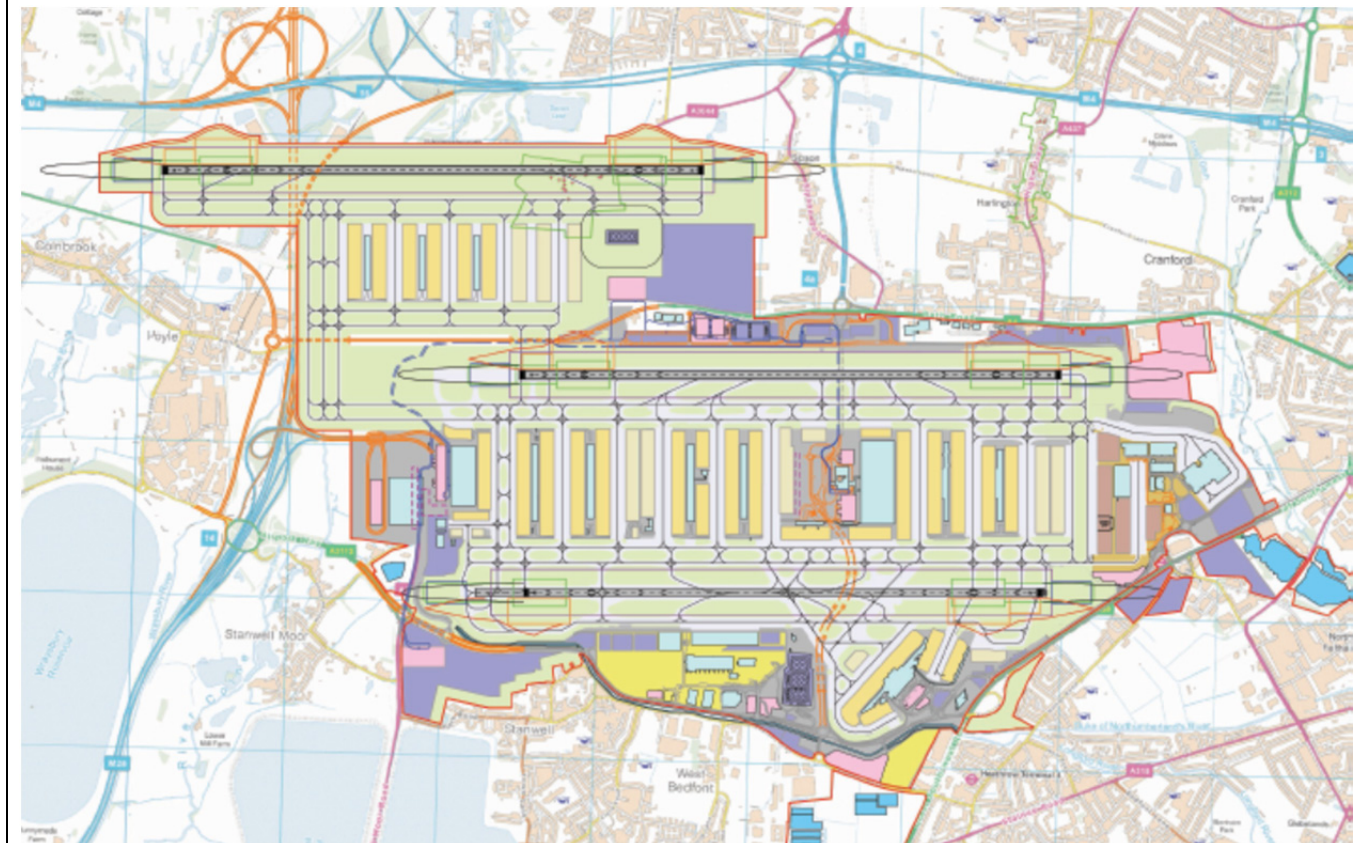


|                        |                                 |                       |            |
|------------------------|---------------------------------|-----------------------|------------|
| <b>PROPOSAL TITLE:</b> | <b>North-West Runway</b>        | <b>Group:</b>         | <b>LHR</b> |
| <b>SUBMITTED BY:</b>   | <b>Heathrow Airport Limited</b> | <b>Reference No.:</b> | <b>62</b>  |

## PROPOSAL

New 3,500m runway constructed to the north-west of the existing airport with linking taxiways to the west of the current north runway. The new runway could operate independently from the existing runways. Includes expansion of existing terminals plus new Terminal 6 immediately west of Terminal 5 serving new satellites and aprons located between the new and current northern runways. Requires tunnelling of the M25 under the new development, plus reconfiguration of the existing M4/M25 interchange.

The new runway is located to the west to reduce noise impact over London.



## ASSESSMENT SUMMARY

| STRATEGIC FIT / ECONOMY / OPERATIONS |                          |               |                              | ENVIRONMENT                             |   |  |
|--------------------------------------|--------------------------|---------------|------------------------------|---|---|--|
| Runways<br>(net increase)            | Passengers<br>(net mppa) | ATMs<br>(net) | London<br>Airports<br>Impact | 57 dBA Leq<br>2030 pop'n<br>with scheme | Listed Bldgs<br>Grades I&II*,<br>SM, CA, RP&G | Heritage &<br>Designations<br>Affected |
|                                      | 62                       | 370,000       | LHR ➡                        | 1,400                                   | 0   | SPA                                    |
|                                      | 60                       | 317,000       |                              | 2,500                                   | 3   | Ramsar                                 |
|                                      | 53                       | 268,000       | LGW ➡                        | 6,300                                   |   | SSSI                                   |
| ▶ 1 ◀                                | 46                       | ▶ 260,000 ◀   | STN ➡                        | 13,500                                  | ▶ 4 ◀   | Grade I                                |
|                                      | ▶ 40 ◀                   | 250,000       |                              | ▶ 142,600 ◀                             | 5   | Grade II*                              |
|                                      | 34                       | 222,500       | LTN ➡                        | 144,000                                 | 8   | Sched. Mon.                            |
|                                      | 30                       | 190,000       | LCY ➡                        | 144,600                                 | 14  |  |
|                                      |                          |               |                              | 180,900                                 |   |  |

