

**DEPARTMENT FOR TRANSPORT CONSULTATION:  
DEVELOPING A SUSTAINABLE FRAMEWORK FOR UK AVIATION**

**RESPONSE BY THE CIVIL AVIATION AUTHORITY**

**October 2011**

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## Introduction

The UK has one of the most developed and complex aviation systems in the world. The range of destinations available from London's airports make it the most globally connected city in the world, while over 70% of the UK population live within less than an hour's journey from an airport that offers connections to international destinations. The last two decades have seen sharp reductions in prices, particularly for short-haul flights, prompted by liberalisation which has driven competition and enabled the development of the low-cost sector. The choice and value available to consumers have, in some ways, made recent years a golden age for UK passengers and for UK businesses that rely on aviation.

However, there is a question mark whether, in a capacity constrained market, the sector will be able to meet the future needs of UK consumers and the country's economy. This is a strategic issue of national importance.

The industry needs to achieve environmental sustainability if it is to grow; addressing the aviation sector's growing share of CO<sub>2</sub> emissions and mitigating the impact of aircraft noise nuisance and detrimental effect on air quality that affect local communities is therefore central to the sector's future success. The challenge of addressing climate change is genuinely global in nature. In contrast, the impact of aircraft noise and local air pollution are highly localised and demand local solutions.

These are major challenges, and Government cannot meet them alone. The Government will therefore need to find ways to support a largely commercial and competitive industry to deliver benefits for passengers and the wider economy, and target any interventions in ways that improve outcomes and minimise unintended consequences.

Government has an important role to play in shaping the future of UK aviation by providing a robust framework that sends credible signals about the long-term direction of policy. Given the long lead times involved in delivering aviation infrastructure and in developing new technologies, this policy stability will be crucial to generating the investment necessary to deliver Government's objectives.

But, policy stability should not come at the cost of restricting the sector's ability to adapt to change. Stability should provide a platform which encourages innovation rather than stifling it. The aviation sector's future success will depend on the degree to which it is able to innovate and adapt to changing circumstances, so as to keep on meeting the needs of those who use its services.

The present policy development process offers an opportunity to address this long-term challenge and to establish a robust and lasting framework that provides a platform for effective development of the sector over the next generation.

## The CAA and the Aviation Policy Framework

The CAA is fully committed to contributing to the development of a Sustainable Framework for UK Aviation which meets the needs of current and future aviation consumers, tackles the environmental effects of aviation and provides a stable platform for the industry to deliver the investment that will meet these goals.

This consultation response is set out in two parts:

- **Part 1** sets out CAA's views on the overarching approach that the CAA believes the Government should adopt in setting its Aviation Policy and the principles that underpin this policy approach;
- **Part 2** addresses the detailed consultation questions set out in the March 2011 Scoping Document.

This document is intended to assist the Government in establishing a robust approach to developing the framework such that all parties can move forward on the basis of a common platform in working up the detail of strategic objectives and implementation measures.

In addition to this response, the CAA intends to publish a series of *Insight Notes* in the coming months. The purpose of these *Insight Notes* will be to make a constructive contribution to the debate on the key challenges facing the Government in developing the framework.

The three *Insight Notes* will address the following topics:

- *Consumers and Connectivity* – will consider the issue of connectivity, a central theme of the scoping document, from the perspective of current and future consumers. In particular, it will address the implications of forecast demand growth for the choice and value offered to UK consumers;
- *Aviation Policy and the Environment* – will consider how UK aviation can grow without unacceptable environmental consequences. This document will be influenced by the CAA's emerging environmental strategy which will be published later this year; and
- *Sustainable Aviation for the Future* – will consider a number of the challenges that will need to be addressed to ensure that the framework provides a robust strategic platform for successful delivery of the investment and improvements to the UK aviation system that will be needed to meet the needs of aviation consumers and the UK economy.

Furthermore, the CAA will continue to engage both formally and informally with the Government and stakeholders to maximise the value of its contribution to the successful delivery of a Sustainable Framework for UK Aviation.

## Part 1: The CAA's Approach to the Framework

### UK Aviation needs a Framework that is both Robust and Flexible

#### *A robust framework...*

The extent of Government involvement in the aviation sector varies significantly across different parts of the industry. In some areas, Government exercises considerable influence. For instance, the sector is governed by a series of well-established and detailed rules in the areas of safety and security that have arisen in response to a concern to protect consumers and the public from the risks associated with flying. The use of airspace is regulated to ensure maximum benefit is achieved from a scarce resource. Economic regulation of airports with significant market power and national air traffic control protects consumers from harm and promotes choice and value.

However, the UK aviation sector is driven by private investment. Over the course of the past 20 years, successive administrations have significantly reduced the scope of Government's involvement in, and control over, the management of the industry. As a result of these decisions, the Government's influence in the UK aviation sector does not extend to building airports or operating airlines, unlike many countries. Accordingly, Government alone cannot achieve choice, value or sustainability.

Moreover, aviation is a global industry. International, European and national law places additional constraints on Government's scope to intervene. For instance, international aviation law limits Government's ability to link aviation taxes to fuel consumption or to include noise-incentives in aeronautical charges.

Therefore, Government has a real but limited role, with many other decision-makers also making important contributions to the evolution of the sector. The future of the industry will be shaped by a myriad of decisions taken by players along the length of the aviation sector's supply chain, as well as being influenced by trends in consumer behaviour and wider developments. A key challenge for the Government will be to find ways to support a largely commercial and competitive industry to deliver benefits for passengers and the wider economy, and target any interventions in ways that improve outcomes and minimise unintended consequences.

One way Government can deliver this is by providing a policy framework that sends credible signals about the long-term direction of policy and helps to align decisions in a way that is consistent with a common strategic direction. Given the long lead times involved in delivering aviation infrastructure and in developing new technologies, policy stability is crucial to the success of the framework. The more effective Government is in generating policy stability and the more robust the policy framework, the more effective the investment signals to industry will be.

For instance, investment will be threatened if investors do not understand broadly how the state will exercise its influence, and whether steps are planned that might render assets redundant; one purpose of a policy framework is to create investment confidence. In addition, a clear policy framework will help technology investors understand what level and kind of progress is to be demanded – for example, what level of environmental protection will be required. This will help investors discern which developments are likely to be the most profitable, and encourage them to accelerate the rate of technological progress.

***...yet one that is flexible enough to adapt as the sector and the challenges it faces evolve***

Throughout its history, aviation has been a driver and a reflector of significant changes, and recent years have been no different. Technological progress has resulted in safer, quieter and more efficient aircraft. International regulation has changed too, with liberalisation of the European aviation market bringing many benefits to consumers. These and other cultural and socio-economic changes have led to changing expectations; on the one hand generating greater demand for travel, and on the other reducing society's tolerance of some of the less welcome outputs of aviation such as aircraft noise and CO<sub>2</sub>.

Change is likely to continue or even accelerate. The sector's future success will depend on the degree to which it is able to innovate and adapt to changing circumstances, so as to respond to and keep on meeting the changing needs of those who use its services.

Ability to cope with change is therefore a key success criterion for an effective policy framework. Policy that is framed too rigidly may deliver an industry that is ill-adapted for the future and may fail to have any effect at all because it lacks credibility and does not influence behaviour.

While change and progress have brought many benefits to consumers, the lack of policy stability over recent decades may have acted as a barrier to long-term development of the UK's aviation infrastructure. Aviation policy has become an increasingly divisive and polarising issue, with the consequence that successive aviation policies have struggled to make the transition from strategy to delivery.

The present process offers an opportunity to address this long-term challenge and to establish a robust and lasting framework that provides a platform for effective development of the sector over the next generation.

## Strategy and Implementation: the Components of a Framework

The CAA agrees with the Government that one of the key attractions of creating a sustainable framework is to generate clarity as to the Government's medium to long-term policy objectives for the sector. This clarity also needs to provide long-term credibility that supports investment in assets or technology, and promotes innovation in service delivery. Without credibility, the framework will not sustain and support the sector in meeting Government's objectives.

In order to meet objectives which look 15-20 years into the future, the framework will need to be durable in the face of the economic, societal and technological changes that will inevitably occur in the coming years, the shape of which will often be difficult, if not impossible, to predict. Government's task is not to try to predict the future, but to shape it; durability will not be achieved by guessing correctly how the future will turn out, but by specifying the framework in a way that will be resilient to change.

Overall, the CAA considers that clarity and durability can best be achieved by formulating the policy framework at two distinct levels, with a clear separation between strategy, which should be expected to be robust over time, and implementation, which will need to balance the need to be sufficiently flexible as to adapt to change while ensuring sufficient stability to drive investor confidence.

At a strategic level, this implies setting out:

- The Government's broad objectives;
- The outcomes it is seeking to achieve which will deliver those objectives.

At the level of implementation, the framework would specify:

- The steps that the Government intends to take to make the outcomes come to pass, ensuring that the Government only intervenes where it has the ability to drive forward delivery;
- The steps that the Government expects from other actors in the sector.

This separation recognises that implementation measures may be expected to have a shorter 'shelf-life' than strategic objectives and outcomes.

