airports, the local Office of Emergency Management serves as a facilitator to pull the stakeholders together to start the exercise planning process," says Newsome. "With larger airports, the operations manager, ARFF chief, security director and emergency preparedness manager play a critical part in coordinating airport exercises."

The HSEEP process is much more detailed and time-consuming than the way most exercises have been structured, so it is becoming more common for airports to contract out their FSEs or create an emergency management position to direct the entire airport emergency plan program, Newsome notes.

One of the biggest advantages to hiring outside evaluators like Emergency Response Educators and Consultants is their expertise in managing the After Action Report, which they provide to all participating agencies, he adds.

"At the conclusion of the exercise process, (we) provide a Master Exercise Closeout Package to the client to include all correspondences, sign-in rosters, all meeting agendas, all meeting minutes, an after action report/improvement plan, a pictorial history of the process, process evaluations and evaluation summary."

Although the final evaluation of the MCO emergency training event is confidential, Kann is able to share some aspects: Areas of improvement were identified for the communications group, with multiple personnel and agencies utilizing several channels. Command and control was characterized as effective and showing a great deal of strengths. And additional ways to enhance the operation of an off-airport incident were identified.

Overall, Kann feels that FSE did what it was supposed to do: prepare first responders for potential mass casualty incidents and provide insight and after action takeaways for the safety of all involved.

On a similar note, Metropolitan Washington Airports Authority conducted an FSE on a closed runway at Washington Dulles International Airport in May. Airport operations employees and authority police and fire/rescue personnel participated in the comprehensive event. According to a press statement, "Over 50 responding emergency vehicles, including mutual aid from eight surrounding fire departments and more than 100 volunteer actors, moulaged to simulate injuries sustained from the incident."

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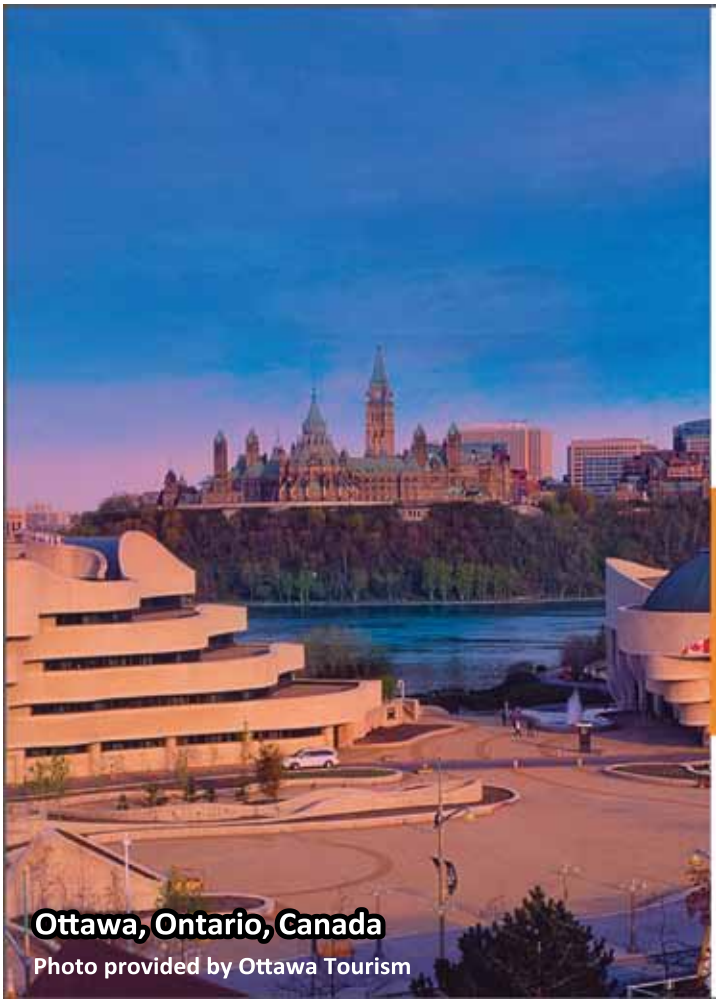

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Best Practices for Fuel Safety Inspection

By Mike **Schwanz**

One of the challenges facing all but the smallest airports is ensuring compliance with FAA fuel safety regulations 14 CFR 139.321. Often, management tasks the Aircraft Rescue and Firefighting (ARFF) or Operations Department with performing quarterly audits of fueling agents to ensure that the specific requirements (listed in paragraphs b through h) are met. Such personnel, however, have other primary focuses and may not have experience with what should be included in a fueling safety audit and/or the proper tasks that should be performed to verify that safety devices or required items are operating correctly.

