



AIRSPACE MODERNISATION AIRSPACE CHANGE PROPOSAL

STEP 2B INITIAL OPTIONS APPRAISAL

APPENDIX C

VECTORED ARRIVALS PART 4



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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.

Initial Options Appraisal

Vectored Arrivals

Runway 27R



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.

Version 1.0 (July 2023)

Vectored Arrivals – Runway (RWY) 27R Baseline 'Do Nothing'

Option Description

This represents the baseline for Doing Nothing with 27R arrivals. The image represents the areas overflowed at least once per day on average by arrivals in 2019.



Communities – Noise impact on health & quality of life

Metric	Option Value	Difference to Baseline
Population above Partial LOAEL (daytime, LA _{eq} , 16h)	570,200	N/A
Population above Partial LOAEL (night-time, LA _{eq} , 8h)	811,700	N/A
Population experiencing at least one event of N65 (daytime)	3,191,600	N/A
Population experiencing at least one event of N60 (night-time)	3,104,700	N/A

Communities - Air Quality

As this is the Baseline 'Do Nothing', there is no change to Air Quality.

Wider Society – Greenhouse Gas Impact

Metric	Option Value
Overall Track miles (nm)	Not possible to assess.

Wider Society – Tranquillity & Biodiversity

Metric	Option Value	Difference to Baseline
Total Area of AONBs/National Parks (NPs) overflowed between 0-7000ft once a day on average (daytime)	24km ²	N/A
Total Area of AONBs/NPs overflowed experiencing at least one event of N65 on average (daytime)	0km ²	N/A
Total Area of Richmond Park overflowed between 0-7000ft at least once a day on average (daytime)	0km ²	N/A
Number of sites (RAMSAR, SAC, SPA, SSSI) overflowed between 0-1640ft which observe a potential change in location overflow	N/A	N/A
Number of sites (RAMSAR, SAC, SPA, SSSI) overflowed between 0-3000ft which observe a potential change in location overflow	N/A	N/A

Wider Society – Capacity/Resilience

Doing nothing would maintain existing performance.

Heathrow's capacity for this ACP is limited by the existing 480,000 movement cap.

General Aviation (GA) – Access

No additional Controlled Airspace (CAS) required.

Option would not facilitate the release of CAS.

Option not expected to impact existing helicopter routes.

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

As this is the Baseline ‘Do Nothing’ there is no economic effect expected on GA or commercial airline operations.

Commercial Airlines – Training costs

Option does not require any re-equipage or upgrade costs for airlines. No training costs required for airlines.

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

Doing nothing will mean no changes to infrastructure costs.

Airport/ANSP – Deployment costs

Doing nothing will mean no deployment costs.

Safety

Doing nothing will mean no Instrument Flight Procedures (IFP) design considerations.

At current traffic levels, there are no safety concerns with the current arrangements at Heathrow. Future traffic growth within the London TMA could however result in increased complexity and workload for ATC and pilots, which may lead to traffic levels within the London Terminal Manoeuvring Area (LTMA) being capped, or increased aircraft holding on the ground, in order to maintain safety.

Interdependencies, Conflicts & Trade-Offs

Heathrow's arrivals generally 'block' Heathrow's departures from climbing above 6000ft. As a result, other airports' routes are also held down below 6000ft.

Doing nothing with Heathrow's arrivals will continue to constrain those routes as well as the ability for those airports to make more beneficial changes to their departures in the future. Doing nothing will therefore continue to inhibit future design options for RAF Northolt, Luton, Stansted, Gatwick, London City, Biggin Hill and Farnborough.

General Aviation / Commercial Airlines – Fuel Burn

Change in Fuel Burn (annual - tonnes)	No change
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Commercial Airlines – Other costs

None identified.

Airport/ANSP – Operational costs

Doing nothing will mean no change to operational costs.

Adherence to Airspace Modernisation Strategy (AMS)

Doing nothing with Westerly arrivals will not align with the AMS. It will not enable environmental benefits, increase airspace capacity, reduce noise impacts or maximise benefits from NERL's re-design of the LTMA. No change and therefore no ACP submission will not enable enhancements to safety, enhanced integration or reductions in the volume of CAS.

Outcome of Vectored Arrival RWY27R Baseline ‘Do Nothing’

The Baseline (Do Nothing) Option was discontinued during the Design Principles Evaluation (DPE) phase of Stage 2, owing to the option not meeting the objectives set by the Airspace Modernisation Strategy (AMS).