In considering how best to specify objectives, outcomes and steps, the Government should bear in mind the need to create empowerment for action across a whole network of players. Durable strategies, in sectors such as aviation where influence is distributed across such a broad supply chain, tend to be those which work with the grain of pre-existing relationships and governance structures and seek to mobilise the relevant actors in the same direction.

The Government should also consider the extent to which the sector is incentivised to deliver the outcomes, and where incentives are not aligned, whether Government has the levers to promote and encourage delivery of the desired outcomes. Where Government does not have powerful levers

to guide delivery, or it considers that the use of available policy levers would inconsistent with wider Government policy, its ability to prescribe outcomes in detail without taking some direct control for delivery will be limited.

### ***Be clear about the objectives...***

The CAA's view is that the Government's primary policy objectives should be clearly established from the outset. From our understanding of the challenges facing the sector and the Government's wider policy objectives, we suggest that there are three primary objectives for the policy framework:

- *Safe and secure.* Aviation policy should be designed to ensure that flying remains amongst the safest ways to travel, with policy backed up by a focus on continuous improvement by those best placed to deliver. Safety underpins all other aspirations the sector might have.
- *Geared to delivering choice and value to consumers.* The benefits from aviation are a function of the sector's ability to transport business and leisure consumers, or their goods, from A to B, and to do so affordably, conveniently and comfortably. The more destinations that are accessible using aviation services, the greater the potential opportunities for both business and leisure activity. This concept is frequently referred to as 'connectivity'.
- *Environmentally sustainable.* It is increasingly clear that the sector's development will be blocked unless environmental sustainability can be demonstrated. Achieving such sustainability is not optional – the choices arise in the domain of 'how', not 'whether'.

In recommending these objectives, the CAA is inevitably driven by our statutory duties and the Government's letter of objectives, which we have brought together in our medium-term Strategic Plan. The CAA's Strategic Plan focuses on the needs of consumers as the end user. It seeks to promote choice and value amongst passengers and shippers by encouraging the development of choice and competition that meet the needs of passengers, shippers and the many businesses in the UK that rely on aviation.

The Authority recognises that the Government's own considerations will be broader than ours and may wish to incorporate broader public interest considerations, such as the contribution of the aviation sector to direct and indirect employment in the UK, and the value-added generated by UK businesses. In many instances the interest of consumers and of the sector that serves them are aligned. However, such an alignment is not inevitable, nor in all cases are the interests of all industry players aligned. In cases of conflict, we would encourage the Government to give prime consideration to the consumer interest.

There are two main reasons for this.

- First, the economic benefit to the UK relating to consumer welfare (broadly, the value that consumers derive from aviation) is larger and more important to the UK economy than the

economic benefits that would be maximised by focussing more narrowly on the producer interest in terms of profits, wages and taxes;

- Second, there is long experience in the UK and around the world of policy frameworks organised around helping the sector or particular players within it. These tend to be aimed at maximising the well-being or competitiveness of industry players, but the results have tended to be the exact opposite: weak and inefficient airlines and expensive airports, which have failed to thrive in the face of competition. In contrast, industries which focus on the interests of consumers tend to be more successful and competitive.

### ***...and how the objectives translate into outcomes***

The policy framework presents an opportunity to establish a development path for the industry that is guided by a set of desired outcomes specified at a high enough level to be able to endure through changing circumstances, while still embodying and driving the achievement of the Government's overall policy objectives.

How outcomes are specified will make a significant difference to the programmes of measures that might be designed to implement them. Clearly, a programme needs to be achievable, for example in terms of affordability or commercial viability as well as consistency with existing legislation. It therefore makes sense to consider together how outcomes are to be specified along with what implementation steps might be taken to deliver the outcomes. However, it is important that outcomes are specified at a high enough level so that they remain relevant as circumstances and context change. A future administration might choose to review the implementation measures adopted to deliver desired outcomes without feeling the need and incurring the cost of changing the specified outcomes.

The outcomes need to be capable of endurance, as it is this level of the policy framework that provides the signals to key parties in the sector such as infrastructure operators, service providers and private investors. It is the credibility of the outcomes that achieves the overall goal of aligning and accelerating the actions of players from across the sector.

### ***Policy should be consistent with the levers available to Government***

The aviation sector is driven by private investment. While some areas of the sector are highly regulated, many other aspects of aviation have been increasingly liberalised over many years. As already noted, Government's influence in the UK aviation sector does not extend to building airports or flying planes and accordingly, Government alone cannot deliver choice, value or sustainability. Actual outcomes in aviation are the product of a myriad of decisions by a network of actors from across the sector. Each actor (an airline, airport, investor, technologist, etc.) has the best information about their own part of the network, but limited information about the network as a whole.

The policy framework should therefore work within existing mechanisms for co-ordinating actors. The market frameworks that are already at the core of the UK industry are the most important such mechanism. Working with the market limits the Government's ability to prescribe policy solutions in great detail. However, a highly prescriptive policy framework that is not supported by adequate levers to deliver the solution or to align industry's incentives with Government policy would be unlikely to succeed in practice.

It is important that the policy framework explores the way in which Government can make a positive, targeted impact on what is a largely commercial and competitive sector. This will require a clear understanding of what aviation can currently deliver, and how these market outcomes might be improved by empowering consumers and promoting competition. This might then reveal a 'gap' between these outcomes and Government's objectives which should be explored, in order to understand how, and whether, intervention can improve outcomes.

Efficient markets can provide accurate signals such that the decisions made by airport operators and airlines produce economically and socially optimal outcomes, as long as the framework within which the market operates is well-specified. However, it is important not to take a naïve view of markets and to take account of issues such as externalities, market power, information asymmetries (or consistent failures of market players to interpret information correctly), time-inconsistency problems, or other factors that can lead to market failure.

Many of the challenges facing aviation derive from the existence of market failures, in particular externalities such as CO<sub>2</sub> emissions and aircraft noise. Where market failures exist, the Government should assess the extent and significance of these failures and determine whether there is potential to improve outcomes with proportionate policy measures, including by encouraging the market to take full account of costs and benefits to other actors and to society in general.

Intervention in a commercial and competitive sector comes with risks, but can improve outcomes. Indeed, there is a broad consensus that, in the absence of policy intervention, the decisions taken by actors in the aviation industry, in common with many other markets, would not reflect the full cost of environmental harm, and that measures such as noise regulations and emissions trading can improve outcomes, despite their costs.

Whilst it is difficult to recommend particular forms of intervention or reforms to market processes, less prescriptive approaches are likely to be more flexible and resilient to change. There will be a risk that a particular implementation measure is rendered obsolete by unforeseen developments, whereas the market has been demonstrated to enable change and produce innovative outcomes that would not have been forecast or delivered through state planning. For example, the experience of liberalisation of the European aviation market since 1993 has demonstrated that opening the aviation market to innovation and competition has enabled consumers to enjoy lower fares and much greater choice.

The policy framework should be clear where markets and other decision-making approaches are expected to deliver, and where Government intends to intervene directly. It is important not to create false expectations, for instance, by creating the impression that Government is planning to

act directly, but without creating any levers to do so. Equally, if Government were to create an impression that the market would be left to deliver outcomes and then step in later in an unplanned and arbitrary manner, it is unlikely that the desired outcomes would be delivered, and Government's credibility and ability to lead the sector into the future would also be damaged.

## Illustrating the Approach

In order to provide additional clarity as to how the two-tier (strategy-implementation) approach outlined above might apply in practice we have developed some illustrative examples derived from questions in the Scoping Document.

Outcomes should be set in a way that is targeted at the root cause of the policy failure that the intervention is intended to address. The range of policy levers available to Government may also influence the way outcomes are specified

Market-based policy measures can be more flexible and resilient to change as well as creating incentives for innovation. However, market-based approaches will not always be appropriate. Where greater certainty is required, more prescriptive implementation measures may be required. However, once again, the Government will need to satisfy itself that it has control of policy levers to ensure delivery of a prescriptive solution.

**It should be stressed that these examples are purely illustrative and do not represent CAA recommendations.**

### *The Consumer Challenge – Ensuring Choice and Value*

The Department for Transport's demand forecasts predict that demand for aviation will continue the long-term growth trend out to 2030 and beyond. While such forecasts are clearly subject to considerable uncertainty, with airport capacity constrained to the existing network of runways, this level of growth would lead to the UK's major airports becoming increasingly full. By 2030, in addition to Heathrow and Gatwick, other South East airports as well as Manchester and Birmingham are forecast to be operating at or close to capacity. The 'premium' on fares generated by the DfT's forecasting model to simulate the additional costs to passengers as a result of capacity constraints at the UK's airports is predicted to total £1.7bn in 2030. In addition, the choice of connections available from certain airports may fall, although this may, in part, be offset by increased connectivity at regional airports benefiting from displaced demand.

Experience at the UK's busiest airports over recent years has demonstrated the impact that airport congestion, resulting from airports operating close to capacity, can have in terms of increased delays and reduced resilience to recover from disruption. In addition to the negative impact on passenger experience, increased delays generally result in arrival stacking with the consequent increase in CO<sub>2</sub> emissions and aircraft noise nuisance. Furthermore, the forecast demand growth will put increasing pressure on UK airspace with potentially complex interactions in the airspace shared by competing airports.

