



Airport Operators Association response to the Second National Infrastructure Assessment: Call for Evidence

February 2022

Executive Summary

- We welcome the work of the NIC on this project as it correctly emphasises the highly significant role infrastructure plays in the future of the UK economy and society.
- Covid has devastated airport finances, with billions of pounds of revenue being lost in 2020, 2021 and continuing now. These losses have been funded by stripping out investment funds as well as taking out loans and support from investors.
- It is vital airports are included in the assessment and its needs and characteristics are considered in relation to surface transport networks as well as the aviation industry.
- The UK has infrastructure in the sky – our airspace. This should be a focus of attention for the NIC and the Government given the holistic benefits that would accrue from optimisation to the UK as a whole – loss of funds through Covid could still threaten the deployment of a modernised airspace for the UK.
- Government should support the development of alternative power sources for aviation, including the ground infrastructure necessary for hydrogen/electric flight.
- Airports should be enabled, encouraged and required to reach net-zero in line with other similar infrastructure facilities across the UK (such as ports, shopping centres, freight hubs), as opposed to out-of-step with these simply because we are related to aviation.
- The planning system and its policies should enable airport growth within the context of meeting the net-zero carbon by 2050 target. Restricting aviation will not achieve net-zero, transformation of how we do aviation will. A healthily growing industry will be better able to sustain the costs associated with this.

Introduction

About AOA

This response is submitted on behalf of the Airport Operators Association (AOA), the trade association representing the interests of airports across the UK. The AOA represents over 40 airports and is the principal body engaging with the UK Government, Parliamentarians, and regulatory authorities on airport matters.

About UK Airports

Airports are facilitators of social and economic activity. In a normal year, our airports enable almost 300 million passenger movements: UK residents going on highly valued holidays, foreign tourists coming to the UK, people connecting across the UK, and business travel supporting the UK's place in the global economy. We are also vital for freight – 40% of the UK's non-EU trade by value travels by air. In a normal year aviation contributes more than £92bn to the economy each year, supports a million jobs and provides more than £8 billion in tax revenues to the Exchequer.



Response to the Call for Evidence

AOA welcomes the National Infrastructure Commission's (NIC) intention to draw up a Second National Infrastructure Assessment (NIA), which will inform future iterations of the National Infrastructure Strategy as well as other important policy decisions. We are aware the focus of this second assessment will be on three strategic themes of reaching net zero, climate resilience and the environment, and supporting levelling up. In the Call for Evidence, it refers to highlighting any other challenges not highlighted and any changes to funding policy that would help to address the NIC's nine challenges. We address these before going onto focus on each of three themes cited above and provide some general views for consideration. However, we do need to address the impact the pandemic has had on the ability of airports to invest as we would have prior to COVID-19 in infrastructure projects.

Impact of the COVID-19 Pandemic on Airport Finances

It is important to note how the impact of COVID-19 could impact the ability of airports to invest in infrastructure due to the constraints on capital expenditure. This once-booming sector has suffered its worst crisis in aviation's history due to COVID-19. Between April-Dec 2020, passenger numbers were down nearly 90% year-on-year.

This has had some major economic impacts:

- Economic output for the air transport sector between Feb -Dec 2020 reduced by 89%.¹
- Prior to COVID-19, UK aviation supported around 960,000 jobs and £57bn in GDP.²
- On 31 July 2021, 51% of staff in the air transport sector were still on furlough.³
- Research by business consultancy Steer for the AOA shows that by 2025, between £32 billion and £95 billion of industry GVA is projected to have been lost relative to 2019.⁴

At the end of 2020 consultancy Steer, at AOA's request, projected three anticipated recovery scenarios for UK aviation. The central one of these indicated that the UK would not return to normal levels of traffic until 2025. But reality in 2021 has been worse than the most pessimistic of Steer's projections. The losses to airports and airlines are massive – as is the continuing damage long term to UK connectivity.

