Swanwick Airspace Improvement Programme Airspace Development 6

LTC Essex Sector Safety Improvement and Luton Airport Arrival Routes

SAIP AD6 TC Essex-Luton Arrivals

Gateway documentation: Stage 2 Develop & Assess

2 A (ii) Design Principle Evaluation



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Roles

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Introduction

NATS and LLA are co-sponsors of this proposal. The scope of our project is to reduce the complexity of Luton Airport arrivals (and their interacting relationship with Stansted arrivals), in turn reducing controller workload and assuring a safe operation for the future.

This document forms part of the document set required for the CAP1616 airspace change process: Stage 2 Develop and Assess, Step 2A (ii) Design Principle Evaluation. Its purpose is to consider this proposal's comprehensive list of airspace design options against its design principles, discarding those which fit least, progressing those which fit better. This document is designed to be read in conjunction with the document Step 2A (i) Design Options which describes and illustrates each element of the design concepts, and also refers to a preceding document Step 1B Design Principles, of which there are fifteen, with eight priorities.

We re-engaged our representative stakeholder groups, recapped the airspace change process and design principles, and explained the fundamental concept of this proposal. We explained that other (non-airspacechange) solutions to the issue have already been considered, and either implemented if possible, or discarded if not, prior to the inception of this airspace change proposal. We explained the constraints, and what was feasible within those constraints. We targeted each stakeholder group for feedback relevant to their interests, which informed the construction of this document. We thank the stakeholders for this engagement.

Where are we in the airspace change process?

We have completed Stage 1 Define, where we established the need for an airspace change and the design principles underpinning it. We are now in Stage 2; Develop and Assess and this document is part of Step 2A.

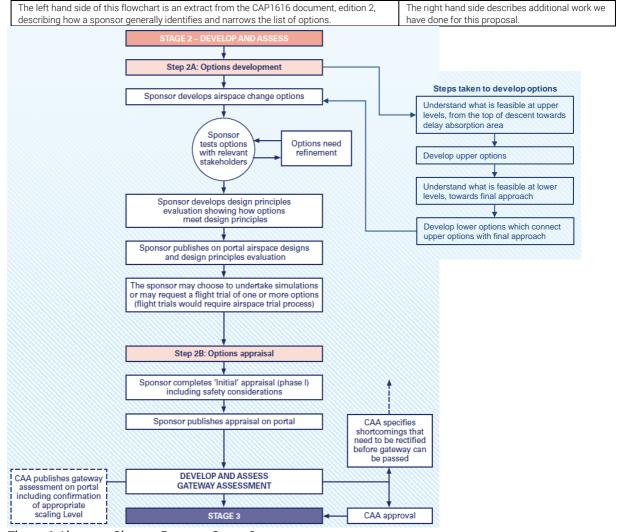


Figure 1 Airspace Change Process Stage 2

¹ CAP1616 Edn 2 page 157 para E14.



About Luton and Stansted Airports, and this proposal

Currently, Luton and Stansted Airports - two of the five busiest airports in the UK in terms of air traffic movements - share exactly the same arrival flows from the en-route cruise phase to the holds. This is a unique situation – other airports sometimes share arrival routes, but one always has a much bigger proportion of movements (for example, Heathrow and RAF Northolt, or London City and Biggin Hill). Like most airports, Luton has a single runway which can be used in two directions – easterly or westerly.

The scope of this proposal specifically addresses Luton arrival flows, and their interaction with Stansted arrival flows in the existing London Terminal Manoeuvring Area (LTMA). The LTMA consists of a complex system of air traffic service (ATS) routes (for all traffic) plus Standard Departure/Arrival Routes (known as SIDs/STARs), existing holding facilities and airspace volumes for all London Airports.

How to read this document – two major sections:

This document describes the broad concept options for Luton Airport arrivals, from the end of the en-route cruise phase of flight, known as "Top of Descent" (TOD), to final approach Luton's runway. The total number of options from en-route to final approach is significant, so in order to manage their development we have split them into two major sections.

Section 1 Upper Options

Options for the routes from TOD, to arriving at the Delay Absorption area (referred to as 'holds' regardless of the existence of a formal holding pattern). This is at higher altitudes, from c.8,000ft and above. Summarising Government guidance, consideration of the reduction of CO₂ emissions takes priority over the minimising of aviation noise at these higher levels². All upper options will be numbered 1.1, 1.2, 1.3...

Section 2 Lower Options

Options for the routes leaving the Delay Absorption area, to final approach at the runway. This is at lower altitudes, from c.8,000ft and below.

Summarising Government guidance, between 7,000ft-4,000ft minimising the impact of aviation noise should be prioritised unless this disproportionately increases CO2 emissions, and below 4,000ft the impact of aviation noise should be prioritised, with preference given to options which are most consistent with existing arrangements². All lower options will be numbered 2.1, 2.2, 2.3...

The following set of tables is based on the proforma provided in CAP1616 2nd edition page 167. The tables list each design principle (the priorities are shown colour-coded to match those in the Step 1B Design Principles document). Design Principles may be abbreviated to "DP" so Design Principle 1 may be referred to as "DP1".

A green box means 'this design principle has been generally met by the specified option'

An orange box means 'this design principle has been partially met by the specified option', or 'there would be no significant change'

A red box means 'this design principle has not been met by the specified option'

A grey box spanning all three items means 'this design principle is not applicable here'

How will we decide which options to progress to the next stage?

DP1 is about safety and is Priority 1.

Any design option which has not met this DP (red) or has partially met this DP (orange) contains safety concerns and will be rejected. .

DP2 is about Government environmental principles and aviation policies, and is Priority 2.

Any design option which has not met this DP (red) will be rejected.

DP3 is specific to MoD USAFE Lakenheath and is also Priority 2.

Any design option which has not met this DP (red) will be rejected.

Design options may progress even if DPs with a Priority of 3 or lower have not been met (red). Some are mutually exclusive, some may not be achievable at all by any design and are aspirational, and some may be manageable in practice even though the DP itself is not met.

² The altitude-based priorities for impacts due to noise vs emissions are set by the Government in the Department for Transport's 2017 paper "Guidance to the CAA on its environmental objectives when carrying out its air navigation functions, and to the CAA and wider industry on airspace and noise management", known as ANG2017, section 3 para 3.3.



What are the Assessment Criteria we used to evaluate the design options against the DPs?

Priority	Ref	Design Principle	Qualitative Criteria for Met, Partial, Not Met
1	1	Safety is the highest priority Optimise the complexity of the TC Essex sector within the scope of this project	Met: No safety concerns Partial: Some safety concern Not Met: Significant safety concern
2	2	Environmental – Must meet the 3 aims of the NPSE, Air Navigation Guidance 2017 and all appropriate Government aviation policies, and updates thereof	Met: Meets the three NPSE aims, the ANG and other Government Aviation policies Partial: Meets some, but not all, of the policies, OR unable to fully determine at this stage Not Met: Fails to meet any policy
	3	Technical – Minimise impacts on MoD USAFE Lakenheath operations to a level acceptable to MoD	Met: Very likely to be acceptable Partial: Likely to be acceptable, with further work Not Met: Unlikely to be acceptable
	4	Operational – Should not constrain the airport's capacity, providing the environmental objectives/ requirements have been met	Met: Unlikely to be constrained Partial: May be constrained to some degree Not Met: Likely to be constrained
	5	Technical – Minimise dependency of LLA's arrivals on those of Stansted Airport.	Met: Has no, or minimal, dependency Partial: Some dependency, likely to be manageable Not Met: Highly dependent
3	6	Operational — Increase the predictability of LLA's arrivals	Met: Increases predictability significantly Partial: Increases predictability slightly, or not significantly Not Met: Does not improve, or reduces, predictability
	7	Environmental – Should enable continuous descent from at least 7,000ft & facilitate continuous descent above that	Met: Enables continuous descent from cruise Partial: Enables continuous descent from, or to, 7,000ft Not Met: Requires a period of level flight
	8	Environmental – Minimise the requirement to change future low altitude arrival flows within the next ten years	Met: Aligns with the Airspace Modernisation Strategy Partial: May align with the AMS Not Met: Unlikely to align with the AMS
4	9	Technical – There must be agreement between stakeholder ANSPs that the design concept being progressed suits all operations. MoD (other than USAFE Lakenheath) MoD (USAFE Lakenheath) Stansted Airport Cambridge Airport Cranfield Airport	Met: There is likely to be agreement between all of the listed stakeholders Partial: There may not be full agreement OR additional work is required to resolve Not Met: We expect significant disagreement by at least one stakeholder, with agreement unlikely to be reached
	10	Environmental – Should provide an equitable distribution of traffic where possible, through e.g. use of multiple routes, new route structures, options/mechanisms for respite	Met: Enables equitable distribution Partial: May enable equitable distribution Not Met: Does not enable equitable distribution
5	11	Economic – Reduce fuel burn	Met: Clearly likely to reduce fuel burn Partial: Has the potential to reduce fuel burn Not Met: Unlikely to reduce fuel burn
3	12	Economic – Minimise potential increases in fuel burn	Met: Clearly likely to minimise increases in fuel burn Partial: May minimise increases in fuel burn Not Met: Unlikely to minimise increases in fuel burn
6	13	Environmental – Should avoid overflying the same communities with multiple routes, & take into account routes of other airports, below 7,000ft	Met: No communities overflown by multiple routes Partial: Communities may be overflown by multiple routes similar to today Not Met: Communities overflown by multiple routes due to the design
7	14	Operational – Should minimise tactical intervention by ATC below 7,000ft	Met: Minimal tactical intervention Partial: Some avoidable tactical intervention Not Met: Significant tactical intervention
8	15	Technical – Minimise negative impact on other airspace users by keeping CAS requirements to a minimum, investigating potential release of existing CAS, keeping new airspace boundaries simple where possible, and FUA if possible	Met: No new CAS Partial: Small or Medium new CAS OR elements of CAS managed under FUA Not Met: Large new CAS



Section 1 Upper Options 1.

