

Airports Commission shortlisted options

Module 14: Operational Efficiency

preliminary safety review

CAP 1215

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Documents

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CHAPTER 1

Context

Introduction

- 1.1 The UK has an enviable aviation safety record of which the industry is rightly proud. Civil aviation safety oversight arrangements in the UK are divided principally between the DfT and the Civil Aviation Authority (CAA). Increasingly, however, the European Commission (EC) and the European Aviation Safety Agency (EASA) are playing a significant role.
- 1.2 The Air Navigation Order (ANO) 2009 requires that, in the UK, flights for the public transport of passengers, or for certain types of flying instruction, take place only at a licensed aerodrome or a government aerodrome. The CAA currently issues licences to aerodromes which establish that they have been inspected and found to meet safety requirements. This licensing process ensures continuous oversight of safety standards at civil aerodromes.
- 1.3 Commission Regulation (EU) No. 139/2014 on aerodromes was published on 14 February 2014 and came into force on 6 March 2014. This contains EASA Implementing Rules and Acceptable Means of Compliance. Existing CAA-issued aerodrome licences will be converted between 2014- 2017. The Regulation also contains the application process for an aerodrome certificate and describes standards required relating to its management systems, operational procedures, physical characteristics, assessment and treatment of obstacles, visual aids, rescue and fire-fighting services and medical services. The CAA is the designated competent authority for this Regulation.
- 1.4 The CAA is also the Airspace Approval and Regulatory Authority for the UK and is designated as the National Supervisory Authority (NSA) by the DfT for the purposes of Single European Sky legislation. The CAA, as specialist regulator;
- Owns, and is fully responsible for, the airspace change process as set out in CAP724 and CAP725.
 - Provides assistance on the application of the process and guidance on fulfilling the operational, environmental and consultation requirements.
 - Scrutinises and assesses the formal airspace change proposals from sponsors of airspace proposals e.g. NATS, airport operator etc.
 - Ultimately approves or rejects a formal proposal.

Safety assurance

- 1.5 Although the UK has an excellent safety record we cannot be complacent. Serious incidents do still occur and the CAA and industry work together to reduce the number and impact of these.
- 1.6 The CAA announced its intention to move to a regime of 'performance based' oversight earlier this summer and has now published further details for the airlines, aerodromes and ground handling organisations affected. The move aims at regulating in a more proportionate, effective and risk-based way, whilst ensuring that the regulatory obligations in the EASA and SES regulations are met. Performance based oversight will draw upon information generated by organisations' own safety management systems, as well as other sources of relevant data, to identify, and then tackle, those areas that generate the greatest risks to safety.
- 1.7 Whilst data is being correlated on these potential risks, the CAA and industry have previously targeted key risks to fixed-wing commercial air transport safety, known as the 'significant seven', which are as follows:
- Loss of control
 - Runway excursion
 - Runway incursion
 - Controlled flight into terrain
 - Airborne conflict
 - Ground handling
 - Fire
- 1.8 It is considered that these remain appropriate but the emphasis may change over time as the sector risk pictures are developed.
- 1.9 In order to be licensed to operate, all aerodromes and associated Air Traffic Control (ATC) units are expected to meet safety standards or put in place mitigations addressing the risks that the standards intend to alleviate. Often the safety mitigations required will have an effect on other operational performance such as the likely capacity, noise footprint, or use of the aerodrome. The more well established a procedure is at other airports or through the availability of international standards and recommended practices, the easier it will be to determine whether the mitigation is a) suitable for the risk it is trying to address and b) anticipate other impacts. Conversely, the more innovative a proposal, the greater the task of safety assurance (i.e. will the proposed mitigation address the risk) and the harder it will be to predict the suitability of any particular mitigation measure.

- 1.10 Safety assurance can only be accepted after the proposer approaches the approving authority (almost certainly to be the CAA) with a fully detailed concept of operations for how it intends to meet the various safety requirements placed on it by the applicable rules and regulations. Since these details may change, for example as a result of the conditions placed on an operator by planning consent, this can only happen following the Airports Commission's final report, the Government's publication of its Airports National Policy Statement and planning consent is granted. Also, some sign-offs might not be possible until the operation itself can demonstrate compliance – permission to operate can sometimes be given so that the operator can demonstrate that the concept works as intended (potentially with further mitigating action required to ensure the concept meets all requirements).

