

The CAA's Future Airspace Strategy (FAS) and Implementation of PBN Technology

What this paper is about

Provides an update on the CAA's FAS and the progress made in modernising the UK's airspace including the implementation of PBN technology. It gives details of the Airports Commission's Senior Delivery Group's (SDG) report on the Implementation of Performance-Based Navigation in the UK and highlights issues for consideration.

Points for Discussion

- What involvement have member ACCs had in the airspace modernisation programme at their airport?
- What issues have arisen at airports and how have they been addressed by the ACC?
- The ACC's role in the airspace change process. Should CAA, NATS and airports in the first instance seek guidance from the ACC on the need for and extent of consultation for changes to the way in which airspace is used?
- Are changes required to the consultation processes?

Possible Action

- Identification of issues for the DfT and/or CAA to consider.

Introduction

1. Over the past few years, the Secretariat has updated the Annual Meeting on the CAA's Future Airspace Strategy (FAS), what it means and the consultation processes that have been established for the process to change the use of airspace.
2. FAS is a programme designed to modernise the UK's airspace and air transport route network. It is an important part of the Government's transport policy and involves airlines, airports, air traffic control and many other aviation stakeholders.
3. The programme also forms part of the Single European Sky (SES) initiative, which sets out implementing rules, backed by legislation, to drive the reform of airspace and air traffic management across all European States. Similar modernisation initiatives are taking place across the globe, coordinated by the International Civil Aviation Organization (ICAO).
4. Much of the air navigation technology that supports air transport needs upgrading. The introduction of new technology, like PBN, will strengthen the resilience of the UK's major airports to react effectively to disruption, improve the environmental performance of aircraft arrival and departure routes and further enhance air safety. One of the key enablers of the FAS is the implementation of new technology that replaces obsolete ground-based (conventional) navigation beacons with a modern GPS based system. The technology is known as Area Navigation (RNAV), and is a form of Performance Based Navigation (PBN). The CAA is expecting to mandate the adoption of a basic variant of PBN (known as RNAV1) for all aircraft operating on major arrival and departure routes in the London terminal area by November 2017.
5. The Government and aviation industry are committed to ensuring that local communities have a say in how the modernisation programme is delivered. Effective engagement with those that may be impacted by the changes is critical to the development of a modern, sustainable air transport route network, particularly as measures needed to upgrade the route network can alter the distribution of aircraft noise over the ground and some local communities may be affected differently.
6. Delegates will recall the airspace paper prepared for the Birmingham meeting in 2012 raising awareness of the potential future changes to the use of airspace¹ and the consultation processes that need to be followed. Member ACCs are encouraged to familiarise themselves with those processes. Delegates may also wish to consider the paper presented at last year's meeting at Gatwick².

Current Position

7. The Airports Commission - in its Interim Report published in December 2013 - recognised the importance of having an effective and efficient airspace strategy and recommended:
 - An 'Optimisation Strategy' to improve the operational efficiency of UK airports and airspace, including: Airport Collaborative Decision Making; airspace changes supporting PBN; enhanced en-route traffic management to drive tighter adherence to schedules; and Time Based Separation.
 - Trials at Heathrow of measures to smooth the early morning arrival schedule to minimise stacking and delays and to provide more predictable respite for local people.

¹ <http://www.ukaccs.info/12almfiles/12airspace.pdf>

² <http://www.ukaccs.info/14almfiles/14airspace.pdf>

- The establishment of a Senior Delivery Group to drive forward the implementation of the Future Airspace Strategy and the delivery of the Commission's recommendations

8. The Airports Commission's Senior Delivery Group (SDG) was set up in 2014, by Rt Hon Patrick McLoughlin MP, Secretary of State for Transport. It is led by the CAA.

9. The SDG produced its first report in July 2014³ when it stated "it will encourage the gathering of evidence to help strike the right balance between operational benefits and the impact on local communities affected by aircraft noise." The SDG set out the Delivery Plan and interdependencies for taking forward FAS. The majority of the SDG's work will centre on considering the challenges associated with the development of a number of complex interrelated projects that require inputs from multiple stakeholder groups.

10. The SDG then produced in February 2015 a technical paper on the "Implementation of Performance-Based Navigation in the UK"⁴ This says: "The measures included in FAS are a pre-requisite for accommodating future growth in demand for aviation, regardless of whether there is a decision to build new runway capacity." It aims to ensure "local communities have a say in how the modernisation programme is delivered. Effective engagement with those that may be impacted by the changes is critical to the development of a modern, sustainable air transport route network." And "Before an airspace trial commences, there should always be a consideration of what level of consultation is appropriate and proportionate to the objectives of the trial and in view of its likely impact".

