AIRSPACE MODERNISATION AIRSPACE CHANGE PROPOSAL

ANNEX 3

DESIGN PRINCIPLE EVALUATION VECTORED ARRIVALS

Version 1.0

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How to view this document

Due to the amount of information contained within the DPE spreadsheets, it will be necessary to zoom into the sheets to read the content of each option.

The zoom function on PDF's is normally along the top bar of a computer screen, or at the bottom of a document page.
For example,

Or

You can change the level of zoom using the drop-down arrow or by clicking the + symbol. Heathrow recommend you read this document at 400%.

All airspace design options in this document are subject to change throughout the airspace change process, as options are matured in detail and refined in accordance with safety requirements, design principles, appraisals and stakeholder engagement and consultation.
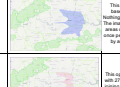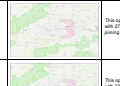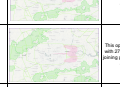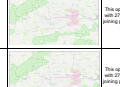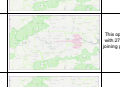
Vectored Arrivals - DPE Methodology

Must/Should	No	Design Principle	Detailed Criteria	Approach to Evaluation		Met	Partially Met	Not Met
Our new airspace design **must**	1	Be safe	N/A	A qualitative assessment undertaken by SME as to whether the option is expected to maintain or improve safety, whether further safety assurances will be required or whether there are issues identified which could be detrimental to safety.		Maintains existing level of safety, or improves on it	Expected to maintain existing level of safety, or improves on it but further safety assurances required	Issues identified which could be detrimental to safety and are not expected to be mitigated
	2	Remain in accordance with the CAA's published Airspace Modernisation Strategy and any current or future plans associated with it and all other relevant UK policy, legislation and regulatory standards (for example, Air Navigation Guidance). This includes preventing any worsening of local air quality due to emissions from Heathrow's aircraft movements, to remain within local authorities' limits	Safety	The outcome of DP1 will be used to evaluate this AMS objective		Evaluated in DP1	Evaluated in DP1	Evaluated in DP1
			Integration of diverse users	The outcome of DP11 will be used to evaluate this AMS objective		Evaluated in DP11	Evaluated in DP11	Evaluated in DP11
			Simplification, reducing complexity and improving efficiency	The outcome of DP5 will be used to evaluate this AMS objective		Evaluated in DP5	Evaluated in DP5	Evaluated in DP5
			Environmental sustainability	The outcomes of DP2, DP3 and DP4 will be used to evaluate this AMS objective.		Evaluated in DP2, DP3 and DP4 and met all 3 design principles	Evaluated in DP2, DP3 and DP4 and a mixture of Met, Partly Met and Not Met the 3 design principles	Evaluated in DP2, DP3 and DP4 and did not meet all 3 design principles
			Overall AMS Evaluation			All 4 AMS known outcomes Met	All 4 evaluations Partly Met or a mixture of Met, Partly Met and Not Met	All 4 AMS known outcomes not met
			Minimise and where possible reduce the total adverse effects on health and quality of life from aircraft noise and Altitude-based priorities (See below for consideration of AONBs and National Parks, as part of Tranquility)	ANG states that the LOAEL is regarded as the point at which adverse effects begin to be seen on a community basis. The 70dB SEL can be considered an indicator of potential effects on the LOAEL and is a more suitable indicator of noise impacts than an overflight cone. For arrivals, the end of an A320 70dB SEL footprint is analogous to c.5000ft. A quantitative assessment of whether the option is expected to affect fewer, the same or more within a 70dB SEL footprint compared to the average 2019 Stage 2 Arrival average baseline. Therefore this quantitative evaluation considers the population number within the combined 70dB SEL footprints of the modelled vectored tracks of each option.		Within the lowest 25th percentile of the data	Within the middle 50th percentile of the data	Within the highest 25th percentile of the data
				A quantitative assessment which considers the number of people overflown (at least once a day on average) between 0-4000ft.		Within the lowest 25th percentile of the data	Within the middle 50th percentile of the data	Within the highest 25th percentile of the data
				A quantitative assessment which considers the number of people overflown (at least once a day on average) between 4-7000ft.		Within the lowest 25th percentile of the data	Within the middle 50th percentile of the data	Within the highest 25th percentile of the data
				Unlike with our PBN arrival options where we have been able to make some assumptions on track miles owing to the low traffic volumes in the LTMA 0430-0600, we cannot do this for the rest of the day. At this time we do not know where Heathrow's holding stacks will be or the profiles above 7000ft taken to get into any of the potential vectoring areas. For example, a longer final approach could be beneficial or detrimental to CO2 emissions depending on the location of the new holding stacks. Therefore it is not possible to make a track mileage assessment at this time.		Not possible to assess at this time	Not possible to assess at this time	Not possible to assess at this time