1.1 Do nothing – the upper baseline	P	REJEC
Description of option: The current Luton and Stansted arrival flows are entwined a	t an early stage, up to the LOREL/ABBOT holds	i.
Design principle 1, priority 1: Safety is the highest priority	NOT MET	
Optimise the complexity of the TC Essex sector within the scope of this project		
No change to existing arrangements, which has identified a latent risk.		
Design principle 2, priority 2: Environmental – Must meet the 3 aims of the NPSE,		
Air Navigation Guidance 2017, all appropriate Government aviation policies, &	DP not applicable to this option	
updates thereof	an akkan na Balaa	
If no changes are made, there is nothing to assess against the NPSE, ANG 2017 of Design principle 3, priority 2: Technical – Minimise impacts on MoD USAFE		
Lakenheath operations to a level acceptable to MoD	MET	
No change to existing arrangements, therefore there will be no impact to USAFE L	akenheath operations	
Design principle 4, priority 3: Operational – Should not constrain the airport's	NOT MET	
capacity, providing the environmental objectives/ requirements have been met	NOT MET	
No change to existing arrangements. Forecast traffic levels will require increased	use of flow regulations to maintain levels of sa	fety
within this airspace which will constrain airport capacity at both Luton and Stanst		,
Design principle 5, priority 3 : Technical – Minimise dependency of LLA's arrivals on	NOT MET	
those of Stansted Airport.		
LLA arrivals will remain entwined with Stansted arrivals, which continues the depe	endency on Stansted traffic.	
Design principle 6, priority 3 : Operational – Increase the predictability of LLA's	NOT MET	
arrivals		
No change to existing arrangements. Predictability of arriving traffic at Luton Airpo	ort will be fully dependent on Stansted arrivals	and vice
versa.		
Design principle 7, priority 3: Environmental – Should enable continuous descent	NOT MET	
from at least 7,000ft & facilitate continuous descent above that		
No change to existing arrangements. In the upper region, traffic will be levelled off Stansted arrival flows.	f at intermediate altitudes to deconflict Luton a	nd
Design principle 8, priority 4 : Environmental – Minimise the requirement to change	DP not applicable to Upper options	;
future low altitude arrival flows within the next ten years		
This section is about the upper options. No change to existing arrangements		
Design principle 9, priority 4 : Technical – There must be agreement between	PARTIAL	
stakeholder ANSPs that the design concept being progressed suits all operations.		
MoD (other than USAFE Lakenheath), MoD (USAFE Lakenheath), Stansted Airport,		
Cambridge Airport, Cranfield Airport. No change to existing arrangements. While maintaining the current airspace desic	en vill recult in the shares to the MaD. Lakenha	
No change to existing arrangements. While maintaining the current airspace design Cambridge Airport and Cranfield Airport, for Stansted a no-change upper option w		
demand on the airspace.	The following states associated with the t	urrent
Design principle 10, priority 4 : Environmental – Should provide an equitable		
distribution of traffic where possible, e.g. through use of multiple routes, new route	DP not applicable to Upper options	
structures, options/mechanisms for respite	2. Not applicable to oppor options	
This section is about the upper options. The intent of this DP is related to noise in	npacts, influenced primarily by the lower option	าร.
Design principle 11, priority 5 : Economic – Reduce fuel burn	NOT MET	
No change to existing arrangements. No reduction.		
Design principle 12, priority 5: Economic – Minimise potential increases in fuel burn	NOT MET	
Predicted increases in traffic is likely to result in more holding, therefore there is a	potential increase in fuel burn. The do nothing	option
provides no opportunity to minimise this potential increase.		
Design principle 13, priority 6 : Environmental – Should avoid overflying the same	DP not applicable to Upper options	
communities with multiple routes, & take into account routes of other airports, pelow 7,000ft		
This section is about the upper options. No change to existing arrangements.		
Design principle 14, priority 7 : Operational – Should minimise tactical intervention	DP not applicable to Upper options	
by ATC below 7,000ft	or flot applicable to opper options	
This section is about the upper options. Because there would be no change to exi	isting shared arrangements, this ontion would	not
minimise tactical intervention.	.sg shared arrangements, this option would	
Design principle 15, priority 8: Technical – Minimise negative impact on other	PARTIAL	
airspace users by keeping CAS requirements to a minimum, investigating potential		
release of existing CAS, keeping new airspace boundaries simple where possible,		
and FUA if possible		



1.2 Point merge delay absorption	REJECT
Description of option: Luton flows are separated from the Stansted flows, towards a linear holding pa	attern using PBN principles
Design principle 1, priority 1: Safety is the highest priority	MET
Optimise the complexity of the TC Essex sector within the scope of this project	
Luton arrivals will be independent from Stansted arrivals reducing complexity and workload.	
Design principle 2, priority 2: Environmental – Must meet the 3 aims of the NPSE,	MET
Air Navigation Guidance 2017, all appropriate Government aviation policies, &	
updates thereof	
This section is about the upper options. A point merge holding area is considered a more environment.	entally efficient system than racetrack
holds.	
Design principle 3, priority 2: Technical – Minimise impacts on MoD USAFE NOT MET	
Lakenheath operations to a level acceptable to MoD The controlled airspace requirement to contain the Point Merge system option will impact USAFE La	alkanhaath anarationa to a dagraa that
is likely to be unacceptable.	akenneath operations to a degree that
Design principle 4, priority 3: Operational – Should not constrain the airport's	MET
capacity, providing the environmental objectives/ requirements have been met	
Luton arrivals will be independent from Stansted arrivals, reducing the capacity constraints of comp	olexity and workload.
	,
Design principle 5, priority 3: Technical – Minimise dependency of LLA's arrivals on	MET
those of Stansted Airport.	
Luton arrivals will be independent from Stansted arrivals.	
Design principle 6, priority 3: Operational — Increase the predictability of LLA's	MET
arrivals	
Luton arrivals will have an independent arrival sequence, and therefore a more predictable arrival flo)W.
Design principle 7, priority 3: Environmental – Should enable continuous descent	
from at least 7,000ft & facilitate continuous descent above that	
In the upper region, the point merge structure is less likely than other upper options to facilitate containing the point merge structure is less likely than other upper options to facilitate containing the point merge structure is less likely than other upper options to facilitate containing the point merge structure is less likely than other upper options to facilitate containing the point merge structure is less likely than other upper options to facilitate containing the point merge structure is less likely than other upper options to facilitate containing the point merge structure is less likely than other upper options to facilitate containing the point merge structure is less likely than other upper options to facilitate containing the point merge structure is less likely than other upper options to facilitate containing the point merge structure is less likely than other upper options to facilitate containing the point merge structure is less likely than other upper options to facilitate containing the point merge structure is less likely than other upper options to facilitate containing the point merge structure is less likely than other upper options to facilitate containing the point merge structure is less likely than other upper options to facilitate containing the point merge structure is less likely than other upper options and the point merge structure is less likely than other upper options and the point merge structure is less likely than other upper options and the point merge structure is less likely than other upper options and the point merge structure is less likely than other upper options and the point merge structure is less likely than other upper options and the point merge structure is less likely than other upper options and the point merge structure is less likely than other upper options and the point merge structure is less likely than other upper options and the point merge structure is likely than other upper options and the point merge structure is likely than other upper opt	
	t applicable to Upper options
future low altitude arrival flows within the next ten years This section is about the upper options. The intent of this DP is related to noise impacts, influenced	I primarily by the lower entions
Design principle 9, priority 4: Technical – There must be agreement between NOT MET	primarily by the lower options.
stakeholder ANSPs that the design concept being progressed suits all operations.	
MoD (other than USAFE Lakenheath), MoD (USAFE Lakenheath), Stansted Airport,	
Cambridge Airport, Cranfield Airport.	
The controlled airspace requirement will impact USAFE Lakenheath, other MoD, and Cambridge ope	erations to an extent that ANSP
agreement would be unlikely.	
Design principle 10, priority 4 : Environmental – Should provide an equitable	
	t applicable to Upper options
structures, options/mechanisms for respite	
This section is about the upper options. The intent of this DP is related to noise impacts, influenced	primarily by the lower options.
Design principle 11, priority 5: Economic – Reduce fuel burn NOT MET	
Reduced holding due segregation from Stansted arrivals requires extended new arrival route structu	ure with significantly longer tracks.
Design principle 12, priority 5 : Economic – Minimise potential increases in fuel burn	PARTIAL
Longer routes are required, however point merge is considered a more efficient method of holding.	
Design principle 13, priority 6 : Environmental – Should avoid overflying the same	
	t applicable to Upper options
below 7,000ft	
This section is about the upper options. The intent of this DP is related to noise impacts, influenced	primarily by the lower options.
Design principle 14, priority 7 : Operational – Should minimise tactical intervention	t applicable to Upper options
by ATC below 7,000ft	
This section is about the upper options, however the ability to sequence arriving traffic within the ho	olding system should aid in minimising
tactical intervention at lower levels.	
Design principle 15, priority 8: Technical – Minimise negative impact on other NOT MET	
airspace users by keeping CAS requirements to a minimum, investigating potential	
release of existing CAS, keeping new airspace boundaries simple where possible,	
and FUA if possible This option requires a large area of new controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge design with the controlled airspace to accommodate point merge airspace are controlled airspace and the controlled airspace are controlle	ith a single base EL75. Proposal to
release existing controlled airspace southeast of Stansted	iti a sirigie pase i L73. Proposal to



