

## AIRPORT AND TERMINAL-AREA OPERATIONS OF THE FUTURE

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Before I play the role of a skunk at a garden party, let me emphasize that the views I will express are personal ones and not necessarily those held by Aviation Week's editor-in-chief Donald Fink or other members of its staff.

One of the penalties of advancing years--a euphemism for old age--is that one is inclined to look backward in time rather than forward and one becomes more conservative. Undoubtedly this will be reflected in my remarks.

On this occasion, I am reminded of an old story about a very patient shoe salesman who had brought out some 40 pairs of shoes without being able to satisfy a very demanding female customer. The woman turned to the salesman and said: "Young man, I don't think you understand what I'm looking for." The salesman tactfully replied: "Now I do. You want something that is smaller on the outside, but bigger on the inside."

We are gathered here today to consider how we can expand the size of an airport in terms of capacity, without significantly increasing its physical size--and without jeopardizing the safety of aviation operations in the terminal area.

Technological advances in avionics have had a remarkable impact on the dependability and safety of air transportation during the last four decades. But can we depend on still further advances in avionics technology to pull this particular rabbit out of the hat? The more basic question is: should we?

Are we really addressing the right issue when we consider terminal area capacity and delays, or only a small piece of the total problem?

About a decade or so ago, at a conference here in Washington, a Federal Aviation Administration engineer, whose name I cannot remember, presented a paper that I shall never forget. The basic subject of his paper was the question of how to increase the capacity of our air traffic control system to reduce in-flight and on-ground delays.

He presented a slide that showed the total travel time for an airline passenger who lived in Connecticut and had a business appointment in downtown Los Angeles, as a function of the year in which the trip was made. The X-axis began in the post-World War II era, with door-to-door travel time based on the 180 mph flight speed of the DC-3.

There was a dramatic reduction in door-to-door trip time with the introduction of the 300 mph Douglas DC-6 and Lockheed Constellation. But, curiously, there was only a modest reduction when jet airliners were introduced. The reason, the speaker explained, was the growing time a passenger had to spend in surface travel getting to and from the airport, plus air traffic control delays. By the early 1970's, total trip time had begun to increase for the same reasons.

This FAA speaker concluded with a very profound statement that is, or should be, important for us during our coming discussions. He said: Even if the time should come when aircraft can fly at the speed of light--186,000 miles per second--it will still take nearly three hours to get from your home in Connecticut to downtown L.A.

Today, I suspect the trip would take four to five hours, if departure and arrival times coincided with rush-hour traffic.

So let me pose a question that should be, but probably won't be, central to our coming deliberations and discussions: IS THE TYPICAL AIR TRAVELER CONCERNED ABOUT TOTAL TRIP TIME, OR ONLY CONCERNED WITH THE TIME HE/SHE SPENDS SITTING IN AN AIRLINER??

I have not made a survey of air travelers. But my intuition leads me to believe that the typical air traveller is concerned about total trip time. At least I am. When I plan a trip, the aircraft departure time is selected with full consideration of how long it is likely to take me to get to the airport at a particular time of day; and how long it will take for surface travel at the other end of the flight to assure meeting my timetable.

IF our objective is to reduce total trip time, then there are many more options available. For example: high-speed surface transportation to and from the airport, and rapid people-mover transportation to/from the departure/arrival gates.

Should this be a responsibility of the FAA? Or should the FAA only seek solutions that begin at the departure ramp and end at the destination tarmac, even when those solutions are necessarily more difficult, more expensive, and perhaps more risky in terms of safety? I think the answer is obvious, especially since the FAA is a part of the Department of Transportation.

This does not mean that we, and the FAA, ought not seek new technology that might enable us to make the airport/shoe a little bigger on the inside, in terms of capacity, without increasing its outside size.

But even if we can pinpoint promising new technology, that by itself can not possibly cope with the prospect of growing air traffic unless the new technology is promptly put into use. This requires political courage--not only on the part of the FAA and its Administrator, but also within the Congress.

More than a decade ago, the price of an altitude-encoded radar transponder came down to less than \$2,000--well within the budget of any one who could afford to own a general aviation aircraft. In my opinion, the FAA should have made altitude-encoded transponders mandatory long ago, to assure that traffic controllers can see every aircraft in the sky and know its identity and its altitude.

Yet because of the powerful lobbying efforts of the Aircraft Owners and Pilots Association it probably will be another decade or longer before the FAA musters its nerve to make transponders mandatory. The FAA might move a little faster if a small aircraft collides with a jam-packed 747 that crashes on Manhattan during the rush-hour.

You are correct. I am not a general aviation pilot who would have to come up with \$2,000 to buy a transponder. But I do own a sailboat, and I had to spend \$1,000 to buy a "pure" toilet for my \$10,000 boat to meet a government regulation.

The government later discovered that the chemicals authorized for use in the toilet caused more pollution than human waste. And the government-approved marine toilet I bought proved so unreliable that its manufacturer went out of business, and I can no longer obtain spare parts, which it sorely needs every year. If the government can mandate a \$1,000 investment for boaters to buy a toilet of questionable effectiveness, surely it can mandate the use of a \$2,000 transponder on a \$50-\$100,000 aircraft to reduce the threat of mid-air collisions, especially in the terminal area.