| SURFACE ACCESS                     |                                 |                                 | COST / DELIVERY                       |                                       | PEOPLE               |                                |
|------------------------------------|---------------------------------|---------------------------------|---------------------------------------|---------------------------------------|----------------------|--------------------------------|
| 45 min<br>Population<br>(millions) | 1hr<br>Population<br>(millions) | 2hr<br>Population<br>(millions) | 2030 Risk-<br>Adjusted Total<br>(Ebn) | Aero Yield<br>(relative to<br>LHR Q6) | Houses<br>Demolished | IMD<br>(Average<br>within 5km) |
| 17                                 | 18                              | 38                              | 9-13                                  | 1.3x                                  | 200                  | 26                             |
| ▶ 14 ◀                             | ▶ 16 ◀                          | ▶ 36 ◀                          | 10-13                                 | ▶ 1.5x ◀                              | 260                  | ▶ 21 ◀                         |
|                                    |                                 |                                 | ▶ 13-18 ◀                             | 1.6x                                  | 720                  | 20                             |
| 10                                 | 14                              | 27                              | 16-22                                 | 2.4x                                  | 800                  | 19                             |
| 9                                  | 13                              | 25                              | 50-67                                 |                                       | 1,300                | 14                             |
|                                    |                                 |                                 | 82-112                                | 3.4x                                  | ▶ 1,500 ◀            | 8                              |
| 6                                  | 12                              | 20                              |                                       |                                       | 1,600                | 7                              |

|                        |                                 |                       |            |
|------------------------|---------------------------------|-----------------------|------------|
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| <b>SUBMITTED BY:</b>   | <b>Heathrow Airport Limited</b> | <b>Reference No.:</b> | <b>62</b>  |

## OVERVIEW

|                               |  |                        |                  |                       |   |                                  |                         |                            |                                  |
|-------------------------------|--|------------------------|------------------|-----------------------|---|----------------------------------|-------------------------|----------------------------|----------------------------------|
| <b>Approach</b>               | The proposer suggests enabling legislation 2015-2019 with construction commencing in 2019 with opening in 2026 following established regulated mechanism. Public support for surface access and other costs: property and noise compensation, and mitigation and flood and ecology impact mitigation, and the infrastructure costs of building over the M25.   |                        |                  |                       |   |                                  |                         |                            | <b>Opening Year</b><br>2026      |
| <b>Operational Viability</b>  | <b>Capacity</b>  |                        | <b>Airport</b>   | <b>Net</b>            | <b>Forecast Use of Maximum Capacity</b> |                                  |                         |                            |                                  |
|                               | <b>Runways</b>   |                        | 3                | 1                     | <b>2030</b>                             | <b>2050</b>                      |                         |                            |                                  |
|                               | <b>ATM</b>   |                        | 740,000          | 260,000               | 80%                                     | 100%                             |                         |                            |                                  |
|                               | <b>pax</b>   |                        | 130              | 40                    | 75%                                     | 98%                              |                         |                            |                                  |
| <b>Cost</b>                   | <b>£b</b>  | <b>Airport</b>         | <b>Access</b>    | <b>Other</b>          | <b>Total</b>                            | <b>Risk</b>                      | <b>OB</b>               | <b>Risk Adjusted Total</b> | <b>Promoter Estimate</b>         |
|                               | <b>2030</b>  | 5-6                    | 2-3              | ~1                    | 6-9                                     | 2-4                              | 4-5                     | 13-18                      | 16.9                             |
|                               | <b>2050</b>  | 7-9                    | 2-3              | ~1                    | 9-12                                    | 4-6                              | 6-8                     | 18-25                      |                                  |
| <b>Surface Access</b>         | <ul style="list-style-type: none"> <li>Based on a public transport mode share of 50% for pax (41% currently) and a 'sustainable modes' share of 40% for employees (30% currently). Primarily achieved by additional rail services. Rail provision includes current HEX; Crossrail, improved Piccadilly line; Western Rail Access Line (all committed); and the currently un-committed Southern Rail Access Line and HS2 spur schemes. These rail services have sufficient capacity to cope with the predicted airport-related demand.</li> <li>Local capacity improvements to M4 spur, J4A and airport tunnel.</li> <li>Some additional airport related traffic on M4 J4-J7 and M25 J10-J15; analysis suggests capacity enhancements are not due to this traffic alone.</li> </ul> |                        |                  |                       |   |                                  |                         | <b>Isochrone</b>           | <b>Pop<sup>n</sup> (million)</b> |
|                               |  |                        |                  |                       |   |                                  |                         | 45 min                     | 14                               |
|                               |  |                        |                  |                       |   |                                  |                         | 1 hr                       | 16                               |
|                               |  |                        |                  |                       |   |                                  |                         | 2 hr                       | 36                               |
|                               |  |                        |                  |                       |   |                                  |                         | London centre              | 15 miles                         |
| <b>Economic</b>               | <b>Borough</b>   | <b>Hillingdon</b>      | <b>Hounslow</b>  | <b>Ealing</b>         | <b>Slough</b>                           | <b>Spelthorne</b>                | <b>Runnymede</b>        | <b>Windsor</b>             |                                  |
| <b>Unemp<sup>nt</sup> (%)</b> | 7.9  | 7.5                    | 10.7             | 8.2                   | 4.4                                     | 4.3                              | 4.2                     |                            |                                  |
| <b>Ave. Salary (£/yr)</b>     | 31,086   | 29,323                 | 29,427           | 26,837                | 31,569                                  | 30,930                           | 37,705                  |                            |                                  |
| <b>County</b>                 | <b>Bucks</b>   | <b>Greater London</b>  | <b>Berkshire</b> | <b>Surrey</b>         |   |                                  |                         |                            |                                  |
| <b>GVA (£/cap)</b>            | 22,125   | 34,779                 | 31,057           | 25,432                |   |                                  |                         |                            |                                  |
| <b>Environment</b>            | <ul style="list-style-type: none"> <li>Slightly fewer people affected by noise compared to the other Heathrow options and fewer new people affected within 57 dBA L<sub>eq</sub> contour but this option offers less night time noise respite.</li> <li>Loss of 2 communities including Harmondsworth and Longford Conservation Areas and listed buildings including Grade I and II* buildings, with a greater direct impact on cultural heritage interest compared to the south-west Heathrow and Heathrow Hub options.</li> <li>No direct loss to water storage reservoirs and SPA/Ramsar designations.</li> <li>Loss of flood plain but much less than the south-west option and slightly less than other Heathrow options.</li> </ul>  |                        |                  |                       |   | <b>57 dBA L<sub>eq</sub></b>     |                         |                            |                                  |
|                               |  |                        |                  |                       |   | <b>2030 promoter impact</b>      | 196,000                 |                            |                                  |
|                               |  |                        |                  |                       |   | <b>2012 local</b>                | 239,600                 |                            |                                  |
|                               |  |                        |                  |                       |   | <b>2030 local - with scheme</b>  | 142,600                 |                            |                                  |
|                               |  |                        |                  |                       |   | <b>2030 Net Local Impact</b>     | (8,100)                 |                            |                                  |
|                               |  |                        |                  |                       |   | <b>2030 system - with scheme</b> | 237,600                 |                            |                                  |
|                               |  |                        |                  |                       |   | <b>2030 Net System Impact</b>    | (8,100)                 |                            |                                  |
|                               |  |                        |                  |                       |   | <b>55 L<sub>DEN</sub></b>        |                         |                            |                                  |
|                               |  |                        |                  |                       |   | <b>2030 promoter impact</b>      | 378,000                 |                            |                                  |
|                               |  |                        |                  |                       |   | <b>2030</b>                      | 380,900                 |                            |                                  |
|                               |  |                        |                  |                       |   | <b>50 L<sub>night</sub></b>      |                         |                            |                                  |
|                               |  |                        |                  |                       |   | <b>2030</b>                      | 170,500                 |                            |                                  |
|                               |  |                        |                  |                       |   | <b>N70</b>                       |                         |                            |                                  |
|                               |  |                        |                  |                       |   | <b>2030</b>                      | 101,100                 |                            |                                  |
|                               | <b>SAC<sup>1</sup></b>   | <b>SPA<sup>1</sup></b> | <b>Ramsar</b>    | <b>CA<sup>1</sup></b> | <b>AONB<sup>1</sup></b>                 | <b>SSSI<sup>1</sup></b>          | <b>Listed Buildings</b> | <b>SM<sup>1</sup></b>      |                                  |
|                               | -  | -                      | -                | 2                     | -                                       | -                                | 30                      | -                          |                                  |
| <b>People</b>                 |  |                        |                  |                       |   |                                  |                         | <b>IMD</b>                 | <b>Houses Lost</b>               |
|                               |  |                        |                  |                       |   |                                  |                         | 21                         | 1,500                            |
| <b>Delivery</b>               |  |                        |                  |                       |   | <b>Aero Yield Increase</b>       | <b>Airport Only</b>     | <b>Including Access</b>    |                                  |
|                               |  |                        |                  |                       |   | <b>Indexation</b>                | ~15%                    | ~20%                       |                                  |
|                               |  |                        |                  |                       |   | <b>No indexation</b>             | ~45%                    | ~55%                       |                                  |

