



York Aviation

DEPARTMENT FOR TRANSPORT

**RESEARCH INTO A STRATEGIC NETWORK OF GENERAL
AVIATION AERODROMES**

Final Report

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York Aviation

Originated by: Richard Kaberry / James Brass

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Reviewed by: Marshall McFadyen

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0 EXECUTIVE SUMMARY

Introduction and Context

- 0.1 York Consulting, in association with York Aviation, was appointed by the Department for Transport (DfT) in January 2018 to undertake a study concerning the identification and characteristics of a strategic network of General Aviation (GA) aerodromes.
- 0.2 Previous research highlighted an issue that was already well known within the GA community, that increasingly GA airfields were coming under pressure from housing developers and that a growing number were under threat of closure. Airfields are attractive to developers because they are often large, relatively undeveloped sites, which are located close to towns and cities, with a primary current land use that is not in itself consistently profitable. However, airfields are clearly a fundamental part of the supply chain for much of the GA sector.
- 0.3 The network of GA airfields in the UK is an important asset for the UK economy and is associated with significant economic benefits. However, the economic cost of the constraint in the UK housing market is potentially an even greater economic driver. Hence, the current dynamic of airfields being sold for housing is probably rational in many cases and will ultimately result in a net gain to society. There is, however, some reason to believe that the market for GA services in the UK does suffer from some market failures that suggest that changes to the network should always be assessed carefully. The primary purpose of this research is to improve understanding of the network and its value to enable society to make better decisions about the allocation of the resources in the economy.
- 0.4 From the outset we placed a high degree of importance on consultation and engagement with the GA community and we were assisted in this by the appointment of the Government's GA Champion, Byron Davies. Our work has involved approaching around 40 representative organisations from different parts of the GA sector and we have been successful in consulting with the majority of these. Our consultation programme has included initial direct consultations with some of the larger organisations who speak for a range of users with GA, followed up with two 'workshops' on different dates to which we invited all the representative organisations.

Policy Context

- 0.5 There is considerable Government policy support for the GA sector in the UK and a recognition of the challenges it faces. The Government's General Aviation Strategy of March 2015 sets out a vision that aims to make the UK *"the best place in the world for GA as a flourishing, wealth generating and job producing sector of the economy"*. The Strategy recognises that the sector is experiencing pressures from a number of angles, not least from the need to find sites for new housing development and provides guidance to local planning authorities such that the network of these sites is considered within Local Plans and taken into account in future planning decisions.



- 0.6 The Government's Aviation Policy Framework of 2013 requires that where there is likely to be an impact on an airfield's operations, its economic benefit and value to the overall network as well as the economic benefits of the proposed development should be considered. The Government's 2017 call for evidence on a new aviation strategy makes clear that the Government is interested in gaining a better understanding of the benefits and requirements of the GA sector, and whether it is possible to identify a strategic network or level of infrastructure to enable the sector to continue its valuable role.
- 0.7 The Government subsequently published 'Beyond the Horizon: The Future of UK Aviation - Next Steps Towards an Aviation Strategy' in which it again recognises the importance of general aviation and explicitly states that it remains committed to supporting and encouraging a dynamic GA sector. This document also recognises the concern expressed by consultees about the number of airfields that are at risk of closure.
- 0.8 The Government has recently published a revised National Planning Policy Framework, which re-enforces the importance of maintaining a national network of general aviation facilities.

Economic Benefits of GA and GA Airfields

- 0.9 The economic value of GA continues to be driven primarily by Business Aviation¹ (£1.7 billion) and particularly by users of complex aircraft, a sub-sector alone which accounts for in excess of £1 billion in economic value when aircraft operations and wider impacts are taken in to account. This balance is important when considering the strategic network. As Business Aviation is the core driver of the economic value from GA, particular care needs to be taken to ensure that its needs are reflected when considering the functioning of the airfield network and individual airfields. In terms of leisure flying, fixed wing flying (£156 million) and helicopter flying (£48 million) are the largest defined sectors. Other flying accounts for £56 million of value but this does include a significant estimate of the impact of air shows. Overall, our analysis suggests that the network of GA airfields is critical in supporting around £2.0 billion in economic value.

Defining a Strategic Network

- 0.10 Initially, we considered the issues that are associated with the concept of a 'strategic network'. Such a concept appears entirely logical and sensible, but more detailed consideration of the ways in which a strategic network might be defined in practice, raises a number of very challenging issues that have ultimately informed our approach:
- Different User Groups - in consultation with GA user groups it became clear that there is a patchwork of varying interests, each of which requires something different from a strategic network of airfields;
 - Constantly Changing Network - a further consideration that makes definition difficult, is that any network will inevitably evolve over time, not only in the sense of the changing needs of its users, but in terms of the number of airfields in use at any given time and the facilities they provide;

¹ In the context of this report the term business aviation refers to flying operations undertaken to support a business purpose. This includes the transportation of passengers but also activities such as surveying or power line checking.

- Future Needs of the Network - a network defined today is likely to be very different from the network of tomorrow. The pace of change within the GA sector is increasing very rapidly.
- Role of Commercial Airports - it will be important, wherever possible, for the GA community to be allowed continued access to commercial airports, and as such they should be seen as a potentially important element of the strategic network. However, it is inevitable that market forces will create a shifting picture in terms of which commercial airports are realistically available to GA;
- Role of Military Airfields - we recognise that there are financial pressures on the MoD to reduce the size of the defence estate, but we also recognise that all usable airfields are potentially national assets and could make a valuable contribution to a strategic network of airfields;
- The Network's Relationship with Individual Aerodromes - it is important to understand that this study is dealing with the value of the evolving strategic network as a whole, rather than setting out to label each individual site in existence today. Any assessment of an individual airfield will change over time as the network changes along with the needs of its users;
- The Competitive Environment in which Airfields Operate - airfields themselves will always change over time and it is right that they should be able to take advantage of opportunities that come about as the network and the competition around them changes. This should also improve viability and ultimately the facilities and services on offer to the GA community.

Evaluating the Network and Developing a Database

- 0.11 The development of our approach has above all been driven by pragmatism and practicality. Through this work, and indeed our previous work in the GA sector, we have developed a good understanding of GA, its sub-sectors and how it functions. We are well aware of the challenges that exist in relation to hard data and evidence in relation to what is an immensely large and diverse part of the overall aviation sector. These challenges are not just about what is or is not available but also about what is consistently available across all of the GA sector.
- 0.12 Our approach is ultimately reliant on what we know about GA airfields or what can reasonably be found out on a consistent basis. A major focus for this work has been gathering data on airfields and GA flying to enable us to understand what we have to work with. Stakeholders from the GA community have been invaluable in this process and we have been able to access and consider a wide range of data sources.
- 0.13 At the outset it is important to be clear that in our view there are two separate issues to be evaluated:
- **assessing the performance of the network as a whole** in terms of its ability to provide the UK population with access to the different GA sub-sectors and hence the benefits GA can bring. In our view this is in many ways the more pertinent question in terms of understanding from a strategic perspective what the impact of any changes to the network might be. Our approach to considering this question and the results of our analysis are presented below;



- **assessing the value of any individual airfield to the network** relating to each GA sub-sector and GA as a whole. This gives some idea of the potential damage to the network if an airfield becomes inactive relative to other airfields but it does not actually ultimately provide guidance on whether the overall performance of the network is affected. Again, our approach is described below.

Assessing the Performance of the Network as a Whole

0.14 We identified two key themes for considering effectiveness:

- the accessibility that the network provides both in terms of individuals being able to access facilities to enable them to undertake or use GA activities and in terms of providing connectivity for travel between different points in the UK;
- the capability of the network in terms of airfields' ability to support a particular GA activity.

0.15 Our approach to assessing the performance of the GA networks in the UK is consistent with these principles. For each sub-sector of GA identified, it considers the proportion of the UK population that is within 35 miles² of an active runway or specialist site that is capable of servicing a significant proportion³ of the aircraft that use that sector.

0.16 Whether or not an airfield is suitable for use by a given GA sub-sector is based on the capability of the longest runway at the site. To determine what GA sub-sectors require, we have analysed the preferences of aircraft in the relevant GA sub-sector in terms of the longest runway at the airfield where they are believed to be based. The key point to note is that different user groups have quite different preferences in terms of the runway lengths they use. In addition to runway length in determining capability, we have also considered runway surface. This analysis identified that, with the exception of Business Aviation Complex Aircraft, users are largely agnostic to hard or soft runways.

0.17 In general, the GA airfield network as it stands now provides excellent coverage of the UK population for most of the GA sub-sectors, with in excess of 95% of the population within 35 miles of a relevant airfield in all but one case. The exception is hang-gliding and parascending, which in many ways should probably be thought of rather differently. In terms of regional coverage, there appears to be some 'bias' towards the south of the UK but in general most regions are well covered for most sectors.

0.18 These results suggest that the current GA network is well placed to serve the UK population in 2030, with coverage for some GA sub-sectors actually increasing. Given this overall pattern it is perhaps unsurprising that coverage at regional levels also remains very strong in most cases. Overall looking forward, therefore, it would not appear that there should be concerns around the network's ability to deal with population change as it stands now.

² Based on an analysis of UK airport access times from LSOAs around the UK, we have identified that 35 miles is typically how far can be travelled in an hour. An hour was identified as a typical reasonable access time for GA users based on our consultations and comments at the workshops.

³ Usually between 80% and 90% of all aircraft.

0.19 We believe that examining the performance of the network as a whole in this way helps to provide a strategic view of its functioning. Moving forward, a starting point for anyone considering the impact of a change on the UK's strategic network of airfields should be to examine the effect in this way. If the change in question results in a significant reduction in network performance then there must be concerns as to whether this will affect the overall ability of the network to support the economic value that GA brings to the UK economy.

Assessing the Value of Individual Airfields to the Network

0.20 Our quantitative assessment of the contribution made by individual airfields to the network follows an essentially three stage approach to considering each airfield as it stands now.

0.21 The assessment of each airfield starts with a gate criterion. This gate criteria is designed to assess whether the airfield is likely to be suitable for use by the given GA sub-sector. This is determined in the same way as assessing whether an airfield is capable of handling the relevant GA sub-sector in our approach to considering the performance of the network as a whole. In other words, the airfield must offer a suitable runway in terms of length and surface or it must be identified as a specialist site either by Pooley's or a representative organisation. If this gate criteria is met then the airfield moves on the scoring process.

0.22 The process then moves on to score the facilities that are available at a given airfield. As we have described above, the data on facilities that is available is in reality fairly limited but we have been able to select a number facilities that are generally important to most forms of GA flying and for which we have been able to identify information from Pooley's or other sources. The features that are scored are as follows:

- whether or not relevant training is available at the airfield;
- whether there is maintenance available on site;
- whether there is fuel available on site;
- whether customs services are available or can be arranged;
- the type of ATC in operation, i.e. tower, information, radio or safetycom.

0.23 Clearly, different GA sub-sectors will value these features differently, just as runway requirements are different for different users. We have therefore again used a combination of G-INFO, Aerodata, Pooley's and the airfields database to analyse how important these features appear to be to different user groups. In addition to these scores for airfield features, we have also included an additional score for airfields that are identified as specialist sites, either within Pooley's or from other sources.

0.24 The total unweighted score for any airfield is the total of the feature score that it achieves for the relevant GA sub-sector. This provides a basic assessment of the value of an airfield to the network. However, it does not take account of two key elements:

- the population coverage of the airfield;
- competition.



0.25 For this reason the basic unweighted score for each airfield for each GA sub-sector is then multiplied by the number of people that live within 35 miles of the airfield divided by the number of airfields within 35 miles that pass the gate criteria for the relevant GA sub-sector. This gives the weighted score for each airfield for each sub-sector. Finally, a total score for each airfield across all GA sub-sectors is calculated by taking the individual weighted scores for each sub-sector and weighting these by the economic contribution of each GA sub-sector to the UK economy. The sum of these outputs is the total score for the airfield. These final weighted scores provide an assessment of the value of each identified airfield to the network for each GA sub-sector and for the network as a whole.

The Importance of Qualitative Criteria

0.26 Ultimately, some element of judgement may also be required in determining the value of an individual airfield compared with an alternative use. In addition to the quantifiable criteria we have set out, there are a number of non-quantifiable criteria that should be borne in mind when evaluating any particular airfield:

- Viability - Financial viability is a critical issue for many smaller GA airfields and has in some cases contributed to the pressure on owners to consider alternative uses;
- Hangarage - the ability of aircraft owners to hangar their aircraft can be an important consideration for users in terms of the value they may ascribe to using a particular airfield;
- Specialised Engineering - some users will require specialised maintenance from time to time, perhaps relating to a particular type of aircraft or to some particular aspect of the aircraft, such as avionics or navigation/radio communications;
- Emergency Services Use - the extent to which an airfield is used by the emergency services should be taken into consideration;
- Heritage Value - there are a number of airfields around the UK that either have some heritage value in their own right, or else provide special facilities for heritage aircraft and their operations and maintenance;
- Community Engagement and Education - many GA airfields have close ties with their local communities and proactively promote interaction with them. These ties can take numerous forms from simply 'watching the planes' on a sunny afternoon from a café or viewing area, to links with local educational and training establishments and hosting of corporate events;
- Environment - airfields by their nature tend to be large open spaces, often in Green Belt, which can provide local visual amenity and a number of environmental and wildlife benefits in terms of habitat or greenspace;
- Surface Access - the extent to which an airfield might be providing alternative means of access to areas of the country where surface access connections are limited may also be a consideration;
- Non-Aviation Activities - many airfields have associated land and property or even business parks which serve non-aviation related businesses, as well as aviation related and supply chain businesses. The implications for such businesses, if alternative uses for the airfield site are being considered, should be taken into account.

Maintaining a Database in the Future

- 0.27 Maintaining the databases moving forward represents a considerable challenge. In our view there are two possible ways forward that should be explored further. The first is to engage with SkyDemon and Pooley's around whether they might be able to take on the upkeep of the database. The second is to examine the potential for a more distributed ownership model, using a central data controller with the GA community actually involved in enhancing and updating the database.



1 INTRODUCTION

- 1.1 York Consulting, in association with York Aviation, was appointed by the Department for Transport (DfT) in January 2018 to undertake a study concerning the identification and characteristics of a strategic network of General Aviation (GA) aerodromes.
- 1.2 In recent years, the UK Government has taken a considerable interest in General Aviation and has recognised the important role that the sector plays in the UK economy, as evidenced by the publication of the Government's General Aviation Strategy in 2015, which set out to make the UK *"the best place in the world for GA as a flourishing, wealth generating and job producing sector of the economy"*⁴. This strategy was accompanied by a detailed assessment of the economic value of the GA sector undertaken by York Aviation, which estimated its impact to be around £3 billion each year⁵. However, this wide ranging study did not just consider the economic value of the sector; it also sought to examine the nature of the sector, the level of activity, its key linkages and, importantly, some of the issues that GA faces moving forward. It was through this research that the original concept of a strategic network of GA airfields was identified.
- 1.3 This previous research highlighted an issue that was already well known within the GA community, that increasingly GA airfields were coming under pressure from housing developers and that a growing number were under threat of closure. Airfields are attractive to developers because they are often large, relatively undeveloped sites, which are located close to towns and cities, with a primary current land use that is not in itself consistently profitable. However, airfields are clearly a fundamental part of the supply chain for much of the GA sector (although not all of the sector as not all activities require a runway) and, as a consequence, the economic value that GA can generate for the UK economy is heavily correlated with the existence of a network of airfields that enable the wide range of activities that constitute GA to be undertaken. The term 'strategic network' essentially refers to a group of airfields that will enable GA to continue to support the economic value it does now, and sustain expected growth in the future. In concept the definition of such a network sounds relatively simple but in reality the issue is extremely complex. This complexity comes from a range of factors:
- the size and diversity of the GA sector;
 - the availability of data on GA and GA airfields;
 - the poor functioning of the GA airfield market;
 - the fact that this is ultimately about a network and not individual airfields.

⁴ General Aviation Strategy – Department for Transport (2015). Page 8.

⁵ The Economic Impact of General Aviation in the UK – York Aviation (2015).

