

Heathrow Expansion

Updated scheme design -

**Executive summary of submission to the Airports Commission
by Runway Innovations Ltd and Heathrow Hub Ltd**

May 2014



FOREWORD

By any measure, Heathrow is one of Britain's world class assets. It is the airport of choice for both passengers and airlines in the UK. Connectivity and flight schedule frequency are unrivalled in Europe and Heathrow has not only retained high quality airlines over time but continues to attract new entrants, often requiring a significant financial investment to secure scarce slots.

Heathrow's continued success is crucial to London, the south-east and the UK economy as a whole – it is the natural location for new capacity.

In recent years Heathrow airport has invested heavily in terminals and infrastructure and is well prepared for the future. These capital costs have been readily absorbed by the structure of user charges from close to 500,000 annual aircraft movements on long-haul, business and leisure routes. As a result the airport now enjoys the combination of a large asset base and high passenger and cargo revenues. These factors, combined with pent-up demand from existing airlines and probable new entrants, mean that sensitivity to predicted passenger growth numbers is low. Heathrow's unique benefits also ensure that future funding costs will have a proportionately lower impact on user charges when compared to Gatwick.

Unlike most transport projects, substantial investment at Heathrow can be undertaken by the private sector at low finance costs, with institutional investors demonstrating exceptionally high confidence in the continued success of the airport.

The Runway Innovations proposal for additional runway capacity is the simplest of the concepts being considered by the Airports Commission. Our analysis suggests it has greater and more secure economic benefits, is innovative and is lower risk than alternatives. The operation provides an increase in runway capacity, is safe and can be accommodated by the Air Traffic Control provider. The scheme also gives significant improvements in public transport and surface access and construction can be phased to match demand growth.

The land take required for implementation of the plans is small. This not only reduces costs but also minimises the loss of existing residential properties.

The Heathrow Hub proposal for a new rail interchange and transit link to existing terminals is expected to result in significant modal shift of passengers to public transport while the proposed road layout will reduce congestion on the M25. The resulting improvements in air quality will be complemented by other infrastructure developments and improvements, including flood prevention measures, providing a comprehensive package of environmental benefits.

Noise is an inevitable consideration when planning a new runway, and we have given this particular attention. The extended runway will keep the same approach flight paths resulting in no new communities exposed to noise. The use of modern aircraft navigation systems and noise mitigation methods are incorporated in the proposal and a solution is offered to the most troubling concern of early morning noise pollution. These suggestions, in co-operation with Air Traffic Control, will help to reduce aviation noise. The mandatory introduction of modern aircraft types will have a beneficial positive effect and this will be accelerated by the opening of additional slots at Heathrow. Some runway alternation will still be possible and resilience will be improved allowing quicker recovery from disruption.

Politically the privately-funded Runway Innovations proposal is the most deliverable of the short-listed airport expansion options. Jobs are protected and created, local, regional and national economic benefits are substantial and consistent with policy and development strategies, community impacts are relatively modest and can be mitigated, and aircraft noise impacts compare well with the other Heathrow scheme.

Runway Innovations and Heathrow Hub, with their professional consultants will continue to supply data as it becomes available in the coming weeks. Meanwhile we respectfully offer the following submission for consideration by the Airports Commission.

Runway Innovations Ltd and Heathrow Hub Ltd

May 2014

EXECUTIVE SUMMARY

Introduction

This executive summary presents details of Runway Innovations Limited (RIL) and Heathrow Hub Limited's (HHL) further proposals and analysis structured around our response to the Airport Commission's Phase 2 objectives¹. Details of which sections of the main report cover each objective are presented in Section 1, Table 1.1 in our main report.

The consultant team appointed by RIL and HHL and responsible for the technical development and analysis of the proposals includes;

- URS – Lead consultant, airport engineering, highways, baggage and transit system design, environmental assessment, and economic appraisal
- Helios – Airport safety and operations
- Think Aero – ATC and airspace
- Aviation Economics – Airline and airport economics
- High Point Economics – Economic regulation
- RDC Aviation – Aviation market assessment
- First Class Partnerships – Rail demand modelling
- Oxford Rail Strategies – Rail operations
- Peter Brett Associates – Rail engineering
- Gardiner & Theobald – Cost consultant
- Maitland – Public affairs
- Quatro – Community engagement
- Guller & Guller – Masterplanning.