<sup>1</sup> SAC: Special Areas of Conservation; SPA: Special Protection Areas; CA: Conservation Area; AONB: Area of Outstanding Natural Beauty; SSSI: Site of Special Scientific Interest; SM: Scheduled Monument.

|                        |                                 |                       |            |
|------------------------|---------------------------------|-----------------------|------------|
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## ECONOMY

|                           |                   |                       |                  |               |                   |                |                  |
|---------------------------|-------------------|-----------------------|------------------|---------------|-------------------|----------------|------------------|
| <b>Borough</b>            | <b>Hillingdon</b> | <b>Hounslow</b>       | <b>Ealing</b>    | <b>Slough</b> | <b>Spelthorne</b> | <b>Windsor</b> | <b>Runnymede</b> |
| <b>Unemployment (%)</b>   | 7.9               | 7.5                   | 10.7             | 8.2           | 4.4               | 4.2            | 4.3              |
| <b>Ave. Salary (£/yr)</b> | 31,086            | 29,323                | 29,427           | 26,837        | 31,569            | 37,705         | 30,930           |
| <b>County</b>             | <b>Bucks</b>      | <b>Greater London</b> | <b>Berkshire</b> | <b>Surrey</b> |                   |                |                  |
| <b>GVA (£/capita)</b>     | 22,125            | 34,779                | 31,057           | 25,432        |                   |                |                  |

### Impact on Industry

Adding a third runway at Heathrow would provide sufficient capacity for the airport to meet expected medium term forecast demand through to the late 2030's, allowing more services with reduced delays due to improved resilience. This would support growth of aviation, tourism, logistics and related support businesses, and contribute to the agglomeration impacts of industry clustered in the Thames Valley/M4 corridor. It would allow significant expansion of airlines based at Heathrow, and a significant improvement in connectivity to a wide range of long haul destinations, Europe and in connecting other parts of the UK to long haul destinations. It is likely to help increase the share of airline traffic carried by UK based network carriers.

