# 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
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## 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	3
2.	Baseline (do nothing)	6
3.	Hold Options	7
4.	Runway 09 SID Options	.14
5.	Runway 27 SID Options	32
6.	Safety Assessment	51
7.	Conclusion and Next Steps	51



## 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.

Group	Impact
Communities	Noise impact on health and quality of life
,	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.

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



General Aviation/ commercial airlines	Fuel Burn
A qualitative assessment of any	y changes to the fuel burn costs.
Commercial airlines	Training costs
A qualitative assessment of any	y 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
be no opportunities to provide Some areas of AoNBs (Cotswo	would continue to be overflown below 7,000ft, resulting in concentration of overflight at low altitudes. There would respite or to otherwise alter flightpaths. If this baseline was retained, the noise impact would not change. Ids, Mendip Hills and Wye Valley) are overflown in a dispersed manner below 7,000ft, which may have an impact ystem was retained,, this impact on transquility would not change.
Communities	Air quality
The same flightpaths would be If this baseline system was retained and local air quality impacts we	ained, arrivals would not change flightpath below 1,000ft, departures would not change flightpath below 1,000ft,
Wider society	Greenhouse gas impact
	be flown, and the same typical altitudes would be attained along the track. If this baseline system was retained, tened, altitudes could not increase, and greenhouse gas impacts would not change.
Wider society	Capacity/ resilience
	to improve airspace capacity or resilience. ained, the predominant swathes of traffic to/ from the east and south of the airport will remain the same; capacity ot change.
General Aviation	Access
	irspace would continue in the areas currently observed (generally this is at or below 4,000ft). If this baseline d continue to access the same areas in a similar manner and access impacts would not change. The current nal for all airspace users.
General Aviation/ commercial airlines	Economic impact from increased effective capacity
	to improve airspace capacity. If this baseline system was retained, the predominant broad swathes of traffic to/ airport will remain the same. Capacity impacts would not change, and there would be no change in economic prcial operators.
General Aviation/ commercial airlines	Fuel Burn
	be flown, and the same typical altitudes would be attained along the track. If this baseline system was retained, rened, altitudes could not increase, and fuel burn impacts would not change for either GA or commercial
Commercial airlines	Training costs
	dwide with each AIRAC cycle and airlines would update their procedures accordingly, training if required. If this the same flight procedures would be used and training cost impacts would not change.
Commercial airlines	Other costs
We are not aware of other com those other costs would not ch	mercial airline costs that are appropriate for inclusion in this appraisal. If this baseline system was retained, ange.
Airport/ ANSP	Infrastructure costs
The infrastructure in place is us way, with no additional costs b	sed daily. If this baseline system was retained, the same infrastructure would continue to be used in the same eyond typical maintenance.
Airport/ ANSP	Operational costs
The operation is used daily. If to operational costs.	this baseline system was retained, the same operation would continue in the same way, with no additional
Airport/ ANSP	Deployment costs
Allport ANOP	Deployment costs



# 3. Hold Options

Hold A

Crown	Impost
Group	Impact
Communities	Noise impact on health and quality of life
stakeholders to the east	27 should avoid overflying any large populations however, may overfly a small (new) quantity of ground-based t of Bristol Airport. This can be minimised through PBN routing. Whilst transitions to Runway 09 should mainly occur fore, this design option has the potential to increase overall impacts of aircraft noise when compared with the
avoid both areas too. He which would be identicia	between the Wye Valley and Cotswolds Areas of Outstanding Natural Beauty (AoNB) and the transitions would likely owever, if traffic is not held, inbound westbound traffic could overfly the Cotswolds at high levels (above 7,000ft) al to today (baseline do-nothing option). Outbound eastbound traffic will also overfly the Cotswolds in a similar track ay even be slightly higher (less impact).
Communities	Air quality
Arriving aircraft will still	states that aircraft flying above 1,000ft are unlikely to have a significant impact on local quality. descend through 1,000ft on final approach, between 2 and 4 nautical miles (about 4-7km) from touchdown at either is close to landing, in the very final stages of the approach, and is no change from today.
Wider society	Greenhouse gas impact
location therefore no su	this Hold is close to the airport. Fuel planning does not have to take into account additional track miles due to the iperfluous environmental impact. Net increase in CO2 emissions would be small as holding will not be employed for n required for reasons such as delay absorption, or bad weather conditions).
Wider society	Capacity/ resilience
baseline do-nothing opt tactically. Well positione	e overhead thus enabling increased use of continuous climb operations (CCO) for departures when compared with the ion. Cross-over with potential departure routes but can be managed through vertical profile restrictions and/or ed 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
descent. Expectation the impact on GA access w	ed Airspace (CAS) required: lower base level of Control Area (CTA) needed south of the Hold to accommodate at the lowest level would be around 5,500ft therefore, this design option has the potential to have a slightly increased hen compared with the baseline do-nothing option. However, it should also be noted that there is the potential that tion will give opportunity to raise some CAS bases to the north-east of the airport.
General Aviation/ comm airlines	nercial Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ comm airlines	nercial Fuel Burn
	this Hold is close to the airport. Fuel planning therefore does not have to take into account additional track miles due rease in GA routings expected.
Commercial airlines	Training costs
	edures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if is not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs ar	re foreseen.
Airport/ ANSP	Infrastructure costs
	ected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some endments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
	Operational costs ected to change airport or ANSP operational 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 availability of operational controllers during their conversion training could mean operational rostering becomes a factor when considering continuous service delivery.



Group	Impact
Communities	Noise impact on health and quality of life
	rerfly any large populations with arrivals to Runway 09 partially overflying the water. PBN routing will be used to ulation centres. This design option has the potential to reduce overall impacts of aircraft noise when compared with
	ver the Quantock Hills AoNB (above 7,000ft) and could therefore have a visual impact on tranquillity. The transitions ve the same impact on the Mendip Hills AoNB as today (baseline do-nothing option).
Communities	Air quality
Arriving aircraft will still o	ates that aircraft flying above 1,000ft are unlikely to have a significant impact on local quality. descend through 1,000ft on final approach, between 2 and 4 nautical miles (about 4-7km) from touchdown at either s close to landing, in the very final stages of the approach, and is no change from today.
Wider society	Greenhouse gas impact
location therefore no sup	his Hold is close to the airport. Fuel planning does not have to take into account additional track miles due to the perfluous environmental impact. Net increase in CO2 emissions would be small as holding will not be employed for required for reasons such as delay absorption, or bad weather conditions).
Wider society	Capacity/ resilience
	overhead thus enabling more use of continuous climb operations (CCO) for departures. Therefore, this design option rement in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option.
General Aviation	Access
Additional CAS will be re-	S required for containment of a Hold in this location. Expectation that the lowest level would be around 6,500ft. quired to ensure containment of the downwind section of the Transition prior to turning base leg. This is a safety todays operational experience.
Therefore, this design op nothing option.	tion has the potential to have a slightly increased impact on GA access when compared with the baseline do-
General Aviation/ comm airlines	ercial Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ comm airlines	ercial Fuel Burn
	his Hold is close to the airport. Fuel planning therefore does not have to take into account additional track miles due acrease in GA routings expected, at medium levels only.
Commercial airlines	Training costs
	dures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if is not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are	e foreseen.
Airport/ ANSP	Infrastructure costs
	ected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some endments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not expe	ected to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
	d to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use acilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
to be recorded and repor operational controllers d service delivery.	d to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs ted etc. Some staff may only require briefings. There may be occasions where the reduced availability of uring their conversion training could mean operational rostering becomes a factor when considering continuous will also require updating.

