Future Airspace Strategy Implementation South (FASI-S)

Bristol Airport

Gateway documentation:

Stage 2 Develop & Assess

Step 2B Options Appraisal

(Phase 1 Initial)

including Safety Considerations

Sign-Off

Action	Role	Date
Produced	Airspace Change Specialist	28/01/2022
Reviewed Approved	Bristol Airport General Manager	28/01/2022
Reviewed Approved	Bristol Head of Airside Operations and Safety	28/01/2022

Publication History

Issue	Date	Comments
Issue 1.0	28/01/2022	First issue submitted to the CAA
Issue 1.1	03/02/2022	Updated with broken links replaced
Issue 2.0	17/06/2022	Updated following CAA feedback with further information on the baseline and impact on biodiversity and tranquillity included

Contents

1. Introduction

This document forms part of the document set required in accordance with the requirements of the CAP1616 airspace change process. It aims to provide adequate evidence to satisfy *Stage 2 Develop and Assess Gateway, Step 2B Options Appraisal Safety Assessment.*

This document has been submitted to the CAA to satisfy the requirements for Stage 2 alongside the *Design Options* and *Design Principle Evaluation* documentation which can also be found on the portal (link).

This Initial Options Appraisal is the first of three options appraisals as part of CAP1616. The design options presented herein all passed the required criteria of the *Stage 2 – Step 2A Design Principle Evaluation*. This Initial appraisal builds on the Design Principle evaluation and identifies the key impacted audiences of the design options and a qualitative assessment of each. This assessment takes into consideration feedback received from stakeholders during the Stage 2 engagement activities alongside operational knowledge of the ACP design team.

The changes in this ACP impact flights below 7,000ft – including arrival and departure routes to/ from Bristol Airport - and has consequently been categorised as a Level 1 change. In line with the requirements for a Level 1 change, this Initial Options Appraisal contains a qualitative environmental impact assessment which has been conducted on the basic of CO_2 emissions and noise impact.

The baseline (do nothing) option would not deliver any improvement or modernisation from today's operations and is used as the benchmark against which the benefits of the proposed change can be measured. The Design Principles are either not met or met by default for this option, i.e., 'no change'. As such, this option is not being progressed but is included here for comparative purposes.

The detailed makeup of the baseline option and the Hold/ SID options, including evaluation is detailed in Stage 2 Develop and Assess: *Step 2A(i) Design Options* and *Step 2A(ii) Design Principle Evaluation*.

Following on from the Design Principle Evaluation, Bristol Airport is progressing the following different design options which form the focus of this Initial Options Appraisal:

- 4 options for a Hold
- 14 options for Runway 09 SIDs
- 13 options for Runway 27 SIDs

Biodiversity

From a biodiversity point of view and CAP1616, airspace changes at the altitudes proposed here are unlikely to have an impact on biodiversity because they do not involve ground infrastructure changes. Engagement with biodiversity legislation or guidance is unlikely to be required. Changes in greenhouse gas emissions and tranquillity, which may have a potential indirect impact on biodiversity, are described separately in this document.

Noise Modelling Category

As part of the Stage 2 Gateway, the CAA requires the change sponsor (here being Bristol Airport) to justify the category its noise modelling methodology falls into. The noise modelling categories can be found in the CAA's CAP2091 document which describes the "minimum acceptable level of sophistication of noise modelling" that can be used for an airspace change, alongside other statutory duties.

CAP2091 describes five noise modelling categories A-E, with category A being the most sophisticated, reflecting the most accurate impact of noise experienced by local stakeholders, and Category E is the least and uses standard ICAO datasets.

As covered above, Bristol Airport is conducting a qualitative Initial Options Appraisal and it is therefore not proportional to categorise this sort of assessment. We have provided high-level statements, based on stakeholder feedback and SME input, which indicates whether the noise impact is likely to change.

As our design options are refined in Stage 3 and beyond, we will update our options appraisal with quantitative evidence where appropriate, which include the noise modelling. Based on the category descriptions contained within CAP2091, Bristol Airport's noise modelling falls under Category B where the noise model is adapted using noise monitoring track-keeping and flight profile data collected by the airport.

Assessment Criteria

The evidence supplied here is qualitative and high level, the assessment criteria based on the opinions of subject matter experts, feedback derived from stakeholders and the evolving design work. Bristol Airport do not have an accurate enough traffic forecast to build quantitative airspace change options appraisals. Therefore, the qualitative initial appraisals for each indicative design option do not consider the traffic forecast. A suitable forecast is required as part of the quantitative analysis at Stage 3 and this will be provided.

Each design option has been assessed based on the criteria contained within CAP1616. These criteria can be found below.

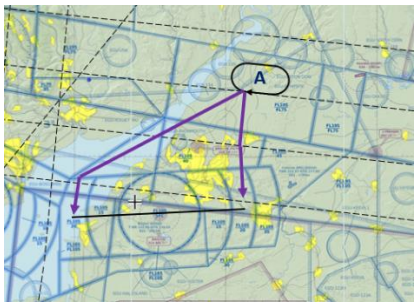
Group	Impact
Communities	Noise impact on health and quality of life
A qualitative assessment of any changes to the noise impact to those affected on the ground. A qualitative assessment of any changes to the tranquillity impact, notably for Areas of Outstanding Natural Beauty or National Parks	
Communities	Air quality
A qualitative assessment of any changes to the air quality impact.	
Wider society	Greenhouse gas impact
A qualitative assessment of any changes to the CO_2 impact.	
Wider society	Capacity/ resilience
A qualitative assessment of any changes to the impact on overall UK airspace structure, specifically in relation to capacity and resilience.	
General Aviation	Access
A qualitative assessment of any changes to the access to airspace for GA users.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
A qualitative assessment of any changes to the forecast increase in air transport movements.	

General Aviation/ commercial airlines	Fuel Burn
A qualitative assessment of any changes to the fuel burn costs.	
Commercial airlines	Training costs
A qualitative assessment of any changes to the training costs.	
Commercial airlines	Other costs
A qualitative assessment of any changes to any other relevant costs.	
Airport/ ANSP	Infrastructure costs
A qualitative assessment of any changes to infrastructure costs.	
Airport/ ANSP	Operational costs
A qualitative assessment of any changes to operational costs.	
Airport/ ANSP	Deployment costs
A qualitative assessment of any changes to deployment costs.	

2. Baseline (do nothing)

The design options in this document are compared to the baseline do-nothing option. As summarised in our Step 2Aii document, the baseline was rejected as it did not meet Design Principles relating to policy, technical, capacity and resilience criteria. It is included here for comparison purposes but is not an option to be progressed.

