



Airports Commission's Air Quality Local Assessment - Consultation

Heathrow Airport's response

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Introduction & summary

Heathrow Airport welcomes the evidence released by the Airports Commission confirming the North-West runway scheme can be delivered within air quality limits.

As the UK's only hub airport, Heathrow is Britain's gateway to the world for passengers, business and freight. Heathrow's plans for expansion will reduce the airport's environmental impacts while creating the greatest possible economic benefits for all of the UK and connecting Britain to global growth.

The Airports Commission has completed a thorough assessment of the air quality impacts for all three expansion options – Heathrow, Gatwick and Heathrow Hub. After rigorous assessment, and based on a conservative analysis of our proposed mitigation measures, the Commission confirms Heathrow can expand within air quality limits. Heathrow's NWR scheme is capable of performing well within limits. There is sizeable 'headroom' identified in the Commission's assessment between the annual emissions of NO₂ and the air quality objective.

Playing our part

Heathrow understands air quality is a real concern for local communities and an issue London needs to tackle urgently for people's health and longevity. Air quality in metropolitan centres in Europe is a critical issue not just for us but for future generations and the recent Supreme Court judgement has helped to focus the attention of government, local authorities and industries on the need for concerted and prompt action to decrease emissions.

Heathrow is fully committed to playing its part in combating air pollution with London meeting air quality limits and working in partnership with the Government to achieve compliance with EU legislation as soon as possible. The evidence produced by the Commission confirming that Heathrow expansion can meet air quality limits is a clear indication the subsequent planning policy test is capable of being passed. Should the NWR scheme be selected by the Airports Commission, we expect any subsequent National Policy Statement to make clear that expansion must not put air quality compliance at risk.

Close Consultation

Before Heathrow was short-listed by the Commission, the airport consulted closely with the community and stakeholders to assess the many different options for new hub capacity.

In 2013, Heathrow developed an entirely new proposal for expansion. The starting point has been to listen to the needs of local people to ensure expansion delivers economic growth in a sustainable way and guarantees those most impacted by expansion get the greatest benefits and are treated fairly.

The Commission has been clear it believes the mitigation measures Heathrow is proposing to deliver in partnership with key stakeholders around the airport and across London will be effective in tackling emissions. Emissions-based landing charges will help drive cleaner aircraft technology, while increasing the efficiency of the airfield and airspace will drive cleaner aircraft operations on the ground and in the air. Emissions from airside vehicle fleets will reduce as we move to incorporate zero emission vehicles and the Airport's Surface Access Strategy will ensure that there are no more Heathrow-related vehicles on the roads than today. It is also reassuring to see that Heathrow is already working on the three additional mitigation measures suggested by the Airports Commission, as part of the airport's strategy to improve air quality prior to expansion.

It is significant that by far the greatest contribution to local air pollution in the Heathrow area arises from non-airport related road traffic. Coordinated and meaningful action is needed from Government and City Hall to get cleaner vehicles on to major roads and motorways across London and the South East and give more people an alternative to cars.

Our long term surface access strategy will transform rail services to the airport starting with Crossrail in 2019 and the Piccadilly line upgrade in the 2020s. Western Rail to Reading and beyond (by 2021) and Southern Rail Access through Clapham Junction and London Waterloo (by 2030) will also provide people to the south and west of Heathrow a better alternative than coming to the airport by car. The combined effect of our surface access strategy will mean more than 50% of airport passengers will be accessing the airport by public transport.

A Catalyst for Change

Expansion at Heathrow will give the airport the ability to act as a catalyst for environmental innovation and to fast-track research and development. Heathrow already hosts the world's largest single site employee car share scheme, has the UK's only free airport public transport travel zone, the busiest bus and coach station in the UK and has the UK's first publicly accessible hydrogen refuelling site.

Now that the Commission's work on air quality is complete it is possible to update the judgement of the sustainability performance of the scheme in relation to air quality. On the basis of the Commission's findings we consider that the Heathrow NWR scheme can be classified as 'adverse' but with the potential to become 'neutral' with mitigation. The effectiveness of the proposed mitigation is confirmed by the Commission on a conservative basis and we believe that the additional scope of the mitigation will deliver a neutral air quality impact.

Our confidence in our ability to tackle air quality in the future stems in part from our strong track record to date. Heathrow has been working hard to reduce environmental impacts through our sustainability strategy Responsible Heathrow. This includes a focus on air quality that has resulted in reductions in annual ground-based NOx emissions from airport activity between 2009 and 2013 of 16% (430 tonnes).

Heathrow continues to invest in pre-conditioned air and fixed electrical ground power infrastructure at aircraft parking stands and technologies to increase approach and taxing efficiencies and reduce emissions from aircraft. The airport will continue to work with airlines to ensure the Heathrow fleet is one of the cleanest and quietest in the world.

In addition to the existing Heathrow Air Quality Action Plan we have announced a 10-point Blueprint to reduce emissions in 2015. As part of that plan the airport is discussing with the Mayor of London how London's Low Emission Zone could be extended to areas around Heathrow. Heathrow has a strong history of delivering sustainable travel. For over 20 years we have been at the forefront of this field having been central to developing guidance for both Airport Surface Access Strategies and Airport Transport Forums. Through the Heathrow Area Transport Forum (HATF) we have delivered innovative solutions including the aforementioned world's largest single site car share scheme, the UK's only airport 'free travel zone' and our own cycle hub. This is funded through our annual public transport levy of over £2m, which is formed through hypothecated car parking revenue.

This has helped to deliver significant change in travel patterns for both air passengers and airport colleagues. Since 1991 we have seen the number of airport passengers using public transport grow from 34% (10 million) to around 42% (19 million) today and airport colleagues driving to work reduce from almost 80% to just over 50% today. We have committed to continue these trends over the next five years through our Sustainable Transport Plan, and forthcoming surface access blueprint which will deliver a further 5% reduction in single occupancy car mode share by 2019 so that the majority of airport colleagues will be using sustainable modes.

Delivering locally and nationally

Throughout the development of Heathrow's new proposal, the airport has sought to balance its impacts on local communities while delivering the greatest possible economic benefits for all of Britain. This work will continue in close collaboration with local communities, government and local authorities.

At the end of the Airports Commission public consultation, the Commission's research and analysis will demonstrate that an expanded Heathrow will result in fewer people being impacted by noise than today even with expansion. Heathrow can also be a catalyst for significant Air Quality reductions and expansion can be delivered within climate change targets.

The Commission has shown that only Heathrow can help to secure the economic recovery for the whole country, connecting our businesses to the world and delivering greater benefits beyond London and the South East than any other option.

As the UK's only hub, Heathrow is Britain's gateway to the world for passengers, business and freight. It is the launch pad for British enterprise and the red carpet for tourists and international inward investment. To win the global race for jobs, trade and growth, the UK must have easy access to the long-haul growth markets of the future with frequent and convenient flights.

Expansion at Heathrow is about Britain's place in the world. It is about delivering for both the environment and the economy. It is about British jobs, growth and opportunity. It's about the future we want for Britain.

Section 1

Response to Question 1

What conclusions, if any, do you draw in respect of the three short-listed options?



Airport's Commission - Question 1:



What conclusions, if any, do you draw in respect of the three short-listed options?



We welcome this opportunity to put forward our views on the new evidence relating to air quality.

Air quality is a significant challenge for each of the shortlisted runway schemes. Promoters have a clear accountability to understand and to mitigate the impact of the development.

We have reviewed the information published by the Commission detailing the local air quality assessment carried out for each of the three shortlisted schemes.

The Airports Commission has carried out a thorough and equitable air quality analysis of the schemes, using an up-to-date emissions inventory and air dispersion modelling techniques.

The Commission's analysis shows that there are differences in how each of the three schemes performs in air quality terms.

The assessment of the air quality impacts for Heathrow North West Runway (NWR) conducted by the Commission is consistent with our own evaluation (with the exception of the benefits of mitigation). It shows that the scheme can operate within air quality limits.

We also consider the Commission's assessment to be conservative in that it is based on an assumption of higher air traffic movements in 2030 than we are forecasting, and also uses one of the Commission's highest 2030 demand scenarios. Furthermore the Commission's road traffic forecast is higher than our own and it does not take into account our commitment to deliver no more airport-related traffic than today's airport, underpinned by a detailed surface access strategy.

We urge the Commission to consider the responses within this document alongside the conclusions in our original submission in 2014, and also those in our consultation response submitted on February 3rd 2015. Both of these demonstrate the Heathrow NWR proposal is deliverable and why we consider that it is the most sustainable Heathrow option. Furthermore Heathrow's location and much better surface access connectivity make it an inherently more sustainable option than Gatwick.

The following are the conclusions that we have drawn from the Commission's assessment of the three schemes.

1.1 Our conclusions

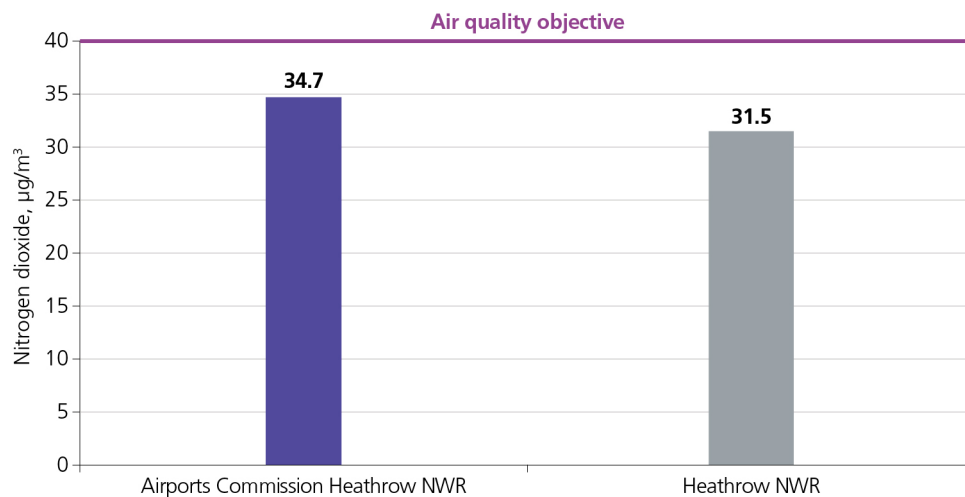
1.1.1 Heathrow NWR has been confirmed by the Airports Commission as being deliverable within air quality limits

We recognise that air quality is a significant concern to our stakeholders, including local communities around Heathrow. We have worked hard for many years to understand and mitigate the impacts of our airport operations on local air quality. This experience has enabled us to hone our approach, developing our expansion plans for the airport with air quality central to our thinking and to build confidence that our scheme can perform to the required environmental standards.