There are many challenges involved in retaining the UK's privileged position at the heart of the global aviation network. The UK will, in the future, no longer be able to rely on sitting across the centre of gravity of the aviation sector. The key destinations that will increasingly drive global aviation are in the Far East, in non-liberalised markets where the competitive position of UK airlines is less strong compared with routes to developed economies.

Global aviation depends on effective international collaboration and is inevitably affected by geopolitical events and challenges. Global governance is under severe strain. The Doha round continues to be stuck at an impasse and attempts to reach a global deal on climate change have similarly stagnated. Ever-higher perceived security threats since 9/11 could yet reach a point where consumers are discouraged from flying. Alongside these developments, innovations in information technology offer increasingly sophisticated alternatives to business travel and in many countries, including the UK, high-speed rail is seen as an effective substitute for short-haul aviation.

Given the strategic importance of these challenges, connectivity is a key theme of the Government's scoping document. The following is an illustrative example of how the two-tier policy approach could be applied if the Government determined that connectivity were a key policy objective.

A number of the consultation questions concern connectivity at regional airports and consider the potential for aviation to contribute to a rebalancing of economic growth. For the purposes of illustration, our example assumes that the Government adopts a policy objective that aviation should contribute to regional rebalancing of the UK economy by enhancing aviation connectivity outside the South-East.

### *Scenario 1: Regional Rebalancing*

#### *Objective and Outcomes*

For the purposes of this illustration we assume that the Government adopts connectivity as one of its core policy objectives, as we have suggested above. More concretely, the Government could state a policy objective that aviation should contribute to regional rebalancing of the UK economy by enhancing aviation connectivity outside the South-East.

Different approaches are possible to defining desired outcomes associated with a regional connectivity objective. For example and for illustrative purposes only, the outcomes could be specified from the point of view of the consumer or from an industry perspective:

- From a consumer perspective: a level of connectivity could be defined that should be available to consumers across the UK. For example, that all cities above a certain size (e.g. 100,000 inhabitants) should be within 2 hours drive of an airport that serves (or connects in one sector to an airport that serves) a specified selection of major European and global destinations (e.g. top 50 global business centres).

Specifying the outcome in such terms would underline the need for access for all UK citizens, but would be less clearly linked to the economic value created by connectivity. This specification is also neutral as to how connectivity is delivered.

- From the industry's point of view: as an example, the stated outcome could be that by 2030, 50% of UK's direct international connections to a range of key global gateways should be from airports outside the South East.

## *Policy and Implementation*

Approaches to defining desired outcomes should be considered alongside potential approaches to implementation. Outcomes specified in terms of regional connectivity would require implementation measures which address the fundamental challenge of stimulating changes to the pattern of demand. The range of potential market-based solutions to achieve this is relatively limited, with potential measures focussed on making regional airports more attractive relative to South-East airports. For example:

- The Government could introduce a differential tax regime to make charges at regional airports relatively cheaper than those at South East airports, either through Air Passenger Duty (APD) relief at regional airports or the imposition of a 'congestion charge' tax at South-East airports. Such a regime has been proposed by certain respondents to the Treasury's recent consultation on APD reform;
- The Government could impose strict Traffic Distribution Rules at South-East airports, essentially forcing any new routes to be established at regional airports. While this would be a highly interventionist approach in terms of the South-East airports, regional airports would continue to compete amongst themselves for new routes;
- Route Development Funds (RDFs) have been used on a number of occasions to promote new routes and raise awareness. Such funding could potentially be routed through Local Economic Partnerships. However, the scope of Route Development Funds is strictly limited by European State Aid legislation.

As the above examples demonstrate, none of these measures is in reality purely market-based. Moreover, the restrictions on Government's ability to stimulate demand would limit the potential effectiveness of the policy measures outlined above.

Alternatively, Government could adopt a more prescriptive approach by favouring growth at a particular regional airport or looking to establish specific routes:

- Government could designate a particular airport as a national or secondary hub. While regional airports mostly have sufficient runway and terminal capacity to handle an expansion of operations, Government could support provision of high-speed rail connections or other forms of infrastructure investment;
- Government could negotiate the terms of future air services agreements (ASAs) in order to promote the designated hub airport;
- Public Service Obligations (PSOs) could be used on strategic international routes to guarantee provision of these services. However, as discussed in relation to RDFs the funding to support such services would be subject to State Aid legislation;

As these set of measures demonstrate, even where Government prescribes a specific policy solution, it has limited levers to encourage the market to deliver this.

Although it is purely illustrative, the above example serves to demonstrate the importance of having regard to the implementation measures when specifying desired outcomes.

The example also shows how outcomes and implementation measures should be consistent with the characteristics of the policy 'failure' that they are attempting to correct. In the regional connectivity example, the root cause demand deficiency influenced both the specification of policy outcomes and the available set of implementation measures.

By way of contrast, an objective focused on the capacity constraints in the South-East would again need to address the key issue, which would be providing sufficient capacity to serve demand. Again, an outcome could be specified in different ways:

- In terms of the economic value of connectivity: for example, being based on a formula that attached a financial value to travel time as well as taking account of fare levels which are affected by capacity. Given wider regional differences in economic activity, this would tend to focus attention on London and South East England;
- The Government might equally consider that maintaining a hub in the UK and/or near London is a primary policy goal linked to wider considerations about aviation's contribution to Gross Value Added (GVA) or employment, and could specify this as a desired outcome.

Outcome specifications that focused on the economic benefits of connectivity are likely to require implementation measures that relate to ensuring sufficient capacity is available to serve demand. This might involve implementation steps relating to the planning system and would require clarity about how much the market for airport capacity had freedom to deliver growth.

Specifying outcomes around connectivity would also involve taking account of hub economics i.e. that nodes which are already very well connected into the global aviation network make attractive locations from which to operate yet more services. Such route density can be achieved by construction of a purpose-designed hub airport (for example, Dubai or Atlanta), with many runways and terminal design which facilitates fast intra-airport connections.

The development of the route network at Heathrow has followed an alternative path – Heathrow is often classified as a hub because the scale of London as a source of local demand has enabled development of a large number of interconnecting routes. Taking advantage of hub economics in the future will mean either constructing purpose-built assets or taking full advantage of the depth of demand in the UK (for example, through promoting specialisation of airports or making targeted improvements to surface access).

### ***The Environmental Challenge – Delivering Sustainability***

Aviation is a growing contributor to greenhouse gas emissions and, although its current contribution of 2% of global emissions is relatively small, that percentage will increase as other sectors successfully tackle their carbon footprints. As aviation joins the EU Emissions Trading System (ETS)

next year, aviation CO<sub>2</sub> emissions will be capped, with aircraft operators able to offset any emissions above the cap by paying for emissions reductions in other industries that are in the ETS.

It is clear that industry needs to do more to mitigate CO<sub>2</sub> emissions. The analysis published by the Department for Transport in August 2011, alongside its response to the Committee on Climate Change report, indicates that the projected uptake of measures to address aviation's climate change impacts would be inconsistent with stabilising CO<sub>2</sub> emissions within a 2050 timeframe and within current demand forecasts.

This not only implies that further action would be required in order to avoid aviation growth becoming constrained, were the Government to adopt such a target in the short term or were international developments to make such restraint inevitable over the longer-term. It also suggests that without further measures airlines would need to spend an increasing amount of resource on additional emissions permits, which would inevitably feed through into higher fares for consumers.

Aviation can cause major disruption to communities located close to airports. These local impacts have been a contributing factor to the highly polarised and controversial public debate about the UK's aviation policy. In order to be successful in ensuring the durability of the policy framework, the Government will not only need to ensure that these impacts are fully accounted for and addressed, but also that local communities feel fully engaged. It may be possible to devise policy solutions that give local residents a more direct stake in aviation policy, for example by compensating local residents who incur additional nuisance or disruption as a result of policy changes or modified airport operations.

As with the consumer objectives, given the scale and strategic importance of the environmental challenges facing aviation, we present two illustrative examples of how a policy approach based on a clear separation of strategy and implementation could apply in practice.

### ***Scenario 2: Climate Change Challenge***

#### ***Objective and Outcomes***

The corollary of the high-level policy objective for local impacts in terms of climate change is that that aviation should play its part in meeting climate change challenges as a precondition for growth. There are a number of options as to how this could be translated into an outcome. For example, the Government could formally adopt the 2050 target that CO<sub>2</sub> emissions from aviation should return to 2005 levels by no later than 2050.

#### ***Policy and Implementation***

Under a market-based approach, emissions trading systems would be likely to offer the central policy lever. EU ETS is due to come into force in 2012 and the Government may wish to continue to push for the development of a global-level trading scheme to reflect the global nature of the climate change challenge.

In addition, the Government and regulation could strengthen the incentives NATS faces to deliver greater efficiency in Air Traffic Management. This would be consistent with current moves, including the emerging UK Future Airspace Strategy. Research and development subsidies could be used to accelerate development of new technologies such as biofuels etc.

Alternatively, under a more prescriptive approach, the Government could favour prescribing minimum emissions standards for aircraft using UK airspace. Airports could face caps on carbon emissions to encourage improved performance.

