Airports Commission

16. Delivery:
Risk Assessment and Mitigation

November 2014

An independent commission appointed by Government

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1. Introduction

1.1 The Commission's *Appraisal Framework* states that the purpose of the Delivery Module is to assess the likelihood that the delivery of proposals could be significantly impacted or prevented by foreseeable problems and risks. The module sets out two objectives for schemes:

- To have the equivalent overall capacity of one new runway operational by 2030; and
- To actively engage local groups in scheme progression, design and management.

1.2 This appraisal report sets out the evidence available to the Commission at this stage in respect of each scheme's performance against those objectives. It comprises an overview of the likely risks that schemes may face and their potential mitigations, including engaging with local groups and communities. Based upon these risks and mitigations, a broad assessment of each scheme's deliverability by 2030 is made.

1.3 This report draws upon findings from across the full spectrum of the other modules within the Commission's *Appraisal Framework*.

2. Risks and Mitigations

2.1 The *Appraisal Framework* indicated the Commission's intention to examine a broad range of risks relating to the potential delivery of schemes. The categories of risk assessed within this report are:

- **Strategic:** including risks to the ability of the scheme to deliver capacity benefits on the scale anticipated.
- **Implementation:** including risks arising during the design, planning and construction phases as appropriate for the airfield site, the supporting airspace structures and any required surface transport schemes.
- **Commercial:** including risks to the affordability or commercial viability of the scheme.
- **Legal and planning:** including risks arising from legislative sources such as environmental regulations, safety regulations and regulations relating to safety human health and rules regarding State Aid.
- **Public engagement:** including risks arising from the level of local and community opposition to the scheme.

2.2 Some risks may fall into more than one of the above categories.

2.3 In some case, the Commission, the scheme promoter or a third party has identified a potential mitigation for a particular risk. The Commission is not at a stage to assess the full potential for these mitigations to diminish or remove the level of risk, but commentary on these potential mitigations is provided within this report. In addition, this report is not intended as a comprehensive risk register as might be used for detailed programme and project management. Instead it highlights the key potential risks and possible mitigations identified by the Commission at this stage in its process.

2.4 Some risks are common to all proposals for new airport infrastructure. While these risks are reflected where necessary within this document, the primary focus of the Commission's appraisal is upon distinguishing factors between schemes which result in particular risks being either amplified or reduced, or new risks entirely being created.

3. Gatwick Airport Second Runway

3.1 The Commission's work to date has identified the following risks in respect of the Gatwick Airport Second Runway scheme.

Strategic

3.2 **Significant presence of Code F aircraft may present significant congestion issues:** The scheme is, in some respects, optimised towards providing new capacity to accommodate growth in short-haul traffic, particularly within the low-cost sector. The proposed airfield site presents a highly efficient option for accommodating airlines within this sector using predominantly Code C aircraft (A320 and Boeing 737 series and any successors), able to offer high capacity and quick turn-around times.

3.3 This is not to say that the scheme can only support short-haul low-cost growth. The infrastructure is sufficiently flexible as to be able to respond to a wide range of fleet mix scenarios, including the ones assumed under the Commission's five scenarios of how the aviation sector may develop. Even in scenarios with a relatively high proportion of long-haul traffic served by legacy carriers, such operations could be served from the existing infrastructure, while low-cost traffic could be then served primarily from the new midfield site.

3.4 Disproportionate growth in the share of Code F aircraft (A380 and any successors) at the airport, however, would be likely to present significant congestion issues on the basis of the appraised layout. Other layouts could be defined at the detailed design phase, but may have their own consequences. This risk may pose a challenge to the airport in these scenarios for the future in which the role of legacy carriers is enhanced and low-cost carriers do not establish successful presence in the long-haul market segment ('*global growth*', '*relative decline of Europe*').

Implementation

3.5 **No significant airfield engineering risk:** In relation to the delivery of airport infrastructure, the risks associated with the Gatwick scheme are relatively low. The project is of a well-understood nature and will be delivered on land that has already been safe-guarded for airport development. While there are some impacts upon local roads and waterways, no other major infrastructure is directly impacted by

the construction of the expanded airfield, rendering the project relatively simple and helping to contain risks.

3.6 **Management of flood risk:** The Gatwick site and its environs have not typically been prone to flooding. However, during December 2013, the airport experienced flooding during severe weather, which had a material and negative impact upon its operations. Since then, the airport operator has taken mitigating actions to protect against a recurrence. Appropriate flood risk measures would be required in relation to any new infrastructure at Gatwick for both the airfield site and its environs.