Our NWR air quality strategy was built around a methodology which is consistent with the conclusions and recommendations of the air quality expert panels set up in 2004 by the Department for Transport to contribute to the Government's Project for the Sustainable Development of Heathrow (PSDH).

The Commission's assessment has now confirmed the results of our own modelling, specifically showing that the NWR scheme can be delivered without breaching air quality limits. In fact, Heathrow's NWR scheme is capable of performing well within limits. There is sizeable 'headroom' identified in the Commission's assessment between the annual concentrations of NO₂ and the air quality objective.

The figure below highlights the Commission's assessment alongside our own with the difference explained by the Commission not having taken into full account of the mitigation we have proposed.

Figure 1 Comparison of the Airports Commission assessment of annual Mean NO₂ concentrations alongside our own.

Our scheme will not therefore result in local air-quality non-compliances, nor will it delay national compliance being achieved at road links identified within the Defra Pollution Climate Mapping (PCM) model. This is despite conservative estimates of the effectiveness and scope of our mitigation measures applied by the Commission.

Specifically the Commission has confirmed that the reductions in concentrations required to prevent a delay in compliance at the Bath Road PCM road sector are achievable with mitigation by design alone (not including the additional mitigation proposed by ourselves nor the additional measures suggested by the Commission). The assessment states that a reduction of $0.1 \mu\text{g}/\text{m}^3$ would be required, while the Commission's assessment shows that a much larger indicative impact reduction in the range of $-2.4 \mu\text{g}/\text{m}^3$ to $-3.6 \mu\text{g}/\text{m}^3$ is possible.

(We recognise that following the Supreme Court judgement, the government is reviewing its plans, and will submit an updated action plan by the end of this year to achieve national compliance as soon as possible. We are committed to playing our role in achieving that. We believe that Defra's modelling of emissions around Heathrow is based on emissions data from 2009, rather than the latest emissions data which shows a significant fall in emissions. We are providing that data to Defra, along with our latest mitigation plans. We are confident that while Heathrow remains a two runway airport, the Bath Road site will not delay national compliance, and that if Heathrow adds a runway, again the Bath Road site will not delay national compliance.)

We can deliver on our promise of a cleaner and quieter Heathrow, and the Airports Commission can be confident we will continue to play our part in local air quality management.

1.1.2 Heathrow NWR can achieve planning consent on air quality

The evidence produced by the Commission confirming the Heathrow NWR scheme can meet air quality limits is a clear indication that the subsequent planning policy test is capable of being passed.

Should our NWR scheme be selected by the Airports Commission, we expect any subsequent National Policy Statement to make clear that expansion must not put air quality compliance at risk.

This assessment by the Commission shows that our scheme is sufficiently well designed to meet the requirements of the National Planning Policy Framework (NPPF) with regard to Air Quality. We believe that the Environmental Impact Assessment process required for planning consent will give us the opportunity to rigorously test the mitigation again and to reconfirm its effectiveness.

1.1.3 Heathrow NWR remains the most sustainable option of the short-listed Heathrow schemes

In our consultation response submitted to the Commission in February 2015 (para 1.5) we set out a number of reasons why the Heathrow NWR scheme is the most sustainable solution for expanding Heathrow.

In relation to environmental sustainability we demonstrated why our scheme performs better than the Heathrow Extended Northern Runway (ENR) on noise, illustrating how we are able to deliver real noise respite from over-flight, and how our scheme will affect fewer people with its noise footprint than the Heathrow ENR scheme.

The Airports Commission's evidence on air quality shows that the Heathrow NWR is the only Heathrow scheme that can be developed sustainably within air quality limits based on current assessments.

The Commission's evidence identifies that the Heathrow ENR would have a greater impact upon the local environment when compared with our NWR option and has highlighted that, even with mitigation, the Heathrow ENR scheme would result in compliance with the EU Limit Value for nitrogen dioxide (NO₂) being delayed.

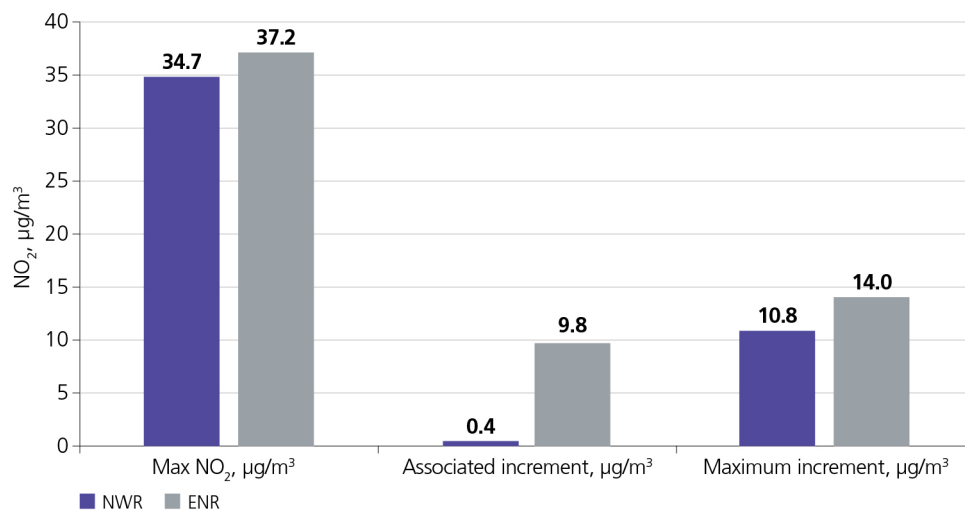
The Commission's evidence (Section 5.4) shows that the Heathrow NWR scheme:

- Generates a lower maximum ambient annual average nitrogen dioxide (NO₂) concentration than ENR (34.7 µg/m³ compared to 37.2 µg/m³ for ENR);
- Has a lower maximum increment point, (0.4 µg/m³ compared with 9.8 µg/m³ for ENR);
- Would also give rise to a lower maximum increment in ground level NO₂ concentrations (10.8 µg/m³ compared to 14.0 µg/m³ for ENR); and
- Would place far fewer residential properties 'at risk' for NO₂ (14 for NWR versus 113 for ENR).

Thus, the NWR scheme performs better than the ENR scheme in terms of impacts upon ambient air quality.

The differences between the schemes in terms of NO₂ concentrations and increments are summarized in the Figure below.

Figure 2 The differences between the Heathrow schemes in terms of maximum annual mean NO₂ concentrations



1.1.4 Heathrow NWR is better located for a new runway than Gatwick

The UK's hub airport should be as accessible to the UK's population and businesses as practical. This is not just a matter of convenience; it goes to the heart of sustainability, journey time distances and to the scale of carbon and local air quality emissions that a new runway may generate. A poorly located runway which is relatively remote from the centres of demand would result in many thousands of longer journeys, with all the economic and environmental costs which that obviously involves.

Heathrow's location and its much greater public-transport connectivity (both locally and to the country as a whole) would bring significant emissions savings when compared with Gatwick.

Heathrow is within easy reach of people in London and surrounding regions and is positioned just 12 miles from the 'demand centroid' (Denham in South Buckinghamshire) for air passengers nationally. Over 12 million people live within a one-hour journey time, including 6.7 million within one hour by public transport. Heathrow is already served by an outstanding choice of well-established public transport connections radiating in every direction and lies at a focus of the strategic highway network. Heathrow already hosts the UK's busiest bus station. The addition of Crossrail, Western Rail access and Southern Rail access will bolster this still further. By contrast Gatwick relies on a single north-south strategic highway route and a single rail line and is located well to the south of London, relatively remote from centres of population and the centre of demand.

Our public transport-led strategy will bring almost 2 million more people within a one-hour public transport journey of the airport. We will also continue to reduce the number of staff driving to work, through the continued work of our Heathrow Commuter Team and significant reductions in staff car parking. These objectives can be targeted because Heathrow is in the right location.

As well as the surface accessibility, the greater immediate population density makes Heathrow far more sustainable as an employment location, whilst its greater sub-regional population (of people and workplaces) makes it a far more sustainable location from which to serve demand. Heathrow's location at the heart of the London and Thames Valley urban network means that it is much more able to sustainably serve and to stimulate further business development.

Gatwick and its Sussex hinterland is comparatively sparsely populated, remote and seriously environmentally constrained in its ability to stimulate conveniently located economic activity. As a consequence, either new economic development will not be generated by the airport or businesses will be obliged to set up away from the airport, with consequent impacts on carbon emissions and air quality for day to day journeys.

Heathrow's much better national connectivity makes Heathrow the only sustainable option to serve as the nation's hub airport.

1.1.5 Heathrow NWR places fewer properties and people 'at risk' than the Gatwick second runway and Heathrow ENR

The primary reason for reducing emissions and improving air quality compliance is to protect people's health.

The evidence presented by the Commission clearly shows that the number of residential properties and people that they consider to be 'at risk' from poor local air quality would be greater under a Gatwick second runway than in the Heathrow NWR scheme.

Four times as many properties and people at Gatwick would be at risk of experiencing an increase in NO₂ above 32 µg/m³.

The Heathrow ENR scheme would result in the most properties and people being placed 'at risk'.

The table below summarises the dataset for the three shortlisted schemes.

Table 1 Comparison of three short-listed scheme properties and people identified as 'at risk' from NO₂ increase by the Commission

Scheme	No. properties 'at risk'	No. of people 'at risk'
Heathrow NWR	14	37
Gatwick second runway	62	151
Heathrow ENR	113	294

1.1.6 Heathrow NWR would result in a lower annual mean NO₂ concentration and increment than the Gatwick second runway and Heathrow ENR

The Commission's evidence has confirmed that the Heathrow NWR scheme would result in a significantly lower maximum annual mean NO₂ concentration than at Gatwick and in a Heathrow ENR scheme.