			Tranquillity	A quantitative assessment which considers the area (Km2) of AONBs and National Parks overflown for each option		Within the lowest 25th percentile of the data	Within the middle 50th percentile of the data	Within the highest 25th percentile of the data
				A quantitative assessment which considers the area (Km2) of Historic Parks and Gardens and Public Parks overflown.		Within the lowest 25th percentile of the data	Within the middle 50th percentile of the data	Within the highest 25th percentile of the data
				A qualitative SME assessment of whether the option would overfly Richmond Park at least 20 times a day, on average below 7000ft. This separate assessment has been performed due to stakeholder feedback. Note that Richmond Park is also included within the Parks and Gardens, SSSI and SAC assessments.		Option is not expected to overfly Richmond Park 20 times per day on average	N/A	Option is expected to overfly Richmond Park 20 times per day on average.
			Ecology and/or biodiversity	The effects of airspace change on ecology or biodiversity are expected to be minimal. CAA guidance states that "In general, airspace change proposals are unlikely to have an impact upon biodiversity because they do not involve ground-based infrastructure. As such they are unlikely to have a direct impact that would engage the Birds or Habitats legislation." Though there is limited research available on the effects of aircraft noise on wildlife, there is some evidence that disturbance effects associated with aircraft can occur during take-off and landing where aircraft are below around 500m (~1,640ft) . Consideration will therefore be given to the effects on ecology and biodiversity where options overfly Special Protection Areas, Special Areas of Conservation, and Sites of Special Scientific Interest, particularly at altitudes below 2000ft. For the purposes of our assessment ecology is equivalent to biodiversity as described in CAP1616. This is a quantitative assessment which considers the area (km2) of SPA, SACs and/or SSSIs overflown below 3000ft in each option.		Within the lowest 25th percentile of the data	Within the middle 50th percentile of the data	Within the highest 25th percentile of the data
			Prevent any worsening of local air quality due to emissions from Heathrow's aircraft movements, to remain within local authorities' limits	A qualitative statement on whether the options could be expected to affect local air quality. ANG2017 states that due to the effects of mixing and dispersion, emissions from aircraft above 1000ft are unlikely to have a significant impact on local air quality. Therefore the impact of airspace design on local air quality is generally negligible compared to changes in the volume of air traffic and that of the local transport infrastructures feeding the airport. If an option has a change to flightpaths below 1000ft it will be evaluated as 'Partially Met' however further analysis will be required to determine the scale of change to local air quality. If an option has no change to flightpaths below 1000ft it will be evaluated as 'Met'.		Option is unlikely to affect local air quality	Option has potential to affect local air quality below 1000ft	N/A - Not possible to ascertain without detailed modelling
			Overall DP 2 Evaluation			All 8 evaluations Met	All 8 evaluations Partly Met or a Mixture of Met and Not Met	All 8 evaluations not met
	3	Use noise efficient operational practices to limit and, where possible, reduce adverse impacts from aircraft noise	Continuous Decent operations (CCO)	CDO from 7000ft has been assumed for all design options. However, if there is anything about the route positioning that the SMEs feel could inhibit CDO, this will be described here.		Option has the potential to achieve CCO	Option has the potential to largely achieve CCO although small-trade offs may be required	Option is not expected to achieve CCO and/or will require significant trade-offs to be achieved
			Low Power Low Drag, Landing Gear Deployment, Steeper Approaches	All these noise efficient operational practices are expected to be able to be applied to all options and this will be considered in more detail in Stage 3. However, if there is anything about the construct of the options that the SMEs feel could inhibit any of these practices, this will be described here.		Nothing identified by SMEs to suggest noise efficient operational practices cannot be applied to the option	N/A	An aspect identified by SMEs to suggest noise efficient operational practices may not be able to be applied to the option
			Overall DP 3 Evaluation			Both evaluations Met	Mixture of Met, Partly Met and Not Met.	Both evaluations Not Met
	4	Reduce the contribution to climate change from CO2 emissions and other greenhouse gas emissions arising from Heathrow's aircraft activities		Unlike with our PBN arrival options where we have been able to make some assumptions on track miles owing to the low traffic volumes in the LTMA 0430-0600, we cannot do this for the rest of the day. At this time we do not know where Heathrow's holding stacks will be or the profiles above 7000ft taken to get into any of the potential vectoring areas. For example, a longer final approach could be beneficial or detrimental to CO2 emissions depending on the location of the new holding stacks. Therefore it is not possible to make a track mileage assessment at this time.		Not possible to assess at this time	Not possible to assess at this time	Not possible to assess at this time