- 1.4 This position sets both the context for this work and also helps to articulate its overall purpose. The need for more houses in the UK is well known⁶ and this dynamic has not changed since 2015. Airfields continue to come under pressure from housing development and it is probably reasonable to suggest that this pressure is increasing. However, at the same time, very little is really known about the airfields that GA uses in the UK and how they contribute to the network that supports GA activity. The fundamental aim of this report is to help to address this information gap. It needs to examine what is in the UK airfield network, to understand its characteristics and the needs of its users, to analyse its functioning and to provide tools to Government to enable it better to assess the value of the network and the contribution of individual airfields to that whole.

The Scope of this Work

- 1.5 Formally, the main requirements of the study are to answer the following research questions:
- summarise and split between private and the various types of commercial users, the main socio-economic benefits to the UK economy and the UK public, from having a strategic network of aerodromes in relation to GA;
 - following the above, identify a series of evaluation criteria that could be used to assess the current and future strategic importance of a UK aerodrome in relation to the various types of GA;
 - apply these criteria so as to create a UK wide database from which a network can be generated, and to recommend what the optimal UK strategic network would be and recommend how and by whom the network can be reviewed and kept up to date in line with changes in aerodrome use and capacity in future years.
- 1.6 This report addresses all of these questions and needs to be viewed alongside the database of airfields that is the fundamental output from our work. This report describes the thinking that has informed our work, what we have done and the methodology behind it. The results, in terms of the application of our evaluation criteria, are contained within the database. At this point it is also important to be clear about what this report and the accompanying database do not do. They do not provide a list of airfields that are within a strategic network. In our view, developing such a list is impractical and largely impossible. It would involve making arbitrary decisions about the relative value of different competing airfields, where there is simply no strong enough basis for such a decision and where there is in reality little value to the decision, as ultimately Government has very limited control over the future of any given airfield. We discuss the issues around this later in the report.

⁶ <http://researchbriefings.files.parliament.uk/documents/CBP-7671/CBP-7671.pdf>



What is General Aviation?

1.7 GA is an integral part of the UK aviation sector: more than 95% of all aircraft on the UK register are engaged in GA activity. Throughout this study we use the commonly agreed definition of general aviation, which encompasses all private flying, together with all commercial flying that is neither military aviation nor scheduled commercial air transport. This definition is consistent with that used by Government. This definition by exclusion rather than inclusion helps to demonstrate the breadth and diversity of the sector. By way of example, we have listed below some of the flying activities that fall under the definition of GA⁷:

- business jets;
- pleasure flying of light aircraft and helicopters;
- gliding;
- microlights;
- hot air balloons;
- parachuting;
- model aircraft flying;
- hang gliding;
- emergency service flying activities.

Our Approach

1.8 GA is a complex sector, with a wide range of disparate needs and interests. It is also a sector of the aviation market on which there is very limited data. Our approach has therefore evolved over the progress of the work and has focussed heavily on identifying then tying together different sources of information to create a more informed picture of the whole. We discuss individual data sources and their use in more detail below.

1.9 From the outset we placed a high degree of importance on consultation and engagement with the GA community and we were assisted in this by the appointment of the Government's GA Champion, Byron Davies. Our work has involved approaching around 40 representative organisations from different parts of the GA sector and we have been successful in consulting with the majority of these. Our consultation programme has included initial direct consultations with some of the larger organisations who speak for a range of users with GA, followed up with two 'workshops' on different dates to which we invited all the representative organisations. Follow up consultations have also been undertaken with a number of organisations that were not able to attend the workshops or that were identified subsequently. We are grateful to all those who have been consulted as part of this work, for their time and expertise. However, it should be said that what is expressed in this report is the view of York Aviation. It is not intended to reflect any particular set of views expressed to us during this work.

1.10 A full list of the representative organisations we approached is included at Appendix A.

⁷ This list is not exhaustive and is only intended to illustrate the breadth of activity.

Structure of this Report

1.11 We have organised the remainder of this report into the following sections:

- in **Section 2** we consider further why defining a strategic network in some form is important and particularly the market context at present;
- in **Section 3** we examine the policy context in which GA is operating in the UK;
- in **Section 4** we set out our updated estimates of the economic impact of GA flying in the UK and consider the elements of this impact that are supported by the network of airfields;
- in **Section 5** we set out the key issues that we have identified through this research around defining a strategic network of GA airfields;
- in **Section 6** we detail our methodology for evaluating airfields and the network as a whole, both now and in the future, and introduce the airfield database;
- in **Section 7** we consider the options for maintaining and enhancing the database over the longer term;
- in **Section 8** we outline some of the related issues for GA that have been brought up during our work but that are not directly related to our research;
- in **Section 9** we present our conclusions.

2 WHY IS DEFINING A STRATEGIC NETWORK IMPORTANT?

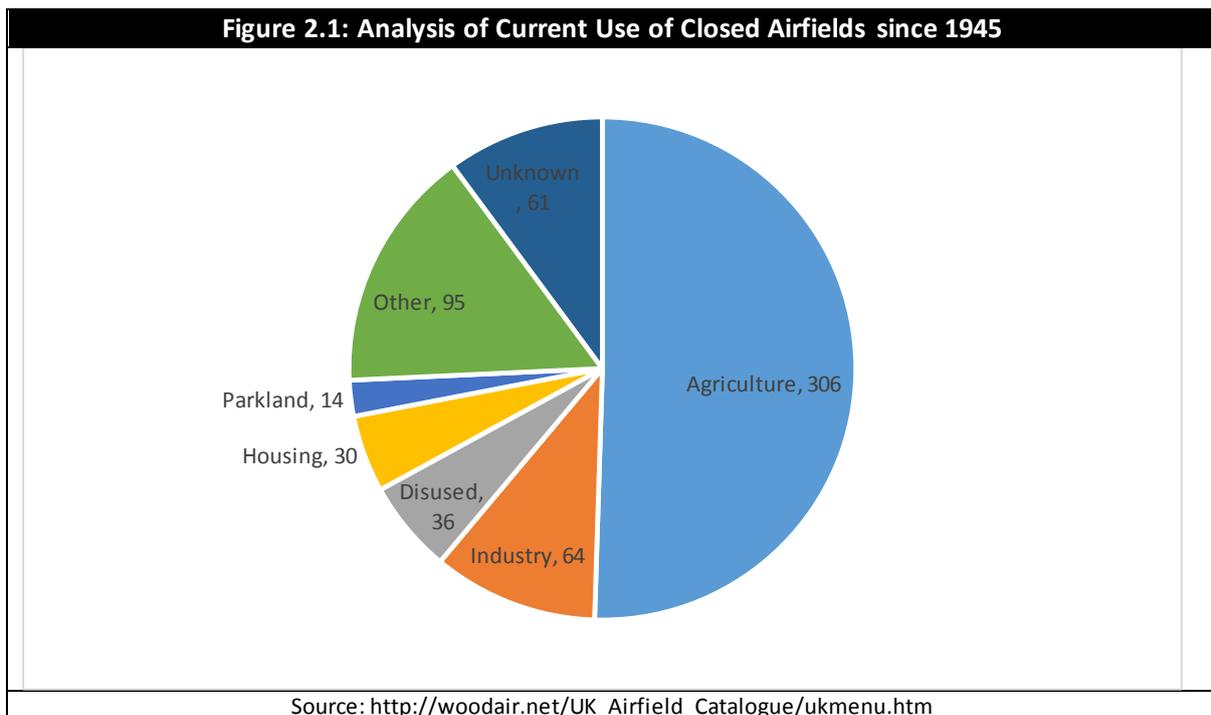
Introduction

2.1 In this section, we examine the context behind this research in more detail and consider whether, ultimately, defining some form of strategic network to aid Government in enacting protections for the network is important.

What is Happening Now?

2.2 As we have described above, the network of airfields that is used by GA across the UK is declining. Some airfields are simply closing while others are being given over to alternative uses. In truth, it is very difficult to know the scale of the issue. One of the key challenges in undertaking this work has been the paucity of data regarding GA airfields in the UK, including the answers to the fundamental questions of how many there are and where they are. There is no single database or list of GA airfields that is comprehensive and while a number of organisations hold lists and there is clearly significant overlap between these lists, it is clear that none are complete. This means that airfields may leave the network and the majority of users will never know. However, the loss of a number of airfields in recent years, such as Panshanger, Plymouth and Manston, demonstrates that the issue is real.

2.3 Research undertaken by Johnathan Woodside into UK GA and Military airfields presents a picture of the decline in airfield numbers since the end of World War 2. His analysis suggests that around 450 airfields have been lost since 1945⁸. **Figure 2.1** provides a broad breakdown of what has happened to these airfields since their closure according to Woodside.



⁸ Source: http://woodair.net/UK_Airfield_Catalogue/ukmenu.htm. This research was originally completed in 2011.

- 2.4 Around half of the airfields that have closed since 1945 are now used for agriculture. This is by far the largest number, followed by airfields that are now industrial sites. Housing only accounts for around 30 of the airfields in the list. However, it should be recognised that it may simply be that pressure from housing development is a more recent factor.
- 2.5 The General Aviation Awareness Council (GAAC) maintains a list of airfields that are felt to be currently at risk of closure⁹. The latest version updated in September 2018 includes 23 airfields. Of these 23, a potential change of use to housing (or at least partial housing) is the source of the threat for 19 of them.
- 2.6 This evidence would seem to demonstrate that the threat to GA airfields and, by extension, the network is real and that the primary source of the threat is housing. Before moving on to consider whether this trend matters, it is important to consider briefly why airfields are vulnerable in this way to housing development. This is basically a question of economics. Land in much of the UK (and particularly in the Greater South East of England where many airfields are located) is a scarce resource. This means that different uses for land are competing. It is not always possible to accommodate the needs of all.
- 2.7 At present, there is a well recognised need for additional housing in the country, particularly around major towns and cities. The current undersupply means that the land values associated with housing uses is very high. At the same time, airfield operators in the GA sector in many cases struggle to make a commercially viable return from airfield operations. This means that the returns to owners from the land taken up by airfields is often very low. Unsurprisingly, many landowners are, therefore, seeking to extract greater returns from their land assets by switching uses. It should be recognised that this is an entirely rational action and consistent with the operation of a market economy.
- 2.8 There is also another dynamic occurring in the GA sector that is exacerbating the issue. Historically, many airfields in the UK have been owned and operated by individuals with a passion for General Aviation and their primary interest has not been achieving a viable financial return. In economics terms, they have been extracting a non-monetary return from the operation of their airfield that has made up for the lack of a financial return. However, this group is aging and diminishing. Their assets are often being inherited by successors who do not have the same passion for GA and hence they are not able to extract the same non-monetary value and they are finding that the financial returns are insufficient and other land use options for their airfield sites are therefore very attractive. Again, it should be recognised that these decisions are perfectly rational and reasonable.
- 2.9 These processes articulate why GA airfields are under pressure, but what actually needs to be considered is whether this is actually important and detrimental to society.

⁹ <http://www.gaac.org.uk/wordpress/threatened-aerodromes-update-5-3-2018/>



Does What is Happening Matter?

- 2.10 The loss of GA airfields is an important issue for the GA community and certainly does detrimentally impact on users but it does need to be viewed from the perspective of the needs of society as a whole. In this broader context, the answer to the question ‘does what is happening matter’ becomes much more complex and the answer is both yes and no. Ultimately, it comes down to the relative value of different uses of resources to the economy and whether the mechanism by which the economy allocates resources, price, is effectively reflecting the true costs and benefits associated with each use.
- 2.11 Additional housing is required in this country and the economic costs to the UK of a constricted housing market are significant. As a result, society is placing a high value on existing homes and on suitable land which can be used to develop new homes. Actors in the market are therefore seeing an opportunity to secure a greater return from their assets, the land on which their airfields are based, by selling the land for housing or seeking to develop housing themselves. This is perfectly rational behaviour and, in many cases, may well be the right outcome for society as a whole. In such circumstances, what we are seeing is simply the working of a market economy and there is no basis for market intervention by the Government. Ultimately, the market will deliver a balance between housing and GA airfields, which offers the most efficient allocation of resources and hence the greatest value to society.
- 2.12 However, GA in its many forms is a significant contributor to the UK economy in its own right. York Aviation’s previous study estimated the impact at £3 billion per annum. To the extent that these benefits are ultimately captured via the price that is paid by users to access GA services, then the market should be able to allocate resources effectively and the right balance between the availability of airfields and the need for housing should be struck, as described above. However, the assumption that price reflects value is critical here. If it does not, there are potentially areas of market failure in relation to the pricing of GA that mean the benefits it offers to society are not fully reflected in the price paid and hence airfield owners are not able to fully capture the benefits of GA to society in the returns they can achieve. This might ultimately lead to airfields closing that shouldn’t in some cases.
- 2.13 In our view there are a number of potential sources of market failure in relation to the network of GA airfields:
- Data Asymmetry – GA is a poorly understood market place with very limited data on key aspects of its functioning, not least in relation to the availability or otherwise of data on airfields, their operations and capabilities. This may make pricing and choice by users haphazard and not reflective of value;
 - Network Effects – part of the value of GA relates to its ability to connect places via the network of airfields. It seems reasonable to suggest that the value of the options offered by this network is not fully reflected in the price that is paid for any given activity;
 - Public Goods – the broader societal role GA airfields play in supporting emergency services activities and similar are unlikely to be reflected in price;
 - Wider Benefits – the wider benefits of GA flying, such as health effects, the links to the STEM educational agenda, its role as a pathway for those seeking to work in commercial flying and the wider social role airfields can play within communities, are ultimately unlikely to be fully reflected in the price paid for GA services;

- Temporal Effects – airfields in particular are infrastructure intensive long-term assets. The pricing of access to these assets now may or may not reflect a future value in an evolving and highly diverse market.

- 2.14 It should be recognised that while these potential market failures do exist, the extent to which they are resulting in a misallocation of resources currently is probably limited. There is probably an over-supply of airfields, particularly in some parts of the country, and the pressure for housing development in many cases is probably legitimate and a reflection of a well-functioning market. However, the existence of these potential market failures does mean that any potential changes to the market should be examined carefully in terms of the costs and benefits associated with them. It should also be recognised that over time as the balance between supply and demand becomes more even, the potential for false steps in market allocation will become greater.
- 2.15 This position further articulates the context for this work and highlights the question as to what we are trying to achieve via this research.

What Are We Trying to Achieve Here?

- 2.16 In the context of a market that may not always be correctly valuing GA airfields, this research is trying to:
- better understand what is in the network now, how it is used, and how it could be used;
 - examine how the network is distributed spatially and how it provides accessibility, both in terms of access to GA flying for the population and in terms of providing connectivity;
 - consider the extent of competition;
 - consider how changes in supply (the number airfields) might affect the ability of the network to deliver services to the UK population (and indeed overseas users accessing UK GA services) and hence its ability to support economic and social value;
 - analyse whether changes in the GA sector over time will impact on what the network needs to provide.
- 2.17 Fundamentally, what we are trying to do is improve the ability of society to make decisions about the value of GA airfields in the context of the functioning of a broader network by improving the understanding of the network and its functioning. This will ultimately lead to an approach to considering the value of any given airfield in the context of the network and the performance of the network as a whole in meeting the needs of GA users.
- 2.18 At this point, it would be appropriate to highlight a number of further issues that are relevant to the approach that we have taken, what we have sought to achieve, and to how the findings of this work should be viewed:



- the GA sector will change over time, as will its needs. Some parts of the GA sector will grow, others will not. Those that grow will do so at different rates. Emerging segments of the GA sector, for instance drones or SETOPS¹⁰, could grow very rapidly and change the focus of the sector completely. The ability to predict this change is limited. As we have described above, data availability in relation to the GA sector is poor. In this context, it is not even possible to accurately establish current baseline levels of activity for most GA segments. Making a quantitative assessment of future growth is therefore impossible. We have made a qualitative assessment of some key potential changes in the sector and discussed the implications of these for the network but there are clearly significant risks to any analysis of this type;
- the airfield network will change over time, with airfields dropping out and potentially new sites coming in (although we accept that this is relatively unlikely), and hence understanding the network and the extent of risk associated with any individual threat is constantly changing. The database as it stands and our assessment of the performance of the network as a whole is therefore only a snapshot at a point in time. As a result, defining the strategic network in terms of particular airfields is difficult and considerable care should be taken in how any list derived from this work is used. The results could potentially change at any time;
- Government has very limited control over the decisions made by individual owners around what they do with their land. Property rights are a fundamental tenet of our society and undermining these by seeking to 'force' airfields to remain open in some way would have significant implications for land and asset values across the whole of the UK economy. This means that our assessment of any given airfield or the performance of the network as a whole can only ever provide information on value as an input to a broader process examining the relative merits of different uses for a site. It can never be a list of airfields that must remain open as there is no mechanism for ensuring that they do;
- airfields themselves will change and should take advantage of opportunities that come about as the network and the competition around them changes. This should improve viability and ultimately the facilities and services on offer to the GA community. A stagnant market, with no competitive threats (including from other uses), is not a healthy market. However, this change will in itself affect any assessment of the value of an airfield to the network and potentially the performance of the network as a whole. This again highlights that any assessment is only ever a snapshot.