Gatwick's maximum annual mean NO₂ concentration at a specific receptor is 38.6 µg/m³, whereas the Heathrow NWR scheme maximum is 34.7 µg/m³.

For Heathrow ENR the maximum annual mean NO₂ concentration at a specific receptor is 37.2 µg/m³.

Gatwick's highest incremental annual mean NO₂ concentration change is also larger than Heathrow NWR, with 4.6 µg/m³ for Gatwick, against 0.4 µg/m³ for Heathrow NWR.

Heathrow ENR would result in the highest incremental annual mean NO₂ concentration generating an increase of 9.8 µg/m³.

We ask that the Commission take into account our conclusions set out above in reaching its recommendation on which option best meets its Terms of Reference.

Section 2

Response to Question 2

Do you have any suggestions for how the short-listed options could be improved, i.e. their benefits enhanced or negative impacts mitigated?



Airport's Commission - Question 2:



Do you have any suggestions for how the short-listed options could be improved, i.e. their benefits enhanced or negative impacts mitigated?



Our suggestions below relate only to our North West Runway (NWR) proposal.

The development of Heathrow's scheme presents a transformative opportunity for the airport to the way it manages air quality. The scale of investment will lead to significant changes in the way people travel to and from the airport and how airlines operate their aircraft.

Heathrow's Air Quality mitigation strategy represents a realistic and effective set of measures. The strategy for expansion is informed by the extension, acceleration and innovation of our current approach. It follows a long history of Heathrow addressing air quality issues as the UK's only hub airport, now operating at full capacity, and situated at the junction of two busy motorway links.

Heathrow is located in an Air Quality Management Area for NO₂ and has been since 2003.

We have had an air quality strategy in place since 2000 and have been identifying, assessing and collaborating with local partners to address air quality in the Heathrow area for more than 20 years.

The package of mitigation measures included with our NWR scheme is comprehensive and practicable. We are also committed to a continued process of innovation and the practice of using new technology as it emerges. We will also foster collaboration with all stakeholders to push forward the on-going development of new mitigation strategies.

In our response to this question we highlight the range of recent and on-going work to reduce emissions associated with the airport. This illustrates how our continued leadership will deliver a runway scheme that will enhance air quality. This leadership, in collaboration with Heathrow businesses, neighbouring Local Government Authorities, the Greater London Authority and TfL will see efforts to address local air quality continue to evolve and their effectiveness increase.

We welcome the recent UK Supreme Court judgement in the case brought by ClientEarth that requires the UK Government, through Defra, to submit a revised action plan to the European Commission by the end of 2015. This is not just about Government targets but also the impact of air quality on local communities and it is critical the UK demonstrates convincingly how it can achieve compliance with the NO₂ annual average limit value in the shortest time possible.

Government, TfL the GLA and Local Authorities will need to respond to the judgement of the Supreme Court. Any responses will need to address the impact of non-airport related traffic and background emissions to the area around Heathrow as these are the biggest source of emissions. We can confidently expect that a concerted effort to reduce emissions will also see a reduction in background concentrations. Heathrow has already committed to supporting our strategic stakeholders in the development of a regional strategy for air quality including a roadmap for compliance with NO₂ limit values in the shortest time possible.

The Commission has confirmed that the NWR scheme would not delay national compliance being achieved at road links identified within the Defra Pollution Climate Mapping (PCM) model in 2030. Based upon trends in our monitoring and modelling we are confident that neither the do-minimum nor NWR scenarios would delay compliance in a shortened timeline.

It is clearly important to the UK economy that sustainable development of aviation capacity should proceed alongside air quality improvements, without adversely impacting upon the UK's ability to achieve legal compliance with environmental standards.

2.1 Additional mitigation measures suggested by the Commission

2.1.1 Airports Commission's approach

The Airports Commission has identified three additional mitigation measures for Heathrow NWR that were not specifically highlighted by the promoter.

2.1.2 Our comments

We have included our comments on the Commission's suggested additional mitigation measures in response to this question as we consider them to be the Commission's own 'Suggestions for how the short-listed options could be improved'.

Since developing our NWR air quality technical assessment for submission in June 2014, improvements in aviation technology and operations at Heathrow have progressed.

We were pleased to see the Airports Commission has proposed some of these newer developments as additional mitigation. We agree with the Commission's assessment that these additional mitigation measures offer opportunities to further reduce emissions and improve air quality.

We are progressing each one already:

1. **Encouraging airlines to shut down an engine during taxiing** – we have committed to establish a baseline and set a target within 2015 (this is measure 3 in our Emissions Blueprint as set out in Section 2.3.2 below). We have worked with NATS to upgrade our flight recording systems to enable us to measure reduced engine taxiing. We will start data collection from June 2015 with a view to setting an improvement target by the end of this year.
2. **Supporting on-going technological developments and innovation, including industry research into the use of alternative fuels for aircraft** – As a founding member of Sustainable Aviation, we're engaged in a number of the technical working groups with industry partners including groups looking at aircraft emissions and noise. We are also supporting the development of sustainable aircraft fuels as outlined in the Sustainable Fuels Roadmap, and are actively supporting some of our airline customers looking to develop and deploy sustainable fuels for use at Heathrow. One particular example is the project being taken forward by Virgin Atlantic and their partners LanzaTech.
3. **Implementation of an Ultra-Low Emissions Zone (ULEZ)** – Through Heathrow's Blueprint For Reducing Emissions we have committed to implementing vehicle standards in line with the ULEZ airside by 2025 establishing emissions standards for Heathrow buses and coaches aligned with London's Ultra Low Emissions Zone.

We already limit vehicle emissions airside through vehicle age limits and encourage companies on airport to adopt low and zero emission vehicles through involvement in the Clean Vehicle Programme and Sustainability Partnership to reduce emissions from the airside vehicle fleet and plant, including electric, hydrogen powered and hybrid vehicles;

We also support initiatives with TfL and other bus operators, to implement changes to the bus fleet serving Heathrow with Euro VI and hybrid buses being introduced; we have made available electrical vehicle charging points in car parks and provided the UK's first publically accessible hydrogen refuelling station.

We are working closely with airlines, NATS, and engine and airframe manufacturers on procedural and technology improvements, and with neighbouring local authorities and TfL to bring low emissions buses onto local roads.

Although each of these measures is being progressed already, the development of a third runway will help us to go further and faster.

2.1.3 Recommendation

We recommend that the Commission:

- recognise within their assessment of the Heathrow NWR Heathrow's current commitment to implementing the additional mitigation measures proposed

2.2 Action since our June '14 submission on air quality - Continued investment in airfield infrastructure and operational efficiency technology to reduce emissions

2.2.1 The Airports Commission's approach

The Airports Commission have conducted their sustainability assessment of each of the three short-listed schemes in relation to air quality by referring to information submitted in the summer of 2014.

2.2.2 Our comments

Since our technical submission on air quality was passed to the Commission in June 2014, we have continued to invest in the airport to proactively reduce emissions

This investment has included £16m to widen airfield taxiways to enable all aircraft, but particularly the increasingly common Airbus A380, to taxi more efficiently from runway to gate and vice versa, thereby reducing emissions from engines whilst aircraft are on the ground.

The Airport Resilience Programme will continue through the Q6 Regulatory period (2014-2018), with taxiways 'Alpha', 'Bravo' (along the north side of the central terminal area) and 'Sierra' (near Terminal 4) being widened and reconfigured. A total fund of £89million is earmarked for these works.

In addition we are intending to take forward an investment of £20million by 2018 to retrofit and add new pre-conditioned air units and associated infrastructure at aircraft stands across the airport, which will reduce emissions from aircraft auxiliary power units.

We are also investing £32million in world-leading technology and systems to ensure that aircraft on approach, taxiing whilst on the ground and departing Heathrow do so with maximum efficiency and consequently minimum emissions. Airport Collaborative Decision Making, enhanced ILS and the world first Time Based Separation of aircraft on approach all contribute to our increased ability to operate the airport to plan, reduce delay and our impact upon the environment.

2.2.3 Recommendation

We recommend that the Commission:

- recognise within their assessment of the Heathrow NWR the extent to which reductions of emissions will be delivered as part of Heathrow's Q6 capital investment programme to increase the efficiency of the airport

2.3 Action since our June '14 submission on air quality - Heathrow's Blueprint for Reducing Emissions

2.3.1 The Airports Commission's approach

The Airports Commission has conducted its sustainability assessment of each of the three short-listed schemes in relation to air quality by referring to information submitted to them in summer of 2014.

2.3.2 Our comments

Our air quality technical submission was made to the Commission in June 2014. This information is still current but it was unable to utilise the work that has been done over the past year by the Heathrow management team and our partners as we continue to proactively address emissions.

Heathrow's 2011-2020 Air Quality Strategy and Action Plan includes a commitment to undertake a review and revision in 2015. In advance of this programmed update, we have developed the **Heathrow's blueprint to reduce emissions** published in April 2015. The 'Emissions Blueprint' comprises a 10 point plan of tangible actions for delivery in 2015 to accelerate, stretch and add to existing plans reduce Heathrow's NOx emissions.

In addition to an established and mature emissions monitoring, modelling and management programme, the actions and targets outlined in the Emissions Blueprint represent Heathrow's continued commitment to reducing emissions from all airport sources. Further, the Blueprint is testament to Heathrow's approach to reducing emissions around the airport from sources that are within our control or influence and working collaboratively with partners to reduce those that are not.

Building on our existing air quality action plan the ten additional points in the Blueprint include:

Aircraft activity

1. Increasing the use of ground-based air-conditioning and power to discourage aircraft from using inefficient on-board generators (auxiliary power units) while at the gate, including a target to increase use of pre-conditioned air by 15% in 2015
2. Consulting with airlines on a doubling of the NOx element of our landing charges, to incentivise deployment of only the cleanest aircraft on routes to and from Heathrow.
3. Improving taxiing efficiency to reduce emissions by encouraging the turning off of one or more engines, and investigating using tugs to tow aircraft to runways.

Airport traffic

4. Upgrading existing electric vehicle charging infrastructure in our short-stay car parks and planning to install points in employee and taxi car parks.
5. Developing fee incentive schemes for low or zero emissions buses, coaches and taxis.
6. Working with partners like the GLA, TfL and Highways England in a joint effort to reduce emissions from road traffic around the airport through a West London Emissions Plan.