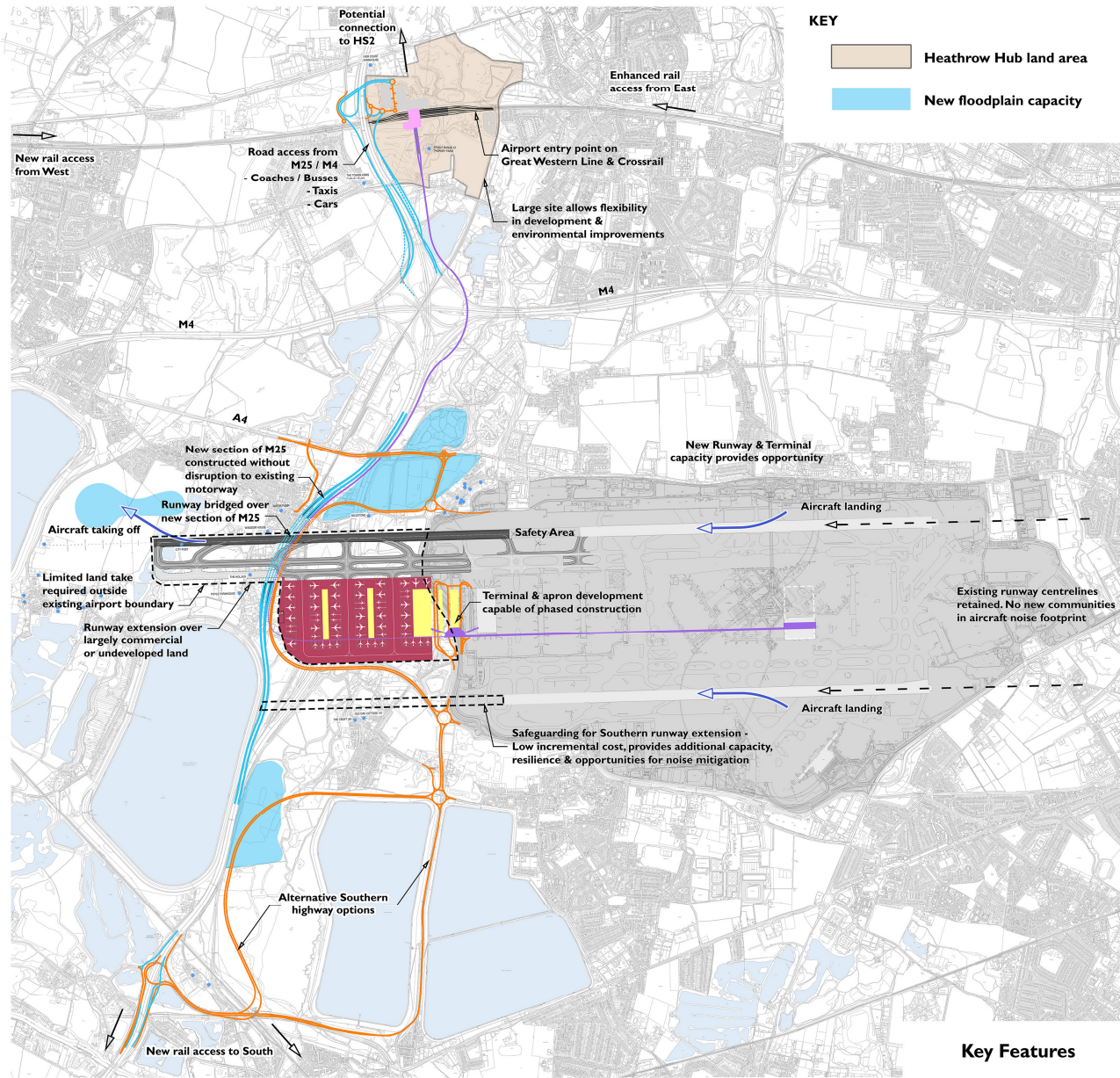
Key Benefits of the Proposals

Key benefits are summarised in **Figure E1** and include:

- Expansion where there is proven demand from passengers and airlines
- New runway capacity maintains existing runway centrelines, no new people in noise footprint
- Innovative but safe and low risk runway design
- Operational measures reduce noise and improve respite under existing flight paths
- Reduces, and potentially removes, noise impacts from early morning arrivals
- Highly efficient airport layout with affordable user charges to meet needs of all airline models
- Opportunity if needed, to introduce competition into some passenger handling facilities
- Low finance cost/risk due to proven airline demand and Heathrow's world class catchment
- Lower incremental cost of expansion, building on passenger numbers and historic investment in Regulatory Asset Base (RAB) and with flexibility in phased development
- Extendable at low incremental cost to provide fourth runway for additional capacity/resilience/noise mitigation
- Lower risk than alternatives reliant on single, highly uncertain structural changes in airline economics and decision making
- Integrated surface access strategy, improved rail access reduces road congestion, enhances the passenger experience and assists in meeting local air quality targets
- Deliverable without significant disruption to M25 or other existing infrastructure during construction
- Less land take and property acquisition, no destruction of local communities
- Integrated package of environmental improvements/mitigation
- Early completion date compared to alternatives.

¹ In places we have modified the order in which these objectives are covered to fit with the sequence of points we make.

Figure E1 Runway Innovation Limited Proposals: Key Features



The Proposition

Third Runway and Airport Capacity

Our proposition is the development of additional runway capacity by extending the existing Heathrow northern runway to the west to create two in-line runways separated by an intermediate safety zone, more than double the length required by international regulations. This configuration allows simultaneous landings on one runway and take-offs on the other in normal operations. In addition the southern runway will continue to be used for a mixture of take-offs and landings. The runways can be operated together in a number of modes and a number of operating methods have been identified to limit the impacts on surrounding communities. As part of a phased approach to development additional terminal capacity will also be provided when demand requires.

This proposition has been developed to provide a holistic solution to the key issues concerning development of additional runway capacity in the south east of England.

The scheme builds on the only hub airport within the United Kingdom – Heathrow Airport. This is to provide capacity where there is a clear demand from airlines, passengers and other users of aviation.

The proposal is based on an extension of the northern runway to the west to create two in-line runways each 3,000m long separated by a distance of 600m forming an intermediate safety area. The runway is provided with a full length parallel taxiway, which is required to support the use of the runway for deep landings where this operational mode is adopted (for example for early morning arrivals when there are few if any departures). There is a dual parallel taxiway to allow ground movement of aircraft to and from the apron area.

Airside support facilities include: a new satellite fire station to allow access to the runway ends within the stipulated times in the appropriate standards and recommended practices; additional airside substations to serve the new facilities; and the appropriate navigational and meteorological instruments together with the supporting airfield roads.

For the passenger processing area the approach has been to create a large coherent area within the constraints of the runway and highway layouts. This then provides the flexibility in layout to respond to developments within the aviation industry and its regulatory environment. Although there are a number of ways the apron and terminals could be arranged, at this stage a continuation of the existing approach has been indicated. The proposed facilities are of a similar scale to the existing Terminal 5 (T5) development and therefore sufficient space is available for the 35-45 million passengers per annum (mppa) capacity required at the planning horizon assuming similar capacities and levels of services as T5. This concept is based on large terminal buildings to support a coherent group of airlines supported by a toast rack of satellite piers to deliver passengers to aircraft. The concept shown is consistent with the approach that Heathrow Airport Limited (HAL) has taken in recent years and shown within its 2 Runway Master Plan. This approach allows for high capacity surface access modes to serve the terminals.

A development of this nature would create a base for a large airline alliance to provide the interconnectivity that supports the connections possible within the hub model of airports. The facilities would be designed to provide a suitable experience for passengers and being based on new build would incorporate then current best-practice in terms of energy use, carbon emissions in construction and water use. The layout is capable of being built in phases to match capacity with demand and is inherently flexible as alternative layouts to ensure that other airline models and different aviation growth patterns can be accommodated. In particular it would allow point-to-point routes to be operated using Code E aircraft such as the B787 Dreamliner with fine-tuning of the airport arrangement rather than fundamental change.

Support facilities are indicated in the terminal area. These include additional short-stay car parks, hotels, energy centre and a central gateway to the Heathrow West area.

As the existing road system serving T5 is disrupted by the extension of the runway and its associated taxiways it needs to be remodelled. In concept the roads are replaced by a new loop serving both T5 and the new T6 and the associated car parks.

The concept option for the area includes a new central gateway to this Heathrow West area where the high level automated people mover (APM) from Heathrow Hub transport interchange would arrive at departures level. This would allow a single station to serve both terminals via moving walkways. Baggage could be off-loaded at this site and fed into the baggage systems for each of the terminals via appropriate conveyors.

Surface Access

Surface access for the substantial additional passengers is facilitated in a number of ways with an underpinning philosophy that dispersal of access for both road and public transport access will lead to the most sustainable solution.