1.3 Delay absorption to the west of Luton Airport		REJECT
Description of option: Luton flows are not separated from the Stansted flows from	n the east until ABBOT, towards a d	elay absorption area
west of Luton Airport favouring arrivals from the west. Design principle 1, priority 1: Safety is the highest priority	NOT MET	
Optimise the complexity of the TC Essex sector within the scope of this project	NOT WET	
The Luton-Stansted arrival complexity is where a latent risk has been identified, th	nis option would move this latent ris	sk into a new high
traffic region of the LTMA. The routes to the delay absorption area would merge of	or cross many existing LTMA flows	at all levels. The
delay absorption area itself is within a region already busy with major LTMA flows	s. Moving the indicated position an	ywhere within the
general area would cause the same result.	Г	N.ET
Design principle 2, priority 2: Environmental – Must meet the 3 aims of the NPSE,		MET
Air Navigation Guidance 2017, all appropriate Government aviation policies, & updates thereof		
This section is about the upper options. It meets the environmental aims of this I	DP.	
Design principle 3, priority 2: Technical – Minimise impacts on MoD USAFE		MET
Lakenheath operations to a level acceptable to MoD		
No additional CAS is required, therefore there would be no impact to USAFE Laker	nheath operations.	
Design principle 4, priority 3 : Operational – Should not constrain the airport's	NOT MET	
capacity, providing the environmental objectives/ requirements have been met		111
The positioning of a hold in an already congested area of airspace is likely to resu flow restrictions to manage safely, constraining Luton's capacity.	lit in a complex traffic interaction w	nich would require
Design principle 5, priority 3: Technical – Minimise dependency of LLA's arrivals on		MET
those of Stansted Airport.		WILL
This option strictly meets this DP, however it is very likely to leave LLA arrival's de	pendent on other airports' traffic flo	DWS.
Design principle 6, priority 3: Operational – Increase the predictability of LLA's	NOT MET	
arrivals		
The positioning of a hold in an already congested area of airspace is likely to resu	ılt in a complex traffic interaction w	hich would require
flow restrictions to manage safely, resulting in unpredictable arrival timings. Design principle 7, priority 3: Environmental – Should enable continuous descent	NOT MET	
from at least 7,000ft & facilitate continuous descent above that	NOT MET	
In the upper region Luton traffic would need to be descended early (contrary to DF	P) to facilitate separation from other	r LTMA traffic.
Design principle 8, priority 4: Environmental – Minimise the requirement to change	DP not applicable to Up	
future low altitude arrival flows within the next ten years		
This section is about the upper options.		
Design principle 9, priority 4 : Technical – There must be agreement between		MET
stakeholder ANSPs that the design concept being progressed suits all operations. MoD (other than USAFE Lakenheath), MoD (USAFE Lakenheath), Stansted Airport,		
Cambridge Airport, Cranfield Airport.		
This option strictly meets the DP, however it is likely to increase complexity with o	other flows such as Heathrow.	
Design principle 10, priority 4: Environmental – Should provide an equitable		
distribution of traffic where possible, through e.g. use of multiple routes, new route	DP not applicable to Up	oper options
structures, options/mechanisms for respite		1
This section is about the upper options. The intent of this DP is related to noise in		lower options.
Design principle 11, priority 5 : Economic – Reduce fuel burn	NOT MET	
Reduced track mileage for arrivals from the west. The predominant arrival flows	are from the east and south which	would travel
significantly further, likely outweighing the reduction from the west. Design principle 12, priority 5: Economic – Minimise potential increases in fuel burn	NOT MET	
Reduced track mileage for arrivals from the west. The predominant arrival flows		
significantly further, likely outweighing the reduction of the lesser flows from the region.	west. Does not minimise potential i	ncreases in the upper
Design principle 13, priority 6 : Environmental – Should avoid overflying the same		
communities with multiple routes, & take into account routes of other airports,	DP not applicable to Up	oper options
below 7,000ft		' '
This section is about the upper options. The intent of this DP is related to noise in		
Design principle 14, priority 7 : Operational – Should minimise tactical intervention	DP not applicable to Up	oper options
by ATC below 7,000ft		1
This section is about the upper options, however the complexity that this option p	presents to the West of Luton is like	ly to increase the
tactical intervention by ATC below 7,000ft. Design principle 15, priority 8: Technical – Minimise negative impact on other		MET
airspace users by keeping CAS requirements to a minimum, investigating potential		IVILI
release of existing CAS, keeping new airspace boundaries simple where possible,		
and FUA if possible		
In this context, 'other airspace users' means non-commercial air traffic such as go		
which would impact those other airspace users, however this option would conflict		
with existing LTMA airspace and route structures. Proposal to release existing co	ontrolled all space southeast of Stal	istea.



1.4 Delay absorption to the north of Luton Airport	ACCEPT	
Description of option: Luton flows are separated from the Stansted flows & route	towards a delay absorption area n	orth of Luton Airport.
Design principle 1, priority 1: Safety is the highest priority		MET
Optimise the complexity of the TC Essex sector within the scope of this project		
Luton arrivals will be independent from Stansted arrivals reducing complexity and	d workload.	
Design principle 2, priority 2: Environmental – Must meet the 3 aims of the NPSE,		MET
Air Navigation Guidance 2017, all appropriate Government aviation policies, &		
updates thereof		
This section is about the upper options. It is expected to meet the aims of NPSE,	ANG 2017 and other aviation police	ies.
Design principle 3, priority 2: Technical – Minimise impacts on MoD USAFE	PARTIAL	
Lakenheath operations to a level acceptable to MoD		
This airspace concept will require additional CAS in the vicinity of RAF Lakenheatl	h, however, it is designed to minim	ise impact on MoD
USAFE operations and is agreed in principle as viable option to progress.		
Design principle 4, priority 3: Operational – Should not constrain the airport's		MET
capacity, providing the environmental objectives/ requirements have been met		
Luton arrivals will be independent from Stansted arrivals reducing the capacity co	onstraints of complexity and workle	
Design principle 5, priority 3 : Technical – Minimise dependency of LLA's arrivals on		MET
those of Stansted Airport.		
Luton arrivals will be independent from Stansted arrivals.	T T	
Design principle 6, priority 3: Operational – Increase the predictability of LLA's		MET
arrivals		
Luton arrivals will be independent from Stansted arrivals, ensuring increased prec	dictability due to Luton traffic not b	eing affected by
issues at Stansted.	DADTIAL	
Design principle 7, priority 3: Environmental – Should enable continuous descent	PARTIAL	
from at least 7,000ft & facilitate continuous descent above that In the upper region, this concept is reasonably likely to facilitate continuous desce	ant Hawayar this antian days not	racelya all confliction
points to the hold so has been assessed as partially met. It is expected to be an i		
Design principle 8, priority 4: Environmental – Minimise the requirement to change	DP not applicable to U	
future low altitude arrival flows within the next ten years	Di Tiot applicable to o	pper options
This section is about the upper options. The intent of this DP is related to noise in	nacts influenced primarily by the	lower ontions
Design principle 9, priority 4: Technical – There must be agreement between	PARTIAL PARTIAL	Tower options.
stakeholder ANSPs that the design concept being progressed suits all operations.	17441742	
MoD (other than USAFE Lakenheath), MoD (USAFE Lakenheath), Stansted Airport,		
Cambridge Airport, Cranfield Airport.		
The controlled airspace requirement is designed to minimise impact on MoD USA	AFE operations. Will almost comple	etely remove the
impact of Luton traffic on Stansted operations, and engagement to date indicates	s that it is unlikely to significantly a	ffect the other ANSPs.
Design principle 10, priority 4 : Environmental – Should provide an equitable		
distribution of traffic where possible, through e.g. use of multiple routes, new route	DP not applicable to U	pper options
structures, options/mechanisms for respite		
This section is about the upper options. The intent of this DP is related to noise in		lower options.
Design principle 11, priority 5 : Economic – Reduce fuel burn	PARTIAL	
New extended arrival route concept will reduce holding and allow aircraft to main	tain higher levels later in the flight _l	orofile, however will
require slightly longer routeings.		
Design principle 12, priority 5 : Economic – Minimise potential increases in fuel burn		MET
New arrival route concept extends the inbound routeing by the shortest possible of	distance to achieve separation fror	n Stansted traffic and
minimise impact on MoD operations.	·	
Design principle 13, priority 6 : Environmental – Should avoid overflying the same		
communities with multiple routes, & take into account routes of other airports,	DP not applicable to U	pper options
below 7,000ft		
This section is about the upper options. The intent of this DP is related to noise in		
Design principle 14, priority 7: Operational – Should minimise tactical intervention	DP not applicable to U	pper options
by ATC below 7,000ft		
This section is about the upper options.		
Design principle 15, priority 8: Technical – Minimise negative impact on other	PARTIAL	
airspace users by keeping CAS requirements to a minimum, investigating potential		
release of existing CAS, keeping new airspace boundaries simple where possible,		
and FUA if possible		
This concept requires medium sized elements of new controlled airspace split to		o minimise impacts to
other airspace users, and using a safety case to minimise CAS containment which Proposal to release existing controlled airspace southeast of Stansted	ii aiso reduces overali volume.	



1.5 Technology driven delay absorption en route	REJECT
Description of option: Luton flows are separated from Stansted flows to the north of Luton Airport. It relies on an extended	d arrival
management system to absorb delay and set the sequence long before aircraft are in the vicinity of Luton Airport, with no	delay
absorption area. The technology to achieve this does not yet exist.	1
Design principle 1, priority 1: Safety is the highest priority NOT MET	
Optimise the complexity of the TC Essex sector within the scope of this project	
The lack of a short term delay absorption area would mean that, in the event of a short term issue which stops or restricts	
rate, there could be multiple aircraft in the vicinity of Luton which would require extensive tactical intervention in order to would introduce a level of traffic complexity that is considered unacceptable. No current arrival management systems are	
entirely without a delay absorption area.	e designed
Design principle 2, priority 2: Environmental – Must meet the 3 aims of the NPSE, Air	MET
Navigation Guidance 2017, all appropriate Government aviation policies, & updates thereof	
This section is about the upper options. It meets the environmental aims of this DP.	
Design principle 3, priority 2: Technical – Minimise impacts on MoD USAFE Lakenheath PARTIAL	
operations to a level acceptable to MoD	
This airspace concept will require additional CAS in the vicinity of RAF Lakenheath, however, it is designed to minimise im	pact on MoD
USAFE operations.	•
Design principle 4, priority 3: Operational – Should not constrain the airport's capacity, PARTIAL	
providing the environmental objectives/ requirements have been met	
Arrival management tools are designed to help smooth out general peaks in traffic and do not have the "resolution" to set	
sequence from multiple directions which achieves today's runway capacity. It is likely that the capacity of the airport wou partially constrained by this option.	lid be at least
Design principle 5, priority 3: Technical – Minimise dependency of LLA's arrivals on those of	MET
Stansted Airport.	IVILI
Luton arrivals will be separated from Stansted traffic.	
Design principle 6, priority 3 : Operational – Increase the predictability of LLA's arrivals PARTIAL	
This option is likely to partially, not fully, increase the predictability due to the arrival management tools limitations of general	erally smoothing
out peaks, not setting up accurate arrival sequences.	crairy stricottiing
Design principle 7, priority 3 : Environmental – Should enable continuous descent from at PARTIAL	
least 7,000ft & facilitate continuous descent above that	
In the upper region, this concept is reasonably likely to facilitate continuous descent.	
Design principle 8, priority 4: Environmental – Minimise the requirement to change future DP not applicable to Upp	per options
low altitude arrival flows within the next ten years	
This section is about the upper options. The intent of this DP is related to noise impacts, influenced primarily by the lower primarily to a primarily to a primarily to the pri	r options.
Design principle 9, priority 4: Technical – There must be agreement between stakeholder ANSPs that the design concept being progressed suits all operations. PARTIAL	
MoD (other than USAFE Lakenheath), MoD (USAFE Lakenheath), Stansted Airport,	
Cambridge Airport, Cranfield Airport.	
The controlled airspace requirement is designed to minimise impact on MoD USAFE operations. Will almost completely r	emove the
impact of Luton traffic on Stansted operations, and is unlikely to significantly affect the other ANSPs.	
Design principle 10, priority 4: Environmental – Should provide an equitable distribution of	
traffic where possible, through e.g. use of multiple routes, new route structures, DP not applicable to Upp	per options
options/mechanisms for respite	
This section is about the upper options. The intent of this DP is related to noise impacts, influenced primarily by the lower Design principle 11, priority 5: Economic – Reduce fuel burn PARTIAL	options.
New extended arrival route concept would allow aircraft to maintain higher levels later in the flight profile and expect less	racetrack
holding, however it will require slightly longer routeings.	NACT
Design principle 12, priority 5: Economic – Minimise potential increases in fuel burn	MET
New arrival route concept extends the inbound routeing by the shortest possible distance.	
Design principle 13, priority 6 : Environmental – Should avoid overflying the same	
communities with multiple routes, & take into account routes of other airports, below 7,000ft DP not applicable to Upp	
This section is about the upper options. The intent of this DP is related to noise impacts, influenced primarily by the lowe Design principle 14, priority 7: Operational – Should minimise tactical intervention by ATC DP not applicable to Upper options.	
below 7,000ft	Del Options
This section is about the upper options, however, not having a hold within the design is likely to increase low level tactical	intervention.
Design principle 15, priority 8: Technical – Minimise negative impact on other airspace users PARTIAL	
by keeping CAS requirements to a minimum, investigating potential release of existing CAS,	
keeping new airspace boundaries simple where possible, and FUA if possible	
This concept requires medium sized elements of new controlled airspace split to be as high as possible, designed to mini	mise impacts,
and using a safety case to minimise CAS containment which also reduces overall volume.	