OPTION DISCONTINUED (During DPE)



CAP1616 - INITIAL OPTIONS APPRAISAL – SUPPLEMENTARY METRICS

VECTOR Arrivals – RWY 27R Do Nothing (Day)



07:00 - 23:00

Overflight

Rate	Population Overflow		Overflight (0-7000 ft) contour map
	Baseline	Do Nothing	
≥ 1	7,318,500	7,318,500	
≥ 5	5,318,700	5,318,700	
≥ 10	4,371,500	4,371,500	
≥ 20	3,320,800	3,320,800	
≥ 50	1,498,900	1,498,900	
≥ 100	360,600	360,600	
≥ 200	209,400	209,400	

Aircraft Noise Events

Rate	Population experiencing noise events above N65 each day		N65 events contour map
	Baseline	Do Nothing	
≥ 1	3,191,600	3,191,600	
≥ 5	1,235,700	1,235,700	
≥ 10	726,400	726,400	
≥ 20	339,500	339,500	
≥ 50	170,200	170,200	
≥ 100	83,900	83,900	
≥ 200	70,000	70,000	

Noise Exposures

Population count	Baseline	Do Nothing	Partial LOAEL contour map
Estimated total population above WHO Threshold (>45 dB L _{den})	3,163,500	3,163,500	
Total population within Partial LOAEL (>51 dB L _{Aeq,16h})	570,200	570,200	

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	0 (0 brought out of Partial LOAEL by Option)	0	0 (0 brought into Partial LOAEL by Option)	



VECTOR Arrivals – RWY 27R Do Nothing (Night)



23:00 - 07:00

Overflight

Rate	Population Overflown		Overflight (0-7000 ft) contour map
	Baseline	Do Nothing	
≥ 1	4,354,100	4,354,100	
≥ 5	1,603,900	1,603,900	
≥ 10	542,400	542,400	
≥ 20	214,900	214,900	
≥ 50	0	0	
≥ 100	0	0	
≥ 200	0	0	

Aircraft Noise Events

Rate	Population experiencing noise events above N60 each day		N60 events contour map
	Baseline	Do Nothing	
≥ 1	3,104,600	3,104,600	
≥ 5	1,210,300	1,210,300	
≥ 10	889,700	889,700	
≥ 20	330,500	330,500	
≥ 50	0	0	
≥ 100	0	0	
≥ 200	0	0	

Noise Exposures

Population count	Baseline	Do Nothing	Partial LOAEL contour map
Estimated total population above WHO Threshold (>40 dB L _{night})	2,208,300	2,208,300	
Total population within Partial LOAEL (>45 dB L _{Aeq,8h})	811,700	811,700	

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 (0 brought out of Partial LOAEL by Option)	0	0 (0 brought into Partial LOAEL by Option)	



Vectored Arrivals – RWY 27R Option A

Option Description

This option has a vectoring area with Runway 27R Final Approach joining points between 8 and 12nm.



Communities – Noise impact on health & quality of life

Metric	Option Value	Difference to Baseline
Population above Partial LOAEL (daytime, LA _{eq} , 16h)	451,900	-118,300
Population above Partial LOAEL (night-time, LA _{eq} , 8h)	651,200	-160,500
Population experiencing at least one event of N65 (daytime)	2,997,200	-194,400
Population experiencing at least one event of N60 (night-time)	3,383,600	+278,900

Communities - Air Quality

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

Wider Society – Greenhouse Gas Impact

Metric	Option Value
Overall Track Miles of the option (nm)	Not possible to assess at this time, owing to uncertainty in new stack locations.

Wider Society – Tranquillity & Biodiversity

Metric	Option Value	Difference to Baseline
Total Area of AONBs/National Parks (NPs) overflown between 0-7000ft once a day on average (daytime)	105km ²	+81km ²
Total Area of AONBs/NPs overflown experiencing at least one event of N65 on average (daytime)	0km ²	No change
Total Area of Richmond Park overflown between 0-7000ft at least once a day on average (daytime)	0km ²	0km ²
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown between 0-1640ft which observe a potential change in location overflown	0	No change
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown between 0-3000ft which observe a potential change in location overflown	0	No change

Wider Society – Capacity/Resilience

The ability to constrain the vectoring area to joining final approach to within just a 4nm window is untested at Heathrow. There is a chance that the loss of flexibility could result in a degradation in landing rate, as an over delivery of arrivals will result in needing to extend arrival beyond the 4nm swathe.