Hold C



Group	Impact
Communities	Noise impact on health and quality of life
Transitions would not ov	erfly any large populations with arrivals to Runway 09 partially overflying the water. PBN routing will be used to Ilation centres. This design option has the potential to reduce overall impacts of aircraft noise when compared with
	ver the Quantock Hills AoNB (above 7,000ft) and could therefore have a visual impact on tranquillity. The transitions ve the same impact on the Mendip Hills AoNB as today (baseline do-nothing option).
Communities	Air quality
Arriving aircraft will still o	ates that aircraft flying above 1,000ft are unlikely to have a significant impact on local quality. Jescend through 1,000ft on final approach, between 2 and 4 nautical miles (about 4-7km) from touchdown at either s close to landing, in the very final stages of the approach, and is no change from today.
Wider society	Greenhouse gas impact
when compared with oth	ion of flights are from the south, the Transition from Hold C to Runway 27 would increase the environmental impact ler design options. Net increase in CO2 emissions would be small as holding will not be employed for most arrivals easons such as delay absorption, or technical troubleshooting).
Wider society	Capacity/ resilience
	overhead thus enabling more use of continuous climb operations (CCO) for departures.
	S would be required for containment. Capacity could be constrained due to length of transition to Runway 27. Also sy region of airspace. Therefore, further design work would be required to ensure a capacity/ resilience benefit when ine do-nothing option.
General Aviation	Access
	equired to accommodate a Hold in this location. Expectation that the lowest level would be around 6,500ft therefore, e potential to have a slightly increased impact on GA access when compared with the baseline do-nothing option.
Additional CAS will be requirement based upon	quired to ensure containment of the downwind section of the Transition prior to turning base leg. This is a safety todays operational experience.
General Aviation/ comm	ercial Economic impact from increased effective capacity
airlines	
No effect on capacity.	
General Aviation/ comm airlines	
	location for a large proportion of arrivals from the south. However, fuel planning would have to take into account the vay 27 (when compared with other options) which would increase fuel burn for airlines.
Commercial airlines	Training costs
	dures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if s not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are	e foreseen.
Airport/ ANSP	Infrastructure costs
	ected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some ndments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not expe	ected to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
of the NATS simulator fa operation. Support staff are require	d to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use cilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their d to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs ted etc. Some staff may only require briefings. There may be occasions where the reduced availability of
	uring their conversion training could mean operational rostering becomes a factor when considering continuous





### Hold F

Group	Impact
Communities	Noise impact on health and quality of life
	w populations, albeit not huge numbers of people. PBN routing will be used to minimise impact. Overall, the re likely to be broadly similar to today when compared with the baseline do-nothing.
•	l over any AoNBs or National Parks. However, the transitions from this Hold would have the same impact on the ay (baseline do-nothing option).
Communities	Air quality
Arriving aircraft will still de	tes that aircraft flying above 1,000ft are unlikely to have a significant impact on local quality. scend through 1,000ft on final approach, between 2 and 4 nautical miles (about 4-7km) from touchdown at either close to landing, in the very final stages of the approach, and is no change from today.
Wider society	Greenhouse gas impact
to take into account addition	s Hold is close to the airport and the majority of arrivals are from the south and east. Fuel planning does not have onal track miles due to the location therefore no superfluous environmental impact. Net increase in CO <sub>2</sub> emissions will not be employed for most arrivals (only when required for reasons such as delay absorption, or technical
Wider society	Capacity/ resilience
Removes Hold from the ov	verhead thus enabling more use of continuous climb operations (CCO) for departures.
	for Bristol arrivals and connectivity from the network. However, some new CAS may be required for containment. d that this design option would provide an improvement in capacity and resilience for Bristol Airport when he do-nothing option.
General Aviation	Access
potential to have a slightly Additional CAS will be requ	modate a Hold in this location but base level expected to be around 6,500ft. Therefore, this design option has the increased impact on GA access when compared with the baseline do-nothing option. Jired to ensure containment of the downwind section of the Transition prior to turning base leg. This is a safety odays operational experience.
General Aviation/ commer airlines	cial Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commer airlines	cial Fuel Burn
not have to take into accou	s Hold is close to the airport and the majority of arrivals are from the south and east. Fuel planning therefore does unt additional track miles due to Hold location. ngs expected, at medium levels only.
Commercial airlines	Training costs
	ures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are f	oreseen.
Airport/ ANSP	Infrastructure costs
	ted to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some dments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not expec	ted to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
	to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use ilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
	to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs ed etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of



## 4. Runway 09 SID Options

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



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





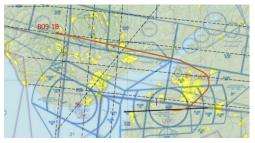
### Runway 09 SID: B09-1A (alternate north-west departure)

Group	Impact
Communities	Noise impact on health and quality of life
overfly the Mendip AoNB. nothing. It should be noted This design option would a	over the Channel. The right turn from Runway 09 would completely avoid overflying Bristol City. However, it would Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do- d that any re-alignment from the current NPR could overfly new communities. 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 Communities	Air quality
	tes 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 ay be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals,
Wider society	Greenhouse gas impact
A direct route to the north- do-nothing option. Should also allow CCOs.	west from Runway 09 therefore anticipated to reduce greenhouse gas impacts when compared with the baseline
Wider society	Capacity/ resilience
potential alternative to SIE for Bristol Airport when co	k connectivity. Anticipated to support 1-minute splits from other east and northbound departures. Offers a D B09-1 to provide respite. Therefore, this design option is anticipated to provide a benefit in capacity and resilience impared with the baseline do-nothing option. ored for suitability of applying reduced departure separations, thus reducing pre-departure delay.
General Aviation	Access
Design intention is to cont compared with the baselir	ain SID within existing CAS therefore, this design option would have a similar impact on GA access when ne do-nothing.
General Aviation/ commen airlines	cial Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commen airlines	rcial Fuel Burn
Direct route will reduce fue reduction in track miles.	el burn when compared with the baseline do-nothing option. Airline fuel planning would have to take into account a
Commercial airlines	Training costs
	ures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are	ioreseen.
Airport/ ANSP	Infrastructure costs
	ted to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some dments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not expec	ted to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
	to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use ilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
to be recorded and reported	to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs ed etc. Some staff may only require briefings. There may be occasions where the reduced availability of ring their conversion training could mean operational rostering becomes a factor when considering continuous
Internal documentation w	Il also require updating.

