NextGen tells a tale of partial success

Progress is some areas is offset by delays in implementing other aspects of the programme. *Ben Vogel* reports

The Federal Aviation Administration (FAA) continues to implement its ambitious USD35.6 billion NextGen programme to overhaul airspace management in the US National Airspace System (NAS), but despite progress in some areas, concerns remain that other important targets will be missed.

President Donald Trump criticised the programme as costly, behind schedule, and ill-defined; and NextGen deliverables are being rolled out against a backdrop of debate over the future structure of the FAA Air Traffic Organization (ATO).

Data Comm is in place at major US airports (such as Miami International, pictured). (Getty Images)

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In 2014, NextGen planners identified four focus areas of technological and operational development: Data Communications (Data Comm), Multiple Runway Operations (MRO), Performance Based Navigation (PBN), and Surface Operations and Data Sharing. In 2017, a fifth priority was added: deploying NextGen capabilities to airspace in the northeast United States.

By combining Data Comm, PBN and Automatic Dependent Surveillance – Broadcast (ADS-B – mandatory in the United States from January 2020), the FAA envisages the capability to implement 4D trajectory-based operations (TBO) in the NAS. TBO enables pilots and controllers to plot flight paths more precisely by latitude, longitude, altitude and time, by sharing knowledge of aircraft position updates.

The FAA seems to be well ahead of the game in terms of its Data Comm objectives. The FAA programme to implement digital communication between pilots and controllers at major airport towers achieved its target of 55 airports in April 2017, when Minneapolis-St Paul International completed deployment of the Tower Data Link Service (TDLS) under the Harris-led Data Communications Integration Services (DCIS) programme.

Programme cost savings were used to deliver the Data Comm capability to seven more airports: Buffalo-Niagara International, Charleston International, John Glenn Columbus International, Fort Myers (Southwest Florida International), Joint Base Andrews, and Reno-Tahoe International are operational. Van Nuys is scheduled to receive Data Comm by the end of 2018.

"As of January 2018, more than 39,000 Data Comm operations were conducted per week. This continues to grow as more aircraft become equipped [including some Department of Defense platforms]. The portion of departures using Data Comm, averaged across all equipped airports, is 25%," the FAA stated in July. A total of 4,000 aircraft flying in the National Airspace System are equipped with Data Comm avionics, and the agency is currently evaluating the use of controller-pilot datalink communications (CPDLC) for en route airspace, before introducing this capability in November.

In an MRO implementation update, published in October 2017, the FAA described how it worked with industry partners to implement wake recategorisation (Wake RECAT) at 16 Terminal Radar Approach Control (TRACON) facilities and 30 airports in the United States. However, planned deployments in the third and fourth quarters of 2017 at Washington Dulles, Las Vegas McCarran and Phoenix Sky Harbor international airports were pushed back to the third quarter of 2018, on the grounds that more time was needed to assess the operational impact of Wake RECAT on air traffic.

Recategorisation allows reduced separation distances, fewer delays, and more runway movements per hour. After conducting post-implementation analysis at five deployed airports (Charlotte-Douglas, Chicago Midway, Chicago O'Hare, Indianapolis, and Philadelphia), the FAA estimated that Wake RECAT would save airlines more than USD70 million per year.

Similar efforts are underway in Europe with the RECAT-EU programme, and the benefits are clear at US airports: at Memphis, for example, Wake RECAT facilitated a 17% increase in capacity.

Metroplex achievements

PBN has brought mixed blessings. The FAA plans to implement about 9,300 PBN procedures, as a means of alleviating congestion in the busiest airspace in the United States (so-called 'metroplexes'). The benefits are considerable in terms of shorter and more direct flight paths, improved airport arrival rates, enhanced air traffic controller productivity, increased safety, fuel savings, and lower aircraft emissions. As the table below shows, work on 11 metroplex PBN projects is either underway or completed (the FAA also planned implementation at Phoenix, but this was cancelled in 2015). Optimal Profile Descents have been implemented at Boston Logan and Gary/Chicago airports; other PBN-related methods to be implemented in the fourth quarter of 2018 and 2019 include specific Time Based Flow Management (TBFM) support tools, such as Integrated Departure Arrival Capability (IDAC) and Terminal Sequencing and Spacing (TSAS). TBFM supports time-based metering of traffic, to develop an orderly and efficient flow of inbound traffic in en route airspace.

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(703 of 1575 words)

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