This example shows once more how the appropriate set of implementation measures will be a function of the nature of the problem under consideration. Market-based measures are likely to be best suited to a global challenge such as climate change.

More prescriptive approaches, such as minimum emissions standards would be likely to require a greater level of international cooperation, which may be even harder to achieve. The uncertain nature of technological development increases the likelihood that a prescriptive approach focused on a specific technology solution would focus on the 'wrong answer'. Since prescription is not self-correcting like markets, adjustments to future innovation would be much slower with policy 'locked in' to the defunct solution even when there is clear evidence that the answer is indeed wrong.

### ***Scenario 3: Neighbourhood Noise Nuisance***

#### *Objective and Outcomes*

The overarching proposition in the Scoping Document implies a high-level policy objective that aviation should play its part in meeting local environmental challenges as a precondition for growth. The Policy Framework could specify this objective in terms of an outcome, for example, that at a national level the total population affected by aircraft noise beyond a certain level should reduce over time.

#### *Policy and Implementation*

Noise nuisance around airfields is by definition a highly localised issue. Accordingly, while market-based solutions could play a role in addressing noise issues they would need to be local in their scope. It is hard to envisage how a national-level noise trading scheme could be implemented, for example.

Under a local scheme, a noise cap could be applied with a reducing profile over time. Within this cap, airports would be allocated allowances based on a profile of noise emissions over the previous five years. Airports would only be able to exceed their allowances via access to a compensation scheme whereby local residents were compensated through council tax rebates subject to the level of incremental nuisance incurred.

A market-based scheme could also give airports positive incentives to reduce noise levels below the limit. For example, airports that over-performed could benefit from reductions in their business rates. Allowance prices and compensation rates could be set in a way that shared the benefits of technological improvement over time between residents and the aviation sector.

In contrast, a more prescriptive approach to enforcement could be adopted. For example, each airport could be designated a noise envelope which reduces in size over time. Failure to comply with the envelope could be punished either through fines or a reduction in the size of future years' noise envelope. Enforcement of the envelope could be further reinforced through mandatory Chapter 2, 3 and 4 limits.

The more prescriptive approach would have the advantage of providing more certainty as to outcome. However, it would also probably mean higher costs overall since it would remove the flexibility to reduce noise in the most cost-effective manner.

In contrast to the climate change example above, the incidence of aviation noise is so localised around specific airports and the impact on well-being so direct that a noise trading solution between UK airports is unlikely to be politically or practically feasible. However, the example shows that outcomes can still be specified in such a way that market-based implementation measures could potentially create strong positive incentives to meet and exceed challenging environmental targets and thus create headroom for growth with consequent benefits for local residents and consumers alike.

## Part 2: Response to Consultation Questions

### The Aviation Sector

The CAA is committed to improving the choice and value delivered by the aviation sector to consumers, whether they be passengers or cargo shippers and the CAA has built an extensive evidence base on this issue, including the following reports on specific sub-sectors:

- UK Business Travel: Traffic Trends and Characteristics (May 2009) and Flying on Business (December 2010) examined how aviation meets the needs of UK business travellers;
- International Relations (September 2009) examined the significant growth in air travel to visit friends and relatives;
- Connecting Passengers at UK Airports (November 2008) presented data on connecting Passengers at Heathrow, Gatwick, Stansted and Manchester airports;
- Air Services at UK Regional Airports (CAP 775, November 2007) examined trends in the development of air services networks at UK regional airports, which at the time of publication (prior to the economic downturn) was driven by expansion in short-haul international services;
- Connecting the Continents (CAP771, July 2007) focussed on the evolution of long haul services to and from the UK;
- In July 2006, the CAA published a Strategic Review of General Aviation which examined the specific issues related to General Aviation.

These reports and other evidence together form a foundation of work which helps to guide the CAA in its duties, including its advisory role to the Government. The answers to the following consultation questions and the further insight notes planned to complement this initial response are informed by this solid body of evidence.

**5.1** How does the aviation sector as a whole benefit the UK? Please consider the whole range of aviation activities including, for example, air freight, General Aviation and aerospace.

Aviation plays a key role in connecting the UK to the world, giving UK businesses access to international markets as well as offering UK consumers greater choice of goods and services. Businesses benefit from the ease with which people and cargo can move around the world and leisure passengers benefit from the opportunity to visit friends and family in other parts of the world and to holiday in an increasingly wide range of destinations.

The advanced and interconnected nature of the UK economy and its citizens means that aviation is a critical enabler of economic activity. According to figures published by the World Economic Forum,

despite the UK's relatively small size, its aviation network measured in Available Seat Kilometres is the third largest in the world behind only the USA and China. Other research, focussed on connectivity between major economic hubs, finds that the range and frequency of routes available from London's five major airports make it the best connected city in the world in terms of serving other major business centres, reinforcing and supporting London's status as a global business hub.

Foreign businesses investing in the UK's capital and its regions regularly cite the ease of access to international markets provided by the UK's aviation connectivity as a key determining factor in their location decision. And in addition to facilitating leisure travel by UK residents, aviation is a key enabler of inbound tourism into the UK, with over 65% of overseas visitors to the UK arriving by air<sup>1</sup>.

In addition, general aviation supports business activity by small and medium sized businesses and facilitates a significant recreational sector. Finally, the UK aviation and aerospace sector is a successful industry in its own right and an important source of employment with figures published by Oxford Economics suggesting that as many as 325,000 people across the travel industry and manufacturing sector are directly employed in UK aviation.

## **5.2 What do you consider to be the aviation sector's most important contributions to economic growth and social well-being?**

See response to question 5.1.

## **5.3 Are some sub-sectors of aviation more important than others? If so, which and why?**

All sub-sectors of aviation add value, either directly through their contribution to the generation of economic value or as sources of enjoyment for its users. Furthermore, there are many interactions and interdependencies between sub-sectors. For example, long-haul passenger routes support the provision of bellyhold cargo services (and vice-versa), general aviation provides trained pilots for commercial aviation, leisure fliers support airports that are also used for niche commercial activity, maintenance supports skills that might also be used in aircraft manufacturing, and military aviation supports the development of civil technologies (and vice-versa).

For these reasons the CAA considers it important that the Government's Sustainable Framework for UK Aviation fully recognises the value of all sub-sectors of aviation, whilst at the time recognising that sub-sectors may be in competition for scarce resources such as congested airspace or airports, and that the need for trade-offs and prioritisation may be inevitable. Where such decisions are necessary, the CAA believes that they should be informed by a comprehensive and balanced assessment of costs and benefits.

## **5.4 How do you think the global aviation sector will evolve in the medium and long term (twenty to fifty years)? What do you expect to be the most significant changes?**

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<sup>1</sup> Source: International Passenger Survey 2010

The aviation industry is continually evolving. There has rarely been a time since the dawn of commercial aviation when it has not been true to say that the industry was in a state of rapid, usually positive, flux. Some of these changes would have been difficult, if not impossible, to predict even 10 or 20 years in advance.

The high-level trends that are likely to drive the development of the aviation industry over the next decade are likely to include:

- Continued rapid economic growth in major emerging markets contrasting with slower growth in the more mature aviation markets in Europe and North America;
- Technological progress, driven by sustained high oil prices and a continuing focus on the negative environmental impacts of aviation;
- Rapid capacity expansion driven by high-levels of aircraft deliveries.

However, it is not possible to predict these trends with any certainty, and looking to the longer-term it becomes even harder to forecast the future. Accordingly, the Policy Framework should not look to fit to any particular future view of the world, but rather to establish a Framework in order to enable policy to adapt in order to deliver the Government's objectives.

The aviation sector's ability to evolve and adapt to changing circumstances is a major strength. Indeed, in many ways, the sector's capacity to innovate in terms of service provision, operating practices and new technology, will be crucial if the pressing consumer and environmental challenges facing UK aviation are to be met. Accordingly, the CAA's view is that the Policy Framework should establish the conditions necessary to encourage and stimulate the innovation and investment in UK aviation needed to meet the demands of future businesses, consumers and the country's broader public policy objectives.

### **5.5 How, and within what constraints, can aviation growth occur as technological developments and improved operating procedures reduce CO<sub>2</sub>, pollutant emissions and noise impacts?**

In light of the significant impacts of aviation on the global and local environment, it is likely that environmental considerations will be important drivers in the way that aviation develops, and it is right that the Government is emphasising the importance of promoting a sustainable growth path for the sector.

Like any other sector, aviation should be allowed and encouraged to grow where it generates net value for society; any value calculation must take full account of the costs of activity as well as the benefits. The CAA believes that market-based policy measures that take realistic account of both costs and benefits, such as trading schemes or targeted pricing measures, offer the best mechanisms to encourage delivery of an efficient and ultimately sustainable sector and create clear incentives for over-delivery in order to facilitate aviation growth.

Much investment in the aviation sector, both in terms of infrastructure and equipment has a very long lead time and involves significant development cost. These characteristics emphasise the

importance of delivering effective long-term signals and policy stability capable of being sustained over an extended period.

**5.6** How should decision-makers address trade-offs or competing interests, where these occur both (a) between different aviation objectives, e.g. CO<sub>2</sub> emissions versus local noise reduction, and (b) between aviation and other sectors, e.g. airspace use versus renewable energy objectives, or the use of land for maintaining a viable network of smaller airfields versus housing development?