To survive this period, airports are supporting current cash flow needs through first running down their capital expenditure funds and then taking out commercial loans or securing additional funds from investors. This will need to be repaid over time once business returns, and these repayments, combined with the highly leveraged situation of airports at present make raising further funds highly difficult. Consequently, the scope to invest in other projects has been decimated.

¹ Office for National Statistics, [Coronavirus and the impact on output in the UK economy: December 2020](#) (London: ONS, 12 February 2021)

² IATA, [The importance of air transport to United Kingdom](#) (Madrid: IATA Economics, 2019), p.1

³ HM Revenue & Customs, [Coronavirus Job Retention Scheme statistics: 29 July 2021](#) (London: HMRC, 1 September 2021)

⁴ AOA, [A UK Airport Recovery Plan](#), p. 7



Role of Government:

The pandemic and high levels of debts accrued by airports will have an effect to the transition to sustainability, improving airspace and even restoring routes that have been lost. Airports will often have to take on upfront costs to persuade airlines to start/restart routes. An airport's commercial responsibility will now not be able to secure investment as early as before, which will have detrimental effects on the UK's economic interest. Hence NIC's recommendations matter more than ever as Government will have to assist to prevent "lost years" as we recover, if we are to keep on track with NIC's wider objectives.

Challenges that should be included in the NIA

First, airports are a major component of the UK's transport and economic infrastructure, vital for the successful running of the wider economy and should therefore be seen as part of the national infrastructure. While airports are privately financed, national and local government plays a major regulatory role in setting the framework for UK connectivity growth. This includes, for example, the setting of conditions for operations, such as environmental limits. Through the planning process, local and national government set caps on passenger and aircraft movement limits and provide permission for facilities to grow, e.g. additional taxiways, improved terminal facilities, etc. Local and national governments also play a role in an airport's ability to make a success of their operations within the constraints those governments have set out. For example, without adequate surface access, passengers cannot get to an airport and the airport will be hindered in its success as a business. Surface access also a good example of how adequate supportive infrastructure influences airlines' route decisions: the wider the catchment area, the more likely an airline will be able to fill an aircraft to a particular destination and the more attractive the airport therefore is. This then has an impact on the economic growth of an area around the airport – the more connected a region is, the better chance it has to become an economic success.⁵

For all these reasons, it is vital that the NIC incorporates aviation in its NIA, including but not limited to airports' integration within other transport modes. It seems there is a tendency to focus on roads and railways but without aviation, which provides essential connectivity both domestically and internationally that is a vital element of the country's economic success.

Second, infrastructure is not just about ground infrastructure. Constrained, unoptimised UK airspace will reduce the resilience of the aviation sector in the UK, preventing increased flexibility and capacity for a range of contingency operations. Government needs to ensure that interconnected resilience issues are addressed. Airspace modernisation is a prime example of this, improvements in which would positively affect all resilience issues including climate change. Airspace modernisation would build in extra resilience to the UK system.

For all these reasons, it is vital that the NIC includes airspace modernisation in its NIA by calling on the Government to continue to provide funding for this process as unless collective UK-wide action is taken airspace efficiency will not be maximised.

Finally, when it comes to digital technology with terrorism and criminal activity will continue to be a major threat to airports. As technological systems evolve cyber-threats will only increase in importance. Increased availability and use of drones will also increase risk factors for airports.

⁵ AOA report: [Connecting the UK's Economy: How Better Access To Airport Can Boost Growth](#), 2016



Government will have a leading role here given the interdependency with national and international security issues – airports will not be best placed to develop individual solutions; this should be done at the national level.

Funding

Airports are committed to sustainability and there are real opportunities to build back sustainably post-pandemic. We cannot do so alone, particularly after the pandemic as resulting travel restrictions have decimated airports’ balance sheets and most, if not all, capital investment has been paused.

