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## Trends in Airport technology

The latest in customer service, operational efficiency, and terminal design

By [Brad McAllister](#)



Heading into the American Association of Airport Executives' annual conference, AIRPORT BUSINESS probes the industry for the latest and greatest in airport [technology](#), from wireless solutions to video security. Today's industry buzz-phrases include network migration to a virtual environment ... shared LAN infrastructure ... and consolidated architecture, relates tech firm Faith Group, LLC. Also featured: a technology case study from Little Rock National Airport; and Gensler's airport terminal design guru Ron Steinert shares his vision for a facility that reflects the increasing passenger adoption of common use.

Faith Varwig, principle of Faith Group, LLC, says the company has six closed-circuit television (CCTV) projects going on currently. "By far right now, that's the biggest tech push our company is seeing.

"The TSA is pushing a significant amount of recovery act money into CCTV installations, many focused at baggage and security checkpoints, but in other cases, other locations as well."

Airport size is not a factor when it comes to this issue, adds Varwig. "We've seen everything from Category 3 to Category X airports taking advantage of this," she says. "But there is a hook ... the TSA would like airports to share the CCTV surveillance video with the agency, and that's very controversial among airports.

"The issue is, how will the video be used? Who is allowed to see it? Will images be printed, stored, or forwarded?"

Some airports are accepting the funds and allowing TSA to do what they will with the video, explains Varwig. The larger hub airports are much more opinionated about what to allow the TSA to look at, she says.

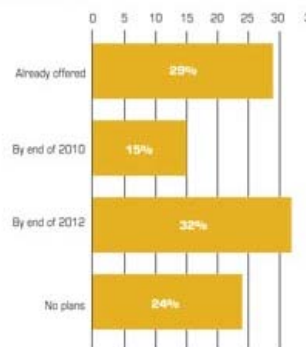
Operational advantages to CCTV are many, including security and passenger processing rate analysis. Comments Varwig, "There are many advantages to implementing CCTV; it's the argument about who owns the video that is interesting."

Another thing to note, she adds, is that the airport has to sign on for all of the operational and maintenance costs for the system. "TSA is actually unloading their previous cost structure onto the airport," says Varwig. "Airports have to maintain the system, expenses which could cost some 10 to 15 percent of the total system installation.

"Implementation of CCTV also has a direct impact on command and control centers; the more cameras you have, the more you need some kind of intelligent video application that can turn the camera from a forensic tool into a proactive detection tool."

After deciding to move forward with a CCTV project, relates Varwig, selecting camera technology that allows flexibility is key. Because new screening technology is consistently

Plans to use self service as the primary<sup>®</sup> means for passenger processing in check-in area



\*NB: Primary means 50%+ PAX  
 Base: Those respondents answering - unweighted

introduced to the security checkpoint setting, Varwig says Faith Group is being pushed to look for camera technology that allows the airport to have the greatest flexibility in terms of viewing angles without having to go back to move the hardware. Some airports may have a combination of camera types at any one location just to meet the need required for that location, says Varwig.

**Wireless technology; Operations consolidation**

The second biggest technology push at airports is the continued improvement toward wireless technology, and being able to cover more points of the facility with a wireless mesh network, explains Varwig.

“More operators want to push data to the people in the field ... to PDAs and laptop computers,” she says. “In order to do that, you have to have a wireless infrastructure that not only covers the physical buildings, but the site as well.”

Comments Varwig, “There is also a lot of investment in new technology to enhance the operator’s situational awareness and ability to record events taking place at an airport. Many airports are upgrading their computer aided dispatch system, which is part of the record-keeping side of things.”

Another major trend involves migrating all stand-alone networks into one large virtual local area network (VLAN) — or group of hosts with a common set of requirements that communicate as if they were attached to the same broadcast domain, regardless of their physical location. A VLAN has the same attributes as a physical local area network (LAN), but it allows for development of a more robust system [architecture](#) at a lower cost due to the requirement of less switches and servers.

“When these systems emerged, they were bought individually and on their own LANs,” explains Varwig. “They all had separate workstations; airports are now looking at migration to more of a virtual environment. VLANs allow those who need access to certain data to attain that data quickly regardless of their location.”

Ron Mathieu, executive director at Little Rock National Airport (LIT), says the airport budgeted some \$150,000 for its “IT Masterplan,” which includes design criteria for implementing a VLAN architecture. Faith Group is helping LIT develop its IT master plan, and the airport is budgeting to refresh the plan each year. However, says Mathieu, “This really goes further than just a conceptual masterplan.”