1.6 Delay absorpti	on via tactical vectoring at low level			REJECT
Description of option: Delay a entirely dedicated to Luton to	absorption to arriving aircraft occurs purely within Luton's R traffic.	adar Manoeuvring	Area, the volume	of airspace
Design principle 1, priority 1:		NOT MET		
	ansted traffic would be achieved in this upper region. In the	ony this reduces th	e complexity of it	nteractions with
	, the impact on the lower region cannot be ignored because			
	ivals into the upper region, where there is no delay absorption			
vectoring or bespoke unplai	tivity), no short-term or en-route delay absorption is allowed aned holds.	for, requiring extre	emely high workid	oad tactical
	Environmental – Must meet the 3 aims of the NPSE, Air			MET
	Il appropriate Government aviation policies, & updates thereof			
	per options. It meets the environmental aims of this DP.	I		
	Technical – Minimise impacts on MoD USAFE Lakenheath		PARTIAL	
operations to a level acceptal			1741111	
	equire additional CAS in the vicinity of RAF Lakenheath, hov	vever it is designed	d to minimise imr	nact on MoD
USAFE operations.	squire additional OAS in the violinity of the Eakerineath, nov	vever, it is designed	J (0 111111111113C 1111)	act on wob
	Operational – Should not constrain the airport's capacity,	NOT MET		
	objectives/ requirements have been met	INOT WILT		
		aldy averland the a	ntrollor	
	t a significant restriction to capacity, as peak traffic will quic		ontroller.	VICT
	Technical – Minimise dependency of LLA's arrivals on those of			MET
Stansted Airport.				
Luton arrivals will be separa			<u> </u>	
	Operational – Increase the predictability of LLA's arrivals	NOT MET		
	ridor will separate the Luton and Stansted traffic, the comp		sector will simply	/ be transferred
	or, therefore there will be no improvement in arrival predicta	bility.		
	Environmental – Should enable continuous descent from at		PARTIAL	
least 7,000ft & facilitate conti				
In the upper region, this con	ncept may facilitate continuous descent, with the caveat tha	at the lower traffic	would build more	quickly to
impact the upper region.				
Design principle 8, priority 4:	Environmental – Minimise the requirement to change future	DP not a	applicable to Upp	er options
low altitude arrival flows with	in the next ten years			
	per options. The intent of this DP is related to noise impact	ts, influenced prima	arily by the lower	options.
This section is about the up		ts, influenced prima	arily by the lower	options.
This section is about the up Design principle 9, priority 4:	per options. The intent of this DP is related to noise impact		arily by the lower	options.
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This section is about the up Design principle 9, priority 4: ANSPs that the design conce	per options. The intent of this DP is related to noise impact Technical – There must be agreement between stakeholder opt being progressed suits all operations. Inheath), MoD (USAFE Lakenheath), Stansted Airport,		arily by the lower	options.
This section is about the up Design principle 9, priority 4: ANSPs that the design conce MoD (other than USAFE Lake Cambridge Airport, Cranfield)	per options. The intent of this DP is related to noise impact Technical – There must be agreement between stakeholder opt being progressed suits all operations. Inheath), MoD (USAFE Lakenheath), Stansted Airport,	NOT MET		
This section is about the up Design principle 9, priority 4: ANSPs that the design conce MoD (other than USAFE Lake Cambridge Airport, Cranfield, The controlled airspace req	per options. The intent of this DP is related to noise impact Technical – There must be agreement between stakeholder opt being progressed suits all operations. Inheath), MoD (USAFE Lakenheath), Stansted Airport, Airport.	NOT MET perations and may	reduce the impac	et of Luton
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Section 2 Lower Options 2.

2.1 Do nothing – the lower baseline for Runway 08 (easterly) arriva	ls		REJECT
and			
2.2 Do nothing – the lower baseline for Runway 26 (westerly) arriva			
Description of options: Luton and Stansted arrival flows arrive jointly at the shared LOREL	_/ABBOT holds ar	nd are separated	at lower levels
by tactical vectoring.			I
Design principle 1, priority 1: Safety is the highest priority	NOT MET		
Optimise the complexity of the TC Essex sector within the scope of this project			c: 1
No change in the lower option is intrinsically linked to the 'Do nothing' high level option, w			
Design principle 2, priority 2: Environmental – Must meet the 3 aims of the NPSE, Air	I his DP	not applicable if	no change
Navigation Guidance 2017, all appropriate Government aviation policies, & updates thereof If no changes are made, there is nothing to assess against the NPSE, ANG 2017 or other	naliaiaa		
Design principle 3, priority 2: Technical – Minimise impacts on MoD USAFE Lakenheath	-	applicable to Low	vor ontions
operations to a level acceptable to MoD	DP HOL &	applicable to Low	rei options
No change to existing arrangements, therefore there will be no impact to USAFE Lakenho	eath operations.		
Design principle 4, priority 3 : Operational – Should not constrain the airport's capacity,	NOT MET		
providing the environmental objectives/ requirements have been met			
No change to existing arrangements. Forecast traffic levels will require increased use of	flow regulations t	to maintain level	s of safety
within this airspace which will constrain airport capacity at both Luton and Stansted.	_		
Design principle 5, priority 3: Technical – Minimise dependency of LLA's arrivals on those of	NOT MET		
Stansted Airport.			
LLA arrivals will remain dependent on Stansted traffic.			
Design principle 6, priority 3: Operational — Increase the predictability of LLA's arrivals	NOT MET		
No change to existing arrangements. Predictability of arriving traffic at Luton Airport will	be fully depender	nt on Stansted a	rrivals and vice
versa.	1		T
Design principle 7, priority 3 : Environmental – Should enable continuous descent from at		PARTIAL	
least 7,000ft & facilitate continuous descent above that			
No change to existing arrangements. CDAs are possible today from 5,000ft.	NOTMET		T .
Design principle 8, priority 4 : Environmental – Minimise the requirement to change future low altitude arrival flows within the next ten years	NOT MET		
The do nothing option will increase the requirement to change the airspace design in the	futuro		
Design principle 9, priority 4 : Technical – There must be agreement between stakeholder	ruture.	PARTIAL	
ANSPs that the design concept being progressed suits all operations.		17411111	
MoD (other than USAFE Lakenheath), MoD (USAFE Lakenheath), Stansted Airport,			
Cambridge Airport, Cranfield Airport.			
No change to existing arrangements. While maintaining the current airspace design will	result in no chang	ge to the MoD, La	akenheath,
Cambridge Airport and Cranfield Airport, for Stansted a no-change lower option will not a	iddress the issues	s associated wit	n the current
demand on the airspace.			
Design principle 10, priority 4 : Environmental – Should provide an equitable distribution of		PARTIAL	
traffic where possible, through e.g. use of multiple routes, new route structures,			
options/mechanisms for respite			
No change to existing arrangements.		•	Τ
Design principle 11, priority 5: Economic – Reduce fuel burn	NOT MET		
No change to existing arrangements. There will be no opportunity to reduce fuel burn.	-1	ı	NACT
Design principle 12, priority 5 : Economic – Minimise potential increases in fuel burn			MET
No change to existing arrangements. No increases in fuel burn in the short-term.			
Design principle 13, priority 6 : Environmental – Should avoid overflying the same		PARTIAL	
communities with multiple routes, & take into account routes of other airports, below 7,000ft			
No change to existing arrangements and therefore there is no mechanism to avoid overf	_	communities.	Г
Design principle 14, priority 7 : Operational — Should minimise tactical intervention by ATC below 7,000ft	NOT MET		
No change to existing arrangements. This option requires not only full tactical interventi	on for Luton arriv	als but also for s	Stansted
arrivals.		2 2 2 2 2 3 3 7 3 7 4	·
Design principle 15, priority 8: Technical – Minimise negative impact on other airspace users		PARTIAL	
by keeping CAS requirements to a minimum, investigating potential release of existing CAS,			
keeping new airspace boundaries simple where possible, and FUA if possible	<u> </u>		
No change to existing arrangements. Assumption that "do nothing" includes not conside	ering release of ot	ther CAS.	