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#### Runway 09 SID: B09-1B

(alternate left turn north-west departure)



Group	Impact
Communities	Noise impact on health and quality of life
	e over the Channel and avoids overflying Bristol City centre. This design option has the potential to reduce overall e when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could es.
	d overfly the Brecon Beacons National Park well above 7,000ft and could therefore have a visual impact on similar to what is flown today (baseline do-nothing option).
Communities	Air quality
Departing aircraft will st	tates that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. ill climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals n work.
Wider society	Greenhouse gas impact
Longer track distance th	nan B09-1 therefore increased environmental impact when compared with the baseline do-nothing option.
Wider society	Capacity/ resilience
Therefore, this design o do-nothing option.	route to B09-1 for low performance aircraft. Anticipated to support 1-minute splits from southbound departures. ption is anticipated to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline
	plored for suitability of applying reduced departure separations, thus reducing pre-departure delay.
General Aviation	Access
Design intention is to co compared with the base	ontain SID within existing CAS therefore, this design option would have a similar impact on GA access when line do-nothing.
General Aviation/ comm airlines	nercial Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ comm airlines	nercial Fuel Burn
	than B09-1 will result in an increase in fuel burn when compared with the baseline do-nothing option. Airline fuel take into account an increase in track miles.
Commercial airlines	Training costs
	edures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if is not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs ar	re foreseen.
Airport/ ANSP	Infrastructure costs
	ected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some endments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not exp	ected to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
	ed to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with us acilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
to be recorded and repo operational controllers of service delivery.	ed to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs rted etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of during their conversion training could mean operational rostering becomes a factor when considering continuous 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
	over the Channel and avoids overflying Bristol City centre. This design option has the potential to reduce overall when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could .
	overfly the Brecon Beacons National Park well above 7,000ft and could therefore have a visual impact on milar to what is flown today (baseline do-nothing option).
Communities	Air quality
Departing aircraft will still	ates that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the nay be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, work.
Wider society	Greenhouse gas impact
More direct route than the option. Should also allow	e current departure therefore, reducing its greenhouse gas impact, when compared with the baseline do-nothing CCOs.
Wider society	Capacity/ resilience
	anticipated to support 1-minute splits from other southbound and possibly eastbound departures. Therefore, this ed to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing
All SID options will be exp	lored for suitability of applying reduced departure separations, thus reducing pre-departure delay.
General Aviation	Access
	tain SID within existing CAS. However, an early turn to minimise population oveflown may result in lowering part of ign option has the potential to have a slightly increased impact on GA access when compared with the baseline do-
General Aviation/ comme airlines	rcial Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ comme airlines	rcial Fuel Burn
Direct route will minimise a reduction in track miles	fuel burn when compared with the baseline do-nothing option. Airline fuel planning would have to take into account.
Commercial airlines	Training costs
	dures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if s not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are	foreseen.
Airport/ ANSP	Infrastructure costs
	cted to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some ndments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not expe	cted to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
	to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use ilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
to be recorded and report operational controllers du service delivery.	I to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs ed etc. Some staff may only require briefings. There may be occasions where the reduced availability of iring their conversion training could mean operational rostering becomes a factor when considering continuous
Internal documentation w	/III 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 overfly the Mendip AoNB.	over the Channel. The right turn from Runway 09 would completely avoid overflying Bristol City. However, it would Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the baseline do- d that any re-alignment from the current NPR could overfly new communities.
This design option would flown today (baseline do-r	overfly the Mendip Hills AoNB below 7,000ft which would have an impact on tranquillity. This is different to what is nothing option).
Communities	Air quality
Departing aircraft will still	ates that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the nay be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, work.
Wider society	Greenhouse gas impact
Longer route than some c baseline do-nothing option	of the other options to the north-west therefore an increased environmental impact when compared with the n.
Wider society	Capacity/ resilience
alternative to SID B09-2. T compared with the baseli	splits from other east and northbound departures. Good connectivity to the network. Potentially a respite Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol Airport when ne do-nothing option. Iored for suitability of applying reduced departure separations, thus reducing pre-departure delay.
General Aviation	Access
Design intention is to con compared with the baseli	tain SID within existing CAS therefore, this design option would have a similar impact on GA access when ne do-nothing option.
General Aviation/ comme airlines	rcial Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ comme airlines	rcial Fuel Burn
	of the other options to the north-west therefore an increase in fuel burn when compared with the baseline do- I planning would have to take into account an increase in track miles.
Commercial airlines	Training costs
	lures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if s not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are	foreseen.
Airport/ ANSP	Infrastructure costs
	cted to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some adments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not exped	cted to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
	to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use silities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
Support staff are required	to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs ed etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of
	ring their conversion training could mean operational rostering becomes a factor when considering continuous

#### Runway 09 SID: B09-2B

(alternate left turn north-west departure)



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



### Runway 09 SID: B09-5B

(alternate eastern departure)



Group	Impact
Communities	Noise impact on health and quality of life
	stol. Could potentially be used as a respite route. This design option has the potential to reduce overall impacts ad with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could overfly
This design option would overf similar to what is flown today (	ly the Cotswolds AoNB above 7,000ft and could therefore have a visual impact on tranquillity. This is very baseline do-nothing option).
Communities	Air quality
Departing aircraft will still clim	nat aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. o through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the e a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals,
Wider society	Greenhouse gas impact
Less direct and longer track dis nothing option.	stance than B09-5C therefore an increased environmental impact when compared with the baseline do-
Wider society	Capacity/ resilience
height requirements. Formalise and resilience for Bristol Airpor	y to the network. Suitable for low performance aircraft providing greater track distance to achieve network es what is currently a tactical route. Therefore, this design option is anticipated to provide a benefit in capacity t 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 S compared with the baseline do	ID within existing CAS therefore, this design option would have a similar impact on GA access when -nothing option.
General Aviation/ commercial airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercial airlines	Fuel Burn
	stance than B09-5C therefore an increase in fuel burn when compared with the baseline do-nothing option. e to take into account an increase in track miles.
Commercial airlines	Training costs
	change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are fores	een.
Airport/ ANSP	Infrastructure costs
	o change airport or ANSP infrastructure, beyond the initial deployment phase which would require some nts (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not expected t	o change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
	quire air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
Support staff are required to ru to be recorded and reported etc	In the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs c. Some staff may only require briefings. There may be occasions where the reduced availabilty of heir conversion training could mean operational rostering becomes a factor when considering continuous
Internal documentation will als	