3.7 **Airspace system risks regarding wider programmes, but no particular scheme specific risks:** In relation to the delivery of airspace structures, Gatwick has relatively few interactions at present with the traffic flows for other airports in the London system. The second runway would increase these interactions, but not to the extent that they represent a fundamental risk to delivery.

3.8 The process of low-level airspace design, however, would likely be controversial. Recent trials of airspace change at Gatwick have highlighted the difficulties involved in making changes to established traffic management procedures. The lack of change in London airspace over a period of decades reflects the extreme difficulty of making changes of this type. As with other proposals, the successful delivery of new capacity at Gatwick is likely to be dependent upon the successful delivery of the Future Airspace Strategy and London Airspace Management Programme. There may also exist a number of ways to mitigate the noise impacts of the scheme, making use of advanced navigational technology.

3.9 In its *Interim Report*, the Commission recommended the creation of an Independent Aviation Noise Authority. The Commission's view remains that the creation of such a body could be an effective way of restoring a degree of trust to the processes regarding airspace change and could reduce this risk to the delivery and acceptability of new airspace structures.

3.10 **Tensions regarding utilisation of Brighton Main Line Capacity:** In relation to surface transport, the nature of infrastructure changes required to support the scheme is not significant, being predominantly composed of changes to roads in the immediate vicinity of the airport. The level of risk associated with these works is considered to be low.

3.11 However, more significant risks arise from the issue of capacity on the Brighton Main Line. The Commission's appraisal of the surface transport package associated with the scheme has indicated that there is generally sufficient capacity to meet airport and background demand by 2030. However, this is based upon a particular service pattern. Different service patterns will produce different levels of crowding

and service quality for different types of user of the line (e.g. inner and outer London commuters, airport users and Brighton commuters). Beyond 2030 as background demand growth renders capacity on the line scarcer (despite the delivery of new capacity via incremental upgrades to the line), guaranteeing a service pattern which meets the needs of airport users may grow more difficult. The Commission believes that these difficulties will grow beyond 2030, as background demand continues to increase, but the cost challenge of infrastructure improvements increases.

Commercial

3.12 **Commercial viability of the scheme has to be considered carefully:** Demand for expanded capacity will be affected both by global trends driving the overall market growth in the aviation sector and the attractiveness of the proposal to airlines, which depends on a set of factors including size and strength of the local market (reflected in airlines' yield), airport costs (such as aero charges, slot prices and sunk costs), congestion costs, advantages of route density created by other airlines from a given airport, service levels and access to capacity (current and future). Change in any of these factors will affect demand.

3.13 While the size and strength of the local market is of primary importance to all airline business models, different airline business models value other factors differently. Expanding Gatwick would increase aero charges per passenger which is a potential risk to future levels of demand for the second runway as low-cost carriers are particularly sensitive to any such increases. This risk is lowest in the future in which low-cost carriers move into the long-haul market and self-connecting becomes more common ('*low-cost is king*') and highest in less optimistic demand scenarios for Gatwick ('*global fragmentation*'). However, policy levers may exist to incentivise the growth of traffic cut at an expanding Gatwick.

3.14 In all of these scenarios there however is potential for airlines to extract higher yields at an expanded Gatwick in the future as doubling the capacity would provide scope to increase route density significantly at the airport, which could to an extent offset the rise in aero charges. This is highly likely in all five Commission's scenarios, even with a carbon cap in place.

Legal and planning

3.15 **Securing planning permission may be a lengthy process – there is no clear precedent:** Airport expansion of this type and scale has not been successfully undertaken in the UK in several years. Recent changes to the legal and planning framework, including the Planning Act 2008 (as amended by the Localism Act 2011) have reformed planning processes for nationally strategic infrastructure

projects and introduced the concept of National Policy Statements. Hybrid bills, often cited as alternative means to securing planning permission for major projects such as HS2, Crossrail and the Channel Tunnel are also relatively uncommon. As such, it is difficult to state definitively how long the planning process will take, including the risk of delay through any legal challenge, and the resulting costs. This is an issue for all schemes.