The primary function of the Policy Framework should be to establish a broad consensus on the set of objectives and outcomes that the UK aviation sector should be expected to achieve, so that an acceptable level of consistency can be provided to investors. Trade-offs and decisions on competing interests should be guided by these objectives and desired outcomes, facilitated where practicable by market-based policy mechanisms that allow different actors to make individual choices based on their specific circumstances. Where the establishment of such mechanisms are not appropriate or impractical, decision-making should be based on evidence of value.

Furthermore, in certain areas, the limitations of single state action in making these trade-offs should be recognised. Given the global nature of the aviation industry and the institutional framework of the UK aviation sector, building consensus on the future direction of the sector will require the UK to work across national boundaries, particularly as many policy levers are dependent on supra-national bodies such as the European Union or ICAO.

**5.7** Should some aspects of UK aviation be considered to be of strategic national interest (e.g. certain airports, air traffic control)? If so, based on what criteria?

Government has identified, from time to time and for a variety of purposes, elements of the UK's aviation infrastructure that are of strategic importance. Examples include a number of the larger UK airports, based on their passenger and/or cargo throughput, and providers of air traffic services.

As elements of the aviation sector, particularly airspace, become increasingly integrated at an international level, for example through the establishment of Functional Airspace Block, it may also be appropriate to determine strategic importance at a supra-national level.

It is for Government to determine which aviation infrastructure should be treated as being of strategic importance both nationally, for example under the Climate Change Act 2008, and internationally, for example under Council Directive 2008/114/EC of 8 December 2008 on European critical infrastructure.

**5.8** How might the cost of regulation to the aviation sector be reduced, while achieving the Government's objectives of promoting sustainable aviation, improving the passenger experience at airports, and maintaining high standards of safety and security for passengers and freight?

In the UK and in many other advanced economies, the trend over the last quarter of a century has been towards significant economic de-regulation of the aviation sector which has led to the emergence of competitive airline and airport markets characterised by private ownership, reduced

Government involvement and control, and in general higher levels of choice and value. In contrast, the need to establish minimum levels of service in these dynamically competitive sectors, combined with rising safety expectations and the ever-evolving security challenge, has driven heightened regulation particularly in the areas of safety, security and passenger protection.

In examining where the costs of regulation may be reduced whilst maintaining or enhancing the sector's performance, it is worth looking at where regulation could be: a) removed; or b) done differently. Where regulation is still considered necessary, it should be proportionate and set out in terms of clearly defined outcomes targeted at protecting consumers and the wider public. Where appropriate, regulation should facilitate the potential for dynamic and innovative solutions that drive improvements through effective incentives, i.e. providing carrots as well as sticks.

## International Connectivity and Hub Airports

**5.9** How important are air transport connections – both international and domestic – to the UK at both national and regional levels?

See response to question 5.1.

**5.10** As long as people and goods can easily reach their desired destination from the UK, does it matter if they use a foreign rather than a UK hub airport?

Consumers place a premium on direct services, for the shorter journey times and added convenience compared with connecting services, as well as on route frequency and availability of services at particular times of day. For UK-originating consumers wishing to fly to their destination directly, the importance of a UK hub is determined by a) their ease of surface access to the airport; and b) the existence of direct services to their preferred destination.

The attractiveness of a UK hub is important to the degree to which transit and transfer passengers originating elsewhere provide traffic volumes which support service frequency on popular routes and sustain services on more marginal routes. For example, a number of high frequency routes at Heathrow also have a high volume of connecting passengers. UK-originating passengers on these routes will benefit from the higher frequency as they will be able to travel nearer to their ideal departure time. Furthermore, there is some evidence that during the current economic downturn, transfer traffic from world regions where economic growth has been less affected have helped maintain the route network at Heathrow, with the share of transfer passengers rising during this period.

Connecting passengers therefore contribute to the sustainability of the overall route network from that airport, generating some additional employment that would otherwise have gone to other hubs. However, where capacity is constrained, routes sustained by transfer and transit passengers may constrain access to UK-based travellers wishing to travel on alternative point-to-point routes.

For routes where no direct service is available, consumers are likely to prefer the combination of connections which offers the highest level of convenience, including best overall journey time. In this respect, consumers are likely to be relatively less guided by whether they hub through a UK or foreign airport, although the Government may be interested in the employment implications of such hub-to-hub competition.

**5.11** Are direct connections from the UK to some international destinations more important than others? If so, which and why?

As the centre of gravity of the global population and its economic activity continues to shift, key business routes will increasingly include those to the emerging markets of Asia and South America. The network of the most important markets for the UK will continue to change over time, as it always has. The most important thing is that the UK aviation sector is responsive to these changes.

In the pursuit of revenue and profits, airlines and airports are constantly gauging how best to meet the demands of their passenger and freight customers and are therefore well placed to understand and react to the changing relative importance of international (and domestic) connections.

It is worth noting that markets are most responsive where air services are liberalised. In the EU or for example on routes between the UK and North America the market is generally best placed to meet the demands of UK aviation consumers and to determine a route network that meets consumers' requirements. As aviation services between the UK and many countries in emerging markets continue to be governed by restrictive Air Service Agreements which limit the full functioning of the market, it will be important to secure liberal agreements with these countries.

**5.12** How will the UK's connectivity needs change in the light of global developments in the medium and long term (twenty to fifty years)?

See response to question 5.11.

**5.13** What are the benefits of maintaining a hub airport in the UK?

See response to question 5.10.

**5.14** How important are transfer and transit passengers to the UK economy?

See response to question 5.10.

**5.15** What are the relative merits of a hub versus a point-to-point airport?

As noted in the responses to question 5.10 above, the primary consumer benefits of the existence of a network hub at a UK airport derive from enhanced choice and value.

Over recent years, the major European 'point-to-point' airlines have established significant hubs or bases of their own at UK airports, in particular Stansted and Gatwick. The number of destinations served from both of these airports is in fact greater than the absolute number of routes available from Heathrow, albeit often at much lower frequency.

Although a number of Europe's major airports, including Heathrow, are referred to as hubs and perform an important hub function for the airlines based there, these airports are not specifically designed as 'hubs'. In contrast, a number of airports in other regions, such as Atlanta in the USA and Dubai in the UAE have been specifically designed with a hub function in mind and the design of the airports facilitates this function.

'Hub and spoke' and 'point-to-point' networks are alternative airline business models. Within Europe, whether an airport is considered a 'hub' airport or a 'point-to-point' airport is largely

determined by the mix of airlines operating at that airport rather than the physical characteristics of the airport infrastructure.

While traffic at some UK airports is dominated by airlines favouring one or other business model (e.g. Heathrow for 'hub' or 'network' carriers, Stansted for point-to-point routes) at many other UK airports, competing airlines operate under both models. Competition between these airlines benefits consumers by driving down price and increasing choice.

Similarly, the choice and value on offer from London's 'system' of five airports offers many competitive advantages. A single 'mega-hub' that replaced the current network may have advantages in terms of the range of destinations but this may come at a price in terms of other characteristics of choice and value.

**5.16** Would it be possible to establish a new 'virtual' hub airport in the UK with better connectivity between existing London and / or major regional airports? Could another UK airport take on a limited hub role? What would be the benefits and other impacts?

As noted in the answer to question 5.10, the attractiveness of a UK hub depends on its ability to attract the connecting passengers needed to support service frequency on popular routes and sustain services on more marginal routes. The ability of a hub, real or 'virtual', to attract connecting passengers is dependent on a number of criteria, which include: cost, minimum connection time; reliability; convenience and passenger catchment.

Any alternative or virtual hub, in London or the regions, would need to compete on the above criteria of service cost, quality and local passenger catchment. Heathrow's ability to perform a function as a long-haul hub airport is supported by its proximity to a large local market in London, which generates significant demand for travel to and from long haul destinations, and the presence of network airlines (and more recently alliances) which supplement this demand by attracting connecting passengers.

Operationally, hubs are generally characterised by their superior scale and reach. Because of that, airports that have attempted to compete against or even provide some complementary hubbing capacity have experienced problems as they face an inability to attract network carriers away from the major hub in the region.

## Regional Connectivity and Regional Airports

**5.17** Can regional airports absorb some of the demand pressures from constrained airports in the south-east? What conditions would facilitate this?

Prior to the economic downturn, growth rates at UK regional airports had tended to exceed those at congested airports in the South East. Since liberalisation of the EU internal aviation market, extensive networks of short-haul routes have developed at many regional airports.

Long-haul development at regional airports to date has been characterised by a large proportion of charter services and UK airlines serving leisure destinations on a point-to-point basis<sup>2</sup> and foreign airlines serving UK regional airports as a spoke of their network, providing UK regional passengers with long-haul connecting possibilities at a hub.

In order for a regional airport to significantly develop its network of long-haul connections it would need to capture a sufficiently large catchment area, with sufficient premium demand, which would require improvements to surface access connections and potentially some constraints on the expansion in activity at South East airports.

**5.18** What more can be done – and by whom – to encourage a switch from domestic air travel to rail?

The potential for substitution from air to rail will be greatest on routes where rail offers consumers a more attractive combination of end-to-end journey time, frequency, convenience and price.

