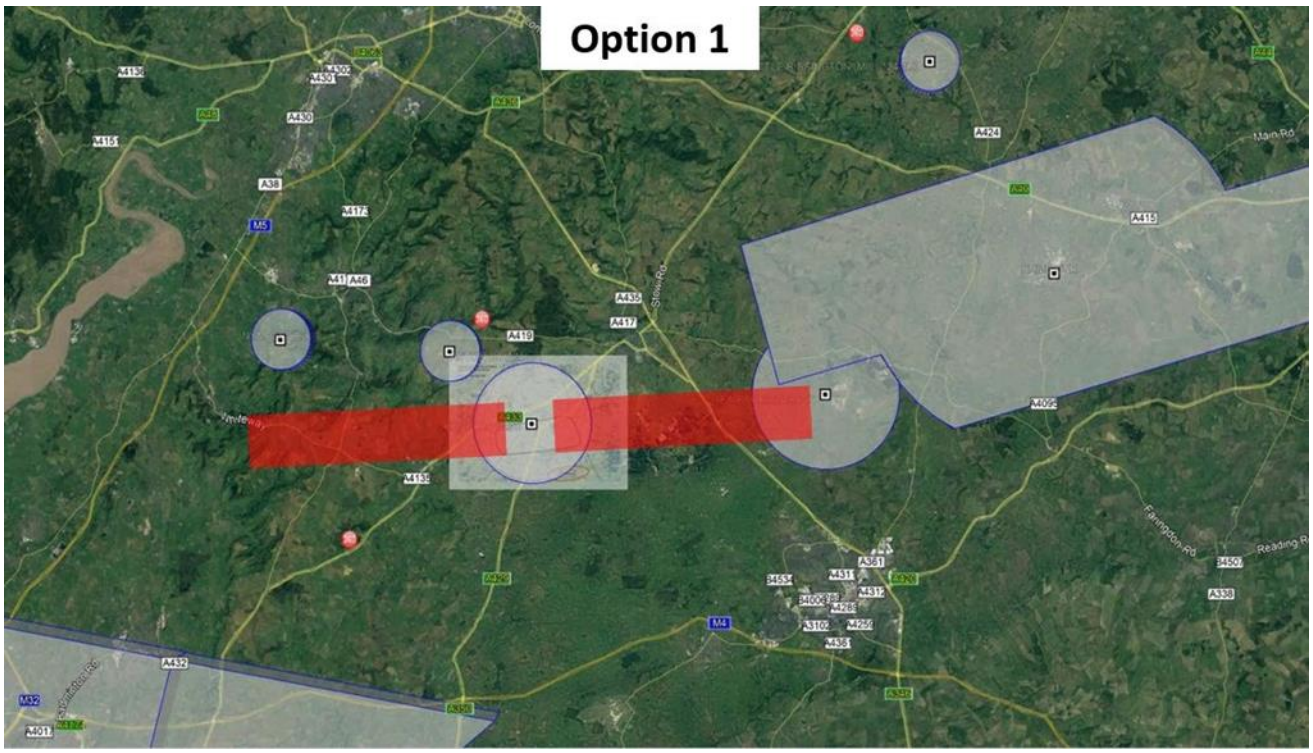
Stage 2a Post Engagement Options Design Principle Evaluation

1. This document articulates the evaluation of the options against the Design Principles agreed in Stage 1. In the spirit of CAP 1616, this evaluation has been conducted post engagement, which in some case included further discussions and challenge meetings with existing and one new stakeholder. This allowed the CS to fully understand all engaged stakeholder views and appropriate modify our stance.

In moving forward, sight of the 'Do Nothing' Option hasn't been lost. However, all engagement to date points to there being no appetite from any quarter to maintain the *status quo* regarding approaches to Kemble by larger passenger and executive jets. It remains the first step on the journey through CAP1616 but as it embodies no changes isn't evaluated in the remainder of the process.

Evaluation Against Design Principles – Option 1

2. An extended linear approach from the centre line outwards for 6 miles for both runway directions is proposed under this Option. It is the most basic option that, in addition to the Design Principles, is compliant with GPS approach technical criteria. There is an interdependency to the east, with RAF Brize Norton (who control their own Class D airspace, and that of RAF Fairford, when activated). This interdependency with RAF Brize Norton as the designated air navigation service provider (ANSP) would need an enhanced Letter of Agreement between the two parties. Aircraft will still need to self-determine transitional routes to join the approach from either the east or west, dependant on which runway is being used.