### Runway 09 SID: B09-5C

Group	Impact
Communities	Noise impact on health and quality of life
	ninimise population overflown (subject to detailed design). This design option has the potential to reduce overall when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could s closer to the airport.
This design option would	d overfly the Cotswolds AoNB below 7,000ft and could therefore have an impact on tranquillity. This is very similar t seline do-nothing option).
Communities	Air quality
Departing aircraft will sti	tates that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Ill climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals n work.
Wider society	Greenhouse gas impact
impact when compared	nd shorter than current route. Therefore, this design option is anticipated to provide a benefit in greenhouse gas with the baseline do-nothing option.
· · · · · · · · · · · · · · · · · · ·	ons may be required to achieve network height requirements which could increase emissions.
Wider society	Capacity/ resilience
Formalises what is curre resilience for Bristol Airp	ectivity to the network. Suitable for high performance aircraft. ently a tactical route (today's NPR). Therefore, this design option is anticipated to provide a benefit in capacity and ort when compared with the baseline do-nothing option. plored for suitability of applying reduced departure separations, thus reducing pre-departure delay.
General Aviation	Access
Design intention is to co compared with the base	ntain SID within existing CAS therefore, this design option would have a similar impact on GA access when line do-nothing option.
General Aviation/ comm airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ comm airlines	ercial Fuel Burn
	nd shorter than current route when compared with the baseline do-nothing option. Should achieve continuous rk speed restrictions may be required to achieve climb which could increase fuel burn (airline fuel planning would this).
Commercial airlines	Training costs
	edures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if is not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are	e foreseen.
Airport/ ANSP	Infrastructure costs
	ected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some endments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not expe	ected to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
This proposal is expecte of the NATS simulator fa operation. Support staff are require to be recorded and repor	ed to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with us acilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their ed to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, output rted etc. Some staff may only require briefings. There may be occasions where the reduced availability of luring their conversion training could mean operational rostering becomes a factor when considering continuous
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### Runway 09 SID: B09-6

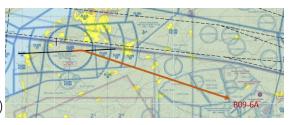
(south-east departure for first rotation traffic)



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

#### Runway 09 SID: B09-6A

(alternate south-east departure for first rotation traffic)

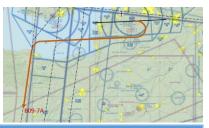


Group	Impact
Communities	Noise impact on health and quality of life
potential to reduce overall impa from the current NPR could over	ne early morning departures. Does not overfly any heavily populated areas. This design option has the icts of aircraft noise when compared with the baseline do-nothing. It should be noted that any re-alignment erfly new communities closer to the airport.
	l between the Mendip Hills and Cotswolds AoNB and would therefore have no impact on tranquillity, This is an oday (baseline do-nothing option).
Communities	Air quality
Departing aircraft will still climb	at aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals,
Wider society	Greenhouse gas impact
When in use, this route will prov do-nothing option.	ide good greenhouse gas/ fuel burn savings from reduced track mileage when compared with the baseline
Wider society	Capacity/ resilience
network connectivity (further w changes. Further design work w	eparture delay during first rotation (a known high demand period). However, it would not comply with current ork required). Achieving reduced departure separation from east or southbound traffic will depend upon NPR yould be required to ensure a capacity/ resilience benefit when compared with the baseline do-nothing option. 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 ty 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
	vill result in good savings for commercial traffic when available (early mornings only) when compared with the ne fuel planning would have to take into account a reduction in track miles.
Commercial airlines	Training costs
	change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if nticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are fores	een.
Airport/ ANSP	Infrastructure costs
	o change airport or ANSP infrastructure, beyond the initial deployment phase which would require some ots (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not expected to	o change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
	quire air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
Support staff are required to ru to be recorded and reported etc	n the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs Some staff may only require briefings. There may be occasions where the reduced availabilty of neir conversion training could mean operational rostering becomes a factor when considering continuous
-	o require updating.



### Runway 09 SID: B09-7A

(alternate southern departure)



Group	Impact
Communities	Noise impact on health and quality of life
	avily populated areas however, overflies the Mendip AoNB. Overall, the impacts of aircraft noise are likely to be when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could es.
	ld overfly the Mendip Hills AoNB below 7,000ft and would therefore have an impact on tranquillity. This is similar to seline do-nothing option).
Communities	Air quality
Departing aircraft will st	states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. till climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals n work.
Wider society	Greenhouse gas impact
	CCOs depending on cross-over with the inbound Transition. Therefore, this design option should provide a benefit for s when compared with the baseline do-nothing;
Wider society	Capacity/ resilience
option is anticipated to	e splits from north or eastbound departures. Well positioned for connectivity to the network. Therefore, this design provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. xplored for suitability of applying reduced departure separations, thus reducing pre-departure delay.
General Aviation	Access
	Il amount of new permanent CAS which could impact GA operations (gliding site in this region). Therefore, this design an increased impact on GA access when compared with the baseline do-nothing option.
General Aviation/ comn airlines	nercial Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ comn airlines	nercial Fuel Burn
	t route will result in good savings for commercial traffic when compared with the baseline do-nothing option. Airline re to take into account a reduction in track miles.
Commercial airlines	Training costs
	edures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if is not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs a	re foreseen.
Airport/ ANSP	Infrastructure costs
	ected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some endments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not exp	pected to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
	ed to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with us facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
to be recorded and repo operational controllers of service delivery.	ed to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs orted etc. Some staff may only require briefings. There may be occasions where the reduced availability of during their conversion training could mean operational rostering becomes a factor when considering continuous 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 hea	avily populated areas however, overflies the Mendip AoNB. Overall, the impacts of aircraft noise are likely to be when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could
This design option woul	d overfly the Mendip Hills AoNB below 7,000ft and would therefore have an impact on tranquillity. This is similar to seline do-nothing option).
Communities	Air quality
Departing aircraft will st	tates that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. ill climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, n work.
Wider society	Greenhouse gas impact
This route should enable with the baseline do-not	e CCOs depending on cross-over with inbound Transition which will reduce greenhouse gas impacts when compared hing option.
Wider society	Capacity/ resilience
option is anticipated to	e splits from north or eastbound departures. Well positioned for connectivity to the network. Therefore, this design provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. plored for suitability of applying reduced departure separations, thus reducing pre-departure delay.
General Aviation	Access
	II amount of new permanent CAS which could impact GA operations (gliding site in this region). Therefore, this design n increased impact on GA access when compared with the baseline do-nothing option.
General Aviation/ comm airlines	nercial Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ comm airlines	nercial Fuel Burn
	route will result in good savings for commercial traffic when compared with the baseline do-nothing option. Airline e to take into account a reduction in track miles.
Commercial airlines	Training costs
	edures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if is not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs ar	e foreseen.
Airport/ ANSP	Infrastructure costs
	ected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some endments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not exp	ected to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
	ed to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use acilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
to be recorded and repo operational controllers of service delivery.	ed to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs rted etc. Some staff may only require briefings. There may be occasions where the reduced availability of during their conversion training could mean operational rostering becomes a factor when considering continuous will also require updating.