The new Mode-S type transponder, with its built-in data link capabilities, will make it possible for ground-based computers to automatically transmit a warning to a Mode-S equipped general aviation aircraft if its pilot should inadvertently approach, or penetrate, a terminal controlled area (TCA). This capability, if implemented, could prevent a repetition of the recent mid-air collision in California.

Will the FAA mandate that all general aviation aircraft be equipped with a Mode-S transponder? I would expect that the FAA will take such action in about 100 or 200 years--but I admit that my forecast may be on the optimistic side.

Economics also has a role to play, in my opinion. I'm sure that all of you have at some time been a passenger on an oversold airliner, when an airline representative has called for one or more volunteers to give up his/her seat, in return for an attractive economic benefits package.

On at least two occasions I decided the offered package was more important to me than arriving home an hour or two earlier. And on several occasions, I reached the same decision but my response time was not as fast as that of other passengers.

Traditionally, our air traffic control system has operated on a first-come, first-served--all are equal--basis, which is appropriate for a democratic society. It served us well during the early years when airport congestion was not a problem, when the largest airliner carried only 10 times as many passengers as a small general aviation aircraft, and when business executives flew aboard airliners.

Today--especially in an era of airline deregulation--when airport congestion already is a major problem and threatens to get worse, I believe it is a waste of a precious natural resource to allow a small aircraft carrying several people to use a landing or takeoff slot at a major airport during peak hours that could be used by an airliner carrying several hundred.

It is especially wasteful when one considers that general aviation aircraft could be operating out of a much smaller "reliever" airport, with less risk to aircraft occupants. With a moderate investment of government funds, for example, and an extension of the present Washington Metro to provide rapid surface transit, a very suitable general aviation/business aircraft airport could be built that could serve both Washington and Baltimore.

If landing fees at major terminals were raised to appropriate levels to more accurately reflect the time-of-day demands and the number of passengers on board who are willing to pay for this convenience, I believe that the airport congestion problem could be eased to the point where new avionics technology could handle the remaining problem. With deregulation, the airlines can set their fares to reflect the convenience of departure-time and can afford to pay higher fees.

If these remarks lead you to believe that I am a great proponent of airline deregulation, let me assure you that I am not. I have serious concerns over its long-range implications. But like it or not, deregulation will be with us for some time--perhaps until this nation has only a single air carrier, appropriately named MONOPOLY AIRLINES, whose motto may be: "Fly With Us Or Stay At Home."

This deregulation fact of life has important implications for many of the promising new avionic technology solutions that may be proposed during this conference. Some of you may be old enough to remember an earlier era when major airlines invested their own funds to develop technology for improved safety and dependability. For example, American Airlines, with a talented young engineer named Frank White, demonstrated the feasibility of using airborne weather radar to spot severe thunderstorms long before the FAA even considered making airborne radar mandatory.

Perhaps you'll also recall when the president of United Airlines, a former banker, announced that his airline would install distance measuring equipment (DME) voluntarily, before its use was made mandatory, because it promised to increase operational reliability and safety.

Today many of the major airlines are being managed by "go-go" operators whose only concern is today's bottom line. Were I in their shoes, in the current airline-eat-airline situation, I'd probably be the same. But that means that if we come up with some promising technology that must be purchased and installed on their airliners in the near-term to ease future airport congestion problems, many airline managements will oppose, if not denounce, such an idea.

About 15 years ago, it was the Air Transport Association that recognized the serious limitations of the ILS instrument landing system and prodded the FAA to initiate a program to develop a new microwave landing system. Now as the FAA is getting ready to introduce an excellent MLS, the ATA is questioning whether the new system is really needed.

More than 30 years ago, the ATA initiated an effort to devise an effective airborne collision avoidance system. A decade ago, after evaluating many different concepts, the FAA finally selected a cost-effective approach based on using radar transponders.

This enabled aircraft outfitted with a traffic-alert/collision system, or T/CAS, to be protected against smaller aircraft providing they were equipped with altitude-encoded transponders. Such a system probably could have prevented the recent mid-air collision in California.

Piedmont Airlines has outfitted one of its 727s for an operational flight evaluation of the new T/CAS, but bureaucratic thumb-twiddlers in the FAA have managed to delay the start of these Piedmont tests for more than two years. More recently, in reaction to the recent mid-air collision in California, FAA Administrator Engen is talking about making T/CAS mandatory.

I cite the foregoing not because the FAA needs another kick in the pants--the agency probably has the sorest behind of any agency in Washington--but as a warning to you assembled here.

It will not be sufficient for you to come up with elegant, expensive technological solutions that may ease the future problem. Any technical solutions you propose must not only be effective, but they should also have some built-in motivation that will prompt both the FAA and airspace users to be willing to make the required investment to develop and implement.

And now, having played the skunk at a garden party, my task is done and your difficult work begins.

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