|                   |  |
|-------------------|--|
| <b>Airports</b>   | Adding a third runway at Heathrow would provide a capacity increase of 260,000 to the existing 480,000 ATM fully segregated operation at Heathrow. The competition dynamic in the London airport system would change. Heathrow could be expected to attract a proportion of traffic from Gatwick. A fourth runway option could be preserved. The north-west and Heathrow Hub options, unlike the south-west, allow for development of a fourth runway without either development of a completely new site or relocation of any of the existing runways.  |
| <b>Airlines</b>   | Airlines currently using Heathrow and others seeking to use it would benefit from the increase in capacity to offer more services, with reduced delays due to greater resilience. Airlines would continue to have the same choices of airports as at present. Some network traffic may transfer from Gatwick because of the greater interlining opportunities, freeing capacity at Gatwick potentially increasing airport choice for LCCs and charter airlines. Competition among carriers is likely to increase at the airport and UK airline operations (British Airways and Virgin Atlantic in particular) would be much less constrained in their ability to compete with major network carriers at airports with more capacity (e.g. Air France/KLM at Charles De Gaulle and Schiphol, Lufthansa at Frankfurt and Munich, and Emirates and Etihad at Dubai and Abu Dhabi respectively). |
| <b>Passengers</b> | Passengers would benefit from increased capacity due to delay reductions and a greater choice of destinations/enhanced frequencies and increased competition, reducing travel times and fares.   |

### Local & Regional Economic Impacts

The new expanded airport would facilitate growth of new and existing industries in airport and aviation support services and travel, tourism, logistics and other related sectors, to service growth in passenger and freight demand. Almost all would be able to continue serving customers of the airport from their existing position on the M4 corridor. This proposal would support agglomeration in the Thames Valley/M4 corridor, given its proximity to existing commercial developments supported by Heathrow. The scale of direct and indirect employment would be in proportion to the numbers of additional passengers. Direct, indirect and induced employment effects would be in the immediate vicinity and along key corridors to Heathrow.

### National Economic Impacts

The main national economic impacts come from the provision of new capacity, enabling more flights and connectivity, and the increase in business and leisure trips, and trade in goods and services, and indirect effects on inward investment. Increased choices of flights and airlines, reducing air travel time and possibly fares, should generate significant consumer/welfare benefits.

|                        |                                 |                       |            |
|------------------------|---------------------------------|-----------------------|------------|
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## SURFACE ACCESS

| Time/Distance to Central London   | Isochrone pop <sup>n</sup> (million) | Key required upgrade schemes (above those already committed) |
|---|--------------------------------------|--|
| Paddington 15 mins (by rail)  | 45 min 14                            | ▪ Southern rail access line.                                 |
| Docklands 40 mins (by rail)   |                                      | ▪ M4/M4A junction improvements.                              |
| 15 miles  |                                      | ▪ M25 tunnelling under the new development.                  |
| Journey times to other population centre  | 60 min 16                            | ▪ HS2 Spur.  |
| Birmingham 50 mins  | 120 min 36                           |  |
| Manchester 70 mins  |                                      |  |
| <b>Modal Split Assumptions</b>  |                                      |  |
| Currently 41% of passengers use public transport modes to access Heathrow: 18% using the underground, 13% bus/coach and 10% rail. The surface access strategy is based on increasing the public transport mode share of passengers to 50% in 2031. This is a realistic assumption, given the significant planned improvements in rail services. The schemes should increase the current combined rail/underground mode split from 28% to around 35%, and further improvements to bus services for areas not well served by rail should increase the bus/coach rail share from 13% to around 15%. Furthermore, changes to road traffic unrelated to the airport would increase congestion and make access by road less attractive. Currently, 35% of employees use “sustainable modes” to access the airport. The target is to increase this to 40%, building on the continuous reduction in the car driver mode share for airport staff, (dropped from 79% in 1991 to 59% in 2011). This target to be achieved by public transport service improvements and staff incentives in line with suggestions from HAL (e.g. 75% off Heathrow Connect), and reduced staff car parking supply, with greater priority given to car sharers in the issuing of staff parking permits.   |                                      |  |
| <b>Rail Infrastructure Capacity Analysis</b>  |                                      |  |
| Peak hour one-directional rail flows to/from LHR on a ‘busy day’ in 2031 estimated to be ~3,500 passengers per hour in the peak direction (pphpd). Based on the current geographic distribution of airport-related rail trips estimated one-way peak hour airport-related demand (pphpd), as follows: HEX (900), Crossrail (1,100), Piccadilly Line (600), Western Rail Access Link (300); and Southern Rail Access Link (500). Estimated volume/capacity (v/c) ratios for airport-related demand on the services as follows: Overall (0.15); HEX (0.30); Crossrail (0.35); Piccadilly Line (0.05); Western Rail Access Link (0.20) and Southern Rail Access Link (0.70). Whereas HEX would only be used by airport-related demand, the other services would be used by both airport-related and other (commuter and leisure) demand. Appears reasonable that the level of overall demand taken up by airport-related trips (30%) provides sufficient capacity for other commuter and leisure trips and thus we conclude that the provision of rail lines and services as specified is sufficient to accommodate LHR surface access demand in 2030.   |                                      |  |
| <b>Highways Capacity Analysis</b>   |                                      |  |
| The air passenger road-based mode share is predicted to reduce from 59% in 2011 to 50% in 2031, and the proportion of employees driving (single occupancy) is predicted to reduce from 61% in 2011 to less than 50% in 2031 (due to the measures discussed in the section below). We conclude that the increase in air passengers more than outweighs the reduction in car-based mode shares, and that there would be some additional airport-related traffic on the road network in 2031. This conflicts with the analysis of the promoter who stated that it is possible to deliver a third runway without airport-related traffic on the roads, partly as they assumed significant reductions in ‘kiss and fly’ and taxi surface access movements that we are unable to validate. As above, based on the current geographic distribution of airport-related car trips and estimated v/c ratios on each motorway link, capacity improvements are required at the central terminal area end of the airport tunnel to dissipate the traffic, and on junction 4A of the motorway spur. Peak hour, peak direction (phpd) airport-related flows to the airport of around 400 vehicles are predicted on the M4 between junctions 7 and 4 and on the M25 between junctions 10 and 15. However, our initial analysis suggests that on the M4 the total flows on this section would be below capacity and on the M25 the over capacity section (junctions 10-12) would be over capacity due to background traffic and not airport-related traffic. Over a wider area, airport-related traffic dissipates quickly to less than 200 vehicles phpd on any link. Therefore, it seems that beyond the local M4 access roads, the local motorway network could cope with the additional airport-related car demand, or is over capacity even without it. |                                      |  |
| <b>Accessibility to Population &amp; Business centres</b>   |                                      |  |
| Heathrow is well located in relation to the strategic highway network, with direct access from the M25 and M4, as well as being within 10 miles of the M3 and M40. 6 of the 16 million people within a 60 minute journey time have a public transport option. Reasonable, albeit regularly congested highway connections exist towards west and central London and towards north London. Heathrow is currently connected to Central London by the Heathrow Express (taking 15 minutes), Heathrow Connect (25 minutes) and the Piccadilly Line (45-60 minutes). Crossrail and the Piccadilly Line upgrade would considerably improve access to central London, as well as Canary Wharf and other locations to the east and north-east. The Western Rail Link would improve rail connections to Reading, the wider Thames Valley, Bristol and Wales, whilst the proposed Southern Rail Access would improve connectivity to south, south-west London, Surrey and the South Coast.   |                                      |  |