**Little Rock National**

“The first phase was an analysis of the existing technology systems,” relates Mathieu. “Faith Group conducted a high level inventory of primary technology systems at the airport to gain an understanding of the airport’s current technology; the inventory focused on defining system type, age, use, ownership, and overall condition.

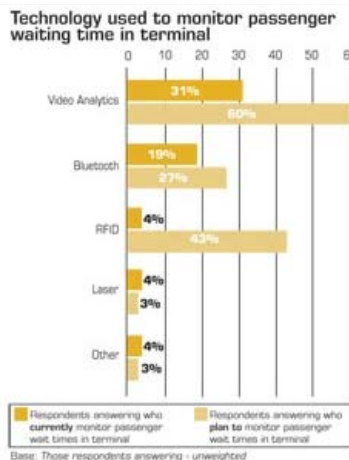
“Next they reviewed current and near-term construction projects to determine the impact on current systems and recommended changes or improvements.”

Going forward, Mathieu says the next step is to develop a “Basis of Design” (BOD) document, which articulates program goals and objectives, provides a summary of existing equipment, and provides preliminary design information including integration recommendations and cost projections.

“The BOD will include diagrams and drawings depicting existing equipment locations, existing and proposed infrastructure, configuration of the [communications](#) center and server rooms, and existing LAN equipment,” explains Mathieu.

The Basis of Design will establish design criteria for:

- 1) Enterprise network functionality;
- 2) Campus-wide fiber optic infrastructure;
- 3) VLAN architecture;
- 4) CCTV architecture;



Based on SITA’s ‘09 airport IT trends survey, passenger processing and services was the highest priority investment for the third consecutive year.



A maintenance technician monitors the status of an in-line baggage system using a wireless device.



A CCTV security camera from Flir Imaging.



Various self-service check-in channels are set to grow further as passengers welcome more automation throughout their travel experience.

- 5) Equipment room locations and configurations; and
- 6) Command center requirements.

The BOD will also define the airport business objectives and requirements for the network concept of operations and shared tenant services, relates Mathieu.

Finally, he says, "The BOD will address methods of procurement, and create a roadmap which ties all ongoing technology related projects with a clear plan for implementation."

In terms of specific technologies, Mathieu comments, "We have put some fiber backbone throughout the facility in preparation for what is coming next; we have also created some new server environments."

On the security side of things, "We were one of the first small hub airports to have biometrics capability for our security access system; and we are the only small hub airport that has taken that and expanded it to the general aviation side of the airport."

The cost of expanding biometric technology to the GA side, including badging everyone, was some \$150,000, relates Mathieu.

LIT is also installing a new flight information display system (FIDS) on a platform that will allow the airport to have distributed video in order to sell advertising space or implement other marketing initiatives on the displays.

"We have also launched our new website," remarks Mathieu. "We used to mail out flight guides to groups and corporations on a regular basis, a service that cost us some \$40,000 annually.

"Now the guide is in PDF format on our website, and we've invited people to sign up for our e-mailing service; that alone paid for the new website and then some."

LIT's website now allows passengers to book flights on its homepage, which produces revenue for the airport, says Mathieu. "We also have links on our website, and that's producing revenue as well," he says. "And we've created a mobile site which gives customers easy access to general information about the airport via their cellular devices. We are also active in the social sphere, with links to our Twitter, YouTube, LinkedIn, and Facebook profiles on our website."

As the airport progresses through its capital project, Mathieu's team will be putting what they call 'vignettes' on the website that will provide information, photography, and video of each construction project that takes place during the airport's development program.

Regarding additional tech projects, "We want to incorporate the AODB (airport operating database) concept where you have all ERP (enterprise resource planning) elements such as finance, purchasing, project control, inventory control, property systems, etc., all tied together with one main interface," says Mathieu.

After receiving some \$6 million from TSA to upgrade and implement a facility-wide CCTV system, comments Mathieu, "TSA is paying for the system and we will be sharing that video with the agency; it will be a server-based IP system, making it much easier to identify and review video content based on a hierarchy of access levels."

**Lifecycle Consideration**

Remarks Mathieu, "The first goal in targeting something for technology investment is, does it allow me to improve operational efficiency? ... and does it allow me deliver on my mission to the public? Then we look at the overall operations and maintenance costs, and the lifecycle costs."

Overall technology lifecycle costs can be fairly significant, says Varwig, especially from a capital cost, or a replacement cost standpoint.

"Many airports spread out the upgrade and replacement of computer hardware — sometimes replacing an eighth or a quarter of its computer inventory each year, each system lasting some five to seven years.