Some airports consequently contract outside specialists to train their auditors, making an investment in general safety, liability prevention and preparation for annual FAA inspections. Advisory Circular 150/5230-4B, available at faa.gov, contains the latest list of FAA-approved trainers.

factsfigures

Project: Fuel Safety Audit Training

Locations: San Antonio (TX) Int'l Airport; Tallahassee (FL) Regional Airport

Consultant: Aviation Training Academy

Format: Onsite training in San Antonio; online courses for Tallahassee personnel

Sample Cost: Online class - $395/student; 2-day on-site course (classroom training, manuals & testing with live audit) – $5,000 + travel expenses (prices vary with number of students, location & session duration)

Benefits: Increased safety & readiness for annual FAA 139 audits

At San Antonio International Airport (SAT), fueling safety is the responsibility of the ARFF department. After its latest annual inspection in December 2012, the FAA suggested that the airport could benefit from additional training in how to inspect hazardous materials fueling systems.

"In an effort to expand our training, we went to an outside consultant, Aviation Training Academy," explains Fire Captain and ARFF Coordinator Georgia N. Rakowitz. The company conducted daylong, on-site sessions for three consecutive days to accommodate SAT's three different shifts. Instruction included both classroom presentations and hands-on training, and was scheduled in May, when most of the ARFF staff was present, notes Rakowitz.

"One of the main advantages we realized after the training was that our inspection forms will be redesigned so that all our inspectors will follow them easier," she relates. "The redesigned forms should add clarity to each step of the process, so there is less room for error."


David **Smith**

Online Approach

At the smaller Tallahassee Regional Airport (TLH), responsibility for fuel safety falls to the Operations Department, and the FAA strongly recommended that the agents in charge of its quarterly fuel inspections take fueling safety courses. Airport Operations Superintendent David Pollard chose operating agent David Smith to undergo training, because he previously worked several years at Million Air Tallahassee, the airport's primary fuel vendor, and already had an inherent knowledge of its fueling operations.

"The FAA wanted to ensure that whoever is doing the inspection is very knowledgeable," Smith says.

Because only two people on staff perform quarterly fuel inspections (Smith and fellow operations agent Haywood Kelly), Pollard also elected to take the fuel safety training. Like SAT, Pollard chose Aviation Training Academy to provide extra training; but he opted for online rather than on-site classes.

Pollard and Smith are each taking 16 hours of instruction via computer. "These online courses have been very useful," Smith reports, noting that each section of material is followed by a quiz and ultimately a final exam at the end. He considers the courses comprehensive enough to train new employees about fuel farm and equipment inspections — even those unfamiliar with aviation fueling practices.

"Now, when we observe Million Air Tallahassee fueling, we don't assume they are doing everything correctly. We can accurately evaluate them," Smith explains. "They are very good at checking fuel quality standards, inspecting tanks for leakage, etc. And if there is a problem, I am sure we will work it out. There are only five trucks in operation, and well more than 50,000 gallons in storage. We should be able to monitor it."

One of the courses, Preparing for a 14 CFR Part 139 Audit, is particularly timely for TLH. "Our next FAA inspection is coming up, so I am confident that if there are any problems, we will be able to work them out before the audit," says Smith. "The course actually walks you through an inspection of fuel farm facilities and refueling trucks. It gives auditors a very good idea of what an FAA inspector will be looking for, and provides a clear outline of NFPA 407 standards."

In addition to inspecting Million Air Tallahassee's fueling operations, THL also audits mobile refueling equipment that comes to the field with helicopter operators contracted by the U.S. Forest Service to help fight wildfires. Experience has taught Smith to have a copy of the NFPA 407 guidelines with him for such inspections.

"They bring their own fueling equipment with them," he notes. "Often, they are confused between DOT and FAA standards for placarding … so we show them the regulations."

Left: A Brake Interlock Override switch should be secured with a brake wire. Center: Bonding Reels must be securely bolted down, Clips/Clamps/Plugs should be unpainted and rust free. Right: Bonding Cables must be tested monthly to ensure electric continuity of less than 25 ohms.

Common Mistakes

While TLH inspects fueling vehicles that support firefighting helicopters, other airports face their own field-specific challenges. Despite these differences, the staff at Aviation Training Academy has detected widespread mistakes that often transcend location.


