



EXPERTS TALK:

Holistic Airport Design with Kevin Ashton

Bringing an Architect's Eye to All Aspects of Airport Projects to Improve Collaboration and Flexibility

As airports across the United States and the globe adjust to new transportation realities, they face aging infrastructure, a backlog of projects and high expectations from travelers for convenience and efficiency. Tackling these issues with a holistic view that understands how each project affects other aspects of airport operations can help keep airports nimble, adaptable and poised to conquer the future rather than be surprised by it.



Kevin Ashton, AIA, NCARB, LEED AP BD+C, serves as an aviation architecture principal at HDR, focusing on airport design and project development, from conception and planning to construction and completion. In this interview, Kevin draws on more than 25 years of

aviation architecture experience related to the planning, design and construction of signature and award-winning airport terminal designs both in the U.S. and abroad. He served as the project manager as well as senior designer and planner for the \$1.5 billion Chengdu International Airport in China and led the planning for the \$4.5 billion LaGuardia Airport Modernization project in New York. He also was the project manager for the Jorge Chavez International Airport Midfield Terminal project in Lima, Peru, and the Newark Liberty International Airport Terminal B Feasibility Study in New Jersey. Contact **Kevin Ashton** for more information on holistic airport design.

Q. Explain a holistic approach. How does being an architect bring a different perspective to airport projects?

A. When many people think of architects, they envision them drawing buildings. My experience has been that architects are really problem solvers; give them the ingredients and parameters and they will put together a solution that best meets the clients' needs. Each recipe yields a different solution. Although my education is in architecture, I have spent decades working on multifaceted aviation projects and therefore my experience also encompasses adjacent fields and disciplines.

An aviation project is extremely site specific. The elements include not only the terminal (the architect's domain) but also the landside components (roadways, parking, rail access) and airside components (aircraft parking layouts, service roads, taxilanes). Ideally, these items should be considered cohesively, as they all play a part in creating the best solutions.



Good design of a terminal interior requires a strong understanding of landside and airside components as well.

Typically, an architectural firm will team with various engineers for an airport project and lead all aspects of the terminal while the engineering firms perform the landside and airside tasks. Such an arrangement can often lead to each discipline working in a vacuum or silo. They provide their best solution for the task at hand, but they may not be aware of the adjacent plans and disciplines involved.

The worst case scenario is that the work of these distinct fields is performed with little collaboration. In a holistic approach, the architect is intimately involved and has meaningful contributions to all phases of development and design. For example, I have always performed my own aircraft parking layouts simultaneously with planning or designing terminal areas, therefore the solution is one which is nuanced and balanced to support operation and user experience. Rather than an architect working within an envelope created by airfield engineers, the architect is creating the envelope.

At a firm like HDR which houses all of these disciplines, I can work on the aircraft parking and maneuvering and incorporate the expertise of our airfield team into my design layouts, resulting in a more holistic solution that incorporates many relevant considerations into the final design solution.

It streamlines design by completing this critical component during the terminal design phase. Taking that one step further, the process also takes into account the roadway and landside issues.

Q. What about smaller projects that don't involve designing a whole new terminal? Why does it matter if the person designing the bathrooms knows the ticketing area?

Even if it is a smaller project — an addition or renovation — the landside and airside still need to be considered in combination with the terminal. For example, let's say we are updating the terminal's restrooms.

In order to plan for ample space, a study must first be done to determine the best size and location of these restroom facilities. That study would take into account factors from throughout the airport. In the ticketing area I would look at the peak hour departures flight schedule in order to discern the number of departing flights, the type and size of aircraft, and their load factors. Bear in mind that international and domestic flights have different patterns with respect to when people arrive at the airport. Family members or friends also often bring others to the airport who need to be considered. All of this information can then be combined it with restroom data including the number of fixtures and space required for men vs. women based on the time each spends using the lavatories. Having an architect with in-depth knowledge of an airport's needs leads to high passenger customer service with restrooms that are right-sized and best located within the terminal.

Let's say an airport wants to add a new gate and holdroom. It would be best to make this gate flexible, allowing for a large range of aircraft sizes to use it. The first step would be a study of each potential aircraft and how it would fit on the site, its proximity to fuel pits, the sill height of the plane — which determines the location and length of the passenger boarding bridge. This addition could then be built based on these airside assumptions. Inside the terminal, my team would plan for ample area for queuing and seating, located best with respect to proximity to restrooms and concessions. This is all completed in concert with the architect's usual duties, which include detailing and finish selection.

Q. What are the time and cost implications of adopting a more holistic approach to airport projects?

A. The point of this approach is to have little or no adverse impacts on time or cost. No matter whether it is a small renovation or larger addition, a holistic approach seeks to identify a design approach that provides the right long-term solution, avoiding costly modifications or service interruptions that can arise from issues that weren't addressed during development.