Airside vehicles

7. Making all of the cars and small vans that Heathrow Airport Limited uses electric or plug in hybrid by 2020.
8. Introducing airside emission standards aligned with the London's Ultra Low Emission Zone by 2025 at the latest.
9. Leading the move to electric vehicles airside by installation of electric vehicle charging infrastructure and changing the pricing structure for airside vehicles.

Energy

10. Modernising on-site energy generation including upgrading all Terminal 5 boilers to low-NOx technology.

A copy of the Blueprint can be found in the Appendix.

The Emissions Blueprint mirrors the success and approach of the Blueprint for Reducing Aircraft Noise that we published in 2014.

The Blueprint has been developed on the back of on-going successful reductions in annual ground-based NOx emissions from airport activity between 2009 and 2013 of 16% (430 tonnes), which is further evidenced by a significant downward trend in NO2 concentrations measured at the on-airport LHR2 monitoring station.

Actions and commitments from the Blueprint have been summarised in Table 2 below, along with our initial estimates and assumptions on additional NOx reductions that the Blueprint is expected to deliver below the forecasted 2020 scenario. In total, the blueprint is capable of delivering a 25.3-tonne reduction in annual NOx emissions below 2020 forecasted levels and even greater reductions would be expected to result from delivery of targets set for 2020 and 2025 in the Emissions Blueprint that were not feasible to model at this point. For example, Heathrow will require vehicle emissions standards that align with London's Ultra Low Emission Zone (ULEZ) for all buses coaches and taxis by 2020 that operate landside at Heathrow and for all airside vehicles by 2025.

Table 2 Summary of Blueprint and associated emissions reductions

Blueprint Action		Expected Emission Reduction-below 2020 forecasted NOx scenario	How Heathrow Airport will achieve this
1	Increasing the use of ground-based air and power to discourage aircraft from using inefficient on-board generators while at the gate	Baseline forecast for 2020 scenario assumes improved total APU run times. Further work is needed to accurately quantify the benefits of this measure.	Targeted engagement beginning with airline partners at T2, T5, and T3. Investment of up to £20m by the end of Q6 for new and upgraded PCA supplies. Benchmark Heathrow performance against other leading airports with the intent to improve Heathrow's performance and goals.
2	Encouraging early phase-out of older, Pre-CAEP aircraft and creating a single comparison table based on noise and emissions performance and report on this quarterly	Aircraft fleet mix used in 2020 forecast scenario assumes relatively low percentage of Pre-CAEP aircraft; no substantial increases above this level are expected to result from this action.	Proposal currently in consultation with the airline community to nearly double Heathrow's NOx landing fees in 2016. Work at a senior level with airlines to encourage an earlier phase-out of older aircraft. Planned review of Heathrow's 'Fly Quiet League Table' in 2015 to incorporate CAEP emission standards as part Heathrow's ranking.
3	Improving taxiing efficiency to reduce emissions by encouraging the turning off of one or more engines, and investigating using tugs to tow aircraft to runways	Reduction: 6.4 tonnes Assumes that 50% of arrivals reduced engine taxi-in. For these arrivals NOx emissions from taxi-in are assumed to be 7.97%* lower than the baseline.	Engagement at a senior level with airlines to encourage reduced engine taxiing Planned upgrade of ground movement record system to record reduced engine taxiing Planned investments in taxiway upgrades to improve flow. Increasing the efficiency of airport collaborative decision making (A-CDM).
4	Upgrading electric charging infrastructure in short-stay car parking and look to install points elsewhere around the airport	The current baseline fleet forecast for 2017 is in line with national projections and includes 0.17% electric cars and 0.25% of petrol cars being plug-in hybrids; further work will be conducted to measure the beneficial impact of this action.	Upgrade the existing charging infrastructure in Heathrow short-stay car parks Evaluate how to best provide charging facilities for Heathrow taxi feeder, long-stay, and staff car parks.
5	Introducing fee incentive schemes for low or zero emissions cars, coaches and taxis	Not feasible to estimate potential reduction expected at this time.	Investigate how to incentivise low or zero emission buses, coaches and taxis. Consider emissions-weighted fee for private hire coach parking and a revised queuing system in Heathrow taxi feeder park. Review staff incentive schemes to encourage low or zero-emission cars for staff commuting.
6	Working with partners like London Borough of Hillingdon, TfL, GLA and Highways Agency in a joint effort to reduce emissions from road traffic around the airport	Not feasible to estimate potential reduction expected at this time..	Potential measures include: Establishing emissions standards for Heathrow buses and coaches aligned with London's ULEZ Working with bus and coach operators to increase the number of hybrid buses Seeing whether Heathrow can set up a geo-fence around Heathrow that forces hybrid vehicles to operate in electric-only mode.

7	Reviewing Heathrow's own fleet of cars and small vans, and making these all electric or plug-in hybrid by 2020	Reduction: 12.7 tonnes (combined with Action 9)** Accounts for commitment that all HAL cars and small vans (approx. 220 vehicles) will be electric by 2020.	Leading the way for the airport community by cutting emissions from Heathrow and tracking Heathrow's vehicle fleet emissions monthly. Fleet review already underway that will result in a detailed timeline for conversion of every car or small van that Heathrow own or lease to electric or plug-in hybrid by 2020.
8	Pooling of ground-support equipment to reduce the overall fleet, introducing airside vehicle standards aligned with London's ULEZ by 2025.	Not feasible to estimate potential reduction expected at this time.	By the end of 2015, all airside vehicles will carry tracking devices to give the airport community the data it needs to reduce vehicle numbers, emissions and costs. Heathrow will begin engagement at all levels with the airside community to introduce the Airport's plans to tighten emission standards.
9	Leading the move to electric vehicles airside by completing a data gathering trial and investing in electric vehicle infrastructure	Reduction: 12.7 tonnes (combined with Action 7)**: Assumes a total of 1,500 cars and small vans (including HAL vehicles) operating airside switch to electric by 2020.	Increased investment in airside electric-charging infrastructure with a current business plan that includes financial provision for charging infrastructure for 1,500 vehicles by the end of Q6 (quinquennium 6 – the period April 2014 to December 2018). Through the Heathrow Clean Vehicles Partnership, run trials to generate data on the costs and operational needs of a range of electric vehicles and charging facilities. Evaluate adapting the pricing structure for airside vehicle permits to favour low-emission vehicles and contracting and providing charging for electric airside buses.
10	Modernising on-site energy generation including upgrading all Terminal 5 boilers to low-NOx editions	Reduction: 6.22 tonnes Modernising on-site energy generation including upgrading all Terminal 5 boilers to low-NOx editions	Replacing output from Boiler House 448 with best available low-NOx boilers. Upgrading remaining 2 of 3 boilers in T5 Boiler House with low-NOx burners.

*<http://www.areco.org/AQ%20Aircraft%20Surface%20Constrants%20Miller.pdf>

**Actions 7 and 9 would result in a total savings of approximately 12.7 tonnes, combined.

2.3.3 Recommendation

We recommend that the Commission:

- recognise within their assessment of the Heathrow NWR the extent to which air quality is being managed at Heathrow today and considers this as valid evidence of our commitment to future management measures

2.4 Scope for road alignment and design features to deliver mitigation

2.4.1 Airports Commission's approach

In its assessment methodology (Chapter 3), the Commission's approach to new road alignments has been set out. On page 31 the report states:

"Where new roads, or changes in road alignments, are included within the Promoters' submissions, in the absence of confirmed alignments these have been included in the dispersion model using straight-line geometry derived from the traffic model. Thus, while the emissions from these new roads have been calculated in detail, the position and alignment of the new roads can only be broadly indicative at this time. The alignment of new roads will, in practice, be different from those simulated in the dispersion model."

2.4.2 Our comments

Our proposals for new roads have been developed with a view to minimising environmental impacts and considering the potential impacts of emissions on air quality. We will continue to engage key stakeholders including local authorities, TfL and surrounding communities on the design and layout of new roads to reduce and mitigate their impacts.

If the Heathrow NWR scheme is recommended by the Airports Commission then we will undertake further detailed modelling and analysis on the design of all new roads. This will enable the most appropriate layout and alignment to be determined. This will allow the optimum proposal from an air quality perspective to be developed to minimise the impacts of the scheme.

For example the re-alignment of the Bath Road will be a fundamental change that provides a clear opportunity for us to consider how we locate and design the road scheme in relation to air quality emissions performance. There will be scope to work in conjunction with TfL and local authorities to incorporate traffic management and calming features into the road scheme to influence the traffic volume and type.

2.4.3 Recommendation

We recommend that the Commission:

- note that new road layouts will be further developed and optimised taking into account air quality impacts as a key consideration

2.5 Mitigation by design

2.5.1 Airports Commission's approach

The Airports Commission has carried out its air quality impact assessment of the three short-listed schemes with mitigation by design only. In addition, a sensitivity analysis has been conducted for each scheme in terms of the effectiveness of the scheme promoters' additional mitigation measures.

In the case of the Heathrow NWR, a detailed assessment of our proposed mitigation measures has been conducted, which has confirmed that planned mitigation would not delay national compliance being achieved at road links identified within the Defra Pollution Climate Mapping (PCM) model in 2030; specifically the EU Limit Value at A4 Bath Road.

For the ENR scheme, even with the totality of mitigation measures applied, compliance with the EU Limit Value would not be achieved – by some margin.

2.5.2 Our comments

We can appreciate the need for the Commission to judge what they consider to be a suitable allowance for how effective each of the mitigation measures are likely to be.

In general we consider that they have made an acceptable assessment albeit, as we point out in our response to question 5 below, a conservative one.

Notwithstanding the conservative nature of the estimate, the assessment has indicated that there is still significant headroom between the emissions modelled for Heathrow NWR and compliance limits. The maximum annual mean NO₂ concentration being 34.7 µg/m³ against an EU limit value of 40 µg/m³. This is shown in Figure 1 above.

2.5.3 Our recommendations

We recommend that the Commission:

- recognise that despite the conservative estimate of mitigation measure effectiveness the Heathrow NWR scheme impacts are well below the compliance limits

2.6 Heathrow NWR scheme mitigation measures would have wider benefits

2.6.1 Airports Commission's approach

The Airports Commission has assessed the mitigation measures proposed for the Heathrow NWR scheme in relation to their effectiveness in addressing emissions on the A4 Bath Road.