One recommendation in the AOA UK Airport Recovery Plan was for the creation of a Green Airports Fund. This could bridge the funding gap with grants for power infrastructure for aircraft, scrappage and conversion grants to grow low-emission or zero-emission airside vehicle fleets, renewable electricity and heat generation and other sustainability initiatives. Longer term, further support for charging infrastructure for electric aircraft and/or hydrogen production/delivery would be required to facilitate infrastructure being ready for significant use of zero-emission flights. For electrical power, this would include addressing quantity of supply to the airport as well as charging infrastructure at it. Clarity would need to be given regarding the status for airports’ carbon footprint of electricity supply for zero-emission planes prior to decarbonisation of electricity supply, anticipated for 2035.

Strategic pillar 1: net zero

Sustainable aviation fuels (SAF) are the main opportunity for decarbonising short-haul and long-haul aviation. The UK already has a global profile in the technical evaluation and approval of SAF through Rolls-Royce, Airbus and the UK Defence Standards. The latter being the first global standard to approve SAF more than 20 years ago. Now, there is a real potential for the UK to have a global leadership role in the production and distribution management and promotion of use on airport. Through the globally recognised Defence Standard 91-091 for Jet A-1 and the Internationally recognised Standards body – the Energy Institute, there is a real opportunity for the UK to set global standards and best practice to follow. The UK is currently not in the international vanguard on production and support for implementation on airport, and the strength of our aerospace and aviation markets and reliance on aviation for leisure and business travel as well as freight mean that it should be.

Role of government:

It is important to have infrastructure to support electric and hydrogen flight, which is part of the NIA’s call for a transition to hydrogen and carbon capture and storage. The aviation fuels of the future are a critical part of aviation’s overarching journey towards net zero in 2050. In the AOA Recovery Plan, we urged the UK Government to look closely at several opportunities for promoting the sustainable recovery of aviation and in our Decarbonisation Report, we outline the work airports have done around powering future flights.⁶

Electric propulsion:

Electric propulsion using batteries is one alternative approach to replace conventional engines. This technology is closer to being viable on short, domestic routes than many people assume.

⁶ Airport Operators Association, [Decarbonisation Report](#) (London: AOA, October 2021)



A crucial part of the trials that have taken place at UK airports as well as of the modelling and development of operational approaches to battery-powered flights is how they should be recharged. There are broadly three options for charging a battery-powered aircraft: directly connecting it to the airport's power infrastructure, charging the aircraft via a ground-power unit, such as a battery, that is brought to the aircraft, or replacing the batteries of the aircraft and then charging the batteries elsewhere in the airport for the next aircraft.

The electricity requirements of each charging option will be subtly different, but all requiring sufficiently robust electricity networks at and to the airport. There is a risk that local grids will not be able to cope with the demand's aviation may place on them, particularly for smaller airports in more remote parts of the UK. This will initially be only for smaller aircraft but ultimately, as various industry roadmaps and scenarios make clear, by 2040 we could see short-haul aircraft of up to 150 seats use battery-powered electric propulsion.⁷ Funding for necessary upgrades could then fall to the airport operator, which may be more than they could reasonably be expected to fund based on their own revenues and expected return on investment.

The UK and devolved governments must therefore ensure that their plans for the future of the electricity grid include the use of grid electricity for charging aircraft. This is a complex area of reserved and devolved responsibilities, and the AOA would urge the UK Government to ensure that the grid is future-proof. If not, there is a risk that aviation cannot make the big steps necessary to reduce its emissions to meet the UK net zero targets.

Hydrogen Propulsion

The challenges of ensuring supply of hydrogen to airports are of an order of magnitude larger than supply of electricity. A whole new supply chain will need to be set up, either delivering hydrogen to airports through regular deliveries by road or by setting up fixed distribution system to airports, similar to the pipes supplying kerosene to several airports currently.