Conclusions

- 2.19 The network of GA airfields in the UK is an important asset for the UK economy and is associated with significant economic benefits. However, the economic cost of the constraint in the UK housing market is potentially an even greater economic driver. Hence, the current dynamic of airfields being sold for housing is probably rational in many cases and will ultimately result in a net gain to society. There is, however, some reason to believe that the market for GA services in the UK does suffer from some market failures that suggest that changes to the network should always be assessed carefully.

¹⁰ Single Engine Turbine Operations.

2.20 The primary purpose of this research is to improve understanding of the network and its value to enable society to make better decisions about the allocation of the resources in the economy.



3 BACKGROUND AND POLICY CONTEXT

Introduction

- 3.1 In this section, we consider current and emerging Government policy as it affects the GA sector, and its relevance to this current study.

The Government's General Aviation Strategy (2015)

- 3.2 The Government published a General Aviation Strategy in March 2015, the first time such a specific government strategy relating to the General Aviation (GA) sector had been published. The Strategy sets out the Government's vision for GA in the UK being:

*"the best place in the world for GA as a flourishing, wealth generating and job producing sector of the economy".*¹¹

- 3.3 Economic research into GA commissioned by the Government in support of the Strategy that was undertaken by York Aviation estimated that the total economic impact of GA on the UK economy is around £3 billion of Gross Value Added with more than 38,000 jobs supported.

- 3.4 The Strategy addresses a wide range of issues relating to GA and makes a number of commitments, but it also recognises that the sector is experiencing pressures from a number of angles, not least from the need to find sites for new housing development, noting that:

*"Airfields may often be located on substantial areas of land that may not be particularly profitable to operate and the owners may well see them as good development opportunities for the construction of new houses. Of course, it is for the owner of land to decide what to do with their property, within the law."*¹²

- 3.5 The Strategy goes on to note that the Government has issued planning guidance about aerodromes to planning authorities, with reference to the National Planning Policy Framework, so that the network of these sites is considered within Local Plans and taken into account in future planning decisions. This planning guidance states that:

*"Aviation makes a significant contribution to economic growth across the country, including in relation to small and medium sized airports and airfields (aerodromes). An aerodrome will form part of a larger network. Local planning authorities should have regard to the extent to which an aerodrome contributes to connectivity outside the authority's own boundaries, working together with other authorities and Local Enterprise Partnerships as required by the National Planning Policy Framework. As well as the National Planning Policy Framework, local planning authorities should have regard to the Aviation Policy Framework, which sets out Government policy to allow aviation to continue making a significant contribution."*¹³

- 3.6 The current study addresses in more detail the approach to defining a GA network.

¹¹ General Aviation Strategy, page 8, March 2015

¹² Ibid, page 30

¹³ <https://www.gov.uk/guidance/transport-evidence-bases-in-plan-making-and-decision-taking>

Wider Government Aviation Policy

- 3.7 The Government's Aviation Policy Framework (APF) was published in March 2013 and specifically notes the role of general and business aviation in supporting economic growth. It also refers to the value of a viable network of business and general aviation aerodromes across the UK. In relation to planning applications, the APF notes that:

*"Where a planning application is made that is likely to have an impact on an existing aerodrome's operations, the economic benefit of the aerodrome and its value to the overall aerodrome network as well as the economic benefits of the development will be considered as part of the application process. However, these benefits will be balanced against all other considerations."*¹⁴

- 3.8 The Government is now working on a new Aviation Strategy that will set out the Government's vision for the long-term direction of aviation policy to 2050 and beyond. This will eventually replace the 2013 APF. A consultation document and call for evidence in relation to the 'Future of Aviation' was published in July 2017 which re-iterates the importance of the GA sector and that:

*"There are specific issues that the government is keen to better understand. These include: the decline in the numbers of leisure pilots and aircraft; the tensions between the needs of scheduled and non-scheduled aviation regarding access to airspace and airport infrastructure; and the closure of some smaller airports, airfields and airstrips. The government is interested in gaining a better understanding of the benefits and requirements of the sector, and whether it is possible to identify a strategic network or level of infrastructure to enable the sector to continue its valuable role."*¹⁵

- 3.9 This study will contribute to identifying the characteristics of the strategic network referred to in the consultation.
- 3.10 In April 2018 the Government published 'Beyond the Horizon: The Future of UK Aviation - Next Steps Towards an Aviation Strategy'. This document outlines six key objectives for the new Aviation Strategy:

- helping the aviation industry work for its customers;
- ensuring a safe and secure way to travel;
- building a global and connected Britain;
- encouraging competitive markets;
- supporting growth while tackling environmental impacts; and,
- developing innovation, technology and skills.

- 3.11 The Government has stated its intention to hold a further consultation on the policy detail for these objectives later in 2018, leading to the publication of the new Aviation Strategy in 2019.

¹⁴ Aviation Policy Framework, March 2013, paragraph 1.91

¹⁵ Beyond the Horizon: The Future of Aviation in the UK, July 2017, paragraph 6.17



- 3.12 The GA sector is recognised in this document as an important component of the wider UK aviation sector rather than a separate consideration. The Government explicitly states that it remains committed to supporting and encouraging a dynamic GA sector.”¹⁶
- 3.13 The ways in which the Government intends to support the general aviation sector is addressed in more detail under the objective of ‘encouraging competitive markets’. In this section of the document the Government recognises the economic benefits of the GA sector and its contribution to skills development, the importance of smaller airfields and the concerns about the number that are at risk of closure, and the importance of ensuring a long term strategic vision for the GA sector that helps it to realise its full economic potential.

“The GA sector benefits the UK economy in multiple ways. It provides direct economic benefits, for instance through generating employment at regional airports and business links, and also skills benefits.

GA can be defined as private or commercial aviation that is neither military aviation nor scheduled commercial air transport. It covers a diverse sector, including business jets, fast parcels, aerial work, such as flight displays, aerial photography, air sea rescue, police and ambulances, flight training, and leisure activities, such as recreational light aircraft flying, gliding, microlights, parachuting, and hot air balloons. Ensuring that smaller airfields are able to thrive is an important issue for the GA sector.

The government believes that it is important to ensure a long term strategic vision for the GA sector that helps it to realise its full economic potential. In 2015, the government published the world’s first GA specific strategy with a vision of making the UK the best country in the world for GA. The new Aviation Strategy will complement, and update where necessary, the 2015 GA strategy.”

Respondents to the call for evidence from the GA sector highlighted the important role that it plays in providing an effective network of airfields and the training of pilots. An issue of particular concern was the number of airfields that are at risk of closure due to the attractiveness of some sites for developments such as housing. Respondents also highlighted the role of GA in developing important aviation skills, including pilot training and engineering.”¹⁷

The National Planning Policy Framework

- 3.14 The revised National Planning Policy Framework (NPPF) was published on 24 July 2018 and sets out the government’s planning policies for England and how these are expected to be applied. This revised Framework replaces the previous National Planning Policy Framework published in March 2012.
- 3.15 In Chapter 9 (Promoting Sustainable Transport) of the new NPPF, paragraph 104 (f) states that planning policies should:

¹⁶ Next Steps Towards an Aviation Strategy, April 2018, paragraph 3.11

¹⁷ Ibid, paragraphs 5.36 to 5.39

“recognise the importance of maintaining a national network of general aviation airfields, and their need to adapt and change over time – taking into account their economic value in serving business, leisure, training and emergency service needs, and the Government’s General Aviation Strategy.”

Conclusion

- 3.16 It is clear from the above that there is considerable Government policy support for the GA sector in the UK and a recognition of the challenges it faces.
- 3.17 The Government’s General Aviation Strategy of March 2015 sets out a vision that aims to make the UK *“the best place in the world for GA as a flourishing, wealth generating and job producing sector of the economy”*. The Strategy recognises that the sector is experiencing pressures from a number of angles, not least from the need to find sites for new housing development and provides guidance to local planning authorities such that the network of these sites is considered within Local Plans and taken into account in future planning decisions.
- 3.18 The Government’s Aviation Policy Framework of 2013 requires that where there is likely to be an impact on an airfield’s operations, its economic benefit and value to the overall network as well as the economic benefits of the proposed development should be considered. The Government’s 2017 call for evidence on a new aviation strategy makes clear that the Government is interested in gaining a better understanding of the benefits and requirements of the GA sector, and whether it is possible to identify a strategic network or level of infrastructure to enable the sector to continue its valuable role. This current report addresses this issue.
- 3.19 The Government subsequently published ‘Beyond the Horizon: The Future of UK Aviation - Next Steps Towards an Aviation Strategy’ in which it again recognises the importance of general aviation and explicitly states that it remains committed to supporting and encouraging a dynamic GA sector. This document also recognises the concern expressed by consultees about the number of airfields that are at risk of closure.
- 3.20 The Government has recently published a revised National Planning Policy Framework, which re-enforces the importance of maintaining a national network of general aviation facilities.



4 SUMMARY OF ECONOMIC BENEFITS OF GA AIRFIELDS

Introduction

4.1 In this section, we present our updated estimates of the economic impact of the GA sector in the UK. This, by extension, provides a view of the economic value of GA airfields to the UK economy given they are an essential part of GA flying. This analysis builds substantially on York Aviation's previous work on the economic value of GA to the UK economy for the Department for Transport, which was published in 2015¹⁸.

The Previous GA Study

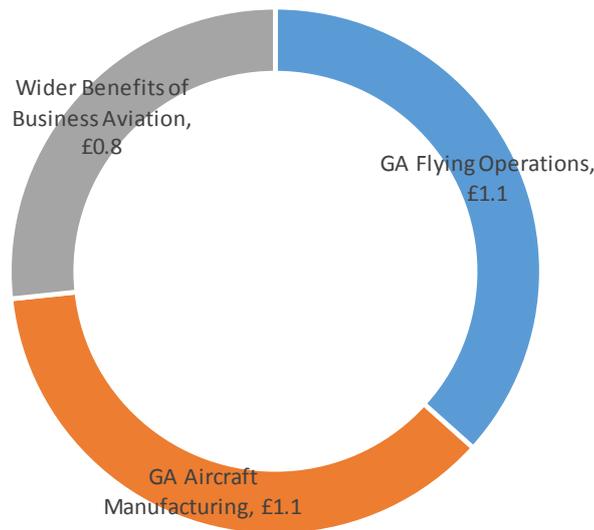
4.2 York Aviation's research into the economic value of GA in the UK economy was a comprehensive and detailed review of the state of GA. It was undertaken to support the development of the Government's GA Strategy (see above) that published later in 2015.

4.3 The study sought to:

- identify, as a baseline, the contribution the GA sector makes to the UK economy. This included considering the impact in different regions of the UK, the impact of different GA sub-sectors and the wider impacts of business aviation in the economy;
- evaluate the wider socio-economic benefits of GA in qualitative terms;
- identify opportunities, including policy interventions, to grow the sector's contribution to the UK economy;
- consider constraints that might be holding back the sector in terms of its ability to maximise its economic impact; and,
- recommend measures against which the health of the GA sector could be monitored in future.

4.4 The research identified that in 2015, GA supported around £3.0 billion in the UK economy, split broadly evenly between GA flying operations, the wider impacts of business aviation and the manufacture of GA aircraft (see **Figure 4.1**). It further identified that the core driver of GA's economic impact was business aviation activities. Around £0.6 billion of the impact from flying operations came from business aviation aircraft, all of the wider economic impacts identified (£0.8 billion) and the manufacture of business jets and associated parts make up the majority of impact from GA manufacturing.

¹⁸ The Economic Impact of General Aviation in the UK – York Aviation (2015).

Figure 4.1: The Economic Impact of GA in the UK in 2015 (£ billion)

Source: York Aviation.

- 4.5 The study also identified significant wider economic impacts arise from the use of GA aircraft for business purposes such as air taxis and the additional connectivity this offers over either commercial air transport or surface transport modes. Business aviation in particular offers major benefits to users in facilitating inward investment or supporting export markets. This can take the form of corporately owned aircraft, fractional ownership, chartered air taxis, or the use of private aircraft for business purposes.
- 4.6 Quantifying this wider economic value, in terms of the long run impact on inward investment, trade and productivity, is extremely difficult given the lack of data. However, the study identified an illustrative impact based on a series of assumptions of around £815 million on UK GDP. This is included within the overall impact figures quoted above but should be viewed with caution.
- 4.7 There could also be benefits that arise from GA flying in terms of enhancing quality of life and the physical and mental wellbeing of participants as they pursue their GA flying activity. The sporting activities undertaken by some sub-sectors of GA flying also form part of the wider socio-economic benefits of sporting activity generally. However, these impacts cannot sensibly be quantified.
- 4.8 The use of GA by the emergency services such as the Police and Air Ambulance also contributes important benefits to society. The relevant part here is the elements relating to GA flying and wider economic benefits.

4.9 In terms of considering the economic impacts supported by the UK's network of GA airfields, it is reasonable to assume that airfields are directly essential to supporting GA flying operations and also the ability of business aviation to deliver wider benefits. This would suggest that around £1.9 billion of the £3.0 billion impact of GA in 2015 relied to a significant degree on the UK's network of GA airfields. We would also highlight that many of the wider socio-economic effects cited are also reliant on flying operations and hence are ultimately reliant on a network of airfields to support those operations. Below, we set out in overview the methodology used previously and how impacts have been updated to current levels.

Overview of the Previous Methodology for Estimating the Impact of GA Flying

4.10 Full details of the methodology used to calculate the economic impact of GA in 2015 are set out in Appendix B to that report. However, as the updated estimates of the economic impact associated with the network of GA airfields set out here are based on the 2015 baseline figures, we have set out an overview of the original methodology here.

4.11 The 2015 economic impact research used a methodology that was designed to work around the significant data gaps and issues that exist in the GA sector. It recognised that conventional economic impact techniques that focus on the financial activities of firms in a market simply could not deal with the disparate nature of the sector or the substantial activity undertaken in relation to privately held aircraft. The study instead built on an approach developed by Terry Lober in the GASAR series of studies undertaken for the Department for Transport in 2006¹⁹. Lober's solution to the issue was to focus on the unit of activity relating to GA for which a reasonably complete dataset existed - individual aircraft and their associated flying hours, as detailed within the CAA G-INFO database - and to identify the final value of services offered by companies operating these aircraft or the personal expenditure relating to aircraft that were in private ownership. This analysis was then extrapolated to consider relevant aircraft that were based in the UK but not detailed on the G-INFO database, namely gliders and non-UK registered aircraft.

4.12 The 2015 economic impact research took broadly the same approach, using the G-INFO database and the records of aircraft and hours recorded within it as the basis for analysis, before extending the scope to include gliders not included within the register and non-UK registered aircraft, based on an analysis of data within the Aerodata database²⁰. This approach had the advantage of being directly comparable with the original GASAR study. As with the original GASAR work, assumptions derived from a range of sources were used to value a range of expenditures relating to the aircraft within our dataset, namely:

- Insurance;
- Hangarage / Parking;
- Fuel;

¹⁹ General Aviation Small Aerodrome Research Study: An Estimate of the Annual Direct Socio-Economic Contribution of GA to the UK economy – T. Lober, The Bartlett School, University College London (2006).

²⁰ Aerodata is a professionally maintained database of aircraft information and observations aimed at enthusiasts and professionals. It combines aircraft records, airfield information, UK air maps and frequencies plus a sophisticated photographic catalogue and digital picture display facility together with an E-mail group membership and updating system. It has also been used in this study to help understand usage of airfields.