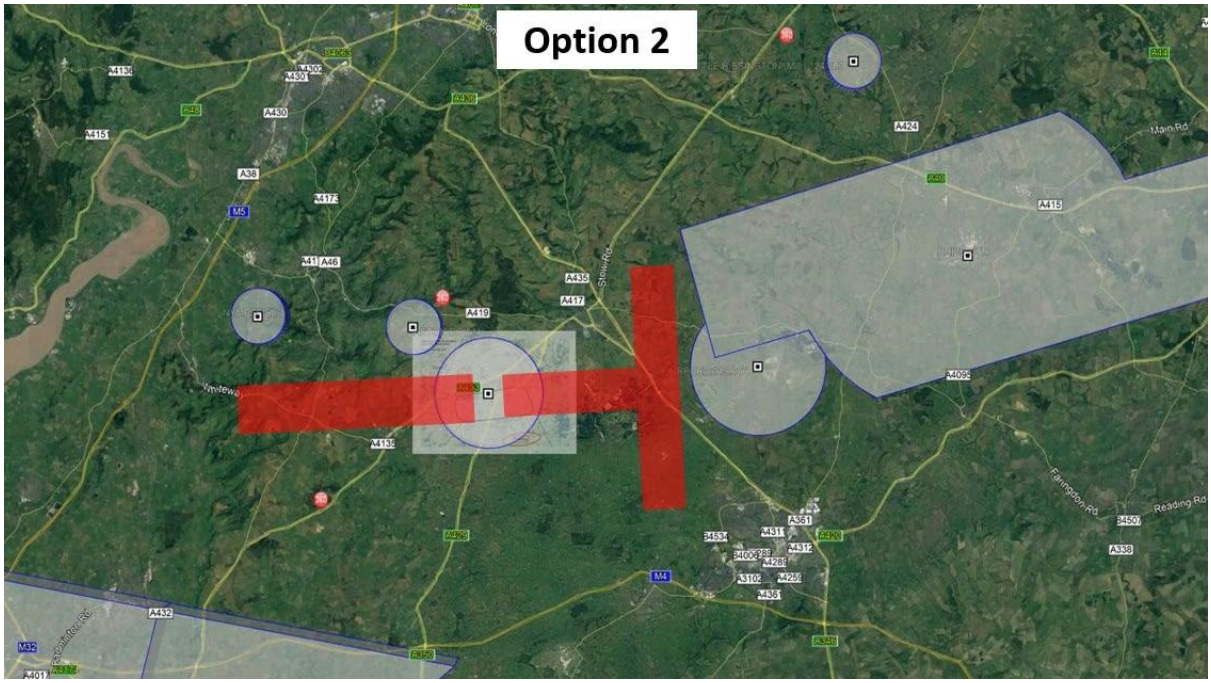
Design Principle	Summary of Evaluation – Option 1	Result
The design must be technically flyable and enhance existing operational performance and levels of safety	This DP is a common requirement and must be met by all options.	Met

The design must integrate with NATS airspace network and RAF Brize Norton Standard Arrivals Routes (STARS)	In tactical terms, the LOA between Kemble and RAF Brize Norton allows for aircraft separation through provision of a radar service from Brize Norton ATC, including a Lower Airspace Radar Service (LARS) in the west. However, this service is not guaranteed, and the option did raise a concern from RAF Brize Norton, who although controlling RAF Fairford traffic, felt it would create traffic friction, particularly in the east when measured against their airspace change proposal. Because this service is not guaranteed, and this approach requires active management by RAF Brize Norton and the use of their controlled airspace, particularly when RAF Fairford's MATZ is activated, this option integrates into Brize Norton's STARS no more than the baseline and thus is deemed not to have met this DP.	Not Met
The design should regularise approach paths onto predetermined, published routes to bring certainty to residents and airspace users.	This DP is met by virtue of any defined approach published in the UK Aeronautical Information Publication (AIP)having to be followed by subject aircraft. However, engagement suggested this is the least favoured option, as it only delivers against the DP when within the defined approach areas. Remaining arrival routes outside this will continue to be as unpredictable and scattered as present until aircraft arrive at the start of the approach. This was also topic of discussion with other airspace users, both gliders and GA. (see table and summary document)	Partial
The design should help ensure aircrew can plan their arrival using defined routes laterally and vertically, so permitting low-power continuous descents, thus reducing noise and emissions	At this stage, it is difficult to assess until further refinement of options is undertaken in 2 and 3. However, this design principle is a common requirement and thus, any developed or selected option must meet this requirement. Therefore, at this stage, it is determined to have been met.	Met
The design should improve existing noise abatement/sensitive areas, as detailed within KAOP 38 (our noise abatement, as listed on our website).	As all options were defined in Stage 2a, analysis of the current approach tracks taken by the jets (for which this proposal intends to deliver defined approaches,) suggested that although height varied, within 4 miles of Kemble, almost all approach tracks were the same. For those villages under the extended centreline for both runways, this is unlikely to fundamentally change the routing from the 'do-nothing' baseline. However, defining a constant low power descent will alleviate overflight and thus improve this for the 2% of our annual movements this proposal will affect.	Met
The design should reduce the amount of people overflown.	This DP is partially met. Outside the defined approach area there is no change from the 'do-nothing' baseline. Equally, when measured against approach tracks of the baseline, most aircraft are flying this approach as they set a course based on our runway compass bearings. This option would likely deliver a slight reduction in aircraft flying self-defined jet circuits, for example when	Partial