The UK Government's Hydrogen Strategy has included the case for hydrogen in aviation and made initial assessments about its use. The Strategy notes that "this decade will see key policy decisions taken that will influence how hydrogen networks develop and are operated".⁸ The Strategy is not yet clear on how distribution networks would be set up and what approach will be taken to ensure that all relevant sectors have the right access to hydrogen. It is vital that the UK and devolved governments ensure that their future plans for hydrogen production and distribution in the UK take into account the use case in aviation and build supply into their plans.

In terms of regulations around the storage of hydrogen airside these are outdated and not designed to assist with the transition to net zero so they need to be reformed, and the development of skills will be essential to introduce hydrogen for aviation.

Decarbonisation of airports:

Whilst airports are essential for aviation, the characteristics of their emissions issues, (outside of supporting future low / zero emission flights), are not 'aviation' emissions, but rather are more of a type with other forms of ground infrastructure – ie the construction and/or operation of roads, seaports, railways (including stations/freight terminals), retail centres, distribution centres etc.

⁷ For example, Waypoint 2050 has a good overview of possible aircraft type using different propulsion techniques. Air Transport Action Group, *Waypoint 2050* (Geneva: ATAG, 2020), p. 48

⁸ HM Government, *UK Hydrogen Strategy* (Cmd Paper 475, 2021)



Airports can and should radically cut their emissions (given the right policy support in areas like electrification and the hydrogen economy), but we believe this is best done in concert with those other ground facilities, rather than aircraft, with which our buildings have a limited amount in common. We have concerns that currently DfT is minded to require early absolute zero performance from airports, simply because aeronautical emissions are hard to reduce.

A significant example of an issue using this approach is power for heating. As with most of society, gas power is frequently used for heating in airports. Clearly a society-wide solution is needed for this issue with which airports should fit in.

The challenge is ensuring terminals and other airport buildings are heated in a sustainable way is a more significant challenge than renewable electricity. This is in line with the wider economy and society, with the Committee on Climate Change noting that decarbonising the UK's building stock (which accounted for 18% of UK emissions in 2019) remains a significant challenge where only limited progress has been made to date. It is expected that gas-for-heating will remain widely used across the UK economy and society, and while this requires a UK-wide solution, airports are taking action to try and decarbonise heat and cooling systems where possible.

Role of Government and financing future fuel model for aviation:

We do not at present know how society collectively will resolve the problem of emissions from gas for heating. The collective approach for the UK needs to be decided and then airports can work with that to eliminate these emissions. The Government clearly has a leading role in ensuring this decision is made.

Going beyond this specific issue, in our UK Airports Recovery report⁹, the AOA recommended that the UK and devolved governments set up a Green Airports Fund that would help support the transition to net-zero through the coming years. The AOA suggested in our report that this Fund could provide grant funding to prepare infrastructure for hydrogen/electric power for aircraft. While these future aviation options are still in development, facilities at airports will be necessary to support research and development but then also prepare infrastructure ahead of the first commercial flights with these new and emerging technologies. Funding should be provided, for example, to enable airports to host and support such a process similar to the Future Flight Challenge funding that has supported the 2Zero demonstrator project. This would also help secure such projects and initiatives within the UK given the fixed nature of ground infrastructure and ensure that the UK is leading the development of these opportunities, benefiting from first-mover advantage and the creation of green aviation jobs and expertise that could subsequently be exported.

Strategic pillar 2: resilience

The reality of climate change will clearly have direct impacts on all infrastructure, including airports.

One form of adaptation issue to address will be the knock-on effects of mitigating climate change itself. The drive to move to net zero emissions will mean new technologies and fuel sources whose resilience issues may vary from traditional operations.

⁹ <https://www.aoa.org.uk/wp-content/uploads/2021/02/AOA-Airport-Recovery-Plan-1.pdf>



At the macro level, an increasing negative view of the appropriateness of aviation amongst the public could impact passenger numbers, which would in turn threaten the commercial viability of UK connectivity. If climate changes drive changes in disease patterns this could also affect the operations of routes/destinations, at least in the form of increased health screening requirements.