- Maintenance;
- Gross Operating Margin for company owned aircraft – this is designed to reflect businesses administrative overheads, loans servicing costs, depreciation and pre-tax profit, which reflects their capital investment;
- Private Financing Costs – namely the interest paid on loans to purchase aircraft or the interest foregone on savings and depreciation of the asset;
- Landing Fees;
- Pre / Post Flight Expenses;
- Used Aircraft Sales Costs;
- Incremental Investment in New Aircraft.

4.13 We also considered expenditures relating to a number of other GA activities that are not included within the G-INFO database, for instance model flying, or others that might not be fully reflected within the G-INFO data, for instance parachuting, hang gliding, paragliding and similar, and the impact of air shows.

4.14 In broad terms, the methodology estimates the cost per flying hour for different aircraft types and multiplies this by the number of annual flying hours to produce an assessment of operators' willingness to pay for GA activities.

Estimating the Current Economic Impact of GA Flying

4.15 York Aviation's research into the economic value of GA was a significant exercise in its own right and hence the intention for this work was to build on the previous modelling and update the estimates of economic impact using the latest available information on flying activity in the GA sector. This intended approach was consistent with the finding of our 2015 work that the economic value of GA is most intrinsically linked to flying hours in the sector²¹. However, during the progress of this work, circumstance has dictated that we take a different approach.

4.16 The data on flying hours is generated by returns to the CAA following aircraft annual maintenance checks. Since our previous work the CAA has altered the way these returns work and the way data is collated. This has produced some confusion amongst those providing responses. This has had the unintended consequence that data collected between 2015 and the current time is not comparable with earlier years and it is not possible to make a reliable assessment of the hours flown either in total or by GA market segment for more recent years. This has significantly limited our ability to effectively update the economic value calculations. We have, therefore, had to use more generic data on activity in different parts of the GA sector using CAA Statistics on GA movements. These statistics provide only a partial view of activity in the market as they only cover the relatively small number of UK airports that report to the CAA²² and they do not cover all forms of flying. However, they are the best available option for producing an updated assessment of economic value.

²¹ The Economic Impact of General Aviation in the UK – York Aviation (2015). Page 108.

²² Relatively small in the context the total number of GA airfields.



4.17 CAA Statistics²³ indicate that:

- Business Aviation movements (assumed to include business aviation and air taxi movements from CAA statistics) have grown around 1% since the base year for our previous work (2013);
- Recreational flying movements in aeroplanes and aircraft (assumed to include Aeroclub and Private movements) have fallen by around 3% since 2013.

4.18 Where flying activity by a segment of GA is not recorded in CAA Statistics activity is assumed to remain the same.

4.19 All economic impacts have been adjusted to 2018 prices using the HM Treasury GDP Deflator²⁴.

The Current Economic Impact of GA Flying

4.20 In relation to this work, we have updated the elements of our previous study that relate to GA airfields, namely the economic value associated with GA flying operations and the wider impacts of business aviation. At 2017 demand levels (2018 prices), we estimate that:

- the economic value of GA flying operations in the UK was around £1.1 billion. This is the same as in our previous assessment but given the change in the price base since the last report, the economic value has declined slightly in real terms (by around 0.1%). It also worth noting that the observable patterns in activity would suggest that the balance in impacts between business aviation and leisure flying has shifted even further towards business aviation;
- the wider impacts of business aviation in 2017 is estimated to be around £0.9 billion. This reflects both an increase in real terms as Business Aviation activity appears to have grown and the change in the price base.

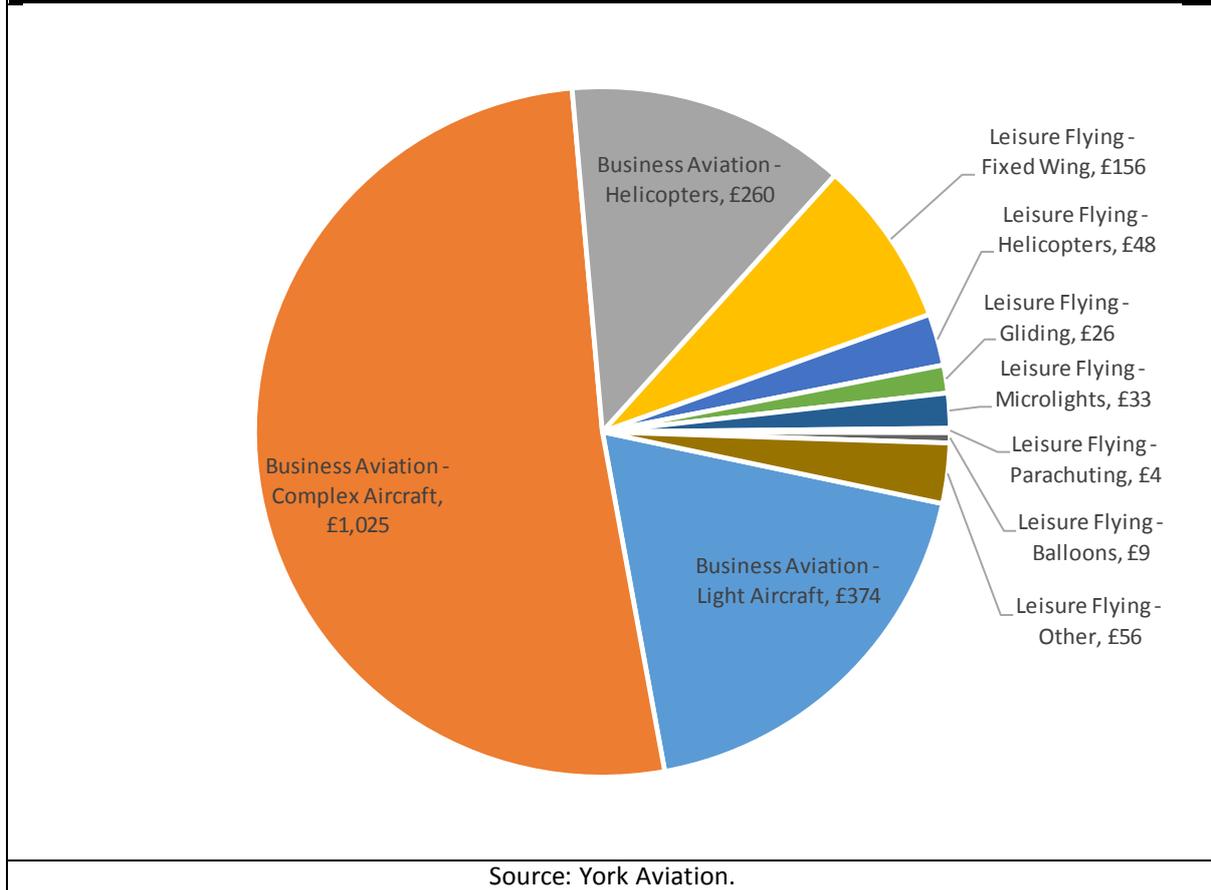
4.21 To aid in developing the database of GA airfields for this study and to assist in our assessment of the value of different airfields to the network, we have considered the economic value associated with different GA sub-sectors. This has been undertaken using the database and economic model developed for our 2015 work combined with the latest information from Aerodata on the nature of use for individual aircraft. It also classifies business aviation aeroplanes into light and complex aircraft. For the purposes of this work, complex aircraft are those with a maximum take-off weight in excess of 5,700kg.

4.22 The results of this analysis are set out in **Figure 4.2**. Given the availability and quality of data on which these assessments of economic value are based, impacts at this level of disaggregation should be considered with caution and seen as broad indicators of effect only. These sub-sector estimates include both impacts from flying operations and the wider economic impacts of business aviation.

²³ <https://www.caa.co.uk/data-and-analysis/uk-aviation-market/airports/datasets/uk-airport-data/>

²⁴ <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-march-2018-quarterly-national-accounts>

Figure 4.2: The Economic Value of GA Sub-sectors in 2018 (£m)



4.23 The economic value of GA continues to be driven primarily by Business Aviation²⁵ (£1.7 billion) and particularly by users of complex aircraft, a sub-sector alone which accounts for in excess of £1 billion in economic value when aircraft operations and wider impacts are taken in to account. This balance is important when considering the strategic network. As Business Aviation is the core driver of the economic value from GA, particular care needs to be taken to ensure that its needs are reflected when considering the functioning of the airfield network and individual airfields.

4.24 In terms of leisure flying, fixed wing flying (£156 million) and helicopter flying (£48 million) are the largest defined sectors. Other flying accounts for £56 million of value but this does include a significant estimate of the impact of air shows.

4.25 Overall, our analysis suggests that the network of GA airfields is critical in supporting around £2.0 billion in economic value.

²⁵ In the context of this report the term business aviation refers to flying operations undertaken to support a business purpose. This includes the transportation of passengers but also activities such as surveying or power line checking.



5 DEFINING A STRATEGIC NETWORK

Introduction

- 5.1 In our 2014 study for the DfT on the economic impact of the GA sector, we set out a framework for analysis of relevant issues when an aerodrome development or change of use is to be evaluated by a local planning authority. The framework offered a starting point for the development of potential Government guidance on planning issues, which could bring a much-needed level of consistency to the approach taken by local planning authorities in relation to GA airfields and, thereby, offer greater protection to the strategic network of aerodromes across the UK. This framework was intended as a simple checklist for consideration by local planning authorities when a change of use was contemplated at an airfield, rather than as a set of fully thought-through evaluation criteria that would determine an airfield's place within the context of a strategic network. For example, although we referred to proximity to major economic centres and alternatives within a 'reasonable' distance, no specific criteria relating to the geographical position of airfields relative to each other or to centres of population were defined. It was always recognised, therefore, that the criteria within this framework needed further development and the present study addresses this.
- 5.2 We set out how we have developed these criteria in the next section, but in this section we address the issues that are associated with the concept of a 'strategic network'. Such a concept appears entirely logical and sensible, but more detailed consideration of the ways in which a strategic network might be defined in practice, raises a number of very challenging issues, each of which we examine further below.

Different User Groups

- 5.3 In consultation with GA user groups it became clear that there is a patchwork of varying interests, each of which requires something different from a strategic network of airfields. For example, the needs of the gliding community and the availability of suitable airfields they can use is quite different from the needs of the business aviation community and the network of airfields they need.
- 5.4 This challenge was recognised by the General Aviation Awareness Council in its paper responding to the question from the Aviation Minister as to how a network should be defined:
- "There is no single essential network of airfields. The UK's existing network effectively comprises a number of user based and often interdependent networks using airfields suitable for its activities. Each network has a hierarchy reflecting its user groups: the requirements of business aviation differ greatly from those of Gliders, which, in turn, differ from Microlights or balloons."*²⁶
- 5.5 A key starting point therefore is to identify and understand the needs of the various sectors within the GA community and we set out to do this through two workshops held in April 2018 with various representative organisations within the GA community as well as through individual consultations with key user groups and organisations²⁷.

²⁶ A Paper on UK General Aviation current airfield network and future requirements, GAAC, May 2017.

²⁷ A full list of the organisations we consulted is attached at Appendix A.

- 5.6 It is also clear that the economic benefits derived by different user groups from access to a 'strategic network' will also vary. Clearly, there are likely to be greater economic benefits resulting from a strategic network that meets the needs of the business aviation community, than those resulting from recreational flying. That is not to say no economic benefits derive from recreational flying but simply that they are likely to be proportionately less, and this needs to be taken into account. It should also be noted that there are social and health benefits derived by some user groups from general aviation flying and whilst these are not easily quantifiable, they are a factor in defining a network that serves the needs of such users.
- 5.7 We have therefore made use of our previous research for the DfT on the economic value of GA to make an assessment of these relative benefits, as set out above. The existence of other, sometimes unquantifiable benefits, to different user groups from the 'strategic network' of airfields to which they require access to meet their needs, illustrates the difficulty of defining a network in purely quantifiable terms, and we return to the subject of defining which qualitative criteria should be borne in mind for a strategic network in the next section.
- 5.8 We therefore agree with the GAAC that there can be no 'single network' of airfields and that the existence of a wide range of different user groups with different needs makes the definition of a network particularly challenging.

A Constantly Evolving Network

- 5.9 A further consideration that makes definition difficult, is that any network will inevitably evolve over time, not only in the sense of the changing needs of its users, but in terms of the number of airfields in use at any given time and the facilities they provide. These things are not static.
- 5.10 The potential 'value' of an individual airfield cannot be defined without taking into account its position within the network. For example, if a particular area of the country is not well served by GA airfields, a single airfield, albeit with limited facilities, could be more valuable than an airfield with better facilities, but which is located in a part of the country where there are several such airfields within relatively close proximity to each other. Our attention was drawn during consultations to several examples of the circumstances at one airfield affecting the viability or operational capability of another. One example would be the recent closure of Panshanger and the effect this has had on the capacity of Elstree, to which a number of former Panshanger users have moved.
- 5.11 A further issue is that some airfields see their usage (and by implication their value to the network) change during the course of the year. For example, Turweston is a basic GA airfield for most of the time serving light aircraft primarily used for leisure activities, but when the nearby Silverstone Grand Prix is on, it becomes a very busy business aviation facility.
- 5.12 Inevitably, some airfields will also disappear from the network from time to time, whether this is a result of viability problems, pressure for housing needs, or other factors. Conversely, farm strips (which can be important for access by some GA users to the more remote parts of the country) can be 'created' for a temporary period under the '28-day rule'²⁸.

²⁸ This is a provision within planning regulations (Part 4 of Town & Country Planning General Permitted Development Order) for the temporary use of land without obtaining formal planning permission.



- 5.13 It is obviously less likely that permanent new airfields will be opened but it is not entirely unheard of²⁹ and if former military airfields can be made available to GA (see below) this could also affect the shape of the network.
- 5.14 Clearly the definition of a network at any given time must also take into account the capacity, facilities and operational characteristics of the individual aerodromes that make up the whole. But these factors are constantly changing. For example, some larger GA facilities with good facilities that serve an increasing number of business aviation movements, may wish to discourage smaller light aircraft from circuit training³⁰. At the same time, larger airports, where slots for commercial air transport are at a premium, may wish to discourage business aviation and corporate jets. It is envisaged by some members of the business aviation community, that this may come to be the case at Luton Airport, as just one example. During consultations we were alerted to the fact that London's commercial airports are now effectively 'closed' at night to business aviation as a result of noise restrictions. The question then becomes, how does the network respond to such pressures?
- 5.15 All these issues illustrate that today's 'strategic network' is a constantly changing entity. But perhaps the greatest changes to the network will be seen in future years, as it adapts to the future needs of users. We consider this issue below.

Future Needs of the Network

- 5.16 A network defined today is likely to be very different from the network of tomorrow. The pace of change within the GA sector is increasing very rapidly.
- 5.17 It could be argued that historically the GA sector and the regulatory and airspace environment in which it operates has been a little 'behind the curve' and perhaps slow to catch up with the pace of new emerging technology. Many private pilots are flying aircraft that were originally designed over 50 years ago. For example, the very popular Piper PA-28 Cherokee, which can be seen at many GA airfields around the country, was originally designed and constructed in the 1960s. The old style navigational instruments in these aircraft, whilst still important, are now being supplemented by GPS systems that allow for different kinds of approaches to runways. Whilst the freedom for some GA users to operate aircraft without sophisticated technology and in uncontrolled airspace will always be valued, other technological changes will facilitate the way in which some airfields can be accessed, including unlicensed airfields. This, in turn, could affect some airfields' position within the network.
- 5.18 Amongst future changes we would highlight the following:
- following recent changes to regulations, there will be greater use of single-engine turboprop operations (SETops) for air taxi style flights, potentially into unlicensed or grass airfields;

²⁹ Fishburn Airfield in the North East was opened in 1995.

³⁰ We recognise that there are conflicting arguments within the GA community about the extent to which it should be possible to meet the requirements of different user groups at a single airfield.

