



## Aviation Enters the Satellite Age

ADAM BAER looks at the FAA's NextGen navigation system

**F**LIGHT DELAYS ARE due not just to extreme weather and overscheduling by airlines but also to America's antiquated air traffic control (ATC) system, which still operates on ground-based radar technology that dates from the 1930's. ATC detects America's planes once every 12 seconds on its radar. That means there's a lot of room for controllers to lose sight of an aircraft. Given that reality, the FAA requires significant distance between planes for safety: a buffer zone of three to five miles in good weather, and more in a storm. The problem, however, is that while maintaining these buffers wasn't a problem when the radar system was designed, there are many more planes in the sky these days. In 1970, there were 2,500 commercial planes and 1,800 corporate jets in America's airspace each day; today there are 8,000 commercial

planes and close to 18,000 corporate jets. As a result, the system moves slower, planes must fly convoluted paths, and travelers have learned to expect delays.

Yet there's been a technical solution for using the sky more efficiently for close to a decade: a satellite-based GPS system called Automatic Dependent Surveillance Broadcast (ADS-B), the centerpiece of the NextGen program. (Yes, your rental car's navigation system may employ more advanced satellite technology to get you to your hotel than the plane that flew you to your destination.) Currently, a satellite-based technology called Required Navigation Performance helps some airlines at select airports. But NextGen, scheduled to be fully deployed by 2025, promises to locate planes precisely, straighten airline paths, and get pilots and air traffic controllers on the same page—or the same »

**\* FAST FACT** Since 2001, the price of the average domestic plane ticket has declined by 10 percent...

screen. Planes can then fly closer to each other. Runway landing capacities will increase by an estimated 25 percent, allowing for landings every 45 seconds. Traffic jams and delays will decrease. And pilots will enjoy increased awareness of neighboring aircraft.

"It will completely change the way we fly," says David Castelvetter, a spokesman for the Air Transport Association, an industry trade group. "Everything in the skies will soon move as efficiently as it should."

Why has the technology taken so long to come to the forefront when even new cell phones offer turn-by-turn directions—and why will it take so long to implement? "NextGen is a viable program, technically speaking," says Mark Hansen, a professor of civil and environmental engineering at the University of California, Berkeley. "The hard part is policy: getting airlines, for example, the technology they need to use the system and getting procedures in place so that the benefits can actu-

ally be realized." There is also the need to upgrade many of the 380 American ATC towers with satellite sensors (the ADS-B system will, however, require fewer towers than the current radar system). "Satellite navigation can adjust airport capacity with certain procedures, to some extent," says Hansen. "But it's only going to provide limited impact compared with capacity increases needed to accommodate future demands. Right now we need two times what we have in airport capacity."

According to Castelvetter, the first step is for Congress to approve a budget that fairly distributes the costs of NextGen between commercial and corporate aviation. "While the price is significant—it will cost the FAA \$15 to \$20 billion to build the necessary infrastructure, and carriers will have to invest \$15 billion to equip aircraft—it looks like we will soon have a plan to move forward."

Optimistic? Perhaps. But for frequent fliers sick of delays, waiting 17 years for major improvements won't be easy. ✚

### FLIGHT PLAN

## The FAA's other tools to reduce delays

Delays may be a perennial travel pitfall, but in addition to the NextGen system, the FAA has other high-tech solutions that they hope will help curb the rising rates. Among them is adaptive compression software, launched this March, which continuously scans for vacant time slots at airports, and then fills them. In the past, when slots were freed up by cancellations, delays, or rerouting, airlines had no way

of finding out and taking advantage of the available space.

Airspace flow programs, which minimize climate-related backlogs and congestion, have also been rolled out at 11 more locations in the South and Midwest this year. They let carriers choose between waiting out a storm or flying around it so that it's not necessary to ground every flight at an airport because of bad weather.

With the goal of slashing delays 20 percent by 2011, the FAA has also reorganized 31,000 square miles of East Coast airspace. The new plan will soon enable planes in New York, New Jersey, and Philadelphia to take off in multiple directions on new flight paths, making departures far more efficient at airports that have often been at the bottom of the list when it comes to on-time records. —W.S.T.