

Gatwick Route 4 Redesign of RNAV SIDs

Design Principles - Stakeholder Review



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1 Design Principles Development Process

1.1 Background

London Gatwick Airport began the process of re-designing the Route 4 Standard Instrument Departure (SID) in late January 2019. During early March, Gatwick Airport began a series of engagement activities with its key aviation and non-aviation stakeholders in order to develop a long list of Design Principles.

Gatwick Airport recognises the importance of engagement and transparency throughout the CAA airspace change process. At key stages, Gatwick Airport will share its progress with its stakeholders and seek continued feedback in support of the Route 4 change.

1.2 Purpose of This Document

This document has been prepared to share the comprehensive list of Design Principles developed during the recent engagement process. It outlines the viability of each Design Principle in the context of the Route 4 project, and from this assessment proposes a short list of Design Principles. This list has been prioritised in a manner consistent with the feedback received during the recent engagement activities.

Gatwick Airport now seeks your further feedback on the short list of prioritised Design Principles.

1.3 Development Methodology

All airspace changes within the UK must follow the regulatory process described in the CAA publication CAP 1616. The process was developed to ensure a high degree of transparency and adequate levels of two-way engagement with all relevant stakeholders, including local communities. The guidance in CAP 1616 sets out the framework for the stages of the process and the activities that must be undertaken from the conception of the need for a change.

Part of the process involves the development of relevant Design Principles and the activities shown below have helped us to determine the comprehensive list of Design Principles detailed later in Section 2:

- Design Principles questionnaire
- Focus groups

In early March, a questionnaire was distributed to key stakeholder groups seeking views on a number of topics related to the Gatwick Airport Route 4 re-design. In addition, three focus groups were held in May (15th, 16th and 20th) where aviation and non-aviation stakeholders were offered the opportunity to share their views on changes to the Route 4 departures.

The responses received in the questionnaires and the discussions during the focus groups have helped us to derive a comprehensive list of potential Design Principles that reflect the statements made during these events, and also any comments received following the events. As with any engagement activity, it

should be noted that opposing views were expressed by stakeholders in a number of areas.

1.4 Use of Design Principles

The Design Principles will be used as the qualitative framework against which the alternative Route 4 Design Options will be considered. It is therefore important that your views have been accurately captured.

It is industry good practice to seek appropriate enhancement of stakeholder aviation safety as part of the process of any change. Part of the CAP 1616 process requires a safety case to be submitted to the CAA when the formal proposal is drafted following the full public consultation. As such, we believe a Design Principle that seeks to enhance the safety of the design/safety management system should attract the highest priority.

In addition to the development of specific Design Principles, this stage of the CAP 1616 process also requires sponsors to ask for stakeholder comment on the suitability of the Level 1¹ categorisation as applied to this change.

1.5 Providing Your Feedback

The feedback provided to date has been extremely useful and underpins the comprehensive list of Design Principles at Section 2. We now need your input in order to:

- Confirm that our Design Principles capture the sentiment of your comments.
- Seek endorsement of our prioritisation of the short list of Design Principles.
- Capture any additional comments.

Section 5 of this document details some further questions and we would welcome your comments in line with timeframe shown below in Figure 1. To make completion easier for you we have provided a separate document for responses (attached).

Please address any responses to lgwairspace.rte4@gatwickairport.com by 1700 hours on 28th June 2019.

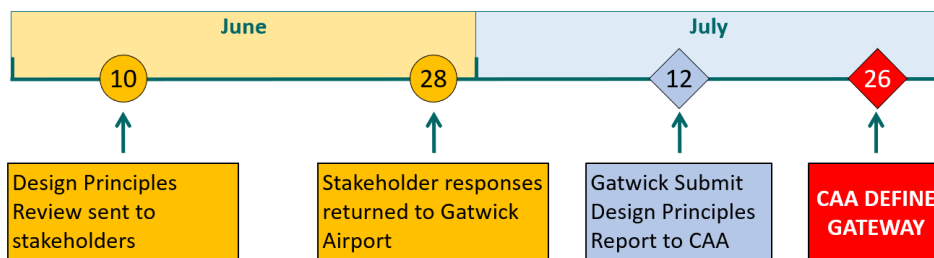


Figure 1 - Design Principles Timeline.

¹ See CAP 1616: “Level 1: a change to the notified airspace design in the Aeronautical Information Publication that has the potential to alter traffic patterns below 7,000 feet over an inhabited area....”

2 Design Principles - Long List

2.1 Introduction

After analysing all responses to questionnaire and considering these alongside the comments received during the focus groups, it has been possible to develop a comprehensive list of Design Principles. These include all the comments directly related to this airspace redesign and also reflects the spread of opinions articulated by those who provided a response, either written or verbally.