- the introduction of flight sharing platforms, which connect private pilots with potential passengers could benefit the GA sector as well as the travelling public and take more cars off the road³¹;
- the future is also likely to see a whole new sector of passenger carrying hybrid and electric aircraft, many of which will have vertical take-off capabilities (electric Vertical Take Off and Landing or e-VTOL) and will be far quieter and more environmentally friendly;
- the use of airships may become more prevalent and the Airlander project is a good example of this; the Airlander 10 aircraft, which combines features of aeroplanes, helicopters and airships with the latest innovations in materials, is now being developed for commercial purposes, such as freight, remote access, aid distribution, advertising, surveillance, communications and luxury passenger transport;
- the commercial drones sector is increasingly being used for building and site inspections, emergency services surveillance and detection, and the transport of goods, including medical supplies. A recent report by PwC has estimated that, by 2030, there could be a £42bn increase in UK gross domestic product from drone activity, 76,000 drones operating in the UK's skies, 628,000 jobs in the drone economy, and £16bn in net cost savings to the UK economy; whilst drones may not need a runway and an airfield, they may need an aerodrome³² in the sense of a hub from which to operate and such hubs could eventually be a vital part of a strategic network.

5.19 Ideally, therefore, consideration should also be given to the usefulness and preparedness of airfields in relation to these developments and this emerging technology, when considering a future strategic network. Exactly how the needs of these future changes will affect the shape of the strategic network is not easy to determine, however. There is no sound basis for forecasting the growth of activity or the spread of activity across the UK. We explain in the next section how we have approached this question using assessments of future population growth up to the year 2030 to enable the performance of the network moving forward to be considered. However, there will necessarily be an element of qualitative judgment that will need to be brought to bear in evaluating the future needs of the network.

Role of Commercial Airports

5.20 An important factor in identifying a strategic network is the role of larger airports that also handle commercial air transport movements. For some of these airports, especially some regional airports, the general aviation business they handle is an important source of revenue (for example at Norwich or Newcastle). Equally, it can be important for the various GA user groups to have access to commercial airports, whether it be for business aviation or air taxi purposes, or for diversions on safety grounds. Some smaller commercial airports also have flight training schools.

³¹ 'Wingly' is an example of such a platform.

³² The International Civil Aviation Organization (ICAO) defines an 'aerodrome' as a defined area on land or water including any buildings, installations, and equipment, intended to be used either wholly or in part for the arrival, departure, and surface movement of aircraft. Therefore, all airports are aerodromes, but not all aerodromes are airports, as aerodromes can include heliports and grass strips.



- 5.21 Inevitably, however, as commercial airports grow in size, capacity constraints (both on the ground and in the air) dictate that general aviation tends to be squeezed out. This might happen through the imposition of punitive landing charges for GA or by a requirement to use the services of an FBO³³ with associated costs. Or it could result from the classification of the airspace around a large airport, making it difficult to use. Heathrow, for example, does not actually ban GA flights but the costs of landing there are prohibitive for all except some and it is extremely hard to obtain a slot. We noted above that Luton's role as one of the premier London business aviation airports could change in future as capacity issues become more acute.
- 5.22 It will be important, wherever possible, for the GA community to be allowed continued access to commercial airports, and as such they should be seen as a potentially important element of the strategic network. However, it is inevitable that market forces will create a shifting picture in terms of which commercial airports are realistically available to GA. The important consideration is that as this happens, the network should be able to provide alternatives, in order that the current quality of service and access enjoyed by GA is not diminished.

Role of Military Airfields

- 5.23 The Government's GA Strategy of 2015 noted³⁴ that it is MoD policy is to encourage the civilian sector, including GA, to have access to military airfields wherever possible, but that this and the associated procedures are not always well known. RAF Henlow was cited as a case study of how a military airfield can be used by GA.
- 5.24 The Ministry of Defence is currently planning to dispose of 15 military airfields as part of its Estates Modernisation programme. We are aware that meetings on this subject have been held between the All-Party Parliamentary Group on General Aviation and the Minister. Discussions on this issue are ongoing at the time of writing.
- 5.25 We also consulted officials in the Ministry of Defence as to their proposals and it is clear that at least some of these sites proposed for disposal could not realistically be brought into use for GA, although others potentially can. It is also clear that there is no objection to military airfields designated for disposal being used by GA until they are decommissioned and sold, subject to the approval of the station commander.
- 5.26 We recognise that there are financial pressures on the MoD to reduce the size of the defence estate, but we also recognise that all usable airfields are potentially national assets and could make a valuable contribution to a strategic network of airfields.

The Network's Relationship with Individual Aerodromes

- 5.27 It is important to understand that this study is dealing with the value of the evolving strategic network as a whole, rather than setting out to label each individual site in existence today. Our methodology, which we explain in more detail in the next section, does allow for a quantitative assessment against specified criteria of individual airfields' contribution to the network at any given time, but any such assessment of an individual airfield will change over time as the network changes along with the needs of its users.

³³ Fixed Base Operator

³⁴ General Aviation Strategy, page 34.

5.28 Because of this, our approach has been to identify and better understand the network as it currently exists, both in terms of how it is distributed spatially and what facilities it is able to offer the different GA user groups. This gives us a consequent 'level of service' the network is currently providing to users in terms of accessibility and connectivity and hence in terms of economic value. We have then established a methodology, using objective criteria, by which the impact of any future changes to the existing network can be evaluated. In some cases, the impact may be severe, whilst in other cases it may be minimal, but each case will be different and will differ over time. Ultimately, some element of judgement may also be required in determining the value of an individual airfield compared with an alternative use and we address the range of qualitative criteria that might be taken into account in such an assessment in the next section.

The Competitive Environment in which Network Airfields Operate

5.29 Airfields themselves will always change over time and it is right that they should be able to take advantage of opportunities that come about as the network and the competition around them changes. This should also improve viability and ultimately the facilities and services on offer to the GA community. A stagnant market, with no competitive threats (including from other uses), would not be a healthy market.

5.30 We recognise, therefore, that in some circumstances, the playing out of market forces could strengthen the network. This could be the case if the loss of an unviable airfield strengthens the viability of other airfields remaining in the network, whilst maintaining a level of service to the GA community. This is another example of how changes to one part of the network can influence other parts.

5.31 That having been said, the market could also be failing in cases where the loss of an airfield from the network results in disproportionate loss of economic or social benefit that outweighs the benefits to be gained from alternate uses. In these cases, some form of intervention may be appropriate in terms of supporting the airfield's viability, although ultimately it is for the owner of the land to determine what he or she should do with it. In terms of viability, it will also be important to ensure that airfields have a level playing field and are not unduly penalised in terms of tax or business rates.

5.32 The methodology we propose in the next section will aid in quantitative terms, supported by a qualitative assessment, in evaluating the implications of losing an airfield from the network and ensuring that levels of service to the GA community can be maintained.

Conclusion

5.33 Defining a strategic network raises a number of very challenging issues. These include the wide variety of user groups and their needs, the fact that the network will constantly evolve in terms of the capacity and facilities it provides and the changing needs of users. Furthermore, the network of today is likely to be very different from the network of tomorrow as the pace of change within the GA sector increases. It is therefore very difficult to define a single network. The network will be constantly evolving and will look different from the perspective of different users.



- 5.34 This study sets out to deal with the definition and value of the evolving strategic network as a whole, rather than setting out to label each individual site in existence today.
- 5.35 We recognise that market forces have a role to play in the natural development of the network, but that intervention may be justified in some circumstances, particularly in ensuring a level playing field for airfields in terms of financial viability. However, it is ultimately for the owner of the land to determine what they should do with it.
- 5.36 The methodology we propose in the next section will aid in quantitative terms, supported by a qualitative assessment, in evaluating the implications of losing an airfield from the network and ensuring that levels of service to the GA community can be maintained.

6 EVALUATION CRITERIA AND DEVELOPING A NETWORK DATABASE

Introduction

6.1 In this section, we set out our suggested approach to evaluating the value of individual airfields to the network and our suggested performance measures in relation to the GA network as a whole. This includes setting our rationale and reasoning for the approach we have taken and the further commentary on challenges inherent in this exercise. Ultimately, the set of tools described here and set out within the accompanying database are intended to assist in understanding the value any given airfield provides to the GA airfield network and whether potential changes might constitute damage to the network such that they would be a strategic concern.

How Have We Developed Our Approach?

6.2 The development of our approach has above all been driven by pragmatism and practicality. Through this work, and indeed our previous work in the GA sector, we have developed a good understanding of GA, its sub-sectors and how it functions. We are well aware of the challenges that exist in relation to hard data and evidence in relation to what is an immensely large and diverse part of the overall aviation sector. These challenges are not just about what is or is not available but also about what is consistently available across all of the GA sector.

6.3 We were aware from the outset that any approach to evaluating airfields or the network as a whole would need to be, as far as possible, universally applicable. Different methodologies should not be used for different sub-sectors or different types of airfield. As we have discussed above, we were also quite clear that GA is not and should not be seen as homogenous. Different parts of the GA community require different things from different airfields and one airfield is not necessarily interchangeable with another. Equally, our discussions with the GA community have highlighted that, while there are fundamental requirements for some users, often the pattern of use at different airfields that can be seen now are sometimes accidents of history and a reflection of entrenched behaviour as much as anything else.

6.4 It has also become very clear that whatever the methodology we developed it would never be perfect. We would never be able to consider all the factors that we would like to or indeed that others would like us to. This is a strong reason why we would view the results set out in the accompanying database as useful intelligence rather than a definitive answer as to the value of any given airfield to the network or indeed whether any potential change to the network represents a strategic change to the network that will damage the value that can be supported by GA. Evidence from this analysis will always need to be supplemented with a more detailed local assessment.

6.5 As we have discussed above, the database needs ultimately to be a 'living' resource. Any assessment of airfield value or the performance of the network is reliant on up to date data otherwise it is no more than an assessment of a snapshot in time. This means that any evaluation approach must use data that can be updated relatively easily. This pushes towards datasources that are publicly available and certainly away from data that requires regular survey work or other interaction with individual airfields. The CAA and NATS have recently undertaken a survey of unlicensed airfields in an attempt to better understand the airfield network and the response rate has been low. This demonstrates the difficulties of maintaining data in this way.



- 6.6 Finally, we clearly identified the need for any evaluation process to rely on objective data and to be transparent. Issues around the GA sector and the GA network and the pressure it is under are contentious. There are competing interests involved both internally within the GA community and externally with the wider market. It was therefore vital that any evaluation approach in relation to airfields or the network as a whole be as devoid as possible of subjective judgements. This is why the core of our approach is based on quantitative measures. We have also included below our thinking on a range of potential qualitative factors that would give a more rounded view of any given airfield but these are by their nature more open to subjective judgement.
- 6.7 These factors have pushed us towards an approach to evaluating airfields and the network as a whole that is conceptually relatively simple, albeit collating the data that supports it is highly complex and a significant challenge.

What do we know about GA airfields?

- 6.8 Our approach is ultimately reliant on what we know about GA airfields or what can reasonably be found out on a consistent basis. A major focus for this work has been gathering data on airfields and GA flying to enable us to understand what we have to work with. Stakeholders from the GA community have been invaluable in this process and we have been able to access and consider a wide range of data sources. Ultimately, we have used some and chosen to discard others. This is not a reflection on those that we have not used but has often been about identifying those that can be tied together with other sources (usually by geographic coordinates and / or airfield names) to provide a more complete overall picture.
- 6.9 Below, we have summarised the main databases that we have accessed and considered in developing our approach to evaluating airfields and the network as a whole:
- the CAA provided us with a file that contains information on around 950 sites in the UK. By the CAA's own description, this file is more of a spreadsheet than a database. The information in it is relatively limited and it is not updated on a regular basis (there are a number of airfields listed that are known to be inactive). There is information on airfield location (coordinates), licence status and some brief notes. There is no information on facilities, infrastructure or the level of usage. However, we have used this list as the starting point for the development of our database. This is primarily because it appears to be the most comprehensive list we have had access to with location information. This information is essential in linking to other data sources as it would appear that airfields are often known by a number of different names;
 - the CAA's list of licensed airfields. This is obviously less extensive in its coverage than the first CAA list but is probably more accurate in the information that it holds regarding licensed airfields (albeit this is essentially very similar to that in the first CAA database). We have not used this database ultimately as its coverage of the network of GA airfields is very limited;
 - SkyDemon's background database of active UK airfields. This is an extensive list of airfields with up to date information on those that are active and inactive. There are in total around 860 airfields listed. However, the database as sent to us provides very little other information and lacks any geographic information, which has meant that its value in understanding the network and its features is limited. The information within it has largely been used to cross check inactive airfields in other databases;

- Pooley's Flight Guide is one of a range of flight guides available to pilots that provide detailed information on UK airfields. It is generally considered to be the most popular and most comprehensive. The Guide provides a wide range of information about airfields in the UK including navigational information (including location), runway capabilities, Air Traffic Control details, lighting, infrastructure and facilities. The Guide has been the primary source used in our analysis on the characteristics of airfields. From the perspective of this work (and indeed with an eye to the future) there are, however, a number of challenges to its use. The most obvious is that it is not a database and it is not available in an electronic format that is readily translatable into one. York Aviation has, therefore, had to use specialist software to 'read' the iPlates that Pooley's produces in PDF format to extract information for use in the database and our analysis. While this is achievable for the 'snapshot' of the current point in time, it presents challenges for the future in terms of keeping a database up to date. It should also be recognised that while there is a wealth of information and much is very useful, some information is open to interpretation and can be ambiguous from the perspective of this work. This has therefore limited the information that we feel can be sensibly used. An example of this is the availability of hangarage and / or parking at airfields. This was raised as an issue in terms of airfield capability at the workshops. At first sight, Pooley's appears to provide some guidance on this. However, closer inspection identified that the information provided is often ambiguous. The information provided might say 'limited' or 'available on request'. This doesn't actually make clear whether there is for instance hangarage capacity or not. 'Limited' could mean that there isn't much provision but what little does exist is available or it could mean that there is a significant amount of hangarage but there is very little available space. We discuss further below the information we have actually used in the context of setting out our evaluation criteria. The other thing to note about Pooley's is the existence of lists of specialist sites for particular GA sub-sectors. We have used these in concert with other data within our evaluation criteria. Ultimately, Pooley's has been used to provide detailed information on airfield characteristics for around 450 sites;
- UK Flying training airfields – information on the location of training facilities for GA activities has kindly been provided by the GAAC and sourced from Flight Training News. We have used this as the basis for our assessment of the availability of training within the network and in the scoring around our airfield evaluation criteria;
- the British Gliding Association (BGA) has provided a list of airfields that hold BGA membership. This also provides information on the ownership of clubs, their links within the community, their links to the ownership of airfields and some additional information on links. This has been used as a basis for identifying sites with a particular focus on gliding within the quantitative analysis and would support qualitative criteria analysis in line with the factors set out below;
- the database compiled privately by Jonathan Woodside as described in Section 2 was provided by the General Aviation Infrastructure Network. The database includes an extensive list of active and inactive airfields across the UK and includes geographic location information. The list has primarily been used in understanding what has been happening to airfields and also as a cross-check to the CAA's database;

- Aerodata Quantum Plus (as mentioned above) is a professionally run and managed database for professionals and enthusiasts that ‘tracks’ the activities of GA aircraft in a range of countries including the UK. In our 2015 work it was used to make an estimate of the number of overseas registered aircraft operating in the UK. For this work, we have used the database to examine at which airfields users of the database believe UK registered aircraft are based and to determine whether they are being used for business activities or private uses. This information has ultimately been linked across to the CAA G-INFO database to enable matching of aircraft characteristics with based location and to our database of airfields to link aircraft type and usage to airfield characteristics. This process is highly complex and time consuming but has been essential to the development of our evaluation criteria and approach to considering the value of each airfield to the network. It provides a revealed preference basis for understanding what different sub-sectors of GA want and / or need that is objective;
 - CAA G-INFO database of aircraft registrations. This holds information on the around 20,000 UK registered aircraft, which encompasses a large proportion of the GA aircraft operating in the UK. This is helpful in this analysis when combined with the Aerodata information and the airfield characteristics information as described above;
 - ONS, Scottish Government and NISRA data on population by Lower Super Output Area (LSOAs) in the UK. This provides the basis for considering the population coverage of individual airfields and the network as a whole;
 - TEMPRO population projections for LSOAs.
- 6.10 The above range of datasets have been at the core of our analysis and have been analysed, collated and linked together to provide as comprehensive a view as we believe is sensibly possible of UK GA airfields, where they are and, crucially, how they are used.
- 6.11 For the avoidance of doubt, it is worth also highlighting some potentially important pieces of information that we do not have:
- data on movements or other metrics of activity by airfields. The CAA only collects such data from a small sub-set of UK airfields and there is no other centralised source for such information. Individual airfields may or may not collect and keep this data and certainly collecting what is out there would be significant task, which would ultimately still only provide a very partial picture;
 - information on the financial viability of airfields is simply not available. Size of companies, the nature of ownership and the structure of ownership, and confidentiality issues mean that there is no sensible way to collect data on financial performance. Given the importance of this issue when set against the nature of the pressure from housing development, this is clearly a gap in the dataset;

- detailed surface access information is not available. Our datasets mean that we know the location of a significant number of the UK’s GA airfields and we have used this to calculate distance metrics and consider competition between airfields. However, it is not feasible to identify detailed access time information for each airfield in the UK. We estimate that this would require in excess of 40,000,000 journey time searches. Similarly, it has not been possible to consider public transport access to airfields as a factor given the sheer volumes of data that would be required. We know that this has been raised as a factor in an airfields usefulness by a range of stakeholders and would fully agree with the point. Unfortunately, acting on it is simply not practical for a quantitative analysis. We have, however, highlighted this as a qualitative factor for consideration in individual cases (see below).