3.16 GAL has set out how it anticipates that its scheme may progress through the Development Consent Order (DCO) planning process. This demonstrates a broadly credible and appropriate understanding of the requirements of this approach at this stage. Government support for the principle of a second runway at Gatwick in a National Policy Statement is identified as necessary by GAL. The extent to which this may delay development of any planning application is unclear.

3.17 The Commission will set out its recommendations for how planning consent for any recommended solution can best be secured in its final report.

Public engagement

3.18 **Some housing losses will be required:** The construction of the airport site is expected to result in the loss of 168 homes. A further 37 may be required in order to construct the associated surface access enhancements, although this number may reduce as detailed plans for the design and construction of the transport links are refined. Clearly, this could be a concern to those affected.

3.19 GAL has set out how it would mitigate this issue by offering financial assistance to those affected via a £131m Property Market Support Bond scheme which will offer home owners 25% above market value. This exceeds the statutory minimum. In addition, GAL has proposed a £14 million Home Owners Support Scheme to buy any homes that would be subject to aircraft noise above a set noise level, under the new plans.

3.20 **Airport expansion will increase the noise-affected population in the local area:** Anticipated noise impacts may result in heightened levels of local opposition to the scheme. GAL has set out a commitment to offer compensation of £1,000 pa to households significantly affected by noise resulting from airport expansion within defined parameters.

3.21 There would be a substantial percentage increase in the number of people affected by aviation noise across the full range of metrics, both in comparison to the 'do minimum' baseline in future years and against current levels.

3.22 Nonetheless, even a scenario where the highest number of people is affected, this is significantly below the total numbers at Heathrow, where currently some 760,000 people fall within the $55L_{DEN}$ contour. Conversely, however, there are large areas around Gatwick that are rural and have high levels of tranquillity that would be adversely impacted by new development at the airport.

3.23 **Other local environmental risks are modest:** Expansion would have a negative impact on a range of other local environmental factors, including air quality, landscape, heritage, biodiversity and water. In general while intelligent detailed design and operational delivery by the airport operator could significantly reduce the impact of the scheme, the impacts in some cases will never be entirely mitigated. However, the mitigated impacts are in most cases not major.

3.24 **More generally**, GAL has set out a strategy to engage with local communities and has offered support in a number of ways building on ongoing and recent engagement, including public consultation, engaging local authorities and businesses and working through its Airport Consultative Committee. GAL has also set out proposals for a number of community pledges including funding to support local authorities delivering additional housing and other infrastructure associated with expansion and funding apprenticeships for local people. The scheme promoter has carried out a public consultation on its expansion plans, which has influenced its proposed compensation offer.

Overall assessment

3.25 On the basis of the above, the Commission notes a number of risks and challenges relating to the delivery of the Gatwick Airport Second Runway proposal. The scale of these risks is relatively modest for a project of this scope and level of development.

3.26 At this stage the Commission does not believe that these risks cannot be addressed at the appropriate junctures sufficient to ensure successful delivery by 2030, provided adequate mitigating actions are taken.

3.27 The Commission has noted detailed plans by GAL to engage local groups in taking the scheme forward.

4. Heathrow Airport Extended Northern Runway

4.1 The Commission's work to date has identified the following risks in respect of the Heathrow Airport Extended Northern Runway scheme.

Strategic

4.2 **Airfield layout may discourage low-cost carriers from operating at Heathrow:** The proposed infrastructure appears sufficiently flexible to accommodate a wide range of future fleet-mix scenarios. However, there would remain a slight risk of Heathrow's layout discouraging low-cost carriers from operating at the airport due to relatively longer aircraft turnaround times. This risk may pose a particular challenge to the airport in those scenarios for the future in which the role of legacy carriers declines and low-cost carriers further expand their market share in all market segments ('*low-cost is king*').

Implementation

4.3 **Manageable levels of engineering risk:** In relation to the delivery of airport infrastructure, the risks associated with the Heathrow Airport Northern Runway Extension scheme are at a level which would be considered normal for a project of this nature and scale. The most complicated aspect of the scheme's engineering involves the placement of a section of the M25 motorway into tunnel. This is a major project in its own right, with a protracted delivery time that has been factored into the estimated opening date for the scheme of 2026. Managing the project while ensuring no unacceptable disruption to traffic flows on a key part of the strategic road network will present a particular challenge. However, on the basis of the available evidence, there is no reason to believe that this work cannot be delivered successfully.