	5	Enable Heathrow to make the most operationally efficient and resilient use of its existing two runways, to maximise benefits to the airport, airlines and cargo handlers, passengers and local communities		A qualitative SME assessment of whether the option has characteristics that are expected to degrade, maintain or enhance Heathrow's operational performance in terms of providing sufficient capacity and resilience to handle demand.		Option considered to enhance operational performance and/or resilience, subject to further work	Option considered to maintain operational performance and/or resilience, subject to further work	Option considered to degrade operational performance and/or resilience
And should also	6	Provide predictable and meaningful respite to those affected by noise from Heathrow's movements		We have identified 3 potential concepts for delivering respite or relief from noise. This can't be assessed until system options are developed and so our options can't be evaluated against this at this time.		Not possible to assess at this time	Not possible to assess at this time	Not possible to assess at this time
	7	Seek to avoid overflying the same communities with multiple routes including those to/from other airports		Qualitative SME assessment of whether the option would overfly the same communities below 7000ft by both airports. This assessment considers the interactions with the FASI airspace design options of adjacent airports compared to each of Heathrow's options. Where those sponsors are in Stage 3, the assessment is against their shortlisted options. Where the sponsor is still in Stage 2, the assessment considers their CLoO. Where those options are not available as the Masterplan Iteration 2. This assessment does not consider interactions with Heathrow's other route options (e.g. Arrivals or departures from the other runway) as system options have not yet been created. In terms of the DP overall, if all airports evaluations are green then the DP overall is green. If they are all red, the DP overall is red. If they are a mixture of red and green the DP overall is party met.	RAF Northolt	No overflight of same communities below 7000ft by both airports identified	N/A	Overflight of same communities below 7000ft by both airports has been identified
					Luton	No overflight of same communities below 7000ft by both airports identified	N/A	Overflight of same communities below 7000ft by both airports has been identified
					Stansted	No overflight of same communities below 7000ft by both airports identified	N/A	Overflight of same communities below 7000ft by both airports has been identified
					London City	No overflight of same communities below 7000ft by both airports identified	N/A	Overflight of same communities below 7000ft by both airports has been identified
					Biggin Hill	No overflight of same communities below 7000ft by both airports identified	N/A	Overflight of same communities below 7000ft by both airports has been identified
					Gatwick	No overflight of same communities below 7000ft by both airports identified	N/A	Overflight of same communities below 7000ft by both airports has been identified
					Farnborough	No overflight of same communities below 7000ft by both airports identified	N/A	Overflight of same communities below 7000ft by both airports has been identified
					Southampton	No overflight of same communities below 7000ft by both airports identified	N/A	Overflight of same communities below 7000ft by both airports has been identified
			Overall DP 7 Evaluation			All 8 evaluations Met	Mixture of Met and Not Met.	All 8 evaluations not met
	8	Contribute to minimising the negative impacts of night flights		We have identified 3 potential concepts to be further considered to deliver this design principle. This will be further explored in Stage 3 once system options are developed.		Not possible to assess at this time	Not possible to assess at this time	Not possible to assess at this time
	9	Keep the number of people who experience an increase in noise from the future airspace design to a minimum	We consider that owing to the concentration effects of a smaller vectoring area, those people living under that area will experience an increase in noise owing to the increased frequency of overflight whether they are currently overflown already or not. For this evaluation at this stage, we are therefore assuming that the vectoring areas that affect the fewest people will keep the number of people who experience an increase in noise from the future airspace design to a minimum. This is a quantitative assessment which considers: - The population number within the combined 70dB SEL footprints of each option. - The total number of people overflown 0-7000ft (at least once a day and at least 20 times per day on average) by each option. Note for this DPE, for the vectored arrivals we have assumed everyone within the reduced vectoring size of swathe would be overflown at least 20 times per day owing to the increased concentration of overflight. We also state the number of people who may be potentially newly overflown (at a rate of 20 times per day or more on average) for the option compared to the 2019 average arrival baseline.	Population number within the 70dB SEL	Within the lowest 25th percentile of the data	Within the middle 50th percentile of the data	Within the highest 25th percentile of the data
					Population overflown 0-7000ft (at least once a day on average)	Within the lowest 25th percentile of the data	Within the middle 50th percentile of the data	Within the highest 25th percentile of the data