6.12 **Figure 6.1** summarises in a simplified way the datasets that we have collected or developed and how they have been linked together to enable us to develop and implement our approach to evaluating the network.





- 6.13 The ultimate target for our work is the Airfields Database (marked in Green). This contains the list of UK GA airfields, their characteristics where known and the results of the application of our evaluation criteria for each airfield. The other key output dataset is the Spatial Database, which includes the calculations which feed into our assessment of the performance of the network as a whole.

Our Approach to Considering the Value of Airfields and the Network

- 6.14 As described above, our approach has been driven significantly by what data is available combined with discussions with stakeholders around what is useful.
- 6.15 At the outset it is important to be clear that in our view there are two separate issues to be evaluated:
- **assessing the performance of the network as a whole** in terms of its ability to provide the UK population with access to the different GA sub-sectors and hence the benefits GA can bring. In our view this is in many ways the more pertinent question in terms of understanding from a strategic perspective what the impact of any changes to the network might be. Our approach to considering this question and the results of our analysis are presented below;
 - **assessing the value of any individual airfield to the network** relating to each GA sub-sector and GA as a whole. This gives some idea of the potential damage to the network if an airfield becomes inactive relative to other airfields but it does not actually ultimately provide guidance on whether the overall performance of the network is affected. Again, our approach is described below.
- 6.16 We have developed methodologies to consider both of these issues. We have also considered how both the performance of the network and that of individual airfields should be considered in the future and in this case in 2030.

Assessing the Performance of the GA Airfield Network as a Whole

- 6.17 In Section 5, we identified that the strategic network is in fact a series of interlinked networks that serve different GA sub-sectors. We also identified two key themes for considering effectiveness:
- the accessibility that the network provides both in terms of individuals being able to access facilities to enable them to undertake or use GA activities and in terms of providing connectivity for travel between different points in the UK;
 - the capability of the network in terms of airfields' ability to support a particular GA activity.

- 6.18 Our approach to assessing the performance of the GA networks in the UK is consistent with these principles. For each sub-sector of GA identified, it considers the proportion of the UK population that is within 35 miles³⁵ of an active runway or specialist site that is capable of servicing a significant proportion³⁶ of the aircraft that use that sector.
- 6.19 The population within 35 miles of each airfield has been identified using the spatial dataset. This includes the coordinates of all airfields in our airfield database and also the coordinates for the centre of every Lower Super Output Area (LSOA) in the UK. The distance between every airfield and every LSOA can therefore be calculated. This is then combined with ONS data on the population of every LSOA in the UK.
- 6.20 Whether or not an airfield is suitable for use by a given GA sub-sector is based on the capability of the longest runway at the site. To determine what GA sub-sectors require, we have analysed the preferences of aircraft in the relevant GA sub-sector in terms of the longest runway at the airfield where they are believed to be based. This uses data combined from Aerodata, G-INFO (the Aircraft Usage and Preferences dataset in Figure 6.1) and the Airfield Database. In each case, we have plotted the cumulative percentage of aircraft in the fleet where a base airfield is identifiable against the maximum runway length at that airfield. The results of this analysis are shown in **Figure 6.2**.
- 6.21 The key point to note is that different user groups have quite different preferences in terms of the runway lengths they use. At one extreme Business Aviation using complex aircraft don't generally appear at airfields with maximum runway lengths much below 1,500m and certainly not below 1,000m. Conversely, microlights are rarely found operating at airfields with runway lengths much above 1,000m. It should also be noted that there are clearly groups shown here where the actual length of the runway is of limited relevance, notably helicopters and hot air balloons. Here we consider that observed preferences are more about the facilities that come with airfields with runways of a certain length rather than the runway itself. However, it probably remains a useful criterion in terms of demonstrating preference. It should also be remembered that for these groups where runway length is largely irrelevant, it may also be that airfields in themselves are largely irrelevant to many operations as they are not actually required for take-offs or landings.
- 6.22 In addition to runway length in determining capability, we have also considered runway surface. This analysis identified that, with the exception of Business Aviation Complex Aircraft, users are largely agnostic to hard or soft runways, with many aircraft types able to operate from either. Hence, in terms of runway suitability, it is only in relation to the Business Aviation Complex Aircraft sub-sector that there must be a hard runway.

³⁵ Based on an analysis of UK airport access times from LSOAs around the UK, we have identified that 35 miles is typically how far can be travelled in an hour. An hour was identified as a typical reasonable access time for GA users based on our consultations and comments at the workshops.

³⁶ Usually between 80% and 90% of all aircraft.

Figure 6.2: Cumulative Proportion of the GA Sub-Sector Fleet by Based Airfield Maximum Runway Length



6.23 Finally in terms of capability for each sub-sector, we have assumed that where an airfield is identified as a specialist site for that sector either by Pooley's or by a relevant representative organisation, that it is capable of handling the great majority of traffic in the relevant sector and is hence capable. We have identified specialist sites in relation to:

- Business Aviation;
- Helicopters;
- Gliding;
- Microlights;
- Parachuting;
- Hang gliding and parascending.

6.24 Combining this information enables us to identify a 'performance level' for the network, which is defined as the percentage of the population that can access an airfield capable of supporting the relevant sub-sectors flying activities within 35 miles. In terms of considering the impact of changes in the strategic network, it is our view that changes that result in a reduction in this coverage at either UK or at nation / region level should be considered as potentially damaging to GA's ability to deliver economic value.

6.25 The current service levels achieved by the GA airfield network are shown in **Table 6.1**.

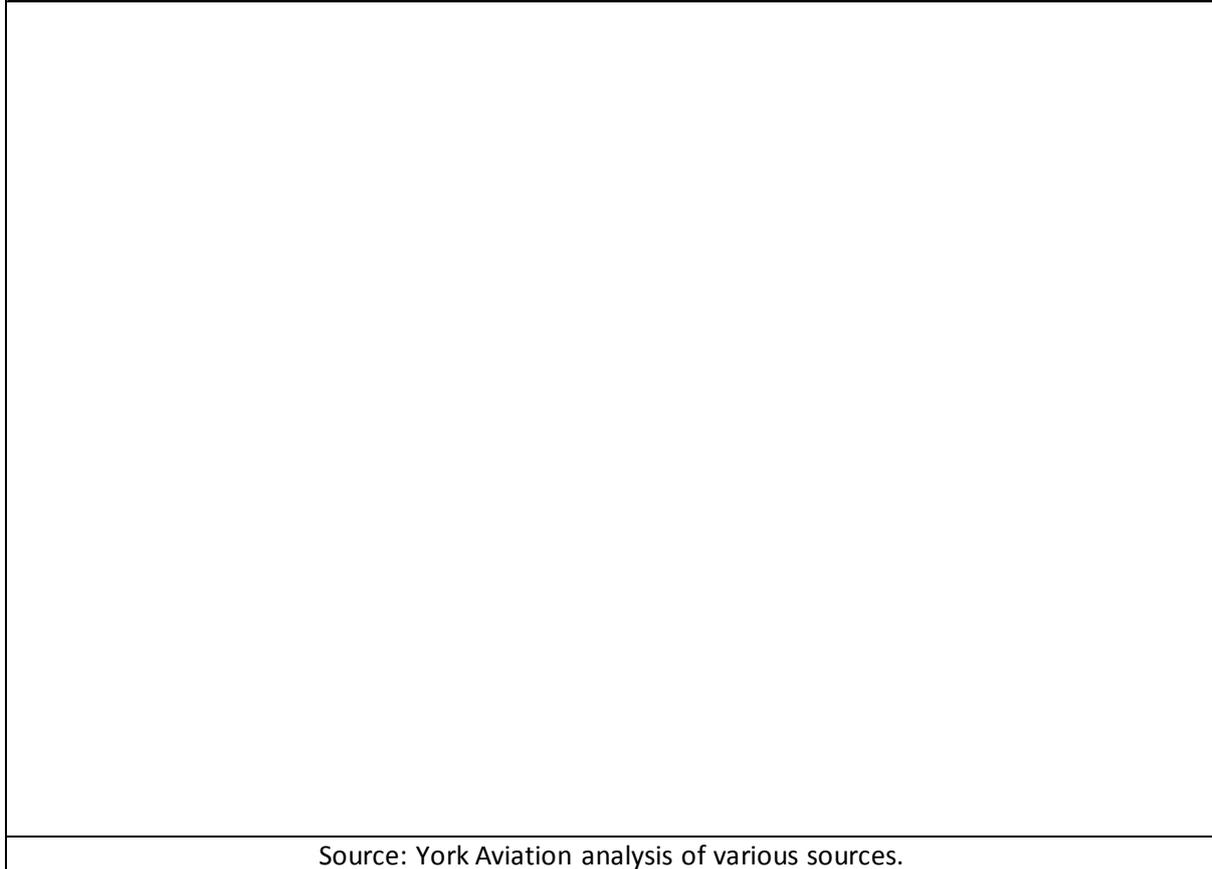
6.26 In general, the GA airfield network as it stands now provides excellent coverage of the UK population for most of the GA sub-sectors, with in excess of 95% of the population within 35 miles of a relevant airfield in all but one case. The exception is hang-gliding and parascending, which in many ways should probably be thought of rather differently. We are not able to identify runway criteria in the same way as there is very little information in G-INFO for the sector and hence any assessment is reliant on sites being identified as specialist sites within the analysis. It should also be recognised that this is a sector of GA that is not reliant to any significant degree on airfields in a conventional sense. As such, findings for this group should be regarded with some caution.

Table 6.1: Current Percentage of the Population that is able to Access a Capable Airfield within 35 miles by GA Sub-Sector

	Business - Light	Business - Complex	Business - Helicopters	Leisure - Fixed Wing	Leisure - Helicopters	Leisure - Gliding	Leisure - Microlights	Leisure - Hang-Gliding & Parascending	Leisure - Parachuting	Leisure - Balloons	Leisure - Other
UK	99.5%	95.0%	99.5%	98.8%	99.2%	99.7%	99.7%	57.0%	98.8%	99.3%	98.1%
North East	100.0%	97.9%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%
North West	99.1%	94.2%	99.1%	99.8%	99.8%	100.0%	99.8%	91.9%	99.8%	98.5%	98.3%
Yorkshire & the Humber	99.7%	95.5%	99.7%	99.7%	99.7%	99.9%	99.9%	42.9%	99.7%	99.9%	99.5%
East Midlands	100.0%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	29.5%	100.0%	100.0%	100.0%
West Midlands	100.0%	96.7%	100.0%	100.0%	100.0%	100.0%	100.0%	19.8%	100.0%	100.0%	100.0%
East of England	100.0%	99.8%	100.0%	100.0%	100.0%	100.0%	100.0%	76.4%	100.0%	100.0%	100.0%
London	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
South East	100.0%	95.1%	100.0%	100.0%	100.0%	100.0%	100.0%	93.5%	100.0%	100.0%	100.0%
South West	100.0%	92.1%	100.0%	100.0%	100.0%	100.0%	100.0%	60.5%	100.0%	100.0%	100.0%
Scotland	98.7%	87.9%	98.9%	91.5%	96.2%	97.1%	97.7%	0.4%	91.5%	96.3%	91.0%
Wales	96.2%	78.2%	96.2%	94.5%	94.4%	98.3%	97.6%	11.9%	94.5%	95.9%	91.8%
Northern Ireland	95.0%	92.2%	95.0%	91.6%	91.6%	99.6%	99.7%	0.0%	91.7%	99.3%	74.3%

Source: York Aviation analysis of CAA, ONS, Pooley's, Aerodata, BGA.

6.27 In terms of regional coverage, there appears to be some 'bias' towards the south of the UK but in general most regions are well covered for most sectors. It should however be recognised that given the density of airfields in the southern part of the UK, excluding parts of the South West, (see **Figure 6.3**) that coverage elsewhere may be more fragile. In other words, airfield losses may be more likely to affect the performance of the network as a whole in the nations and regions away from the south of the UK.

Figure 6.3: UK GA Airfields Heat Map

Source: York Aviation analysis of various sources.

- 6.28 In terms of the future and the performance of the current airfield network in serving the UK population as it is expected to be distributed in 2030, we have set out the same results in **Table 6.2**. This projects current population forward to 2030 at an LSOA level using information from the Department for Transport's TEMPRO model.
- 6.29 These results suggest that the current GA network is well placed to serve the UK population in 2030, with coverage for some GA sub-sectors actually increasing. Given this overall pattern it is perhaps unsurprising that coverage at regional levels also remains very strong in most cases.
- 6.30 Overall looking forward, therefore, it would not appear that there should be concerns around the network's ability to deal with population change as it stands now.

Table 6.2: Percentage of the Population that is able to Access a Capable Airfield within 35 miles by GA Sub-Sector in 2030

	Business - Light	Business - Complex	Business - Helicopters	Leisure - Fixed Wing	Leisure - Helicopters	Leisure - Gliding	Leisure - Microlights	Leisure - Hang-Gliding & Parascending	Leisure - Parachuting	Leisure - Balloons	Leisure - Other
UK	99.5%	95.1%	99.5%	98.9%	99.2%	99.7%	99.7%	57.6%	98.9%	99.4%	98.2%
North East	100.0%	97.8%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%
North West	99.1%	94.2%	99.1%	99.8%	99.8%	100.0%	99.8%	91.9%	99.8%	98.6%	98.3%
Yorkshire & the Humber	99.7%	95.6%	99.7%	99.7%	99.7%	99.9%	99.9%	42.7%	99.7%	99.9%	99.5%
East Midlands	100.0%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	29.7%	100.0%	100.0%	100.0%
West Midlands	100.0%	96.7%	100.0%	100.0%	100.0%	100.0%	100.0%	19.6%	100.0%	100.0%	100.0%
East of England	100.0%	99.8%	100.0%	100.0%	100.0%	100.0%	100.0%	76.1%	100.0%	100.0%	100.0%
London	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
South East	100.0%	95.2%	100.0%	100.0%	100.0%	100.0%	100.0%	93.6%	100.0%	100.0%	100.0%
South West	100.0%	92.3%	100.0%	100.0%	100.0%	100.0%	100.0%	60.6%	100.0%	100.0%	100.0%
Scotland	98.8%	88.1%	99.0%	92.0%	96.4%	97.2%	97.8%	0.4%	92.0%	96.5%	91.5%
Wales	96.3%	78.2%	96.3%	94.6%	94.5%	98.3%	97.6%	12.0%	94.6%	96.0%	91.9%
Northern Ireland	94.8%	92.1%	94.8%	91.3%	91.3%	99.6%	99.7%	0.0%	91.4%	99.3%	73.8%
Source: York Aviation analysis of CAA, ONS, Pooley's, Aerodata, BGA.											

6.31 In **Table 6.3** we have considered how the network's population coverage would be affected if all the airfields on the GAAC's 'at risk' list were to close. Clearly, this is a hypothetical example but it does provide some illustration of how the network could be affected by future closures.