4.4 **Approvals required for novel runway concept:** There is no direct precedent for the "in-line" runway proposal that forms part of this scheme, although partial precedents can be found in diagonally-offset end-to-end runways, for instance at Madrid. On the basis of the available evidence, the Commission's view is that it should be possible to operate the proposed runway infrastructure in a safe manner.

4.5 Confirming this finding, however, is likely to require significant work with both UK and international safety regulators. The processes involved are protracted and would need to begin early in the implementation stage of the scheme.

4.6 **Management of flood risk is important:** While the current Heathrow airfield is not considered susceptible to flooding, areas adjacent to the airfield, particularly to the west, are considered to have significant flood risk. The proposed expanded airfield would significantly impinge upon flood plains and potentially heighten this flood risk. Mitigating actions have been identified which can mitigate this disbenefit.

4.7 **Airspace system risks regarding wider programmes:** Heathrow sits within a complicated airspace system and its traffic flows must be managed in relation to flows at a number of other commercial airports, most notably London City and Luton. Expansion at Heathrow would require a redesign of this airspace system; a complicated process likely to require several years.

4.8 The London Airspace Management Programme and Future Airspace Strategy represent viable vehicles for this redesign. The Commission has noted, however, the risks associated with these programmes. Their continued progress would be highly important for the redesign of airspace to support Heathrow expansion.

4.9 Based on the available evidence, the Commission does not believe that Heathrow expansion would impact upon capacity at other commercial airfields. However, fast-time simulation, conducted by NATS over the consultation period, will provide additional assurance of this position.

4.10 **Interactions with RAF Northolt require monitoring:** Advice from NATS has identified a low likelihood that the new runway would have significant operational impacts upon RAF Northolt, a military airfield located approximately six miles north of Heathrow, which also accommodates a number of civilian business and general aviation movements. On the basis of the available evidence, the Commission does not believe that mitigating actions would be required, but this will be kept under review.

4.11 **Local airspace design likely to be controversial:** Recent trials of airspace change in the London system have highlighted the difficulties involved in making changes to established traffic management procedures. The lack of change in London airspace over a period of decades reflects the difficulty of making changes of this type. As with other proposals, the successful delivery of new capacity at Heathrow will depend upon the design and delivery of low-level airspace structures. The size of the noise affected population at Heathrow means that design issues are likely to be particularly contentious.

4.12 The scheme promoter has put forward a number of proposals for mitigating the noise impacts of the scheme, which make use of advanced navigational technology to provide further respite for communities affected by noise. The Commission intends to carry out more work on assessing the likely implications of these proposals during the consultation period.

4.13 In its *Interim Report*, the Commission recommended the creation of an Independent Aviation Noise Authority. The Commission's view remains that the creation of such a body could be an effective way of restoring a degree of trust to the processes regarding airspace change and could reduce this risk to the delivery of new airspace structures.

4.14 **Tensions regarding utilisation of rail links:** In relation to rail access, the scheme is based upon a mixture of existing infrastructure (the Piccadilly Line and the connection from the Great Western Main Line currently used by Heathrow Express and Heathrow Connect), planned additions to the network (Crossrail, Western Rail Access and a connection to HS2 via Old Oak Common) and a new Southern Rail Access proposal.

4.15 The Commission's analysis has identified that while there is sufficient capacity on these links to accommodate both background demand and demand related to airport expansion through to 2030, the situation beyond that point becomes more uncertain and capacity issues are likely to become increasingly severe without major infrastructure investment. Airport expansion is not a key driver of this requirement, which chiefly stems from background demand growth.

4.16 Tensions relating to the use of rail infrastructure to serve airport users, as opposed to commuters and other users of the network, are likely to emerge. These are likely to be seen as early as 2023, when the track access rights for the Heathrow Express service are due for renegotiation. Ambitions to increase rail mode share at Heathrow (linked to the risk identified in the "legal" section below relating to air quality) may come further into tension with the need to ensure adequate capacity for commuters.

Commercial

4.17 **Commercial viability of the scheme has to be considered carefully:** Demand for expanded capacity will be affected both by global trends driving the overall market growth in the aviation sector and attractiveness of the proposal to airlines, which depends on a set of factors including size and strength of the local market (which determines the yield to airlines for their flights), airport costs (such as aero charges, slot prices and sunk costs), congestion costs, advantages of route density

created by other airlines from a given airport, service levels and access to capacity (current and future). Change in any of these factors will affect demand.