Group	Impact
Communities	Noise impact on health and quality of life
The same set of communities would continue to be overflown below 7,000ft, resulting in concentration of overflight at low altitudes. There would be no opportunities to provide respite or to otherwise alter flightpaths. If this baseline was retained, the noise impact would not change. Some areas of AoNBs (Cotswolds, Mendip Hills and Wye Valley) are overflown in a dispersed manner below 7,000ft, which may have an impact on tranquility. If this baseline system was retained,, this impact on transquility would not change.	
Communities	Air quality
The same flightpaths would be flown below 1,000ft . If this baseline system was retained, arrivals would not change flightpath below 1,000ft, departures would not change flightpath below 1,000ft, and local air quality impacts would not change.	
Wider society	Greenhouse gas impact
The same route lengths would be flown, and the same typical altitudes would be attained along the track. If this baseline system was retained, track lengths could not be shortened, altitudes could not increase, and greenhouse gas impacts would not change.	
Wider society	Capacity/ resilience
There would be no opportunity to improve airspace capacity or resilience. If this baseline system was retained, the predominant swathes of traffic to/ from the east and south of the airport will remain the same; capacity and resilience impacts would not change.	
General Aviation	Access
GA access to Bristol Airport's airspace would continue in the areas currently observed (generally this is at or below 4,000ft). If this baseline system was retained, GA would continue to access the same areas in a similar manner and access impacts would not change. The current access is considered sub-optimal for all airspace users.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
There would be no opportunity to improve airspace capacity. If this baseline system was retained, the predominant broad swathes of traffic to/ from the east and south of the airport will remain the same. Capacity impacts would not change, and there would be no change in economic impact for either GA or commercial operators.	
General Aviation/ commercial airlines	Fuel Burn
The same route lengths would be flown, and the same typical altitudes would be attained along the track. If this baseline system was retained, track lengths could not be shortened, altitudes could not increase, and fuel burn impacts would not change for either GA or commercial operators.	
Commercial airlines	Training costs
Flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. If this baseline system was retained, the same flight procedures would be used and training cost impacts would not change.	
Commercial airlines	Other costs
We are not aware of other commercial airline costs that are appropriate for inclusion in this appraisal. If this baseline system was retained, those other costs would not change.	
Airport/ ANSP	Infrastructure costs
The infrastructure in place is used daily. If this baseline system was retained, the same infrastructure would continue to be used in the same way, with no additional costs beyond typical maintenance.	
Airport/ ANSP	Operational costs
The operation is used daily. If this baseline system was retained, the same operation would continue in the same way, with no additional operational costs.	
Airport/ ANSP	Deployment costs
If this baseline system was retained, there would be no deployment, hence no associated costs.	

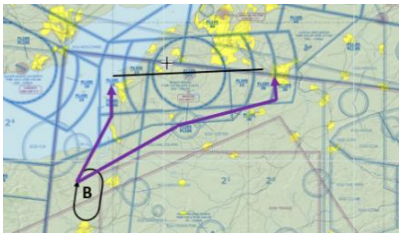


3. Hold Options

Hold A

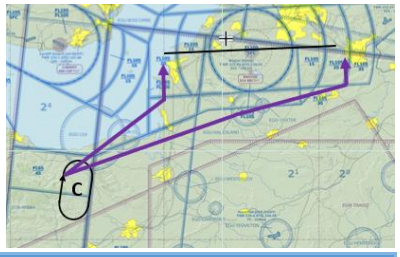
Group	Impact
Communities	Noise impact on health and quality of life
Transitions to Runway 27 should avoid overflying any large populations however, may overfly a small (new) quantity of ground-based stakeholders to the east of Bristol Airport. This can be minimised through PBN routing. Whilst transitions to Runway 09 should mainly occur over the Channel. Therefore, this design option has the potential to increase overall impacts of aircraft noise when compared with the baseline do-nothing. This Hold is positioned between the Wye Valley and Cotswolds Areas of Outstanding Natural Beauty (AoNB) and the transitions would likely avoid both areas too. However, if traffic is not held, inbound westbound traffic could overfly the Cotswolds at high levels (above 7,000ft) which would be identicial to today (baseline do-nothing option). Outbound eastbound traffic will also overfly the Cotswolds in a similar track pattern to today and may even be slightly higher (less impact).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local quality. Arriving aircraft will still descend through 1,000ft on final approach, between 2 and 4 nautical miles (about 4-7km) from touchdown at either end of the runway. This is close to landing, in the very final stages of the approach, and is no change from today.	
Wider society	Greenhouse gas impact
Appropriate location as this Hold is close to the airport. Fuel planning does not have to take into account additional track miles due to the location therefore no superfluous environmental impact. Net increase in CO_2 emissions would be small as holding will not be employed for most arrivals (only when required for reasons such as delay absorption, or bad weather conditions).	
Wider society	Capacity/ resilience
Removes Hold from the overhead thus enabling increased use of continuous climb operations (CCO) for departures when compared with the baseline do-nothing option. Cross-over with potential departure routes but can be managed through vertical profile restrictions and/or tactically. Well positioned for Bristol arrivals and connectivity from the network. However, further design work required to ensure required Hold levels can be obtained due to busy network traffic.	
General Aviation	Access
Minimum new Controlled Airspace (CAS) required: lower base level of Control Area (CTA) needed south of the Hold to accommodate descent. Expectation that the lowest level would be around 5,500ft therefore, this design option has the potential to have a slightly increased impact on GA access when compared with the baseline do-nothing option. However, it should also be noted that there is the potential that the design of the Transition will give opportunity to raise some CAS bases to the north-east of the airport.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Appropriate location as this Hold is close to the airport. Fuel planning therefore does not have to take into account additional track miles due to Hold location. No increase in GA routings expected.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs

This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.



Hold B

Group	Impact
Communities	Noise impact on health and quality of life
Transitions would not overfly any large populations with arrivals to Runway 09 partially overflying the water. PBN routing will be used to minimise overflying population centres. This design option has the potential to reduce overall impacts of aircraft noise when compared with the baseline do-nothing. This Hold is positioned over the Quantock Hills AoNB (above 7,000ft) and could therefore have a visual impact on tranquillity. The transitions from this Hold would have the same impact on the Mendip Hills AoNB as today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local quality. Arriving aircraft will still descend through 1,000ft on final approach, between 2 and 4 nautical miles (about 4-7km) from touchdown at either end of the runway. This is close to landing, in the very final stages of the approach, and is no change from today.	
Wider society	Greenhouse gas impact
Appropriate location as this Hold is close to the airport. Fuel planning does not have to take into account additional track miles due to the location therefore no superfluous environmental impact. Net increase in CO_2 emissions would be small as holding will not be employed for most arrivals (only when required for reasons such as delay absorption, or bad weather conditions).	
Wider society	Capacity/ resilience
Removes Hold from the overhead thus enabling more use of continuous climb operations (CCO) for departures. Therefore, this design option would provide an improvement in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option.	
General Aviation	Access
Small amount of new CAS required for containment of a Hold in this location. Expectation that the lowest level would be around 6,500ft. Additional CAS will be required to ensure containment of the downwind section of the Transition prior to turning base leg. This is a safety requirement based upon todays operational experience. Therefore, this design option has the potential to have a slightly increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Appropriate location as this Hold is close to the airport. Fuel planning therefore does not have to take into account additional track miles due to Hold location. Small increase in GA routings expected, at medium levels only.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