11. Delegates should note that the SDG's paper specifically highlights the problems associated with the implementation of PBN. It recognises that the increased navigational accuracy generated by the use of PBN means that while fewer people overall might be affected by aircraft noise, those who are will potentially experience more disturbance. This understandably causes concern and some opposition to the introduction of PBN routes, as demonstrated by the reaction from communities affected by PBN trials or the implementation of permanent PBN routes in 2014. The current status of PBN implementation in the UK is set out in Annex 1.

12. The challenge will be to introduce measures (as part of PBN) which will offset the impact from more concentrated paths over a reduced number of people. The SDG's report addresses the issue of respite.

13. The DfT's Aircraft Noise Management Advisory Committee (ANMAC) is also considering the environmental challenges arising from the implementation of the CAA's Future Airspace Strategy and the airspace change process.

14. NATS, working with airports, has been developing proposals to modernise the UK's airspace while the SDG has been undertaking its work. The experiences of NATS and airports in undertaking trials and consultations on airspace change proposals has been fed into the SDG's deliberations.

³ http://www.caa.co.uk/docs/33/SDG_Delivery_Report_1_July_2014.pdf

⁴ http://www.caa.co.uk/docs/2408/Airports%20Commission%20SDG%20Tech%20Report%2001_PBN%20Implementation.pdf

London Airspace Management Programme (LAMP)

15. The focus of the first phase of LAMP was on the network connections for **Gatwick** and **London City** airports. Within that, NATS and Gatwick Airport Ltd undertook the London Airspace Consultation (LAC) in partnership, covering both network and low altitude changes in one consultation. The LAC covered proposed changes to the following:

- Arrival routes for Gatwick and London City airports above 4,000ft;
- Some departure routes at Gatwick and London City airports to complement the changes to arrivals above 4,000ft;
- All routes below 4,000ft in the immediate vicinity of Gatwick Airport (but not at London City Airport); and
- Changes to some routes for traffic to/from Biggin Hill and **Southend** airports that share some of the same airspace as London City Airport

16. Proposals for this work were subject to consultation in 2013/14 and in light of the significant level of response from the public NATS has since decided to split the LAC project into two parts; the first part focuses on parts of North and East Kent, Essex and Suffolk which are primarily designed to improve the efficiency of London City Airport flight paths, and the second part on changes in the vicinity of Gatwick Airport.

17. In respect of Gatwick Airport, a further consultation was undertaken by Gatwick Airport Limited in summer 2014 on specific low altitude options for their route changes. This focused on the low altitude routes below 4,000ft where accountability for route design rests with the airport. A significant level of response was received from many communities around the airport including communities some distance from the airport. It has since been decided by Gatwick Airport Limited and NATS to postpone both the high altitude and low altitude changes in order to undertake more work to better understand their options and next steps. (see current status in Annex 1).

Airspace trials and other consultations

18. At **Heathrow** in summer 2014, the airport in conjunction with NATS conducted airspace trials, again being driven by FAS. The easterly and westerly trials affected departing aircraft, and began on July 28th and August 25th respectively and were aimed to test concepts and techniques necessary to inform how airspace can be better managed in the future. The routes were not indicative of future flight paths.

19. In light of residents' feedback and after meetings with local authorities and MPs, Heathrow asked NATS to shorten the trials. Additional trials were scheduled to start in October 2014 but have been postponed until Autumn 2015. Heathrow, like other airports throughout the country, is still required to provide the necessary data to inform the CAA's plans for future airspace modernisation and will be required to run other trials in the future.

20. The reaction to these trials has been much stronger than previous trials held and NATS and the airports will need to review how any trials are carried out in future.

21. At **Gatwick** in 2014, a time based separation trial was undertaken which tested the angle of divergence from the centre line of the runway which involved the use of a new departure route. This trial generated a significant level of complaint from local communities who had experienced frequent aircraft overflight for the first time. This trial route was subsequently included as an option in the second round of consultation undertaken by Gatwick Airport Limited on proposals as part of the LAMP work.

22. At **Edinburgh** airport, NATS is due to commence a trial (June 2015) to introduce a new Standard Instrument Departure (SID) route for certain aircraft taking off on a westerly departure route from the airport. This will enable aircraft to depart in one minute intervals.