4.18 While the size and strength of the local market is of primary importance to all airline business models, different airline business models value other factors differently. While expanding Heathrow would increase aero charges to very high levels, there is a very high likelihood that additional capacity at Heathrow would be well used as although yields may decrease to a degree as a result of a reduction in excess demand at the airport, they are expected to remain relatively high. This is supported by all five of the Commission's scenarios even with a carbon cap in place.

4.19 **Transfer of scheme design may present risks**: The scheme design has been devised by HHL and is not owned or endorsed by Heathrow Airport Limited. The transfer of any relevant intellectual property may require commercial negotiations, which could present a risk to delivery timelines.

Legal and Planning

4.20 **Securing planning permission may be a lengthy process – there is no clear precedent:** Airport expansion of this type and scale has not been successfully undertaken in the UK in several years. Recent changes to the legal and planning framework, including the Planning Act 2008 (as amended by the Localism Act 2011) have reformed planning processes for nationally strategic infrastructure projects and introduced the concept of National Policy Statements. Hybrid bills, often cited as alternative means to securing planning permission for major projects such as HS2, Crossrail and the Channel Tunnel are also relatively uncommon. As such, it is difficult to state definitively how long the planning process will take, including the risk of delay through any legal challenge, and the resulting costs. This is an issue for all schemes.

4.21 It is anticipated that HAL is most likely to be the delivery agent for the LHR-ENR scheme if it is the Government's policy to support this proposal. HAL has set out how it anticipates that its scheme may progress through the Development Consent Order (DCO) planning process. This demonstrates a broadly credible and appropriate understanding of the requirements of this approach at this stage. Government support for the principle of a third runway at Heathrow in a National Policy Statement is identified as necessary by HAL. HAL has set out an intention to begin preparing a planning application as soon as (and if) Government confirms support for its proposals.

4.22 The Commission will set out its recommendations for how planning consent for any recommended solution can best be secured in its final report.

4.23 **European rules on air quality may present a risk:** At present, a number of areas around the Heathrow site are in breach of European rules regarding air quality. This is due largely to background traffic on the M25 and M4, as opposed to airport users or operations. However, regardless of the cause, the UK is under a firm obligation to reduce these levels of air pollution to levels that comply with legal limits.

4.24 There are three main risks related to this scheme in relation to air quality. First, the risk that fleet-turnover does not produce the expected reduction in relation to per-vehicle emissions. Second, the risk that the anticipated shift towards sustainable modes of transport does not occur to the extent expected. Third, the risk that European rules on air quality are further tightened during the delivery period.

4.25 The Commission intends to undertake more detailed modelling of the air quality impacts of schemes during the consultation period. This will include dispersion modelling to examine health impacts on local populations, based on more detailed surface transport modelling.

Public engagement

4.26 **Some housing losses will be required:** The construction of the airport site will result in the loss of 242 homes. A further 165 may be required in order to construct the associated surface access enhancements, although this number may reduce as detailed plans for the design and construction of the transport links are refined. Clearly, this could be a concern to those affected.

4.27 It is anticipated that HAL is most likely to be the delivery agent for the LHR-ENR scheme if it is the Government's policy to support this proposal. HAL has set out how it would mitigate this issue by offering to purchase affected homes at 25% above market value plus meeting legal and stamp duty costs. Again, automatic translation of this mitigation to the LHR-ENR scheme cannot not be assumed.

4.28 **Airport expansion will increase the noise-affected population in the local area:** Anticipated noise impacts may result in heightened levels of local opposition to the scheme. It is anticipated that HAL is most likely to be the delivery agent for the LHR-ENR scheme if it is the Government's policy to support this proposal. HAL has set out how it will seek to address this issue by committing £250m for noise insulation and residential property compensation if Government supports a third runway. However, automatic translation of this mitigation to the LHR-ENR scheme cannot not be assumed.

4.29 The Commission's analysis shows that operating an extended northern runway at Heathrow would see a percentage increase in the number of people affected

by aviation noise across the full range of metrics, both in comparison to the 'do minimum' baseline in future years and against current levels. This is true of both top end and lower end forecasts.