Hold C

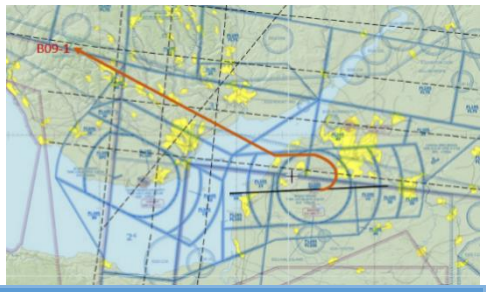
Group	Impact
Communities	Noise impact on health and quality of life
Transitions would not overfly any large populations with arrivals to Runway 09 partially overflying the water. PBN routing will be used to minimise overflying population centres. This design option has the potential to reduce overall impacts of aircraft noise when compared with the baseline do-nothing. This Hold is positioned over the Quantock Hills AoNB (above 7,000ft) and could therefore have a visual impact on tranquillity. The transitions from this Hold would have the same impact on the Mendip Hills AoNB as today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local quality. Arriving aircraft will still descend through 1,000ft on final approach, between 2 and 4 nautical miles (about 4-7km) from touchdown at either end of the runway. This is close to landing, in the very final stages of the approach, and is no change from today.	
Wider society	Greenhouse gas impact
Although a large proportion of flights are from the south, the Transition from Hold C to Runway 27 would increase the environmental impact when compared with other design options. Net increase in CO_2 emissions would be small as holding will not be employed for most arrivals (only when required for reasons such as delay absorption, or technical troubleshooting).	
Wider society	Capacity/ resilience
Removes Hold from the overhead thus enabling more use of continuous climb operations (CCO) for departures. However, some new CAS would be required for containment. Capacity could be constrained due to length of transition to Runway 27. Also situated within a very busy region of airspace. Therefore, further design work would be required to ensure a capacity/ resilience benefit when compared with the baseline do-nothing option.	
General Aviation	Access
Small extension of CAS required to accommodate a Hold in this location. Expectation that the lowest level would be around 6,500ft therefore, this design option has the potential to have a slightly increased impact on GA access when compared with the baseline do-nothing option. Additional CAS will be required to ensure containment of the downwind section of the Transition prior to turning base leg. This is a safety requirement based upon todays operational experience.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Hold is in an appropriate location for a large proportion of arrivals from the south. However, fuel planning would have to take into account the longer transition to Runway 27 (when compared with other options) which would increase fuel burn for airlines. No increase in GA routings expected.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery.	

Internal documentation will also require updating.

Hold F

Group	Impact
Communities	Noise impact on health and quality of life
Transitions may overfly new populations, albeit not huge numbers of people. PBN routing will be used to minimise impact. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. This Hold is not positioned over any AoNBs or National Parks. However, the transitions from this Hold would have the same impact on the Mendip Hills AoNB as today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local quality. Arriving aircraft will still descend through 1,000ft on final approach, between 2 and 4 nautical miles (about 4-7km) from touchdown at either end of the runway. This is close to landing, in the very final stages of the approach, and is no change from today.	
Wider society	Greenhouse gas impact
Appropriate location as this Hold is close to the airport and the majority of arrivals are from the south and east. Fuel planning does not have to take into account additional track miles due to the location therefore no superfluous environmental impact. Net increase in CO_2 emissions would be small as holding will not be employed for most arrivals (only when required for reasons such as delay absorption, or technical troubleshooting).	
Wider society	Capacity/ resilience
Removes Hold from the overhead thus enabling more use of continuous climb operations (CCO) for departures. Geographically well suited for Bristol arrivals and connectivity from the network. However, some new CAS may be required for containment. On balance, it is anticipated that this design option would provide an improvement in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option.	
General Aviation	Access
New CAS required to accomodate a Hold in this location but base level expected to be around 6,500ft. Therefore, this design option has the potential to have a slightly increased impact on GA access when compared with the baseline do-nothing option. Additional CAS will be required to ensure containment of the downwind section of the Transition prior to turning base leg. This is a safety requirement based upon todays operational experience.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Appropriate location as this Hold is close to the airport and the majority of arrivals are from the south and east. Fuel planning therefore does not have to take into account additional track miles due to Hold location. Small increase in GA routings expected, at medium levels only.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery.	

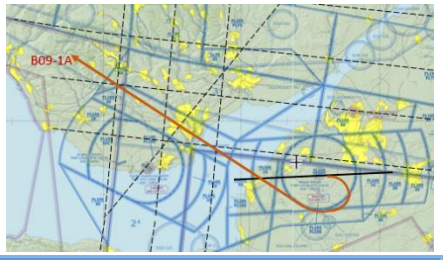
Internal documentation will also require updating.



4. Runway 09 SID Options

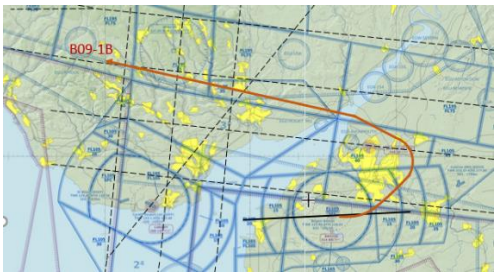
Runway 09 SID: B09-1 (north-west departure)

Group	Impact
Communities	Noise impact on health and quality of life
Some of the climb will be over the Channel. It turns earlier than the current SID which could reduce the population overflown by avoiding central Bristol. This design option has the potential to reduce overall impacts of aircraft noise when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities closer to the airport. This design option would overfly the Brecon Beacons National Park well above 7,000ft and could therefore have a visual impact on tranquillity. This is very similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current Noise Preferential Routes (NPR) to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
More direct route than the current departure therefore, reducing greenhouse gas impact when compared with the baseline do-nothing option. Should also allow CCOs.	
Wider society	Capacity/ resilience
A more systemised route compared with the current baseline do-nothing option, and well positioned for network connectivity. Anticipated to support 1-minute splits from other east and northbound departures. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Design intention is to contain SID within existing CAS however, the early turn to minimise population overflown may require lowering part of CTA7. Therefore, this design option has the potential to have a slightly increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter and more direct route will result in modest savings for commercial traffic when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