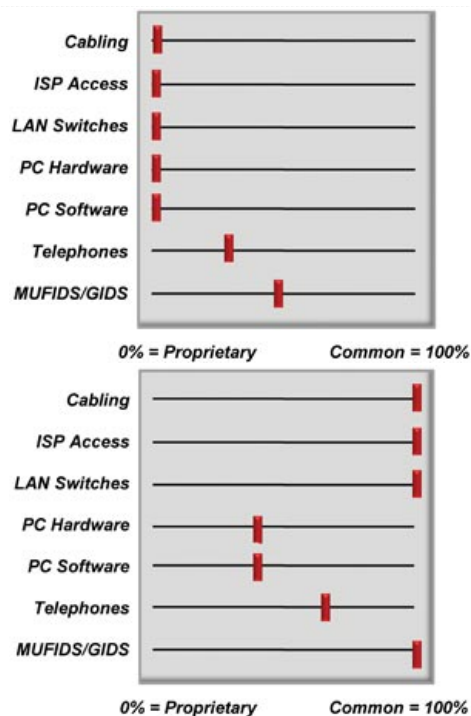
"Because of that, technology is being refreshed constantly; every system added, whether it's hardware or a software application, has a refreshing implication to it.

"The kicker with technology is, the more you invest in it, the more you are bound to it."

**Terminal Design**

Ron Steinert, a principal of global architecture, design, and planning firm Gensler, has been designing terminal buildings for 37 years, and has been involved with Gensler in the design of more than 50 terminal buildings in the last 25 years.

"I came to the conclusion a couple years ago that technology was changing things so fast, terminal buildings weren't addressing the fact that technology has a major impact on how they are designed," says Steinert.



Little Rock National Airport is in the process of upgrading to a shared common use environment.

For example, comments Steinert, "We really don't need to go to a ticket counter anymore, except to perhaps change a ticket or check a bag. It's basically a bag-check now ... you can get a boarding pass anywhere that has a computer and a printer. Soon we will be able to check bags anywhere."

Steinert's latest vision in terminal design involves swapping the locations of an airport's ticket hall and baggage claim locations.

"What we currently call a ticket hall is sometimes the most amazing space in the whole terminal, with high ceilings and lots of natural lighting, and we are spending less and less time in that space," remarks Steinert. "Ticketing continues to be put in a prevalent space when less people are using it. In Europe there are several places where you can tag your bag yourself; there is no need for the airline to touch it because it goes to security before going back to the airline anyway. All you need is a tag on the bag, and you're off to security."

Naturally, Steinert is concerned with where travelers spend most of their time while at the airport. "Beyond security," he says. "We are seeing an increase in airside concessions; the variety has gone up considerably, and certainly revenue potential has gone up with that."

Then there is baggage claim ... "In most terminals, you can get to baggage claim faster than the bag gets there," comments Steinert. "Baggage claims are typically located in the darkest place in the terminal, usually in a lower level with low ceilings; most have departure roads above the windows so you don't really get any direct light."

"My premise is, technology is changing the way we use airports, and so the design of the terminal should change as well."

The suggestion Steinert offers is to flip the areas — put baggage claim on top and ticketing below.

"Upstairs in the baggage claim, you put high ceilings, lots of natural light, and in many cases, a good glimpse of the geographical environment the airport is located in," says Steinert.

"The idea's reception has been positive, but like everything else, it's a new idea and someone has to be first. I want to do it; I think the idea would work best for a brownfield project site."

Another area of airport design where technology is playing a key role is in the evolution of the command center, relates Steinert.

"The advent of fiber optics and a very aggressive infrastructure backbone that allows airports to plug and play just about anything causes a major reduction in the amount of space needed for operation command centers," he says.

"You do need to have some repeater sites when things get large and distances get great, but that's a lot cheaper than building multiple control rooms for multiple systems."

#### ACI's WBP Board

Airports Council International (ACI) has announced that Catherine Mayer, vice president of SITA Inc, has been re-elected as chair of the World Business Partner (WBP) Advisory Board. Ron Steinert, a principal of Gensler, Architecture, Design & Planning Worldwide, will serve as new vice chair.

As chair of the ACI World Business Partners Board, Mayer has served since 2006 as the first non-airport member to be appointed as an observer to the ACI World Governing Board.

Steinert heads Gensler's aviation practice and has over 35 years in the planning and design of airport terminal facilities. He is past president of the Airport Consultants Council and an associate member of ACI-North America.



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