4.30 The number of noise-affected people increases because of an increase in traffic into the Extended Northern Runway, over highly populated areas of west London (and areas where population figures are due to increase). The indicative Extended Northern Runway flight paths are designed to limit the numbers of new residents affected by overflight in the event of expansion: for instance, people living to the north of the current flight paths would continue to experience no (or very limited) overflight, but this increases the noise impacts under current flightpaths. It may be possible to design flight paths which could achieve different noise impacts, should this scheme be granted Government approval.

4.31 **Landscape impacts may require mitigation**: The development would have significant impacts on the landscape and on visual amenity, especially during the construction phase. Part of the Colne Valley Regional Park would be lost to accommodate the new runway, although mitigation measures would reduce the visual impact of the development in the longer term. There would however be a permanent loss of landscape features in the Hillingdon Lower Colne Floodplain.

4.32 **More generally**, HHL has engaged with local authorities, communities, political and business representatives in taking forward its proposal. It is anticipated that HAL is most likely to be the delivery agent for the LHR-ENR scheme if it is the Government's policy to support this proposal. HAL has set out a strategy to engage with local communities and offered support in a number of ways building on ongoing and recent engagement, including public consultation, engaging local authorities and businesses and working through its Airport Consultative Committee. HAL has set out details of its Community Investment Programme, including supporting training for local people through its Heathrow Academy initiative and supporting local charities such as the Hillingdon Community Trust. It should not be assumed, however, that such an engagement strategy would automatically be deployable to support delivery of the LHR-ENR scheme. In particular it is noted that HAL's engagement to date has of course been on the details of its own scheme.

Overall assessment

4.33 On the basis of the above, the Commission notes a number of risks and challenges relating to the delivery of the Heathrow Airport Northern Runway Extension proposal. The scale of these risks is not unusual for a project of this nature and level of development.

4.34 At this stage we do not believe that these risks cannot be addressed at the appropriate junctures sufficient to ensure successful delivery by 2030, provided adequate mitigating actions are taken.

4.35 The Commission has noted detailed plans by HHL to engage local groups in taking the scheme forward.

5. Heathrow Airport North West Runway

5.1 The Commission's work to date has identified the following risks in respect of the Heathrow Airport North West Runway scheme.

Strategic

5.2 **Airfield layout may discourage low-cost carriers from operating at Heathrow:** The proposed infrastructure appears sufficiently flexible to accommodate a wide range of future fleet-mix scenarios. However, there would remain a slight risk of Heathrow's layout discouraging low-cost carriers from operating at the airport due to relatively longer aircraft turnaround times. This risk may pose a particular challenge to the airport in those scenarios for the future in which the role of legacy carriers declines and low-cost carriers further expand their market share in all market segments ('*low-cost is king*').

Implementation

5.3 **Manageable levels of engineering risk:** In relation to the delivery of airport infrastructure, the risks associated with the Heathrow Airport North West Runway scheme are at a level which would be considered normal for a project of this nature and scale. The most complicated aspect of the scheme's engineering involves the placement of a section of the M25 motorway into tunnel. This is a major project in its own right, with a protracted delivery time that has been factored into the estimated opening date for the scheme of 2026. Managing the project while ensuring no unacceptable disruption to traffic flows on a key part of the strategic road network will present a particular challenge. However, on the basis of the available evidence, there is no reason to believe that this work cannot be delivered successfully.

5.4 **Management of flood risk is important:** While the current Heathrow airfield is not considered susceptible to flooding, areas adjacent to the airfield, particularly to the west, are considered to have significant flood risk. The proposed expanded airfield would impinge upon flood plain and potentially heighten this flood risk. Mitigating actions have been identified which can negate this disbenefit and on the basis of the available evidence it appears that the risk of heightened flood risk in adjacent areas can be offset.

5.5 **System airspace risks regarding wider programmes:** Heathrow sits within a complicated airspace system and its traffic flows must be managed in relation to flows at a number of other commercial airports, most notably London City and Luton. Expansion at Heathrow would require a redesign of this airspace system; a complicated process likely to require several years.

5.6 The London Airspace Management Programme and Future Airspace Strategy represent viable vehicles for this redesign. The Commission has noted, however, the risks associated with these programmes. Their continued progress would be highly important for the redesign of airspace to support Heathrow expansion. There may also exist a number of ways to mitigate the noise impacts of the scheme, making use of advanced navigational technology.

5.7 Based on the available evidence, the Commission does not believe that Heathrow expansion would impact upon capacity at other commercial airfields. However, fast-time simulation, conducted by NATS over the consultation period, will provide additional assurance on this position.