Whilst climate change is overall a massive negative phenomenon for airports as well as society, it is truthful to acknowledge that some potential impacts might not be adverse – for example changes in local weather conditions could increase the desirability of parts of the UK for inbound holiday travel. However, this is only one scenario and others (increased rainfall for example) could make the UK less attractive.

Clearly the most direct effects will be on physical infrastructure and operations. Physical impacts will come through changed patterns of rainfall/snowfall, temperature, and wind. Infrastructure building and renewal needs to take account of and prepare for these in the next decade. Operational conditions may also vary, for example due to increased prevalence of fog and high winds. Extreme weather events are already a threat to the resilience of UK and international movements, this can be expected to increase. For some airports, rises in sea levels combined with increased extreme weather may also create resilience issues (in terms of affecting surface connectivity rather than airports sites directly).

If not managed correctly, climate change has the potential to negatively affect the quality of UK connectivity. This could be through a new standard of operational non-optimisation and/or through periodic extreme disruption (ie airport or even airspace closures). Having a global connectivity network for passengers and freight that cannot be relied on, could have knock-on effects on UK business and society, beyond the direct effects on our sector.

Airspace modernisation is vital for resilience in a context of more unpredictable weather patterns. The airspace structures across the UK have changed little since the 1950s. If we are to handle the forecasted growth in air traffic across the whole of the UK, we need to modernise that infrastructure. The challenge is already being felt at peak periods. Modernising airspace is timely and complex. Principally, airspace modernisation moves the UK away from relying on ground-based beacons to satellite navigation. This brings clear benefits. Through better operating procedures there is a potential carbon saving to UK aviation by 2050 of between 9% and 14% and, alongside the introduction of quieter aircraft, 'the potential to reduce UK aviation noise output by 2050 compared to 2010' according to Sustainable Aviation.¹⁰

This is because aircraft would be able to fly more directly as aircraft are not constrained by ground-based aids. It will also mean greater use of Continuous Descent and Climb Operations, which reduce noise and CO₂ emissions. And it will reduce the need for conventional orbital holding; instead aircraft can be readied for landing higher and thereby reduce noise and CO₂ emissions. Routes could also be designed to avoid noise-sensitive areas or provide a more equitable spread of noise. In essence, aircraft would be able to fly quieter and more efficient routes, increasing the sky's capacity for growth. This brings clear economic benefits too, because of reduced journey times and fewer delays.

¹⁰ Sustainable Aviation, *CO₂ Road-Map* (December 2016) http://www.sustainableaviation.co.uk/wp-content/uploads/2016/12/FINAL_SA_Roadmap_2016.pdf



Role of government:

Airspace modernisation requires Government funding and for bodies like the NIC to see that this stays on track and delivers.

Industry has received funding to complete Stage 2 of their local upgrade processes. However, modernisation offers the potential to reduce UK aviation emissions by around 5% by 2050, while also accommodating a doubling of passenger numbers. Airspace changes made over the next few years will mean less airborne holding and fewer miles flown per aircraft, resulting in less fuel burn and CO2 emissions. It is one of the near-term measures which are necessary for UK aviation to meet its commitment to achieving net-zero by 2050. Without vital further funding to bridge the funding gap created by a lagging recovery due to the pandemic there is a major risk that airports will have to pause, once again, this essential upgrade work. We urge the commission to view Airspace modernisation as part of the UK's connectivity, infrastructure resilience, and that without this major work it will minimise carbon emissions.