|  |                                 |                       |            |
|--|---------------------------------|-----------------------|------------|
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| <b>Accessibility to Transport Interchanges</b><br>Key transport interchanges directly served by existing and proposed rail services include: Paddington; Bond Street; Tottenham Court Road; Canary Wharf; Stratford; Old Oak Common and Reading. A HS2 Heathrow Spur would enable direct services to Birmingham, Leeds, Manchester, Nottingham, Edinburgh and Glasgow, with rail journey time savings of between 80 and 120 minutes, compared to today's journey times (partly by removing the need for a trip into central London). The Piccadilly line connects Heathrow to Kings Cross and St Pancras Stations.   |                                 |                       |            |
| <b>Accessibility to Workforce</b><br>Currently most of the workforce is located locally, with Hounslow, Hillingdon and Ealing, and the District of Slough having the highest numbers of workers. The catchment area is expected to increase, with improvements to rail and bus services.   |                                 |                       |            |
| <b>Demand Management Assumptions</b><br>The following demand management measures identified by the proposer are suggested to influence travel behaviour to meet the mode choice targets: new and improved bus/coach routes, doubling the frequency of existing services and targeting new routes to key catchment areas such as Portsmouth, Southampton, Brighton, Luton and high Wycombe; real time information and journey planning tools to raise awareness of travel choices to passengers and influence travel behaviour; systems and incentives to encourage more efficient taxi use; improvements to the cycle network and further development of the Heathrow Cycle Hub to offer incentives and support to cyclists using the airport; and collaboration with freight operators to deliver further consolidation of freight movements. |                                 |                       |            |



|                        |                                 |                       |            |
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## ENVIRONMENT

|                      |  |                        |   |                             |
|----------------------|--|------------------------|---|-----------------------------|
| Overall noise impact | HAL state that 196,000 people would be within airport 57 LA <sub>eq</sub> contour 15% less than currently affected (2011). | 57 dBA L <sub>eq</sub> | 2030 promoter stated impact                                       | 196,000                     |
|                      |  |                        | 2012 local  | 239,600                     |
|                      |  |                        | 2030 local - without scheme                                       | 150,700                     |
|                      |  |                        | 2030 local - with scheme  | 142,600                     |
|                      |  |                        | 2012-2030 Local Impact with scheme                                | (97,000)                    |
|                      |  |                        | 2030 Net Local Impact   | (8,100)                     |
|                      |  |                        | 2012 system   | 269,250                     |
|                      |  |                        | 2030 system - without scheme                                      | 245,700                     |
|                      |  |                        | 2030 system - with scheme   | 237,600                     |
|                      |  |                        | 2012-2030 system impact with scheme                               | (31,650)                    |
|                      |  |                        | 2030 Net System* Impact   | (8,100)                     |
|                      |  |                        | 2030 population within 2012 and 2030 57 L <sub>eq</sub> contour   | 107,700                     |
|                      |  |                        | 2030 additional population within 2030 57 L <sub>eq</sub> contour | 34,800                      |
|                      |  |                        | 55 L <sub>DEN</sub>   | 2030 promoter stated impact |
|                      |  |                        |   | 2030                        |
|                      |  | 50 L <sub>night</sub>  | 2030  |                             |
|                      |  | N70                    | 2030  |                             |
|                      |  |                        | 101,100   |                             |
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### Air Quality

Heathrow is located in the southern part of the Hillingdon AQMA with exceedences for NO<sub>2</sub> predominately at residential properties close to heavily trafficked roads. Promoter proposes in mitigation to maximise public transport use and restrict access to Low emission vehicles only and to work with partners in surrounding areas to ensure air quality limits are not breached. HAL also states that additional capacity can be delivered at Heathrow whilst meeting air quality standards. HAL's analysis is based on modelled results and assumptions for:

- 2030 with 570,000 ATMs and for 2040 with 740,000 ATMs and expected improved standards and aircraft fleet for 2030; and
- Improvements in road vehicle emissions and assuming an increased use of passenger public transport to 50%. Airside emission assumptions include increased use of low emission vehicles.

These assumptions are considered not unreasonable but it should be noted that transport analysis indicates an overall increase in airport related traffic on the road network even accounting for reduction in car-based mode share. No significant difference between Heathrow runway options for meeting air quality standards: all options are partly within 3 AQMAs for Hillingdon, Hounslow and Spelthorne.