2.3 Controller vectoring to Runway 08 (easterly) arrivals			ACCEPT
and			
2.4 Controller vectoring to Runway 26 (westerly) arrivals Description of options: Luton flow is separated from Stansted flow at upper levels, followe	d by vootoring to	final approach	at aither runway
Design principle 1, priority 1: Safety is the highest priority	d by vectoring to	ппагарргоастт	MET
Optimise the complexity of the TC Essex sector within the scope of this project			
Assuming that the Luton and Stansted arrival flows have been separated in one of the hig	jh-level options, i	maintaining tacti	cal vectoring as
a method of routing to the runways from the hold is considered safe.		DARTIAL	
Design principle 2, priority 2 : Environmental – Must meet the 3 aims of the NPSE, Air Navigation Guidance 2017, all appropriate Government aviation policies, & updates thereof		PARTIAL	
It should not result in the change of traffic flows below c.5,000ft. However, unlike options			
above c.5,000ft to connect to the high level options. It is therefore unlikely that this option			
nature of this solution means that the design cannot be said to minimise the number of p predictable nature of the concept.	eopie auversely	impacted due to	trie iess
Design principle 3, priority 2: Technical – Minimise impacts on MoD USAFE Lakenheath	DP not a	pplicable to Low	er options
operations to a level acceptable to MoD			
This option would have no effect on MoD Lakenheath operations, only the Upper options	may have an imp	pact.	NACT
Design principle 4, priority 3: Operational — Should not constrain the airport's capacity, providing the environmental objectives/ requirements have been met			MET
Tactical vectoring is currently the most flexible way of ensuring the airport capacity is not	constrained and	d this method is	used throughout
the UK.			3
Design principle 5, priority 3: Technical – Minimise dependency of LLA's arrivals on those of			MET
Stansted Airport. This option complements the re-positioning of Luton arrivals to the high-level options whi	ch aims to sena	rate the Luton ar	nd Stansted
arrival flows.	cir airis to sepai		iu Staristeu
Design principle 6, priority 3: Operational – Increase the predictability of LLA's arrivals		PARTIAL	
The high level options primarily affect the predictability of Luton arrivals. Tactically vecto			
contribute towards increasing the predictability of Luton arrivals for the airport or commu position aircraft to appropriately space and sequence arriving traffic.	inities. However,	the controller wo	ould be able to
Design principle 7, priority 3: Environmental – Should enable continuous descent from at	NOT MET		
least 7,000ft & facilitate continuous descent above that			
Continuous descent from 7,000ft is not possible because traffic is likely to be levelled off Continuous descent from 5,000ft is likely to be similar to today.	to deconflict fro	m other LTMA ro	utes.
Design principle 8, priority 4 : Environmental – Minimise the requirement to change future	NOT MET		
low altitude arrival flows within the next ten years			
While it is not possible to pre-determine future design for Luton airport and the wider LTM			
the use of "PBN transitions" — the name given to a route linking the upper region with fina that a design based entirely on tactical vectoring will not be consistent with future low alt			
Design principle 9, priority 4: Technical – There must be agreement between stakeholder	itade arrivar novi	5 WIGHIT GIC LTV	MET
ANSPs that the design concept being progressed suits all operations.			
MoD (other than USAFE Lakenheath), MoD (USAFE Lakenheath), Stansted Airport,			
Cambridge Airport, Cranfield Airport.			
Tactical vectoring is used today, therefore this option is expected to be acceptable to othe Design principle 10, priority 4: Environmental – Should provide an equitable distribution of	er ANSPs.	DADTIAL	
traffic where possible, through e.g. use of multiple routes, new route structures,		PARTIAL	
options/mechanisms for respite			
Whilst tactical vectoring should provide a distribution of traffic, this option does not provide		es or mechanisr	ns for respite.
As this option does not result in concentration of traffic, initial engagement shows it in a f	avourable light.	T	NACT
Design principle 11, priority 5 : Economic – Reduce fuel burn			MET
The track miles and descent profile are likely to be broadly improved, when compared to t	he situation toda	ay, at low levels,	therefore fuel
burn in this phase of flight is likely to be reduced. Design principle 12, priority 5: Economic – Minimise potential increases in fuel burn			MET
	h = = i+=+i= += = -		
The track miles and descent profile are likely to be broadly improved, when compared to t burn in this phase is unlikely to be increased.	ne situation toda	ay, at low levels,	
Design principle 13, priority 6 : Environmental – Should avoid overflying the same			MET
communities with multiple routes, & take into account routes of other airports, below 7,000ft Tactical vectoring from a hold to runway would negate the need to publish specific routes	s (which could re	equire traffic to a	ccurately overfly
the same communities). Routes of other airports would be considered by controllers on a			Sociately Overly
Design principle 14, priority 7: Operational – Should minimise tactical intervention by ATC	NOT MET	, , , , , , , , , , , , , , , , , , , ,	
below 7,000ft			
This option relies solely on tactical vectoring as the mechanism to route from a hold to the	e runways.	<u> </u>	MET
Design principle 15, priority 8: Technical – Minimise negative impact on other airspace users by keeping CAS requirements to a minimum, investigating potential release of existing CAS,			MET
keeping new airspace boundaries simple where possible, and FUA if possible			
The use of tactical vectoring should keep aircraft within existing CAS (in the lower region)	Release of CAS	will be consider	ed



2.5 PBN Route (RNAV1) south of Leighton Buzzard to Runway 08 (e	asterly) arrivals	ACCEPT
Description of option: Luton flow is separated from Stansted flow at upper levels, followed by a PBN Route (RNAV1 standard) south of		
Leighton Buzzard to Runway 08 (easterly) arrivals Design principle 1, priority 1: Safety is the highest priority		MET
Optimise the complexity of the TC Essex sector within the scope of this project		IVILI
This option reduces the complexity of the airspace by concentrating the flow of arrival tra		known and
predictable interaction with other flows which is expected to significantly reduce controlle		
Design principle 2, priority 2 : Environmental – Must meet the 3 aims of the NPSE, Air Navigation Guidance 2017, all appropriate Government aviation policies, & updates thereof	PARTIAL	
Using a PBN transition enables aircraft to accurately fly a profile avoiding Leighton Buzzar	rd to the south, therefore likely to	reduce the
population overflown. However, it removes the ability to provide respite for those properti		
use a degree of tactical vectoring to appropriately space and sequence arriving traffic.		
Design principle 3, priority 2: Technical – Minimise impacts on MoD USAFE Lakenheath	DP not applicable to Low	ver options
operations to a level acceptable to MoD Design principle 4, priority 3: Operational – Should not constrain the airport's capacity,	DADTIAL	
providing the environmental objectives/ requirements have been met	PARTIAL	
There is no evidence to suggest that a PBN transition would constrain Luton airport's capa		
would be required to enable the controller to appropriately space and sequence arriving tra		
a reduced radio workload which improves controller capacity. A single PBN transition work traffic management, by keeping complexity to a minimum.	uid be preferable from the persp	ective of air
Design principle 5, priority 3: Technical – Minimise dependency of LLA's arrivals on those of		MET
Stansted Airport.		
This option complements the re-positioning of Luton arrivals with the high-level options w		ent holding
facility. The PBN transitions are not expected to have any dependency on Stansted arrival	S.	NACT
Design principle 6, priority 3: Operational – Increase the predictability of LLA's arrivals		MET
This option complements the re-positioning of Luton arrivals with the high-level options w facility. The PBN transitions are expected to deliver predictability to the TC Luton Approac		
surrounding the airport.	in runction, the airport and the oc	minumes
Design principle 7, priority 3: Environmental – Should enable continuous descent from at	NOT MET	
least 7,000ft & facilitate continuous descent above that		
Owing to the constraints of the LTMA interactions on the Luton RMA, continuous descent		
PBN transitions are likely to increase compliance with continuous descent procedures fro Design principle 8, priority 4: Environmental – Minimise the requirement to change future	PARTIAL	
low altitude arrival flows within the next ten years	17,1117,12	
While it is not possible to pre-determine future design for Luton airport and the wider LTM	IA, the Airspace Modernisation S	trategy supports
the use of PBN transitions. Design principle 9, priority 4: Technical – There must be agreement between stakeholder		MET
ANSPs that the design concept being progressed suits all operations.		IVILI
MoD (other than USAFE Lakenheath), MoD (USAFE Lakenheath), Stansted Airport,		
Cambridge Airport, Cranfield Airport.		
There will be no new controlled airspace, therefore it is expected that there will be no impact Design principle 10, priority 4: Environmental – Should provide an equitable distribution of	act on stakeholder ANSPs. NOT MET	
traffic where possible, through e.g. use of multiple routes, new route structures,	NOTIMET	
options/mechanisms for respite		
As a standalone option this does not offer multiple routes to facilitate respite. If this option	n is progressed it could be comb	ined with other
PBN options later in the ACP, which may make traffic distribution more equitable.		VICT
Design principle 11, priority 5 : Economic – Reduce fuel burn		MET
A single PBN transition optimised for track miles would fully meet this principle, subject to	the caveat that controllers will i	require a level of
tactical vectoring to space and sequence arriving traffic. Design principle 12, priority 5: Economic – Minimise potential increases in fuel burn		MET
A single PBN transition optimised for track miles would enable increases in fuel burn to be	minimized by decign, subject to	
controllers will require a level of tactical vectoring to space and sequence arriving traffic.	a minimised by design, subject to	o the caveat that
Design principle 13, priority 6 : Environmental – Should avoid overflying the same	NOT MET	
communities with multiple routes, & take into account routes of other airports, below 7,000ft		
There is no proposed change to any other traffic flow other than the Luton arrivals. Where	the proposed PBN transition cro	osses these
routes below 7,000ft, communities will still be overflown by multiple routes. Design principle 14, priority 7: Operational – Should minimise tactical intervention by ATC		MET
below 7,000ft		WILL
The PBN transitions minimise the need for tactical intervention below 7,000ft. However, a		
separate Luton arrivals from other flows and for sequencing. The 180° wraparound turn of	onto final approach may also req	uire tactical
intervention dependent on the wind conditions. Design principle 15, priority 8: Technical – Minimise negative impact on other airspace users		MET
by keeping CAS requirements to a minimum, investigating potential release of existing CAS,		MET
keeping new airspace boundaries simple where possible, and FUA if possible		
This option would not require any new Controlled airspace because the transition design i	is wholly contained within existin	g CAS and is
compliant with the containment policy. Release of CAS will be considered.		