Assuming that can be managed or occasional excursions from the small vectoring area is allowed, there is no other evidence to suggest an optimal landing rate cannot be achieved with this length final.

Heathrow's capacity for this ACP is limited by the existing 480,000 movement cap.

General Aviation – Access

No additional CAS envisaged.

Option would not facilitate the release of CAS.

Option not expected to impact existing helicopter routes.

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

No economic effect expected on GA operations.

Assuming a smaller vectoring area has no negative effect on capacity, vectoring to final approach is expected to deliver the required landing rate.

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 – Training costs

Option does not require any re-equipage or upgrade costs for airlines. No training costs required for airlines.

Commercial Airlines – Other costs

None identified.

Airport/ANSP – Infrastructure costs

No changes to infrastructure costs envisaged.

Airport/ANSP – Operational costs

This option is not anticipated to change airport or ANSP operational 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.

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

No IFP Design issues identified.

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

Adherence to AMS

Supports the AMS by enabling an efficient flow of traffic, accommodating demand and providing system resilience to the benefit of airspace users, where a sole reliance on PBN Arrivals is not expected to achieve this.

Interdependencies, Conflicts & Trade-Offs

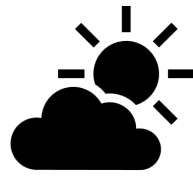
Option may restrict CCO/CDO to/from 7000ft for RAF Northolt, London City, Biggin Hill, Gatwick and Farnborough, subject to the preferred options taken forward by those airports.

Outcome of Vectored Arrival RWY27R Option A

All vectored arrival options have been retained into Stage 3 to allow us to determine if it would be beneficial and/or feasible to use different vectoring areas during different periods to provide respite or relief from noise. This will be informed by our Concept work during Stage 3 system assembly.

OPTION CARRIED FORWARD TO STAGE 3

CAP1616 - INITIAL OPTIONS APPRAISAL – SUPPLEMENTARY METRICS



07:00 - 23:00

VECTOR Arrivals – RWY 27R Option A (Day)

Overflight

Rate	Population Overflow		Overflight (0-7000 ft) contour map
	Baseline	Option A	
≥ 1	7,318,500	4,198,000	
≥ 5	5,318,700	3,879,000	
≥ 10	4,371,500	3,384,800	
≥ 20	3,320,800	2,971,000	
≥ 50	1,498,900	1,722,900	
≥ 100	360,600	393,000	
≥ 200	209,400	128,800	

Aircraft Noise Events

Rate	Population experiencing noise events above N65 each day		N65 events contour map
	Baseline	Option A	
≥ 1	3,191,600	2,997,200	
≥ 5	1,235,700	1,672,400	
≥ 10	726,400	797,900	
≥ 20	339,500	281,100	
≥ 50	170,200	170,600	
≥ 100	83,900	83,300	
≥ 200	70,000	70,100	

Noise Exposures

Population count	Baseline	Option A	Partial LOAEL contour map
Estimated total population above WHO Threshold (>45 dB L _{den})	3,163,500	3,234,100	
Total population within Partial LOAEL (>51 dB L _{Aeq,16h})	570,200	451,900	

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	162,100 (of which 135,900 brought out of Partial LOAEL by Option)	408,100	17,700 (of which 17,700 brought into Partial LOAEL by Option)	



CAP1616 - INITIAL OPTIONS APPRAISAL – SUPPLEMENTARY METRICS

VECTOR Arrivals – RWY 27R Option A (Night)



23:00 - 07:00

Overflight

Rate	Population Overflow		Overflight (0-7000 ft) contour map
	Baseline	Option A	
≥ 1	4,354,100	3,259,400	
≥ 5	1,603,900	1,517,000	
≥ 10	542,400	638,000	
≥ 20	214,900	114,500	
≥ 50	0	0	
≥ 100	0	0	
≥ 200	0	0	

Aircraft Noise Events

Rate	Population experiencing noise events above N60 each day		N60 events contour map
	Baseline	Option A	
≥ 1	3,104,600	3,383,600	
≥ 5	1,210,300	1,729,700	
≥ 10	889,700	781,300	
≥ 20	330,500	272,000	
≥ 50	0	0	
≥ 100	0	0	
≥ 200	0	0	