Evidence from the West Coast Main Line upgrade suggests that reduced rail journey times between Manchester and London have had an impact on market share of point-to-point air traffic between these two cities, demonstrating the potential for air to rail modal shift.

However, even with existing rail journey times of approximately 2 hours, well within the margins of what is generally considered to be necessary for rail to be competitive with air, multiple daily frequencies between London and Manchester, as well as on short-haul international routes between London and Paris and Brussels, continue to be sustained by demand for onward connections. In addition, 60% of UK domestic passengers in 2010 were travelling either on routes which do not pass through any London airport or on which currently propose high-speed rail routes would offer no significant journey time benefit.

**5.19** How could the benefits from any future high speed rail network be maximised for aviation?

There are two potential channels through which high-speed rail could deliver benefits for the UK:

- a) Substitution – modal-shift from aviation to rail in order to free up capacity at already congested airports;

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<sup>2</sup> More recently regional airports have seen the withdrawal of all services from BA and bmi on long-haul routes. Virgin is mostly serving the leisure destination of Orlando.

- b) Complementarity – high-speed rail providing feeder services to bolster longer-range aviation routes.

The response to question 5.18 considers the potential for air-rail substitution. Modal shift from domestic aviation to rail would potentially free up a limited amount of capacity at congested airports.

Evidence on the complementarity between rail and air is limited. A credible rail-air product would need to maximise intermodal convenience, ensuring that the rail-air interface was as seamless as possible and in particular minimised connection times. Relevant factors would include the proximity of the railway station to the main airport terminal as well as the provision of through-ticketing, remote baggage handling and other procedural formalities.

**5.20** How can regional airports and the aviation sector as a whole support the rebalancing of the economy across the UK?

Regional airports have historically struggled to generate sufficient demand to develop and sustain an extensive route network of direct connections, in particular on long-haul routes. It may be that as a consequence of capacity constraints in the South East, demand might switch towards regional airports.

Government has limited policy levers to correct demand deficiency. Policy measures such as Route Development Funds (RDF) and Public Service Obligations (PSOs) could be implemented, as has been attempted at various times in the past. However, the scope for using both of these tools is strictly limited by European State Aid legislation.

## Making Better Use of Existing Capacity

**5.21** To what extent do UK airports meet the needs of their customers? How might those needs be more effectively met within existing capacity? What is the right balance between competition and regulation?

While the passenger experience at most airports meets consumer expectations most of the time there is room for improvement. For example, recent events such as the disruption caused by volcanic ash and snow in 2010 have highlighted the problems that can arise when the aviation system is unable to operate normally. The disaggregated nature of the industry adds to the complexity of resolving such major disruptions with the minimum possible impact on consumers.

Airport competition has been effective in generating benefits for passengers where there has been sufficient contestability and the CAA has been supportive of the recent moves to place the major airports of Heathrow, Gatwick and Stansted in separate ownership to further encourage competition.

The CAA continues to regulate charges at Heathrow, Stansted and Gatwick airports, as these airports are designated by the Secretary of State, and the CAA is currently consulting on its proposed approach to the next regulatory period, Q6 in order to ensure that this approach adequately protects consumers and strikes the appropriate balance between competition and regulation. A key part of the consultation on the Q6 approach is considering how well airports meet the needs of consumers. The CAA will provide further advice on this subject once the consultation period has concluded.

**5.22** Can we extract more capacity out of the UK's existing airport infrastructure? Can we do this in a way which is environmentally acceptable? To what extent might demand management measures help achieve this?

UK airports already face strong incentives to maximise the use of existing airport infrastructure: Heathrow consistently operates at close to 100% of its potential capacity; Gatwick is the busiest single runway airport in the world; and a number of other UK airports suffer congestion at peak periods. The existence of capacity constraints at these airports over the years has meant that the UK has generated significant expertise in getting the most capacity out of these constrained parts of aviation infrastructure. However, some evidence suggests that in the future a greater emphasis on maximising other elements of airport performance might be required.

For example, work carried out by XPX / Helios for the CAA in 2008 and updated for the purposes of the South East Airports Taskforce<sup>3</sup> highlights the trade-off between throughput and delay that becomes increasingly apparent as airports become more and more congested. This research implies that optimal capacity usage in order to ensure punctual operational performance as well as to ensure resilience to recover from disruption is likely to be significantly less than 100% utilisation.

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<sup>3</sup> Both studies are available online at [www.caa.co.uk/apfg](http://www.caa.co.uk/apfg)

The nature of the throughput-delay trade-off will vary depending on the individual characteristics of specific airports. However, it is likely that operating on the basis of optimal capacity would imply capacity at the most congested airports being used significantly less intensively than at present.

Excessive congestion at regulated airports results as airport operators are incentivised to provide capacity beyond the optimal level as they receive revenue for doing so. Individual airlines benefit from a marginal additional flight as it generates revenue from operating this service. However, the disbenefits in terms of reduced performance are suffered by all pre-existing services.

Given the benefit of this evidence, the debate might therefore be better recast as how should the Aviation Policy Framework ensure the optimal use of airport capacity, taking into account environmental and airspace constraints as well as other performance considerations, rather than how do we extract the most capacity. In this regard, the lessons of the South East Airports Taskforce, together with the emerging work on airspace modernisation being taken forward at a national level (see the CAA's Future Airspace Strategy) and European level (through the Single European Sky agenda), should be useful.

Policy measures, such as the capacity management guidelines, which the Airport Performance Facilitation Group is encouraging airports to develop, could also be used to correct this externality and discourage airlines and airports from operating above optimal capacity. Market-based mechanisms, such as a congestion charge would offer one solution, and the CAA would favour such a solution, although it recognises that alternative policy instruments could be used.

**5.23 How can we support Heathrow's hub status within the constraints of its existing capacity? Can we do this in a way which is environmentally acceptable?**

It is for the Government to determine whether the promotion of a UK hub airport is a priority given the capacity constraints at the UK's busiest airports.

The CAA considers that the market is generally best placed to allocate scarce capacity to the most valuable routes. Heathrow's operators are incentivised to maximise throughput within the constraints of existing capacity and to focus on those routes which generate maximum value.

However, if the Government were to determine that network economies deriving from hub-and-spoke operations at Heathrow constituted a positive externality that would not be fully captured by the market, it could consider policy interventions which captured the added value of connecting routes. Any such policy options would need to be carefully designed to minimise competitive distortions and accompanied by full analysis of costs and benefits.

The future of large airport operations such as Heathrow is closely linked to the degree to which it can mitigate the environmental impacts of its operations, and an airport's ability to address these concerns will inevitably be significant in determining its room for further traffic growth.

**5.24** How important is increased resilience at the UK's major airports to reduce delays? How best could resilience be improved with existing capacity, e.g. how might trade-offs between existing capacity and resilience play a role in this?

See response to question 5.22.

**5.25** Could resilience become an issue at regional airports? If so, how might this be avoided?

The demand forecasts published by the Department for Transport in August 2011 suggest that an increasing number of UK airports are likely to be approaching theoretical maximum capacity by 2030. It is further possible that airspace conflicts between airports could further limit the maximum capacity which could be achieved at some airports.

Where there is effective competition between airports, airport operators are incentivised to take account of the importance of delivering levels of resilience that are acceptable to their users, though the Government should be mindful of the commercial incentives that may lead to throughput being set at a level where resilience suffers.

Furthermore, it is likely that under forecast demand growth, an increasing number of airports will exercise some degree of market power. In these circumstances, it is envisaged that the reform of economic regulation will give CAA the authority to intervene in order to manage any resulting service quality issues, including resilience.

Through the work of the South East Airports Taskforce (SEAT) and the Airport Performance Facilitation Guidance (APFG) a number of mechanisms are being developed, including performance charters and capacity guidelines, which have the potential to avoid or mitigate the resilience issues experienced at some South-East airports being replicated at other airports if demand growth continues.

**5.26** Could existing airport capacity be more efficiently used by changing the slot allocation process, for example, if the European Commission were to alter grandfather rights? If so, what process of slot allocation should replace it?

Reform of slot allocation alone is unlikely to be sufficient to significantly improve the use of airport capacity. It is partly for this reason that the Airport Performance Facilitation Group is encouraging the development by airports of guidelines on capacity management, as set out in the response to 5.22 above.

The European Commission carried out a consultation on slot reform in 2010, and the CAA contributed to a joint UK response to that consultation.<sup>4</sup>

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<sup>4</sup> Public consultation on the impact assessment for a possible revision of Council Regulation (EEC) 95/93 on common rules for the allocation of slots at Community airports

The current European Slot Regulation has in general operated smoothly in the UK. However, there may be a case for further market principles to be introduced in the slot allocation system, because an administrative allocation system can have imperfections. This can lead to the inefficient use of slots that has an adverse impact on the consumer and potentially the environment.

Secondary trading has been shown to bring considerable fluidity in slots at congested UK airports, enhancing competitive rivalry and bringing benefits to consumers. Secondary trading has been very useful in improving efficient use of scarce airport capacity and allowing airlines to respond to shifting market conditions. Any changes made to legislation should not impede secondary trading operating in its current form.

