Classification: Public





AIRSPACE MODERNISATION AIRSPACE CHANGE PROPOSAL

STEP 2B INITIAL OPTIONS APPRAISAL

APPENDIX B

PBN ARRIVALS Runway 09R - Part 12





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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.

PBN Arrivals – RWY 09R Option Q

Option Description

This option was developed to address a blend of DPs 2, 4, 9 & 10. This option assumes a single PBN arrival track used for all RWY09R arrivals capable of RNP-AR during the 0430-0600 period from ALESO.



Communities – Noise impact on health & quality of life

Metric	Option Value	Difference to Baseline
Population above Partial LOAEL (daytime, LA _{eq} , 16h)	N/A	N/A
Population above Partial LOAEL (night-time, LA _{eq} , 8h)	8,200	+2,400
Population experiencing at least one event of N65 (daytime)	N/A	N/A
Population experiencing at least one event of N60 (night-time)	85,100	+85,100

Communities - Air Quality

As there is no change to track distribution below 1000ft, there is no effect on Air Quality from this option.

Metric	Difference to Baseline
Track Miles of the routes used (nm)	-13

Wider Society – Tranquillity & Biodiversity						
Metric	Option Value	Difference to Baseline				
Total Area of AONBs/National Parks (NPs) overflown betwee 7000ft once a day on average (night-time)	n 0-	8km²	+8km ²			
Total Area of AONBs/NPs overflown experiencing at least one of N60 on average (night-time)	event	0km ²	No change			
Total Area of Richmond Park overflown between 0-7000ft at l once a day on average (night-time)	0km ²	No change				
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown betwee 1640ft which observe a potential change in location overflow	4	+4				
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown betwee 3000ft which observe a potential change in location overflow	8	+8				
Wider Society – Capacity/Resilience	General Aviation – Access					
Arrival throughput not of concern 0430-0600. A single	No	No additional CAS required.				
or multiple PBN route could handle the low number of arrivals in this period if required.		Option would not facilitate the release of CAS.				
There is no distinguishing difference between any option regards arrival throughput. Any aircraft not RNP-AR equipped would have another PBN route to rely on.		ion not expecte copter routes.	d to impact existing			
Heathrow's capacity for this ACP is limited by the existing 480,000 movement cap.						
3						



General Aviation / Commercial Airlines –
Economic impact from increased effective
capacity

No economic effect expected on GA operations.

Arrival delay is not an issue during the 0430-0600 period. Use of PBN arrivals during this time would be for noise mitigation purposes only. PBN arrivals in this time will not affect delay performance. There is no distinguishing difference between any option regards arrival delay.

Commercial Airlines – Training costs

This option would require RNP-AR capability and approvals. This can come with significant costs for airlines, however, it is unknown at this time whether RNP-AR route options would be progressed in isolation i.e. without other arrival procedures being available. Should an RNP-AR arrival be mandatory, there may be additional costs for some operators. This will be quantified in Stage 3.

Airport/Air Navigation Service Provider (ANSP) – Infrastructure costs

Option may require re-location and/or addition of Noise Monitoring Terminals.

Airport/ANSP – Deployment costs

There will be considerable costs associated with deployment in terms of operational training and system upgrades which will be quantified in Stage 3. However, there is not expected to be any differences in these costs between the different options.

Safety

There are no IFP design issues identified with this option however, there are no RNP-AR arrivals published in the UK at this time. Therefore additional considerations may arise through the regulatory approval process.

Although new or revised safety assurances may be needed, an acceptable safety argument is envisaged to be achievable.

Interdependencies, Conflicts & Trade-Offs

Option may result in conflicts/interdependencies with Gatwick's options.

General Aviation / Commercial Airlines – Fuel Burn

Change in Fuel Burn (compared to the Baseline annual - tonnes) Not able to quantify at this time, owing to uncertainty in new stack locations

Commercial Airlines – Other costs

None identified.

Airport/ANSP – Operational costs

This option is not anticipated to change airport nor ANSP operational costs. Heathrow will continue to require ILS and other ground based infrastructure even with the implementation of PBN arrival procedures.

Option may lead to a change in the number of properties eligible for the noise insulation scheme) which could lead to a change in operational costs for the airport.

Adherence to AMS

Supports the AMS through increased systemisation and meeting the Governments key environmental objectives by utilising PBN. The use of PBN arrivals has been appraised at this stage during periods where the landing rate is less critical. PBN arrivals in a system design might enable simplification, safety, efficiency and resilience enhancements and/or provide respite opportunities.