Noise Exposures

Population count	Baseline	Option A	Partial LOAEL contour map
Estimated total population above WHO Threshold (>40 dB L _{night})	2,208,300	2,372,800	
Total population within Partial LOAEL (>45 dB L _{Aeq,8h})	811,700	651,200	

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	299,200 (of which 245,300 brought out of Partial LOAEL by Option)	495,900	101,400 (of which 84,800 brought into Partial LOAEL by Option)	



Vectored Arrivals – RWY 27R Option B



Option Description

This option has a vectoring area with Runway 27R Final Approach joining points between 9 and 13nm.

Communities – Noise impact on health & quality of life

Metric	Option Value	Difference to Baseline
Population above Partial LOAEL (daytime, LA _{eq} , 16h)	508,500	-61,700
Population above Partial LOAEL (night-time, LA _{eq} , 8h)	775,900	-35,800
Population experiencing at least one event of N65 (daytime)	2,911,000	-280,600
Population experiencing at least one event of N60 (night-time)	3,277,800	+173,100

Communities - Air Quality

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

Wider Society – Greenhouse Gas Impact

Metric	Option Value
Overall Track Miles of the option (nm)	Not possible to assess at this time, owing to uncertainty in new stack locations.

Wider Society – Tranquillity & Biodiversity

Metric	Option Value	Difference to Baseline
Total Area of AONBs/National Parks (NPs) overflown between 0-7000ft once a day on average (daytime)	90km ²	+66km ²
Total Area of AONBs/NPs overflown experiencing at least one event of N65 on average (daytime)	0km ²	No change
Total Area of Richmond Park overflown between 0-7000ft at least once a day on average (daytime)	0km ²	0km ²
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown between 0-1640ft which observe a potential change in location overflown	0	No change
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown between 0-3000ft which observe a potential change in location overflown	0	No change

Wider Society – Capacity/Resilience

The ability to constrain the vectoring area to joining final approach to within just a 4nm window is untested at Heathrow. There is a chance that the loss of flexibility could result in a degradation in landing rate, as an over delivery of arrivals will result in needing to extend arrival beyond the 4nm swathe.

Assuming that can be managed or occasional excursions from the small vectoring area is allowed, there is no other evidence to suggest an optimal landing rate cannot be achieved with this length final.

Heathrow's capacity for this ACP is limited by the existing 480,000 movement cap.

General Aviation – Access

No additional CAS envisaged.

Option would not facilitate the release of CAS.

Option not expected to impact existing helicopter routes.



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

No economic effect expected on GA operations.

Assuming a smaller vectoring area has no negative effect on capacity, vectoring to final approach is expected to deliver the required landing rate.

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 – Training costs

Option does not require any re-equipage or upgrade costs for airlines. No training costs required for airlines.

Commercial Airlines – Other costs

None identified.

Airport/ANSP – Infrastructure costs

No changes to infrastructure costs envisaged.

Airport/ANSP – Operational costs

This option is not anticipated to change airport or ANSP operational 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.

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

No IFP Design issues identified.

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

Adherence to AMS

Supports the AMS by enabling an efficient flow of traffic, accommodating demand and providing system resilience to the benefit of airspace users, where a sole reliance on PBN Arrivals is not expected to achieve this.

Interdependencies, Conflicts & Trade-Offs

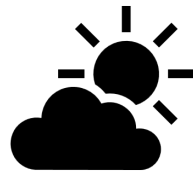
Option may restrict CCO/CDO to/from 7000ft for RAF Northolt, London City, Biggin Hill, Gatwick and Farnborough, subject to the preferred options taken forward by those airports.

Outcome of Vectored Arrival RWY27R Option B

All vectored arrival options have been retained into Stage 3 to allow us to determine if it would be beneficial and/or feasible to use different vectoring areas during different periods to provide respite or relief from noise. This will be informed by our Concept work during Stage 3 system assembly.