Heathrow Hub

Creation of a new multi modal transport gateway as an integral part of the airport with facilities that include:

- A railway served by up to 30 trains per hour based on Great Western Main Line and Crossrail services
- High capacity travelators and lifts providing access directly from platform level to the interchange level with a short distance to connect to an automated people mover (APM)
- Multi airline self-service check-in machines could be made available for those who have not checked in online
- The possibility of secure baggage drop facilities at the interchange level which would connect directly into the baggage facilities of the airport
- State of the art, high quality, fast, landside APM to transport passengers free of their baggage to the main terminals every 90 seconds with a journey time of about five minutes to the Terminal 5/6 complex and seven minutes to the Terminal 2 complex
- Direct access off the M25 from the north and the M4 with taxi, drop-off facilities and car parking, which would have direct enclosed access via travelators to the interchange level
- Airport hotel(s) providing a range of price points for overnight accommodation for passengers catching early morning flights or arriving late in the evening, and providing meeting and conference facilities
- Bus and coach facilities. The hub is likely to be attractive, particularly for longer distance coaches, as they would have easy access from the motorway network and would only have to serve one location for passengers to access the airport terminals.
- The size of the site identified for the interchange allows the opportunity for other potential facilities, and allows phased construction without disruption to the existing road and rail networks.

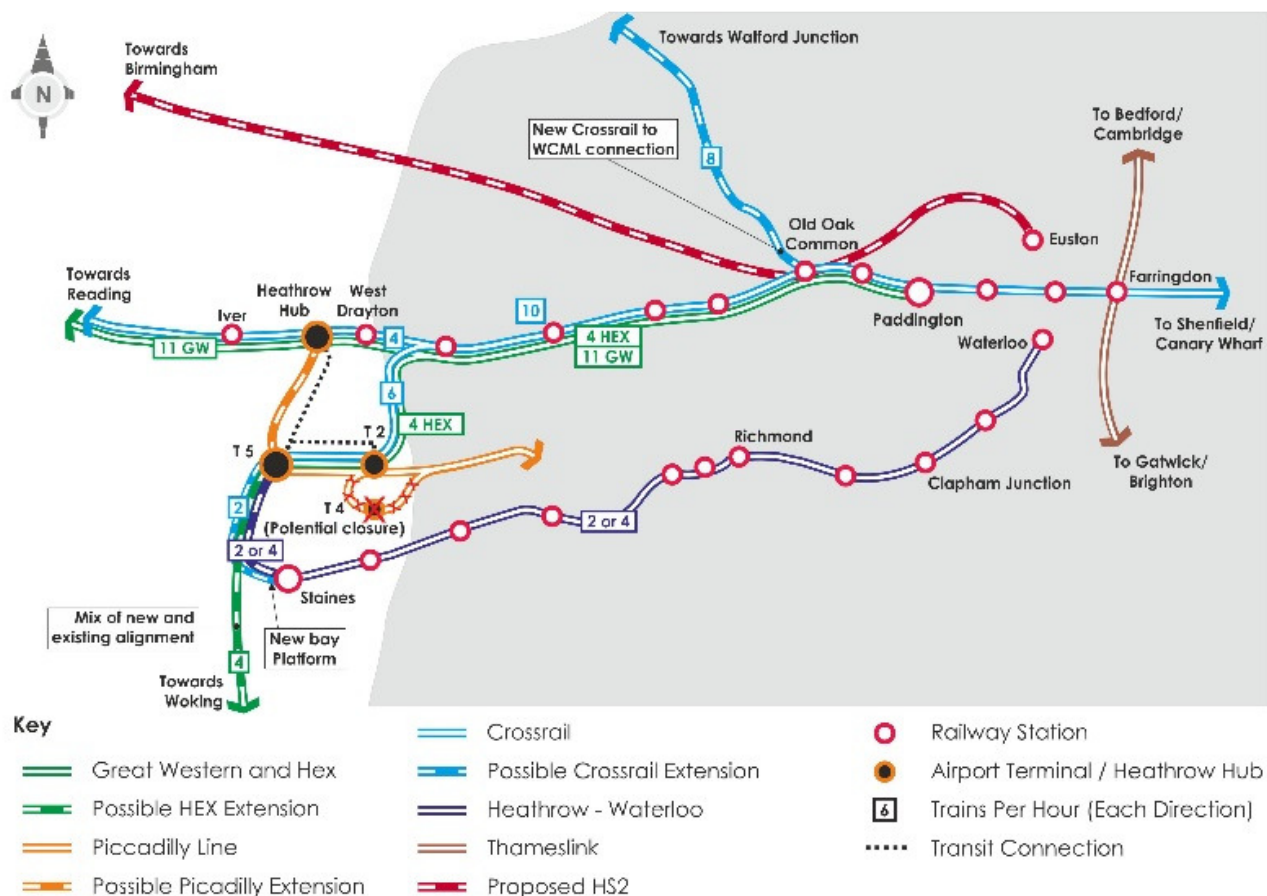
Public Transport

Significantly more rail capacity will be made available through the provision of additional Crossrail services, new services from Heathrow Hub and a new southern rail access to south west London and Waterloo. These are illustrated in **Figure E2** below. This strategy not only caters for the additional demand into London without overstressing the rail network for commuters and inter-city travellers but will transform public transport accessibility across the region for both passengers and employees by connecting to the UK's key mainline rail routes, either directly or with a single same station connection at either Old Oak Common, Farringdon, Clapham Junction or Liverpool Street.

Roads

Highway access dispersion, providing different access points for both cars/bus/coach from the south, west and north to the airport bringing relief to the M25/M4 in the vicinity of the airport. The road network around Heathrow will be re-modelled, with a section of the M25 diverted and bridged by the new runway and taxiways, the removal of Junction 14 of the M25, an enhanced Junction 13 (giving access to existing and proposed facilities), and a new junction for the Heathrow Hub inter-modal interchange off the M25 north of the M4.

Figure E2 Proposed Rail Enhancements



Strategic Fit²

The Role of Heathrow as an Aviation Hub

To provide additional capacity that facilitates connectivity in line with the assessment of need

It is our view that the most secure and certain way to provide additional aviation capacity in the UK to meet future needs and maximise benefits is to focus this capacity at the only existing international hub airport in the UK – Heathrow. In summary key points in our case are:

- Air transport has shown long-term growth trends and these are expected to continue in to the future. In particular part of the reason for the long-term growth is deregulation in the industry, unlocking demand. The effects of deregulation, and potential for further deregulation, are anticipated to continue to positively affect demand for aviation in Europe for many years to come. Global aviation will continue to grow, and Europe and the UK will play a key part in this market.
- Hub airports like Heathrow are very likely to continue to play a key role in the global aviation market. This is because of a range of factors including the commercial characteristics and parameters of hub-and-spoke operations and the consolidation amongst European flag-carriers into three main competitive groupings. The UK is well placed to continue providing a hub airport that fits well in the existing and forecast overall aviation market.
- Heathrow is the best location for UK airport expansion because:
 - It has the highest population and economic output catchment of any of the existing or proposed UK airports and this will be further enhanced with the connectivity provided by the Heathrow

² The Strategic Fit objective 'To maximise benefits in line with relevant long term strategies for economic and spatial development' is covered under 'Economy' below.