Outcome of PBN Arrival RWY09R Option Q

All 09R PBN arrivals perform worse than the Baseline for noise metrics, since this runway is not routinely used for arrivals today.

Options that perform relatively well (i.e. when compared with each other) have been retained for further development at Stage 3.



CAP1616 - INITIAL OPTIONS APPRAISAL – SUPPLEMENTARY METRICS PBN Arrivals – RWY 09R Option Q (Night)

		(Overflight
Data	Population	Overflown	Overflight (0-7000 ft) contour map
Rate	Baseline	Option Q	EANSING LABOR FOR
≥1	0	108,400	Part Andrew Branch
≥ 5	0	0	
≥ 10	0	0	
20	0	0	
≥ 50	0	0	
100	0	0	And the 22 Martin Part of the
200	0	0	

Aircraft Noise Events

Rate	Population experiencing noise events above N60 each day		
Rale	Baseline	Option Q	
≥1	0	85,100	
≥ 5	0	0	
≥ 10	0	0	
≥ 20	0	0	
≥ 50	0	0	
≥ 100	0	0	
≥ 200	0	0	

Noise Exposures

Population count	Baseline	Option Q	Partial LOAEL contour map	
Estimated total population above 40 dB L _{Aeq,1.5h}	16,300	35,100		
Total population within Partial LOAEL (>45 dB L _{Aeq,1.5h})	5,800	8,200		

Noise Exposure Change

Change in Noise Exposure	Population experiencing at least 1 dB reduction within partial LOAEL or brought out of partial LOAEL	Population experiencing no change in noise exposure within partial LOAEL	Population experiencing at least 1 dB increase within partial LOAEL or brought into partial LOAEL	Change in noise exposure map
Partial LOAEL	200 (of which 200 brought out of Partial LOAEL by Option)	300	7,900 (of which 2,600 brought into Partial LOAEL by Option)	 I de Constante I de Constante



Heathrow

PBN Arrivals – RWY 09R Option R

Option Description

This option was developed to address a blend of DPs 2, 4, 9 & 10. This option assumes a single PBN arrival track used for all RWY09R arrivals capable of RNP-AR during the 0430-0600 period from LOGAN.



Heathrow

Communities – Noise impact on health & quality of life

Metric	Option Value	Difference to Baseline
Population above Partial LOAEL (daytime, LA _{eq} , 16h)	N/A	N/A
Population above Partial LOAEL (night-time, LA _{eq} , 8h)	23,700	+17,900
Population experiencing at least one event of N65 (daytime)	N/A	N/A
Population experiencing at least one event of N60 (night-time)	185,900	+185,900

Communities - Air Quality

As there is no change to track distribution below 1000ft, there is no effect on Air Quality from this option.

Metric	Difference to Baseline
Track Miles of the routes used (nm)	-14

Wider Society – Tranquillity & Biodiversity						
Metric	Option Value	Difference to Baseline				
Total Area of AONBs/National Parks (NPs) overflown betwee 7000ft once a day on average (night-time)	Total Area of AONBs/National Parks (NPs) overflown between 0- 7000ft once a day on average (night-time)					
Total Area of AONBs/NPs overflown experiencing at least one of N60 on average (night-time)	event	0km ²	No change			
Total Area of Richmond Park overflown between 0-7000ft at loonce a day on average (night-time)	0km ²	No change				
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown betwee 1640ft which observe a potential change in location overflow	4	+4				
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown betwee 3000ft which observe a potential change in location overflow	4	+4				
Wider Society – Capacity/Resilience	General Aviation – Access					
Arrival throughput not of concern 0430-0600. A single	No additional CAS required.					
or multiple PBN route could handle the low number of arrivals in this period if required.		Option would not facilitate the release CAS.				
There is no distinguishing difference between any option regards arrival throughput. Any aircraft not RNP-AR equipped would have another PBN route to rely on.		d to impact existing				
Heathrow's capacity for this ACP is limited by the existing 480,000 movement cap.						
6						

General Aviation / Commercial Airlines – Economic impact from increased effective capacity

No economic effect expected on GA operations.

Arrival delay is not an issue during the 0430-0600 period. Use of PBN arrivals during this time would be for noise mitigation purposes only. PBN arrivals in this time will not affect delay performance. There is no distinguishing difference between any option regards arrival delay.