6.32 The results are interesting in that there is very little change in coverage in most cases. This suggests that the common perception that there is a degree of oversupply in the market currently is correct. In other words, most of the time, if an airfield is lost there is another with a similar level of capability nearby that can substitute. Of course, it should be recognised that our measure of network performance is a relatively blunt measure and any change should be looked at more closely but it does help to demonstrate that there is significant resilience in the network at present.

6.33 The exception to this finding is for Business Aviation – Complex aircraft. In this case, there is a drop in coverage as airfields are closed of around 0.6%. This reflects the generally more stringent runway requirements of this group (longer runways and hard surfaces), which are ultimately in shorter supply around the country. Given that this group is the core driver of the economic value of GA, this level of impact would potentially be a concern.

6.34 Overall, we believe that examining the performance of the network as a whole in this way helps to provide a strategic view of its functioning. Moving forward, a starting point for anyone considering the impact of a change on the UK’s strategic network of airfields should be to examine the effect in this way. If the change in question results in a significant reduction in network performance then there must be concerns as to whether this will affect the overall ability of the network to support the economic value that GA brings to the UK economy.

Table 6.3: Percentage of the Population that is able to Access a Capable Airfield within 35 miles by GA Sub-Sector in 2030 with GAAC At Risk Airfields Removed

	Business - Light	Business - Complex	Business - Helicopters	Leisure - Fixed Wing	Leisure - Helicopters	Leisure - Gliding	Leisure - Microlights	Leisure - Hang-Gliding & Parascending	Leisure - Parachuting	Leisure - Balloons	Leisure - Other
UK	99.5%	94.4%	99.5%	98.9%	99.2%	99.7%	99.7%	57.6%	98.9%	99.4%	98.2%
North East	100.0%	97.8%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%
North West	99.1%	94.2%	99.1%	99.8%	99.8%	100.0%	99.8%	91.9%	99.8%	98.6%	98.3%
Yorkshire & the Humber	99.7%	95.4%	99.7%	99.7%	99.7%	99.9%	99.9%	42.7%	99.7%	99.9%	99.5%
East Midlands	100.0%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	29.7%	100.0%	100.0%	100.0%
West Midlands	100.0%	96.7%	100.0%	100.0%	100.0%	100.0%	100.0%	19.6%	100.0%	100.0%	100.0%
East of England	100.0%	99.8%	100.0%	100.0%	100.0%	100.0%	100.0%	76.1%	100.0%	100.0%	100.0%
London	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
South East	100.0%	89.9%	100.0%	100.0%	100.0%	100.0%	100.0%	93.6%	100.0%	100.0%	100.0%
South West	100.0%	92.3%	100.0%	100.0%	100.0%	100.0%	100.0%	60.6%	100.0%	100.0%	100.0%
Scotland	98.8%	88.1%	99.0%	92.0%	96.4%	97.2%	97.8%	0.4%	92.0%	96.5%	91.5%
Wales	96.3%	78.2%	96.3%	94.6%	94.5%	98.3%	97.6%	12.0%	94.6%	96.0%	91.9%
Northern Ireland	94.8%	92.1%	94.8%	91.3%	91.3%	99.6%	99.7%	0.0%	91.4%	99.3%	73.8%

Source: York Aviation analysis of CAA, ONS, Pooley’s, Aerodata, BGA.

6.35 In addition to considering access to airfields as whole, we have also considered accessibility for the UK population to training for GA activities. Based on the information provided to us by GAAC on the locations of training facilities in the UK, we have identified the following current service levels:

- ➔ 83.4% of the UK population is within 35 miles of a general training facility of some form;
- ➔ 24.1% of the UK population is within 35 miles of a training facility for microlight flying;
- ➔ 71.1% of the UK population is within 35 miles of a training facility for gliding.



6.36 Again, in terms of moving forward, we believe that changes to the network should be considered in the context of how these current service levels for training are affected. Clearly, training is an essential feature for the GA market in the UK. Changes that significantly affect these service levels need to be examined with particular care and should potentially raise concerns. There is, however, an additional factor in considering access to training compared to access to airfields. Training operations are potentially mobile and could possibly move location if their existing base were closed. Hence, in the event of considering a real situation further analysis will be required to examine the likelihood of the operation moving to another airfield and hence what the net effect on coverage of the UK population would be.

Assessing the Contribution of Individual Airfields to the Network – Quantitative Approach

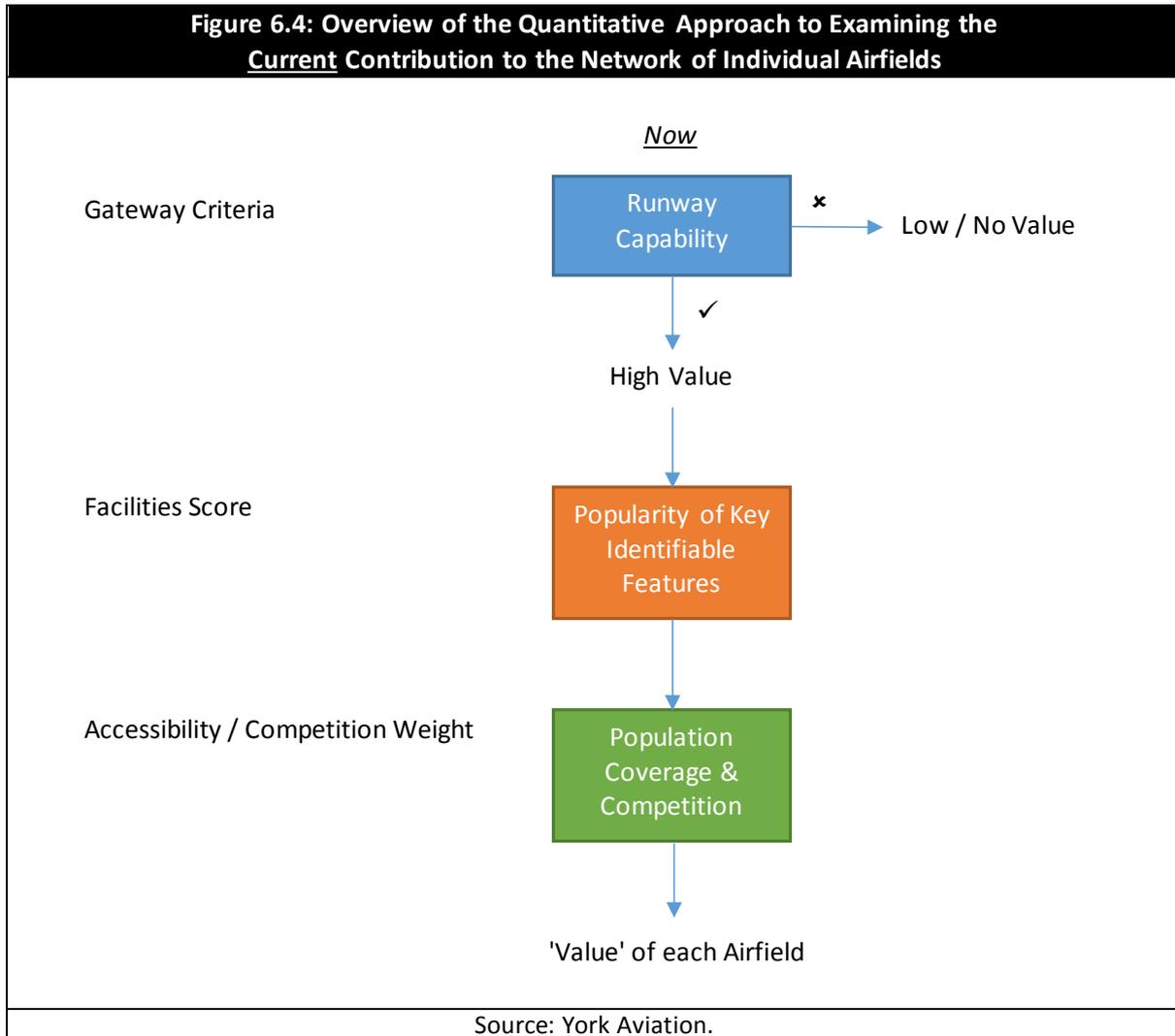
6.37 The approach above provides a view on the performance of the UK GA airfield network as a whole. However, as described, this is a relatively blunt instrument and in the light of potential changes to the network it may also be helpful to consider the contribution of individual airfields to the network.

6.38 We would again emphasise that this is a highly complex exercise that is reliant on the limited, consistent data that is available on GA airfields and their usage. We have, therefore, defined a quantitative approach that builds on the data available to us and described above. We believe this approach to be the most objective way of assessing the value of an individual airfield to the network but fully accept that there are limitations to its effectiveness stemming from the level, consistency and quality of the data available. Nevertheless, we believe it provides a useful guide. Given this position, we have also identified a number of more qualitative criteria that could be examined when analysing the contribution of an individual airfield. These are set out below.

6.39 Our quantitative assessment follows an essentially three stage approach to considering each airfield as it stands now. In terms of considering the future potential contribution of an airfield a simplified approach is recommended for reasons we explain below. The three stage approach for considering current contribution is summarised in **Figure 6.4** below.

6.40 The same process is used to consider each airfield for each different GA sub-sector. A total 'score' for an airfield is also produced based on a weighted average of the scores for individual sub-sectors based on the economic contributions of the individual sub-sectors as described in Section 4.

6.41 The assessment of each airfield starts with a gate criterion. This gate criteria is designed to assess whether the airfield is likely to be suitable for use by the given GA sub-sector. This is determined in the same way as assessing whether an airfield is capable of handling the relevant GA sub-sector in our approach to considering the performance of the network as a whole. In other words, the airfield must offer a suitable runway in terms of length and surface or it must be identified as a specialist site either by Pooley's or a representative organisation. If this gate criteria is met then the airfield moves on the scoring process. If it does not meet the gate criteria the assessment for the relevant sub-sector goes no further as the airfield is assumed to have limited or no value for the sub-sector.



6.42 The process then moves on to score the facilities that are available at a given airfield. As we have described above, the data on facilities that is available is in reality fairly limited but we have been able to select a number facilities that are generally important to most forms of GA flying and for which we have been able to identify information from Pooley's or other sources. The features that are scored are as follows:

- whether or not relevant training is available at the airfield;
- whether there is maintenance available on site;
- whether there is fuel available on site;
- whether customs services are available or can be arranged;
- the type of ATC in operation, i.e. tower, information, radio or safetycom.

- 6.43 Clearly, different GA sub-sectors will value these features differently, just as runway requirements are different for different users. We have therefore again used a combination of G-INFO, Aerodata, Pooley's and the airfields database to analyse how important these features appear to be to different user groups. For each feature and for each sector we have identified the proportion of the UK fleet that appears to be based at airfields which the feature in question. As with all elements of this analysis, this is not a perfect approach but we do believe that it does give a revealed preference view on how much individuals are valued. The score each airfield receives if it has the relevant feature is the percentage of relevant aircraft based at airfields with the feature. If it does not have the feature or there is no data the airfield scores 0%.
- 6.44 In addition to these scores for airfield features, we have also included an additional score for airfields that are identified as specialist sites, either within Pooley's or from other sources. This specialist site score is simply a binary measure; airfields either score 0% or 100%. The intention of this additional score is to pick out the clear value of these specialist sites to the relevant parts of the GA community, as in a significant number of cases there is very little known about these sites and hence they are unlikely to develop scores on the other measures that distinguish them from other airfields.
- 6.45 The results of this analysis are set out in **Table 6.4**. Where information is either not available or where sample sizes are very small scores are said to be not available.

	Business - Light	Business - Complex	Business - Helicopters	Leisure - Fixed Wing	Leisure - Helicopters	Leisure - Gliding	Leisure - Microlights	Leisure - Hang-	Leisure - Parachuting	Leisure - Balloons	Leisure - Other
Training Facilities	6%	4%	15%	10%	8%	8%	2%	n/a	n/a	n/a	10%
Maintenance	72%	87%	86%	70%	84%	18%	42%	n/a	70%	n/a	60%
Fuel	90%	95%	96%	87%	96%	33%	72%	n/a	87%	n/a	77%
Customs Available / PNR	78%	96%	92%	71%	88%	23%	35%	n/a	n/a	n/a	47%
ATC											
Tower	46%	62%	47%	19%	28%	3%	3%	n/a	23%	n/a	7%
Information	22%	1%	15%	13%	22%	10%	8%	n/a	0%	n/a	14%
Radio	17%	6%	24%	45%	41%	21%	49%	n/a	15%	n/a	57%
Safetycom	15%	31%	13%	23%	10%	65%	39%	n/a	62%	n/a	22%
Specialist Site	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: York Aviation analysis of G-INFO, Aerodata, Pooley's, CAA and others.

- 6.46 The total unweighted score for any airfield is the total of the feature score that it achieves for the relevant GA sub-sector. This provides a basic assessment of the value of an airfield to the network. However, it does not take account of two key elements:
- the population coverage of the airfield – this is important because for it to be of value to the network it needs to be accessible to people. The more people it is accessible to the better;
 - competition – if there are a significant number of competitor airfields around the airfield in question that are able to handle traffic from the relevant GA sub-sector then the value of the airfield to the network is lower as there are alternates for people to use.

- 6.47 For this reason the basic unweighted score for each airfield for each GA sub-sector is then multiplied by the number of people that live within 35 miles of the airfield divided by the number of airfields within 35 miles that pass the gate criteria for the relevant GA sub-sector. This gives the weighted score for each airfield for each sub-sector³⁷.
- 6.48 Finally, a total score for each airfield across all GA sub-sectors is calculated by taking the individual weighted scores for each sub-sector and weighting these by the economic contribution of each GA sub-sector to the UK economy. The sum of these outputs is the total score for the airfield.
- 6.49 These final weighted scores provide an assessment of the value of each identified airfield to the network for each GA sub-sector and for the network as a whole. It should be recognised that they are of course a relative measure, that enables comparisons of value to be considered rather than an absolute economic value, but it provides a basis for considering hierarchies in the UK or within particular areas.
- 6.50 Again, it is worth re-emphasising that we recognise that this approach is not perfect but we believe it to be sensible and helpful in being able to provide guidance.
- 6.51 In looking to the future and any assessment of the potential value of individual airfields by 2030, we believe that a simpler approach is more appropriate. Our view is that consideration should only be given to the fundamental capability of the airfield (the results of the gate criteria analysis) rather than a consideration of the features of the airfield. The primary reason for this is that by 2030 features of airfields can and probably will change. Operators will react to the market and the needs of customers. Changes in the network in particular are likely to result in changes in features at other airfields as operators seek to invest and capture market share. It is not sensibly possible to predict how this will play out across the network and so it is more appropriate to focus on the key feature of airfields that will in the great majority of cases not change and ultimately defines who can use them, their runway capability.

Potential Qualitative Criteria

- 6.52 Ultimately, some element of judgement may also be required in determining the value of an individual airfield compared with an alternative use. In addition to the quantifiable criteria we have set out above, there are a number of non-quantifiable criteria that should be borne in mind when evaluating any particular airfield.

³⁷ It should be noted that this approach to weighting can cause some problems in relation to the scoring of airports located on islands, for instance in the Scottish Islands or on the Channel Islands, the Isle of Man or the Isles of Scilly, or in very remote areas. The reason for this is that the population base in these areas is often either very low as a large amount of their catchments are in the sea or unpopulated, or statistics are not collected by the Office for National Statistics. However, clearly, these airfields have a significant value for the communities they serve in terms of accessibility. Some consideration was given to adding an 'island score' but this was ultimately rejected as being disproportionate to the number of airfields involved. Instead, in our view, considerations in relation to any issues around island or isolated airfields should simply take into account the unique circumstances at play here.



Viability

- 6.53 Financial viability is a critical issue for many smaller GA airfields and has in some cases contributed to the pressure on owners to consider alternative uses. We consider later in this report some of the specific issues relating, for example, to tax and business rates, which can contribute to the financial pressures faced by GA airfields.
- 6.54 However, it is not possible to assess the financial position of each airfield at any given time, which would in any case involve confidential information and would also change over time. For this reason, the financial viability of an airfield could only be considered on a case by case basis if a particular airfield were under threat of closure.
- 6.55 We would also urge caution when considering using commercial viability as a criteria when considering an airfield's role in relation to the broader strategic network. Simply because an airfield is not commercially viable does not necessarily mean it is not strategically important. It is quite possible that an airfield could cover an area where there are few others or have features that would be hard to replace elsewhere or have significant future potential but be unable to generate a commercial return.

