Creating airspace design principles that will guide the development of Southampton Airport's airspace change proposal.

Briefing to gather feedback from stakeholders on design principle themes.

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Objectives of the workshop

The main objectives of today's workshop are to:

1. Increase awareness and understanding among the participants about the need for airspace change and of the process for bringing it about.

2. Gain an understanding of what key stakeholders' believe are the main constraints and opportunities connected with the use of airspace and any proposed changes.

3. Gather feedback from stakeholders about the potential impacts of airspace change, grouped into seven themes that will be used to develop our proposed design principles.

4. Establish a forum which can meet further to help shape and challenge our design principles and the development of potential airspace design options.


TWENTY-FIRST
CENTURY

UK Aviation Strategy

Airspace modernisation is a UK Government policy objective.

Southampton is required to prepare an airspace change proposal (ACP) to update the airport's arrival and departure routes and the controlled airspace that supports them.

An airspace change must be made by 2024 to meet the requirements of the Government's Aviation Strategy that sets out the UK's overall objectives for airspace modernisation to deliver: Quicker, quieter and cleaner journeys and more capacity for the benefit of those who use and are affected by UK airspace.

The UK Department for Transport (DfT) and Civil Aviation Authority (CAA) have set out the main initiatives that the industry stakeholders must implement in the Airspace Modernisation Strategy (AMS).

FAS Implementation - South

A fundamental redesign of the route network in southern England is one of the most important AMS initiatives.

- The initiative is known as FASI (Future Airspace Strategy Implementation) South and is being implemented by a group of 16 airports and NATS (the UK's enroute air traffic controller provider), working together on a set of integrated ACPs.
- The FASI South airports are responsible for upgrading their individual arrival and departure routes from the ground to 7000ft.
- NATS are responsible for redesigning the route network above 7000ft. this will guide traffic to and from the boundaries of the UK's airspace.
- The airports and NATS are working closely to ensure that their individual ACPs are aligned and the final set of changes can be combined seamlessly to form a safe and efficient network.

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Airports participating in the FASI South initiative

Southampton Airport is one of 16 airports participating in the FASI South initiative.

1. Heathrow
2. Gatwick
3. Stansted
4. Luton
5. Birmingham
6. Bristol
7. East Midlands
8. London City
9. Southampton
10. Cardiff
11. Southend
12. Bournemouth
13. Farnborough
14. Biggin Hill
15. RAF Northolt
16. Manston

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Limitations of the existing airspace

The airspace and route network in southern England, including those which serves Southampton, is designed to manage high volumes of climbing and descending aircraft, traveling to and from several airports in close proximity. It was originally designed decades ago and has adapted incrementally as traffic levels have grown.

A complex web of intersecting flight paths that results in aircraft flying longer routes and more inefficient climbs and descents.

High workload on air traffic controllers to manage crossing traffic and airborne queues for landing, are limiting airspace capacity

Flights in southern England are forecast to double in the next 20 years. If the airspace and route network are not upgraded, flight delays and cancellations are expected to increase sharply.

Analysis conducted by NATS estimates that the impact of future growth on delays could be more than 70 times greater than today. If additional airspace capacity is not introduced, one out of three flights could depart over 30 minutes late.

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New technology enables airspace modernisation

FASI South is based on the widespread adoption of satellite navigation systems, which remove the reliance on ground-based navigation aids. This allows the network to be overhauled at both low altitudes and across the terminal airspace, introducing routes with greater precision and flexibility that offer a range of opportunities:

- ADDITIONAL CAPACITY: Significant airspace capacity gains can be achieved by implementing closely spaced arrival and departure routes, dedicated to individual airports.
- GREATER EFFICIENCY: Designing routes with greater precision and flexibility reduces track miles and improves climb and descent profiles, increasing flight efficiency and environmental performance.
- BETTER NOISE MANAGEMENT: Airspace change also creates opportunities to better manage the impact of impact noise, such as avoiding noise-sensitive areas and deploying multiple routes to offer relief.
- MORE RESILIENT: Additional capacity and the introduction of dedicated routes to and from each airport in the terminal area can strengthen the network's resilience to delays from poor weather or disruption.