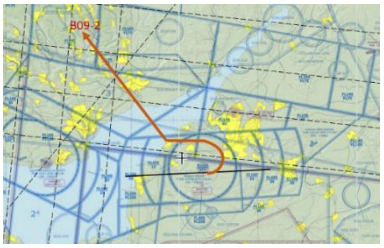
Runway 09 SID: B09-1A (alternate north-west departure)

Group	Impact
Communities	Noise impact on health and quality of life
Some of the climb will be over the Channel. The right turn from Runway 09 would completely avoid overflying Bristol City. However, it would overfly the Mendip AoNB. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities. This design option would overfly the Mendip Hills AoNB below 7,000ft which would have an impact on tranquillity. This is similar to today's right-turn traffic (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
A direct route to the north-west from Runway 09 therefore anticipated to reduce greenhouse gas impacts when compared with the baseline do-nothing option. Should also allow CCOs.	
Wider society	Capacity/ resilience
Well positioned for network connectivity. Anticipated to support 1-minute splits from other east and northbound departures. Offers a potential alternative to SID B09-1 to provide respite. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Design intention is to contain SID within existing CAS therefore, this design option would have a similar impact on GA access when compared with the baseline do-nothing.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Direct route will reduce fuel burn when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



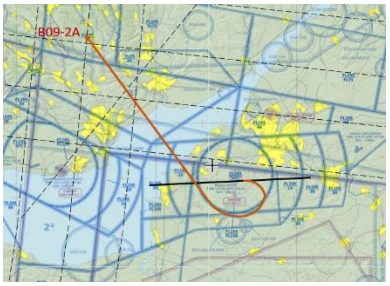
Runway 09 SID: B09-1B
(alternate left turn north-west departure)

Group	Impact
Communities	Noise impact on health and quality of life
Some of the climb will be over the Channel and avoids overflying Bristol City centre. This design option has the potential to reduce overall impacts of aircraft noise when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities. This design option would overfly the Brecon Beacons National Park well above 7,000ft and could therefore have a visual impact on tranquillity. This is very similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
Longer track distance than B09-1 therefore increased environmental impact when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Provides an alternative route to B09-1 for low performance aircraft. Anticipated to support 1-minute splits from southbound departures. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Design intention is to contain SID within existing CAS therefore, this design option would have a similar impact on GA access when compared with the baseline do-nothing.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
A longer track distance than B09-1 will result in an increase in fuel burn when compared with the baseline do-nothing option. Airline fuel planning would have to take into account an increase in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



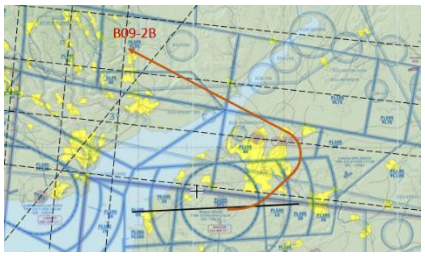
Runway 09 SID: B09-2 (left turn north-west departure)

Group	Impact
Communities	Noise impact on health and quality of life
Some of the climb will be over the Channel and avoids overflying Bristol City centre. This design option has the potential to reduce overall impacts of aircraft noise when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities. This design option would overfly the Brecon Beacons National Park well above 7,000ft and could therefore have a visual impact on tranquillity. This is very similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
More direct route than the current departure therefore, reducing its greenhouse gas impact, when compared with the baseline do-nothing option. Should also allow CCOs.	
Wider society	Capacity/ resilience
Should allow CCOs and is anticipated to support 1-minute splits from other southbound and possibly eastbound departures. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Design intention is to contain SID within existing CAS. However, an early turn to minimise population oveflown may result in lowering part of CTA7. Therefore, this design option has the potential to have a slightly increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Direct route will minimise fuel burn when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



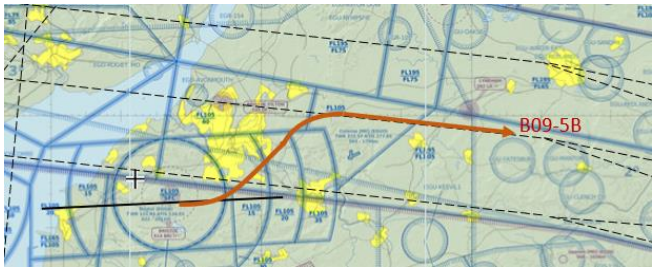
Runway 09 SID: B09-2A
(alternate right turn north-west departure)

Group	Impact
Communities	Noise impact on health and quality of life
Some of the climb will be over the Channel. The right turn from Runway 09 would completely avoid overflying Bristol City. However, it would overfly the Mendip AoNB. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities. This design option would overfly the Mendip Hills AoNB below 7,000ft which would have an impact on tranquillity. This is different to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
Longer route than some of the other options to the north-west therefore an increased environmental impact when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Should support 1-minute splits from other east and northbound departures. Good connectivity to the network. Potentially a respite alternative to SID B09-2. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Design intention is to contain SID within existing CAS therefore, this design option would have a similar impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Longer route than some of the other options to the north-west therefore an increase in fuel burn when compared with the baseline do-nothing option. Airline fuel planning would have to take into account an increase in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



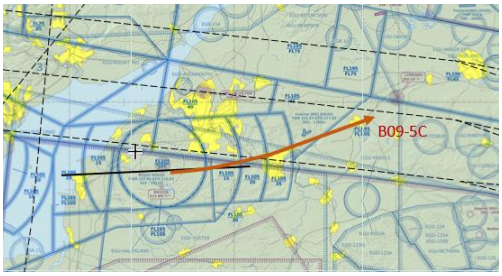
Runway 09 SID: B09-2B
(alternate left turn north-west departure)

Group	Impact
Communities	Noise impact on health and quality of life
Some of the climb will be over the Channel. The left turn from Runway 09 would avoid overflying Bristol City centre. This design option has the potential to reduce overall impacts of aircraft noise when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities. This design option would overfly the Brecon Beacons National Park well above 7,000ft and could therefore have a visual impact on tranquillity. This is very similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
Longer route than the other options to the north-west therefore an increased environmental impact when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Should be suitable for low performance aircraft. Further design work would be required to ensure a capacity/ resilience benefit when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Design intention is to contain SID within existing CAS therefore, this design option would have a similar impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Longer route than the other options to the north-west therefore an increase in fuel burn when compared with the baseline do-nothing option. Airline fuel planning would have to take into account an increase in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



Runway 09 SID: B09-5B
(alternate eastern departure)