OPTION CARRIED FORWARD TO STAGE 3

CAP1616 - INITIAL OPTIONS APPRAISAL – SUPPLEMENTARY METRICS



07:00 - 23:00

VECTOR Arrivals – RWY 27R Option B (Day)

Overflight

Rate	Population Overflow		Overflight (0-7000 ft) contour map
	Baseline	Option B	
≥ 1	7,318,500	4,326,500	
≥ 5	5,318,700	3,983,400	
≥ 10	4,371,500	3,461,900	
≥ 20	3,320,800	3,014,900	
≥ 50	1,498,900	1,903,900	
≥ 100	360,600	467,900	
≥ 200	209,400	154,200	

Aircraft Noise Events

Rate	Population experiencing noise events above N65 each day		N65 events contour map
	Baseline	Option B	
≥ 1	3,191,600	2,911,000	
≥ 5	1,235,700	1,692,100	
≥ 10	726,400	882,400	
≥ 20	339,500	282,500	
≥ 50	170,200	172,000	
≥ 100	83,900	83,300	
≥ 200	70,000	70,100	

Noise Exposures

Population count	Baseline	Option B	Partial LOAEL contour map
Estimated total population above WHO Threshold (>45 dB L _{den})	3,163,500	3,229,500	
Total population within Partial LOAEL (>51 dB L _{Aeq,16h})	570,200	508,500	

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	88,800 (of which 74,400 brought out of Partial LOAEL by Option)	481,400	12,700 (of which 12,700 brought into Partial LOAEL by Option)	



CAP1616 - INITIAL OPTIONS APPRAISAL – SUPPLEMENTARY METRICS

VECTOR Arrivals – RWY 27R Option B (Night)



23:00 - 07:00

Overflight

Rate	Population Overflow		Overflight (0-7000 ft) contour map
	Baseline	Option B	
≥ 1	4,354,100	3,348,600	
≥ 5	1,603,900	1,652,700	
≥ 10	542,400	781,500	
≥ 20	214,900	146,400	
≥ 50	0	0	
≥ 100	0	0	
≥ 200	0	0	

Aircraft Noise Events

Rate	Population experiencing noise events above N60 each day		N60 events contour map
	Baseline	Option B	
≥ 1	3,104,600	3,277,800	
≥ 5	1,210,300	1,780,000	
≥ 10	889,700	843,600	
≥ 20	330,500	298,100	
≥ 50	0	0	
≥ 100	0	0	
≥ 200	0	0	

Noise Exposures

Population count	Baseline	Option B	Partial LOAEL contour map
Estimated total population above WHO Threshold (>40 dB L _{night})	2,208,300	2,401,100	
Total population within Partial LOAEL (>45 dB L _{Aeq,8h})	811,700	775,900	

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	205,400 (of which 166,200 brought out of Partial LOAEL by Option)	600,700	136,000 (of which 130,400 brought into Partial LOAEL by Option)	



Vectored Arrivals – RWY 27R Option C



Option Description

This option has a vectoring area with Runway 27R Final Approach joining points between 10 and 14nm.

Communities – Noise impact on health & quality of life

Metric	Option Value	Difference to Baseline
Population above Partial LOAEL (daytime, LA _{eq} , 16h)	559,800	-10,400
Population above Partial LOAEL (night-time, LA _{eq} , 8h)	797,400	-14,300
Population experiencing at least one event of N65 (daytime)	2,821,400	-370,200
Population experiencing at least one event of N60 (night-time)	3,337,800	+233,100

Communities - Air Quality

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

Wider Society – Greenhouse Gas Impact

Metric	Option Value
Overall Track Miles of the option (nm)	Not possible to assess at this time, owing to uncertainty in new stack locations.

Wider Society – Tranquillity & Biodiversity

Metric	Option Value	Difference to Baseline
Total Area of AONBs/National Parks (NPs) overflown between 0-7000ft once a day on average (daytime)	86km ²	+62km ²
Total Area of AONBs/NPs overflown experiencing at least one event of N65 on average (daytime)	0km ²	No change
Total Area of Richmond Park overflown between 0-7000ft at least once a day on average (daytime)	0km ²	0km ²
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown between 0-1640ft which observe a potential change in location overflown	0	No change
Number of sites (RAMSAR, SAC, SPA, SSSI) overflown between 0-3000ft which observe a potential change in location overflown	0	No change

Wider Society – Capacity/Resilience

The ability to constrain the vectoring area to joining final approach to within just a 4nm window is untested at Heathrow. There is a chance that the loss of flexibility could result in a degradation in landing rate, as an over delivery of arrivals will result in needing to extend arrival beyond the 4nm swathe.