Commercial Airlines – Training costs

This option would require RNP-AR capability and approvals. This can come with significant costs for airlines, however, it is unknown at this time whether RNP-AR route options would be progressed in isolation i.e. without other arrival procedures being available. Should an RNP-AR arrival be mandatory, there may be additional costs for some operators. This will be quantified in Stage 3.

Airport/Air Navigation Service Provider (ANSP) – Infrastructure costs

Option may require re-location and/or addition of Noise Monitoring Terminals.

Airport/ANSP – Deployment costs

There will be considerable costs associated with deployment in terms of operational training and system upgrades which will be quantified in Stage 3. However, there is not expected to be any differences in these costs between the different options.

Safety

There are no IFP design issues identified with this option however, there are no RNP-AR arrivals published in the UK at this time. Therefore additional considerations may arise through the regulatory approval process.

Although new or revised safety assurances may be needed, an acceptable safety argument is envisaged to be achievable.

Interdependencies, Conflicts & Trade-Offs

Option not expected to interact with other airports' options.

General Aviation / Commercial Airlines – Fuel Burn

Change in Fuel Burn (compared to the Baseline annual - tonnes) Not able to quantify at this time, owing to uncertainty in new stack locations

Commercial Airlines – Other costs

None identified.

Airport/ANSP – Operational costs

This option is not anticipated to change airport nor ANSP operational costs. Heathrow will continue to require ILS and other ground based infrastructure even with the implementation of PBN arrival procedures.

Option may lead to a change in the number of properties eligible for the noise insulation scheme) which could lead to a change in operational costs for the airport.

Adherence to AMS

Supports the AMS through increased systemisation and meeting the Governments key environmental objectives by utilising PBN. The use of PBN arrivals has been appraised at this stage during periods where the landing rate is less critical. PBN arrivals in a system design might enable simplification, safety, efficiency and resilience enhancements and/or provide respite opportunities.

Outcome of PBN Arrival RWY09R Option R

Option R offers a significant reduction in track miles. It indicates no overflight of AONBs and NPs.

The option indicates a significant increase in the population experiencing at least one N60 (night) noise event and an increase in the number of biodiversity sites between 0-3000ft that may experience a change in location overflown. Critically, the option failed Test 1 of the shortlisting process, as it increases the population above the Partial LOAEL by 4 times when compared to the Baseline.

OPTION DISCONTINUED





CAP1616 - INITIAL OPTIONS APPRAISAL – SUPPLEMENTARY METRICS PBN Arrivals – RWY 09R Option R (Night)

		(Overflight
Data	Population	Overflown	Overflight (0-7000 ft) contour map
Rate	Baseline	Option R	ENALSE LABOR FOR THE
≥1	0	416,000	
≥ 5	0	0	
≥ 10	0	0	
20	0	0	
50	0	0	
100	0	0	
200	0	0	

Aircraft Noise Events

Pata	Rate Population experiencing noise events above N60 each day Baseline Option R	
Rale		
≥1	0	185,900
≥ 5	0	0
≥ 10	0	0
≥ 20	0	0
≥ 50	0	0
≥ 100	0	0
≥ 200	0	0

Noise Exposures

Population count	Baseline	Option R	Partial LOAEL contour map
Estimated total population above 40 dB L _{Aeq,1.5h}	16,300	64,100	
Total population within Partial LOAEL (>45 dB L _{Aeq,1.5h})	5,800	23,700	

Noise Exposure Change Population experiencing at least 1 dB increase within partial LOAEL or brought into partial LOAEL opulation experiencing Population Change in Change in noise exposure map at least 1 dB reduction within partial LOAEL or experiencing no Noise change in noise brought out of partial LOAEL exposure within Exposure 300 21,800 Partial (of which 200 (of which 18,100 1,800 LOAEL brought out of brought into Partial LOAEL Partial LOAEL by Option) by Option) + 1 dB Baseline — 51 dB Option — 51 dB

Heathrow



PBN Arrivals – RWY 09R Option S

Option Description

This option was developed to address a blend of DPs 2, 4, 9 & 10. This option assumes a single PBN arrival track used for all RWY09R arrivals during the 0430-0600 period from LOGAN.