Group	Impact
Communities	Noise impact on health and quality of life
Avoids overflying Bath and Bristol. Could potentially be used as a respite route. This design option has the potential to reduce overall impacts of aircraft noise when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities. This design option would overfly the Cotswolds AoNB above 7,000ft and could therefore have a visual impact on tranquillity. This is very similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
Less direct and longer track distance than B09-5C therefore an increased environmental impact when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Well positioned for connectivity to the network. Suitable for low performance aircraft providing greater track distance to achieve network height requirements. Formalises what is currently a tactical route. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Design intention is to contain SID within existing CAS therefore, this design option would have a similar impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Less direct and longer track distance than B09-5C therefore an increase in fuel burn when compared with the baseline do-nothing option. Airline fuel planning would have to take into account an increase in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



Runway 09 SID: B09-5C
(north-east departure)

Group	Impact
Communities	Noise impact on health and quality of life
Precisely positioned to minimise population overflown (subject to detailed design). This design option has the potential to reduce overall impacts of aircraft noise when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities closer to the airport. This design option would overfly the Cotswolds AoNB below 7,000ft and could therefore have an impact on tranquillity. This is very similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
Direct departure route and shorter than current route. Therefore, this design option is anticipated to provide a benefit in greenhouse gas impact when compared with the baseline do-nothing option. However, speed restrictions may be required to achieve network height requirements which could increase emissions.	
Wider society	Capacity/ resilience
Well positioned for connectivity to the network. Suitable for high performance aircraft. Formalises what is currently a tactical route (today's NPR). Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Design intention is to contain SID within existing CAS therefore, this design option would have a similar impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Direct departure route and shorter than current route when compared with the baseline do-nothing option. Should achieve continuous climbs. However, network speed restrictions may be required to achieve climb which could increase fuel burn (airline fuel planning would have to take account of this).	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery.	

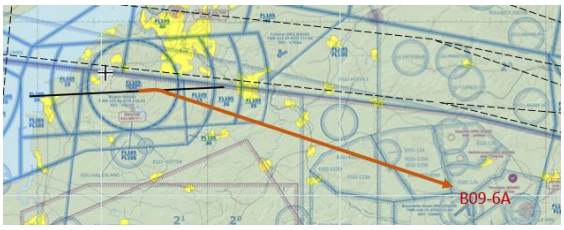
Internal documentation will also require updating.

Runway 09 SID: B09-6
(south-east departure for first rotation traffic)

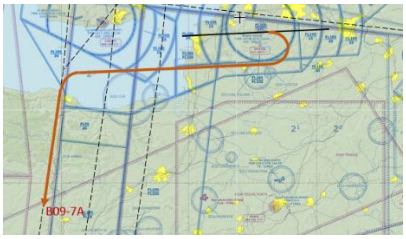
Group	Impact
Communities	Noise impact on health and quality of life
New route intended only for some early morning departures. Does not overfly any heavily populated areas. This design option has the potential to reduce overall impacts of aircraft noise when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities closer to the airport. This design option is positioned between the Mendip Hills and Cotswolds AoNB and would therefore have no impact on tranquillity, This is an improvement to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
When in use, this route will provide good greenhouse gas/ fuel burn savings from reduced track mileage (more direct than today) when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Would be used to reduce pre-departure delay during first rotation (a known high demand period). However, it would not comply with current network connectivity (further work required). Potential to achieve reduced departure separation from north and eastbound departures. Further design work would be required to ensure a capacity/ resilience benefit when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
This SID will require change of classification of airspace but limited to early morning periods (e.g. before 08.30). Therefore, this design option has the potential to have a slightly increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter and more direct route will result in good savings for commercial traffic when available (early mornings only) when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	

Runway 09 SID: B09-6A

(alternate south-east departure for first rotation traffic)

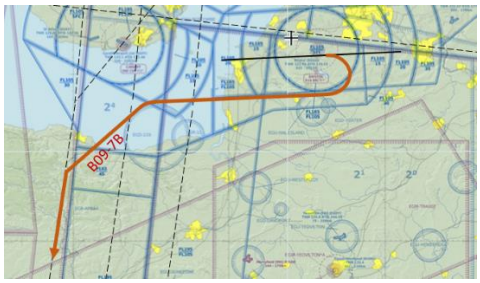


Group	Impact
Communities	Noise impact on health and quality of life
New route intended only for some early morning departures. Does not overfly any heavily populated areas. This design option has the potential to reduce overall impacts of aircraft noise when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities closer to the airport. This design option is positioned between the Mendip Hills and Cotswolds AoNB and would therefore have no impact on tranquillity, This is an improvement to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
When in use, this route will provide good greenhouse gas/ fuel burn savings from reduced track mileage when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Would be used to reduce pre-departure delay during first rotation (a known high demand period). However, it would not comply with current network connectivity (further work required). Achieving reduced departure separation from east or southbound traffic will depend upon NPR changes. Further design work would be required to ensure a capacity/ resilience benefit when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
This SID will require change of classification of airspace but limited to early morning periods (e.g. before 08.30). Therefore, this design option has the potential to have a slightly increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter and more direct route will result in good savings for commercial traffic when available (early mornings only) when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



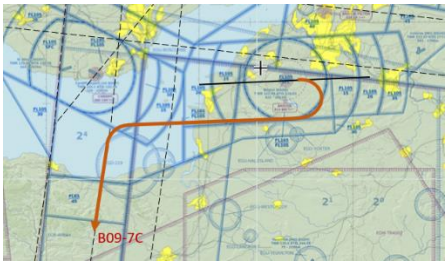
Runway 09 SID: B09-7A
(alternate southern departure)

Group	Impact
Communities	Noise impact on health and quality of life
Does not overfly any heavily populated areas however, overflies the Mendip AoNB. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities. This design option would overfly the Mendip Hills AoNB below 7,000ft and would therefore have an impact on tranquillity. This is similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
This route should allow CCOs depending on cross-over with the inbound Transition. Therefore, this design option should provide a benefit for greenhouse gas impacts when compared with the baseline do-nothing;	
Wider society	Capacity/ resilience
Should support 1-minute splits from north or eastbound departures. Well positioned for connectivity to the network. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
This may require a small amount of new permanent CAS which could impact GA operations (gliding site in this region). Therefore, this design option is likely to have an increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter and more direct route will result in good savings for commercial traffic when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



Runway 09 SID: B09-7B
(alternate southern departure)

Group	Impact
Communities	Noise impact on health and quality of life
Does not overfly any heavily populated areas however, overflies the Mendip AoNB. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities. This design option would overfly the Mendip Hills AoNB below 7,000ft and would therefore have an impact on tranquillity. This is similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
This route should enable CCOs depending on cross-over with inbound Transition which will reduce greenhouse gas impacts when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Should support 1-minute splits from north or eastbound departures. Well positioned for connectivity to the network. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
This may require a small amount of new permanent CAS which could impact GA operations (gliding site in this region). Therefore, this design option is likely to have an increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter and more direct route will result in good savings for commercial traffic when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	