## Runway 09 SID: B09-7C

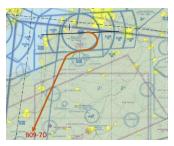
(alternate southern departure)



Group	Impact
Communities	Noise impact on health and quality of life
	vily populated areas however, overflies the Mendip AoNB. Overall, the impacts of aircraft noise are likely to be vhen compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR could
This design option would what is flown today (base	overfly the Mendip Hills AoNB below 7,000ft and would therefore have an impact on tranquillity. This is similar to line do-nothing option).
Communities	Air quality
Departing aircraft will stil	ates that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. I climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the nay be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, work.
Wider society	Greenhouse gas impact
This route should enable with the baseline do-noth	CCOs depending on cross-over with inbound Transition which will reduce greenhouse gas impacts when compared ing option.
Wider society	Capacity/ resilience
option is anticipated to pr	splits from north or eastbound departures. Well positioned for connectivity to the network. Therefore, this design rovide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. Nored for suitability of applying reduced departure separations, thus reducing pre-departure delay.
General Aviation	Access
	amount of new permanent CAS which could impact GA operations (gliding site in this region). Therefore, this design increased impact on GA access when compared with the baseline do-nothing option.
General Aviation/ comme airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ comme airlines	ercial Fuel Burn
	oute will result in good savings for commercial traffic when compared with the baseline do-nothing option. Airline to take into account a reduction in track miles.
Commercial airlines	Training costs
	dures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if s not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are	foreseen.
Airport/ ANSP	Infrastructure costs
	cted to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some ndments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not expe	cted to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
	I to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use cilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
Support staff are required to be recorded and report	to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs ed etc. Some staff may only require briefings. There may be occasions where the reduced availability of uring their conversion training could mean operational rostering becomes a factor when considering continuous vill also require updating.

### Runway 09 SID: B09-7D

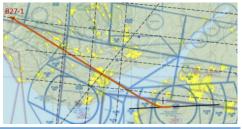
(alternate southern departure)



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

## 5. Runway 27 SID Options

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



Group	Impact
Communities	Noise impact on health and quality of life
which could overfly new c baseline do-nothing. It sho This design option would d	over the Channel however a small (new) population could be affected by a re-alignment from the current NPR ommunities. Overall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the build be noted that any re-alignment from the current NPR could overfly new communities close to the airport. overfly the Brecon Beacons National Park well above 7,000ft and could therefore have a visual impact on point to the airport.
	nilar to what is flown today (baseline do-nothing option).
Communities	Air quality
Departing aircraft will still	tes that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the ay be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, vork.
Wider society	Greenhouse gas impact
	current departure therefore, reducing greenhouse gas impact when compared with the baseline do-nothing option. ubject to design separation from Cardiff procedures).
Wider society	Capacity/ resilience
separation from southbou Airport when compared w	compared with the current procedure and well positioned for network connectivity. Should support reduced nd departures. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol ith the baseline do-nothing option.
	ored for suitability of applying reduced departure separations, thus reducing pre-departure delay.
General Aviation	
	nal CAS may be required to the northwest of Cardiff Airport. Therefore, this design option has the potential to have t on GA access when compared with the baseline do-nothing option.
General Aviation/ commen airlines	cial Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commen airlines	rcial Fuel Burn
	oute will result in fuel burn savings for commercial traffic when compared with the baseline do-nothing option. I have to take into account a reduction in track miles.
Commercial airlines	Training costs
	ures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are	ioreseen.
Airport/ ANSP	Infrastructure costs
	ted to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some dments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not expec	ted to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
	to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use ilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
Support staff are required to be recorded and reporte operational controllers due service delivery.	to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs ed etc. Some staff may only require briefings. There may be occasions where the reduced availability of ring their conversion training could mean operational rostering becomes a factor when considering continuous
Internal documentation w	Il also require updating.





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

Group	Impact
Communities	Noise impact on health and quality of life
reduce overall impacts	be over the Channel and can be aligned to avoid large population centres. This design option has the potential to of aircraft noise when compared with the baseline do-nothing. It should be noted that any re-alignment from the fly new communities close to the airport.
	ld overfly the Brecon Beacons National Park well above 7,000ft and could therefore have a visual impact on similar to what is flown today (baseline do-nothing option).
Communities	Air quality
Departing aircraft will st	states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. till climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals n work.
Wider society	Greenhouse gas impact
	the current departure therefore, reducing greenhouse gas impact when compared with the baseline do-nothing option
Should also allow CCOs	s (subject to design separation from Cardiff procedures).
Wider society	Capacity/ resilience
separation from southb Airport when compared	te compared with the current procedure and well positioned for network connectivity. Should support reduced yound departures. Therefore, this design option is anticipated to provide a benefit in capacity and resilience for Bristol I with the baseline do-nothing option. xplored for suitability of applying reduced departure separations, thus reducing pre-departure delay.
General Aviation	Access
Design intention is to co compared with the base	ontain SID within existing CAS therefore, this design option would have a similar impact on GA access when eline do-nothing option.
General Aviation/ comn airlines	nercial Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ comn airlines	nercial Fuel Burn
	t route will result in fuel burn savings for commercial traffic when compared with the baseline do-nothing option. uld have to take into account a reduction in track miles.
Commercial airlines	Training costs
	edures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if I is not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs ai	re foreseen.
Airport/ ANSP	Infrastructure costs
	pected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some rendments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not exp	pected to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
of the NATS simulator f operation.	ed to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use facilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
to be recorded and repo	ed to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs orted etc. Some staff may only require briefings. There may be occasions where the reduced availabilty of during their conversion training could mean operational rostering becomes a factor when considering continuous
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 departur impacts of aircraft noise are will enable earlier climb to hig	re route, however depending on climb requirements may be below 7,000ft above parts of Bristol City. Overall, the likely to be broadly similar to today when compared with the baseline do-nothing although relocation of the Hold gher altitude. It should be noted that any re-alignment from the current NPR could overfly new communities. erfly the Cotswolds AoNB above 7,000ft and could therefore have a visual impact on tranquillity. This is very
	(baseline do-nothing option).
Communities	Air quality
Departing aircraft will still clir	that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. nb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, k.
Wider society	Greenhouse gas impact
More direct route than the cu Should also allow CCOs.	rrent departure therefore, reducing greenhouse gas impact when compared with the baseline do-nothing option.
Wider society	Capacity/ resilience
climb to avoid other traffic flo southbound departures. On b Airport when compared with	work therefore reduced ATC and pilot workload compared with current procedures. However, may require step- bows and speed limits to achieve required turn performance. Should support reduced departure separation from balance, it is anticipated that this design option would provide a benefit in capacity and resilience for Bristol the baseline do-nothing option. ed for suitability of applying reduced departure separations, thus reducing pre-departure delay.
General Aviation	Access
Design intention is to contain compared with the baseline of	SID within existing CAS therefore, this design option would have a similar impact on GA access when do-nothing option.
General Aviation/ commercia airlines	Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ commercia airlines	I Fuel Burn
	e will result in fuel burn savings for commercial traffic when compared with the baseline do-nothing option. ave to take into account a reduction in track miles.
Commercial airlines	Training costs
	es change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if t anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are for	eseen.
Airport/ ANSP	Infrastructure costs
	t to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some nents (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
	require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use es at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
to be recorded and reported e	run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs etc. Some staff may only require briefings. There may be occasions where the reduced availability of g their conversion training could mean operational rostering becomes a factor when considering continuous
internal documentation will a	iso require updating.