2.6.2 Our Comments

In terms of the wider effectiveness of the additional mitigation measures put forward by the NWR scheme, the A4 Bath Road is not the only location at which air quality improvements would accrue as a result of the scheme mitigation measures.

- A number of communities closer-in to the airport would also benefit to a greater extent from the additional mitigation measures targeted at on-airport emission sources.
- Our approach is to achieve the greatest emissions reduction practicable, not just to achieve compliance with limits. We recognise that the limit values are health based and so strive to reduce emissions wherever practicable.

2.6.3 Our Recommendations

We recommend that the Commission:

- recognise that a more comprehensive examination of the wider effects of the NWR scheme additional mitigation measures could have been undertaken to demonstrate the benefits to air quality at receptor locations

2.7 Conclusion

With an Airports Commission recommendation we will have a huge opportunity to enhance our scheme. We will engage and consult extensively with our stakeholders to ensure that the expanded airport can perform as well as possible in relation to local emissions.

Heathrow Airport's Air Quality Strategy will continue to be developed and implemented to improve our local environment. As we have done in the past, we will stretch our on-airfield targets raising the bar each year on measures such as reducing allowable APU run times, and incentivising the use of pre-conditioned air.

We remain confident in the potential of the mitigation put forward and our ability to continue to innovate.

Queen's

Section 3

Response to Question 3

Do you have any comments on how the Commission has carried out its appraisal?



Airport's Commission - Question 3:

“

Do you have any comments on how the Commission has carried out its appraisal?

”

This question has not been directly answered as part of this consultation response.

The responses to question 5 as set out below deal with our comments on how the Commission has carried out its appraisal.

Section 4

Response to Question 4

In your view, are there any relevant factors that have not been fully addressed by the Commission to date?



Airport's Commission - Question 4:



In your view, are there any relevant factors that have not been fully addressed by the Commission to date?



4.1 Surface Access

4.1.1 Airports Commission's approach

The air quality appraisal has used traffic flows taken from the Airport's Commission's surface access appraisal.

4.1.2 Our comments

The Airport's Commission's surface access appraisal did not make allowances for all elements of our proposed surface access strategy and therefore additional emissions mitigation. Whilst it allowed for the predicted change in air passenger public transport mode share, it did not account for our strategy for airport colleagues.

The traffic flows are based on an assessment that assumed no further reduction in airport worker private car mode share compared to today. Given the transformative change in rail access, commitment to local bus improvements, reduction in parking spaces by 2030 and our track record of reducing colleague single occupancy cars from 79% in 1991 to 51% in 2013, we believe this further reduction is achievable.

In addition to improvements to public transport, we also proposed measures to make more efficient use of cars. This included a commitment to work with the private hire industry to develop solutions to reduce the number of 'empty return' journeys made to and from the airport. The taxi industry is being transformed by the introduction of applications for mobile devices. We will work with the industry to develop solutions that will allow more vehicles to carry passengers in both directions and reduce car trips to and from the airport. The requisite technology exists today and as the airport develops it will be possible to provide the facilities and systems to make this a reality before 2030.

In our 'Taking Britain Further' submission in May 2014, we also suggested a congestion charge could be introduced after 2030 should it be required to reduce traffic congestion and emissions. Dependent on the requirement for mitigation this could be introduced as either a traditional congestion charge (i.e. to encourage shift to public transport) or it could first be introduced as a 'low emissions zone', similar to that in place in London today, to accelerate take up of technology for vehicles using Heathrow. The appraisal notes that such an intervention could have a significant impact on car mode share and overall traffic demand.

4.1.3 Our recommendations

We recommend that the Commission:

- note that further mitigation to reduce traffic is available to ensure that Heathrow NWR can be delivered whilst meeting the EU limits

Section 5

Response to Question 5

Do you have any comments on how the Commission has carried out its appraisal of specific topics including methodology and results?



Airport's Commission - Question 5:

“

Do you have any comments on how the Commission has carried out its appraisal of specific topics including methodology and results?

”

Our comments in this section relate to the report prepared for the Airports Commission by Jacobs.

For the purposes of this consultation we consider the Jacobs report to be the 'appraisal' as the Commission have not provided an updated sustainability assessment in relation to air quality.

5.1 Overview

5.1.1 Airports Commission's approach

The Airports Commission has now completed their detailed air quality dispersion modelling.

In particular, the Commission's air quality assessment has:

- Calculated emissions from airport and surface access activities and used local-scale dispersion modelling (ADMS Airport) to identify air pollutant concentrations, subsequent impacts on health and compliance with EU Limit values;
- Concentrated upon NO_x, NO₂, PM₁₀ and PM_{2.5};
- Calculated total emissions and compared these on a National scale with the National Emissions ceilings and Gothenburg Protocol limits;
- Assessed the societal costs of increased emissions and changes in air quality resulting from the schemes;
- Monetised the costs of the increased emissions; and
- Assessed the likely impacts of air pollutant emissions upon ecosystems.

5.1.2 Our comments

The Airports Commission has carried out a thorough and detailed air quality impact assessment of the three short-listed schemes. The approach and methodologies used by the Commission are consistent, in general, with its stated aims and objectives in Chapter 6 of the Appraisal Framework, published in April 2014.

The Commission's assessment has captured all the relevant airport emission sources associated with the three short-listed schemes, together with their respective surface access emissions. The use of ADMS Airport as the dispersion code to assess the effects of changes in emissions upon air quality is consistent with the original stated aim that the assessment should be based upon the ICAO's "sophisticated" assessment level (paragraph 6.25 of the Appraisal Framework document).

The Commission's methodology and output is consistent with the conclusions and recommendations of the air quality expert panels set up in 2004 by the Department for Transport to contribute to the Government's Project for the Sustainable Development of Heathrow (PSDH).

5.1.3 Our recommendations

We recommend that the Commission:

- note our comments in relation to the methodology and assessment approach taken by the Commission

5.2 Evaluation of mitigation

5.2.1 Airports Commission's approach

The Airports Commission have made a judgement on the effectiveness of our scheme mitigation measures in relation to improving air quality.

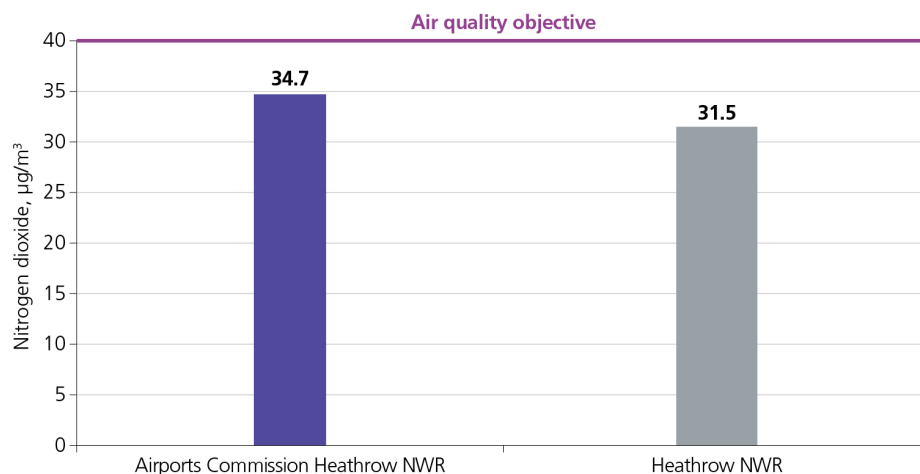
5.2.2 Our comments

We appreciate that the Commission has had to make a judgement on the effectiveness of our scheme mitigation measures but consider that the judgement made is conservative.

In the development of our scheme we have assessed all the mitigation measures put forward and are confident that they are able to provide improvements in air quality in excess of what the Commission has identified as being necessary to achieve EU Limit Value compliance for NO₂.

The figure below illustrates the Commission's assessment of the effectiveness of mitigation in comparison to our own.

Figure 3 Comparison of the Airports Commission assessment of annual Mean NO₂ concentrations alongside our own.



The Commission has made no assessment of the potential reduction of emissions and associated air quality impacts of the proposed rerouting of the A4/Colnbrook bypass and severance of the Bath Road crossing of the M25. As per our comment in 2.4.2 above, there is significant scope for road re-alignment to be designed to deliver mitigation.

The comprehensive package of mitigation put forward for the Heathrow NWR scheme is practicable and will deliver mitigation in excess of the conservative levels assessed by the Commission. We are pleased to note that the Commission is in agreement with the results of our own, earlier detailed assessment, which demonstrates that the NWR scheme can be delivered within air quality limits. Of particular note is the extent to which the Commission has identified the effectiveness of each individual measure. This clearly demonstrates that the totality of the mitigation proposed will go above and beyond that required to achieve compliance with air quality limits.

If our scheme is recommended by the Airports Commission, our air quality mitigation measures must then meet the policy tests required by the National Policy Statement and planning consent process. As part of the detailed environmental impact assessment the measures will be refined and developed further to demonstrate to the planning authorities that our scheme can meet the required standards.

5.2.3 Our recommendations

We recommend that the Commission:

- recognise in their assessment of the Heathrow NWR the significant potential for additional mitigation measures to reduce air quality impacts

5.3 2030 Time horizon

5.3.1 Airports Commission's approach

The Airports Commission has carried out their assessment of each scheme for 2030.

5.3.2 Our comments

It is noted that the Commission also intended that "as a minimum, modelling will be conducted for initial operations and mature operations phases" (paragraph 6.7 of the Appraisal Framework document).

It is unclear if the Commission consider 2030 to be a phase of initial or mature operations.

The Commission identify 2030 as the assessment year due to the limitations in surface access forecasts and we can understand the Commission's logic for doing so.

However, we have modelled out to 2040 (as presented in our technical air quality submission to the Airports Commission in June 2014) and shown continued compliance with limits. We can add capacity at Heathrow while improving air quality and meeting limits in the future. Although air traffic continues to increase from 2030 to 2040, aircraft technology and operations evolve to reduce emissions, while public transport mode share continues to increase and road vehicles continue to become cleaner.