2.2 Long List of Design Principles

Table 1 below shows the long list of Design Principles developed from the questionnaire responses and conversations during the focus groups.

| No (a) | Design Principle (b) | Source (c) | Category (d) |
|--------|---|--|----------------------|
| 1. | Route 4 options will be designed safely with full regulatory compliance | <i>FG1</i> | <i>Safety</i> |
| 2. | New Route 4 designs should give due regard to the historic routings in use before 2012 | <i>Pub Reps FG1 FG2</i> | <i>Environmental</i> |
| 3. | Route 4 designs should, where possible, involve CCOs | <i>AO&GA Loc Govn Pub Reps FG3</i> | <i>Technical</i> |
| 4. | Design of CCOs should consider optimal use of generic aircraft performance to minimise noise impact | <i>Loc Govn Pub Reps</i> | <i>Technical</i> |
| 5. | Routes should include an extended westerly climb profile before a later easterly turn | <i>Pub Reps FG1</i> | <i>Environmental</i> |
| 6. | Minimise the practice of radar vectoring below 7,000ft | <i>Pub Reps FG3</i> | <i>Operational</i> |
| 7. | Procedures should include RF legs | <i>AO&GA</i> | <i>Technical</i> |
| 8. | Designs should incorporate 'all engine' and 'engine out' considerations | <i>AO&GA</i> | <i>Technical</i> |
| 9. | ARINC 424 coding must ensure aircraft follow the desired lateral and vertical paths | <i>AO&GA</i> | <i>Technical</i> |
| 10. | Route 4 designs should consider neighbouring airports procedures to ensure adequate deconfliction | <i>AO&GA AP&ANSP FG1</i> | <i>Operational</i> |

| No (a) | Design Principle (b) | Source (c) | Category (d) |
|--------|--|---|---------------|
| 11. | Route 4 designs must consider FASI-S objectives and ensure alignment | AP&ANSP | Operational |
| 12. | Key aviation stakeholders should be engaged during the early design stages | Loc Govn | Technical |
| 13. | Overflight protections already contained in the UK AIP must be maintained | Loc Govn FG2 | Environmental |
| 14. | Designs should be built to manage dispersion below 7,000ft | Loc Govn Pub Reps FG1 FG2 FG3 | Environmental |
| 15. | Routes should be designed to concentrate dispersion below 7,000ft | Loc Govn | Environmental |
| 16. | Designs should not include respite options that place routes over newly overflown populations | FG1 FG2 | Environmental |
| 17. | Designs should seek to minimize overflight of previously unaffected locations | Loc Govn Pub Reps FG1 FG3 | Environmental |
| 18. | Use of the WIZAD SID for respite reasons should be considered | Loc Govn FG3 | Environmental |
| 19. | Routes should be designed to limit the wrap around turn to no more than 180° | FG2 | Environmental |
| 20. | Route 4 designs should seek to minimise the impact of adverse noise on the Surrey Hills AONB | Loc Govn Pub Reps FG3 | Environmental |
| 21. | Route 4 designs should remain within the existing NPR | Loc Govn Pub Reps FG1 FG3 | Environmental |
| 22. | Route 4 designs should not be constrained by the lateral dimensions of the existing NPR to 4,000ft | FG1 | Environmental |
| 23. | Route 4 procedures should seek to minimise noise exposure during the night-time period | Loc Govn Pub Reps | Environmental |
| 24. | Minimising noise must be a higher priority than fuel efficiency | Loc Govn | Environmental |

| No (a) | Design Principle (b) | Source (c) | Category (d) |
|-----------|--|------------------------------|----------------------|
| 25. | Route 4 procedures should follow M25 and A24 corridors where background noise is already high | <i>Pub Reps FG3</i> | <i>Environmental</i> |
| 26. | Designs should use the shortest routing to minimise pollution | <i>Loc Govn Pub Reps</i> | <i>Environmental</i> |
| 27. | Designs should seek to avoid the same residents suffering aircraft noise from Route 4 and Route 3 departures | <i>Pub Reps</i> | <i>Environmental</i> |
| 28. | Designs will seek to avoid overflight of notified noise sensitive areas | <i>Loc Govn FG2</i> | <i>Environmental</i> |

Table 1 - Long List of Design Principles.

3 Long List Review

3.1 Introduction

Having developed the comprehensive list shown in Table 1, this section now considers each of the Design Principles identified from the engagement activities and in line with CAP 1616 guidance, identifies those items we do not intend to include as a shortlisted Design Principle. The constraints and dependencies that provide the evidence to support these decisions are listed against the relevant Design Principle in Table 2 below.