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

Group	Impact
Communities	Noise impact on health and quality of life
and Bristol - from the no compared with the base This design option would	alises the current tactical option of left-turn out. Could potentially be used as a respite route – avoiding both Bath rmal right-turn departure route. Overall, the impacts of aircraft noise are likely to be broadly similar to today when line do-nothing. It should be noted that any re-alignment from the current NPR could overfly new communities. d overfly the Mendip Hills, potentially below 7,000ft, which would have a impact on tranquillity. It also has the btswolds AoNB well above 7,000ft which could have a visual impact on tranquillity. This would be different to what is -nothing option).
Communities	Air quality
Departing aircraft will sti	tates that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. Il climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the may be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, work.
Wider society	Greenhouse gas impact
Network alignment resul baseline do-nothing opti	ts in shorter track than the current departure therefore, reducing greenhouse gas impact when compared with the on.
Wider society	Capacity/ resilience
required turn performant option would provide a b	ectivity to the network. However, may require step-climb to avoid other traffic flows and speed limits to achieve ce. Should support reduced separation from northbound departures. On balance, it is anticipated that this design renefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing option. plored for suitability of applying reduced departure separations, thus reducing pre-departure delay.
General Aviation	Access
	ne potential to require additional CAS to the southeast of Bristol Airport. Therefore, this design option has the Iy increased impact on GA access when compared with the baseline do-nothing option.
General Aviation/ comm airlines	ercial Economic impact from increased effective capacity
No effect on capacity.	
General Aviation/ comm airlines	ercial Fuel Burn
	route will result in fuel burn savings for commercial traffic when compared with the baseline do-nothing option. Id have to take into account a reduction in track miles.
Commercial airlines	Training costs
	edures change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if is not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are	e foreseen.
Airport/ ANSP	Infrastructure costs
	ected to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some endments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not expe	ected to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
of the NATS simulator fa	d to require air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use acilities at both locations. Training may also be required at Cardiff Airport if design changes impact upon their d to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety applyets, outputs
to be recorded and report operational controllers d service delivery.	d to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs red etc. Some staff may only require briefings. There may be occasions where the reduced availability of uring their conversion training could mean operational rostering becomes a factor when considering continuous 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 clir performance aircraft as it pro	nb to be over the channel and avoids Bristol City. Could be used as a respite route to the east or for low vides a longer track distance to achieve height requirements. This design option has the potential to reduce se when compared with the baseline do-nothing. It should be noted that any re-alignment from the current NPR	
	fly the Cotswolds AoNB above above 7,000ft and could therefore have a visual impact on tranquillity. This is oday (baseline do-nothing option).	
Communities	Air quality	
Departing aircraft will still clim	that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. b through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the be a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals, c.	
Wider society	Greenhouse gas impact	
	departure therefore, reducing greenhouse gas impact when compared with the baseline do-nothing option. nmental impact when compared with SID B27-5.	
Wider society	Capacity/ resilience	
this design option is anticipat option.	nance aircraft and well positioned for connectivity to the network. Reduced ATC and pilot workload. Therefore, ed to provide a benefit in capacity and resilience for Bristol Airport when compared with the baseline do-nothing d 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	
	departure therefore, reducing airline fuel burn when compared with the baseline do-nothing option. However, en compared with SID B27-5 due to its positioning to avoid populated areas. Airline fuel planning would have to in track miles.	
Commercial airlines	Training costs	
	s change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs	
No other airline costs are fore	seen.	
Airport/ ANSP	Infrastructure costs	
	to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some ents (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	
of the NATS simulator facilitie operation.	equire air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use at both locations. Training may also be required at Cardiff Airport if design changes impact upon their	
to be recorded and reported e	un the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs tc. Some staff may only require briefings. There may be occasions where the reduced availabilty of their conversion training could mean operational rostering becomes a factor when considering continuous	



Internal documentation will also require updating.

### Runway 27 SID: B27-6

(south-east departure for first rotation traffic)

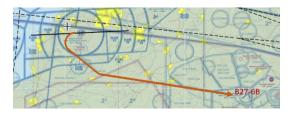


Group	Impact
Communities	Noise impact on health and quality of life
New route intended only for som AONB. Overall, the impacts of air	e early morning departures. Does not overfly any heavily populated areas however, will overfly the Mendip craft noise are likely to be broadly similar to today when compared with the baseline do-nothing. It should be the current NPR could over-fly new communities.
	the Mendip Hills, potentially below 7,000ft, which would have a impact on tranquillity. However, this design norning use only, up to about 0830 local time, which would limit the impact. This would be different to what ng option).
Communities	Air quality
Departing aircraft will still climb t	t aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. hrough 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals,
Wider society	Greenhouse gas impact
When in use, this route will provid compared with the baseline do-n	le good greenhouse gas/ fuel burn savings from reduced track mileage (more direct than today) when othing option.
Wider society	Capacity/ resilience
network connectivity (further work compared with the baseline do-n	
	or suitability of applying reduced departure separations, thus reducing pre-departure delay.
General Aviation	Access
	airspace classification but limited to early morning periods (e.g. before 08.30). Therefore, this design option eased 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
	I result in good savings for commercial traffic when available (early mornings only) when compared with the e fuel planning would have to take into account a reduction in track miles.
Commercial airlines	Training costs
	nange worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if ticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are foresee	en.
Airport/ ANSP	Infrastructure costs
	change airport or ANSP infrastructure, beyond the initial deployment phase which would require some s (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
	ire air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use t both locations. Training may also be required at Cardiff Airport if design changes impact upon their
Support staff are required to run to be recorded and reported etc.	the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs Some staff may only require briefings. There may be occasions where the reduced availability of ir conversion training could mean operational rostering becomes a factor when considering continuous



#### Runway 27 SID: B27-6B

(alternate south-east departure for first rotation traffic)