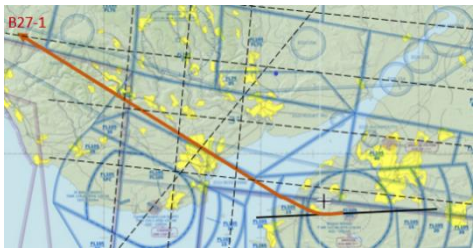


Runway 09 SID: B09-7C
(alternate southern departure)

Group	Impact
Communities	Noise impact on health and quality of life
Does not overfly any heavily populated areas however, overflies the Mendip AoNB. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities. This design option would overfly the Mendip Hills AoNB below 7,000ft and would therefore have an impact on tranquillity. This is similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
This route should enable CCOs depending on cross-over with inbound Transition which will reduce greenhouse gas impacts when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Should support 1-minute splits from north or eastbound departures. Well positioned for connectivity to the network. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
This may require a small amount of new permanent CAS which could impact GA operations (gliding site in this region). Therefore, this design option is likely to have an increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter and more direct route will result in good savings for commercial traffic when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	

Runway 09 SID: B09-7D
(alternate southern departure)

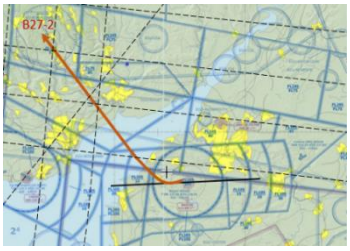
Group	Impact
Communities	Noise impact on health and quality of life
Does not overfly any heavily populated areas however, overflies the Mendip AoNB. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities. This design option would overfly the Mendip Hills AoNB below 7,000ft and would therefore have an impact on tranquillity. This is similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
This route is shorter than what is currently flown therefore, will provide good greenhouse gas/ fuel burn savings from reduced track mileage, when compared with the baseline do-nothing option. It should also allow CCOs as it is designed to be separated from the inbound Transition.	
Wider society	Capacity/ resilience
Should support 1-minute splits from east or northbound departures. Well positioned for connectivity to the network. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Would require a significant amount of new permanent CAS which could potentially impact GA or military operations. Although, this new CAS would be limited to above 4,000ft which would lessen the impact. Therefore, this design option is likely to have an increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter and more direct route will result in good savings for commercial traffic when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



5. Runway 27 SID Options

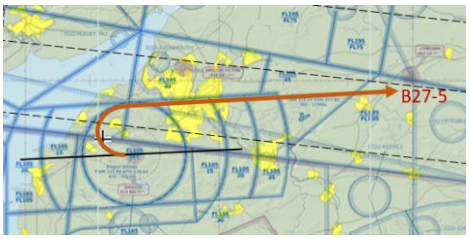
Runway 27 SID: B27-1 (north-west departure)

Group	Impact
Communities	Noise impact on health and quality of life
Much of the climb will be over the Channel however a small (new) population could be affected by a re-alignment from the current NPR which could overfly new communities. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities close to the airport. This design option would overfly the Brecon Beacons National Park well above 7,000ft and could therefore have a visual impact on tranquillity. This is very similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
More direct route than the current departure therefore, reducing greenhouse gas impact when compared with the baseline do-nothing option. Should also allow CCOs (subject to design separation from Cardiff procedures).	
Wider society	Capacity/ resilience
A more systemised route compared with the current procedure and well positioned for network connectivity. Should support reduced separation from southbound departures. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
A small amount of additional CAS may be required to the northwest of Cardiff Airport. Therefore, this design option has the potential to have a slightly increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter and more direct route will result in fuel burn savings for commercial traffic when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



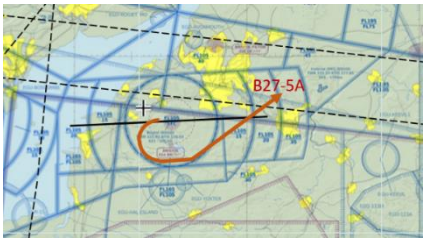
Runway 27 SID: B27-2 (north-west departure, towards Brecon)

Group	Impact
Communities	Noise impact on health and quality of life
Much of the climb will be over the Channel and can be aligned to avoid large population centres. This design option has the potential to reduce overall impacts of aircraft noise when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities close to the airport. This design option would overfly the Brecon Beacons National Park well above 7,000ft and could therefore have a visual impact on tranquillity. This is very similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
More direct route than the current departure therefore, reducing greenhouse gas impact when compared with the baseline do-nothing option. Should also allow CCOs (subject to design separation from Cardiff procedures).	
Wider society	Capacity/ resilience
A more systemised route compared with the current procedure and well positioned for network connectivity. Should support reduced separation from southbound departures. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Design intention is to contain SID within existing CAS therefore, this design option would have a similar impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter and more direct route will result in fuel burn savings for commercial traffic when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



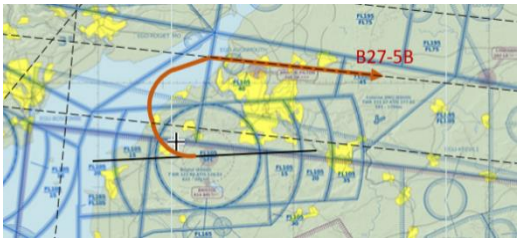
Runway 27 SID: B27-5 (eastern departure)

Group	Impact
Communities	Noise impact on health and quality of life
Principal eastbound departure route, however depending on climb requirements may be below 7,000ft above parts of Bristol City. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing although relocation of the Hold will enable earlier climb to higher altitude. It should be noted that any re-alignment from the current NPR could overfly new communities. This design option would overfly the Cotswolds AoNB above 7,000ft and could therefore have a visual impact on tranquillity. This is very similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
More direct route than the current departure therefore, reducing greenhouse gas impact when compared with the baseline do-nothing option. Should also allow CCOs.	
Wider society	Capacity/ resilience
Direct connectivity to the network therefore reduced ATC and pilot workload compared with current procedures. However, may require step-climb to avoid other traffic flows and speed limits to achieve required turn performance. Should support reduced departure separation from southbound departures. On balance, it is anticipated that this design option would provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Design intention is to contain SID within existing CAS therefore, this design option would have a similar impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter and more direct route will result in fuel burn savings for commercial traffic when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



Runway 27 SID: B27-5A (alternate eastern departure)