Purpose of document

- 1.11 The purpose of this document is to provide preliminary safety review for each of the options currently under consideration by the Airports Commission and to comment on, where possible, the likelihood of being able to mitigate perceived risks and the potential effects they could have on the scheme in terms of capacity, cost or environmental issues.
- 1.12 The following sections provide the following;
- A preliminary safety assessment of the Airports Commission's shortlisted proposals.
 - Identification of key interdependencies and delivery risks.
 - Identification of further information likely to be required to enable these risks to be assessed in more detail.
- 1.13 This preliminary assessment is based on information provided at an early stage and does not constitute any form of 'approval' by the CAA. A full concept of operations and safety justification will need to be provided by promoters at the appropriate stage in the future, which as described above, could be after planning permission or for certain elements, even once opened. In this case the scheme would need to be assessed against the requirements in place at the time.

CHAPTER 2

Airports Commission short-listed options

Introduction

- 2.1 The following sections provide a brief summary of the key areas identified in a preliminary safety review of aerodrome, air traffic and airspace risks for each short-listed option. This has been based on the following information;
- Scheme promoter submissions to the Airports Commission May 2014.
 - Responses to CAA questions sent to scheme promoters by the Airports Commission in April 2014 (see Appendix A).
 - Briefings by NATS and Leigh Fisher, the Airports Commission's consultants, on 4th July 2014.
 - Initial discussions with scheme promoters to clarify assumptions and discuss specific scheme risks, where requested.
- 2.2 Further details of the preliminary safety review are included in Appendix B.

Gatwick 2nd runway

Aerodrome

- 2.3 The current ICAO separation for allowing independent approaches with no mitigations is 1525m. The proposed runway separation is 1045m from the existing runway. The proposer must demonstrate that the design meets the requirements of ICAO Document 9643 The Manual on Simultaneous Parallel or Near Parallel Instrument Runways (SOIR) for all possible modes of operation. This will require appropriate mitigations to be provided otherwise Gatwick would operate with dependent runways and a lower capacity.
- 2.4 The promoter has yet to confirm if the scheme proposal includes taxiways to enable the movement of aircraft on the ground without runway crossings ('End Around Taxiways' or EATs). Where they are possible, EATs are preferred by the CAA as they provide safe movements with the potential to operate Compass arrivals and departures (less crossing of aircraft in the air), whilst avoiding runway crossings and maximising runway capacity. In this particular case the inclusion of EATs would also result in inset thresholds, which has the added safety benefit of moving higher risk areas of the Public Safety Zone (PSZ) further into the airport site, and an existing infringement of the Approach surface to runway 26L would no longer be an issue. The runway would be extended to provide appropriate declared distances. If EATS are not provided, the CAA would expect the

aerodrome's concept of operations to incorporate features and / or equipment to mitigate any increased risk posed by a commensurate increase in runway crossings.