Strategic pillar 3: levelling-up

The UK Government's Global Britain and levelling-up agendas rely on effective, competitive aviation sector. It is vital to highlight the benefits of aviation to the local economy:

- Business and leisure visitors encourage inbound visitors: Prior to easyJet's route between Edinburgh and Hamburg, travel between the two countries was inconvenient as people had to go via one of the hubs. Following easyJet's introduction of that route, travel between the Hamburg area and Scotland increased tenfold. 80% of that travel was Germans coming to Scotland.
- It also encourages inward investment and exports: The Emirates route from Newcastle to Dubai was so successful that Emirates upgraded its capacity ten years after it started. UK Trade & Investment analysis shows that trade between the North East and Australasia has grown from £150m in 2007 to over £360m in 2015. The value of exports flown out of Newcastle has grown from under £20m in 2006 to over £350m in 2016

Domestic aviation is key for inter-urban connectivity across longer distances and links to a key NIC's challenge. The UK has the fifth- largest domestic market in Europe. In 2019, UK airports facilitated 22.4 million journeys within the UK. These were handled by 50 UK airports. Whilst some are intra-England, there is a preponderance of cross-union routes given the distances involved in those journeys.

Air travel is especially important for the nation's connectivity given the geography involved. Much business travel needs to be on a day trip basis – or on such a tight schedule that train or boat services are not sufficient. Leisure travel is also affected as some journeys will be too long for many to want to undertake. Domestic connectivity also facilitates global connectivity across the UK – as domestic journeys may form the first part in an onward journey through a hub (we note that short haul international routes around the UK may also play this role).

Role of government: Planning

Government needs to deliver a clear, coherent national policy framework that allows all airports to grow, helping the country deliver, sustainably, the connectivity it requires in the future. The AOA



recommends that there should be a clear presumption in favour of development at an airport provided sustainability principles are met. The AOA has been very supportive of the National Infrastructure Commission, in particular the political independence of the NIC from government, which allows it to assess dispassionately and free from political influence, the future long-term infrastructure needs of the country. We were pleased to see the NIC's views referenced in the National Infrastructure Strategy. In setting a clear framework, Government must also offer its support by working in the local and national interest, positively supporting the implementation of development proposals. Airport operators have invested time and money in building improved community relations in recent years and have been proactive in responding to local concerns. However, although aviation is an important enabler of economic activity, airport development is sometimes met with local opposition.

Airports should be considered to constitute a key contributor to sustainable development as they act as major economic drivers, providing jobs and connectivity, and have the capability of delivering social and environmental benefits through corporate social responsibility, community outreach programmes and biodiversity offsetting.

Surface access

Improving surface access is an issue that has long been a focus and priority of airports. As set out in the AOA's report *Connecting the UK's economy: How better surface access to airports can boost growth*, surface access is a crucial enabler of aviation growth. By enlarging catchment areas, airports are better able to attract airlines and this boosts economic growth in their areas. That is why surface access improvement has been a long-standing ask of the AOA to the UK and devolved governments. Airports have traditionally favoured public transport improvements in efforts to improve their surface access. These can bring significant volumes of people to the airport while minimising the impact on local roads, in terms of congestion, air quality and also carbon emissions.

We call on the NIA to urge Government to take action in this area as surface access improvements to help increase catchment area and address some constraints expressed through the planning system. This would also support public transport services and the sustainability agenda. Much of the infrastructure around airports is already reaching capacity. The Airports Commission recently concluded, regardless of decisions on airport expansion that many key road and rail links are expected to be close to capacity by 2030.

Key challenge: digital transformation

As we have mentioned in the challenges section but to reiterate again when it comes to digital technology with the threat of terrorism and criminal activity, which will continue to be a major threat to airports then technological systems must evolve where cyber-threats will only increase in importance. Increased availability and use of drones will also increase risk factors for airports. Government will have a leading role here given the interdependency with national and international security issues – airports will not be best placed to develop individual solutions; this should be done at the national level.

As with so many other areas of government and business activity, digital technology has the potential to “change the game” in Border management. Better information-sharing and technology can help meet traveller demands. For example, receiving passenger information further in advance of boarding could assist with Border Force processing – through facial recognition ePassport gates, for example.



New technologies have the potential to revolutionise air travel. The AOA therefore encourages Government to drive dialogue with suppliers to the aviation industry to develop and drive solutions which will unleash cost effective and attractive technology solutions.