	arriving from the east to land on the 08 runway from the west.	
The Design must reduce the scattering effect of aircraft arrival tracks resulting from pilot managed visual navigation, including overhead joining of the circuit.	This option does deliver a reduction, but further analysis will be required to quantify the amount for Stage 3 Consult. Analysis prior to engagement demonstrated that scattering of aircraft tracks increases the further out the aircraft is from Kemble. Within this option, the Do-Nothing baseline suggests that most aircraft are within the shaded approach area (see diagram) by the time they are half way along that shaded area, towards Kemble i.e. around 4 miles from touchdown. Further analysis for Stage 3 is needed, but in comparison to the following options and the baseline, although it meets the DP, it does so by the least amount.	Met
The design should take account of local planning policy with regards to future urbanisation in the vicinity of the airfield, so that no future communities are overflown (and that our safeguarding remains extant).	This design has considered known and potential planning applications, in particular, the known development plan for the south west of Cirencester. No further issues were raised by local and district councillors, or by the Cotswold AONB.	Met
Summary of Evaluation	Although this option met most of the design principles, engagement has highlighted a few fundamental concerns, primarily from other airspace users regarding predictability of participating traffic and potential airspace friction with, and dependence upon RAF Brize Norton and Fairford (see summary of engagement document and table). When measured against the Do Nothing baseline and other options it delivers a sub-optimal improvement over the baseline in terms of reduction in both scatter and number of people overflown. The design requires significant refinement in stage 2b but, with refinement could be considered the base-minimum option that meets the statement of need and all design principles.	

Evaluation Against Design Principles – Option 2

3. Taking account of the routes flown by aircraft in Fig 2.0, this Option 2 maintains a linear approach from the West (avoiding glider sites) but provides a north and south link on the eastern approach to help enable aircraft to join from these directions and minimise the variation (fig 2.0) which is most prevalent to the east of Kemble, as highlighted in the diagrams within the Main Step 2a Design Options document. As in Option 1, it requires pilots to define their own transitional routing onto either the north or south T from the east, or linear join from the west.