2.6 PBN Route (RNAV1) over Leighton Buzzard to Runway 08 (eas	terly) arrivals		REJECT
Description of option: Luton flow is separated from Stansted flow at upper levels, followed	d by a PBN Route	(RNAV1 standar	d) over Leighton
Buzzard to Runway 08 (easterly) arrivals Design principle 1, priority 1: Safety is the highest priority	1		MET
Optimise the complexity of the TC Essex sector within the scope of this project			WIE I
This option reduces the complexity of the airspace by concentrating the flow of arrival t predictable interaction with other flows which is expected to significantly reduce contro		8. This results in	known and
Design principle 2, priority 2: Environmental – Must meet the 3 aims of the NPSE, Air	NOT MET		
Navigation Guidance 2017, all appropriate Government aviation policies, & updates thereof			
While other options are considered viable, using a PBN transition that results in aircraft the total population overflown, and most would be newly overflown. This does not mee counter to the CAA condition from the May 2006 airspace change.			
Design principle 3, priority 2: Technical – Minimise impacts on MoD USAFE Lakenheath	DP not a	pplicable to Low	er options
operations to a level acceptable to MoD			
Design principle 4, priority 3 : Operational – Should not constrain the airport's capacity, providing the environmental objectives/ requirements have been met		PARTIAL	
There is no evidence to suggest that a PBN transition would constrain Luton airport's cae would be required to enable the controller to appropriately space and sequence arriving a reduced radio workload which improves controller capacity. A single PBN transition we traffic management, by keeping complexity to a minimum.	traffic. The use of	a PBN transition	should result in
Design principle 5, priority 3: Technical – Minimise dependency of LLA's arrivals on those of Stansted Airport.			MET
This option complements the re-positioning of Luton arrivals with the high-level options facility. The PBN transitions are not expected to have any dependency on Stansted arriv		of an independe	ent holding
Design principle 6, priority 3 : Operational – Increase predictability of LLA's arrivals			MET
This option complements the re-positioning of Luton arrivals with the high-level options facility. The PBN transitions are expected to deliver predictability to the TC Luton Approx surrounding the airport.			
Design principle 7, priority 3: Environmental – Should enable continuous descent from at	NOT MET		
least 7,000ft & facilitate continuous descent above that			
Owing to the constraints of the LTMA interactions on the Luton RMA, continuous desce PBN transitions are likely to increase compliance with continuous descent procedures f		not possible.	
Design principle 8, priority 4: Environmental – Minimise the requirement to change future		PARTIAL	
low altitude arrival flows within the next ten years While it is not possible to pre-determine future design for Luton airport and the wider LT	TAAA tha Airanaaa N	Madarniantian C	ratagy augusta
the use of PBN transitions.	ivia, trie airspace i	viouernisation Si	rategy supports
Design principle 9, priority 4: Technical – There must be agreement between stakeholder			MET
ANSPs that the design concept being progressed suits all operations. MoD (other than USAFE Lakenheath), MoD (USAFE Lakenheath), Stansted Airport,			
Cambridge Airport, Cranfield Airport. There will be no new controlled airspace, therefore it is expected that there will be no im	nact on stakeholde	er ANSPs	
Design principle 10, priority 4 : Environmental – Should provide an equitable distribution of traffic where possible, through e.g. use of multiple routes, new route structures,	NOT MET	I ANOI 3.	
options/mechanisms for respite			
As a standalone option this does not offer multiple routes to facilitate respite. If this opt PBN options later in the ACP, which may make traffic distribution more equitable.	ion is progressed i	t could be comb	
Design principle 11, priority 5: Economic – Reduce fuel burn			MET
A single PBN transition optimised for track miles would fully meet this principle, subject tactical vectoring to space and sequence arriving traffic.	to the caveat that	controllers will r	equire a level of
Design principle 12, priority 5 : Economic – Minimise potential increases in fuel burn			MET
A single PBN transition optimised for track miles would enable increases in fuel burn to controllers will require a level of tactical vectoring to space and sequence arriving traffic	-	esign, subject to	the caveat that
Design principle 13, priority 6 : Environmental – Should avoid overflying the same communities with multiple routes, & take into account routes of other airports, below 7,000ft	NOT MET		
There is no proposed change to any other traffic flow other than the Luton arrivals. Whe routes below 7,000ft, communities will still be overflown by multiple routes.		3N transition cro	sses these
Design principle 14, priority 7: Operational – Should minimise tactical intervention by ATC			MET
below 7,000ft The PBN transitions minimise the need for tactical intervention below 7,000ft. However,	, a degree of tactic	al vectoring will	oe required to
separate Luton arrivals from other flows and for sequencing.	,		MET
Design principle 15, priority 8: Technical – Minimise negative impact on other airspace users by keeping CAS requirements to a minimum, investigating potential release of existing CAS, leaving page in the property of the p	5		MET
keeping new airspace boundaries simple where possible, and FUA if possible This option would not require any new Controlled airspace because the transition design	n is wholly contain	ed within existin	g CAS and is
compliant with the containment policy. Release of CAS will be considered.	S Wilding Contain	Ca mani calouit	9 0, 10 4114 10



2.7 PBN Route (RNAV1) north of Leighton Buzzard to Runway 08 (e	asterly) arrivals	ACCEPT
Description of option: Luton flow is separated from Stansted flow at upper levels, followed Leighton Buzzard to Runway 08 (easterly) arrivals	d by a PBN Route (RNAV1 stand	ard) north of
Design principle 1, priority 1: Safety is the highest priority		MET
Optimise the complexity of the TC Essex sector within the scope of this project	offic to Dunavey 00. This recoults i	n lan avvan avad
This option reduces the complexity of the airspace by concentrating the flow of arrival trapredictable interaction with other flows which is expected to significantly reduce controlled	er workload.	n known and
Design principle 2, priority 2: Environmental – Must meet the 3 aims of the NPSE, Air Navigation Guidance 2017, all appropriate Government aviation policies, & updates thereof	PARTIAL	
Using a PBN transition enables aircraft to accurately fly a profile avoiding Leighton Buzza		
population overflown. However, it removes the ability to provide respite for those propertiuse a degree of tactical vectoring to appropriately space and sequence arriving traffic.	es that are overflown. Controller	s may need to
Design principle 3, priority 2: Technical – Minimise impacts on MoD USAFE Lakenheath	DP not applicable to Lov	ver options
operations to a level acceptable to MoD		,
Design principle 4, priority 3: Operational – Should not constrain the airport's capacity, providing the environmental objectives/ requirements have been met	PARTIAL	
There is no evidence to suggest that a PBN transition would constrain Luton airport's cap		
would be required to enable the controller to appropriately space and sequence arriving tr a reduced radio workload which improves controller capacity. A single PBN transition wo		
traffic management, by keeping complexity to a minimum.	raid be preferable from the persp	ective of all
Design principle 5, priority 3: Technical – Minimise dependency of LLA's arrivals on those of Stansted Airport.		MET
This option complements the re-positioning of Luton arrivals with the high-level options w	vith the provision of an independ	ent holding
facility. The PBN transitions are not expected to have any dependency on Stansted arriva	ls.	Lucz
Design principle 6, priority 3: Operational – Increase the predictability of LLA's arrivals		MET
This option complements the re-positioning of Luton arrivals with the high-level options w facility. The PBN transitions are expected to deliver predictability to the TC Luton Approach		
surrounding the airport.		
Design principle 7, priority 3: Environmental – Should enable continuous descent from at	NOT MET	
least 7,000ft & facilitate continuous descent above that Owing to the constraints of the LTMA interactions on the Luton RMA, continuous descent	t from 7 000ft is not possible	
PBN transitions are likely to increase compliance with continuous descent procedures fro	om 5,000ft.	
Design principle 8, priority 4 : Environmental – Minimise the requirement to change future	PARTIAL	
low altitude arrival flows within the next ten years While it is not possible to pre-determine future design for Luton airport and the wider LTN	MA. the Airspace Modernisation S	trategy supports
the use of PBN transitions.		3, 11
Design principle 9, priority 4 : Technical – There must be agreement between stakeholder ANSPs that the design concept being progressed suits all operations.	PARTIAL	
MoD (other than USAFE Lakenheath), MoD (USAFE Lakenheath), Stansted Airport,		
Cambridge Airport, Cranfield Airport.		
To meet the CAA containment policy, this option is likely to require a small fillet of CAS wl ANSPs. It is expected that this additional CAS will be kept to a minimum.	hich is expected to have an impa	ict to other
Design principle 10, priority 4: Environmental – Should provide an equitable distribution of	NOT MET	
traffic where possible, through e.g. use of multiple routes, new route structures, options/mechanisms for respite		
As a standalone option this does not offer multiple routes to facilitate respite. If this option	on is progressed it could be comb	pined with other
PBN options later in the ACP, which may make traffic distribution more equitable.	т т	Tuer
Design principle 11, priority 5: Economic – Reduce fuel burn		MET
A single PBN transition optimised for track miles would fully meet this principle, subject to tactical vectoring to space and sequence arriving traffic.	o the caveat that controllers will	require a level of
Design principle 12, priority 5: Economic – Minimise potential increases in fuel burn		MET
A single PBN transition optimised for track miles would enable increases in fuel burn to be	e minimised by design, subject t	o the caveat that
controllers will require a level of tactical vectoring to space and sequence arriving traffic. Design principle 13, priority 6: Environmental – Should avoid overflying the same	NOT MET	T
communities with multiple routes, & take into account routes of other airports, below 7,000ft	NOT MET	
There is no proposed change to any other traffic flow other than the Luton arrivals. Where	e the proposed PBN transition cr	osses these
routes below 7,000ft, communities will still be overflown by multiple routes. Design principle 14, priority 7: Operational – Should minimise tactical intervention by ATC		MET
below 7,000ft		
The PBN transitions minimise the need for tactical intervention below 7,000ft. However, a separate Luton arrivals from other flows and for sequencing.	a degree of tactical vectoring will	be required to
Design principle 15, priority 8: Technical – Minimise negative impact on other airspace users	PARTIAL	
by keeping CAS requirements to a minimum, investigating potential release of existing CAS,		
keeping new airspace boundaries simple where possible, and FUA if possible To meet the CAA containment policy, this option is likely to require a small fillet of CAS. It	t is expected that this additional	L CAS will be kept
Late a mainimum and Delegation of OAO will be a small demand	•	•