Air traffic management

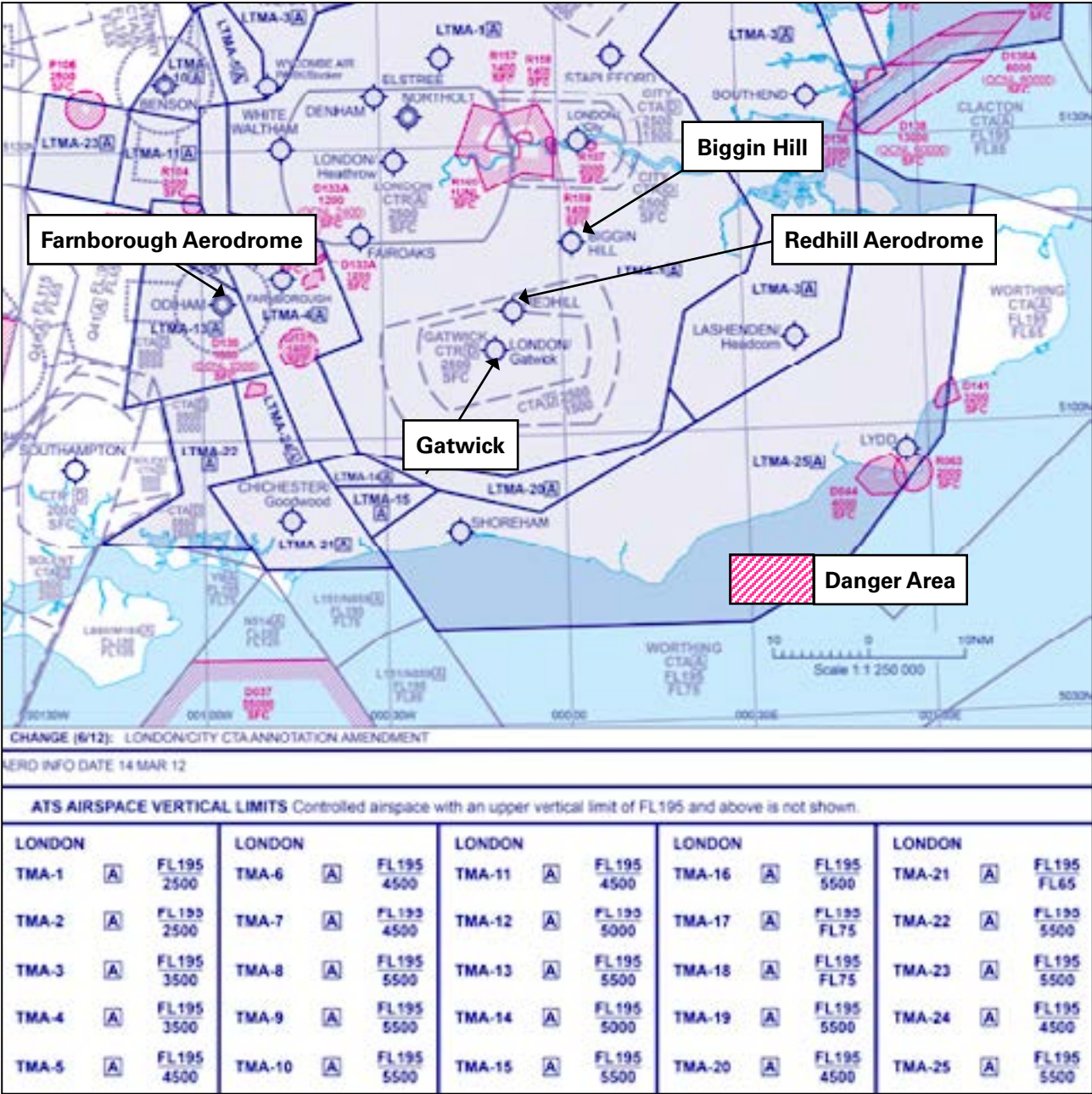
- 2.5 If the airport was operated in segregated mode it would have less of an effect on the surrounding airspace except that the airport would generate a lower number of movements. Though more complex than a segregated mode operation, an independent mixed mode operation provides fairly straightforward ATC procedures and therefore reduces workload and risk. However, as already described above, the separation of the runways will require mitigations to be put in place.
- 2.6 The proposer will in due course need to provide an ATC strategy to align with the Concept of Operations, including Missed Approach Procedures (MAPs) and helicopter crossings. This is considered unlikely to present significant challenges.

Airspace

- 2.7 There is currently a lack of detail available at this early stage regarding airspace designs. However, an initial informal assessment of some of the impacts is provided below.
- 2.8 Gatwick is on the Southside of the London Terminal Manoeuvring Area and is sufficiently displaced to the south of Heathrow to have a relatively lower impact on other aerodrome procedures and knock on effects to other airports.
- 2.9 Standard Instrument Departure Routes (SIDs) would need to be redesigned to avoid conflicts associated with having two runways providing arrivals and departures. However, the position of the runways and a compass departure operation is unlikely to be a significant challenge. There is a potential issue of standard arrival routes (STARs) to parallel runways and the transitions flown, with potential for confusion if runway alternation (or Terminal arrivals) is likely to be a feature of the operation - if the existing runway is always the arrival runway this is less of an issue as arriving aircraft would not be required to cross in the air.

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Figure 1: Gatwick Control Area (CTR)



2.10 Farnborough aerodrome is currently in the process of developing new procedures and has just completed consultation on a new airspace design. The outcome of this is not yet determined. With revisions to arrival and departure procedures for an expanded Gatwick, there could be requirements for some additional controlled airspace to the west. Until designs are formalised, it is not possible to determine what impact, if any, new Gatwick procedures would have on Farnborough operations. Operations at Shoreham (south of Gatwick) are unlikely to be affected. Redhill (north of Gatwick) and Biggin Hill (north of Gatwick) are unlikely to be affected.