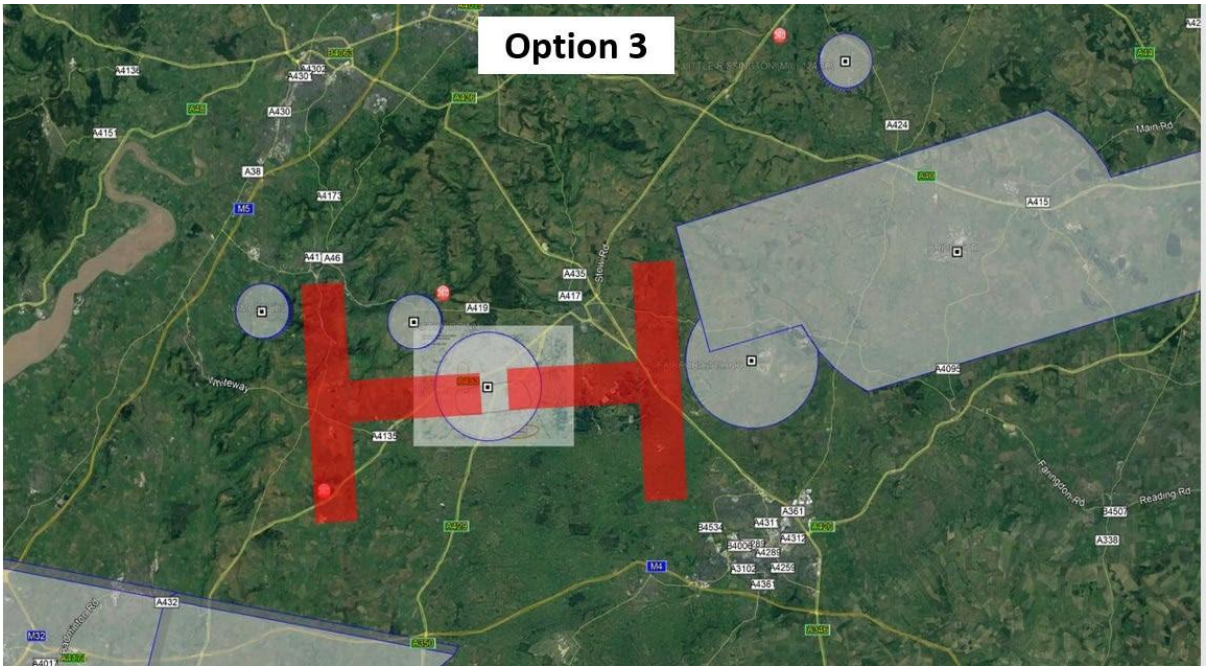


Design Principle	Summary of Evaluation – Option 2	Result
The design must be technically flyable and enhance existing operational performance and levels of safety	This DP is a common requirement and must be met by all options.	Met
The design must integrate with NATS airspace network and RAF Brize Norton Standard Arrivals Routes (STARS)	The positive improvements regarding extra areas to the north and south for the approach adjacent to RAF Brize Norton and Fairford, aimed at meeting the DP deliver an approach that does not depend upon a service from RAF Brize Norton (although in tactical terms, it is likely to continue providing one).	Met
The design should regularise approach paths onto predetermined, published routes to bring certainty to residents and airspace users.	This DP is met by virtue of any defined approach published in the UK Aeronautical Information Publication (AIP) having to be followed by subject aircraft. However, engagement suggested Option 1 was the least favoured, as it only delivered against the DP when within the defined limited approach areas. Remaining arrival routes outside this will continue to be as unpredictable and scattered as present until aircraft arrive at the start of the approach. By adding north and south arms for the approach from the east, an improvement in reaching the DP has been made. However, this isn't mirrored to the west and so remains as Partial.	Partial
The design should help ensure aircrew can plan their arrival using defined routes laterally and vertically, so permitting low-power continuous descents, thus reducing noise and emissions	At this stage, it is difficult to assess until further refinement is undertaken for Option 3. However, this design principle is a common requirement and thus, any developed or selected option must meet this requirement. Therefore, at this stage, it is determined to have been met.	Met

The design should improve existing noise abatement/sensitive areas, as detailed within KAOP 38 (our noise abatement, as listed on our website).	As all options were defined in Stage 2a, analysis of the current approach tracks taken by the jets (for which this proposal intends to deliver defined approaches) suggested that although height varied, within 4 miles of Kemble almost all approach tracks were the same. For those villages under the extended centreline for both runways, this is unlikely to fundamentally change the routing from the 'do-nothing' baseline. However, defining a constant low power descent will alleviate overflight and thus improve this for the 2% of our annual movements this proposal will affect.	Met
The design should reduce the amount of people overflown.	This DP is partially met. Outside the defined approach area there is no change from the 'do-nothing' baseline. Equally, when measured against approach tracks of the baseline, most aircraft are flying this approach as they set a course based on our runway compass bearings. With the additional north and south legs, Option 2 will deliver a further slight reduction in aircraft flying self-defined jet circuits.	Partial
The Design must reduce the scattering effect of aircraft arrival tracks resulting from pilot managed visual navigation, including overhead joining of the circuit.	This option continues deliver reductions, but further analysis will be required to quantify the amount for Stage 3 - Consult. Analysis prior to engagement demonstrated that scattering of aircraft tracks increases the further out the aircraft is from Kemble. Within this option, the Do-Nothing baseline suggests that most aircraft are within the shaded approach area (see diagram) by the time they are half way along that shaded area, towards Kemble i.e. around 4 miles from touchdown. Compared to the previous option and the baseline, although it meets the DP, there is more that can be done to meet the DP.	Met
The design should take account of local planning policy with regards to future urbanisation in the vicinity of the airfield, so that no future communities are overflown (and that our safeguarding remains extant).	This design has considered known and potential planning applications, in particular, the known development plan for the south west of Cirencester. No further issues were raised by local and district councillors, or by the Cotswold AONB.	Met
Summary of Evaluation	Although like Option 1 this option meets most of the design principles, engagement has highlighted the issues set out above. When measured against the Do Nothing baseline and Options 1, it still only delivers a sub-optimal improvement over the baseline in terms of reduction in scatter or number of people overflown. This design too requires significant refinement in stage 2b but, with refinement also could be considered as a slightly better than base-minimum option which meets the statement of need and all design principles. It does deliver a balanced compromise between other airspace users and the effect on the ground, whilst delivering the Statement of Need.	