Hub inter-modal interchange and other rail improvements. This means that it is the best location for the major gateway airport for the UK irrespective of the model for airline services.

- Heathrow demonstrates consistent and proven success in attracting and retaining airlines, and slot trading values demonstrate high levels of suppressed demand. Experience shows that many airlines would rather not serve the UK than establish operations elsewhere.
- It is already established as a hub and so risks of expansion in terms of demand and wider benefits for the economy are less than in seeking to establish a new/alternative hub.
- Heathrow is well placed to serve any growth in point-to-point travel given the advantages described in this document.
- The costs of developing a new hub elsewhere, covering both immediate airport and transport-related infrastructure and costs of relocations of businesses and workforce, are likely to be significantly greater than expansion at Heathrow.
- Adding capacity at Heathrow meets any conceivable future airline scenario, and the relatively low cost of our proposals ensure that user charges remain competitive for both network and low cost airline markets.
- The Heathrow Hub proposition further enhances the case for Heathrow in terms of regional connectivity and extension of economic benefits (see below).

With Heathrow as the UK's hub we forecast future passengers of 130 million passengers per annum by 2050. This is in contrast with a forecast of 78 million passengers per annum by 2050 with no third runway.

The inclusion of Heathrow Hub as part of the offer increases the likelihood of the above forecasts and/or could result in higher growth forecasts than presented. The reasons why Heathrow Hub enhances the likelihood of the forecasts/higher forecasts include:

- Heathrow Hub will facilitate easier and more reliable domestic connections to Heathrow, facilitating demand (as well as a domestic travel modal shift)
- Heathrow Hub with the offer of greater overall connectivity will help national and regional economies grow more than otherwise.

Maximising the Benefits of Competition

To maximise the benefits of competition to aviation users and the broader economy

Heathrow and the UK now operate in an international market and expansion at Heathrow will allow it to compete more effectively with rival European airports such as Schiphol, Frankfurt and Paris. This more effective competition will tend to lower costs to aviation users, increase service quality and choice, and benefit the broader UK economy.

It may transpire that Europe is found to be over-served with hub airports given the growth of new international competitors. Suppressing capacity at Heathrow - which has proven highly attractive to passengers and airlines alike - may not necessarily mean that airlines choose to relocate to an alternative UK competitor airport but that they simply transfer growth to competitor countries.

The expansion of capacity at Heathrow will provide possibilities for new entrants to the Heathrow market and allow competition between them and incumbent airlines. This has the potential to increase the service provision to range of destinations with consequent benefits to the broader economy. The new facilities will also address capacity constraints, with a shift in benefits to users from providers.

The development of a wide range of surface access options will allow rail services to compete against road based transport with the potential to reduce congestion on the highway network to the benefit of the broader economy.

The size of the Heathrow Hub site, its road and rail connections and proximity to existing airport facilities also potentially allow further competition and choice in both aeronautical and non-aeronautical services including retail, hotels, car parking and airport related concessions.

The Experience of Passengers and Users of Aviation

To improve the experience of passengers and other users of aviation

The proposition will improve the experience of passengers and other users of aviation in ways including:

- Providing increased connectivity at a place which is both where airlines wish to locate the services and where passengers wish to fly.
- Improving surface access options to allow choice and the potential for an improved journey to and from the airport.
- Inclusion within the scheme of space for modern facilities compatible with good levels of service and consistent with emerging best practice.
- Flexibility to cope with future developments in technology to enhance the passenger experience and improve the competitiveness of airlines and the airport. For example the APM could provide different levels of functionality depending on decisions on the location of future passenger processing facilities.

Economic Benefits³

National Economic Benefits

To maximise economic benefits and support the competitiveness of the UK economy

We estimate substantial national economic benefits from our proposals at Heathrow. These benefits include:

- Productivity, agglomeration and employment gains from better connectivity, both in terms of aviation connectivity and also surface access connectivity with Heathrow Hub and the public transport improvements package
- Foreign direct investment (FDI)
- Benefits for UK trade
- Tourism benefits.

Our work to date suggests that the benefits of our proposals, including Heathrow Hub, will be potentially significantly greater than the Airports Commission assessment of capacity constraints on GDP of the UK economy⁴. This will benefit regions across the UK, for example including the Thames Gateway. In particular we believe the Heathrow Hub interchange can play an important part in the overall national economic benefits with our initial work and benchmarking suggesting it will contribute in the range of at least £5 billion to £10 billion of net present value benefits to the UK economy. Overall we estimate benefits in the region of at least £50 to £70 billion net present value.

Heathrow's strategic location within the UK, and the maturity of its economic links to London and the dynamic Thames Valley region, mean it can offer greater and more certain economic benefits at lower risk than non-Heathrow locations. In particular seeking to establish a hub around Gatwick or in the Thames Estuary involves significant risks that even if the hub is successfully set up there could be significant damage/lost opportunities from the difficulties and uncertainties associated with how the Thames Valley economy will respond. Uncertainty is also likely to delay or discourage FDI decisions.

Regional Economic Benefits

To promote employment and economic growth in the local area and surrounding region

We believe there will be significant regional economic benefits of our proposals, which also fit well with regional economic and land-use planning policy and strategy, including alignment with the London Plan and forecast growth in the M4 corridor.

³ The Economic Benefits objective 'To produce positive outcomes for local communities and the local economy from any surface access that may be required to support the proposal' is covered under Surface Access below.

⁴ Interim Report, Appendix 3: Technical Appendix, December 2013, para 2.67, p27.

We estimate that the proposals will generate an estimated 19,000 to 30,000 additional jobs directly associated with Heathrow compared with the baseline of no additional runway⁵. There will also be direct jobs associated with Heathrow Hub.

There will be significant knock-on benefits for the sub-regional economy including the Berkshire M4 corridor and West London. These will also extend on to the wider London, Thames Valley, South-East and national economies.

These benefits can be accommodated within existing and future environmental and policy constraints on development to the west of London by channelling the natural, in-built flexibility in the way the economy works and evolves to focus growth in appropriate ways. In particular activity in the M4 corridor can take the form of 'smart growth' with a greater emphasis on enhanced GVA over increased employment and population, with expanded employment and population taking place in locations including the West of London (e.g. Old Oak and Park Royal Opportunity Area). This approach is possible because over the timescales of the project and its benefits there will be significant turn-over and change in the sectors, companies and workforce in the sub-region, allowing companies most dependent on/benefiting from Heathrow to further focus around the airport, and companies with more flexible requirements to focus around other locations.