Group	Impact
Communities	Noise impact on health and quality of life
	d only for some early morning departures. Does not overfly any heavily populated areas however, will overfly 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.
	fly the Mendip Hills, potentially below 7,000ft, which would have a impact on tranquillity. However, this design y morning use only, up to about 0830 local time, which would limit the impact. This would be different to what thing option).
Communities	Air quality
Departing aircraft will still clim	hat aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. b through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from either end of the e a slight re-alignment of the current NPR to achieve the requirement of reduced minimum departure intervals,
Wider society	Greenhouse gas impact
When in use, this route will proceed with the baseline do	wide good greenhouse gas/ fuel burn savings from reduced track mileage (more direct than today) when p-nothing option.
Wider society	Capacity/ resilience
to provide a benefit in capacity	leparture delay during first rotation (a known high demand period). Therefore, this design option is anticipated v 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
	of airspace classification but limited to early morning periods (e.g. before 08.30). Therefore, this design option creased 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
	will result in good savings for commercial traffic when available (early mornings only) when compared with the line fuel planning would have to take into account a reduction in track miles.
Commercial airlines	Training costs
	change worldwide with each AIRAC cycle and airlines would update their procedures accordingly, training if anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs are fore	seen.
Airport/ ANSP	Infrastructure costs
	to change airport or ANSP infrastructure, beyond the initial deployment phase which would require some ents (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
	equire air traffic controller training for controllers and assistants at NATS Swanwick and Bristol Airport with use s at both locations. Training may also be required at Cardiff Airport if design changes impact upon their
Support staff are required to reto be recorded and reported effective of the second staff are required to report to	un the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety analysts, outputs c. Some staff may only require briefings. There may be occasions where the reduced availabilty of their conversion training could mean operational rostering becomes a factor when considering continuous
	so require updating.

# Runway 27 SID: B27-7 (southern departure)



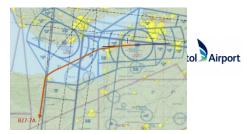
Group	Impact	
Communities	Noise impact on health and quality of life	
of aircraft noise are likely to b that any re-alignment from th This design option would over	arge population centres. Some of the climb is situated over the Channel. Overall, the impacts be broadly similar to today when compared with the baseline do-nothing. It should be noted be current NPR could over-fly new communities close to the airport. erfly the Quantock Hills AoNB above above 7,000ft and could therefore have a visual impact erfly the Mendip Hills AoNB below 7,000ft which would be very similar to what is flown today	
Communities	Air quality	
Departing aircraft will still clir either end of the runway. How	that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. nb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from wever, there may be a slight re-alignment of the current NPR to achieve the requirement of 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	
Therefore, this design option compared with the baseline of	onnectivity and would support reduced separation from north or eastbound departures. is anticipated to provide a benefit in capacity and resilience for Bristol Airport when do-nothing option. ed for suitability of applying reduced departure separations, thus reducing pre-departure	
delay.		
General Aviation	Access	
	ange of airspace classification but only at higher levels so impact on GA access should be ption has the potential to have a slightly increased impact on GA access when compared with n.	
General Aviation/ commercial airlines	Economic impact from increased effective capacity	
No effect on capacity.		
General Aviation/ commercial airlines	Fuel Burn	
	oublished; airlines will often request this route for fuel saving. Therefore, this design option g when compared with the baseline do-nothing option. Airline fuel planning would have to n in track miles.	
Commercial airlines	Training costs	
	is change worldwide with each AIRAC cycle and airlines would update their procedures ed. This proposal is not anticipated to require additional training costs for airlines.	
Commercial airlines	Other costs	
No other airline costs are fore	eseen.	
Airport/ ANSP	Infrastructure costs	
	t to change airport or ANSP infrastructure, beyond the initial deployment phase which would ering amendments (internal ATC system adaptation changes only).	
Airport/ ANSP	Operational costs	
This proposal is not expected	t o change airport or ANSP operational costs.	
Airport/ ANSP	Deployment costs	
Bristol Airport with use of the design changes impact upon		
analysts, outputs to be record the reduced availability of ope	run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety ded and reported etc. Some staff may only require briefings. There may be occasions where erational controllers during their conversion training could mean operational rostering idering continuous service delivery.	



Internal documentation will also require updating.

### Runway 27 SID: B27-7A

(alternate southern departure)

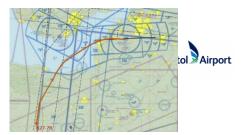


Group	Impact
Communities	Noise impact on health and quality of life
below 7,000ft. This de	b will be over the Channel although lower performance aircraft may overfly Weston-Super-Mare sign option has the potential to reduce overall impacts of aircraft noise when compared with the should be noted that any re-alignment from the current NPR could over-fly new communities close
This design option wo	uld not overfly any AoNBs or National Parks and therefore have no impact on tranquillity.
Communities	Air quality
Departing aircraft will either end of the runw	states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from ay. However, there may be a slight re-alignment of the current NPR to achieve the requirement of parture intervals, subject to further design work.
Wider society	Greenhouse gas impact
Shorter route than the with the baseline do-n	current route which would have a positive impact on greenhouse gas emissions when compared othing option.
Wider society	Capacity/ resilience
provide a benefit in ca	and well positioned for connectivity to the network. Therefore, this design option is anticipated to pacity and resilience for Bristol Airport when compared with the baseline do-nothing option. explored for suitability of applying reduced departure separations, thus reducing pre-departure
General Aviation	Access
	contain SID within existing CAS therefore, this design option would have a similar impact on GA ed 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 miles.	current published route. Airline fuel planning would have to take into account a reduction in track
Commercial airlines	Training costs
	cedures change worldwide with each AIRAC cycle and airlines would update their procedures 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
	spected to change airport or ANSP infrastructure, beyond the initial deployment phase which would engineering amendments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not ex	pected to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
Bristol Airport with use	ted to require air traffic controller training for controllers and assistants at NATS Swanwick and e of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if st upon their operation.
analysts, outputs to be the reduced availability becomes a factor whe	ired to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safet e recorded and reported etc. Some staff may only require briefings. There may be occasions where of operational controllers during their conversion training could mean operational rostering en considering continuous service delivery.
internal documentatio	n will also require updating.

**NATS** Internal

# Runway 27 SID: B27-7B

(alternate southern departure)



Group	Impact
Communities	Noise impact on health and quality of life
over the Channel. Over	raft may overfly some of Weston-Super-Mare below 7000ft. Much of the remaining climb is situated rall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the should be noted that any re-alignment from the current NPR could over-fly new communities close
This design option wo	uld not overfly any AoNBs or National Parks and therefore have no impact on tranquillity.
Communities	Air quality
Departing aircraft will either end of the runwa	states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from ay. However, there may be a slight re-alignment of the current NPR to achieve the requirement of parture intervals, subject to further design work.
Wider society	Greenhouse gas impact
This route will provide baseline do-nothing op	some greenhouse gas/ fuel burn savings from reduced track mileage when compared with the otion.
Wider society	Capacity/ resilience
provide a benefit in ca	nnectivity to the network and should support CCOs. Therefore, this design option is anticipated to pacity and resilience for Bristol Airport when compared with the baseline do-nothing option. explored for suitability of applying reduced departure separations, thus reducing pre-departure
General Aviation	Access
	contain SID within existing CAS therefore, this design option would have a similar impact on GA ed 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 miles.	current published route. Airline fuel planning would have to take into account a reduction in track
Commercial airlines	Training costs
	cedures change worldwide with each AIRAC cycle and airlines would update their procedures required. This proposal is not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs a	are foreseen.
Airport/ ANSP	Infrastructure costs
	pected to change airport or ANSP infrastructure, beyond the initial deployment phase which would engineering amendments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not ex	pected to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
Bristol Airport with use	ted to require air traffic controller training for controllers and assistants at NATS Swanwick and e of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport i st upon their operation.
analysts, outputs to be the reduced availabilty	ired to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safet e recorded and reported etc. Some staff may only require briefings. There may be occasions where of operational controllers during their conversion training could mean operational rostering n considering continuous service delivery.