5.3.3 Our recommendations

We recommend that the Commission:

- clarify if the assessment they have conducted for 2030 represents an initial or mature operational phase

5.4 Airport Surface Access Strategy

5.4.1 Airports Commission's approach

In Chapter 5: Heathrow Airport North West Runway, the appraisal includes a commentary on the promoter's mitigation measures. On page 73, there is consideration of the surface access strategy:

"Measure 1: Achieving an increase in public transport access from 40% to >50% to ensure total road passenger road vehicle trips to and from the airport do not increase relative to the baseline.

The Promoter's Air Quality Assessment sets out a vision for high public transport access, but it is not clear whether this is deliverable. The surface access modal share and traffic volumes assumed in this Airports Commission assessment have been built into the dynamic modelling."

5.4.2 Our comments

The Airports Commission's own analysis suggests that the future public transport mode share would increase to 55% by 2030. The air quality assessment report is misleading and contradictory when it states that it is not clear whether the level of mode shift from 40% to >50% is deliverable.

5.4.3 Our recommendations

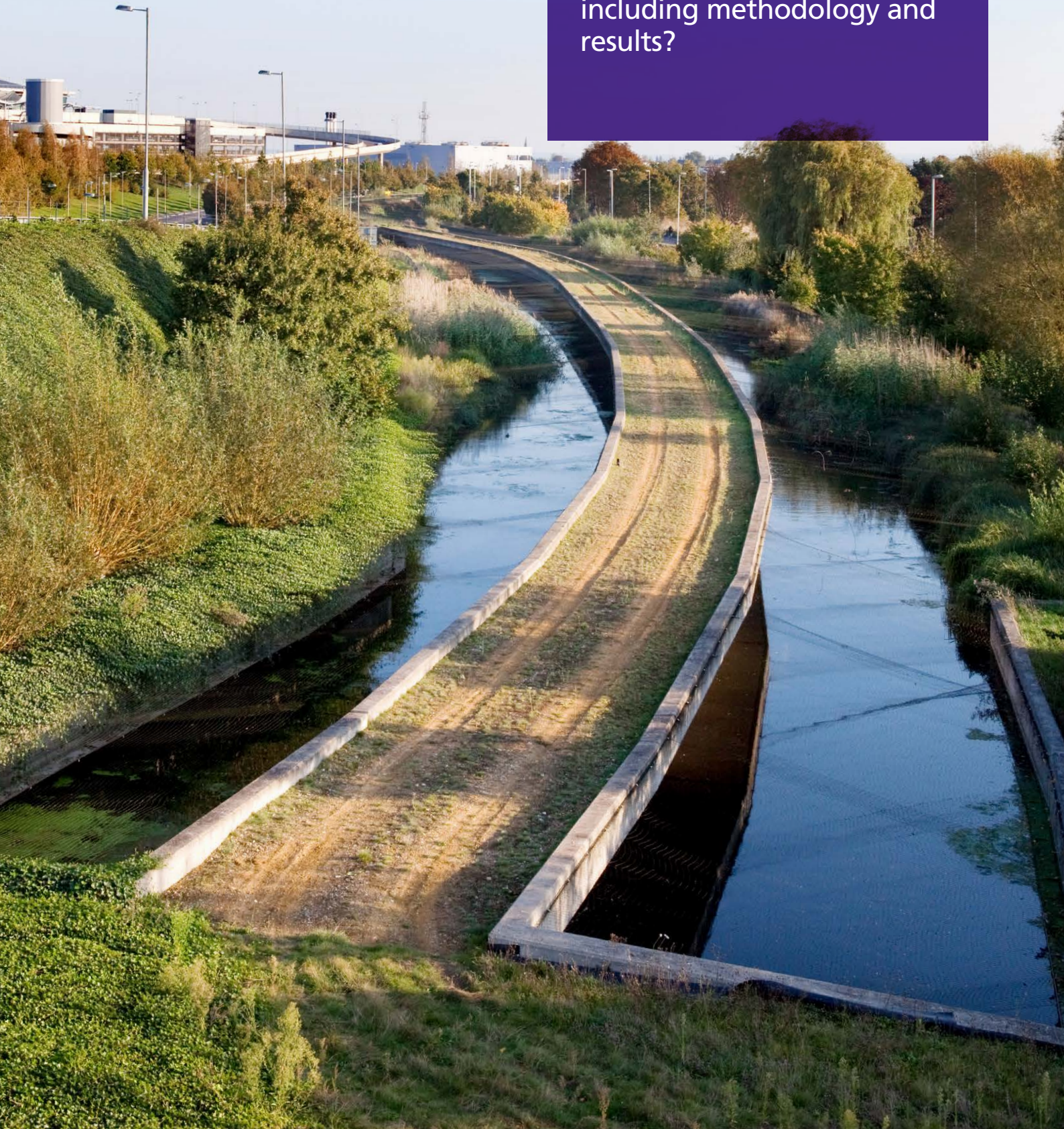
We recommend that the Commission:

- amend the conclusion of the air quality assessment to remove the statement that it is unclear whether the level of public transport mode shift is achievable

Section 6

Response to Question 6

Do you have any comments on the Commission's sustainability assessments, including methodology and results?



Airport's Commission - Question 6:



Do you have any comments on the Commission's sustainability assessments, including methodology and results?



Our comments in this section relate to the report prepared for the Airports Commission by Jacobs.

For the purposes of this consultation we consider the Jacobs report to be the 'appraisal' as the Commission have not provided an updated sustainability assessment in relation to air quality.

6.1 Air Quality Sustainability performance levels have not been updated

6.1.1 Airports Commission's approach

The Airports Commission has set out an Appraisal Framework against which a range of relevant environmental, social and economic indicators have been assessed for each of the three short-listed schemes.

Each of the indicators has been assigned an objective by the Airports Commission. For Air Quality the objective is; 'to improve air quality consistent with EU standards and local planning policy requirements'.

The Airports Commission Sustainability Assessment measures the performance of each scheme for the identified environmental, social and economic indicators and defines the impacts using the following five levels; **Highly Supportive, Supportive, Neutral, Adverse, Highly adverse***.

(*We assume 'highly adverse' to mean 'significantly adverse' in the Commission's sustainability assessment.)

6.1.2 Our comments

In its Sustainability Assessments of each scheme published on the 11th November 2014, the Commission made judgements upon the schemes and applied one of the five levels of performance for each of the ten modules being assessed, including Air Quality.

The Commission concluded that the Heathrow NWR scheme had been assessed as 'significantly adverse' (or highly adverse) with the potential to be reduced to 'adverse'.

In our February 3rd 2015 consultation response submission to the Airports Commission we highlighted that due to the incomplete air quality assessment at the time the air quality performance of each scheme could not be properly assessed. Our recommendation was that the Commission should review the assignment of the air quality impacts of our NWR scheme once the detailed assessment work had been completed.

An updated Sustainability Assessment module on air quality has not been made available by the Commission and, as a result, the Commission has not confirmed how it now judges the performance levels of each scheme.

The detailed air quality evidence is now available to the Commission for each scheme and can be used to re-assess performance, and it will inform different judgements to those made by the Commission in November 2014.

Reviewing this evidence we believe that the following performance level can now be applied to our scheme:

	Performance level previously attributed	Proposed updated performance level
Heathrow NWR	' SIGNIFICANTLY ADVERSE ' with the potential to become ' ADVERSE '.	' ADVERSE ' with the potential to become ' NEUTRAL '

6.1.3 Our recommendations

We recommend that the Commission:

- revisit and update the sustainability assessment module on air quality and revise the performance levels applied to each scheme

Section 7

Response to Question 7

Do you have any comments on the Commission's business cases, including methodology and results?



Airport's Commission - Question 7:

“

Do you have any comments on the Commission's business cases, including methodology and results?

”

7.1 Air quality monetisation

7.1.1 Airports Commission's approach

The approach taken by the Commission and its consultants is to undertake the analysis following the Air Quality – Damage Cost methodology published by Defra and the Interdepartmental Group on Costs and Benefits, Air Quality Subject Group. To estimate air quality damage costs the Commission uses:

The government's Supplementary Green Book guidance (with central-low and central-high sensitivities), giving a range of £749.5-£1,088.4m discounted over a 60 year appraisal period;

Reference also to results based upon the European Environment Agency (EEA) estimates for the "Value of Life" and the "Value of Statistical Life", giving a range of £470.7-£1,299.5m discounted over a 60 year appraisal period.

Since the Green Book methodology results lie comfortably within the range based on EEA estimates, we consider these to be the best estimates under the circumstances and, even if there is uncertainty, these costs, in relation to the overall cost:benefit ratio, are very unlikely to make any significant change to the overall balance.

7.1.2 Our comments

We agree with the approach taken by the Commission. Since the Green Book methodology results lie comfortably within the range based on EEA estimates, the Commission confidently can assume that this latter range captures (£470.7-£1,299.5m) the true monetised cost of deterioration in air quality before any mitigation action by Heathrow is taken.

Of course, even if just some of the mitigation measures proposed by Heathrow are taken into account, the monetised cost will be reduced.

When set against the economic benefits of airport expansion, or even the net benefits after already subtracting the environmental costs already identified by the Commission's previous work, these costs are small. We note that the Commission has used the passenger demand scenario "that results in the greatest likely air quality impact" (see Section 3.5), i.e. the "Global Growth" scenario. Naturally, this scenario also results in the greatest economic benefits – see Table 3 below.

Table 3 Summary of economic benefits and environmental costs in each of the Commission's passenger demand scenarios

	Assessment of need	Global growth	Relative decline of Europe	Low-cost is king	Global fragmentation
Transport economic efficiency	£18.3bn	£42.0bn	£16.4bn	£41.6bn	£10.3bn
Reduced delays	£0.8bn	£0.8bn	£2.2bn	£1.4bn	£2.1bn
Monetised Environmental costs (noise, carbon emissions, biodiversity)	-£2.7bn	-£2.7bn*	-£2.7bn*	-£2.7bn*	-£2.7bn*
Total net benefit before air quality cost	£16.4bn	£40.1bn	£15.9bn	£40.3bn	£9.7bn

Source: Airports Commission, "Heathrow Airport North West Runway: Business case and Sustainability Assessment", Table 2.12

(*) Assumed to be same as "Assessment of needs case"

The Commission's range for the monetised value of unmitigated air quality impacts of £470.7-£1,299.5m should be compared with a net economic benefit (after taking account of other environmental costs) of £40.1bn.