					Population overflown 0-7000ft (at least 20 times per day on average)	Within the lowest 25th percentile of the data	Within the middle 50th percentile of the data	Within the highest 25th percentile of the data
					The number of people who are potentially newly overflown at least 20 times per day on average.	Within the lowest 25th percentile of the data	Within the middle 50th percentile of the data	Within the highest 25th percentile of the data
			Overall DP 9 Evaluation			All 4 evaluations Met	All 4 evaluations Partly Met or a Mixture of Met and Not Met.	All 4 evaluations not met
	10	Keep the total number of people who experience noise from the future airspace design to a minimum	A quantitative assessment considering the number of people within a 70dB SEL for each option.	Population number within the 70dB SEL		Within the lowest 25th percentile of the data	Within the middle 50th percentile of the data	Within the highest 25th percentile of the data
				Population overflown 0-7000ft		Within the lowest 25th percentile of the data	Within the middle 50th percentile of the data	Within the highest 25th percentile of the data
			Overall DP 10 Evaluation			Both evaluations Met	Both evaluations Partly Met or a Mixture of Met and Not Met.	Both evaluations Not Met
	11	Enable the efficiency of other airspace users' operations	General Aviation	A qualitative assessment by SME on whether GA will be impacted by the option, assessing whether changes to existing CAS may be required		Option is not expected to require any additional CAS	Option may require additional CAS, further work is required	Option requires additional CAS
			Adjacent Airports	A qualitative assessment by SME of whether Heathrow's option could restrict CCO/CDO to/from 7000ft of adjacent airport's operations. For the 'do nothing' scenario we know where the location of the stacks are and the typical profiles flown from the stacks to Heathrow's runways. For the future scenarios, we do not yet know stack locations, heights, or the aircraft's profile from those stacks into the vectoring areas. The aspiration of NERL and Heathrow is for higher holding facilities and so we assume continuous descent from at least FL100 into the vectoring areas for each of our options from the stacks, wherever they may be. This should enable improved CCO/CDO for some airports that are currently restricted by Heathrow's stacks. This is reflected in the qualitative assessments.	RAF Northolt	Option does not restrict CCO/CDO to/from 7000ft of airport's FASI options.	N/A	Option may restrict CCO/CDO to/from 7000ft of airport's FASI options.
					Luton	Option does not restrict CCO/CDO to/from 7000ft of airport's FASI options.	N/A	Option may restrict CCO/CDO to/from 7000ft of airport's FASI options.
					Stansted	Option does not restrict CCO/CDO to/from 7000ft of airport's FASI options.	N/A	Option may restrict CCO/CDO to/from 7000ft of airport's FASI options.
					London City	Option does not restrict CCO/CDO to/from 7000ft of airport's FASI options.	N/A	Option may restrict CCO/CDO to/from 7000ft of airport's FASI options.
					Biggin Hill	Option does not restrict CCO/CDO to/from 7000ft of airport's FASI options.	N/A	Option may restrict CCO/CDO to/from 7000ft of airport's FASI options.
					Gatwick	Option does not restrict CCO/CDO to/from 7000ft of airport's FASI options.	N/A	Option may restrict CCO/CDO to/from 7000ft of airport's FASI options.
					Farnborough	Option does not restrict CCO/CDO to/from 7000ft of airport's FASI options.	N/A	Option may restrict CCO/CDO to/from 7000ft of airport's FASI options.
					Southampton	Option does not restrict CCO/CDO to/from 7000ft of airport's FASI options.	N/A	Option may restrict CCO/CDO to/from 7000ft of airport's FASI options.
			Military	A qualitative SME assessment of whether the option is expected to affect or impede defence and security objectives. MoD feedback received in Stage 2 has been used to inform this assessment.		Option not expected to affect defence and security objectives	N/A	Option expected to impede defence and security objectives
			Helicopters	A qualitative assessment by SME on whether existing helicopter routes within the London CTR could be impacted by the option		Option is not expected to impact existing Heli routes	Option may impact existing Heli routes, further work is required	Option will impact Heli routes, further work is required
			Overall DP 11 Evaluation			All 11 evaluations Met	A mixture of Fully and Not met	All 11 evaluations not met
	12	Minimise the impact to all stakeholders from future changes to Heathrow's airspace	A qualitative assessment of known, conceptual or paused future changes to Heathrow's airspace.	Easterly Alternation (known)		Option may be compatible with the future change	Unclear if option compatible with the future change	Option is not compatible with the future change
				AAM (conceptual)		Option may be compatible with the future change	Unclear if option compatible with the future change	Option is not compatible with the future change
				3rd Runway (paused)		Option may be compatible with the future change	Unclear if option compatible with the future change	Option is not compatible with the future change
			Overall DP 12 Evaluation			All 3 evaluations Met	All 3 evaluations Partly Met or a mixture of Fully, Partly and not met	All 3 evaluations not met

Runway 27L - Vectored Arrivals

Runway 27R - Vectored Arrivals

Runway 09L - Vectored Arrivals

Runway 09R - Vectored Arrivals