- 2.11 The Terminal Manoeuvring Area (TMA) and London Airspace Management Programme (LAMP - which does not include an additional runway) would need to be redesigned. The airspace change development work could take 3-5 years to complete due to the position of Gatwick on the southside of the TMA (LAMP Phases 1 & 2 are expected to take 5 and 9 years respectively).

Heathrow 3rd runway - north west

Aerodrome

- 2.12 The current ICAO separation for allowing independent approaches with no mitigations is 1525m. The existing runway separation is approximately 1450m and the proposed northern runway separation is 1035m from the existing northern runway. The proposer must demonstrate that the design meets the requirements of ICAO Document 9643 The Manual on Simultaneous Parallel or Near Parallel Instrument Runways (SOIR) for all possible modes of operation, in particular given the stagger of the proposed northern runway. Appropriate mitigations will need to be provided.
- 2.13 The CAA's policy is currently to allow appropriately certificated aircraft to operate on existing 45m width runways. The proposal includes a new 60m runway which is consistent with EASA requirements.
- 2.14 The Air Traffic Control (ATC) Tower currently infringes Obstacle Limitation Surfaces at Heathrow. This was accepted by the CAA based on the existing operational modes and an assessment of the likely number of missed approaches. The proposal changes the character of the airport operation. This would therefore require a new safety assessment to be undertaken by the promoter. There is a risk that this may not justify an EASA derogation, and could result in the need for alternative tower arrangements.
- 2.15 The CAA welcomes the inclusion of taxiways to enable movement of aircraft on the ground without runway crossings ('End Around Taxiways' or EATs). EATs are preferred by the CAA as they provide safe movements as well as the potential to maximise runway capacity. All taxiways should meet EASA design requirements at the time of certification.
- 2.16 The proposal includes an area of car parking within the airfield area assumed to be accessed via a landside road link. This area is likely to be within the 1:10,000 Public Safety Zone contour. The type of parking proposed should be restricted to ensure low concentration of numbers of people.

