# CAP1616 Gateway documentation
# Stage 1: Define Gateway

# Design Principles
# for PLAS Dep5 ScTMA
Level 2 Change (above 7000ft)

**NATS Uncontrolled**

Publication history

| Issue | Month/Year | Change Requests in this issue |
|---|---|---|
| Issue 1 | Jan 2018 | Submitted to CAA. |
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Contents

# 1. Introduction

1.1 This document forms part of the document set required in accordance with the requirements of the CAP1616 airspace change process.

1.2 This document aims to provide adequate evidence to satisfy
Stage 1 Define Gateway, Step 1B Design Principles

# 2. SARG/DfT Design Requirements

2.1 An outline of the generic design aims relating to the SARG/DfT requirements that NATS considers for all ACPs is given below, including those relating specifically to environmental aspects.
Those which can be applied to the PLAS Dep 5 ScTMA proposals are highlighted in **bold**.

2.2 SARG/DfT design aims:

- **a) To design routes based on RNAV1.**
- **b) To ensure that designs are consistent with Government policy (e.g. Air Transport White Paper/ Review).**
- c) Runway development: where applicable accommodate future growth due to proposed runway expansion projects.

2.3 Environmental design aims:

Where practical, within operational and safety constraints:

- **a) enable CDAs**
- **b) minimise track mileage**
- **c) allow more efficient flight profiles (i.e. clear climbs/descents on separated tracks)**
- d) minimise population over-flown
- e) minimise exposure of new populations to noise and visual impacts
- f) minimise low level over-flight of AONBs, National Parks and other tranquil areas

2.4 These aims are aspirational – it may not be possible to achieve all aims within one design. The final design will reflect a balance between competing requirements. NATS will seek to demonstrate this balanced approach to achieving the design aims within the consultation material and ACP.

# 3. Airspace Design Principles and Evaluation

For the PLAS Dep 5 ScTMA project NATS has collaboratively agreed the following set of design principles through engagement with many stakeholder groups. Below are the Design Principles which will be used in this project.

## 3.1 Safety

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|---|---|
| Safety is always the number one priority. | Many of the factors below are motivated by ensuring the utmost safety. A change to airspace will only be approved by the CAA if it is as least as safe as current operations. Where possible we will always strive to improve safety. |

### 3.2 Environmental

| | |
|---|---|
| $CO_2$ emissions | Reduction of $CO_2$ emissions will be prioritised, due to the altitude of the proposed changes. |
| Noise impact to those on the ground | This ACP is only concerned with changes to airspace above 7000ft agl. Hence noise impact is not a primary consideration for this ACP. Note: the >7000ft is based on the typical altitudes achieved. |
| Visual impact | Due to the altitude of proposed changes (>7000ft) visual impacts will not be prioritised. |

### 3.3 Airspace use

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|---|---|
| Minimise the volume of CAS | The volume of Controlled Airspace should be kept to a minimum. Where improved climb/descent profiles allow, base levels should be raised, with the lower airspace returned to Class G uncontrolled airspace. |
| No impact on GA | The proposed changes should not cause an impact on General Aviation operations. |
| No impact on MoD | The proposed changes should not cause an impact on UK military operations. |

### 3.4 Physical constraints

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|---|---|
| Procedure design limitations | PANS-OPS parameters for design of flight procedures are governed by the International Civil Aviation Organisation (ICAO), and adopted by the UK CAA. These are limits that will be used for terrain/obstacle clearance, maximum climb and descent angles, minimum distances between waypoints, stabilisation distances. |
| Avoidance of other airspace | Restricted areas, military danger areas. |
| Minimum turn radii | Determined by aircraft speed and maximum bank angle. |
| Speed | Maximum speed can be specified for procedures. Below 10,000ft the maximum speed for aircraft is 250knots unless otherwise notified. |

### 3.5 Efficiency

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|---|---|
| Air traffic controller workload | ATC workload can be a limiting factor for how many aircraft can be handled. This determines the capacity of each sector. We aim to reduce controller workload through use of systemisation. |
| Pilot workload | For safety, pilot workload must be kept to a manageable level e.g. complex routings can cause an unacceptable increase in pilot workload. We aim not to increase pilot workload and if possible to reduce it. |
| Airspace capacity | Systemisation can result in efficiencies such that the number of aircraft able to be handled in a sector can be increased. We aim to increase airspace capacity. |