3.2 Design Constraints

Gatwick Airport is working collaboratively with 16 other airports and NATS on the FASI-South programme to modernise airspace design across the south east of England. Gatwick Airport will define the entry and exit points to the terminal airspace at 7,000 ft, while airspace modernisation outcomes, derived from UK and international policies, are expected to deliver the following:

- Maintaining and enhancing high aviation safety standards
- Securing the efficient use of airspace and enabling integration
- Avoiding flight delays by better managing the airspace network
- Improving environmental performance by reducing emissions and by better managing noise
- Facilitating defence and security objectives

All design options will be designed in accordance with the ICAO document *PANS-OPS 8168 Aircraft Operations – Volume 2 Construction of Visual and Instrument Flight Procedures* and the CAA publication *CAP 778 Policy and Guidance for the Design and Operation of Departure Procedures in UK Airspace*.

3.3 Design Principles - Reasons for Not Making Shortlist

Table 2 below articulates the constraints and reasons why the listed items have not been taken forward into the final shortlist of Design Principles for subsequent prioritisation.

| Original No (a) | Design Principle (b) |
|--------------------|---|
| 3 | Route 4 designs should, where possible, involve CCOs |
| Reason | Existing airspace constraints and altitude restrictions means that implementing CCOs would be impracticable for Route 4 SIDs. A CCO to achieve the necessary altitude for the en-route airways structure would result in a small rate of climb which would keep the aircraft at lower altitudes for longer, increasing the noise impact along the route |
| 4 | Design of CCOs should consider optimal use of generic aircraft performance to minimise noise impact |

| Original No (a) | Design Principle (b) |
|--------------------|---|
| Reason | The use of CCOs would result in a greater noise impact due to the reduce rate of climb as described above |
| 6 | Minimise the practice of radar vectoring below 7,000ft |
| Reason | The use of radar vectoring is a tactical procedure used by ATC above 4,000 ft to manage air traffic routing and does not form part of the designed procedure and is therefore outside of the scope of this airspace change |
| 8 | Designs should incorporate ‘all engine’ and ‘engine out’ considerations |
| Reason | Procedures are designed in accordance with <i>PANS-OPS 8168 Aircraft Operations – Volume 2 Construction of Visual and Instrument Flight Procedures</i> and do not incorporate procedures for aircraft that have experienced engine failure(s) |
| 12 | Key aviation stakeholders should be engaged during the early design stages |
| Reason | This is not a Design Principle that will inform the development of the design options. Key aviation stakeholders will continue to be engaged in accordance to the process laid down in CAP 1616 |
| 18 | Use of the WIZAD SID for respite reasons should be considered |
| Reason | The WIZAD SID is an existing procedure at Gatwick and so this Design Principle does not inform the design of the new Route 4 SID options. The WIZAD SID cannot be flight planned and cannot therefore be used as a respite option |
| 21 | Route 4 designs should remain within the existing NPR |
| Reason | In order to explore all options for the Route 4 SIDs, the Design Principle ‘ <i>Route 4 designs should not be constrained by the existing NPR</i> ’ will be taken forward to the short list. This will allow options that remain within the NPR to be designed hence this Design Principle has been covered |
| 23 | Route 4 procedure should seek to minimise noise exposure during the night-time period |
| Reason | Separate procedures are not produced for day/night operations. The Route 4 procedures will seek to minimise noise exposure in accordance with Government guidelines and those Design Principles taken forward to the short list |
| 24 | Minimising noise must be a higher priority than fuel efficiency |

| Original No (a) | Design Principle (b) |
|--------------------|--|
| Reason | The procedures must follow Government guidelines for prioritising noise exposure against aircraft emissions. This is published in the Department for Transport Air Navigation Guidance 2017 under Altitude Based Priorities (para 3.2 to 3.3). |
| 26 | Designs should use the shortest routing to minimise pollution |
| Reason | In order to design procedures that limit noise and other impacts, it may not be possible to fly direct routings; for example, where this approach might conflict with safety imperatives, including aircraft deconfliction. During the design phase direct routing may be possible if this generates an acceptable balance between competing environmental and operational impacts |
| 27 | Designs should seek to avoid the same residents suffering aircraft noise from Route 4 and Route 3 departures |
| Reason | Route 4 and Route 3 departures both route to the north of the Airport, from different ends of the runway and route in opposite directions. Feedback to date, suggests current NPRs should be retained and moving this would be beyond the scope of this project |

Table 2 - Design Principles Not Taken Forward.

4 Design Principles Short List - Prioritised

4.1 Introduction

As stated at Section 1.4, Design Principles are used to help us identify the suite of options that has the greatest potential to achieve the desired outcomes and should also assist in maximising the potential benefits. Prioritising the Design Principles allows us to assess the merits of each option on a relative basis and make better trade-off decisions.

4.2 Prioritised Shortlist of Design Principles

Prioritisation of the Design Principles has initially been conducted based on the volume of comments received through feedback in the Design Principles Questionnaires alongside the comments and discussions recorded during the Focus Groups. We now need your help to provide further comment on the list and to help us to understand which Design Principles are most important to our stakeholder groups.

