AIR TRAFFIC MODERNIZATION

THE NEED FOR AIR TRAFFIC MODERNIZATION IS AN AIRPORT PRIORITY

Maximizing the safe and efficient use of the airspace and airports is critical to accommodating future aviation demand. If the aviation industry is to meet the challenge of Federal Aviation Administration (FAA) forecasts that predict one billion passengers by 2015 and a doubling of today's passenger levels by 2025, it will require substantial improvements and investments in the air traffic control system, just as it will require federal and local capital investments in airport infrastructure. Airports believe that these investments require that the FAA have a stable and predictable funding system to ensure sufficient capital resources are available.

WHAT IS NEXTGEN?

The Next Generation Air Transportation System (NextGen) includes a set of FAA initiatives that will apply new technologies, set standards and develop new procedures that together will transform today's ground-based air traffic control system to a system based on a combination of ground and satellite navigational capabilities having far greater precision and capability. Once the core elements of NextGen are in place, air carriers, general aviation and the military will be able to use the airspace and airport operating environments in a safer, more sustainable and efficient manner, helping to enable the FAA and aviation industry to continuously improve performance and meet the challenges of the future.

HOW DOES NEXTGEN ADDRESS AIRPORT NEEDS?

NextGen would increase capacity in the enroute and terminal environments, particularly in weather conditions that today cause en route and terminal airspace capacity to drop, resulting in delays and cancellations and less than desirable passenger experiences. If investments are not made, and the full benefits of NextGen are not realized, airspace capacity will be insufficient to meet forecasts and system disruptions will become routine.

Following are three areas where air traffic modernization and NextGen can play important roles:

- **Airport Safety:** As aircraft traffic increases, surface movements of aircraft and other vehicles on the airfield grows significantly. This raises the potential for accidents and equipment damage on runways and taxiways as well as for traffic gridlock on the airfield. It is vital that both air traffic controllers and air crews have updated information available to them that accurately determines the position and identification of aircraft and surface vehicles so that safety and airfield throughput can be maintained.
- **Airspace:** Today, much of the airspace surrounding our nation's most intensively used airports is congested, limiting system capacity. Without modernization, this challenge will only increase as the projected numbers of commercial and general aviation aircraft

accessing congested airspace is forecast to grow significantly. By reducing aircraft spacing and separation requirements and better managing traffic in, out and within busy terminal airspace, NextGen will safely permit more aircraft to operate in these areas and be routed to the appropriate airports in the region.

- **Airport Capacity:** Many of busiest airports today have runway configurations that do not permit independent arrival and departure streams when aircraft are operating under Instrument Meteorological Conditions (IMC) and flight minimums must be raised. As a result under IMC conditions aircraft spacing and separation must be increased, airport arrival and departure rates drop, and the system is forced to queue, divert, delay or cancel flights. By enabling pilots and controllers to more accurately identify the exact position of aircraft, more precise routes in and out of airports can be flown, increasing throughput during almost all weather conditions.

WHAT ARE THE AIRPORT NEXTGEN PRIORITIES?

There are a number of programs that are critical for the aviation system and U.S. airports. These range from projects that are being deployed now and can be in the near future, as well as those that are in development and/or being tested for future deployment. FAA identifies several programs as key elements to NextGen that are currently in their budget. They include programs to enable better data and voice exchange among controllers and users in the system, enhanced information on national and local weather conditions, conduct research and pilot operational programs into wake turbulence detection, among others.

The most important FAA initiatives for airports are:

- **ASDE-X (Airport Surface Detection Equipment-Model X):** Reads signals from aircraft transponders using multilateration and determines the position of aircraft and vehicles on the airport's runways and taxiways as well as the airport's approach corridors. By creating a constantly updated map of the airport movement area—at night and in all weather conditions—it provides a key tool for controllers to maintain safe distance margins, increase throughput and avoid potential collisions.
  Status: First deployed in 2003, ASDE-X is operational at approximately 10 airports and scheduled to be deployed at 27 others by 2011.
- **ADS-B (Automatic Dependent Surveillance -Broadcast):** Uses the signals of Global Positioning Satellites (GPS) to provide pilots and air traffic controllers with much more accurate information on the position of aircraft in the sky and on the ground than is available today. When pilots and controllers are properly equipped they will be able to see real-time displays of nearby air traffic, both on air traffic control (ATC) displays and in the cockpit.
  Status: Deployment beginning in Philadelphia, Louisville and Juneau. The agency is seeking over $500 million for the program over the next five years.
- **Performance-Based Navigation:** Provides a basis for the design and implementation of automated flight paths which assure aircraft separation and obstacle clearance. Among other benefits to airports and communities, these flight paths improve access to airport and airspace in nearly all weather conditions, have the potential to permit operations to closely spaced runways and reduce emissions and noise. While these procedures are being used at airports such as Atlanta, Dallas/Ft. Worth, Juneau, Palm Springs and Reagan-National today, such use is still limited compared to procedures that continue to rely on ground-based navigation aids (NAVAIDS). Aircraft that use ground-based NAVAIDS must fly restrictive flight procedures that don't efficiently use airspace and airport capacity. In contrast, performance based navigation, such as RNAV (Area

Navigation) and Required Navigation Performance (RNP) operations enable much greater operational flexibility that is a key component of NextGen. Performance based navigation also allows air crews to precisely track the aircraft's location, its navigation performance and provides an alert in case the required performance is not met during an operation. FAA now needs to begin development of RNP procedures that will permit independent operations to runways spaced as closely as 750 feet apart.
Status: The FAA reports that 63 procedures were approved in Fiscal Year 2006 and it expects to approve an additional 300 each year between now and 2015. However, most of these procedures are simple overlays of existing procedures that do not improve upon the performance of ground-based NAVAIDS. Airports support the technologies, procedures and FAA staffing to enable the widespread use of performance based navigation that improve upon the safety and functional performance of ground-based NAVAIDS.

- **Wake Vortex Detection and Avoidance:** FAA has been conducting extensive research in this area. It is time to develop high quality in-service demonstration programs, similar to the very successful CAPSTONE program that validated ADS-B, to assess the potential for safely minimizing the wake vortex separation requirements. Promising developments on the use of displaced flight paths in Europe, coupled with field evaluations of the several laser wake detection systems being commercially developed in the U.S. are needed to determine the correct technological solution to this pressing capacity problem.
Status: Research conducted, but there is a need to develop in-service demonstration programs.