### 3.6 $CO_2$ Emissions

| | |
|---|---|
| Climb profiles | Departures will aim to improve the climb profiles, with the goal of providing continuous climb operations. We aim to reduce $CO_2$ emissions during the climb phase. |
| Descent profiles | Improved STARs synchronised with RNAV1 arrival transitions will aim to provide more efficient and predictable descent profiles. We aim to reduce $CO_2$ emissions during the descent phase. |
| Flight planning/fuel uplift | Truncation of SIDs and improved departure & arrival vertical profiles will improve fuel uplift. (this reduces $CO_2$ emissions) |

The target is for there to be a net reduction in average per-flight $CO_2$ emissions.

### 3.7 Noise

Due to the altitude of proposed changes (>7000ft) noise impacts are not prioritised. No noise analysis is proposed.

### 3.8 Network

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|---|---|
| Altitude | The proposed network will interface with the SIDs, STARs and arrival transitions proposed by PH, PF & PK. The altitude of flights concerned will be above 7000ft. |
| Proximity to airfield | Changes may be within 25km of an airfield. |
| Visual Impact | Due to the altitude of proposed changes (>7000ft) no analysis of visual impact is proposed. |
| Use RNAV1 | New routes should be RNAV1. |
| Systemise routes | Use modern navigation standards (e.g. RNAV1) in order to safely space routes more closely. Reduce controller and pilot workload via reduction of tactical intervention (vectoring, speed control). |

## 4. Stakeholder Engagement in Developing Design Principles

Table 1 below gives a summary of the ongoing engagement that has taken place and is planned, between NATS and aviation stakeholder groups.

Additionally airlines (including BAW, EZY, VIR, IATA, RYR, EXS, TUI, TCX, UAL, AAL, BEE) were consulted via the SIP and RP2 consultations. Airlines were also consulted for RP3 and they have responded that they support the objective to modernise the UK airspace network and the design principles which support this goal.

| Date | Meeting | Attended by |
|---|---|---|
| 4th Nov 2015 | SDDG | NATS, EGPH, EGPF, EGPK |
| 16th Sept 2016 | NDDG/SDDG | NATS, EGPH, EGPF, EGPK, EGCC, EGGP |
| 22nd Feb 2017 | FASVIG | NATS, GA, BGA, LAA |
| 14th Aug 2017 | ScTMA Working Group | NATS, EGPH, EGPF, EGPK, CAA |
| 21st Aug 2017 | FASI (N) Steering Group (Formally NDDG/SDDG) | NATS, EGPH, EGPF, EGPK, CAA |
| 30th Aug 2017 | ScTMA Working Group | NATS, EGPH, EGPF, EGPK, CAA |
| 21st Sept 2017 | ScTMA Concept Simulation Planning | NATS, EGPH, EGPF, EGPK |
| 26 Oct 2017 | ScTMA Working Group | NATS, EGPH, EGPF, EGPK |
| 10th Nov 2017 | MoD JANSC | NATS, MoD, CAA |
| 15-21st Nov 2017 | Real time simulations at NATS Prestwick Centre | NATS, EGPH, EGPF, EGPK, CAA |
| 13th Nov 2017 | ScTMA Framework Brief (Statement of Need) | NATS, CAA |
| 8th December 2017 | GA Alliance meeting | NATS, CAA, GA |
| 13-14th December 2017 | Real time simulations at NATS Prestwick Centre | NATS, EGPH, EGPF |
| 19th Dec 2017 | ScTMA Working Group | NATS, EGPH, EGPF, EGPK, CAA |
| 1st Feb 2018 | FASI (N) Steering Group | NATS, EGPH, EGPF, EGPK, CAA |
| March/April 2018 | ScTMA Development Sims | TBC |
| Sept 2018 | ScTMA Validation Sims | TBC |

Table 1: Summary of Stakeholder Engagement Activity

During this series of meetings design principles have been discussed and this dialogue has influenced the design principles stated in section 3. There was general agreement to the design principles, hence no “differing views” which needed to be reconciled (ref. CAP1616 para 114).