Table 3 below shows the final shortlist of initially prioritised Design Principles for your further review and comment, as described in Section 5.

| Prioritised (a) | Original Ref (b) | Design Principle (c) |
|--------------------|---------------------|---|
| 1 | 1 | Route 4 options will be designed safely with full regulatory compliance |
| 2 | 14 | Designs should be built to manage dispersion below 7,000 ft |
| 3 | 2 | New Route 4 designs should give due regard to the historic routings in use before 2012 |
| 4 | 17 | Designs should seek to minimize overflight of previously unaffected locations |
| 5 | 28 | Designs will seek to avoid overflight of notified noise sensitive areas |
| 6 | 20 | Route 4 designs should seek to minimise the impact of adverse noise on the Surrey Hills AONB |
| 7 | 10 | Route 4 designs should consider neighbouring airports procedures to ensure adequate deconfliction |
| 8 | 5 | Routes should include an extended westerly climb profile before a later easterly turn |
| 9 | 16 | Designs should not include respite options that place routes over newly overflown populations |
| 10 | 13 | Overflight protections already contained in the UK AIP must be maintained |

| Prioritised (a) | Original Ref (b) | Design Principle (c) |
|--------------------|---------------------|--|
| 11 | 25 | Route 4 procedures should follow M25 and A24 corridors where background noise already high |
| 12 | 15 | Routes should be designed to concentrate dispersion below 7,000ft |
| 13 | 7 | Procedures should include RF legs |
| 14 | 9 | ARINC 424 coding must ensure aircraft follow the desired lateral and vertical paths |
| 15 | 19 | Routes should be designed to limit the wrap around turn to no more than 180° |
| 16 | 11 | Route 4 designs must consider FASI-S objectives and ensure alignment |
| 17 | 22 | Route 4 designs should not be constrained by the lateral dimensions of the existing NPR to 4,000ft |

Table 3 - Suggested Prioritised Shortlist of Design Principles

5 Requested Feedback

Please provide your feedback using the standalone document entitled **Design Principles Review Response**, provided separately.

Please send your completed response document to the address immediately below by 1700 hours on 28th June 2019:

lgwairspace.rte4@gatwickairport.com

Question 1

Do you agree that London Gatwick Airport has developed its Route 4 Design Principles in full accord with the process detailed in CAP 1616, Step 1B?

Response Yes No

Additional Comments:

Question 2

Do you agree that the comprehensive list of Design Principles captures the specific areas of concern you have articulated in either a questionnaire or during participation in one of the focus groups?

Response Yes No

Additional Comments:

Question 3

Do you broadly support our reasons for not including certain Design Principles in the short list? If not, please provide further comment.

Response Yes No

Additional Comments:

Question 4

Do you believe any of the items selected for the shortlist of Design Principles are inappropriate selections? If so, please explain why.

Response Yes No

Additional Comments:

Question 5

Do you agree with the prioritisation that we have applied to the shortlist of Design Principles? If not, please add any comments and use Table 1 (page 6 of the attached Response document) to provide us with your preferred prioritisation.

Response Yes No

Additional Comments:

Question 6

Are there other Design Principles not included in the long list that you feel should be considered as candidates for the final shortlist? If so, please provide your comments.

Response Yes No

Additional Comments:

Question 7

Do you have any other comments on how the CAP 1616, Step 1B process has been conducted to date?

Response Yes No

Additional Comments:

The table referred to in Question 5 has been included in the standalone document entitled **Design Principles Review Response**, provided separately for your responses.

6 Next Steps

6.1 CAP 1616 Process

The development of Design Principles will mark the completion of Stage 1 (Define Stage) of the London Gatwick Airport Route 4 Redesign project. The response you now provide will help us to refine the Design Principles ahead of the CAA DEFINE Gateway shown in Figure 1.

Following your responses, our submission to the CAA will take place on 12th July.

Passing through the CAA DEFINE Gateway will then allow us to commence detailed Route 4 option design work. It is anticipated that these options will be ready to share with you during August, ahead of the DEVELOP and ASSESS Gateway planned for late October.

Based on our current timeline, in July you should receive details of the August engagement events.

6.2 Future Project Timescales

The table below details the anticipated dates for the key steps of the project going forward.

| CAP 1616 Stage | Estimated Completion Date |
|--|--------------------------------|
| Stage 1 Define | 26 th July 2019 |
| Stage 2 Develop and Assess | 25 th October 2019 |
| Stage 3 Consult | 29 th November 2019 |
| Stage 4 Update and Submit ACP ² | 24 th July 2020 |
| Stage 5 Decide | 18 th December 2020 |
| Stage 6 Implement | 25 th March 2021 |

Table 4 - CAP 1616 Timeline.

² Subject to public consultation commencing in January 2020.