The Commission provides reasons why it was not possible to undertake an Impact Pathway Assessment at this present point in time. In any event, the partial assessment of respiratory and cardiovascular related hospital admissions (assuming them to be correct) supports the broad conclusions from the analysis above.

The Commission can confidently conclude that even the unmitigated (the Commission can also recognise that mitigation will further reduce these costs) monetised value of air quality damage costs are low compared to the economic benefits and other environmental costs.

This further reinforces the strong Business Case for a Heathrow NWR.

7.1.3 Our recommendations

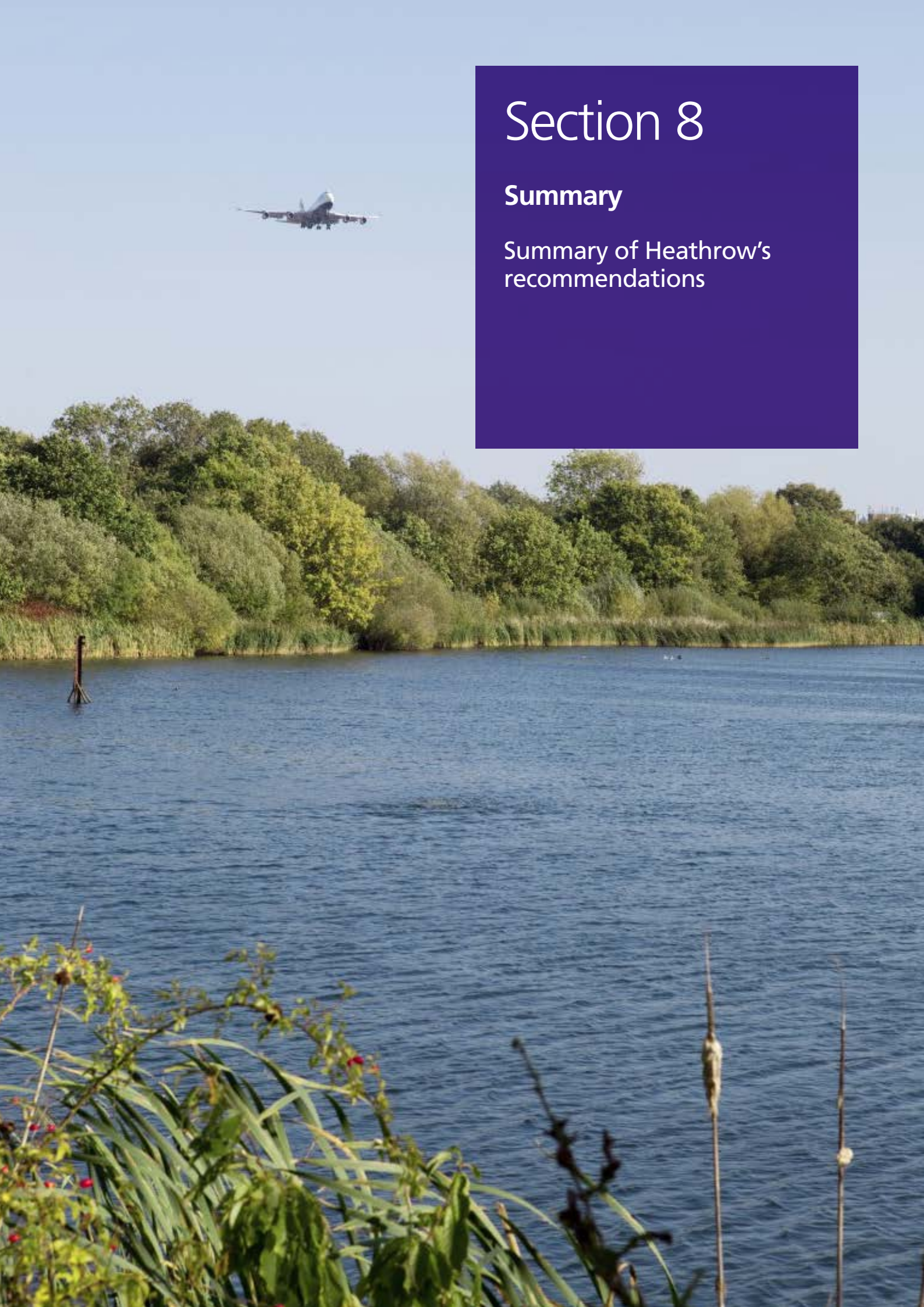
We recommend that the Commission:

- recognise the balance between of low environmental costs against the economic benefits of the Heathrow NWR

Section 8

Summary

Summary of Heathrow's
recommendations



Section 8

Summary of Heathrow's recommendations

Summary of our recommendations to the Commission

Q2. Do you have any suggestions for how the short listed options could be improved, i.e. their benefits enhanced or negative impacts mitigated?

We recommend that the Commission:

- recognise within their assessment of the Heathrow NWR Heathrow's current commitment to implementing the additional mitigation measures proposed
- recognise within their assessment of the Heathrow NWR the extent to which reductions of emissions will be delivered as part of Heathrow's Q6 capital investment programme to increase the efficiency of the airport
- recognise within their assessment of the Heathrow NWR the extent to which air quality is being managed at Heathrow today and considers this as valid evidence of our commitment to future management measures
- note that new road layouts will be further developed and optimised taking into account air quality impacts as a key consideration
- recognise that despite the conservative estimate of mitigation measure effectiveness the Heathrow NWR scheme impacts are well below the compliance limits
- recognise that a more comprehensive examination of the wider effects of the NWR scheme additional mitigation measures could have been undertaken to demonstrate the benefits to air quality at receptor locations

Q4. In your view, are there any relevant factors that have not been fully addressed by the Commission to date?

We recommend that the Commission:

- note that further mitigation to reduce traffic is available to ensure that Heathrow NWR can be delivered whilst meeting the EU limits

Q5. Do you have any comments on how the Commission has carried out its appraisal of specific topics (as defined by the Commission's 16 appraisal modules), including methodology and results?

We recommend that the Commission:

- note our comments in relation to the methodology and assessment approach taken by the Commission
- recognise in their assessment of the Heathrow NWR the significant potential for additional mitigation measures to reduce air quality impacts
- clarify if the assessment they have conducted for 2030 represents an initial or mature operational phase
- amend the conclusion of the air quality assessment to remove the statement that it is unclear whether the level of public transport mode shift is achievable

Q6. Do you have any comments on the Commission's sustainability assessments, including methodology and results?

We recommend that the Commission:

- revisit and update the sustainability assessment module on air quality and revise the performance levels applied to each scheme

Q7. Do you have any comments on the Commission's business cases, including methodology and results?

We recommend that the Commission:

- recognise the balance between low environmental costs against the economic benefits of the Heathrow NWR

Section 9

Appendix

Heathrow's blueprint for
reducing emissions



Appendix:

Heathrow's blueprint for
reducing emissions

Heathrow's blueprint for reducing emissions

**Our ten-point plan to reduce
Heathrow's emissions in 2015**

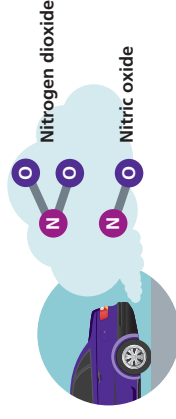


Improving air quality around Heathrow

Our goal: to reduce ground-based NOx emissions by 5% by 2020.

The air quality in some areas near Heathrow – and in many other parts of London and the UK – exceeds the EU's health limit for the pollutant, nitrogen dioxide (NO₂).

Most NO₂ in the air comes from the burning of fuels. Combustion creates nitrogen oxides (NOx), a mixture of NO (nitric oxide) and NO₂. Some NO then reacts with oxygen in the atmosphere to form more NO₂.



Air pollution around Heathrow comes from the airport and from a variety of other sources: surrounding roads, industry, heating and background levels of NO₂. As a responsible neighbour, we and the bodies responsible for those other sources of emissions are working to bring local air quality within EU and UK Government limits.

At the airport, we and our partners are working to improve air quality by reducing emissions from aircraft, vehicles and buildings. Our goal is to cut ground-based emissions of NOx by 5% by 2020 (from 2009 levels).

Responsible Heathrow 2020 is our plan to support the UK and local economies, reduce Heathrow's environmental impacts and look after passengers and people. It's a step towards achieving our ambition to be one of the most responsible airports in the world.



Our ten-point plan to manage and reduce emissions

Aircraft activity

1

Reduce emissions from aircraft at the gate

When their engines are turned off, aircraft rely on on-board generators, known as APUs, for internal power and climate control. To discourage APU use, we've invested around £20 million on equipment to supply pre-conditioned air and electrical power to aircraft at many gates. We've also set limits on the use of APUs by aircraft standing at gates offering ground-based air and power.

To help achieve this, we will encourage airlines to regularly use ground-based air and power with a target to increase usage by 15% in 2015, investigate ways to expand and upgrade our supplies and publish an investment plan by the end of the year. We'll also ensure that airlines adhere to the limits we've set on APU use. By comparing our performance and standards against other leading airports, we'll work to be among the best.

2

Phase out the oldest and dirtiest aircraft

Some aircraft pollute more than others. The worst are aircraft that were built before the introduction of a series of higher international emissions standards. In 2014, these aircraft types accounted for just over 6% of Heathrow flights.

To encourage airlines to fly cleaner aircraft, we already link our landing fees to an aircraft's NOx emissions. In 2015, we've proposed to nearly double our NOx landing fees and will work at a senior level with our airline partners to encourage an earlier phase-out of older aircraft. We'll work to add the international NOx standards to our quarterly Fly Quiet league table to create a single comparison table for airline performance on noise and emissions.

3

Improve taxiing efficiency

Taxiing produces just over 40% of our ground-based aircraft emissions. By working more collaboratively with our airline partners, we've streamlined the decision-making process, which helps to reduce taxi times and emissions. We've also been working with the air-transport community to develop a code of practice that encourages the turning off of one or more engines during taxiing – known as 'reduced-engine taxiing'.