The proposals include a need to relocate a significant element of the current employment in the Poyle industrial area to the west of Heathrow. We currently estimate this will involve relocating around 64 ha of employment activities and covering around 5,600 jobs. There are a number of allocated sites in the surrounding local authorities that could accommodate this requirement. In addition our initial discussions with some of the authorities suggest that there could be opportunities for new or alternative uses for some sites (such as the proposed Intermodal Freight Exchange to the north of the A4 Colnbrook bypass).

We have drawn up an outline skills and training strategy to ensure that the right skills are available and that the local workforce benefits from the opportunities. This builds upon the wide range of initiatives in place and proposed by Heathrow Airport Limited (HAL).

Fit with Strategies for Economic and Spatial Development

To maximise benefits in line with relevant long term strategies for economic and spatial development

Our proposals fit well with regional and local spatial and socio-economic development strategies. In particular we believe that a third runway at Heathrow is implicit in and consistent with the growth and development forecasts and plans behind relevant economic and spatial development strategies including the London Plan and the relevant surrounding M4 corridor/Thames Valley local plans.

Operational Viability

Airport Resilience

To enhance individual airport and airports system resilience

Operational resilience is in general improved by the provision of spare capacity and redundancy within the system. The operational modes for the runways contain a degree of unused potential capacity to limit the impacts of disruption on operations.

The provision of alternative access routes and modes limits the impact of a failure on any one of them and initial modelling of the M25 suggests that the likelihood of a failure might be reduced as congestion is reduced and operational flexibility increased.

⁵ These figure assume productivity gains in employment, which tends to lower the number of jobs compared with no productivity gains.

Airport Efficiency

To ensure individual airport and airports system efficiency

A coherent site has been developed for a compact and efficient operation. The site is large enough for an efficient layout to be developed in response to best practice at the time of design. The design of taxiways, aprons and satellites draws on proven international experience, with parallel taxiways, flexible stands and permeable two way aprons allowing short turn-round times to maximise airline efficiency and competitiveness and in particular address the specific needs of low cost carriers (LCCs).

Design Flexibility

To build flexibility into scheme designs

The scale of the available land, both on the Hub site and within the expanded airport campus, creates opportunities for flexibility in the layout and design of passenger and baggage processing facilities, and for phased delivery of stand and terminal capacity to allow capacity to be matched with demand. This has the potential to reduce capital expenditure and investment risk, minimise increases in airport charges and allow smoothing of profiles and secure Heathrow's competitiveness.

The sizing of the facilities has been undertaken to achieve levels of redundancy consistent with best practice within the industry. The aviation facilities can be provided in a single plot which allows flexibility in the distribution of functions over the site in line with the needs at the time of design. There is also the option of extending the southern runway to increase capacity and resilience and further improve opportunities for alternation and respite.

To meet present industry safety and security standards

To maintain and where possible enhance current safety performance with a view to future changes and potential improvements in standards

A high level assessment of the risks arising from the concept has been carried out. The proposal, specifically the positioning of the runways and associated changes in taxiways and airspace, can meet all national and international safety regulatory requirements.

The option of a third, in-line runway at Heathrow does not present any major obstacles that cannot be resolved. Whilst the workload of tower, approach and terminal manoeuvring area (TMA) controllers will increase, sometimes substantially, various projects including Performance Based Navigation (PBM), London Airspace Management Project (LAMP) and Advanced Controller Toolsets will help offset the associated increase in controller workload. The findings of this report conclude that the option of a third in-line runway at Heathrow is feasible from an Air Traffic Management (ATM) perspective.

The proposed concept brings changes to current operations that can improve safety. A reduction in the throughput per runway will increase the resilience of the operations and reduce the complexity of the controller task when the new runway comes into operation (2023). The presence of the ultra-long extended northern runway (6.6km in total) brings benefits in the event of known aircraft emergencies, enabling a recovery runway to be used safely. The use of in-line runways with parallel taxiways reduces the necessity for runway crossings. Specifically for Terminal 4 operations, it is expected that a higher percentage of the aircraft arriving/departing at Terminal 4 will be able to be sequenced onto the southern runway, reducing the number of crossings compared to current operations.

Surface Access

Sustainable Modes of Transport

To maximise number of passengers and workforce accessing the airport via sustainable modes of transport

Heathrow Hub transforms the public transport mode share in the Great Western corridor (the largest catchment outside London), increasing it to nearly 60%. With rail journey access times being drastically reduced over the majority of the country and the geographic dispersion of direct or single interchange connections across the network, the overall public transport mode share will be in excess of 50%. This

quantum change to sustainable transport for both passengers and workers will enable the expansion of the airport to be accommodated without overstressing the transport network.

A quantum leap in public transport accessibility is needed for Heathrow. Developments at Amsterdam Schiphol, Frankfurt, Paris Charles de Gaulle and Zurich in the last 30 years have provided airport gateways directly on main rail corridors as part of strategic expansion phases. Heathrow Hub provides an equivalent airport gateway, served by long distance, regional and local rail services. With the creation of a new entry point and terminal infrastructure, the airport is in effect moved onto one of the UK's most strategic rail corridors. This provides far more efficient use of scarce rail capacity than the alternative approach of loops or spurs which require dedicated airport rail services, and which cannot match the frequency or range of destinations of a station located on through main lines.