The UK would welcome any changes to the Regulation that evidence suggests would improve the openness and transparency of slot allocation, and hence improve competition and efficiency, subject to evidence suggesting that any such change to the Regulations would not reduce the volume of trade and liquidity of the market for slots.

Any proposals to limit existing grandfather rights would require further analysis of the cost, benefit and practical effects, including the application to non-EU airlines, and in particular whether it is a proportionate response to the market and competition problems. Time-limiting slots (e.g. 10 year leases) could affect airlines' route and network development decisions. It could deter airlines from investing in new, more efficient fleets if they are not able to guarantee the use of those slots in the longer term, as airlines tend to have long planning timescales and aircraft are purchased for utilisation over relatively long periods.

The proposal to withdraw a percentage of grandfathered slots has been assessed in the past in NERA's 2004 study for the Commission (Study to Assess the Effects of Different Slot Allocation Schemes, pp 199-211 and 216) and Mott MacDonald's 2006 study for the Commission (Study on the Impact of the Introduction of Secondary Trading at Community Airports pp 12-24 to 12-33), and more recently in Steer Davies Gleave's May 2011 report for the Commission (Impact Assessment of Revisions to Regulation 95/93 pp 297 to 314).

#### **5.27 What provision, if any, should be made for regional access into congested airports?**

It is for Government to determine the outcomes that it wishes to be delivered by aviation, including with regard to economic development and social well-being in UK regions. The CAA recognises that many UK regional bodies consider access to London airports, and in particular to Heathrow and to Gatwick, as important as a way of connecting their region to the rest of the world.

The CAA's view is that market-led competition offers the best mechanism for allocating scarce capacity at congested airports with capacity operated by those users who value it most. However, at present only airlines are able to own slots, and this prevents other entities who may value the services associated with the operation of a slot e.g. (local public authorities) expressing this value in the market-place. Placing an artificial premium on regional access could mean that other competing uses for those slots would be squeezed out, at a possible cost to other users and those providing the

services. Such intervention should therefore be done with a proper appreciation of the costs of such action.

**5.28** What provision, if any, should be made for General and Business Aviation access into congested airports?

Traffic Distribution Rules currently restrict the access of General and Business Aviation at Heathrow and Gatwick by making access to those airports in peak periods subject to express approval by the airports.

While the CAA would not be in favour of slots being ring-fenced specifically for general and business aviation, as this would risk scarce slots being under-utilised, the CAA does support the Competition Commission's recommendation that Traffic Distribution Rules should be reviewed.

**5.29** What is the role of airspace design and air traffic management in making better use of existing capacity?

UK airspace is an essential component of our aviation infrastructure. A policy framework that takes a holistic view of fully integrating airspace into future aviation needs would be beneficial. Ensuring that national airspace is not a constraint on reasonable demand growth is a key element of the CAA's Future Airspace Strategy (FAS).

The FAS has the potential to make a substantial contribution to the Government's objectives as part of a sustainable framework that will guide the aviation industry in its investment and technological development plans. This will enable the benefits of innovation to feed through to improvements in operational efficiency. The FAS also provides the means for the UK to implement Single European Sky proposals to increase the overall safety, capacity and efficiency of the international Air Traffic Management (ATM) system at the same time as making commensurate environmental improvements.

The FAS is based on the, broadly accepted, assumption that improvements in airspace capacity are needed now and will continue to be needed in the future. There are already congestion hotspots in UK airspace today that must be addressed as predicted traffic flows increase in order to minimise delay and to continually improve safety. Revised navigational performance standards will deliver a capability to fundamentally re-design the airspace in order to achieve free-flow from airports, continuous climb and descent operations and reduce and, over time, eliminate routine airborne stack holding.

To achieve some of these benefits, there will have to be changes to some of the existing routes that have been in place for the last 40-50 years. Under the levels of traffic growth set out in the DfT's revised demand forecasts, the pressure on the UK's airspace system will continue to grow with a changing profile of demand from different user groups leading to a tightening in the supply/demand balance for airspace at certain times and in certain places, in particular in the south-east.

The full benefits of the FAS will not be delivered if airspace is re-designed in isolation from other considerations. The shift to a fundamentally more flexible and integrated airspace system to improve safety, capacity, efficiency and environmental performance will require complementary changes at airports to achieve improvements in the service benefits to passengers. The interface with the newly created Network Management function in Eurocontrol will be critical in ensuring that issues are resolved at the network and Functional Airspace Block level and not in UK in isolation. Balancing these network requirements with national aspirations will continue to be a challenge.

## Climate Change Impacts

**5.30** What do you consider to be the most significant impacts of aviation, including its non-CO<sub>2</sub> emissions, on climate change? How can these impacts best be addressed?

The CAA considers that global and local environmental impacts are important and should therefore be considered within the Framework. In line with the approach set out in this consultation response, the Framework should define the Government's environmental objectives in terms of desired outcomes. At the level of implementation steps, policy measures should aim to incentivise the aviation industry to deliver these outcomes as efficiently as possible.

Market-based measures, such as taxation or trading systems offer effective mechanisms for addressing environmental challenges as they enable the external costs caused by aviation to be internalised, while minimising the cost impacts for consumers. Nevertheless, other policy levers may also be required to deliver desired outcomes. Moreover, it is important to recognise the global nature of both the aviation sector and the climate change challenge. Accordingly, multilateral solutions are likely to be more effective than unilateral ones.

In terms of non-CO<sub>2</sub> impacts, the CAA's view is that further work is required to develop scientific understanding of these measures in order to better judge the non-CO<sub>2</sub> effects and determine appropriate policy measures.

**5.31** What role should aviation play relative to other sectors of the economy in reducing greenhouse gas emissions in the medium and long term?

The most efficient approach to reducing greenhouse gas emissions is where the overall cost of reducing emissions across all sectors is minimised. In economic terms, this occurs where the marginal costs of abatement are equalised across all sectors, an objective most easily achieved through an Emissions Trading System.

**5.32** How effective do you believe the EU ETS will be in addressing the climate impacts of aviation? Should the UK consider unilateral measures in addition to the EU ETS? If so, what?

As discussed in the responses to 5.31 and 5.32, emission trading systems offer an effective and economically efficient means of reducing emissions. Given the global nature of aviation, a global trading system would provide the first-best solution, as it would mitigate competitiveness concerns and potential regional discrepancies. The Government should therefore continue to work towards a global solution for aviation emissions.

Nevertheless, the EU ETS does provide a second-best solution and in the absence of global agreement, provides an effective framework for addressing the CO<sub>2</sub> impacts of aviation from the European Union.

The Government could consider further additional measures unilaterally, but it would be important to demonstrate that any additional measures actually reduced emissions, and did not create carbon leakage, for example as a result of diversion of activity via European hubs.

Any potential policy instruments would need to be carefully designed in order to: set clear objectives; be applied fairly; provide long-term certainty, provide strong incentives comprising both carrots and sticks; and minimise distortions. Moreover, it would be important to assess the consumer impacts of any unilateral measures to ensure that UK's competitiveness is not unduly prejudiced.

**5.33** What is the best way to define and quantify the UK's share of the CO<sub>2</sub> emissions generated from international aviation?

The Government should develop definitions in line with international best practice to avoid double counting and / or potential for perverse incentives to reduce emissions. This is likely to be achieved in concert with international partners by ensuring that there is a clear link between activity and actual emissions.

**5.34** What is the potential for increased use of sustainable biofuels in aviation and over what timeframe? What are the barriers to bringing this about?

The CAA's Safety Regulation Group is involved in the Aviation Fuel Committee, which supports the development and management of international aviation fuel specifications. However, the CAA does not have the appropriate expertise to express an informed opinion on the potential scalability of biofuels uptake.

**5.35** What mechanisms could the Government use to increase the rate of uptake of sustainable biofuels in the aviation sector? In particular, how can we accelerate the successful development of second generation biofuels?

As noted in the response to question 5.34, this is not an area where CAA has specific expertise.

**5.36** Which technologies (e.g. for aircraft and air traffic management) have the most potential to help reduce aviation's CO<sub>2</sub> emissions (noting potential trade-offs with local environmental impacts)?

The CAA does not have the specific expertise necessary to express an informed opinion on the likely scope of technological developments over the 30-year time-frame of the Policy Framework.

However, with an increasingly congested airspace it is clear that operational and air traffic management (ATM) innovations will have an important role to play. The CAA is leading or participating in a number of projects to improve operational and ATM performance, including leading implementation of the Future Airspace Strategy and participating in the Single European Sky initiative.

**5.37** What more could be done to encourage the aviation industry to adopt new technology to reduce its climate change impacts?

Aviation is a global industry, working with a legal framework that is also established at a global level. Accordingly the UK authorities have limited levers to encourage adoption of new technologies on a unilateral basis.

The UK should, however, explore what more could be done to develop International standards, which could offer a potential mechanism to drive faster technology development and uptake. Any international standards would need to be fair, effective and provide long-term certainty. The CAA notes that the initiatives and standards developed in the automotive car industry both in the EU and elsewhere may provide some useful lessons for thinking about potential standards that could be developed in aviation.

**5.38** What more can the UK aviation industry do to reduce the climate change impact of its ground operations and surface access to and from the airport (which can also help reduce local environmental impacts)?