Walter **Chartrand**

Walter Chartrand, a company partner who has been training fueling agents for more than 30 years, highlights improper testing of braking procedures as one of the most common: "Mobile fuel trucks have a brake interlock," he explains. "When I remove the nozzle, the brakes are supposed to set, and the truck can't move up … We show (auditors) how to do it properly."

Another big problem is complacency. "Fire extinguishers should be near the exit point, unobstructed, and in the path of the emergency fuel shutoff switch," Chartrand adds. "I have noticed that they are often hidden away out of sight, which is definitely a violation."

A third widespread error is improper inspection of the continuity bonding cables and connections to fuel trucks. Each fuel truck is required to have a bonding cable connected to the frame of the truck, with less than 25 ohms of electrical resistance. This is often neglected, he notes.

Overall, Chartrand advises airport executives to be proactive in evaluating fuel safety procedures: "It's imperative that you make sure your fuel auditors are properly trained for the quarterly inspections, so that when the FAA annual certification inspection is held, you will already be compliant."

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Functional Facility Assessment, You Need One

Patrick Graham, A.A.A.E.

Patrick Graham, A.A.A.E., is executive director of the Savannah Airport Commission, president of Leadership Savannah and chairman emeritus of the Savannah Area Chamber of Commerce. He is also past president of both the Georgia Airports Association and the Southeastern Airport Managers Association. In 2004, Graham served as chairman of the Airports Council International - North America; and in 2011, he was named Airport Manager of the Year by Airport Revenue News.

While airports cannot control every facet of the passenger experience as travelers transition from ground to air transportation and from air to ground transportation, they *can* enhance the experience by tracing and reviewing every detail of passengers' movement through the terminal. We can also take every opportunity to assist passenger flow with ease and comfort.

At Savannah/Hilton Head International Airport, our motto "First in Service" emphasizes our commitment to provide passengers with a "first-class" experience from the minute they arrive on airport property to the minute they depart — coming or going. Even though our facility was inaugurated in May 1994, and still appears new, we felt the need to review and reassess our property from top to bottom, landside to airside, to ensure that we address our future needs and meet the objectives we have set for ourselves:

- To keep the terminal and property not just looking new, but to make it new
- To anticipate future customer service needs based on best practices worldwide
- To anticipate the effects of changing technology and their impact on airport facilities
- To anticipate the changing needs of our tenants and passengers
- To maintain Savannah/Hilton Head's preeminence in providing exceptional customer service

To this end, the Savannah Airport Commission hired consultant Ben Lao, the original design architect of our terminal, to perform a Functional Facility Assessment and help us develop a modernization program. His study began with an on-site visit and walking tour of the entire facility to observe current conditions and assess all the terminal components from both departure and arrival sequences. Sessions and interviews were conducted with airport commissioners, airline station managers, airport tenants and airport staff in all operating departments.

Various aspects of airport operations were discussed to elicit employees' observations and passenger perceptions of the facilities, their functionality and their utilization. Due to limited time, passengers were not interviewed. They were, however, observed in the parking areas, curbside, queuing and check-in at the departure lobby area, security processing, concessions and baggage claim areas.

Findings were documented and categorized in a comprehensive report with close to 100 recommendations, spanning both the departure and arrival areas. The recommendations include:

- Rework access road to alleviate traffic congestion at I-95 interchange
- Replace old green DOT roadway directional signage
- Replace and redesign all terminal overhead green signs and rental car directional signage
- Construct a "Thank You" sign
- Number each parking stall in addition to existing automated directional system
- Install additional lighting in the parking structures and pathways leading to the terminal
- Provide free luggage carts
- Install protective bollards at all entrances at the front of the terminal
- Redesign airline counters with self-service options adaptable for self-tagging of luggage
- Undertake major restroom improvements
- Replace rental car counters with more user-friendly features
- Install additional lighting in baggage claim areas
- Replace interior graphic signage and incorporate international graphic symbols

The final report included photographs of each area of our airport identified for improvements as well as sample pictures of other airports around the world. We formed an in-house committee, and our "Airport Modernization Program" was born!

Implementation of the ideas outlined in the study began immediately. Because our own staff can undertake most of the recommendations, we were able to keep the program budget at $7 million.

It is not possible, in such a short article, to do justice to the report and attest to our consultant's level of expertise. The $64 million question most people would ask is, "How much would a similar study cost us?" Naturally, that will vary based on the size and activity of the airport and the scope of work involved. For us, one thing is certain: We consider it a very small price to pay for exceptional results.

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