Communities – Noise impact on health & quality of life

Metric	Option Value	Difference to Baseline
Population above Partial LOAEL (daytime, LA _{eq} , 16h)	N/A	N/A
Population above Partial LOAEL (night-time, LA _{eq} , 8h)	8,100	+2,300
Population experiencing at least one event of N65 (daytime)	N/A	N/A
Population experiencing at least one event of N60 (night-time)	60,500	+60,500

Communities - Air Quality

As there is no change to track distribution below 1000ft, there is no effect on Air Quality from this option.

Metric	Difference to Baseline
Track Miles of the routes used (nm)	-6

Wider Society – Tranquillity & Biodiversity								
Metric	Option Value	Difference to Baseline						
Total Area of AONBs/National Parks (NPs) overflown betwee 7000ft once a day on average (night-time)	0km ²	No change						
Total Area of AONBs/NPs overflown experiencing at least one of N60 on average (night-time)	Less than 1km ²	Less than 1km ²						
Total Area of Richmond Park overflown between 0-7000ft at l once a day on average (night-time)	0km ²	No change						
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown betwee 1640ft which observe a potential change in location overflow	4	+4						
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown betwee 3000ft which observe a potential change in location overflow	8	+8						
Wider Society – Capacity/Resilience		General Aviation – Access						
Arrival throughput not of concern 0430-0600. A single	No	No additional CAS required. Option would not facilitate the release of CAS.						
or multiple PBN route could handle the low number of arrivals in this period if required.								
There is no distinguishing difference between any option regards arrival throughput. Any aircraft not RNP-AR equipped would have another PBN route to rely on.		Option not expected to impact existing helicopter routes.						
Heathrow's capacity for this ACP is limited by the existing 480,000 movement cap.								
9								



No economic effect expected on GA operations. Arrival delay is not an issue during the 0430-0600 period. Use of PBN arrivals during this time would be for noise mitigation purposes only. PBN arrivals in this time will not affect delay performance. There is no distinguishing difference between any option regards arrival delay. Commercial Airlines – Training costs None identified.	mercial Airlines – General Aviation / Commercial increased effective Airlines – Fuel Burn ty
Arrival delay is not an issue during the 0430-0600 period. Use of PBN arrivals during this time would be for noise mitigation purposes only. PBN arrivals in this time will not affect delay performance. There is no distinguishing difference between any option regards arrival delay. Commercial Airlines – Other costs None identified.	
option regards arrival delay. Commercial Airlines – Other costs None identified.	the 0430-0600 period. Use ould be for noise mitigation is time will not affect delay
Commercial Airlines – Training costs	Commercial Airlines – Other costs
_	- Training costs
Option does not require any re-equipage or upgrade costs for airlines. No training costs required for airlines.	
nor ANSP operational costs. Heathrow w continue to require ILS and other ground base	This option is not anticipated to change airport nor ANSP operational costs. Heathrow will continue to require ILS and other ground based infrastructure even with the implementation of PBN arrival procedures.
Infrastructure costs properties eligible for the noise insulation	
Option may require re-location and/or addition of Noise operational costs for the airport.	
Airport/ANSP – Deployment costs	loyment costs
There will be considerable costs associated with deployment in terms of operational training and system upgrades which will be quantified in Stage 3. However, there is not expected to be any differences in these costs between the different options.	stem upgrades which will be re is not expected to be any
Safety Adherence to AMS	Adherence to AMS
There are already PBN to ILS procedures in the UK. No IFP Supports the AMS through increase	cedures in the UK. No IFP
Although new or revised safety assurances may be needed, an acceptable safety argument is envisaged to be achievable. The use of PBN arrivals has been appraised this stage during periods where the landir rate is less critical. PBN arrivals in a system design might enable simplification, safet	urances may be needed, an aged to be achievable. The use of PBN arrivals has been appraised at this stage during periods where the landing rate is less critical. PBN arrivals in a system design might enable simplification, safety,
Interdependencies, Conflicts & Trade-Offs efficiency and resilience enhancements and/provide respite opportunities.	flicts & Trade-Offs efficiency and resilience enhancements and/or provide respite opportunities.
Option not expected to interact with other airports' options.	other airports' options.

Outcome of PBN Arrival RWY09R Option S

All 09R PBN arrivals perform worse than the Baseline for noise metrics, since this runway is not routinely used for arrivals today.

Options that perform relatively well (i.e. when compared with each other) have been retained for further development at Stage 3.