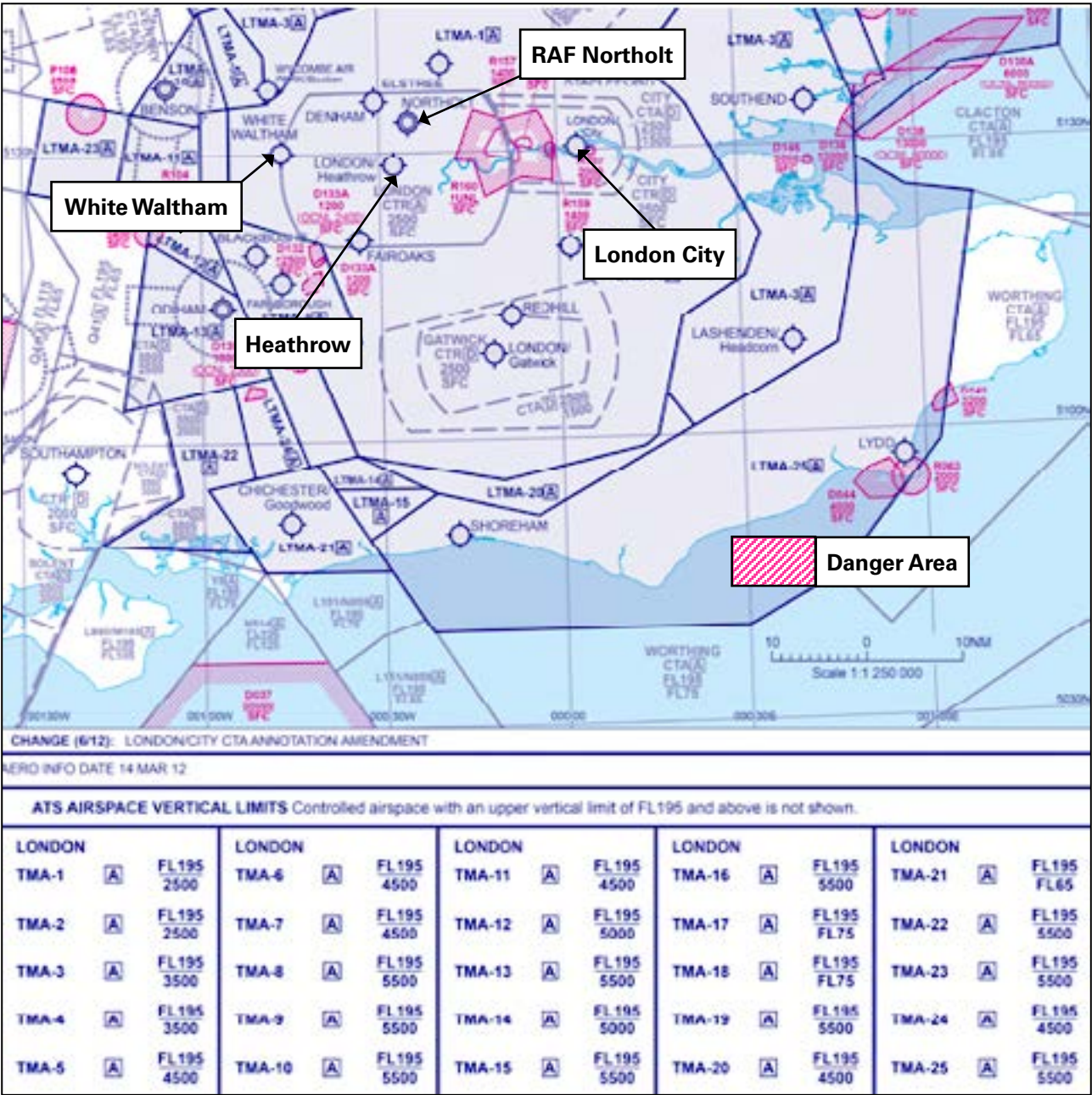
Air traffic management

- 2.17 The proposal is likely to require new procedures and mitigations to ensure safety of the ATC operation. Due to the intensive and complex nature of the current Heathrow operation, the development of a new 3rd runway will require a complete review and update of the entire operation. There can be no automatic reliance on previous mitigations which are likely to have been designed for different scenarios. This could provide an opportunity to exploit safety enhancements that may be now available with an expanded infrastructure and increased resilience.
- 2.18 **Note:** The operation associated with noise respite periods 2 and 3, where aircraft are departing from adjacent runways may be particularly difficult to achieve given the staggered position of the northern runway. Further work will be required to understand whether these modes are viable.
- 2.19 In normal operations RAF Northolt is likely to become dependent with the proposed northern runway from an ATC perspective. This may limit flexibility for Heathrow or RAF Northolt. Further work will be required to understand the effects on capacity for Heathrow and RAF Northolt.
- 2.20 Missed Approach Procedures (MAPs) for both Heathrow and RAF Northolt will need to be developed and assessed in detail, particularly given the different operational modes and the proximity to RAF Northolt. Any impacts on RAF Northolt procedures need to be understood and assessed.
- 2.21 Helicopter crossing operations are a routine feature of the Heathrow operating environment because of the proximity to the established helicopter route structure. It will be necessary to review these operations and to understand their likely impact on the reconfigured airport. It may be necessary to determine if crossing arrangements remain viable with the revised operation.

Airspace

- 2.22 There is currently a lack of detail available at this early stage regarding airspace designs. However, an initial informal assessment of some of the impacts is provided below.
- 2.23 The design is likely to require a dependency with RAF Northolt to ensure safe separations, which could reduce capacity at either or both airports. Any impacts on RAF Northolt procedures need to be understood and assessed.
- 2.24 Missed Approach Procedures for both Heathrow and RAF Northolt remain a major design issue and a major challenge to deliver a safe and operationally effective environment due to close proximity of RAF Northolt and its runway axis (25/07).

Figure 2: Heathrow Control Area (CTR)



2.25 SIDs would need to be redesigned to avoid conflicts associated with having two runways providing departures and the issue of the third runway being further west. It is unclear whether further controlled airspace to the western extremity of the Heathrow CTR is required to accommodate both arrival and departures for the proposal. The impact (if any) on operations at White Waltham and Denham aerodromes is unclear given that flight path vertical profiles are unknown at this stage. The impact on London City operations is also unclear as precise arrival and departure flight paths are unknown at this stage.