### Noise

Proposer sets out mitigation of noise:

- Current restrictions on night flights to continue.
- Potential for further operational mitigation in use of runways. Full packages for compensation/mitigation for new and increased noise exposure.
- With same restrictions on night flights and use of just one runway for small number of night flights - could operate to provide respite to residents through runway alternation. (NB Respite achievable with three runways generally averages to 33% of the time, compared with 50% of the time now).

HAL also suggests that population within 57 dB L<sub>eq</sub> will be reduced by 15% compared to 231,000 people affected currently. It is considered likely that continued efficiency improvements in aircraft engine and airframe technology would result in quieter aircraft which would off-set the increase in ATMs. Although there is an overall reduction in the number of people affected in 2030 compared to 2012, the population affected would change including communities not currently experiencing noise nuisance, whilst some would experience an increase in noise and others a reduction in noise.

**2030 Forecast:** Independent noise modelling for comparison provided the following results based on 2030 forecast population distribution (adjusted for housing demolished), forecast aircraft mix appropriate for the number of aircraft movements, passenger load and reflecting respite potential in the proposal:

- 57dBA L<sub>eq</sub>: 142,600 people affected of which 107,700 are currently affected at this level and 34,800 would be brought into this noise contour - the smallest population affected within this contour compared to all options at Heathrow.
- 55 L<sub>DEN</sub>: 380,900 people affected – fewer than the south-west and 4 runway options but more than the Heathrow Hub option.
- 50 L<sub>night</sub>: 170,500 people affected – affecting the largest population of all the options at Heathrow.
- N70: 101,100 people affected at the 50 event contour, the fewest of the all the Heathrow options, but significantly

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|------------------------|---------------------------------|-----------------------|------------|
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more than Gatwick+1 (5,100 people), Stansted+1 (4,000) Stansted +4 (11,900) and Isle of Grain 4 (900).

The difference between the promoter's figures and the independent analysis is due to a combination of different assumptions for aircraft mix, flight paths and population data.

**2050 Forecast:** From 2030 to 2050 ATMs are expected to increase by around 25% potentially leading to an increase of about 1.2dB in overall noise levels, which would affect all contours equally. However, assuming no further change to the aircraft mix it is considered likely that improvements in aircraft technology would result in quieter aircraft which would off-set this increase. Even without a change to measured noise levels however there is potential for increased nuisance to residents from the increased number of flights passing overhead.

**Net noise:** The net reduction in noise exposure for 142,600 in 2030 compared to 239,600 affected in 2012 is largely due to improved aircraft technology. With continued Heathrow 2 runway operations, by 2030 the affected population would have reduced to 150,700; the north-west option thus offers a further reduction of 8,100 people exposed at the 57dB level whilst increasing capacity.

#### Designations

##### Ecology:

- No direct loss to international (SPA, SAC, Ramsar) or national (SSSI) sites.
- 1 SPA/Ramsar site (the South West London Water Bodies complex) located within 2km of the airport with potential for indirect effects; this option would therefore still need Habitats Regulations Assessment. Given existing airport proximity this is not expected to be as significant as the direct loss associated with the south-west Heathrow option or the boundary impact with the Heathrow Hub option.

##### Cultural Heritage:

- Loss of Harmondsworth, a large part of which is designated as Conservation Area, and listed buildings in Longworth Conservation Area. A total of around 30 listed buildings may be lost.
- The Great Tithe Barn, a Grade I listed building, and St Mary's Church, a Grade II\* listed building, would both be lost.
- This north-west runway has a greater direct impact on historic buildings than the south-west and Heathrow Hub options. All options would affect the setting for surrounding cultural heritage features.
- HAL note they would examine the potential to retain the listed buildings but difficult to see how this would be possible without major realignment of the runway. Mitigation maybe limited to relocation of the Grade I and II\* buildings although this removes them from their original setting.

##### Landscape and Townscape:

- No national landscape designations affected.

#### Climate Change

**Operation:** HAL State that a third runway is consistent with meeting UK's legally binding climate change targets. This is the same for all Heathrow runway options and all hub options. Increased efficiency of aircraft movements (in air, on ground) would improve carbon efficiency per ATM / PAX than current operations.

**Construction and demolition:** North-west option includes M25 tunnel diversion. Construction related carbon emissions are indicated as 0.80Mt in a central estimate based on runway, taxiway and terminal build. This is lower than new hub construction, and is slightly higher than one new runway at Gatwick and lower than one new runway at Stansted.

#### Other Issues

##### Water Resources and Flood Risk:

- Flood plain (flood zones 2 & 3) loss totalling 19% of the airport area (i.e. 370ha).
- The runway cuts across part of the flood plain with loss (according to the proposer) of 116,000m<sup>2</sup> flood zone 3 storage area, but much less than the loss with the south-west option and also without flood conveyance obstruction and loss of flood diversion channel (similar to the Heathrow Hub 3<sup>rd</sup> runway and Heathrow 4<sup>th</sup> runway).
- No water supply storage impact as Wraysbury Reservoir (impacted by south-west option) can be retained.
- Approximately 0.5Mm<sup>3</sup> of flood compensation storage would be required to be provided in addition to significant drainage attenuation.