2.8 PBN Route (RNAV1 standard) – S-bend type – to runway 26 (we	esterly) arrivals	ACCEPT
Description of option: Luton flow is separated from Stansted flow at upper levels, followed	d by a PBN Route (RNAV1 s	tandard) to Runway
26 (westerly) arrivals via an S-bend to the west		NACT
Design principle 1, priority 1: Safety is the highest priority Optimise the complexity of the TC Essex sector within the scope of this project		MET
This option reduces the complexity of the airspace by concentrating the flow of arrival tra	iffic to Runway 26. This resu	ults in known and
predictable interaction with other flows which is expected to significantly reduce controlle	er workload.	
Design principle 2, priority 2: Environmental – Must meet the 3 aims of the NPSE, Air	PARTIAL	
Navigation Guidance 2017, all appropriate Government aviation policies, & updates thereof Using a PBN transition enables aircraft to accurately fly a profile, therefore likely to reduce	the population everflows	Llowover it removes
the ability to provide respite for those properties that are overflown. Controllers may need		
appropriately space and sequence arriving traffic.		
Design principle 3, priority 2: Technical – Minimise impacts on MoD USAFE Lakenheath	DP not applicable to	Lower options
operations to a level acceptable to MoD	DADTIAL	
Design principle 4, priority 3 : Operational – Should not constrain the airport's capacity, providing the environmental objectives/ requirements have been met	PARTIAL	
There is no evidence to suggest that a PBN transition would constrain Luton airport's cap	acity. However, a degree of	f tactical vectoring
would be required to enable the controller to appropriately space and sequence arriving tr		
a reduced radio workload which improves controller capacity. A single PBN transition wo	uld be preferable from the p	perspective of air
traffic management, by keeping complexity to a minimum. Design principle 5, priority 3: Technical – Minimise dependency of LLA's arrivals on those of		MET
Stansted Airport.		IVILI
This option complements the re-positioning of Luton arrivals with the high-level options w		pendent holding
facility. The S bend PBN transition is not expected to have any dependency on Stansted a	rrivals.	
Design principle 6, priority 3 : Operational — Increase the predictability of LLA's arrivals		MET
This option complements the re-positioning of Luton arrivals with the high-level options w		
facility. The PBN transitions are expected to deliver predictability to the TC Luton Approac surrounding the airport.	ch function, the airport and t	the communities
Design principle 7, priority 3: Environmental – Should enable continuous descent from at	NOT MET	
least 7,000ft & facilitate continuous descent above that		
Owing to the constraints of the LTMA interactions on the Luton RMA, continuous descent		e.
PBN transitions are likely to increase compliance with continuous descent procedures from		
Design principle 8, priority 4 : Environmental – Minimise the requirement to change future low altitude arrival flows within the next ten years	PARTIAL	
While it is not possible to pre-determine future design for Luton airport and the wider LTM	1A, the Airspace Modernisat	ion Strategy supports
the use of PBN transitions.		, , , , , , , , , , , , , , , , , , ,
Design principle 9, priority 4 : Technical – There must be agreement between stakeholder		MET
ANSPs that the design concept being progressed suits all operations. MoD (other than USAFE Lakenheath), MoD (USAFE Lakenheath), Stansted Airport,		
Cambridge Airport, Cranfield Airport.		
There will be no new controlled airspace, therefore it is expected that there will be no impa	act on stakeholder ANSPs.	
Design principle 10, priority 4 : Environmental – Should provide an equitable distribution of	NOT MET	
traffic where possible, through e.g. use of multiple routes, new route structures, options/mechanisms for respite		
As a standalone option this does not offer multiple routes to facilitate respite. If this optio	n is progressed it could be a	combined with other
PBN options later in the ACP, which may make traffic distribution more equitable.	p g	
Design principle 11, priority 5 : Economic – Reduce fuel burn		MET
A single PBN transition optimised for track miles would fully meet this principle, subject to	o the caveat that controllers	will require a level of
tactical vectoring to space and sequence arriving traffic.	<u> </u>	NACT
Design principle 12, priority 5: Economic – Minimise potential increases in fuel burn		MET
A single PBN transition optimised for track miles would enable increases in fuel burn to be controllers will require a level of tactical vectoring to space and sequence arriving traffic.	e minimised by design, subj	ect to the caveat that
Design principle 13, priority 6 : Environmental – Should avoid overflying the same	NOT MET	
communities with multiple routes, & take into account routes of other airports, below 7,000ft		
There is no proposed change to any other traffic flow other than the Luton arrivals. Where	e the proposed PBN transition	on crosses these
routes below 7,000ft, communities will still be overflown by multiple routes.		NACT
Design principle 14, priority 7 : Operational – Should minimise tactical intervention by ATC below 7,000ft		MET
The PBN transitions minimise the need for tactical intervention below 7,000ft. However, a	degree of tactical vectoring	g will be required to
separate Luton arrivals from other flows and for sequencing.		
Design principle 15, priority 8: Technical – Minimise negative impact on other airspace users		MET
by keeping CAS requirements to a minimum, investigating potential release of existing CAS,		
keeping new airspace boundaries simple where possible, and FUA if possible This option would not require any new Controlled airspace because the transition design	I L is wholly contained within e	xisting CAS and is
compliant with the containment policy. Release of CAS will be considered.	Johnamed Withill C	



2.9 PBN Route (RNAV1 standard) – direct type – to runway 26 (wes	sterly) arrivals	ACCEPT
Description of option: Luton flow is separated from Stansted flow at upper levels, followed	d by a PBN Route (RNAV1 stanc	lard) to Runway
26 (westerly) arrivals via a direct route to final approach	<u> </u>	NACT
Design principle 1, priority 1: Safety is the highest priority Optimise the complexity of the TC Essex sector within the scope of this project		MET
This option reduces the complexity of the airspace by concentrating the flow of arrival tra	I I I I I I I I I I I I I I I I I I I	in known and
predictable interaction with other flows which is expected to significantly reduce controlle		
Design principle 2, priority 2: Environmental – Must meet the 3 aims of the NPSE, Air	PARTIAL	
Navigation Guidance 2017, all appropriate Government aviation policies, & updates thereof		<u> </u>
Using a PBN transition enables aircraft to accurately fly a profile, therefore likely to reduce		
the ability to provide respite for those properties that are overflown. Controllers may need appropriately space and sequence arriving traffic.	i to use a degree or tactical vect	oring to
Design principle 3, priority 2: Technical – Minimise impacts on MoD USAFE Lakenheath	DP not applicable to Lo	wer options
operations to a level acceptable to MoD		
Design principle 4, priority 3: Operational – Should not constrain the airport's capacity,	PARTIAL	
providing the environmental objectives/ requirements have been met There is no evidence to suggest that a PBN transition would constrain Luton airport's cap	anity. However a degree of too	tical vactoring
would be required to enable the controller to appropriately space and sequence arriving tr		
a reduced radio workload which improves controller capacity. A single PBN transition wo		
traffic management, by keeping complexity to a minimum.		
Design principle 5, priority 3: Technical – Minimise dependency of LLA's arrivals on those of	PARTIAL	
Stansted Airport.	dale also considerate of a mission of	de cetado e delicer es
This option complements the re-positioning of Luton arrivals with the high-level options w facility. The direct PBN transition may create a dependency on Stansted arrivals.	vith the provision of an independ	dent nolding
Design principle 6, priority 3: Operational – Increase the predictability of LLA's arrivals		MET
This option complements the re-positioning of Luton arrivals with the high-level options w	with the provision of an independ	dent holding
facility. The PBN transitions are expected to deliver predictability to the TC Luton Approac		
surrounding the airport.	, , , , , , , , , , , , , , , , , , , ,	
Design principle 7, priority 3: Environmental – Should enable continuous descent from at	NOT MET	
least 7,000ft & facilitate continuous descent above that	6 7006	
Owing to the constraints of the LTMA interactions on the Luton RMA, continuous descent		
PBN transitions are likely to increase compliance with continuous descent procedures from Design principle 8, priority 4: Environmental – Minimise the requirement to change future	PARTIAL	
low altitude arrival flows within the next ten years	174111142	
While it is not possible to pre-determine future design for Luton airport and the wider LTM	MA, the Airspace Modernisation S	Strategy supports
the use of PBN transitions.	<u> </u>	
Design principle 9, priority 4 : Technical – There must be agreement between stakeholder ANSPs that the design concept being progressed suits all operations.		MET
MoD (other than USAFE Lakenheath), MoD (USAFE Lakenheath), Stansted Airport,		
Cambridge Airport, Cranfield Airport.		
There will be no new controlled airspace, therefore it is expected that there will be no impa	act on stakeholder ANSPs.	
Design principle 10, priority 4 : Environmental – Should provide an equitable distribution of	NOT MET	
traffic where possible, through e.g. use of multiple routes, new route structures,		
options/mechanisms for respite As a standalone option this does not offer multiple routes to facilitate respite. If this optio	n is progressed it could be com	L hined with other
PBN options later in the ACP, which may make traffic distribution more equitable.	Trio progressed it codia be com	bined with other
Design principle 11, priority 5: Economic – Reduce fuel burn		MET
A single PBN transition optimised for track miles would fully meet this principle, subject to	the caveat that controllers will	require a level of
tactical vectoring to space and sequence arriving traffic.		'
Design principle 12, priority 5: Economic – Minimise potential increases in fuel burn		MET
A single PBN transition optimised for track miles would enable increases in fuel burn to be	e minimised by design, subject	to the caveat that
controllers will require a level of tactical vectoring to space and sequence arriving traffic.		1
Design principle 13, priority 6 : Environmental – Should avoid overflying the same	NOT MET	
communities with multiple routes, & take into account routes of other airports, below 7,000ft There is no proposed change to any other traffic flow other than the Luton arrivals. Where	the proposed PPN transition of	rossos thoso
routes below 7,000ft, communities will still be overflown by multiple routes.	and proposed ribin transition ci	เบงจะจ แพระ
Design principle 14, priority 7 : Operational – Should minimise tactical intervention by ATC		MET
below 7,000ft		
The PBN transitions minimise the need for tactical intervention below 7,000ft. However, a	degree of tactical vectoring wil	I be required to
separate Luton arrivals from other flows and for sequencing. Design principle 15, priority 8: Technical – Minimise negative impact on other airspace users	T T	MET
besign principle 15, priority 8: Technical – Minimise negative impact on other airspace users by keeping CAS requirements to a minimum, investigating potential release of existing CAS,		MET
keeping new airspace boundaries simple where possible, and FUA if possible		
This option would not require any new Controlled airspace because the transition design	is wholly contained within existi	ng CAS and is
compliant with the containment policy. Release of CAS will be considered.		