23. In Autumn 2014 NATS, supported by **Stansted** Airport, conducted a 12-week consultation on proposed changes to flight allocation between Stansted departure routes to the east and south which would help to reduce congestion in the skies above Heathrow Airport. The proposals redirected the majority of Stansted departures from an established southerly route, to an existing route to the east of the airport. As no new departure routes were proposed, the CAA advised that the consultation should be conducted through the Stansted ACC and the National Air Traffic Management Advisory Committee (NATMAC); and the airport and NATS encouraged these bodies to cascade information to their members. By request of Stansted Airport and its ACC NATS agreed to go beyond these requirements to extend the consultation to the public so they could respond if they wished through the NATS website.

24. The Stansted ACC also proposed that the airspace changes should be deferred pending the Airports Commission work. There were concerns that, whilst residents living further out would experience less overflight, some residents living nearer to the airport would experience more overflight. However, following consultation NATS decided to go ahead with the original proposals.

25. Stansted Airport has also been trialling PBN on certain routes. The on-going trial has achieved good results with a greater concentration of flights along the centre line. There has been consultation with local residents affected before and during the trial. The general impression is that the trial has been welcomed locally and demonstrated the airport's wish to minimise local environmental impacts.

Issues for consideration

26. Recent consultations on changes to airspace as well as trials at a Heathrow and Gatwick have highlighted the difficulties involved in making changes to established traffic management procedures. The lack of change in London airspace over a period of decades reflects the difficulty of making changes of this type. Difficulties associated with recent trials and the impacts associated with the implementation of PBN highlights the importance of better engagement with, and possibly the involvement of, noise-affected communities in the airspace design process which will also help in identifying options for respite and other mitigation measures.

27. As mentioned above, the DfT's ANMAC is considering the environmental challenges arising from the implementation of the CAA's FAS, the airspace change process and whether amendments need to be made to that process. Any changes would be subject to views of Ministers and would be consulted upon. Tamara Goodwin, DfT will give a presentation at the Annual Meeting on the key government policies in relation to the modernisation of the UK's airspace and the issues being considered by ANMAC.

28. The consultation processes for airspace change proposals have been in place for a number of years now. Whilst the CAA has in a number of cases suggested that the principal consultation mechanism should be through ACCs, it is questioned whether the CAA, NATS and the airport operators should seek guidance from the ACC in the first instance on the need for and the extent of consultation that is required prior to embarking on trials and changes to the use of airspace. Delegates are asked to consider whether any changes are required to the consultation processes e.g. the CAA's CAP725.

29. As highlighted in Annex 1, there are a number of UK airports where PBN (RNAV1) has been implemented on departures/arrivals routes. There are also other trials that are likely to

be undertaken in the coming months. Delegates are therefore asked to share the experiences of their committee in addressing the concerns of the local communities, the involvement they have had to date with the roll out of FAS and issues/problems associated with the implementation of PBN.

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Current Status of PBN Implementation in the UK on Airport Arrival and Departure Routes

London Area

Gatwick Airport - The departure flight paths at the airport were updated in November 2013 to RNAV 1 standards after trialling routes since 2007. RNAV1 was mandated on all departures from May 2014. Plans for the introduction of new PBN departure and arrival routes are not expected until after 2020.

Heathrow Airport - PBN departure trials on specific southbound routes began as part of the wider NATS Departure Enhancement Project (DEP) in December 2013. Having gathered sufficient evidence the trials were concluded in November 2014. Heathrow is planning PBN departure and arrival routes for implementation in 2019.

London City Airport - The airport is proposing to switch to PBN arrival and departure routes below 4,000ft from winter 2015, and it is seeking to replicate 10 existing departure routes and two existing arrival routes to a PBN standard.

Stansted Airport - Two RNP 1 departure routes including advanced curved path radius turns have been trialled since April 2013 with plans to propose that the procedures become permanent in late 2015.

Luton Airport - Two RNAV 1 departure routes are currently part way through the CAA oversight process and, if approved, implementation is planned before summer 2015.

Farnborough - An airspace change proposal is anticipated for the introduction of PBN arrival and departure routes.

Southend - An airspace change proposal is anticipated for the introduction of PBN arrival and departure routes.

Rest of the UK

Bristol - The airport introduced RNAV 1 arrival routes in 2014.

Birmingham Airport - The airport has already introduced a number of RNAV 1 departures and continues to trial options for others.

Scottish Development and Deployment Group - Prestwick, Glasgow and Edinburgh airports have developed plans for the modernisation of the Scottish airspace, including the introduction of PBN routes. Edinburgh plans to trial an RNAV 1 departure procedure in 2015.

Northern Development and Deployment Group - Manchester, Liverpool John Lennon, Birmingham, East Midlands, Leeds Bradford, Hawarden and Newcastle airports have recently established this Group to coordinate the implementation of PBN routes in the Manchester Terminal Control Area. Newcastle already has a small number of RNAV 1 departures published with arrival routes under consideration.