Hangarage

- 6.56 The ability of aircraft owners to hangar their aircraft can be an important consideration for users in terms of the value they may ascribe to using a particular airfield. We are also aware of the shortage of hangar capacity at airfields in some parts of the country and that the cost of using hangars can rise in relation to how far from London an airfield is located.
- 6.57 We would have liked this to be included as a quantifiable criterion, but there is no reliable source of data as to the availability and price of hangarage at GA airfields, without contacting each airfield individually. And given that the availability and cost of hangarage is always changing, such research would quickly become out of date. Pooleys does indicate whether hangarage is available for given airfields, but this seems to relate to whether hangars exist at the airfield in question rather than the current availability of space within them.

Specialised Engineering

- 6.58 Basic aircraft maintenance is often available at GA airfields and this is one of the quantifiable criteria that we have used in the assessment above, based on information in Pooleys. However, Pooleys does not indicate what type of maintenance is available. Some users will require specialised maintenance from time to time, perhaps relating to a particular type of aircraft or to some particular aspect of the aircraft, such as avionics or navigation/radio communications.

Emergency Services Use

- 6.59 The extent to which an airfield is used by the emergency services, such as Air Ambulances and Police Helicopters, or the use of an airfield for the purposes for transporting medical supplies or to transfer people to hospital by air in life threatening circumstances, should be taken into consideration. In consultation with the National Police Air Service (NPAS) we were told that the geographical spread of aerodromes available to their aircraft is an important criterion, and that they often drop into smaller airfields to uplift fuel during operations.

Heritage Value

- 6.60 There are a number of airfields around the UK that either have some heritage value in their own right, or else provide special facilities for heritage aircraft and their operations and maintenance.
- 6.61 An example of an airfield with important heritage value might be Barton Airport in Manchester (now City Airport and Heliport) which was the first municipal airfield in the UK to be licensed by the Air Ministry and the iconic Control Tower is a Grade II listed building. There are many examples of airfields that cater for heritage aircraft, but one would be Old Warden Airfield in Bedfordshire, which is a privately owned unlicensed airfield accommodating the Shuttleworth Collection of vintage aircraft and cars.
- 6.62 Many airfields also have associated museums. An example would be the Allied Air Forces Memorial and Yorkshire Air Museum at Elvington Airfield. Although the airfield itself has very limited facilities, the museum is the largest independent air museum in the UK with over 100,000 visitors each year and is home to over 50 iconic aircraft, as well as hosting educational and corporate events.

Community Engagement and Education

- 6.63 Many GA airfields have close ties with their local communities and proactively promote interaction with them. These ties can take numerous forms from simply 'watching the planes' on a sunny afternoon from a café or viewing area, to links with local educational and training establishments and hosting of corporate events.
- 6.64 The way in which an airfield interacts with local schools and educational establishments can be particularly valuable in terms of, for example, providing training, work experience, and apprenticeships for local students, especially in STEM³⁸ related subjects. Air Cadet and Scout units are also sometimes accommodated on airfield sites.
- 6.65 Many airfields host air shows on a regular basis, which provide an opportunity for local people to gain an insight into the way the airfield works and also provide commercial and marketing opportunities to local businesses.

Environment

- 6.66 Airfields by their nature tend to be large open spaces, often in Green Belt, which can provide local visual amenity and a number of environmental and wildlife benefits in terms of habitat or greenspace, or sometimes agricultural cultivation of outlying airfield land.

Surface access

- 6.67 The extent to which an airfield might be providing alternative means of access to areas of the country where surface access connections are limited may also be a consideration. Although we have factored in the proximity of airfields in our database to centres of population in our quantitative criteria, the extent of good surface transport connectivity is an additional consideration.

³⁸ Science, Technology, Engineering, and Mathematics.



Non-Aviation activity

- 6.68 Many airfields have associated land and property or even business parks which serve non-aviation related businesses, as well as aviation related and supply chain businesses. Quite often these businesses are SMEs. Property rental income from such activity is often a critical component of an airfield's viability. The implications for such businesses, if alternative uses for the airfield site are being considered, should be taken into account.
- 6.69 Airfields are also used for non-aviation activities such as motor vehicle testing and driving instruction/tuition, sometimes undertaken by the emergency services.

7 OPTIONS FOR MAINTAINING A DATABASE IN THE LONGER TERM

- 7.1 In this section, we consider how the database of airfields that has been developed through this project could be maintained and enhanced in the longer term.
- 7.2 As we have highlighted throughout this report, data of any sort in relation to GA is a significant challenge. This was an issue highlighted in our 2015 report on the economic value of GA and the situation remains the same and in some areas is worse.
- 7.3 There is simply no central organisation or agency with responsibility in relation to the full range of GA activities and certainly none with a remit to collect significant amounts of data. It should also be recognised that the sector is one that is in many ways 'self-regulated' in some areas. The result is that data is limited, sporadic, inconsistent, partial and held by many different individuals and organisations. Data on GA airfields is no exception to this rule. Ultimately, this means that maintaining and enhancing the database that has been developed is a significant ongoing challenge.
- 7.4 The database as it stands now should also be recognised for what it is. It is substantially more complete than anything previously available in terms of bringing together information from a wide range of sources but equally it is far from a definitive view, despite a considerable amount of time and resource being put into its development. The data within it has been subject to sample quality checks and where clear uncertainties have been identified further investigation has been made using a range of sources. However, the entry for each and every airfield has not been checked. We have little doubt that there are airfields missing from the dataset, airfields that are inactive within it and potentially duplicates where different names have been used in different original sources (although this has been addressed to a significant degree). In terms of airfield features, there are significant numbers where no data is available at present and we have limited ability to ascertain the quality of the underlying data. Nevertheless, the database is a significant step forward in understanding the network, its features, how it functions and its performance.
- 7.5 If the database is to remain live and relevant and be useful in making strategic decisions about airfields in the UK it needs to be enhanced and maintained. This means 'ownership'³⁹ needs to be passed to an agency that is capable of taking it forward. In our view, this agency needs to have a number of key features:
- have an active interest in the UK airfield network and, ideally, work with the network or communicate with its users on a daily / very regular basis;
 - have staff with the technical skills to deal with the complexities of the database and ultimately enhance its functionality over time;
 - have the capacity and resource to devote time to the maintenance and enhancement of the database;
 - have the resourcefulness to actively seek out, access and manipulate new sources of information, bearing in mind that most sources will not actually be specifically designed to give the relevant information in a format that is useful and analysis friendly;

³⁹ In the sense of responsibility for rather than actual possession of the data.



- be able to develop a full understanding of the performance measures and scoring systems that underlie our approach to assessing the network and individual airfields such that more data can be collected intelligently and efficiently and integrated.

7.6 There are a number of potential options but it is probably a fair assessment to say that none is ideally positioned:

- DfT – the Department could take on the role internally. It would fulfil many of the criteria above but, in our view, it is unlikely to have staff that are sufficiently close to the airfield network on a day to day basis to consistently pick up changes;
- CAA – responsibility could be passed to the CAA to maintain the database. Again, it would fulfil many of the potential required features but its interaction with the full range of the network on a regular basis may not be sufficient;
- York Aviation or a similar consultancy – a company such as York Aviation would be able to fulfil the technical requirements and would be able to access new sources effectively but, again, its day to day contact with the GA airfield network is probably not sufficient to keep the database live. It should also be recognised that consultancy time is relatively expensive;
- Sky Demon, Pooley’s or similar – these companies have a very specific interest in the airfield network and hence would be able to ensure that the database remained as close to live as possible. They would also have an area of mutual interest in terms of collecting and collating new data both in terms of actual airfields but also in terms of their features. The greater question here is around capacity, resource and willingness. This is not something that it is possible to judge at present. Engaging with one of these organisations would also potentially be expensive.

7.7 A further option would be to seek to develop a more ‘distributed ownership’ model and engage with the GA community via the representative organisations to maintain and enhance the database. This might involve making the database available to interested parties so that they can check the existing data and add in new data where information is currently not known. There would need to be a central point to act as a data controller through which changes would need to pass to ensure that they are valid but this role would likely be relatively low intensity. The data controller role could be played by any of the organisations above.

7.8 In our view there are probably two viable ways forward to explore. The first would be seeking to engage with Sky Demon or Pooley’s or similar to provide a complete service around the database and the second would be to explore further the distributed ownership model. This would involve examining what would be needed from a technical point of view and also then perhaps having preliminary discussions with GAAC, LAA, AOPA, GAIN and others in relation to how they or their members might participate in such a process.

8 RELATED ISSUES

Introduction

- 8.1 In this section, we set out a number of related issues that were raised by various sections of the GA community in the course of our consultations. Some of these related issues are quite complex and were not specifically part of the brief for this study. We do not therefore explore them in great depth in this report, except to point out that they may have indirect implications for the robustness of the strategic network and how it can be supported in the future.
- 8.2 We are grateful to the General Aviation Awareness Council and the UK Regional and Business Airports Group, who have provided us with some supporting information in relation to many of these issues.

Airspace

- 8.3 The issue of airspace, as it relates to general aviation use, was raised on numerous occasions during our consultations. One of the major concerns was the application by some airfields for the introduction of controlled airspace in their vicinity. Whilst we do not take a view in this report on the merits of otherwise of such applications, the GA community is keen to ensure that airspace policy facilitates wherever possible the smooth passage of GA aircraft from one point to another or from one airfield to another. Clearly, the value of a strategic network of airfields would be diminished if the airspace around and between these airfields becomes increasingly difficult to use.
- 8.4 The detailed issues relating to airspace are many and sometimes technically complex and we do not aim to explore them in depth here. However, we note that the All-Party Parliamentary Group on General Aviation (APPG GA) is addressing these issues through its Airspace Sub-Group, which has already set out a programme of work.

Aerodrome Safeguarding

- 8.5 The safeguarding of aerodromes is not primarily about preserving their existence in the face of alternative use proposals but is related to ensuring that operations are not affected by neighbouring developments, which could interfere with navigational aids or distract pilots.
- 8.6 A process of consultation between a local planning authority, made obligatory by statutory direction, safeguards some aerodromes, but currently only 29 aerodromes in England and Wales and 12 in Scotland are 'officially' safeguarded in this way. Other aerodromes can be 'unofficially' safeguarded by private consultation with the local planning authority.
- 8.7 The APPG GA has called for official safeguarding status to be accorded to all licensed aerodromes in the UK.

Related Planning Issues

- 8.8 Current planning policy relating to the status of GA airfields as 'brownfield' sites remains unclear and needs to be clearly set out. Airfields had been previously specifically exempted from brownfield status given that they are generally large areas of greenspace.



8.9 Planning policy also needs to recognise the potential value of new kinds of aerodromes that might be located within an urban environment to service future drone technology. Such sites have sometimes been referred to as ‘vertiports’, where electrical vertical take-off and landing (eVTOL) aircraft could bring far-reaching changes to our cities and our lives within the next 10 years or so. Benefits could include less traffic congestion and cleaner air and such sites could in future form an important component of the strategic network.

Airfield Viability

8.10 We have mentioned airfield viability earlier in Section 6 of this report as a non-quantifiable criterion, which should be borne in mind when considering the position of an individual airfield within the network. It is often the difficulty of maintaining viability that leads smaller GA airfields to consider alternative uses. Our consultation raised a number of points that are worth considering in relation to the viability of airfields:

- Permitted Development - an airport operator whose annual turnover at the airport exceeded £1m in at least two of the last three financial years may apply Permitted Development (PD) rights, which negate the need for formal planning permission to develop ‘operational buildings’ in connection with the provision of aviation related services and facilities, although non-operational buildings, runways and passenger terminals still have to go through the normal planning process. Many airfields consider the use of PD rights as crucially important to the viability of their business and making the threshold for qualification lower than the current £1m turnover and widening the definition of ‘operational buildings’, could facilitate the continued viability of some airfields;
- Business Rates - the GA community pointed out to us that often the business rates charged to the owners of small GA aerodromes are disproportionate to their profitability. Rates valuations should be proportionate to the actual activity on the site rather than theoretical activity that could take place there;
- Taxation - the APPG GA has set up a sub-group to consider issues relating to taxation that could affect the GA sector and by implication the viability of airfields.

Conclusion

8.11 Whilst the above does not form a comprehensive analysis of all the related issue that could potentially affect the strategic network of aerodromes, it serves to flag up a number of issues that could impinge on the network’s strength and which Government may wish to bear in mind when considering network related issues.

9 CONCLUSIONS

- 9.1 GA continues to be a significant contributor to the UK economy and the airfields that support this activity are an essential element of the supply chain. Increasingly these airfields are coming under pressure from housing development across the UK. To a significant degree this probably reflects the workings of a market economy and ultimately the market needs to find an equilibrium between the supply of airfields and the supply of housing.
- 9.2 Defining a strategic network of GA airfields is a highly complex issue. There are in reality a number of networks within the UK serving different GA sub-sectors, which have different features and needs. This issue is further complicated by the fact that the performance of the network is not ultimately about individual airports but about the functioning of the whole in terms of its ability to provide access to GA services at capable airfields.
- 9.3 The economic impact of GA flying in the UK is estimated currently to be around £1.1 billion, while the wider benefits associated with business aviation are estimated to be currently around £0.9 billion. In real terms, the value of flying has fallen slightly. While business aviation appears to have grown, this appears to have been offset by a decline in leisure flying. Wider benefits have grown in real terms with the increase in business aviation activity. Overall, Business Aviation remains the largest driver of economic value from the GA sector by some margin.
- 9.4 We have concluded that defining the network in terms of a list of airfields is challenging. Given that the network functions as an entity and the value of any airfield is dependent on what is around it. It should also be recognised that any assessment is really only capable of providing a snapshot at a point in time. The GA market will evolve and the balance between user groups will change, technology will change the nature of GA flying and the actual network of airfields will change and the facilities offered by individual airfields will react to the market.
- 9.5 We have set out two approaches to assessing the network of GA airfields, one that focusses on the performance of the network as a whole, which considers the coverage of the population by the network for different GA services, and an approach that considers the contribution of individual airfields to the network, which assesses fundamental capability, the facilities on offer, population coverage and competition. It should be recognised that these approaches are to a significant degree a function of the data that is available. They are not perfect but we believe that they offer an objective and effective way forward. The calculations for these approaches are set out in the accompanying databases.
- 9.6 Maintaining the databases moving forward represents a considerable challenge. In our view there are two possible ways forward that should be explored further. The first is to engage with SkyDemon and Pooley's around whether they might be able to take on the upkeep of the database. The second is to examine the potential for a more distributed ownership model, using a central data controller with the GA community actually involved in enhancing and updating the database.

10 APPENDIX A: GA REPRESENTATIVE ORGANISATIONS APPROACHED

- Air League, The
- Airfield Operators Group
- Airport Operators Association
- All-Party Parliamentary Group on General Aviation
- Aircraft Owners & Pilots Association
- Association of Air Ambulances
- Association of Remotely Piloted Aircraft Systems
- British Aerobatic Association
- British Association of Balloon Operators
- British Aviation Preservation Council
- British Balloon and Airship Club
- British Business & General Aviation Association
- British Gliding Association
- British Hang Gliding and Paragliding Association
- British Helicopter Association
- British Medical Pilots Association
- British Microlight Aircraft Association
- British Model Flying Association
- British Parachute Association
- British Rotorcraft Association
- British Women Pilots Association
- Civil Aviation Authority General Aviation Unit
- Department for Transport
- Flying Farmers Association
- General Aviation Alliance

- General Aviation Awareness Council
- General Aviation Infrastructure Network
- General Aviation Safety Council
- Guild of Air Traffic Control Officers
- Helicopter Club of Great Britain
- Historic Aircraft Association
- Honourable Company of Air Pilots
- Light Aircraft Association
- Ministry of Defence
- National Police Air Service (NPAS)
- Pooleys
- PPL/IR Europe
- Royal Aero Club
- Royal Aeronautical Society
- SkyDemon
- Vintage Aircraft Club