

NextGen for Airports

The Far-Term Perspective

Many of the near-term applications and plans under the Federal Aviation Administration's (FAA) NextGen initiative are widely understood within the aviation industry. The implementation of new Performance-Based Navigation (PBN) routes and procedures will lead to enhancements in the use of airspace, resulting in increased safety, efficiency and environmental benefits. The latest version of FAA's NextGen Implementation Plan will provide additional detail and clarity on these near-term applications. But what about longer-term NextGen initiatives and what will they mean for airport facilities?

FAA currently defines the "far-term" for NextGen as 2018 and beyond. The Joint Planning and Development Office (JPDO) is tasked with developing the far-term plans. Looking ahead, airport consultants should be aware of several concepts, technologies and policies that are directly related to airports or will have significant impact on airport operations and design.

CLOSELY SPACED RUNWAY OPERATIONS: NextGen applications are expected to allow more closely spaced runway operations at airports across the country. The JPDO is currently developing a roadmap for deriving the far-term benefits from these closely spaced operations. This includes determining the benefits and costs for operations in marginal visual and instrument meteorological conditions (MVMC and IMC), along with assessing the readiness of associated enabling technologies and supporting policies.

The ambitious and complex evaluation will identify opportunities for closely spaced operations at the 35 airports named in the FAA's

Operational Evolution Partnership (OEP) plan. The JPDO will:

- Synthesize all research and analysis on this subject by the FAA, NASA, and their respective contractors, as well as other organizations such as the Airport Cooperative Research Program (ACRP) and Radio Technical Commission for Aeronautics (RTCA);
- Develop a description of capabilities at various separations of parallel runways for arrival and departure procedures, as well as wake turbulence mitigation;
- Identify candidate airports for implementation. Priority airports will be those that are currently capacity-constrained as well as those that are expected to have capacity challenges in the far-term;
- Conduct a high-level, low fidelity operational analysis for these candidate airports under various operating configurations and meteorological conditions to determine the feasibility of the proposed operating procedures;
- Study in greater detail the airports that prove feasible in the low fidelity exercise to determine a cost/benefit relationship of such procedures given the diversity of aircraft fleet mixes, flight schedules, parallel runway configurations and weather conditions; and
- Identify implementation issues such as environmental considerations, infrastructure enhancements, requirements for additional navigational and visual aids, and finally the development of resulting procedures and associated certification issues.

FAR-TERM LANDSIDE CAPACITY ANALYSIS:

Another airport-specific project underway at the JPDO is the far-term landside capacity study for the OEP 35 airports. The study will take a look at the available landside improvements for the 35 OEP airports in the 2018 timeframe. This is a unique enterprise because previous capacity analyses at the JPDO have centered on airside improvements.

The results of this study will be used by the JPDO Interagency Portfolio and System Analysis (IPSA) division in modeling curb-to-curb system capacity, identifying system choke points and substantiating the ongoing NextGen business case activities. It examines capacity potential of the passenger and cargo terminals and synthesizes trends in passenger flow in terminal buildings. The study also examines baggage claim and ticketing areas, roadway access and parking accommodations. This effort will supplement the previous airside capacity studies and will allow a more comprehensive analysis of system bottlenecks.

BENEFITS OF NEXTGEN TO SUPPORTING AIRPORTS:

In response to industry feedback, the JPDO is also taking a look at NextGen benefits that will be derived in the far-term by medium and small airports, including non-OEP airports in 15 congested metropolitan areas as well as other public use general aviation airports. Safety, efficiency, security and access benefits are expected at these locations from an increased use of relatively inexpensive NextGen technologies, procedures and infrastructure upgrades.

AIRPORT OPERATIONS CONCEPT OF OPERATIONS (CONOPS):

An Airport Operations ConOps is also under development by the JPDO. This will describe the improved

situational awareness resulting from integration of airport operational functions into a NextGen Net Centric Operations (NCO) environment. Information regarding ramp operations, airfield maintenance and inspections, de-icing/anti-icing operations and runway snow clearing, emergency response, airport command centers, security, safety and resource management will be integrated and made readily available.

POLICY DEBATE: A critical component in the feasibility of long-term NextGen benefits is federal and local support for new initiatives. Two major areas of federal level policy are being debated at the JPDO that directly impact airports: a national policy on airport advocacy and a national policy on the role of the federal government in supporting national level system wide planning. The debate considers strategies for increasing the local, state, regional and

federal support for preservation of the existing system infrastructure and enhancements to airport system capacity.

It is clear that the public's perception of their metropolitan airports as simply a local asset needs to be altered. This can happen through a coordinated effort between airport operators, users and government officials at all levels. All of these parties need to work together to educate the public and gain popular support for the idea that airports are a national asset and an economic driver for the local, regional and national economy. To that end, the debate includes:

- Increasing the role of state, regional and metropolitan system plans for aligning local community needs with national aviation system interests;

- Increasing the role of the federal government, and, in particular, the FAA, in advocacy for airport preservation and capacity enhancements; and
- Changing to a more systematic funding approach, as well as changing legislation to allow the FAA to take a more prominent and proactive role in aviation system planning and airport development initiatives.

Certainly these are difficult issues to resolve and the JPDO has a long road ahead before these concepts and policies can be implemented by FAA. However, these ambitious far-term plans are critical for realizing a NextGen program that goes beyond air traffic modernization. ✈

NextGen in the Near Term

ENVIRONMENTAL IMPACTS OF NEXTGEN OPERATIONS

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CASE STUDY: DENVER INTERNATIONAL AIRPORT

In a recent presentation at the Transportation Research Board's Annual Meeting, Lourdes Maurice of FAA's Office of Environment and Energy acknowledged that one of the major challenges to implementing near-term NextGen will be meeting environmental review requirements, even for projects that provide a net environmental benefit. While consolidation of flights through RNAV and other advanced navigational procedures will reduce noise in most locations, it will also increase noise levels in some concentrated locations. This may require numerous NEPA reviews to assess the impacts from the consolidated flight tracks.

Denver International Airport's (DIA) recent work with FAA provides a good case study in how collaborative engagement between the FAA and an airport can result in improved procedures. DIA must comply with an Intergovernmental Agreement (IGA) between the City and County of Denver and Adams County that defines annual average Noise Exposure Performance Standards at 101 points northwest, west and southwest of DIA. Exceedance of these thresholds by more than two decibels in a year results in fines of \$500,000 per occurrence.

The noise exposure levels must be computed with "ARTSMAP"[®], which uses radar data to model the actual flight path and climb profile for every aircraft taking off or landing at the airport. Novel mitigation measures, developed with DIA staff, the FAA and major carriers, have been key to reducing multi-million dollar penalties over the 15 years that DIA has been operational.

FAA's first NextGen action at DIA is modification of DIA departure procedures to include RNAV "overlays." DIA and its consultants are continuing to meet with FAA, airlines and other stakeholders to fine-tune the procedures to minimize noise impacts over sensitive locations. The FAA expects to incorporate this analysis in its Environmental Assessment.

Looking ahead, ACI-NA has recommended that FAA engage a 'Go-Team' that would include various FAA offices (e.g., ATO, AEE, ARP, AGC) to integrate environmental responsibility for implementing NextGen procedures. The experience at Denver shows that early and substantive involvement by the local ATO leadership is critical to effective implementation.