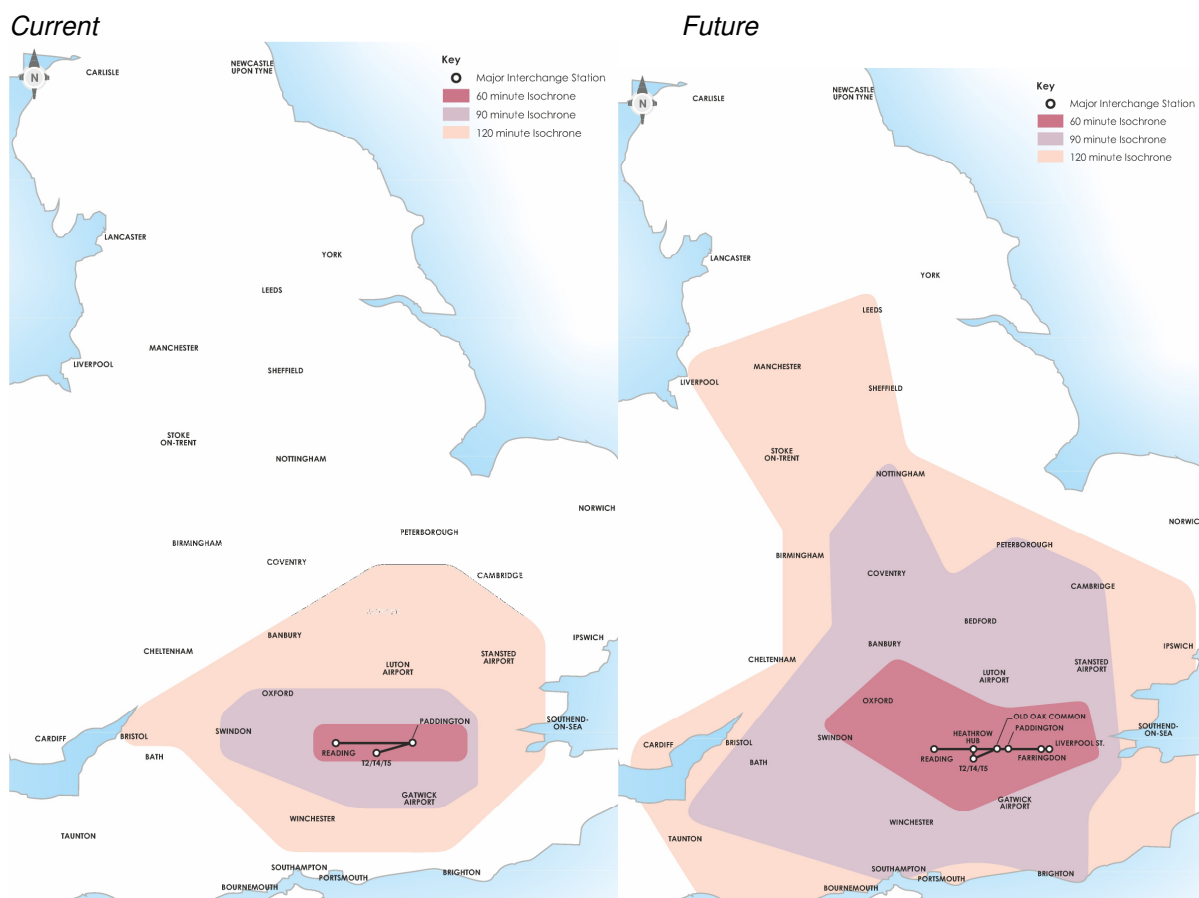
Airport Access Catchment Area

To enable access to the airport from a wide catchment area

Connecting to the country's key mainline rail routes either directly or with a single same station connection at either Old Oak Common, Farringdon, Clapham Junction or Liverpool Street, will bring an unprecedented 95% of the airport's passengers within 120 minutes of the airport by rail. No other airport in the UK could achieve such geographic connectivity or deliver a greater public transport mode share. The current and future rail catchment isochrones are shown in **Figure E3** below. Our initial demand and modal shift estimates do not however assume any changes in existing patterns of passenger allocation between airports.

Heathrow's geographic location in relation to the motorway network makes it the most accessible and resilient for cars, buses, coaches and taxis. It is not dependent on a single motorway link with the consequent disruption should there be an incident.

Figure E3 Current and Future Rail Access



Needs of Non-Airport Users of Transport Networks

To accommodate needs of other users of transport networks, such as commuters, intercity travellers and freight

To produce positive outcomes for local communities and the local economy from any surface access that may be required to support the proposal

Our dispersion strategy means that rail access to London is spread across four different corridors:

- Heathrow T2 and T5 – Paddington/Crossrail, 10 trains per hour (tph)
- Piccadilly line
- Heathrow via Staines to Waterloo, 2 tph minimum, and
- Heathrow Hub (Great Western) and Crossrail, 15tph.

This compares with only 6tph today between Heathrow and Paddington. As a result our strategy provides high levels of resilience and flexibility, minimises the impact of airport demand on the commuter and inter-city networks, and we expect no further loading on the Piccadilly line.

Network Rail have confirmed that our Heathrow Hub layout is more than adequate for accommodating any freight aspirations and we also retain the Colnbrook freight branch.

The highway proposals are aimed at distributing the traffic away from the very busiest sections of the M25 and M4 with the consequent reductions in congestion caused by airport traffic and improved journey times for all users.

Environment

Noise

To minimise and where possible reduce noise impacts

The proposed scheme presents a number of inherent opportunities to minimise the noise effects associated with additional runway capacity. These include the following:

- Maintaining the similar flight paths as currently flown
- Enabling deeper landings in the early morning
- Enabling deep take-offs in the late evening, and
- Runway alternation throughout the day.

By extending the existing runway the current flight paths remain unchanged, which would not be the case with a third runway solution at Heathrow. This means that no new areas of population over central and the densely populated west London will be affected as a result of new approach paths.

The longer runway will enable deeper landings, particularly in the early morning, which will result in a decrease in the population exposed to noise that may cause sleep disturbance by shifting noise contours westwards. Furthermore, early morning arrivals can begin later than they currently do. With an increase in capacity during the daytime which will further reduce the number of aircraft seeking early morning slots operations can therefore begin at 0600, instead of the current 0430, without affecting the number of arriving aircraft. The introduction of a second in-line runway to the west also has the associated benefit of moving the noise associated with aircraft take-off at night to the centre of the airfield and away from the existing eastern boundary.

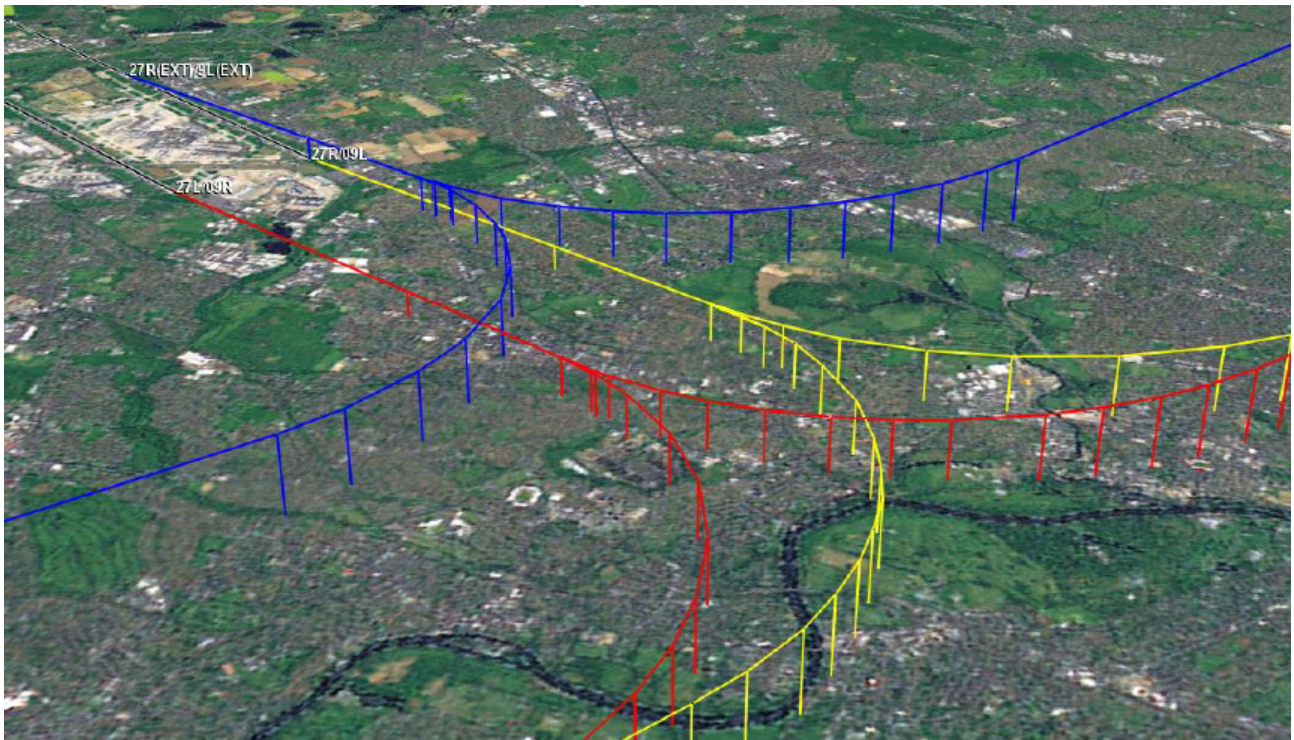
The location and siting of the proposed runway extension also allows for a unique series of operations. A number of operational runway scenarios have been modelled making best use of the three runways to provide additional respite during the day. This runway alternation throughout the day will provide significant respite over areas of west London.