Evaluation Against Design Principles – Option 3

4. This option enables aircraft to join an approach from the east or west by using northern and southern legs. This is the most common for GPS approaches and moving aircraft into these areas provides maximum reduction in scatter due to less transitional routing and the most certainty to other airspace users.



Design Principle	Summary of Evaluation – Option 3	Result
The design must be technically flyable and enhance existing operational performance and levels of safety	This DP is a common requirement and must be met by all options.	Met
The design must integrate with NATS airspace network and RAF Brize Norton Standard Arrivals Routes (STARS)	For this DP, Option 3 is considered the same as Option 2.	Met
The design should regularise approach paths onto predetermined, published routes to bring certainty to residents and airspace users.	This DP is met by virtue of any defined approach published in the UK Aeronautical Information Publication (AIP) having to be followed by subject aircraft. However, engagement suggested Option 1 was the least favoured, as it only delivered against the DP when within the defined limited approach areas. Remaining arrival routes outside this will continue to be as unpredictable and scattered as present until aircraft arrive at the start of the approach. In Option 2's design, by adding north and south arms for the approach from the east, an improvement in reaching the DP was made. Now that the same areas added in the east are included to the west the DP is met as far as practicably possible. It should be noted that only aircraft flying below 7000' are encompassed by the need to assess and during normal descent into Kemble these areas will afford the desired level of certainty to stakeholders and the wider public at large.	Met

The design should help ensure aircrew can plan their arrival using defined routes laterally and vertically, so permitting low-power continuous descents, thus reducing noise and emissions	This design principle is a common requirement and thus, any developed or selected option must meet this requirement. As seen in the progressive addition of areas of airspace in Options 1 & 2 this option affords aircrew the greatest opportunity to plan their approach in accordance with this DP	Met
The design should improve existing noise abatement/sensitive areas, as detailed within KAOP 38 (our noise abatement, as listed on our website).	As all options were defined in Stage 2a, analysis of the current approach tracks taken by the jets (for which this proposal intends to deliver defined approaches) suggested that although height varied, within 4 miles of Kemble almost all approach tracks were the same. For those villages under the extended centreline for both runways, this is unlikely to fundamentally change the routing from the 'do-nothing' baseline. However, defining a constant low power descent will alleviate overflight and thus improve this for the 2% of our annual movements this proposal will affect.	Met
The design should reduce the amount of people overflown.	This DP is partially met. Outside the defined approach area there is no change from the 'do-nothing' baseline. Equally, when measured against approach tracks of the baseline, most aircraft are flying this approach as they set a course based on our runway compass bearings. With the additional north and south legs to the east as per Option 2 and now to the west, Option 3 will deliver a further slight reduction in aircraft flying self-defined arrivals to commence the defined approach	Met
The Design must reduce the scattering effect of aircraft arrival tracks resulting from pilot managed visual navigation, including overhead joining of the circuit.	In this final iteration of design, the maximum reduction in scattering has been achieved compared to the previous option and the baseline. This DP is now fully met.	Met
The design should take account of local planning policy with regards to future urbanisation in the vicinity of the airfield, so that no future communities are overflown (and that our safeguarding remains extant).	This design has considered known and potential planning applications, in particular, the known development plan for the south west of Cirencester. No further issues were raised by local and district councillors, or by the Cotswold AONB	Met
Summary of Evaluation	By following the guidance in CAP1616, producing Design Principles (DPs) (Option 3) has emerged as a viable option that best meets the DPs for further appraisal in Step 2b. In the east of Kemble, tis design is essentially the same as option 2. However, engagement did highlight key concerns, particularly to the west of Kemble in terms of both interference with other airspace users, notably the two gliding sites and the effect on the ground (AONB). The initial Appraisal in Step 2b, will test this option to assess its continued viability for progression.	