Southampton Airport's ACP

The local airspace that serves Southampton Airport must be modernised to ensure both sufficient capacity and better management of the impact of aircraft noise, as traffic levels continue to grow.

To meet the growing demand for flights, airspace modernisation at Southampton Airport (below 7000ft) must provide sufficient capacity between the runway and terminal airspace network.

The precision and flexibility of arrival and departure routes based on satellite navigation should also be used to better manage the impact of aircraft noise.

Satellite navigation offers the potential to avoid noise-sensitive areas and offer new noise abatement and relief options, designed in collaboration with local communities.

Airspace developments at lower altitudes around the airport must also consider the need to safely integrate other airspace users within the vicinity.

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The regulatory airspace change process

Every organisation that sponsors an ACP must follow the regulatory process for changing the airspace design, including community engagement requirements - known as CAP1616 (Civil Aviation Publication no. 1616).

- CAP1616 sets out the process for developing airspace change options. This entails engaging with affected stakeholders, evaluating the impacts of options, consulting the public, regulatory approval and implementation.
- The outputs of each stage are reviewed by the CAA to ensure the engagement and analysis is robust prior to moving to the next stage.

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Stage 1: Define

Our ACP is currently in Stage 1 of the CAP1616 process – known as the Define Stage.

1. **As a first step (1a), we have prepared a Statement of Need that sets out the issues that our ACP is seeking to address and we have met with the CAA to discuss how we will progress through the process.**

   (the Statement of Need and minutes of our Assessment Meeting with the CAA can be viewed **here**).

2. **The second step of Stage 1 (1b) is to draw up design principles that we will use later in the process, to guide how airspace change options are developed and evaluated.**

3. **Our design principles will be drawn up through discussions with a mix of stakeholders that are potentially affected by the airspace change.**

4. **They aim to capture all important considerations that should be factored when developing airspace design options.**

5. **Some principles will be based on fundamentals like safety, throughput of traffic and environmental performance; others may be specific to local circumstances.**

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Creating Design Principles

For the Stage 1 gateway meeting we are required to submit a set of proposed design principles to the CAA and an explanation of how these were developed and influenced through our engagement with stakeholders.

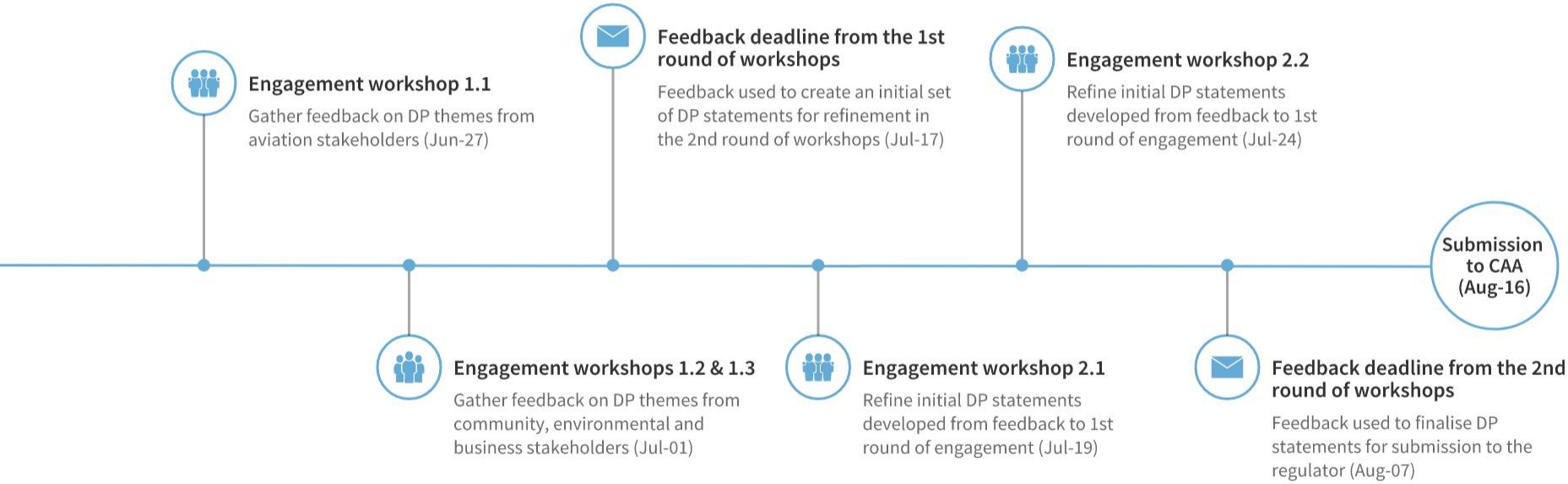
1. Gather feedback from stakeholders about the potential impacts of airspace change, grouped into seven themes.