A departures code of practice, agreed by all interested parties, would supplement the existing arrivals code of practice and codify some of the potential operational measures that could be adopted relatively quickly.

**5.39** What scope is there to influence people and industry to make choices aimed at reducing aviation's climate change impacts, e.g. modal shift, alternatives to travel, better information for passengers, fuller planes, airspace management (which can also help reduce local environmental impacts)?

CAA research suggests that providing aviation consumers with additional and enhanced information could improve consumer choice across a range of issues including environmental performance. Providing the public with targeted information about environmental performance could enable consumers to make better choices, which in turn would encourage the industry to improve its environmental performance.

In terms of airspace management, the CAA's Future Airspace Strategy<sup>5</sup> aims to drive the implementation of air traffic management measures and procedures that enable aircraft to fly in more environmentally efficient ways and therefore contribute to minimising aviation's environmental impacts.

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<sup>5</sup> The Future Airspace Strategy is available online at [www.caa.co.uk/fas](http://www.caa.co.uk/fas)

## Local Impacts

**5.40** What do you consider to be the most significant impacts – positive and negative - of aviation for local communities? Can more be done to enhance and / or mitigate those impacts? If so, what and by whom?

Local communities benefit from access to the route connections provided by their local airports. These benefits are considered in the response to questions 5.1 and 5.2 above. Aviation is also a major source of employment, particularly in the areas located in the immediate vicinity of airports.

In terms of local environmental impacts, noise disturbance and impacts on local air quality are the most significant effects. The relative significance of the impacts will vary from airport to airport. The distribution of noise disturbance will depend on the orientation of departure and arrival routings. Local air quality impacts derive from a combination of aviation and non-aviation sources.

Mitigation of these impacts will be best achieved where those undertaking the activities bear the environmental costs of the impacts generated, providing appropriate incentives for improvement. Ideally, this would be best done through the introduction of market mechanisms that create the potential for properly pricing local impacts such as noise, and the CAA intends to examine the practicality of such an approach in its 'Aviation Policy and the Environment' insight note.

**5.41** Do you think that current arrangements for local engagement on aviation issues, e.g. through airport consultative committees and the development of airport master plans, are effective? Could more be done to improve community engagement on issues such as noise and air quality? If so, what and by whom?

Consultative committees can perform a useful role as a starting point for local engagement as they bring together all the parties who benefit from or suffer from aviation activities, which could in principle could produce an outcome to which all groups can subscribe. Although significant gains have been made by voluntary agreements, it can take considerable time and effort to secure even the most basic consensus.

**5.42** Do you think that current arrangements for ensuring sustainable surface access to and from airports, e.g. Airport Transport Forums and airport surface access strategies, are effective? Could more be done to improve surface access and reduce its environmental impacts? If so, what and by whom?

The CAA does not have particular expertise in the area of sustainable surface access or a particular view on this question.

**5.43** What are your views on the idea of setting a 'noise envelope' within which aviation growth would be possible, as technology and operations reduce noise impacts per plane? What do you consider to be the advantages and disadvantages of such an approach?

It is for the Government to set the outcomes which it wishes to see achieved with regard to addressing aircraft noise disturbance impacts. It is fundamental for clear outcomes to be established in order to ensure that a 'noise envelope' sets appropriate incentives.

Subject to the desired outcomes, a noise envelope could be implemented according to a number of approaches:

- In terms of the inputs that contribute to noise created;
- by measurement of the noise itself, or in terms of the impact created by noise; or
- through a combination of the above approaches.

Input measures can be used as a proxy for the amount of noise created. Other things being equal the greater the level of inputs the more noise will be created. Input measures could play a useful role in developing a 'noise envelope' approach as measures such as numbers of air transport movements (ATMs) or passengers are in general relatively easy to understand and measure, objective and for the most part trusted by local residents and politicians.

The standard method of measuring aircraft noise is to take into account the number of noise events combined with the sound levels and duration of those noise events over a given period to give an equivalent continuous sound level. Research has shown that there is a reasonable statistical relationship between these types of metric and community annoyance. Noise exposure contours can be used to provide a graphical demonstration of the distribution of noise in the vicinity of an airport. An alternative approach is to consider an inventory approach to noise management. The most common way of describing the noise contours in numerical format is by stating the area of the region encompassed by the outer contour. This has been used numerous times in planning conditions. Setting a limit on contour area contains the extent of the noise impact but does nothing to minimise the number of people affected or put any restriction on the severity of the impact experienced by individuals within the contour area.

Noise exposure contours and other metrics can be used to form dose-response relationships, which are statistical models that enable the impact of a given amount of noise to be predicted. The impacts of noise range from annoyance, sleep disturbance, effects on children's learning through to health effects. In principle, it would be possible to establish a noise envelope based on these impacts. For example, that an airport should ensure that its operations generate no more than a set number of highly annoyed people or a given number of awakenings per night. Any such noise envelope would be subject to the same difficulties as those previously described in attempting to limit the number of people exposed to a stated amount of noise compounded by difficulties in uncertainties inherent in any dose-response relationship employed for the purposes of the noise envelope.

Noise metrics can be combined in different ways. A noise envelope might be defined by a set of objectives, all of which must be met to meet the noise envelope criteria. For example, a movement limit might be combined with a noise exposure contour area cap. An alternative but complementary approach would be to assess the amount of environmental detriment per unit of productivity. For example, measurement of the noise exposure contour area divided by the number of air transport movements provides a relative measure of environmental efficiency. Such relative measures are

helpful in assessing whether the amount of environmental damage is minimised for a set amount of productivity.

**5.44** Is it better to minimise the total number of people affected by aircraft noise (e.g. through noise preferential routes) or to share the burden more evenly (e.g. through wider flight path dispersion) so that a greater number of people are affected by noise less frequently?

As noted in the response to 5.43 above, it is for the Government to set the objectives and outcomes which it wants to achieve with regard to addressing aircraft noise impacts. However, there are clearly some trade-offs that can be made. These will differ between intensively utilised airspace over areas of high population density (such as in the south-east of England) and less complex airspace over more rural areas adjacent to airports in the remainder of the UK.

Noise Preferential Routes are tightly defined and cover only the very initial phase of flight immediately after departure (up to a specified altitude) typically about 3-4,000 ft vertically and 1.5 km either side of the route centre-line down track after departure.

Both concentration and dispersion have merits in terms of the distribution of impacts and downsides in terms of operational delivery. In the more densely utilised airspace of the south-east, there is a finite limit, both in terms of physical airspace and complexity of the operation, to the degree of dispersion that can be delivered safely. Future navigation performance capabilities will allow aircraft to fly chosen routes more accurately in most weather conditions. This increase in accuracy does permit the design of an airspace structure that has a number of routes that are flown precisely and as a consequence are closer together. The complexity issue does not permit an infinite number of routes to be selected that could lead to a natural dispersion effect through the switching on and off of routes in a systemised way – this would be neither practical nor optimal. In the south-east in particular, the existing NPR structure provides a good basis on which to design accurate and repeatable routes, contained within the lateral extent of current NPR swathes.

is the CAA recommends that the Government continues with a policy of concentration, but maximising route design to utilise the potential for modern flight navigation systems to fly an optimised lateral and vertical profile to give good climb performance and the best possible track over the ground in noise terms, commensurate with safe operation.

**5.45** What is the best way to encourage aircraft manufacturers and airlines to continue to strive to achieve further reductions in noise and air pollutant emissions (notably particulate matter and NO<sub>x</sub>) through the implementation of new technology?

Aviation is a global industry, working with a legal framework that is also established at a global level. Accordingly the UK authorities have limited levers to encourage adoption of new technologies on a unilateral basis.

The UK should, however, explore what more could be done to develop International standards, which could offer a potential mechanism to drive faster technology development and uptake. Any

international standards would need to be fair, effective and provide long-term certainty. The CAA notes that the initiatives and standards developed in the automotive car industry both in the EU and elsewhere may provide some useful lessons for thinking about potential standards that could be developed in aviation.

**5.46** What are the economic benefits of night flights? How should the economic benefits be assessed against social and environmental costs?

The provision of next-day delivery services depend on night flights in order to enable late-afternoon collection from the shipper and early-morning delivery to the consignee. Many UK businesses benefit from the ability to access international markets within such a compressed delivery window, particularly for highly time-sensitive shipments.

Cost-benefit analysis provides the best approach for assessing economic benefits and social and environmental impacts on a common basis.

**5.47** How can the night flying regime be improved to deliver better outcomes for residents living close to airports and other stakeholders, including businesses that use night flights?

It is for the Government to set the outcomes which it wishes to see achieved with regard to addressing aircraft noise disturbance impacts, including those specific to night noise.

**5.48** Should extended periods of respite from night noise be considered, even if this resulted in increased frequency of flights before or after those respite periods?

As noted in the response to 5.47 above, it is for the Government to set the outcomes which it wishes to see achieved with regard to addressing aircraft noise disturbance impacts, including those specific to night noise.

Some European airports implement curfews between 0000 and 0500 hours, but have more flights in the 0500 to 0600 period. The current scientific research does not distinguish between the time of a flight during the night period and any health impacts.