5.8 **Interactions with RAF Northolt require further exploration:** Advice from NATS has identified a high likelihood that the new runway would have significant operational impacts upon RAF Northolt, a military airfield located six miles north of Heathrow, which also accommodates a number of civilian business and general aviation movements. Possible mitigations for this impact may range from tighter co-ordination between the control towers of Northolt and Heathrow or the limitation or removal of civilian traffic at Northolt, although on the basis of the available evidence, the Commission believes that continued military operations at Northolt could be accommodated alongside the scheme. More significant impacts cannot be ruled out at this stage and the Commission intends to explore this issue further in the coming months. The loss of civilian traffic at Northolt would have no significant impact upon overall levels of traffic within the London system, though Northolt is considered to play an important military role even though the number of military flights is small.

5.9 **Local airspace design likely to be controversial:** Recent trials of airspace change in the London system have highlighted the difficulties involved in making changes to established traffic management procedures. The lack of change in London airspace over a period of decades reflects the difficulty of making changes of this type. As with other proposals, the successful delivery of new capacity at Heathrow will depend upon the design and delivery of low-level airspace structures. The size of the noise affected population at Heathrow means that design issues are likely to be particularly contentious.

5.10 In its *Interim Report*, the Commission recommended the creation of an Independent Aviation Noise Authority. The Commission's view remains that the creation of such a body could be an effective way of restoring a degree of trust to the processes regarding airspace change and could reduce this risk to the delivery of new airspace structures.

5.11 **Tensions regarding utilisation of rail links:** In relation to rail access, the scheme is based upon a mixture of existing infrastructure (the Piccadilly Line and the connection from the Great Western Main Line currently used by Heathrow Express and Heathrow Connect), planned additions to the network (Crossrail, Western Rail Access and a connection to HS2 via Old Oak Common) and a new Southern Rail Access proposal.

5.12 The Commission's analysis has identified that while there is sufficient capacity on these links to accommodate both background demand and demand related to airport expansion through to 2030, the situation beyond that point becomes more uncertain and capacity issues are likely to become increasingly severe without major infrastructure investment. Airport expansion is not a key driver of this requirement, which chiefly stems from background demand growth.

5.13 Tensions relating to the use of rail infrastructure to serve airport users, as opposed to commuters and other users of the network, are likely to emerge. These are likely to be seen as early as 2023, when the track access rights for the Heathrow Express service are due for renegotiation. Ambitions to increase rail mode share at Heathrow (linked to the risk identified in the "legal" section below relating to air quality) may come further into tension with the need to ensure adequate capacity for commuters.

5.14 **Replacement of Energy from Waste Plant is required:** The proposed airfield expansion would required the removal and replacement of the Lakeside Energy from Waste Plant. The plant, while not of national importance, nevertheless plays a significant role in regional and local waste management and has a valuable capability to process clinical waste and other contaminated material. Its replacement is not considered an optional component of the scheme. The planning and construction of an Energy from Waste Plant is a substantial exercise in its own right, whose timescales are not substantially shorter than the delivery of new runway infrastructure. The process of planning a provision of an alternative facility would, therefore, need to begin soon after a decision to proceed with airport expansion.

Commercial

5.15 **Commercial viability of the scheme has to be considered carefully:** Demand for expanded capacity will be affected both by global trends driving the overall market growth in the aviation sector and attractiveness of the proposal to airlines, which depends on a set of factors including size and strength of the local market (which determines the yield to airlines for their flights), airport costs (such as aero charges, slot prices and sunk costs), congestion costs, advantages of route density created by other airlines from a given airport, service levels and access to capacity (current and future). Change in any of these factors will affect demand.

5.16 While the size and strength of the local market is of primary importance to all airline business models, different airline business models value other factors differently. While expanding Heathrow would increase aero charges to very high levels, there is a very high likelihood that additional capacity at Heathrow would be well used as although yields may decrease to a degree as a result of a reduction in excess demand at the airport, they are expected to remain relatively high. This is supported by all five of the Commission's scenarios even with a carbon cap in place.