Group	Impact
Communities	Noise impact on health and quality of life
A new route which formalises the current tactical option of left-turn out. Could potentially be used as a respite route – avoiding both Bath and Bristol - from the normal right-turn departure route. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities. This design option would overfly the Mendip Hills, potentially below 7,000ft, which would have a impact on tranquillity. It also has the potental to overfly the Cotswolds AoNB well above 7,000ft which could have a visual impact on tranquillity. This would be different to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
Network alignment results in shorter track than the current departure therefore, reducing greenhouse gas impact when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Well positioned for connectivity to the network. However, may require step-climb to avoid other traffic flows and speed limits to achieve required turn performance. Should support reduced separation from northbound departures. On balance, it is anticipated that this design option would provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
This design option has the potential to require additional CAS to the southeast of Bristol Airport. Therefore, this design option has the potential to have a slightly increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter and more direct route will result in fuel burn savings for commercial traffic when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



Runway 27 SID: B27-5B
(alternate eastern departure for slow climbing aircraft)

Group	Impact
Communities	Noise impact on health and quality of life
Possibility for some of the climb to be over the channel and avoids Bristol City. Could be used as a respite route to the east or for low performance aircraft as it provides a longer track distance to achieve height requirements. This design option has the potential to reduce overall impacts of aircraft noise when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could over-fly new communities. This design option would overfly the Cotswolds AoNB above above 7,000ft and could therefore have a visual impact on tranquillity. This is very similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
Shorter track than the current departure therefore, reducing greenhouse gas impact when compared with the baseline do-nothing option. However, an increased environmental impact when compared with SID B27-5.	
Wider society	Capacity/ resilience
Could be used for low performance aircraft and well positioned for connectivity to the network. Reduced ATC and pilot workload. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Design intention is to contain within existing CAS therefore, this design option would have a similar impact on GA access when compared with the baseline do-nothing option..	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter track than the current departure therefore, reducing airline fuel burn when compared with the baseline do-nothing option. However, an increased track length when compared with SID B27-5 due to its positioning to avoid populated areas. Airline fuel planning would have to take into account an increase in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery.	

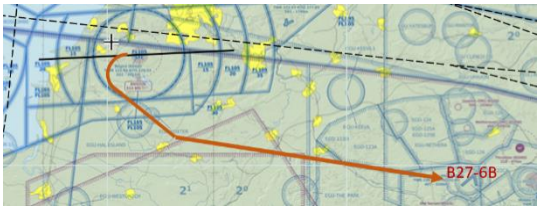
Internal documentation will also require updating.

Runway 27 SID: B27-6
(south-east departure for first rotation traffic)

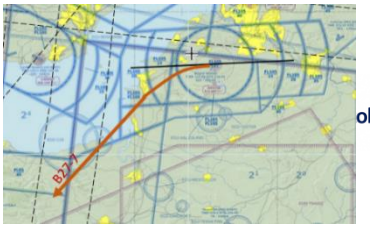
Group	Impact
Communities	Noise impact on health and quality of life
New route intended only for some early morning departures. Does not overfly any heavily populated areas however, will overfly the Mendip AONB. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could over-fly new communities. This design option would overfly the Mendip Hills, potentially below 7,000ft, which would have a impact on tranquillity. However, this design option would be limited to early morning use only, up to about 0830 local time, which would limit the impact. This would be different to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
When in use, this route will provide good greenhouse gas/ fuel burn savings from reduced track mileage (more direct than today) when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Would be used to reduce pre-departure delay during first rotation (a known high demand period). However, it would not comply with current network connectivity (further work required). Therefore, further design work would be required to ensure a capacity/ resilience benefit when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
The SID will require a change of airspace classification but limited to early morning periods (e.g. before 08.30). Therefore, this design option has the potential to have an increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter and more direct route will result in good savings for commercial traffic when available (early mornings only) when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	

Runway 27 SID: B27-6B

(alternate south-east departure for first rotation traffic)



Group	Impact
Communities	Noise impact on health and quality of life
An alternative route 6 intended only for some early morning departures. Does not overfly any heavily populated areas however, will overfly the Mendip AONB. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could over-fly new communities. This design option would overfly the Mendip Hills, potentially below 7,000ft, which would have a impact on tranquillity. However, this design option would be limited to early morning use only, up to about 0830 local time, which would limit the impact. This would be different to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
When in use, this route will provide good greenhouse gas/ fuel burn savings from reduced track mileage (more direct than today) when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Would be used to reduce pre-departure delay during first rotation (a known high demand period). Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
The SID will require a change of airspace classification but limited to early morning periods (e.g. before 08.30). Therefore, this design option has the potential to have an increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter and more direct route will result in good savings for commercial traffic when available (early mornings only) when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



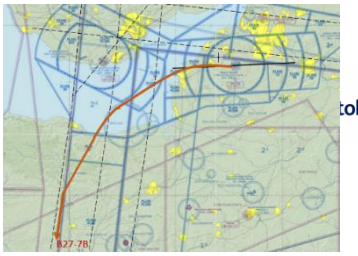
Runway 27 SID: B27-7 (southern departure)

Group	Impact
Communities	Noise impact on health and quality of life
Potential to avoid overflying large population centres. Some of the climb is situated over the Channel. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could over-fly new communities close to the airport. This design option would overfly the Quantock Hills AoNB above above 7,000ft and could therefore have a visual impact on tranquillity. It may also overfly the Mendip Hills AoNB below 7,000ft which would be very similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
This route will provide greenhouse gas/ fuel burn savings from reduced track mileage (more direct than today) when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Well positioned for network connectivity and would support reduced separation from north or eastbound departures. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
The SID will require some change of airspace classification but only at higher levels so impact on GA access should be low. Therefore, this design option has the potential to have a slightly increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter route than currently published; airlines will often request this route for fuel saving. Therefore, this design option will provide a fuel burn saving when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery.	

Internal documentation will also require updating.

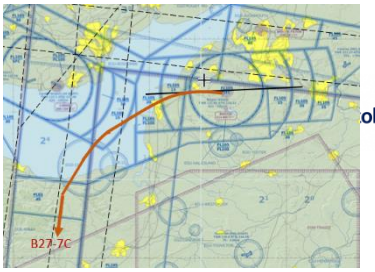
Runway 27 SID: B27-7A
(alternate southern departure)

Group	Impact
Communities	Noise impact on health and quality of life
Much of the initial climb will be over the Channel although lower performance aircraft may overfly Weston-Super-Mare below 7,000ft. This design option has the potential to reduce overall impacts of aircraft noise when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could over-fly new communities close to the airport. This design option would not overfly any AoNBs or National Parks and therefore have no impact on tranquillity.	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
Shorter route than the current route which would have a positive impact on greenhouse gas emissions when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Should support CCOs and well positioned for connectivity to the network. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Design intention is to contain SID within existing CAS therefore, this design option would have a similar impact on GA access when compared with the baseline do-nothing..	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter route than the current published route. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



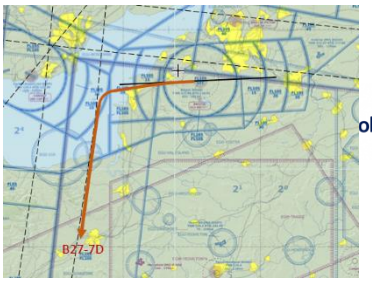
Runway 27 SID: B27-7B
(alternate southern departure)