2. Develop an initial set of design principle statements based on the feedback gathered in step 1 and share with stakeholders for their consideration.

3. Refine the proposed design principle statements based on a second round of feedback and use them to guide the development of airspace design options.

4. Submit our proposed set of design principles to the CAA, along with an explanation of how they were created and influenced through two-way conversations with our stakeholders.

Timeline for design principles engagement



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Design principle themes

There are several themes associated with the drivers for, and impacts of, an airspace change that may be considered when developing design principles. These are:

1. Safety
2. Airspace capacity
3. Flight efficiency and environmental performance
4. Noise management and mitigations
5. New technology
6. Airspace integration
7. Resilience

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Theme 1. Safety

Aviation safety is often considered the first and overriding priority for a framework intended to guide the development of airspace design options.

- **Airspace change is often considered an opportunity to enhance safety performance by reducing, and even removing, risks from the operation.**
- **As traffic levels grow and the airspace accommodates a larger number of flights, continuous enhancements in safety are considered necessary to maintain the established level of safety performance per flight.**
- **Airspace modernisation often involves the deployment of new concepts and technologies that could introduce new safety risks. These must be each be assured independently and collectively as part of an overall 'system approach' to aviation safety.**

QUESTIONS

1.1. What do you consider to be particularly important when developing design principles that concentrate on safety?

1.2. Are there any other themes linked to safety that should be considered when developing design principles?

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Theme 2. Airspace Capacity

A main driver of most ACPs progressed by the commercial air transport sector is the introduction of additional airspace capacity - to support existing flights without generating delays - and accommodate the forecast increase in traffic levels over time.

- **Airspace capacity is closely linked to operational feasibility. The potential capacity of the airspace to accommodate a given number of flights can only be achieved if the key capabilities required to support the operation (e.g. resources, procedures and technology) are in place.**

- **Operational feasibility is also linked with regulatory compliance because capabilities that are not compliant with the current (and/or future) regulatory framework are by default not feasible.**

- **For additional airspace capacity in the vicinity of the airport to accommodate flights without delays it must be integrated effectively with the wider terminal airspace capacity, the capacity of the runway and the capacity used by neighboring airports.**

QUESTIONS

2.1. What do you consider to be particularly important when developing design principles that concentrate on capacity?

2.2. Are there any other themes linked to capacity that should be considered when developing design principles?

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Theme 3. Flight efficiency & environmental performance

Where introducing the capacity to enable growth is often a main driver of an airspace change. Ensuring any growth is sustainable is an essential requirement as set out in government policy.

- **Flight efficiency and environmental performance in terms of emissions are closely linked; improvements could be enabled by the airspace change through more continuous climb and descent profiles and shorter track miles.**
- **Steeper climbs and approaches are usually more fuel efficient for aircraft to fly and generate fewer emissions.**
- **Airspace design options should mitigate the impact of routes on local air quality. Air quality is only relevant below c.1000ft. Aircraft emissions are approximately 1 percent nitrogen oxides (NOx). NOx can affect local air quality when emitted close to the ground.**

QUESTIONS

3.1. What do you consider to be particularly important when developing efficiency/environmental performance principles?

3.2. Are there any other themes linked to efficiency that should be considered when developing design principles?

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Theme 4. Noise management and mitigation

Airspace design options could seek to minimise the total adverse effects of aircraft noise at lower altitudes.