A number of mitigation measures are built in to the scheme to provide additional respite including:

- Changes to Standard Terminal Arrival Routes (STAR) to introduce curved, angled and offset approaches
- Steeper approaches and take-offs
- Operations management and airport policies.

An illustration of curved approach flight paths to reduce the range of approaches is shown in **Figure E4** below.

Figure E4 Curve Approach Flight Paths



Heathrow Airport currently adopts a balanced approach to noise management. This can also be applied to the extended runway proposals.

A comprehensive package of payments for noise mitigation measures such as additional/enhanced double glazing would be developed and offered to relevant households, businesses and facilities. This could apply the principles recently announced by HAL. We support best practice in mitigation and believe the principles announced by HAL and Gatwick warrant further investigation.

The proposed Heathrow Hub masterplan includes the re-alignment of a number of highways with the extended runway and taxiways bridged over a short section of the diverted M25. Noise modelling at detailed design stage will further refine the road realignment design to mitigate any significant adverse effects.

Water Resources and Flood Risk

To protect the quality of surface and ground waters, use water resources efficiently and minimise flood risk

The area is crossed by a number of rivers and channels including the River Colne, Colne Brook, Wraysbury River, Poyle Channel, Duke of Northumberland River and Longford River. It also includes a number of surface water bodies, including five large reservoirs: King George IV Reservoir, Staines Reservoir, Wraysbury Reservoir, and the Queen Mother Reservoir.

The proposed scheme will require the diversion of Colne Brook and the Poyle Channel around the western end of the proposed runway extension and the culverting of the River Colne, Wraysbury River, Duke of Northumberland River and Longford River. Some have previously been diverted and/or culverted under

previous airport developments, for example Terminal 5. Suitable flood plain compensation is provided within the scheme to mitigate for the loss due to the enlarged airfield and road re-alignments at the standard of the 1% annual event probability (1 in 100 year) flood with allowance for climate change. A range of measures is proposed to mitigate any accidental water pollution through surface runoff and a concept surface water drainage strategy has been developed which will be further refined as the design is developed. Standard and well established measures to reduce any impacts on groundwater quality and quantity will be included at detailed design stage.

Biodiversity

To protect and maintain natural habitats and biodiversity

A number of nationally and internationally designated sites are present in the area including the South West London Waterbodies Special Protection Area and Ramsar site and Sites of Special Scientific Interest (SSSI) including the Wraysbury Reservoir, Wraysbury and Hythe End Grave Pits, Staines Moor, Langham Pond, Thorpe Hay Meadow and Windsor Forest & Great Park.

The proposed scheme will result in the loss of land from both designated and non-designated habitats and sections of rivers and brooks will need to be culverted and/or diverted which could affect a range of species. A comprehensive programme of biodiversity mitigation measures has been developed to address this. In consultation with Natural England, compensation provision is proposed for habitat lost and a total of approximately 150 hectares of land and 7km of linear watercourse are included in the proposals to compensate for the loss of designated sites, wetlands and terrestrial biodiversity action plan habitat. Further assessment at detailed design stage will refine these proposals.

Air Quality

To improve air quality consistent with EU standards and local planning policy requirements

The inclusion of the Heathrow Hub transport interchange and the consequent modal shift, in the region of up to 50% from road to rail, is a key element in the reduction of impacts on local air quality by providing public transport links for passengers arriving and leaving the airport as well as through the provision of the APM for transfers between the Heathrow Hub and airport terminals.

The road realignments and road access dispersion strategy will also reduce concentration on the M25 west of the airport. The proposed surface access improvements, coupled with the anticipated improvements in ambient air quality, the proposed development will not have a significant impact on local air quality. At detailed design stage further design refinements will be made. Operationally, the measures by Heathrow Airport are assumed will be continued and improved wherever possible.

Carbon Emissions

To minimise carbon emissions in airport construction and operation

The proposed development provides a number of opportunities to increase the capacity of Heathrow airport while remaining within the carbon constraints of UK legislation. It is anticipated that the greatest carbon savings will be achieved through, *inter alia*, the use of construction materials with lower embedded carbon and maximising modal shift, import of construction materials by rail and use of on-site renewables.

Landscape and Heritage

To minimise impacts on existing landscape character and heritage assets

While there will be some loss of open space due to the proposed development this will be offset by new open space as part of the detailed scheme design. Where possible, higher quality more accessible open space which can be of greater benefit in terms of landscape character, recreation and amenity will be designed to encapsulate, wherever possible, the ecological compensation habitat areas and the river flood alleviation mitigation proposals.

To mitigate for any impacts on the Colne Valley Regional Park there is potential to accommodate an extension within the green belt land to the east of the M25 and south of the M4. This would bring the open

space within proximity of the settlements of Harmondsworth and Harlington to the north of the airport enhancing local community benefits.

Landscape mitigation will focus on enhancing the character and quality of the park and green belt. To avoid further fragmentation, new green links will be considered as part of the detailed design where possible or existing green links enhanced to promote movement through the park including: opening up the Colne Brook underpass to create a new green link; between Brands Hill and Colnbrook at Horton Road; land between Colnbrook and Poyle; and land between the safeguarded railway corridor and West Drayton.