Group	Impact
Communities	Noise impact on health and quality of life
Low performance aircraft may overfly some of Weston-Super-Mare below 7000ft. Much of the remaining climb is situated over the Channel. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could over-fly new communities close to the airport.. This design option would not overfly any AoNBs or National Parks and therefore have no impact on tranquillity.	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
This route will provide some greenhouse gas/ fuel burn savings from reduced track mileage when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Well positioned for connectivity to the network and should support CCOs. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Design intention is to contain SID within existing CAS therefore, this design option would have a similar impact on GA access when compared with the baseline do-nothing..	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter route than the current published route. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



Runway 27 SID: B27-7C
(alternate southern departure)

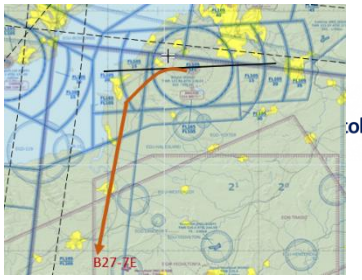
Group	Impact
Communities	Noise impact on health and quality of life
Low performance aircraft may overfly some of Weston-Super-Mare below 7000ft. Much of the remaining climb is situated over the Channel. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could over-fly new communities close to the airport. This design option would not overfly any AoNBs or National Parks and therefore have no impact on tranquillity.	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
This route will provide some greenhouse gas/ fuel burn savings from reduced track mileage when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Well positioned for connectivity to the network and should support CCO. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
Design intention is to contain SID within existing CAS therefore, this design option would have a similar impact on GA access when compared with the baseline do-nothing..	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Shorter route than the current published route. Airline fuel planning would have to take into account a reduction in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.	



Runway 27 SID: B27-7D
(alternate southern departure)

Group	Impact
Communities	Noise impact on health and quality of life
Low performance aircraft may overfly some of Weston-Super-Mare below 7000ft. Much of the remaining climb is situated over the Channel. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could over-fly new communities close to the airport. This design option has the potential to overfly the eastern edge of the Quantock Hills AoNB above 7,000ft which could have a visual impact on tranquillity. This is very similar to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
Continuous climbs may not be possible (increase in greenhouse gas impact) due to not being separated from potential southern Hold. Therefore, this design option could potentially increase the impact of greenhouse gas emissions when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Well positioned for connectivity to the network and should support CCO. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
SID will require change of airspace classification but only at higher levels. Therefore, this design option has the potential to have a slightly increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Continuous climbs may not be possible (due to potential Hold location) which could increase fuel burn when compared with the baseline do-nothing option. Airline fuel planning would have to take into account an increase in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery.	

Internal documentation will also require updating.



Runway 27 SID: B27-7E
(alternate southern departure)

Group	Impact
Communities	Noise impact on health and quality of life
Alignment should avoid overflying large population centres below 7,000ft. This design option has the potential to reduce overall impacts of aircraft noise when compared with the baseline do-nothing option. It should be noted that any re-alignment from the current NPR could over-fly new communities close to the airport. Dependent on how quickly departures can turn, this design option has the potential to overfly the western edge of the Mendip Hills AoNB below 7,000ft which could have an impact on tranquillity. This would be different to what is flown today (baseline do-nothing option).	
Communities	Air quality
Government guidance states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Departing aircraft will still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the runway. However, there may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, subject to further design work.	
Wider society	Greenhouse gas impact
Continuous climbs may not be possible (increase in greenhouse gas impact) due to not being separated from potential southern Hold, although could be offset by the route alignment being shorter than today. On balance, this design option may have a similar greenhouse gas impact when compared with the baseline do-nothing option.	
Wider society	Capacity/ resilience
Well positioned for connectivity to the network and should support CCO. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. All SID options will be explored for suitability of applying reduced departure separations, thus reducing pre-departure delay.	
General Aviation	Access
SID will require change of airspace classification but only at higher levels. Therefore, this design option has the potential to have a slightly increased impact on GA access when compared with the baseline do-nothing option.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
Continuous climbs may not be possible (potential transitions location) which could increase fuel burn (although route is shorter than today). On balance, this design option may have a similar greenhouse gas impact when compared with the baseline do-nothing option. Airline fuel planning would have to take into account an increase in track miles.	
Commercial airlines	Training costs
Qualitatively, flight procedures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs
No other airline costs are foreseen.	
Airport/ ANSP	Infrastructure costs
This proposal is not expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some system engineering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs
This proposal is not expected to change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs
This proposal is expected to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their operation. Support staff are required to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs to be recorded and reported etc. Some staff may only require briefings. There may be occasions where	

the reduced availabilty of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery. Internal documentation will also require updating.

6. Safety Assessment

A qualitative safety assessment has been completed for each of the above design options and also includes those which were rejected as part of the *Stage 2 – Step 2A Design Principle Evaluation.*

This safety report documents the initial safety appraisal of the Bristol Airport design options by providing a summary of potential safety implications and a qualitative statement for each design option.

The safety assessment has been summarised in a separate report and uploaded to the portal (link) alongside this document.

7. Conclusion and Next Steps

This proposal has been developed following the submission of the Statement of Need to the CAA Airspace Regulation which can be found on the portal (link). This summarised Bristol Airport's requirement for an airspace change including a reduction of emissions through minimisation of additional track miles and better management of noise impact.

This document has described the design options which address the Statement of Need by the proposed introduction of new arrival and departure procedures. These options have been developed through engagement with Bristol Airport's stakeholders including representatives from airlines and the GA/ MoD communities. Bristol Airport thanks all of these stakeholders and looks forward to continuing the development of this proposal alongside them.

These design options have been qualitatively appraised and will be taken forward for further development and consultation. Subject to CAA approval at the *Stage 2 Develop and Assess* Gateway Assessment, this proposal will then move on to *Stage 3 Consult*.

At this point in the process, we have not rejected any of the design options based on the outcome of this Initial Options Appraisal. Where negative impacts have been identified, such as an increased noise impact, there is ample opportunity for the options to be further refined and impacts reduced later in the process. Similarly, there is not currently enough quantitative information required for us to identify a "preferred" option(s) at this point in the process.

Each of the design options featured herein passed the Step 2Aii Design Principle Evaluation and are in support of Bristol Airport's Statement of Need. By progressing each of these remaining indicative design options, it provides an opportunity for the maximum number of options to glean further benefit through combination with each other – or other airspace change proposals. Our Stage 3 work will include a cumulative impact assessment of our proposed design options alongside other changes in the West Terminal Airspace cluster (Cardiff, Exeter and NERL) which will provide this detail.