CAP1616 - INITIAL OPTIONS APPRAISAL – SUPPLEMENTARY METRICS PBN Arrivals – RWY 09R Option S (Night)

		(Overflight
Data	Population Overflown		Overflight (0-7000 ft) contour map
Rate	Baseline	Option S	E MALLAND TO BE
≥1	0	171,100	A STANK ALE STATISTICS OF
≥ 5	0	0	
≥ 10	0	0	
≥ 20	0	0	
≥ 50	0	0	
≥ 100	0	0	Sould 22 State
≥ 200	0	0	

Aircraft Noise Events

Pata	Population experiencing noise events above N60 each day		
Rate	Baseline	Baseline Option S	
≥1	0	60,500	
≥ 5	0	0	
≥ 10	0	0	
≥ 20	0	0	
≥ 50	0	0	
≥ 100	0	0	
≥ 200	0	0	

Noise Exposures

Population count	Baseline	Option S	Partial LOAEL contour map
Estimated total population above 40 dB L _{Aeq,1.5h}	16,300	26,300	
Total population within Partial LOAEL (>45 dB L _{Aeq,1.5h})	5,800	8,100	

Noise Exposure Change

Change in Noise Exposure	Population experiencing at least 1 dB reduction within partial LOAEL or brought out of partial LOAEL	Population experiencing no change in noise exposure within partial LOAEL	Population experiencing at least 1 dB increase within partial LOAEL or brought into partial LOAEL	Change in noise exposure map
Partial LOAEL	0 (of which 0 brought out of Partial LOAEL by Option)	0	8,100 (of which 2,300 brought into Partial LOAEL by Option)	 A 16 dotters a file A 16 dotters a file<



Heathrow

PBN Arrivals – RWY 09R Option T

Option Description

This option was developed to address a blend of DPs 2, 4, 9 & 10. This option assumes a single PBN arrival track used for all RWY09R arrivals during the 0430-0600 period from ALESO.



Heathrow

Communities – Noise impact on health & quality of life

Metric	Option Value	Difference to Baseline
Population above Partial LOAEL (daytime, LA _{eq} , 16h)	N/A	N/A
Population above Partial LOAEL (night-time, LA _{eq} , 8h)	8,100	+2,300
Population experiencing at least one event of N65 (daytime)	N/A	N/A
Population experiencing at least one event of N60 (night-time)	83,100	+83,100

Communities - Air Quality

As there is no change to track distribution below 1000ft, there is no effect on Air Quality from this option.

Metric	Difference to Baseline
Track Miles of the routes used (nm)	+2

Wider Society – Tranquilli	ty & E	Biodiversity	
Metric		Option Value	Difference to Baseline
Total Area of AONBs/National Parks (NPs) overflown betwee 7000ft once a day on average (night-time)	n 0-	Less than 1km ²	Less than 1km ²
Total Area of AONBs/NPs overflown experiencing at least one of N60 on average (night-time)	event	1km ²	+1km ²
Total Area of Richmond Park overflown between 0-7000ft at I once a day on average (night-time)	east	0km ²	No change
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown betwee 1640ft which observe a potential change in location overflow		4	+4
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown betwee 3000ft which observe a potential change in location overflow		8	+8
Wider Society – Capacity/Resilience		General Avia	tion – Access
Arrival throughput not of concern 0430-0600. A single	No	additional CAS re	quired.
or multiple PBN route could handle the low number of arrivals in this period if required.	Opt CAS		acilitate the release of
There is no distinguishing difference between any option regards arrival throughput. Any aircraft not RNP-AR equipped would have another PBN route to rely on.	Opt	-	d to impact existing
Heathrow's capacity for this ACP is limited by the existing 480,000 movement cap.			
12			