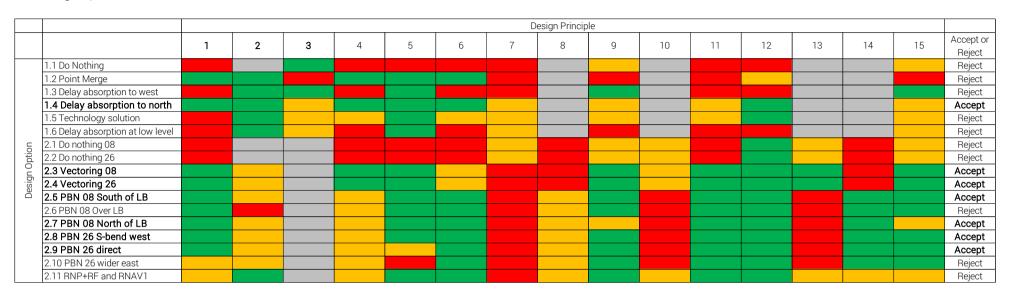
2.10 PBN Route (RNAV1 standard) – wider type – to runway 26 (wes	terly) arrivals		REJECT
Description of option: Luton flow is separated from Stansted flow at upper levels, followed 26 (westerly) arrivals via a wider S-bend to the east	d by a PBN Route (R	NAV1 standa	rd) to Runway
Design principle 1, priority 1: Safety is the highest priority Optimise the complexity of the TC Essex sector within the scope of this project	PA	ARTIAL	
This option interacts with the Stansted RMA and therefore introduces complexity at low leads to the complexity at leads to the complexity a	evels.		
Design principle 2, priority 2: Environmental – Must meet the 3 aims of the NPSE, Air		ARTIAL	
Navigation Guidance 2017, all appropriate Government aviation policies, & updates thereof			
Using a PBN transition enables aircraft to accurately fly a profile, therefore likely to reduce the ability to provide respite for those properties that are overflown. Controllers may need appropriately space and sequence arriving traffic.			
Design principle 3, priority 2: Technical – Minimise impacts on MoD USAFE Lakenheath operations to a level acceptable to MoD		icable to Low	er options
Design principle 4, priority 3: Operational – Should not constrain the airport's capacity, providing the environmental objectives/ requirements have been met		ARTIAL	
There is no evidence to suggest that a PBN transition would constrain Luton airport's cap would be required to enable the controller to appropriately space and sequence arriving transition workload which improves controller capacity. A single PBN transition wo traffic management, by keeping complexity to a minimum.	affic. The use of a P uld be preferable fro	BN transition	should result in
Design principle 5, priority 3: Technical – Minimise dependency of LLA's arrivals on those of Stansted Airport.	NOT MET		
This option interacts with the Stansted RMA and therefore introduces a dependency on S	tansted traffic.		NACT
Design principle 6, priority 3: Operational – Increase the predictability of LLA's arrivals			MET
This option complements the re-positioning of Luton arrivals with the high-level options w facility. The PBN transitions are expected to deliver predictability to the TC Luton Approach surrounding the airport.	ch function, the airpo		
Design principle 7, priority 3: Environmental – Should enable continuous descent from at least 7,000ft & facilitate continuous descent above that	NOT MET		
Owing to the constraints of the LTMA interactions on the Luton RMA, continuous descen		possible.	
PBN transitions are likely to increase compliance with continuous descent procedures from Design principle 8, priority 4: Environmental – Minimise the requirement to change future		ARTIAL	
low altitude arrival flows within the next ten years	1 7	SITTIAL	
While it is not possible to pre-determine future design for Luton airport and the wider LTM the use of PBN transitions.	1A, the Airspace Mod	dernisation St	rategy supports
Design principle 9, priority 4: Technical – There must be agreement between stakeholder			MET
ANSPs that the design concept being progressed suits all operations.			
MoD (other than USAFE Lakenheath), MoD (USAFE Lakenheath), Stansted Airport, Cambridge Airport, Cranfield Airport.			
There will be no new controlled airspace, therefore it is expected that there will be no important the controlled airspace.	act on stakeholder A	NSPs.	
Design principle 10, priority 4 : Environmental – Should provide an equitable distribution of	NOT MET		
traffic where possible, through e.g. use of multiple routes, new route structures, options/mechanisms for respite			
As a standalone option this does not offer multiple routes to facilitate respite. If this option	n is progressed it co	uld be combi	ned with other
PBN options later in the ACP, which may make traffic distribution more equitable.	progresses is a		
Design principle 11, priority 5: Economic – Reduce fuel burn			MET
A single PBN transition optimised for track miles would fully meet this principle, subject to tactical vectoring to space and sequence arriving traffic.	o the caveat that co	ntrollers will r	equire a level of
Design principle 12, priority 5 : Economic – Minimise potential increases in fuel burn			MET
A single PBN transition optimised for track miles would enable increases in fuel burn to be controllers will require a level of tactical vectoring to space and sequence arriving traffic.	e minimised by desi	gn, subject to	the caveat that
Design principle 13, priority 6 : Environmental – Should avoid overflying the same	NOT MET		
communities with multiple routes, & take into account routes of other airports, below 7,000ft There is no proposed change to any other traffic flow other than the Luton arrivals. Where	e the proposed PBN	 transition cro	sses these
routes below 7,000ft, communities will still be overflown by multiple routes. Design principle 14, priority 7: Operational – Should minimise tactical intervention by ATC			MET
below 7,000ft			
The PBN transitions minimise the need for tactical intervention below 7,000ft. However, a separate Luton arrivals from other flows and for sequencing.	aegree of tactical v	ectoring will b	be required to
Design principle 15, priority 8: Technical – Minimise negative impact on other airspace users			MET
by keeping CAS requirements to a minimum, investigating potential release of existing CAS,			
keeping new airspace boundaries simple where possible, and FUA if possible This option would not require any new Controlled airspace because the transition design	is wholly contained y	within evicting	n CAS and is
compliant with the containment policy. Release of CAS will be considered	is writing contained	within Exignin	y unu anu 15



2.11 Supplementing RNP+RF designs with RNAV1 designs		REJECT
Description of option: Luton flow is separated from Stansted flow at upper levels. RNP+RF routes are designed but only available to of traffic, so they are supplemented with RNAV1 route designs for those aircraft unable to meet the RNP+RF standard.		
Design principle 1, priority 1: Safety is the highest priority Optimise the complexity of the TC Essex sector within the scope of this project	PARTIAL	
If a combination of RNAV and RNP+RF PBN routes were used to the same runway, there controller to determine the PBN equipage of each aircraft prior to the controller issuing the		
Design principle 2, priority 2: Environmental – Must meet the 3 aims of the NPSE, Air Navigation Guidance 2017, all appropriate Government aviation policies, & updates thereof		MET
The mix of RNP+RF and RNAV1 routes would likely lead to some natural dispersal (deper would be based on aircraft equipage instead of being based on airspace design or ATC.		
mixed PBN specifications. A degree of tactical vectoring to appropriately space and sequ		
Design principle 3, priority 2: Technical – Minimise impacts on MoD USAFE Lakenheath operations to a level acceptable to MoD	DP not applicable to Low	ver options
Design principle 4, priority 3: Operational – Should not constrain the airport's capacity, providing the environmental objectives/ requirements have been met	PARTIAL	
The mix of RNP+RF and RNAV1 routes would introduce routes with different track length	s, making it difficult to sequence	aircraft. This is
likely to constrain runway capacity. Design principle 5, priority 3: Technical – Minimise dependency of LLA's arrivals on those of	Γ	MET
Stansted Airport.		
These PBN routes do not result in a dependency on Stansted traffic. Traffic will have been Design principle 6, priority 3: Operational – Increase the predictability of LLA's arrivals	n split by the upper level options.	MET
This option complements the re-positioning of Luton arrivals with the high-level options w facility. The PBN transitions are expected to deliver predictability to the TC Luton Approach surrounding the airport.		
Design principle 7, priority 3: Environmental – Should enable continuous descent from at least 7,000ft & facilitate continuous descent above that	NOT MET	
Owing to the constraints of the LTMA interactions on the Luton RMA, continuous descent	t from 7,000ft is not possible.	1
Design principle 8, priority 4 : Environmental – Minimise the requirement to change future low altitude arrival flows within the next ten years	PARTIAL	
While it is not possible to pre-determine future design for Luton airport and the wider LTN	1A, the Airspace Modernisation S	trategy supports
the use of PBN transitions. Design principle 9, priority 4: Technical – There must be agreement between stakeholder	Γ	MET
ANSPs that the design concept being progressed suits all operations.		IVIET
MoD (other than USAFE Lakenheath), MoD (USAFE Lakenheath), Stansted Airport,		
Cambridge Airport, Cranfield Airport.		
We expect there would be no impact on stakeholder ANSPs.		
Design principle 10, priority 4 : Environmental – Should provide an equitable distribution of traffic where possible, through e.g. use of multiple routes, new route structures, options/mechanisms for respite	PARTIAL	
The mix of RNP+RF and RNAV1 routes would likely lead to some natural dispersal (deper	I ding on the equipage of each air	craft) Dispersal
would be based on aircraft equipage instead of being based on airspace design or ATC. I degree of tactical vectoring to appropriately space and sequence arriving traffic would be	t is unlikely to provide equitable of	
Design principle 11, priority 5 : Economic – Reduce fuel burn		MET
These routes are designed to be optimised for fuel efficiency.		
Design principle 12, priority 5 : Economic – Minimise potential increases in fuel burn		MET
These routes are designed to be optimised for fuel efficiency.		
Design principle 13, priority 6 : Environmental – Should avoid overflying the same	PARTIAL	
communities with multiple routes, & take into account routes of other airports, below 7,000ft		
There is no proposed change to any other traffic flow other than the Luton arrivals. Where	the proposed PBN transitions o	ross these
routes below 7,000ft, communities will still be overflown by multiple routes.	DADTIAL	
Design principle 14, priority 7 : Operational – Should minimise tactical intervention by ATC below 7,000ft	PARTIAL	
The PBN transitions minimise the need for tactical intervention below 7,000ft. The mixed intervention to sequence traffic on routes of different length. A degree of tactical vectoring the order of the contraction of the co		
other flows and for sequencing. Design principle 15, priority 8: Technical – Minimise negative impact on other airspace users	PARTIAL	
by keeping CAS requirements to a minimum, investigating potential release of existing CAS, keeping new airspace boundaries simple where possible, and FUA if possible	TAILUAE	
This option may require new Controlled airspace because some of the transition designs		existing CAS and
the design would need to comply with the containment policy. Release of CAS will be contained to comply with the containment policy.	onsidered.	

3. Conclusion and Shortlist

The design options have been evaluated, and are summarised below.



We conclude that upper design option 1.4 and lower design options 2.3, 2.4, 2.5, 2.7, 2.8 and 2.9 best meet the design principles and their relative priorities.

4. Next Steps

These options will be formally appraised under Stage 2 Step 2B Options Appraisal (Phase 1 Initial), including Safety Assessment.

Only one upper option progressed through this evaluation and all of the progressed lower options are compatible with this upper option. Therefore the Options Appraisal only needs to refer to options 2.3, 2.4, 2.5, 2.7, 2.8 and 2.9 because upper option 1.4 will be common to all.



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