Legal and Planning

5.17 **Securing planning permission may be a lengthy process – there is no clear precedent:** Airport expansion of this type and scale has not been successfully undertaken in the UK in several years. Recent changes to the legal and planning framework, including the Planning Act 2008 (as amended by the Localism Act 2011) have reformed planning processes for nationally strategic infrastructure projects and introduced the concept of National Policy Statements. Hybrid bills, often cited as alternative means to securing planning permission for major projects such as HS2, Crossrail and the Channel Tunnel are also relatively uncommon. As such, it is difficult to state definitively how long the planning process will take, including the risk of delay through any legal challenge, and the resulting costs. This is an issue for all schemes.

5.18 HAL has set out how they anticipate that their scheme may progress through the Development Consent Order (DCO) planning process. This demonstrates a broadly credible and appropriate understanding of the requirements of this approach at this stage. Government support for the principle of a third runway at Heathrow in a National Policy Statement is identified as necessary by HAL. HAL has set out an intention to begin preparing a planning application as soon as (and if) Government confirms support for its proposals.

5.19 The Commission will set out its recommendations for how planning consent for any recommended solution can best be secured in its final report.

5.20 **Rules on air quality may present challenges:** At present, a number of areas around the Heathrow site are in breach of European rules regarding air quality. This is due largely to background traffic on the M25 and M4, as opposed to airport users or operations. However, regardless of the cause, the UK is under a firm obligation to reduce these levels of air pollution to levels that comply with legal limits.

5.21 There are three main risks related to this scheme in relation to air quality. First, the risk that fleet-turnover does not produce the expected reduction in relation to per-vehicle emissions. Second, the risk that the anticipated shift towards sustainable modes of transport does not occur to the extent expected. Third, the risk that European rules on air quality are further tightened during the delivery period.

5.22 The Commission intends to undertake more detailed modelling of the air quality impacts of schemes during the consultation period. This will include dispersion modelling to examine health impacts on local populations, based on more detailed surface transport modelling.

Public engagement

5.23 **Significant housing losses will be required:** The construction of the airport site will result in the loss of 783 homes, including most of the village of Harmondsworth. Other houses would need to be lost to permit the construction of the associated surface access enhancements; an initial assessment is that up to a further 289 dwellings may be required for this purpose, but this figure is likely to reduce as the detailed design is refined. Clearly, this could be a concern to those affected.

5.24 HAL has set out how they would mitigate this issue by offering to purchase affected homes at 25% above market value plus meeting legal and stamp duty costs.

5.25 **Airport expansion will increase the noise-affected population in the local area:** Anticipated noise impacts may result in heightened levels of local opposition to the scheme. HAL has set out how it will seek to address this issue by committing £250m for noise insulation and residential property compensation if Government supports a third runway.

5.26 Heathrow Airport's location, adjacent to densely populated areas of London, means that the airport's noise affected population is substantial. The Commission's analysis shows that against most metrics operating a new north west runway at Heathrow

would see a percentage increase in the number of people affected by aviation noise in comparison to the 'do minimum' baseline in future years although these numbers would generally be lower than current figures, due to improvements in aviation technologies.

5.27 This same is not true, however, for night flights, where improvements to aircraft technology and the capability of late evening and early morning arrivals to land further to the west sees a positive impact against the do minimum in all assessment years.

5.28 **Landscape impacts may require mitigation:** The development would have significant impacts on the landscape and on visual amenity, especially during the construction phase. A significant proportion of the Colne Valley Regional Park would be lost to accommodate the new runway, although HAL has proposed extensive mitigation measures which would improve the quality and appearance of the remainder of the park. It also proposes to create a green corridor for recreational use, linking and enhancing existing open spaces to the north and west of the airport.

5.29 **More generally**, HAL has set out a strategy to engage with local communities and offered support in a number of ways building on ongoing and recent engagement, including public consultation, engaging local authorities and businesses and working through its Airport Consultative Committee. HAL has set out details of its Community Investment Programme, including supporting training for local people through its Heathrow Academy initiative and supporting local charities such as the Hillingdon Community Trust.

Overall assessment

5.30 On the basis of the above, the Commission notes a number of risks and challenges relating to the delivery of the Heathrow Airport North West Runway proposal. The scale of these risks is not unusual for a project of this nature and level of development. HAL has casrried out a consultation exercise with local communities, which influenced its Updated Scheme Design and proposed compensation strategies.

5.31 At this stage the Commission believes these risks can be addressed at the appropriate junctures sufficient to ensure successful delivery by 2030, provided adequate mitigating actions are taken.

5.32 The Commission has noted detailed plans by HAL to engage local groups in taking the scheme forward.

Contact Information

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