General Aviation / Commercial Airlines – Economic impact from increased effective capacity	General Aviation / Commercial Airlines – Fuel Burn
No economic effect expected on GA operations.	Change in Fuel Not able to quantify Burn (compared at this time, owing
Arrival delay is not an issue during the 0430-0600 period. Use of PBN arrivals during this time would be for noise mitigation purposes only. PBN arrivals in this time will not affect delay performance. There is no distinguishing difference between any	to the Baseline - annual - tonnes) new stack locations
option regards arrival delay.	Commercial Airlines – Other costs
Commercial Airlines – Training costs	None identified.
Option does not require any re-equipage or upgrade costs for airlines. No training costs required for airlines.	Airport/ANSP – Operational costs
	This option is not anticipated to change airport nor ANSP operational costs. Heathrow will continue to require ILS and other ground based infrastructure even with the implementation of PBN arrival procedures.
Airport/Air Navigation Service Provider (ANSP) – Infrastructure costs Option may require re-location and/or addition of Noise Monitoring Terminals.	Option may lead to a change in the number of properties eligible for the noise insulation scheme) which could lead to a change in operational costs for the airport.
Airport/ANSP – Deployment costs	
There will be considerable costs associated with deployment in terms of operational training and system upgrades which will be quantified in Stage 3. However, there is not expected to be any differences in these costs between the different options.	
Safety	Adherence to AMS
There are already PBN to ILS procedures in the UK. No IFP design issues are anticipated with this option.	Supports the AMS through increased systemisation and meeting the Governments
Although new or revised safety assurances may be needed, an acceptable safety argument is envisaged to be achievable.	key environmental objectives by utilising PBN. The use of PBN arrivals has been appraised at this stage during periods where the landing rate is less critical. PBN arrivals in a system design might enable simplification, safety,
Interdependencies, Conflicts & Trade-Offs	efficiency and resilience enhancements and/or provide respite opportunities.
Option not expected to interact with other airports' options.	

Outcome of PBN Arrival RWY09R Option T

All 09R PBN arrivals perform worse than the Baseline for noise metrics, since this runway is not routinely used for arrivals today.

Options that perform relatively well (i.e. when compared with each other) have been retained for further development at Stage 3.



CAP1616 - INITIAL OPTIONS APPRAISAL – SUPPLEMENTARY METRICS PBN Arrivals – RWY 09R Option T (Night)

		C	Dverflight
Rate	Population Overflown		Overflight (0-7000 ft) contour map
Rale	Baseline	Option T	ENALLAR ALP-102
≥1	0	157,800	
5	0	0	
10	0	0	
20	0	0	
2 50	0	0	
100	0	0	The state of the state of the
200	0	0	

Aircraft Noise Events

Pata		ng noise events above ach day
Rate	Baseline	Option T
≥1	0	83,100
≥ 5	0	0
≥ 10	0	0
≥ 20	0	0
≥ 50	0	0
≥ 100	0	0
≥ 200	0	0

Noise Exposures

Population count	Baseline	Option T	Partial LOAEL contour map
Estimated total population above 40 dB L _{Aeq,1.5h}	16,300	25,100	
Total population within Partial LOAEL (>45 dB L _{Aeq,1.5h})	5,800	8,100	

Noise Exposure Change

Change in Noise Exposure	Population experiencing at least 1 dB reduction within partial LOAEL or brought out of partial LOAEL	Population experiencing no change in noise exposure within partial LOAEL	Population experiencing at least 1 dB increase within partial LOAEL or brought into partial LOAEL	Change in noise exposure map
Partial LOAEL	0 (of which 0 brought out of Partial LOAEL by Option)	0	8,100 (of which 2,300 brought into Partial LOAEL by Option)	 4 θ στατα στατα 4 θ στατα στατα 4 θ στατα στατα 4 θ στατα στατα 4 στατα στατα 4 στατα στατα 4 στα 4 σ





PBN Arrivals – RWY 09R Option U

Option Description

This option was developed to address a blend of DPs 2, 4, 9 & 10. This option assumes a single PBN arrival track used for all RWY09R arrivals during the 0430-0600 period from TOBID.



Heathrow

Communities – Noise impact on health & quality of life

Metric	Option Value	Difference to Baseline
Population above Partial LOAEL (daytime, LA _{eq} , 16h)	N/A	N/A
Population above Partial LOAEL (night-time, LA _{eq} , 8h)	8,100	+2,300
Population experiencing at least one event of N65 (daytime)	N/A	N/A
Population experiencing at least one event of N60 (night-time)	82,600	+82,600

Communities - Air Quality

As there is no change to track distribution below 1000ft, there is no effect on Air Quality from this option.