**NATS** Internal

# Runway 27 SID: B27-7C

(alternate southern departure)



Group	Impact
Communities	Noise impact on health and quality of life
over the Channel. Overa baseline do-nothing. It s to the airport.	aft may overfly some of Weston-Super-Mare below 7000ft. Much of the remaining climb is situated all, the impacts of aircraft noise are likely to be broadly similar to today when compared with the should be noted that any re-alignment from the current NPR could over-fly new communities close
This design option wou	ld not overfly any AoNBs or National Parks and therefore have no impact on tranquillity.
Communities	Air quality
Departing aircraft will st either end of the runwa	states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. till climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from y. However, there may be a slight re-alignment of the current NPR to achieve the requirement of arture intervals, subject to further design work.
Wider society	Greenhouse gas impact
This route will provide s baseline do-nothing opt	ome greenhouse gas/ fuel burn savings from reduced track mileage when compared with the ion.
Wider society	Capacity/ resilience
provide a benefit in cap	nectivity to the network and should support CCO. Therefore, this design option is anticipated to acity and resilience for Bristol Airport when compared with the baseline do-nothing option. xplored for suitability of applying reduced departure separations, thus reducing pre-departure
General Aviation	Access
	ontain SID within existing CAS therefore, this design option would have a similar impact on GA I 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 c miles.	current published route. Airline fuel planning would have to take into account a reduction in track
Commercial airlines	Training costs
	edures change worldwide with each AIRAC cycle and airlines would update their procedures equired. This proposal is not anticipated to require additional training costs for airlines.
Commercial airlines	Other costs
No other airline costs a	re foreseen.
Airport/ ANSP	Infrastructure costs
	pected to change airport or ANSP infrastructure, beyond the initial deployment phase which would ngineering amendments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not exp	pected to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
	ed to require air traffic controller training for controllers and assistants at NATS Swanwick and of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if upon their operation.
analysts, outputs to be the reduced availability o becomes a factor when	ed to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safet recorded and reported etc. Some staff may only require briefings. There may be occasions where of operational controllers during their conversion training could mean operational rostering considering continuous service delivery.
Internal documentation	will also require updating.

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## Runway 27 SID: B27-7D

(alternate southern departure)



	1 John Martin Carton
Group	Impact
Communities	Noise impact on health and quality of life
over the Channel. Ove	craft may overfly some of Weston-Super-Mare below 7000ft. Much of the remaining climb is situated erall, the impacts of aircraft noise are likely to be broadly similar to today when compared with the It should be noted that any re-alignment from the current NPR could over-fly new communities close
	as the potential to overfly the eastern edge of the Quantock Hills AoNB above 7,000ft which could on tranquillity. This is very similar to what is flown today (baseline do-nothing option).
Communities	Air quality
Departing aircraft will either end of the runw	e states that aircraft flying above 1,000ft are unlikely to have a significant impact on local air quality. I still climb through 1,000ft on initial departure, between 2 and 4 nautical miles (about 4-7km) from vay. However, there may be a slight re-alignment of the current NPR to achieve the requirement of parture intervals, subject to further design work.
Wider society	Greenhouse gas impact
southern Hold. There	ay not be possible (increase in greenhouse gas impact) due to not being separated from potential fore, this design option could potentially increase the impact of greenhouse gas emissions when aseline do-nothing option.
Wider society	Capacity/ resilience
provide a benefit in ca	onnectivity to the network and should support CCO. Therefore, this design option is anticipated to apacity and resilience for Bristol Airport when compared with the baseline do-nothing option. explored for suitability of applying reduced departure separations, thus reducing pre-departure
General Aviation	Access
	ge of airspace classification but only at higher levels. Therefore, this design option has the potential to sed 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
	ay not be possible (due to potential Hold location) which could increase fuel burn when compared nothing option. Airline fuel planning would have to take into account an increase in track miles.
Commercial airlines	Training costs
. , , , , , , , , , , , , , , , , , , ,	ocedures change worldwide with each AIRAC cycle and airlines would update their procedures 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
	expected to change airport or ANSP infrastructure, beyond the initial deployment phase which would engineering amendments (internal ATC system adaptation changes only).
Airport/ ANSP	Operational costs
This proposal is not e	expected to change airport or ANSP operational costs.
Airport/ ANSP	Deployment costs
Bristol Airport with us design changes impa	cted to require air traffic controller training for controllers and assistants at NATS Swanwick and se of the NATS simulator facilities at both locations. Training may also be required at Cardiff Airport if act upon their operation.
analysts, outputs to b the reduced availabilt	uired to run the simulator – planning, training staff, data preparation and testing, pseudo pilots, safety be recorded and reported etc. Some staff may only require briefings. There may be occasions where by of operational controllers during their conversion training could mean operational rostering en considering continuous service delivery.



Internal documentation will also require updating.

#### Runway 27 SID: B27-7E

(alternate southern departure)



(alternate southern departure)		
Group	Impact	
Communities	Noise impact on health and quality of life	2
overall impacts of aircr alignment from the cur	d overflying large population centres below 7,000ft aft noise when compared with the baseline do-not rent NPR could over-fly new communities close to ckly departures can turn, this design option has the	thing option. It should be noted that any re- o the airport.
	w 7,000ft which could have an impact on tranquil	
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	
	of airspace classification but only at higher levels ad impact on GA access when compared with the l	
General Aviation/ commercial airlines	Economic impact from increased effectiv	ve capacity
No effect on capacity.		
General Aviation/ commercial airlines	Fuel Burn	
shorter than today). On	y not be possible (potential transitions location) wh balance, this design option may have a similar gro tion. Airline fuel planning would have to take into a	eenhouse gas impact when compared with the
Commercial airlines	Training costs	
	edures change worldwide with each AIRAC cycle required. This proposal is not anticipated to requir	
Commercial airlines	Other costs	
No other airline costs a	re 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 exp	pected to change airport or ANSP operational cost	ts.
Airport/ ANSP	Deployment costs	
	ed to require air traffic controller training for contr of the NATS simulator facilities at both locations. t 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 availability 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 <sup>(ink)</sup>. 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.