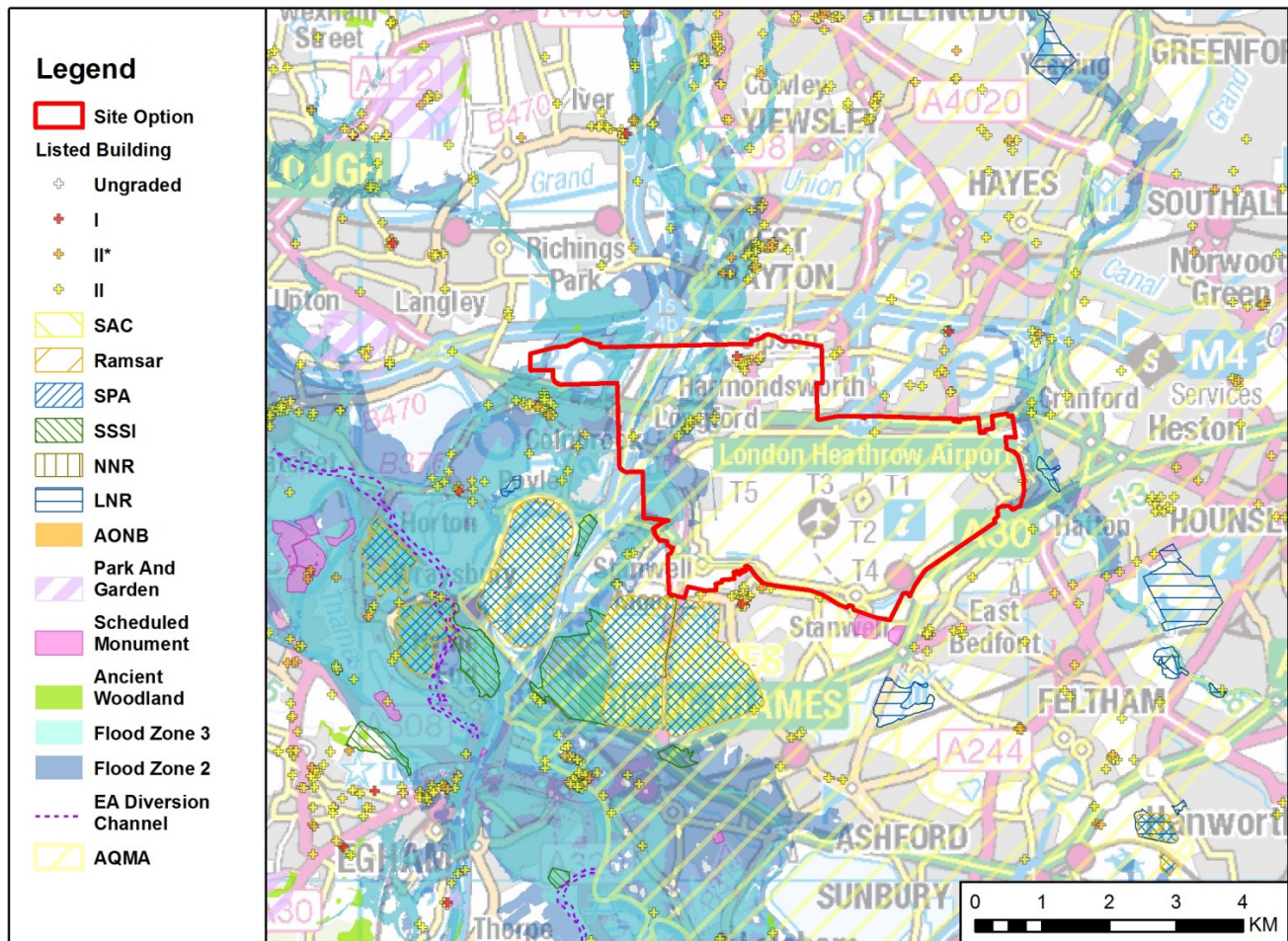
##### Land Use and Development:

- Greenbelt losses and open space recreational amenity losses including Harmondsworth Moor Country Park located on a restored landfill site.
- Loss of over 300ha of Grade 1 and 2 (best and most versatile) agricultural land.
- Approximately 400 ha of greenfield land would be lost; a smaller area of undeveloped land compared to all the other options except for Heathrow Hub and south-west options. This may include loss of some local landscape and cultural heritage features, hedgerows, protected species habitat, footpaths and archaeological interest.
- Landfill sites within runway footprint (may require relocation).
- Loss of Old Lane Sewage treatment works.
- Loss of Harmondsworth cemetery.

##### Surface Access Improvements:

Potential impacts related to all access improvements including Southern Rail access, M25/4 junction improvements and M25/M4 tunnelling under proposed development area.

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|-----------------|--------------------------|----------------|-----|
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## PEOPLE

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|---|---------------------------------------|
| <p><b>Housing</b></p> <p>Housing within Longford and Harmondsworth would need to be demolished. Sipson, Harlington, Cranford Cross, Colnbrook and Poyle communities likely able to be retained.</p> <ul style="list-style-type: none"> <li>A slightly greater number of residential properties would be lost for the north-west option compared to south-west and Heathrow Hub options.</li> <li>Along with the increase in employment opportunities, all options at Heathrow are likely to add to housing pressure in the region.</li> </ul>   | <p><b>Demolished</b></p> <p>1,500</p> |
| <p><b>Vulnerable Groups</b></p> <ul style="list-style-type: none"> <li>The Index of Multiple Deprivation (IMD) averaged within 5km of the airport, is 20.8: a greater proportion of the population around Heathrow is affected by deprivation compared to areas around Stansted (7.5) and Gatwick (14.4), but a smaller proportion than around the Isle of Grain (26.1). The north-west option is marginally higher than for the south-west (19.1) and Heathrow Hub (18.7) options.</li> <li>The area around Heathrow is more densely populated than the area around Gatwick, Stansted or the Isle of Grain and the numbers of people within more vulnerable groups such as elderly and children are likely correspondingly greater. There are also 4 schools located within the footprint.</li> <li>Vulnerable groups may be more sensitive to the negative effects of aircraft noise. However, some vulnerable groups may also benefit from economic opportunities from airport expansion.</li> <li>This option would result in the loss of Longworth and Harmondsworth as communities and of the Heathrow Special Needs Farm.</li> </ul> |                                       |