Assuming that can be managed or occasional excursions from the small vectoring area is allowed, there is no other evidence to suggest an optimal landing rate cannot be achieved with this length final.

Heathrow's capacity for this ACP is limited by the existing 480,000 movement cap.

General Aviation – Access

No additional CAS envisaged.

Option would not facilitate the release of CAS.

Option not expected to impact existing helicopter routes.

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

No economic effect expected on GA operations.

Assuming a smaller vectoring area has no negative effect on capacity, vectoring to final approach is expected to deliver the required landing rate.

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.

Commercial Airlines – Training costs

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 or ANSP operational 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.

Airport/ANSP – Infrastructure costs

No changes to infrastructure costs envisaged.

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

No IFP Design issues identified.

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

Adherence to AMS

Supports the AMS by enabling an efficient flow of traffic, accommodating demand and providing system resilience to the benefit of airspace users, where a sole reliance on PBN Arrivals is not expected to achieve this.

Interdependencies, Conflicts & Trade-Offs

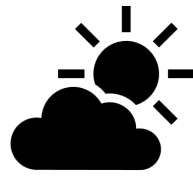
Option may restrict CCO/CDO to/from 7000ft for London City, Biggin Hill, Gatwick and Farnborough, subject to the preferred options taken forward by those airports.

Outcome of Vectored Arrival RWY27R Option C

All vectored arrival options have been retained into Stage 3 to allow us to determine if it would be beneficial and/or feasible to use different vectoring areas during different periods to provide respite or relief from noise. This will be informed by our Concept work during Stage 3 system assembly.

OPTION CARRIED FORWARD TO STAGE 3

CAP1616 - INITIAL OPTIONS APPRAISAL – SUPPLEMENTARY METRICS



07:00 - 23:00

VECTOR Arrivals – RWY 27R Option C (Day)

Overflight

Rate	Population Overflown		Overflight (0-7000 ft) contour map
	Baseline	Option C	
≥ 1	7,318,500	4,568,100	
≥ 5	5,318,700	4,170,400	
≥ 10	4,371,500	3,607,200	
≥ 20	3,320,800	3,148,200	
≥ 50	1,498,900	1,920,900	
≥ 100	360,600	547,400	
≥ 200	209,400	206,100	

Aircraft Noise Events

Rate	Population experiencing noise events above N65 each day		N65 events contour map
	Baseline	Option C	
≥ 1	3,191,600	2,821,400	
≥ 5	1,235,700	1,598,000	
≥ 10	726,400	836,800	
≥ 20	339,500	324,400	
≥ 50	170,200	172,000	
≥ 100	83,900	83,300	
≥ 200	70,000	70,100	

Noise Exposures

Population count	Baseline	Option C	Partial LOAEL contour map
Estimated total population above WHO Threshold (>45 dB L _{den})	3,163,500	3,154,500	
Total population within Partial LOAEL (>51 dB L _{Aeq,16h})	570,200	559,800	

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	24,100 (of which 24,100 brought out of Partial LOAEL by Option)	546,100	13,700 (of which 13,700 brought into Partial LOAEL by Option)	



VECTOR Arrivals – RWY 27R Option C (Night)



23:00 - 07:00

Overflight

Rate	Population Overflow		Overflight (0-7000 ft) contour map
	Baseline	Option C	
≥ 1	4,354,100	3,555,100	
≥ 5	1,603,900	1,670,600	
≥ 10	542,400	810,400	
≥ 20	214,900	188,400	
≥ 50	0	0	
≥ 100	0	0	
≥ 200	0	0	

Aircraft Noise Events

Rate	Population experiencing noise events above N60 each day		N60 events contour map
	Baseline	Option C	
≥ 1	3,104,600	3,337,800	
≥ 5	1,210,300	1,737,900	
≥ 10	889,700	888,400	
≥ 20	330,500	334,400	
≥ 50	0	0	
≥ 100	0	0	
≥ 200	0	0	

Noise Exposures

Population count	Baseline	Option C	Partial LOAEL contour map
Estimated total population above WHO Threshold (>40 dB L _{night})	2,208,300	2,357,500	
Total population within Partial LOAEL (>45 dB L _{Aeq,8h})	811,700	797,400	

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	107,600 (of which 90,700 brought out of Partial LOAEL by Option)	703,700	76,800 (of which 76,400 brought into Partial LOAEL by Option)	