No World Heritage Sites, Scheduled Monuments, Grade I or II* listed buildings or English Heritage Registered Parks and Gardens will be directly impacted by the proposed scheme. A small number of Grade II listed structures are likely to be affected including: the Milestone at Madbridge in Colnbrook; a waterpump); and City Post. The proposed noise respite measures – alternating runway operations and the adoption of STARs - will reduce overflight over sensitive heritage assets and receptors, and therefore reduce secondary impacts of noise on the Royal Botanic Gardens Kew World Heritage Site, heritage assets associated with the Arcadian River Thames between Hampton and Kew, Scheduled Monuments, English Heritage Registered Parks and Gardens and Conservation Areas.

Other Environmental Matters

To identify and mitigate any other significant environmental impacts

As with all projects the development will generate waste during construction and operation. A large majority of construction waste can be recycled or reused, and Heathrow has demonstrable expertise in diverting waste from landfill (a 97% diversion rate was achieved for the Terminal 5 development). Similar measures will be used and can be expected to deliver a similar level of diversion for the proposed development.

People

Housing Loss and Re-Provision

To manage and reduce the effects of housing loss on local communities

We estimate that there will be a need to re-provide 246 dwellings directly affected by the proposals. These are mostly focused in the eastern part of Colnbrook and northern part of Poyle. Many of these homes already experience noise and other environmental impacts from the M25 and traffic associated with the Poyle industrial area. There may in addition be some homes that it could be decided should be re-provided because of environmental impacts such as increases in noise.

There are a number of options for re-providing these homes and communities. These include locations in the immediate area, subject to further discussion with the relevant local authorities and more detailed environmental and policy assessment. There are also a number of allocated housing sites in the wider area some of which could be appropriate to relocate some of the housing, for example potentially covering relocation of the more dispersed and smaller clusters of housing on the edge of the affected area.

Quality of Life of Local and Wider Population

To maintain and where possible improve the quality of life for local residents and the wider population

We have developed a comprehensive package of measures to maintain and improve the quality of life of local residents and the wider population. These are outlined in the sections above and in summary cover:

- A proposal that reduces noise levels below those of present operations at Heathrow, by means of a comprehensive package of alternation measures combined with new airline and air traffic control (ATC) operational procedures. This could be in addition to the financial proposals for noise mitigation proposed by HAL.
- A comprehensive package of air quality and low carbon mitigation and improvement measures, including a significant shift to use of public transport with the Heathrow Hub inter-modal interchange proposals.
- Landscape and heritage measures, including the potential to accommodate an extension to the Colne Valley Regional Park within the green belt land to the east of the M25 and south of the M4.

- A strategy for sensitive relocation of the relatively small number of homes needing relocation combined with community engagement and planning for example to keep clusters of households together in relocations, re-provision of community facilities such as schools, and consideration of the specific needs of groups who may require help with relocation.
- A skills and employment strategy.
- Business support including assistance with relocations.

Details of these measures will be developed further in subsequent stages of development.

Social Groups

To reduce or avoid disproportionate impacts on any social group

We have carried out an initial assessment of equality context and potential approaches to ensure protected social groups⁶ are not disproportionately affected. Potential issues that may have a varying effect of different groups include: access to and provision of employment opportunities; provision and re-provision of housing; access to schools; access to and quality of pedestrian routes; physical isolation effects with new layouts; and noise and air quality effects. The nature of issues is likely to differ between the construction and the operational phases of the project.

There is likely to be a variety of forms of mitigation measures and initial ideas that could include a focus on monitoring and ensuring appropriate inclusion. These build on the strategies outlined above under 'quality of life of local and wider population'. An equality impact assessment, including full mitigation proposals, will be developed, and finalised once the scheme design is fixed.

Cost and Delivery

Affordability and Finance

To be affordable and financeable, including any public expenditure that may be required and taking account of the needs of airport users

We are in the process of finalising our estimates of total costs and will provide these separately. We anticipate that overall costs will compare favourably with alternative proposals, ensuring that Heathrow's new capacity is affordable and competitive. The flexible nature of the scheme also allows phased delivery of major capital-intensive elements, reducing risk and initial capital expenditure. Early completion of the runway extension, aprons and at least some stands allows revenue streams before subsequent investment is required in major facilities such as additional terminal capacity, smoothing investment and user charging profiles.

We anticipate that private sector investment will cover the costs of airport infrastructure including the third runway, additional terminal capacity and some/all of the relevant costs of road network modifications and enhancements. Our initial assessment suggests that there are good prospects of this proposition being commercially attractive and it being possible to secure suitable investors. Our baseline assumption is that the development of the airport element of the scheme will be financed by existing operator Heathrow Airport Limited (HAL) under the existing Regulatory Asset Base (RAB) model.

The Heathrow Hub element could either be fully or partly incorporated into the airport RAB, or be fully or partly developed and operated by Heathrow Hub Ltd – either on a stand-alone basis or with a third-party private sector investor (e.g. property fund). Given elements of the public transport proposition will have wider economic benefits there is anticipated to be a good case for public sector finance as appropriate as well.

⁶ See Equality Act 2010

Costs and Benefits

To make efficient use of public funds, where they are required, and ensure that the benefits of schemes clearly outweigh the costs, taking account of social, environmental and economic costs and benefits

Overall we believe our scheme offers a favourable costs to benefits proposition compared to alternatives and other use of public and private funds. Key points include:

- The relatively low cost of our proposition when compared with the pent-up demand for capacity at Heathrow creates a compelling case for our proposal
- The attractiveness of expansion at Heathrow as a commercial low risk proposition, reflected in likely lower finance costs than other alternatives for new capacity elsewhere, proven interest from private sector institutional investors and hence more secure prospects of delivery from private sector investors without the need for policy makers to drive airlines and passengers away from their preferred facility in order to fill newly created capacity elsewhere
- The relatively low community and environmental costs of our proposals, with for example only modest numbers of homes needing to be relocated and a favourable noise impact footprint
- The likely lower level of risks and higher levels of regional and national economic benefits of our scheme compared to the non-Heathrow locations. The growth and sub-regional economic benefits for the economy can be accommodated in a sustainable way within the same broad labour market area.

Programme

To have the equivalent overall capacity of one new runway operational by 2030

With a decision and agreement to proceed in 2015, and permission for the scheme sought by applying for a Development Consent Order, we anticipate construction can start in around 2018/19 and the earliest opening date of the third runway would be around 2023. New terminal capacity and the Heathrow Hub can be programmed in either simultaneously with runway expansion or to follow in the light of more detailed analysis of requirements.

Future Consultation and Engagement

To actively engage local groups in scheme progression, design and management

The proposals have been the subject of a wide-ranging community engagement programme. In particular we have engaged directly with local councils (councillors and officers), Members of Parliament, members of the London Assembly and local groups and other stakeholders to both inform them of the proposals and to seek their views on the key issues of concerns and how these concerns might be overcome.

With selection of our proposals we envisage a comprehensive programme of future consultation and engagement to explore, refine and confirm details of the proposals in the light of comment and feedback from local communities and relevant stakeholders.