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| <b>Quality of Life and Health</b> <ul style="list-style-type: none"> <li>Approximately 129,600 and 510,800 people located within 2km and 5km respectively of the airport.</li> <li>Scheme affects an area between M4/M25 junction and existing airport and therefore further impacts an area already heavily affected by major transport infrastructure compared to other schemes.</li> <li>Population noise impact for 57 L<sub>eq</sub> lower than for other Heathrow options. Option offers less respite from night time noise than the other options.</li> <li>Additional impacts from increase in aircraft noise affecting both new populations and currently affected populations.</li> <li>Less open space lost than for other Heathrow options and reduced severance effects for surrounding communities.</li> <li>All the Heathrow options cause a smaller loss of open space/greenfield than the Stansted and Isle of Grain options.</li> </ul> |                                 |                       |            |
| <b>Wider Social Impacts</b><br>Maintains and adds to employment opportunities in the region with related opportunity and access benefits.   |                                 |                       |            |

## COST

|  |                            |             |             |
|--|----------------------------|-------------|-------------|
| <b>Capital Cost</b>  | <b>£ bn</b>                | <b>2030</b> | <b>2050</b> |
| 2050 airport cost includes construction of additional terminal and airfield infrastructure to accommodate increase in demand.  | <b>Airport</b>             | 5 - 6       | 7 - 9       |
|  | <b>Access</b>              | 2 - 3       | 2 - 3       |
| Promoter estimates £16.9bn.  | <b>Other</b>               | ~1          | ~1          |
|  | <b>Total</b>               | 6 - 9       | 9 - 12      |
|  | <b>Risk</b>                | 2 - 4       | 4 - 5       |
|  | <b>Optimism Bias</b>       | 4 - 6       | 6 - 8       |
|  | <b>Risk Adjusted Total</b> | 13 - 18     | 18 - 25     |
| <b>Key Risks</b> <ul style="list-style-type: none"> <li>Tunnelling for rail and road links including M25</li> <li>Location and provision of compensatory flood areas.</li> <li>Construction in area currently occupied by reservoirs.</li> <li>Construction over the M25 and adjacent to the M25/M4 interchange.</li> <li>Construction adjacent to and in line with the existing northern runway.</li> </ul>   |                            |             |             |
| <b>Risk and Contingency Allowances</b><br>40% contingency applied to all costs. 50% optimism bias applied.   |                            |             |             |
| <b>Surface Access Costs</b><br>Surface access strategy based upon modifying motorway layouts, capacity improvements of motorway junctions, capacity upgrades to existing central terminal area tunnel and new rail link to the South West of the airport at Staines. Assumes that a new rail connection to the north of the airport, upgrade of the Piccadilly underground line and HS2 high speed rail connection are schemes that would be funded by others.<br><br>Infrastructure investment to 2030 along with wider transport infrastructure upgrades, currently unknown, is expected to accommodate the increase in passenger demand at the airport to 2050. |                            |             |             |
| <b>Other Off-Airport Costs</b><br>Significant levels of mitigation and/or compensation required to ensure Water Framework Directive and flood risk storage requirements are met. This includes mitigation measures for compensatory lost flood storage and habitat provision.  |                            |             |             |

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## OPERATIONAL VIABILITY

| Capacity  | Net     | Airport | Net     | Forecast Usage of Maximum Capacity |      |
|---|---------|---------|---------|------------------------------------|------|
| Increase to existing airport capacity and enabling operations to be conducted in a more resilient manner.   | Runways | 3       | 1       | 2030                               | 2050 |
|   | ATM     | 740,000 | 260,000 | 80%                                | 100% |
|   | pax     | 130     | 40      | 75%                                | 98%  |
| <b>Resilience, Reliability and Efficiency</b><br><p>The proposal supports independent parallel approaches; however, capacity has been constrained to limit noise impacts. This reduction in capacity would also improve resilience over current operations.</p> <p>Transfer between terminal zones may exceed times acceptable to airlines; however, we would anticipate that airlines alliances would co-locate within a terminal zone reducing the impact of lengthier inter-terminal zone transfer times.</p>  |         |         |         |                                    |      |
| <b>Safety</b><br><p>The proposal could be designed to comply with safety requirements. The proposal increases the number of flights over central London.</p>  |         |         |         |                                    |      |
| <b>Scalability</b><br><p>This option of the three presented by Heathrow Airport is the only proposal that allows for development of a fourth runway without either development of a completely new site or relocation of any of the existing runways. Such a fourth runway, to the north of this third runway, however would require displacement of the M25/M4 interchange. Conversely, a fourth runway could be delivered by adopting the south-west runway option, although this would establish a third operational centre remote from the two that would exist at that time.</p> |         |         |         |                                    |      |
| <b>Airspace</b><br><p>The proposal would not require significant airspace redesign. The boundaries of the London terminal manoeuvring area (LTMA) would be amended and Heathrow's SIDs, STARS and interfaces with en route airspace would be amended to include the additional runway. However, given the long-term nature of the options and the likely airspace and air traffic management developments under SESAR, restructuring could be achieved as part of the on-going development process. There would not need to be any change of international boundaries.</p>            |         |         |         |                                    |      |

## DELIVERY

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|---|
| <b>Timescale</b><br><p>Proposer claims open in 2026, with public policy in place 2015 to 2019, which seems a reasonable timetable.</p>  |
| <b>Commercial Deliverability</b><br><p>Independent high level assessment suggests that, to meet the full debt requirement, aero yield may have to be increased by between ~15% and 20% and indexed at 2.5% per annum thereafter, depending upon the level of contribution to surface access costs. Alternatively, without indexation, an increase of between ~45% and 55% may be required.</p> <p>Aeronautical yield index relative to Heathrow Q6 to breakeven: 1.5.</p> <p>The borrowing requirement is large and above precedent for finance to be raised in the context of a wholly privately funded, single transaction. Bond issuance under a RAB model might be possible for the on-airport-only works, although there might be investor concerns about investment concentration in a single asset. Likely therefore that there would need to be an element of Government support.</p> |