A holistic airport design takes airside operations into account in all other areas.

When the same experts are involved with each phase of the project, there is no learning curve when moving on to a subsequent phase. It allows for total coordination. There is no need for the usual time the terminal architects would take to understand the site, the aircraft parking, the terminal roadways, etc. This is one reason why I have been fortunate to support many of the same clients — they know it can be more efficient to hire an architect for an airport project who has experience in this type of facility design and operation.

Airports also happen to be a rather complex building type — I can't think of another type which must accommodate large flying vehicles. Baggage systems and security requirements are also rather unique components to weave into a building. Ensuring all of these elements work together seamlessly is a challenging task, and having experts that understand the entire system can mean smoother implementations and fewer changes.

Q. How does this sort of holistic approach change or flex depending on the size of the airport? Is it equally valid for big hubs and smaller airports?

A. I am certain it is the best approach regardless of the size or scope. For example, smaller terminals — or airports in smaller cities — often have arrival and departure facilities on the same level. In larger airports — or in dense cities where real estate comes at a premium — arrival and departure facilities are often split vertically and are on different levels. This distinction leads to different functional requirements both inside and outside the building. But in both cases, knowing the design and plan for all areas of the airport is a necessity

for maximizing the efficiency and usefulness of the facilities. Consider growing airports with single level processors where roadway frontage begins to get overcrowded. If these locations are limited in available real estate, the only way to go is up, therefore an elevated roadway and adjacent ticket lobby is sometimes the solution. Having a holistic knowledge of the overall master plan and possibilities for the roadway frontage is a key part of developing the solution.

Some things are also true no matter the airport size — everyone would agree that a consolidated passenger security checkpoint is best. It is better for operations and staff as there is less redundancy. It is better for passengers as there is less confusion or need for excessive signage and wayfinding. For any airport, designing the best checkpoint requires a strong grasp of all of the other factors that affect how travelers and employees get to and from the funnel point.

Q. How flexible is a holistic approach when creating infrastructure to support aviation growth decades into the future?

A. It is the ultimate in flexibility. Anyone providing professional services at airports must be flexible. During the timespan of my career, there have been meteoric changes in the industry, especially post-9/11 with passenger and baggage security. Those terminals which were most flexible best allowed for easier updates. Some previous design decisions that may have helped include large column spacing, open floor plans, etc.

Additionally, aircraft trends have changed and will continue to do so. The proliferation of low-cost carriers in the past

10 years and their quick turnarounds surprised the industry. More recently, we are seeing smaller, regional aircraft being replaced by larger ones, and very large aircraft being replaced by smaller jets. Concourses should be spaced and taxi lanes should be ample so as to allow for continued shifts in trends in the future.

By being involved in every aspect of the airport or familiar with its details, designers can be most mindful of the flexibility that could be built into a project — as well as the cost impacts of such allowances.

One way of addressing this is by designing a terminal to include Multiple Apron Ramp System (MARS) gates. MARS allows airport planners to make their gates more flexible and efficient, servicing more planes and getting them back into the air in as little time possible. For example, the A380 aircraft was introduced to keep up with passenger demand and airports had to build gates to accommodate them. By making these parking positions MARS gates, one larger

A380 position, including dual loading bridges, could also accommodate two smaller aircraft.

It was a solution my team used extensively at Lima International Airport (LIM) Midfield Terminal in Peru. The terminal holdrooms were also designed to accommodate this more flexible option. “Swing” gates were used throughout: that is, aircraft positions could either be international or domestic, and the terminal was designed to be flexible enough to accommodate either — even at different times during the day. Knowing the airfield plan and needs, part of a holistic approach on this project, made this flexibility possible.

Successful airport projects find the perfect balance between airside, landside and terminal operations to provide the best user experience, whether as an airline operator, airport staff or airport customer. I have found that a constant back-and-forth between these elements and expert disciplines — adjusting each until they meet seamlessly — yields the best result.



Inspiration & Advice

Q. What inspired you to focus your career on airport architecture?

A. First of all, I love to travel. Moreover, once I got one aviation project under my belt, I was able to parlay that to the next one, and so on. My first terminal project was Terminal One at JFK. It introduced me to all phases of a project — schematic design, design development, construction documents. I spent two years full time on the job site and got to see firsthand how to put a major passenger terminal together during construction administration. I have found that clients appreciate this type of deep knowledge, and it has served me well for all of these years.

Q. What advice would you offer to new professionals in the aviation industry who will either design airports or work with airport designers?

A. Always think flexibility! Otherwise, you will learn the hard way how quickly things change and how adaptability is key.

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