During 2015, we'll do more by:

- Working with NATS to record the frequency and effectiveness of reduced-engine taxiing
- Increasing the frequency of reduced-engine taxiing
- Upgrading taxiways to maximise efficiency
- Investigating other approaches such as hybrid-electric aircraft tugs that tow aircraft to the runway while their engines are off.

4

Provide more and better electric-vehicle charging points

To encourage more electric vehicles to Heathrow, we've installed 21 charging points in our car parks. They're part of the Source London network. In 2015, we'll upgrade the charging infrastructure in our short-stay car parks and look for the best way to introduce points for our taxi feeder, long-stay passenger and colleague car parks.

5

Incentivise low-emission vehicles

Heathrow has invested millions in public transport to host the UK's largest free travel zone and deliver the Personal Rapid Transport system to provide electric transport for passengers between the business car parks and Terminal 5. Since 2002, we've been home to one of the biggest employee car share schemes in Europe.

- We want to encourage a wider range of low-emissions vehicles at Heathrow. So we'll develop incentive schemes for low or zero-emission buses, coaches and taxis. Measures we're looking at include lower fees for better performing vehicles and priority to hybrid or electric taxis in our taxi feeder park. We'll also review our colleague incentive schemes to encourage low or zero-emission cars for staff commuting.

6

Work with partners to set up emission zones and standards

On our local stretch of the M4, 13% of vehicle-generated NOx comes from airport-related traffic. To tackle the whole problem, we have to work with local authorities, TfL, GLA, Highways England and other stakeholders.

In 2015, we will champion a joint approach to reducing emissions from road traffic in the Heathrow area and work with TfL, GLA, and local key stakeholders to help formulate a Regional Strategy for Air Quality to include a roadmap for compliance with NO₂ limit values by 2020.

Measures we'll investigate include:

- Establishing emissions standards for Heathrow buses and coaches aligned with London's Ultra Low Emission Zone
- Working with bus and coach operators to increase the number of hybrid buses
- Seeing whether we can set up a geofence around Heathrow that forces hybrid vehicles to operate in electric-only mode.

Airport traffic





Airside vehicles

7

Reduce emissions from our own fleet

More than 400 companies operate around 8,500 vehicles airside at Heathrow. We're leading the way for the airport community by cutting emissions from our own (Heathrow Airport Ltd) fleet of 220 vehicles – and monitoring progress once a month. During 2015, we'll review our entire fleet to help us plan ahead; our goal for 2020 is that every car or small van we own or lease will be electric or a plug-in hybrid.

8

Pool vehicles to reduce numbers and emissions

Pooling of ground-support equipment could cut the size of this element of the airside fleet by up to 30%. During 2015, we'll use the data from our pooling trials to develop a preferred option and support our ground handling partners to implement it. Wherever practical, we'll specify that pooled equipment should be electric.

By the end of the year, all airside vehicles will carry tracking devices to give the airport community the data it needs to reduce vehicle numbers, emissions and costs. We'll also start planning for the introduction by 2025 of airside vehicle emissions standards aligned with London's Ultra Low Emission Zone.

9

Lead the move to electric vehicles airside

We encourage investment in electric vehicles by exempting them from the maximum age limit for airside vehicles. We already have hundreds of electric charging points, and nearly all of our 800 baggage tugs are electric.

In 2015, we'll increase our investment in airside electric-charging infrastructure. Through the Heathrow Clean Vehicles Partnership, we'll run trials to generate data on the costs and operational needs of a range of electric vehicles and charging facilities. We'll also look at how we can favour cleaner vehicles by adapting the pricing structure for airside vehicle passes, and how we can contract and provide charging for electric airside buses.

10

Modernise our heating supply

On-site energy generation, a more efficient district heating network and the construction of an 11MW biomass plant is helping us cut emissions from Heathrow's energy use. We'll continue to cut emissions by modernising our heating infrastructure.

We'll replace old equipment and move towards a more efficient network in which heating and energy are shared.

Increases to our biomass capacity are already in the pipeline. Until that happens we'll wind down operations in one of our oldest boiler houses and replace it with low-NOx boilers. And we'll upgrade Terminal 5 boilers with the same low-NOx technology.

Heathrow emissions in context

Heathrow is just one of many local sources of NOx emissions. Although the airport is a significant contributor of NOx, it's by no means the largest. Most NOx in the Heathrow locality comes from general road traffic. Railways and industry also generate NOx.

Traffic not aircraft

Data from the Hillingdon monitoring station shows that non-airport traffic generates more than twice as much NOx as all airport sources combined.

At the Hayes monitoring station, non-airport traffic is responsible for more than six times as much NOx as all airport sources combined.

Emissions from airborne aircraft are negligible at ground level. Once an aircraft rises above 100m, pollutants disperse rapidly throughout the atmosphere. They have no effect on air quality at ground level.

Carbon reduction

Although the actions covered by this Blueprint are aimed at NOx emissions, they'll also help to reduce our carbon emissions. To find out more about our efforts to tackle climate change, visit heathrow.com/responsibleheathrow

The Heathrow Air Quality Working Group is a partnership between us, our neighbouring local authorities (Hillingdon, Hounslow, Slough and Spelthorne), British Airways and Environment Agency. Together we monitor, share and publish data from more than 20 air-quality recording stations around Heathrow. For up-to-date air-quality data, as well as information and reports on Heathrow's emissions, visit www.heathrowairwatch.org.uk

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Working together to improve air quality

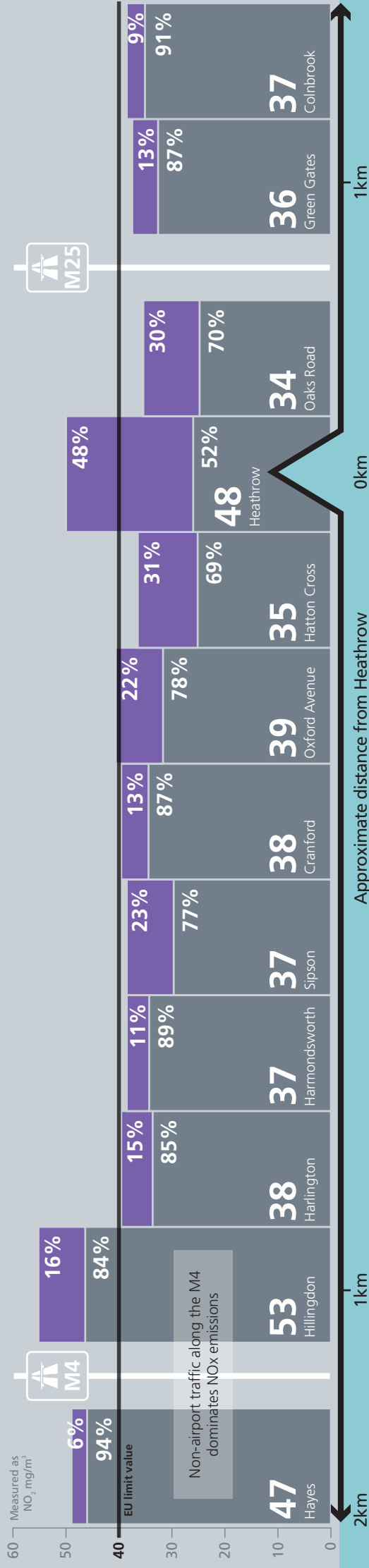
This Blueprint builds on our **Air Quality Strategy and Action Plan** – our plan to reduce ground-based emissions by 5% by 2020.

1. By accurately measuring the contribution to local air quality from airport-related activities
2. By helping to meet EU air-quality limits locally by reducing NOx emissions we control, guide or influence
3. By engaging stakeholders to explain and ensure that our approach is the best way to reduce Heathrow's effect on air quality.

Heathrow
Making every journey better

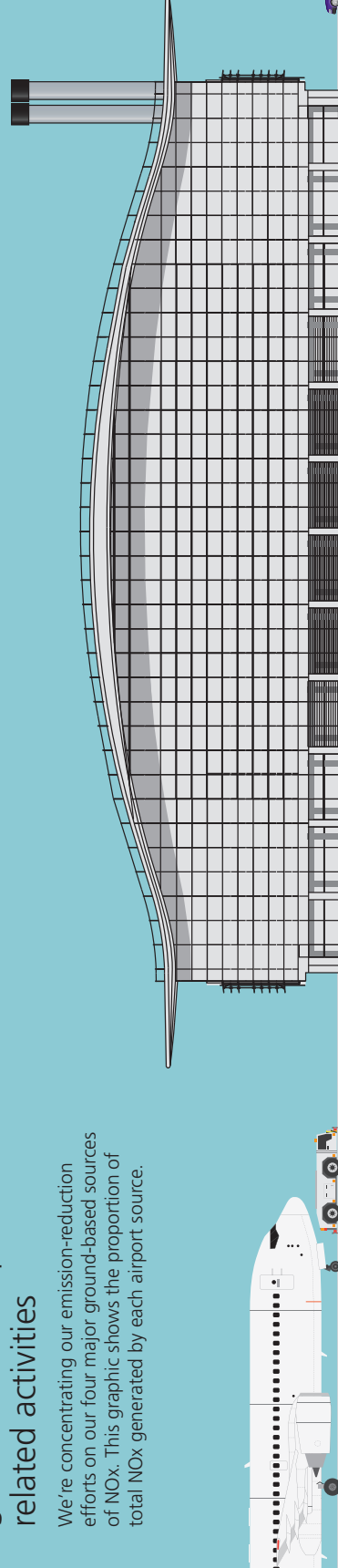
Responsible Heathrow

Air quality monitoring sites around Heathrow



Sources of Heathrow's NO_x: ground-based, airport-related activities

We're concentrating our emission-reduction efforts on our four major ground-based sources of NO_x. This graphic shows the proportion of total NO_x generated by each airport source.



Aircraft activity

70%

Emissions from all ground-based aircraft activity, including take-offs, landings and taxiing, in which aircraft wheels are in contact with the ground.

Airport traffic

17.6%

Emissions from vehicles carrying passengers, staff and goods to, from and around Heathrow, occurring within an 11x11km grid centred on the airport in line with agreed upon air quality modelling methods.

Airside vehicles

8.4%

Emissions from vehicles and specialist equipment, such as catering vehicles, aircraft tugs and baggage loaders, operating on the airfield.

Energy

4%

Emissions from on-site generation of heat and electricity to power the airport.