- Airspace design options should conform as far as possible to the existing arrival and departure swathes to limit the number of new flights over people that were previously unaffected by aircraft noise.
- The airspace design options should consider multiple routes that can be switched on and off to reduce the impact of noise. The use of multiple routes is likely to increase the total number of people affected by noise, including people that were previously unaffected.
- Other methods to manage the impact of noise, like alternating runway modes and the way that inbound and outbound traffic are sequenced, could also be included in the airspace design options where possible.

QUESTIONS

4.1. How should the minimising the total noise impact of overflights and the difference between multiple route options and avoiding areas that were previously unaffected be traded off against one another.

4.2. Are there any other themes linked to noise management and mitigation that should be considered when developing design principles?

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Theme 5. New technology

The ground-based NAVAIDs that the airport's existing routes rely on are being removed because they are old and outdated. All new routes should be designed to an advanced satellite navigation standard that aircraft can fly to high levels of track keeping accuracy and with minimal intervention from air traffic controllers.

- **With new technology there should be less need for air traffic controllers to regularly vector aircraft away from their designated route (generating greater predictability that underpins better noise management).**
- **The use of advanced navigation standards enable routes to be designed with the precision and flexibility to avoid more noise sensitive areas and buildings. Routes could also be designed with steeper climb gradients, so aircraft fly higher sooner on departure, and steeper approaches, keeping aircraft higher for longer on arrival.**
- **For some departure routes, there may be a trade-off between climbing quickly and making early turns to avoid noise sensitive areas and buildings.**

QUESTIONS

5.1. What do you consider to be particularly important when developing design principles that concentrate on new technology?

5.2. Are there any other themes linked to technology that should be considered when developing design principles?

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Theme 6. Airspace Integration

The Airspace Modernisation Strategy promotes the concept of airspace integration, rather than segregation, to meet the demands of all airspace users in the most efficient way.

- **The airport's airspace design will be developed and deployed in the same timeframe as the other London airports. upgrade their own arrival and departure routes to increase local capacity and efficiency.**

- **NATS are developing plans to upgrade the terminal airspace in southern England to accommodate the forecast traffic growth (as part of FASI South). The airport's airspace design should integrate seamlessly with the wider network and not constrain the other airport's plans.**

- **The airspace structures deployed to support air transport operations at SOU should not place disproportionate constraints and/or limitations on other airspace users' access to the surrounding airspace.**

QUESTIONS

6.1. What do you consider to be particularly important when developing design principles that concentrate on airspace integration?

6.2. Are there any other themes linked to integration that should be considered when developing design principles?

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Theme 7. Resilience

The resilience of our airspace to poor weather and other forms of disruption is a key factor for passengers, aviation stakeholders and companies that rely on air transport to conduct their business.

- **The airspace design should strengthen the resilience of operations at SOU against bad weather, technical failures and other forms of disruption.**
- **Additional airspace capacity and the introduction of dedicated routes for arrivals and departures can strengthen the resilience against poor weather and disruption at other airports by adding redundancy to the system and enabling quicker recovery.**
- **The airspace design should also be stable and fit for the long term. Once it has been developed, refined through engagement and implemented, it should not be changed fundamentally again.**

QUESTIONS

7.1. What do you consider to be particularly important when developing design principles that concentrate on resilience?

7.2. Are there any other themes linked to resilience that should be considered when developing design principles?

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How to respond

- We encourage you to provide your views on how Southampton Airport should develop its airspace design principles, in reference to today. Feedback will be used to help draw up our proposed design principles, which will form a core basis of the airspace change process moving forwards.

- Please provide your feedback by email to airspace.change@southamptonairport.com before Wednesday 17th July.

Follow-up Workshops

We would like to invite you to our ‘Follow-up Design Principles Workshop’. There are two dates available:

- **Date: Friday 19th July 2019**
  Time: 10.00am to 1.00pm
  At: Holiday Inn Eastleigh, Leigh Rd, Eastleigh, Hampshire, SO50 9PG

- **Date: Tuesday 23rd July 2019**
  Time: 10.00am to 1.00pm
  At: Holiday Inn Eastleigh, Leigh Rd, Eastleigh, Hampshire, SO50 9PG

- **To facilitate these workshops, please let us know by email which session you can attend. Please email airspace.change@southamptonairport.com before Monday 15th July to confirm.**