Metric	Difference to Baseline
Track Miles of the routes used (nm)	-7

Wider Society – Tranquil	ity & E	Biodiversity	
Metric		Option Value	Difference to Baseline
Total Area of AONBs/National Parks (NPs) overflown betwe 7000ft once a day on average (night-time)	en 0-	40km ²	+40km ²
Total Area of AONBs/NPs overflown experiencing at least one of N60 on average (night-time)	event	6km ²	+6km ²
Total Area of Richmond Park overflown between 0-7000ft at once a day on average (night-time)	least	0km ²	No change
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown betw 1640ft which observe a potential change in location overflo		4	+4
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown betw 3000ft which observe a potential change in location overflo		8	+8
Wider Society – Capacity/Resilience		General Avia	tion – Access
Arrival throughput not of concern 0430-0600. A single	No a	additional CAS re	quired.
or multiple PBN route could handle the low number of arrivals in this period if required.	Opti CAS		acilitate the release of
There is no distinguishing difference between any option regards arrival throughput. Any aircraft not RNP-AR equipped would have another PBN route to rely on.	Opti		d to impact existing
Heathrow's capacity for this ACP is limited by the existing 480,000 movement cap.			



General Aviation / Commercial Airlines – Economic impact from increased effective capacity	General Aviation / Commercial Airlines – Fuel Burn
No economic effect expected on GA operations.	Change in FuelNot able to quantifyBurn (comparedat this time, owing
Arrival delay is not an issue during the 0430-0600 period. Use of PBN arrivals during this time would be for noise mitigation purposes only. PBN arrivals in this time will not affect delay performance. There is no distinguishing difference between any	to the Baseline - annual - tonnes) new stack locations
option regards arrival delay.	Commercial Airlines – Other costs
Commercial Airlines – Training costs	None identified.
Option does not require any re-equipage or upgrade costs for airlines. No training costs required for airlines.	Airport/ANSP – Operational costs
	This option is not anticipated to change airport nor ANSP operational costs. Heathrow will continue to require ILS and other ground based infrastructure even with the implementation of PBN arrival procedures.
Airport/Air Navigation Service Provider (ANSP) – Infrastructure costs	Option may lead to a change in the number of properties eligible for the noise insulation scheme) which could lead to a change in operational costs for the airport.
Monitoring Terminals.	
Airport/ANSP – Deployment costs	
There will be considerable costs associated with deployment in terms of operational training and system upgrades which will be quantified in Stage 3. However, there is not expected to be any differences in these costs between the different options.	
Safety	Adherence to AMS
There are already PBN to ILS procedures in the UK. No IFP design issues are anticipated with this option.	Supports the AMS through increased systemisation and meeting the Governments
Although new or revised safety assurances may be needed, an acceptable safety argument is envisaged to be achievable.	key environmental objectives by utilising PBN. The use of PBN arrivals has been appraised at this stage during periods where the landing rate is less critical. PBN arrivals in a system design might enable simplification, safety,
Interdependencies, Conflicts & Trade-Offs	efficiency and resilience enhancements and/or provide respite opportunities.
Option not expected to interact with other airports' options.	

Outcome of PBN Arrival RWY09R Option U

All 09R PBN arrivals perform worse than the Baseline for noise metrics, since this runway is not routinely used for arrivals today.

Options that perform relatively well (i.e. when compared with each other) have been retained for further development at Stage 3.



CAP1616 - INITIAL OPTIONS APPRAISAL – SUPPLEMENTARY METRICS PBN Arrivals – RWY 09R Option U (Night)

		(Overflight
Rate	Population	Overflown	Overflight (0-7000 ft) contour map
Rale	Baseline	Option U	
≥1	0	86,200	
≥ 5	0	0	
10	0	0	
20	0	0	
50	0	0	
.00	0	0	and the second second second
200	0	0	

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Heathrow

Aircraft Noise Events

Population experiencing noise events above N60 each day		
Rate	Baseline	Option U
≥1	0	82,600
≥ 5	0	0
≥ 10	0	0
≥ 20	0	0
≥ 50	0	0
≥ 100	0	0
≥ 200	0	0

Noise Exposures

	Population count	Baseline	Option U	Partial LOAEL contour map	
	Estimated total population above 40 dB L _{Aeq,1.5h}	16,300	23,700		
	Total population within Partial LOAEL (>45 dB L _{Aeq,1.5h})	OAEL 5,800 8,1	8,100		

Noise Exposure Change

Change in Noise Exposure	Population experiencing at least 1 dB reduction within partial LOAEL or brought out of partial LOAEL	Population experiencing no change in noise exposure within partial LOAEL	Population experiencing at least 1 dB increase within partial LOAEL or brought into partial LOAEL	Change in noise exposure map
Partial LOAEL	0 (of which 0 brought out of Partial LOAEL by Option)	0	8,100 (of which 2,300 brought into Partial LOAEL by Option)	 A definition like A definition like<

